Empire Wind 2 Project

Appendix I
Visual Impact Assessment

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ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

ac	acre
aMSL	above mean sea level
BLM	U.S. Bureau of Land Management
BOEM	U.S. Bureau of Ocean Energy Management
BP	BP Wind Energy North America Inc
CMP	Coastal Management Program
COP	Construction and Operations Plan
CZMP	Coastal Zone Management Program
DEM	Digital Elevation Model
dSLR	digital single lens reflex
Empire, the Applicant	Empire Offshore Wind LLC
Empire HoldCo	Empire Offshore Wind Holdings LLC
Equinor	Equinor ASA
EW 1	Empire Wind 1
EW 2	Empire Wind 2
ft	foot
GIS	Geographic Information System
GPS	global positioning system
ha	hectare
HVAC	high voltage alernating current
km	kilometer
kV	kilovolt
KOP	Key Observation Point
Lease Area	Designated Renewable Energy Lease Area OCS-A 0512
m	meter
mi	statute mile
nm	nautical mile
NAVD88	North American Vertical Datum of 1988
NJDEP	New Jersey Department of Environmental Protection
NJHPO	New Jersey State Historic Preservation Office
NOAA	National Oceanic and Atmospheric Administration
NPS	U.S. National Park Service
NRHP	U.S. National Register of Historic Places
NYDOS	New York Department of State
NYISO	New York Independent System Operator, Inc.
NYSPSC or Commission	New York State Public Service Commission
NYSDEC	New York State Department of Environmental Conservation

NYSHPO	New York State Historic Preservation Office
OCS	Outer Continental Shelf
POI	Point of interconnection at an expansion of the Barrett 138-kV Substation
NY Project	EW 2 Project transmission facilities in New York
PSL	New York Public Service Law
SASS	Scenic Areas of Statewide Significance
VIA	Visual Impact Assessment
VRM	Visual Resource Management
VSA	Visual Study Area

I.1 Introduction

Tetra Tech, Inc. was contracted by Empire Offshore Wind LLC[1] (Empire or the Applicant) to prepare a Visual Impact Assessment (VIA) in support of the development of the Empire Wind 2 (EW 2) Article VII Application. Empire proposes to construct and operate the EW 2 Project (**Figure I-1**) as one of two separate offshore wind projects to be located within the Bureau of Ocean Energy Management (BOEM) designated Renewable Energy Lease Area OCS-A 0512 (Lease Area). This assessment is being submitted to the New York State Public Service Commission (NYSPSC or Commission) for the portions of the EW 2 Project transmission system located within the State of New York (collectively the NY Project) pursuant to Article VII of the New York Public Service Law (PSL).

The NY Project will interconnect to the New York State Transmission System operated by the New York Independent System Operator, Inc. (NYISO) at the Oceanside Point of Interconnection (POI), located at an expansion of the Barrett 138-kV Substation. The Barrett 138-kV Substation is located in Oceanside in the Town of Hempstead, New York. The NY Project's onshore facilities, including the onshore export and interconnection cable routes, onshore substation, and the POI, are located entirely within Nassau County, New York.

The purpose of this VIA is to assess the potential visual effects resulting from the construction and operation of the NY Project.

BOEM will review the Construction and Operations Plan (COP) for the full offshore wind energy project (Empire Wind, including Empire Wind 1 [EW 1] and Empire Wind 2 [EW 2]). The COP for Empire Wind contains a visual analysis of all related onshore and offshore facilities. This assessment is focused on the NY Project, which is the portion of EW 2 in New York State and the subject of the Article VII Application; this assessment does not address the offshore wind farm itself. Because the offshore submarine export cables and the onshore export and interconnection cables included in the NY Project will be entirely submerged underwater or buried underground (with the exception of the portion of the interconnection cable route, which will cross Barnums Channel via a cable bridge) and therefore not visible, this VIA primarily focuses on the onshore substation in the Village of Island Park, Town of Hempstead, New York.

The VIA contained herein includes a detailed description of the NY Project components that were evaluated (Section I.2); a summary of the regulatory requirements and drivers behind the assessment conducted (Section I.3); a detailed discussion of the methods used to identify the Visual Study Area (VSA) (a 4-mi [6.4-km] buffer drawn around the aboveground onshore substation) and an inventory of visual resources potentially affected by the construction and operation of the NY Project (Section I.4); a detailed discussion of the methods used to evaluate impacts and a summary of potential effects (Section I.5); and an evaluation of potential mitigation measures applicable to the NY Project (Section I.6).

The scope and approach to the visual analysis were supported through engagement with BOEM, U.S. National Park Service (NPS), the New York State Office of Parks, Recreation and Historic Preservation in its role as New York State Historic Preservation Office (NYSHPO), the New Jersey State Historic Preservation Office

[1] Empire is a direct, wholly owned subsidiary of Empire Offshore Wind Holdings LLC (Empire HoldCo). Empire HoldCo is jointly owned by (1) an indirect, wholly owned subsidiary of Equinor ASA (collectively, Equinor); and (2) an indirect, wholly owned subsidiary of BP Wind Energy North America Inc. (BP). BP acquired ownership interest in Empire HoldCo in a transaction that closed on January 29, 2021.

(NJHPO), New Jersey Department of Environmental Protection (NJDEP), and New York State Department of Environmental Conservation (NYSDEC).

For the purposes of this VIA, the NY Project Area refers to the onshore substation and facilities discussed in Section I.2 and shown on **Figure I-1**.

Some historic resources are included as representative viewpoints and assessed as part of the VIA. A full evaluation of the potential impacts on historic resources is included in **Appendix J Analysis of Visual Effects to Historic and Architectural Properties**.

I.2 NY Project Description

This section describes the following NY Project locations and infrastructure that have been reviewed for potential visual effects, including the following:

- Three three-core 230-kV high-voltage alternating-current (HVAC) submarine export cables located within an approximately 7.7-nautical miles (nm, 14.2-km)-long submarine export cable corridor from the boundary of New York State waters 3 nm (5.6 km) offshore to the cable landfall;
- A cable landfall in the City of Long Beach, New York;
- Three 230-kV onshore export cable circuits, each with three single-core HVAC onshore export cables, buried underground within an approximately 1.5-mi (2.4-km)-long onshore export cable corridor from the cable landfall to the onshore substation;
- An onshore substation in the Village of Island Park, within the Town of Hempstead, New York, which will step up the voltage to 345-kV for the onshore interconnection cables; and
- Up to three 345-kV interconnection cable circuits, each with three single-core HVAC interconnection cables, buried underground within an approximately 1.7-mi (2.8-km)-long interconnection cable corridor from the onshore substation to the POI.

This VIA primarily focuses on the onshore substation in the Village of Island Park. The submarine export cables will be entirely submerged underwater. The onshore export cables and the interconnection cables will be entirely underground with the exception of the portion of interconnection cable route across an inland waterway (Barnums Channel) between the Village of Island Park and Oceanside, New York, which will utilize an above-water cable bridge.

Locations for the NY Project facilities are shown on **Figure I-1.**

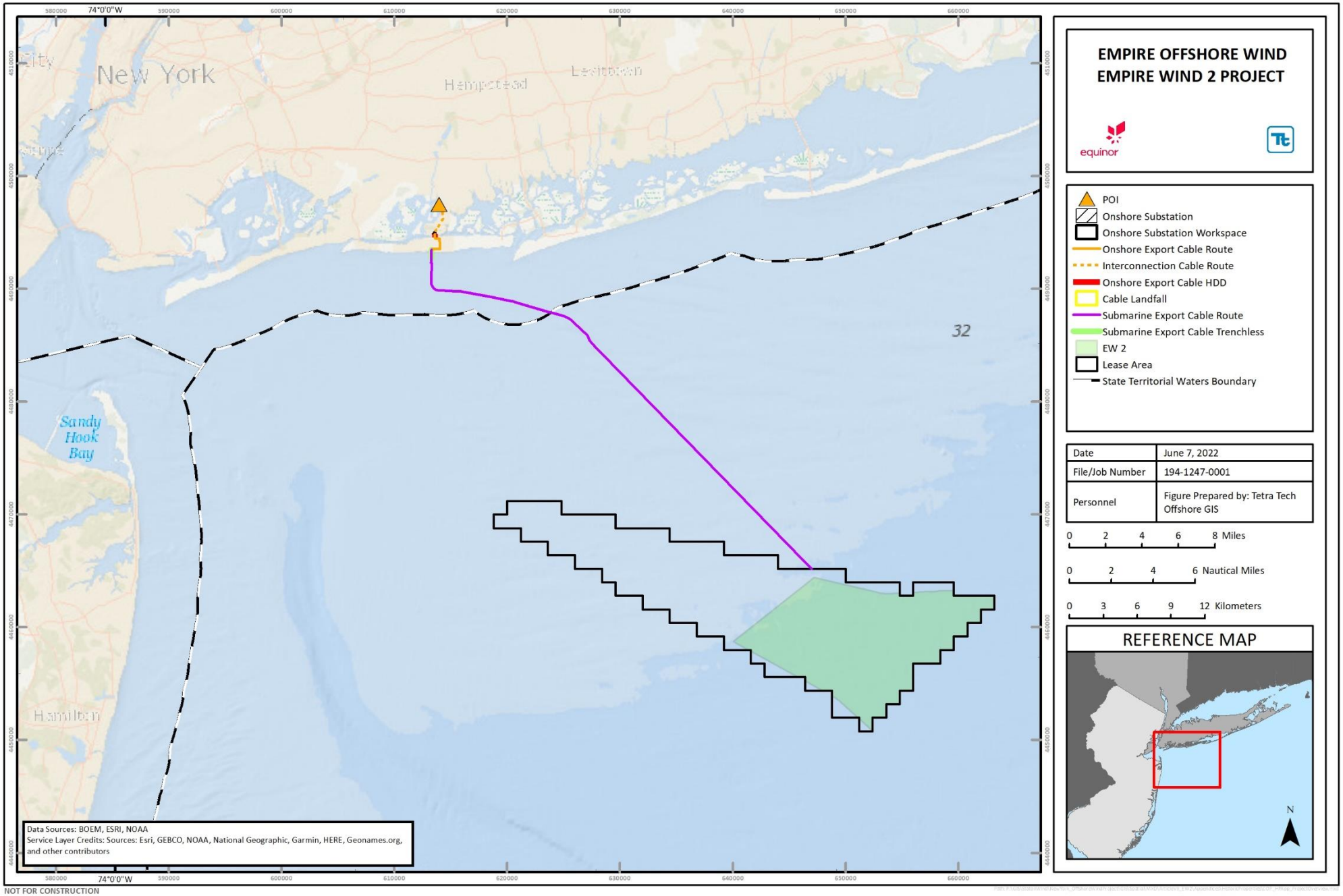


Figure I-1 EW 2 Project Overview Map

I.2.1 Substation Conceptual Layout

The onshore substation site is located on Long Island in the incorporated Village of Island Park, in Nassau County, New York. The site is located on land that is currently developed with a restaurant and storage unit buildings. The site also includes some vegetation consisting of primarily grasses, shrubs, and patches of trees. The site is bounded by Long Beach Road to the east, Reynolds Channel to the south, and the Long Island Rail Road (LIRR) to the north and west.

The onshore substation will be designed to comply with applicable state and federal building codes, local rules, electrical standards, and environmental conditions to the extent practicable[2]. For the purposes of this VIA, a conceptual onshore substation layout and design was developed. Empire is considering the development of a gas-insulated substation, which is typically designed to house certain electrical substation equipment within buildings. The design used for this assessment is based on conservative assumptions.

The onshore substation will generally contain enclosed buildings and/or walled structures that will contain various equipment, such as switchgear, control equipment, batteries, reactive compensation equipment and harmonic filters, and a designated outside area to house outdoor equipment. The onshore substation will be constructed within an approximately 5.2-ac (2.1-ha) portion of the property; the maximum height of the proposed facilities, including the site elevation and maximum building height, will be no more than 60 ft (18 m). Other outside structures will generally include:

- Outside electrical equipment including shunt reactors and transformers;
- Static masts;
- A 10-ft (3-m) high perimeter chain link security fence with a 2-ft (0.6-m) tall barbed wire extension for a total height of 12 ft (3.7 m), although other types of fencing materials are being discussed and may include, but are not limited to, mesh security fencing and anti-scalable vertical rail fencing;
- A gravel maintenance road encircling the facility just inside the perimeter security fence; and
- A minimum of one drive-through gate and one walk-through gate providing access to the site.

The size and configuration of the buildings and location of outside electrical equipment for the substation will depend on the environmental conditions and electrical constraints. The onshore substation conceptual layout used in the visual assessment is shown on **Figure I-2**.

[2] In the event that certain standards cannot be met, variances or waivers will be sought through the appropriate regulatory mechanisms. **Exhibit 7: Local Ordinances** provides additional information on waivers of local ordinances that are being sought by the Applicant.

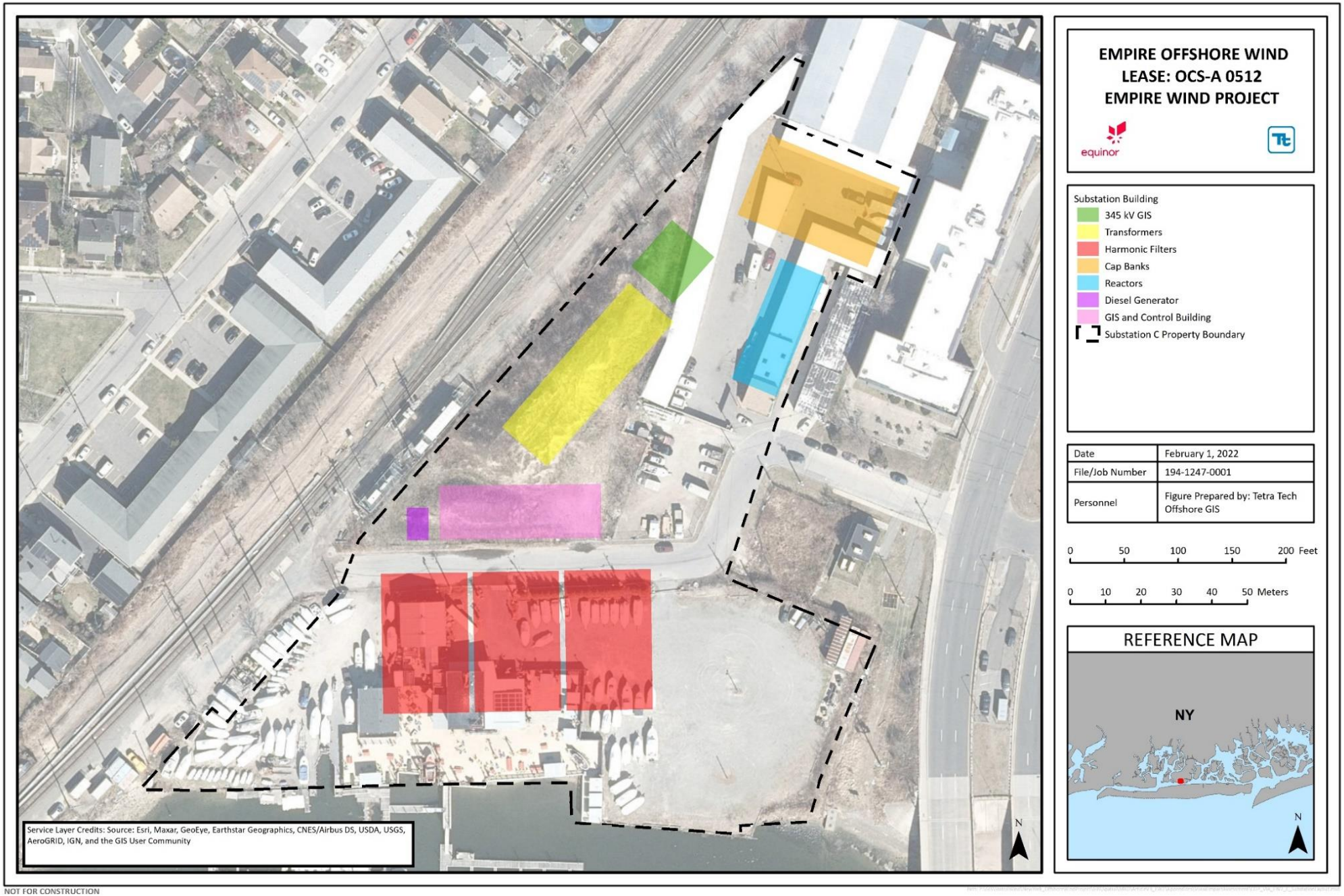


Figure I-2 Onshore Substation – Conecptual Layout

I.2.2 Cable Bridge

The cable bridge crossing is proposed to be located at Barnums Channel, adjacent to the existing LIRR rail bridge, between Long Beach Road and Daly Boulevard. The crossing is proposed to be located in an industrial and commercial area and is bordered to the east by the existing LIRR corridor, to the east and south by the E.F. Barrett Power Station, to the west by a body of water, and to the north by commercial development which includes a gas station and parking lot. An existing pedestrian bridge on the E.F. Barrett Power Station property crosses above the existing LIRR right-of-way. Vegetation is limited to the banks on either side of Barnum Channel and includes scattered short grasses. The cable bridge is in a highly urbanized area that is characterized by commercial buildings and industrial facilities.

This trenchless crossing will use up to four support columns (pile caps) located within the waterway to support the truss system, which will hold the cables above the water. These supports will include up to three 1.5-ft (0.5-m)-diameter steel pipe piles per pile cap, for a total of 12 steel pipe piles within the waterway. The cable bridge will be constructed from a prefabricated steel truss system assembled offsite and set in place, and the structure will measure up to 25 ft (7.6 m) wide and 8 ft (2.4 m) tall, and span a length of approximately 300 ft (91 m). The crossing will be located adjacent to the existing LIRR railway bridge. The structure is anticipated to have a total height of up to 15 ft (4.6 m) above MSL, similar to the adjacent railway bridge, with a maximum total height of 30 ft (9.1 m). A conceptual drawing of this cable bridge is provided in **Exhibit 5: Design Drawings**.

I.3 Regulatory Setting

Several federal and state agencies have regulatory authority over the NY Project, based on the location of the different NY Project components.

I.3.1 Federal and State

I.3.1.1 BOEM's National Environmental Policy Act Review

Assessments of visual resources are required to support BOEM's National Environmental Policy Act review process for an offshore wind energy lease. BOEM's *Guidelines for Information Requirements for a Renewable Energy Construction and Operations Plan* (BOEM 2016) indicate that the visual resource assessment should apply appropriate viewshed mapping, photographic simulations, and field inventory techniques to determine, with reasonable accuracy, the visibility of the proposed project to sensitive and scenic viewpoints. Empire is working with BOEM on the full offshore wind energy project, which includes a full COP that contains a visual analysis of the entire Empire Wind 1 and 2 Projects.

Therefore, to support the COP, Empire has coordinated with stakeholders that have an interest in visual resources, including BOEM, NPS, NYSHPO, NYSDEC, NJHPO, and NJDEP. As part of this outreach, Empire provided background information on the Empire Wind 2 Project, including the scope, as well as the methodology proposed to identify, inventory, and evaluate visual resources. Stakeholder feedback was used to inform the VSA, as well as to confirm the methodology and baseline characterization, and to inform Empire's planning and mitigation measures.

I.3.1.2 Coastal Zone Management Program

The National Coastal Zone Management Program (CZMP) was established as part of the Coastal Zone Management Act which was enacted in 1972 to address issues associated with continued growth in coastal zones (NOAA 2019). The CZMP comprehensively addresses the nation's coastal issues through a voluntary partnership between the federal government and coastal and Great Lake states and territories and provides the basis for "protecting, restoring, and responsibly developing our nation's diverse coastal communities and

resources" (NOAA 2019). Permitting systems are established to control activities that affect coastal resources. Jurisdictions that oversee these permitting systems vary state-by-state but generally fall within one of two categories: state-only jurisdiction or shared state and local jurisdiction (Rath et al. 2018). New York shares permitting jurisdiction with local governments, with the New York State Coastal Management Program encouraging local communities to prepare and adopt a local waterfront revitalization program. New York State Department of State (NYSDOS) will need to confirm that the NY Project complies with the policies outlined in the New York State Coastal Management Program. **Appendix D Coastal Zone Management Consistency Statement** presents the Coastal Zone Management Consistency Statement with additional information on compliance with these policies.

I.3.1.3 New York State Department of Environmental Conservation Policy DEP-00-2

New York State Department of Environmental Conservation (NYSDEC) Policy DEP-00-2: Assessing and Mitigating Visual Impacts provides guidance for the evaluation of visual impacts of proposed projects. Per this policy, scenic and aesthetic resources of statewide significance may be derived from one or more of the following categories:

- Properties on or eligible for inclusion in the National Register of Historic Places (NRHP) or State Register of Historic Places;
- State Parks;
- New York State Heritage Areas (formerly Urban Cultural Parks);
- State Forest Preserves;
- National Wildlife Refuges, State Game Refuges, and State Wildlife Management Areas;
- National Natural Landmarks;
- Sites on the National Park System, including Recreation Areas, Seashores, and Forests;
- National or State Wild, Scenic, or Recreational Rivers;
- Sites, areas, lakes, reservoirs, or highways designated or eligible for designation as scenic;
- Scenic Areas of Statewide Significance (SASS);
- State or federally designated trails, or those proposed for designation;
- Adirondack Park Scenic Vistas;
- State Nature and Historic Preserve Areas;
- Palisades Park;
- Bond Act Properties purchased under Exceptional Scenic Beauty or Open Space Category; and
- National Heritage Areas.

The Applicant reviewed the presence of visually sensitive and aesthetic resources in the 4-mi (6.4-km) VSAfor the purposes of assessing the visual impacts and identifying Key Observation Points (KOPs). Significant aesthetic resources were identified in accordance with the NYSDEC's Program Policy DEP-00-2 (NYSDEC 2019).

I.3.1.4 New York State Coastal Management Program: Policy 24 and 25

In 1982, the New York State Coastal Management Program (CMP) was created to establish the boundaries of the coastal area within which the CMP applies, to describe the organizational structure to implement the CMP, and to provide a set of statewide policies enforceable on all state and federal agencies that manage resources and coordinate actions along the State's coastline (NYC 2019a). New York CMP Policy 24 aims to prevent the impairment of SASSs identified by the CMP (NYSDOS 2017). Policy 24 outlines evaluation methods to

determine whether a project would impact these resources and provides guidelines to comply with this policy. In this case, impairments to scenic resources are defined as:

- The irreversible modification of geologic forms;
- The destruction or removal of vegetation;
- The modification, destruction, or removal of structures, whenever the geologic forms, vegetation or structures are significant to the scenic quality of an identified resource; and
- The addition of structures, which because of siting or scale, will reduce identified views or which because of scale, form, or materials will diminish the scenic quality of an identified resource.

There are no SASSs identified within the NY Project Area. The closest SASS is located at the eastern end of Long Island, near Montauk (NYSDOS 2019).

Policy 25 aims to protect, restore, and enhance natural and human-made resources that contribute to the overall scenic quality of the coastal area (NYSDOS 2017). These resources are not identified as SASSs, though the same compliance guidelines and evaluation methods in Policy 24 apply to Policy 25.

The New York State CMP also encourages local communities to prepare and adopt local waterfront revitalization programs. These local programs provide a more detailed implementation of the State's program through local planning, zoning and review processes. There are no locally addopted waterfront revitalization programs applicable to the NY Project Area.

I.3.2 Local Land Use Plans and Guidance

Development of the onshore facilities in the NY Project Area will be guided by applicable land use plans, the substantive provisions of which will be applied by the Commission under Article VII. One land use plan with relevant guidelines and policies for visual resources was found for the NY Project Area: the Long Island South Shore Estuary Reserve Comprehensive Plan.

Originally implemented in 2001, The Long Island South Shore Estuary Reserve Comprehensive Management Plan is the result of The Long Island South Shore Estuary Reserve Act passed in 1993 creating the Long Island South Shore Estuary Reserve (Reserve). The Act also implemented the Long Island South Shore Estuary Reserve Act Council (Council) whose task was to design a Comprehensive Management Plan (CMP 2001) to protect the reserve and its inhabitants. This CMP emphasizes the importance of the Long Island South Shore Estuary Ecosystem and outlines actions necessary to preserve, protect, and enhance the natural, recreational, economic, aesthetic, and educational resources that the reserve provides. The Plan discusses various components such as implementing projects that create parks at the end of streets and in vacant lots, providing public parking, and providing benefits such as improved aesthetics and public access.

Local land use plans, including those which do not contain visual resources guidelines or policies, are discussed further in Section 4.10 of **Exhibit 4: Environmental Impacts**.

I.4 Resource Inventory

A standard inventory and assessment approach that applied certain elements of the U.S. Bureau of Land Management (BLM) Visual Resource Management (VRM) system was used for this VIA (BLM 2018), which complies with the NYC DEP-00-2 policy (NYSDEC 2019). The BLM VRM system is widely used for a variety of projects and, with some modifications, has been applied successfully to projects that do not occur on lands under the jurisdiction of the BLM.

Key steps in the methodology include establishing a study area, inventorying visual resources within that study area, identifying sensitive viewing locations and KOPs[3], conducting fieldwork to assess the existing visual character of the landscape and to inventory KOPs, creating visual simulations, and assessing impacts and mitigation. Additionally, DEP-00-2 guidance (NYSDEC 2019) provides a list of visual resources, which was searched for the NY Project.

The majority of the types of aesthetic resources of statewide significance defined in NYSDEC's Program Policy DEP-00-2 (NYSDEC 2019) are not found within the VSA. Within the VSA, there are twelve properties on or eligible for inclusion in the NRHP, five of which have potential views (these properties with potential views are discussed in **Appendix J**); one wildlife management area identified with potential views; and one scenic pier was identified with no views. Additionally, three resources of statewide or regional significance were identified, two of which have potential views; and 72 locally important resources were identified, 33 of which had no views of the NY Project. **Table I-1** illustrates the scenic and aesthetic resources of statewide significance within the VSA.

Table I-1 Scenic and Aesthetic Resources of Significance within the Visual Study Area

Site	Location	Distance to NY Project mi (km)	NY Project Visibility
Properties Listed in the National or State Register of Historic Places a/			
Barkin House	Long Beach	0.7 (1.1)	Potential Views
Cobble Villa	Long Beach	0.8 (1.3)	Potential Views
Denton Homestead	East Rockaway	3 (4.8)	No Views
Pauline Felix House	Long Beach	1 (1.6)	Potential Views
Granada Towers	Long Beach	0.6 (1)	Potential Views
Haviland-Davison Grist Mill	East Rockaway	3.3 (5.3)	No Views
House at 226 West Penn Street	Long Beach	0.9 (1.4)	No Views
House at 251 Rocklyn Avenue	Lynbrook	3.8 (6.1)	No Views
House at 474 Ocean Avenue	Lynbrook	4 (6.4)	Potential Views
US Post Office - Long Beach	Long Beach	0.6 (1)	No Views
Samuel Vaisberg House	Long Beach	0.9 (1.4)	No Views
Jones Beach State Park, Causeway and Parkway System	Freeport	3.4 (5.5)	Potential Views
State Parks			
None in Study Area			
Urban Cultural Parks (now termed the Heritage Area System)			
None in Study Area			
State Forest Preserves			
None in Study Area			
National Wildlife Refuges, State Game Refuges and State Wildlife Management Areas			
Lido Beach Wildlife Management Area	Lido Beach	2.1 (3.4)	Potential Views
National Natural Landmarks			
None in Study Area			
National Parks, Recreation Areas, Seashores, Forests			

[3] Key observation points are discussed in Section I.4.6.

Site	Location	Distance to NY Project mi (km)	NY Project Visibility
None in Study Area			
Rivers Designated as National or State Wild, Scenic, or Recreational			
None in Study Area			
A site, area, lake, reservoir or highway designated or eligible for designation as scenic			
Woodcleft Scenic Pier	Oceanside	2.2 (3.5)	No Views
Scenic Areas of Statewide Significance			
None in Study Area			
State or federally-designated trail, or one proposed for designation			
None in Study Area			
Adirondack Park Scenic Vistas			
None in Study Area			
State Nature and Historic Preserve Areas			
None in Study Area			
Palisades Park			
None in Study Area			
Bond Act Properties			
None in Study Area			
National Heritage Properties			
None in Study Area			
Other Resources of Statewide or Regional Significance b/			
Bedell Creek Tidal Wetlands Area (SCA)	Oceanside	2.3 (3.7)	No Views
Lido Beach Tidal Wetlands Area (SCA)	Lido Beach	2.3 (3.7)	Potential Views
Nike Missile Site NY-29/30	Lido Beach	2.2 (3.5)	Potential Views
Locally Important Resources b/			
Atlantic Village Lands	Atlantic Village	3.4 (5.5)	No Views
Baldwin Park	Hempstead	3 (4.8)	Potential Views
Barrett Park	Valley Stream	4 (6.4)	Potential Views
Bay County Park	Bay Park	1.7 (2.7)	Potential Views
Bistrol Park	Hempstead	2.7 (4.3)	No Views
Cedarhurst Park	Cedarhurst	3.9 (6.3)	Potential Views
Clark Street Playground	Long Beach	0.9 (1.4)	Potential Views
Department Of Recreation Campus	Long Beach	0.4 (0.6)	Potential Views
East Atlantic Town Beach	Hempstead	2.4 (3.9)	Potential Views
Georgia Avenue Park	Long Beach	2.1 (3.4)	No Views
Grant County Park	Hewlett	3.4 (5.5)	Potential Views
Hewlett Point Park	Hempstead	2.2 (3.5)	Potential Views
Kennedy Plaza	Long Beach	0.6 (1)	No Views
Leroy Conyers Park	Long Beach	0.4 (0.6)	Potential Views
Lido Beach District Park	Lido Beach	1.7 (2.7)	Potential Views

Site	Location	Distance to NY Project mi (km)	NY Project Visibility
Lido Beach Town Park	Lido Beach	2.1 (3.4)	Potential Views
Lido Beach West Town Park	Lido Beach	1.4 (2.3)	Potential Views
Long Beach City Lands	Long Beach	0.2 (0.3)	Potential Views
Long Beach Dog Run	Long Beach	0.4 (0.6)	No Views
Long Beach Park	Long Beach	0.9 (1.4)	No Views
Magnolia Playground	Long Beach	1 (1.6)	No Views
Malibu Town Park	Hempstead	3.2 (5.1)	Potential Views
Margie Street Park	Hempstead	1.9 (3)	Potential Views
Marina West Town Boat Launch	Lido Beach	3.3 (5.3)	Potential Views
Marine Nature Study Area	Hempstead	2.4 (3.9)	No Views
Mayor George Landgarf Memorial Playground	Island Park	1 (1.6)	No Views
Memorial Park	East Rockaway	3.3 (5.3)	Potential Views
Mill River Complex Park	Rockville Centre	3.7 (6)	Potential Views
Nassau Beach County Park	Lido Beach	2.5 (4)	Potential Views
North Street Park	Lawrence	3.6 (5.8)	Potential Views
Oceanside Park	Hempstead	2 (3.2)	No Views
Pacific Playground	Long Beach	1.2 (1.9)	No Views
Point Lookout Town Park	Hempstead	3.3 (5.3)	Potential Views
Reynolds Channel Esplanade	Long Beach	0.6 (1)	Potential Views
Sands At Lido Beach Town Park	Hempstead	2.4 (3.9)	Potential Views
Shell Creek Park	Island Park	0.4 (0.6)	Potential Views
Sherman Brown Park	Long Beach	0.3 (0.5)	Potential Views
Silver Lake County Park	Baldwin	4 (6.4)	Potential Views
Skateboard Park	Long Beach	0.4 (0.6)	Potential Views
Unnamed Local Park - Long Beack	East Atlantic Beach	2.3 (xx)	Potential Views
East Rockaway Recreation Center	East Rockaway	2.5 (4)	Potential Views
Veterans Memorial Park - Long Beach	Long Beach	0.4 (0.6)	Potential Views
Wrights Field	Hempstead	2.4 (xx)	No Views
Long Beach City Lands (LRMA)	Long Beach	0.2 (0.3)	Potential Views
Long Island Water Lands (LRMA)	Barnum Island, Lakeview	0.9 (1.4)	Potential Views
Parkway Dr Baldwin Harbor	Baldwin	3.7 (6)	No Views
Curtis E. Fisher West Marina Fishing Pier	Lido Beach	3.6 (5.8)	Potential Views
Inwood Beach Club	Atlantic Beach	3.6 (5.8)	No Views
Atlantic Beach Club	East Atlantic Beach	2.8 (4.5)	No Views
Neptune Boulevard Beach & Park	Long Beach	1.1 (1.8)	No Views
Atlantic Beach	Atlantic Beach	3.7 (6)	No Views

Site	Location	Distance to NY Project mi (km)	NY Project Visibility
Long Beach	Long Beach	1 (1.6)	No Views
Nickerson Beach Park	Lido Beach	2.8 (4.5)	No Views
Sands Beach Club	Lido Beach	2.4 (3.9)	Potential Views
Lido Beach	Lido Beach	2.3 (3.7)	No Views
Nickerson Beach Campgrounds	Lido Beach	3.1 (5)	No Views
Lincoln Beach Boardwalk	Long Beach	1 (1.6)	No Views
Ocean Club	Atlantic Beach	3.2 (5.1)	Potential Views
Atlantic Beach Boardwalk	Atlantic Beach	3.5 (5.6)	No Views
Clearwater Beach Club	Atlantic Beach	3.9 (6.3)	No Views
Lawrence Beach Club	East Atlantic Beach	3 (4.8)	No Views
Waterview Road Park	Barnum Island	0.2 (0.3)	No Views
Shell Harbor	Barnum Island	1.2 (1.9)	No Views
Vella's Marina	Oceanside	1.7 (2.7)	Potential Views
Harbor Isle Beach	Harbor Isle	0.5 (0.8)	No Views
Little Beach Village of Island Park	Island Park	0.5 (0.8)	No Views
Harbor Isle Marina	Harbor Isle	0.6 (1)	No Views
Boathouse Marina	Harbor Isle	0.4 (0.6)	No Views
Andy's Marine Service (Marina)	Harbor Isle	0.3 (0.5)	Potential Views
Rockaway Hunting Club	Lawrence	3 (4.8)	Potential Views
Inwood Beach Club	Atlantic Beach	3.6 (5.8)	No Views
Trinity Cemetery	Hewlett	3.6 (5.8)	No Views

Notes:
a/ Multiple locations can be found in Appendix J, Analysis of Visual Effects to Historic and Architectural Properties.

b/ These are not considered resources of statewide significance as identified in VIA Inventory of Aesthetic Resources (NYSDEC 2019), however, they are important local resources.

I.4.1 Visual Study Area (VSA)

The VSA was identified based on locations from the onshore NY Project components that would potentially be visible and noticeable to the casual observer. The "casual observer" is considered to be an observer who is not actively looking or searching for the NY Project facilities but is engaged in activities at locations with potential views of the NY Project, such as hiking, driving on a scenic road, or relaxing near the water.

A 4-mi (6.4-km) VSA was used to review potential visibility of the onshore NY Project facilities. Typically, for an onshore substation proposed in a relatively flat area that is heavily developed, such as the one proposed for the NY Project, a smaller VSA of 2 miles would be used to assess potential visibility. The use of a 4-mi (6.4-km) VSA for the NY Project was determined by the location of the onshore substation adjacent to open water and Long Beach. The use of a larger VSA captures more of the eastern and western portion of Long Beach, where visual receptors may have unobstructed views toward the NY Project across open water (i.e., Reynolds Channel).

I.4.2 Viewshed Analysis

The viewshed for the onshore substation was derived using ESRI ArcGIS Pro 2.2.0 software with the Spatial Analyst extension to process 10 m Digital Elevation Models (DEMs) based on the National Elevation Dataset. The viewshed was developed from the perimeter of the onshore substation site looking out using the tallest proposed building height of 60 ft (18 m)[4] and perimeter fencing height of 7.5 ft (2.3 m)[5] to determine areas with potential visibility. Areas with potential visibility were further evaluated to define Key Observation Points (KOPs). The site perimeter and tallest onshore building height were used for a worst case scenario, as the conceptual onshore substation layouts will most likely change (become more refined) during final design. Viewsheds run from the site perimeter provide the most conservative indication of potential visibility and were therefore used in the onshore viewshed analysis. The onshore viewshed used building footprints of Nassau County, New York and LANDFIRE existing vegetation height data to identify areas within the VSA where potential screening may be provided by buildings and vegetation. Potential visibility results based on the viewshed analysis that was conducted for the onshore substation is shown in **Figure I-3**.

[4] The use of 60 ft (18 m) building height was based on the tallest proposed building used for the conceptual substation layout.
[5] A 10-ft (3-m) high perimeter chain link security fence with a 2-ft (0.6-m) tall barbed wire extension for a total height of 12 ft (3.7 m) fence will be used; however, a 7.5 ft fencing height represented for modeling purposes.

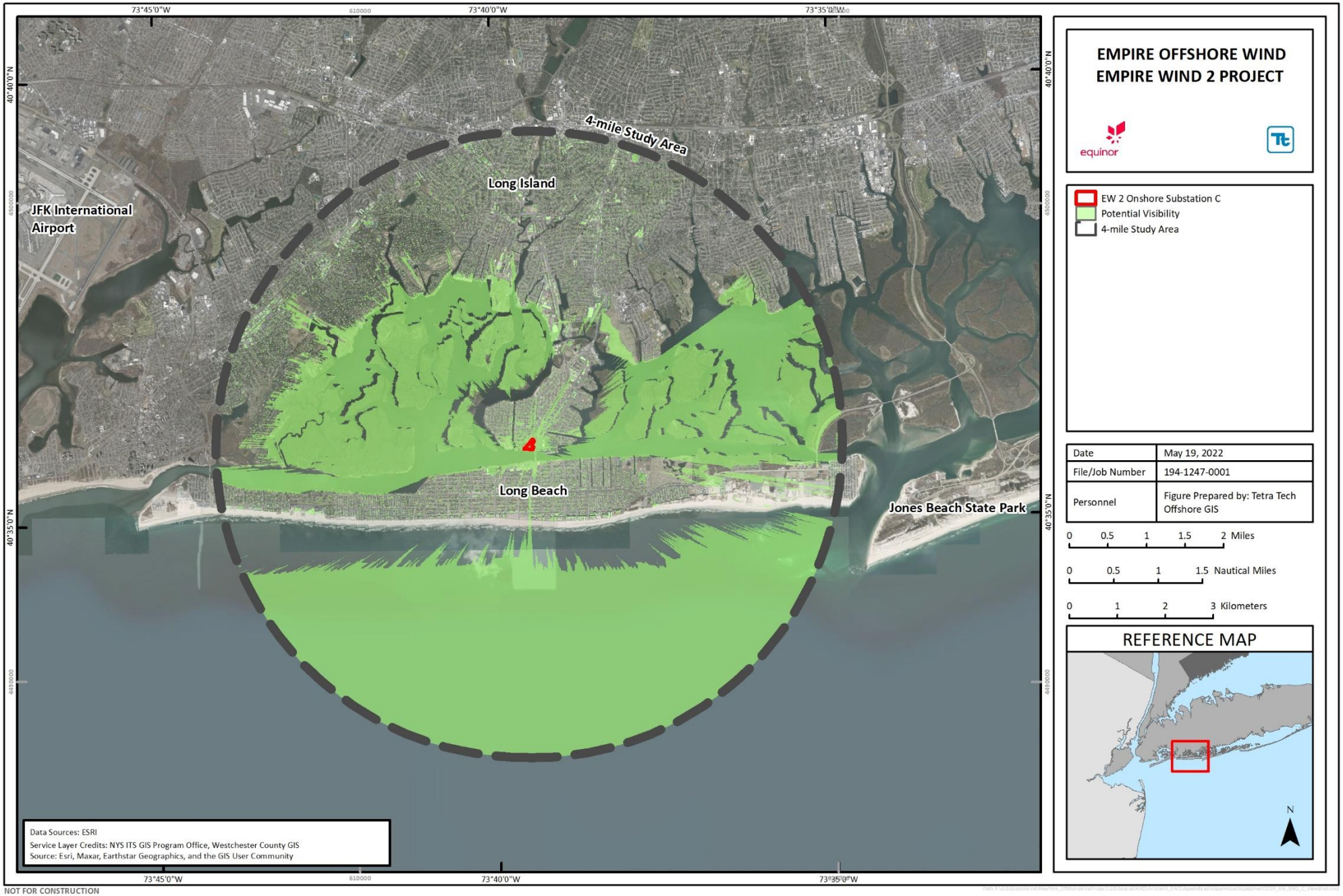


Figure I-3 Onshore Substation Conceptual Layout Refined Viewshed Analysis

I.4.3 Inventory Components

The inventory of visual resources included the existing landscape and scenery and the viewers and KOPs within the VSA. These visual components are described below.

I.4.3.1 Landscape and Scenery

Scenery is the aggregate of features that give character to the landscape (BLM 1984). Typically, every landscape comprises varying characteristics of landform, vegetation, existence of water, color, scarcity, adjacent scenery, and cultural modifications, all of which combine to exhibit landscape character (BLM 1986a). Existing conditions in the VSA were evaluated by means of aerial photography and field reconnaissance to determine where and to what extent cultural modifications have affected natural settings. Existing conditions observed during the inventory processes are described in Section I.4.3.3.

I.4.3.2 Sensitive Viewers/Key Observation Points (KOPs)

The term "sensitive viewers" refers to specific user groups associated with various land uses that have a sensitivity to landscape change, and therefore could be adversely affected by the construction and operation of the NY Project. In this regard, viewing locations are typically associated with key travel routes, recreation areas, and residential areas. KOPs represent critical or typical viewpoints within, or along, an identified viewing location and are used to assess the visual effect of a proposed project. The sensitivity of viewers at each KOP is based on the type of use and expected concern for aesthetics. Identifying groups of individuals who will likely be sensitive to visual changes is an important part of the visual assessment process and helps to define specific locations from which to assess changes to the visual character of the landscape. The inventory considered: 1) the most critical viewpoints (i.e., views from communities, residential areas, and recreational areas); 2) views from scenic areas specifically identified in local planning documents; and 3) views that best represent the general area or landscape setting.

I.4.3.3 Field Visits

A field visit to the VSA was conducted on September 2, 2021 to properly assess the existing visual character of the landscape and to inventory current conditions at a set of sensitive viewing locations. The field inventory included three components: (1) identification and photo-documentation of sensitive viewing locations; (2) classification of visual sensitivity at the locations visited; and (3) description of expected NY Project visibility from locations visited. Following the field inventory, a subset of the sensitive viewing locations was selected as representative KOPs for use in the impact evaluation.

A panorama (overlapping series of photos) was captured at each location visited in the field. **Attachment I-1 Visual Resource Inventory** provides the locational details for photographs taken during the field visit and a description of the existing views for the locations initially identified as potentially sensitive within the VSA.

I.4.4 Summary of Inventory Results

The following sections describe the existing environment in the VSA. Existing conditions were evaluated by means of aerial photography and field reconnaissance to determine where modifications have affected natural settings.

I.4.4.1 Regional Landscape Character/Existing Conditions

The existing landscape character provides the context for assessing the effects of changes to the landscape. Landscape character is identified and described by the combination of the scenic attributes that make each landscape identifiable or unique. A region's landscape character creates a sense of place and describes the visual

image of an area. To assess impacts to the landscape's visual character and quality, it is important to establish the context for the visual environment at both a regional level and at a project-specific level.

Environmental Protection Agency Level III ecoregions of New York were used to develop a description of the existing landscape character within the VSA. Ecoregions provide a convenient foundation for describing visual character at the regional level because they are defined based on multiple elements similar to those used in the BLM's VRM for inventorying and assessing scenic quality (BLM 1986a). These factors include physiographic elements of landform, vegetation, and water, and cultural modifications, defined as human-made modifications to the landscape. Level III ecoregions of New York that cross the VSA include the Atlantic Coastal Pine Barrens ecoregion. Landscape conditions within this Level III ecoregion is discussed below.

Atlantic Coastal Pine Barrens

This ecoregion is characterized by gently undulating, low-elevation coastal plain and distinguished by sandy, droughty, infertile soils, and extensive pine-oak woodlands (Woods et al. 2007). Streams occur throughout this ecoregion, which are fed by a large aquifer of fresh water supplied by precipitation. Vegetation type consists of pine-oak forests in upland areas and include pitch pines, shortleaf pines and various oak species. Low-lying areas support white cedar swamps, swamp hardwoods, pitch pine lowlands, and mineral-poor fens. Cultural modifications in this ecoregion include residential and commercial development and agriculture.

Onshore NY Project Area

The proposed onshore substation site is an approximately 5.2 ac (2.1 ha) parcel located adjacent to Long Beach Road. The POI, which will support the interconnection of the NY Project to the existing electrical grid, is north of the onshore substation. The topographic character of the NY Project Area ranges from approximately 0 ft (0 m) above mean sea level (aMSL) to 38.25 ft (11.66 m) aMSL elevation NAVD88. The proposed onshore substation parcel is currently developed with several commercial businesses. Areas that are undeveloped are vegetated primarily with low growing weeds, grasses and shrubs, and scattered trees. The onshore substation site is surrounded by buildings to the north and is located in an urban area characterized by a mixture of industrial, commercial, and residential development.

The proposed cable bridge will be located at an inland waterway crossing (Barnums Channel) between Island Park and Oceanside, New York. The crossing will be located adjacent to the existing LIRR railway bridge. An existing pedestrian bridge on the E.F. Barrett property crosses above the existing LIRR corridor. Vegetation is limited to the banks on either side of Barnum Channel and includes scattered short grasses. The proposed cable bridge location is in a highly urbanized area that is characterized by commercial buildings and industrial facilities.

I.4.5 Viewer Types and Characteristics

This section provides a general description of the key viewer groups in the VSA who might experience the visual effects of the NY Project. Distinctions among user groups and their expected sensitivity to landscape changes, based on activity types and viewing characteristics, are standard components of a VIA.

Viewer concern can vary depending on the characteristics and preferences of the viewer group. For example, residential viewers are expected to have high concern for changes in views from their residences. Motorists' concern generally depends on when and where travel occurs and the type of travel involved (e.g., commuting vs. recreational travel).

Scenic views designated in land use plans adopted by federal, state, or local government entities typically formalize a widely recognized visual value of a resource and the public's desire to protect that value (e.g., a designated wilderness or scenic area). Where such official designated lands exist, the public expectation is that

the view at the location or of the identified resource will be preserved, and the viewer concern is considered high.

In general, the types of viewers present within the VSA are classified as local residents, travelers, or tourists and recreational users. The following discussion summarizes the composition of these groups and their characteristics that are relevant to the visual assessment.

I.4.5.1 Local Residents

The local residential viewer groups consist of people who live within the VSA. Many local residents are present on a year-round basis, whereas some have permanent residences elsewhere and are seasonal residents. Generally, they view the landscape from their yards and homes, and often from places of employment while engaged in daily activities. Residents of primary interest for the analysis are located in residential neighborhoods close to the onshore NY Project components.

Residents' sensitivity to visual quality can be variable and may be tempered by the visual character and setting of their neighborhoods. For example, residents with a view of existing commercial or industrial facilities may respond differently to landscape changes associated with NY Project facilities than those with a view of open ocean or forested areas. It is assumed, however, that local residents are generally familiar with the local landscape and may be more sensitive to changes in particular views that are important to them.

I.4.5.2 Travelers

Travelers passing through an area typically view the landscape from motor vehicles on their way to work or other destinations. Travelers include daily commuters and people engaged in various types of business or personal travel.

Commuters traveling within the VSA view the landscape from motor vehicles and/or the commuter LIRR corridor on their way to work or other business destinations. Commuting activity occurs all throughout the VSA since much of the area is developed and in or near New York City, a major metropolitan area. Commuters generally do not tend to stop along their travel routes, have a relatively narrow field of view because they are focused on road and traffic conditions, and are destination oriented. Passengers in commuter vehicles would have greater opportunities for prolonged off-road views toward landscape features and, accordingly, may have greater perception of changes in the visual environment.

Through travelers are typically moving, have a relatively narrow field of view, and are destination oriented. Generally, drivers in this group are focused on driving and on the road and traffic conditions but have the opportunity to observe roadside scenery from time to time. Both drivers and passengers may have greater opportunities for prolonged views toward landscape features and may take more notice of changes in the visual environment.

I.4.5.3 Tourists and Recreational Users

This viewer group includes local and seasonal residents engaged in recreational activities, and tourists and recreational users visiting from outside of the local area. These users can be involved in outdoor recreational activities at beaches, parks and other developed recreational facilities or in undeveloped natural settings such as forests or preserves. Tourists and recreational users come to the area for the purpose of experiencing its cultural, scenic, and/or recreational resources. They may view the landscape while traveling to these destinations on local roads, LIRR, ferries, or from the sites themselves.

The recreational user group includes those involved in active recreation (e.g., bicyclists, hikers, walkers, joggers, swimmers, recreational boaters) and those involved in more passive recreational activities (e.g., lounging at the beach, picnicking, sightseeing, and wildlife observation). For some of these viewers, scenery is a very important part of their recreational experience, and recreational users often have continuous views of landscape features over relatively long periods of time. Most recreational viewers will only view the surrounding landscape from ground-level or water-level vantage points. Recreational users' sensitivity to visual quality and landscape character will be variable, depending on their reason for visiting the area. However, recreators are generally considered to have relatively high sensitivity to scenic quality and landscape character.

I.4.6 Key Observation Points

Based on the results of the field visit (see Section I.4.3.3), a total of four KOPs within the VSA were selected for detailed study. Criteria used to select KOPs for onshore NY Project components included:

- Locations representing the most critical viewpoints within the VSA (i.e., views from communities, residential areas, or recreational areas, scenic areas specifically identified in planning documents); and
- Geographic distribution representing locations closest to the onshore substation and at various distances within the VSA.

Table I-2 includes a list of KOPs within the VSA and potential visibility of the NY Project based on the results of the viewshed (see Section I.4.2). KOPs within the VSA for the onshore substation are shown in **Figure I-4**. Photographic simulations were created for four KOPs.

Table I-2 List of Key Observation Points within the Visual Study Area

Map ID Number a/	Name	Location	Resource Type	Distance to Project Site mi (km)	Project Visibility
1	Quebec Road/Residential Neighborhood	Island Park, NY	Residential/Travel Way	0.07 (0.11)	Partially Visible b/
2	Long Beach Bridge	Island Park, NY	Travel Way	0.09 (0.15)	Visible
3	Long Beach Skate Park	Long Beach, NY	Public Recreation	0.43 (0.69)	Partially Visible
4	Island Park Station	Island Park, NY	Travel Way/Residential	0.19 (0.31)	Partially Visible

Note:
a/ Map ID numbers for the EW 2 onshore substation site corresponds to the map shown on **Figure I-4**.

b/ Viewpoint is not visible from the public right-of-way (see simulations in Appendix I); however, there may be partial views from residences adjacent to the substation site.

I.4.6.1 Quebec Road/Residential Neighborhood

This KOP is located at a dead end along Quebec Road in the Village of Island Park, Nassau County, New York. This residential neighborhood is located approximately 0.07 mi (0.11 km) west of the onshore substation site (at its closest point) and is currently bounded by the Wreck Lead Channel to the south, LIRR, Pop's Seafood Shack and Grill to the east, and residential development to the north and west.

Existing View

This KOP is within the Atlantic Coastal Pine Barrens ecoregion. The landscape surrounding this location is typical of this ecoregion and is characterized by gently undulating low-elevation coastal plain with sandy, droughty, infertile soils with extensive pine-oak woodlands. Views from this location primarily include residential development in the foreground, with residential power lines extending above vegetation and fencing crisscrossing the ground. Vegetation consists of landscaping shrubs and grasses, including lawns and trees associated with residential development. Human-made modifications include residences, paved roads, and power lines. From this KOP, views east toward the onshore substation site are mostly to completely screened by foreground vegetation and topography.

View with the NY Project

This location represents residential neighborhoods and travel ways. Views toward the onshore substation site from this location will vary from mostly to completely screened by vegetation and/or residential development. From Quebec Road, views will be screened by existing development and vegetation which block views towards the proposed substation (see simulation in **Appendix I**). Based on review of aerial imagery, from residential backyards adjacent to LIRR and the substation, views are anticipated to be mostly screened by vegetation. For residential backyard viewers, the upper portions of the substation building may be visible above existing vegetation. However, the portion of the potential building that is visible will be seen in the context of residential development, power lines, and a commuter railroad line that splits the two areas. The substation at the onshore substation site will appear as a subordinate feature in the landscape setting. As such, the NY Project will introduce no to weak visual contrast in this area. Views toward the onshore substation site from residences farther west and north in the residential neighborhood are anticipated to be completely screened by residential development and will experience no visual contrast at this KOP.

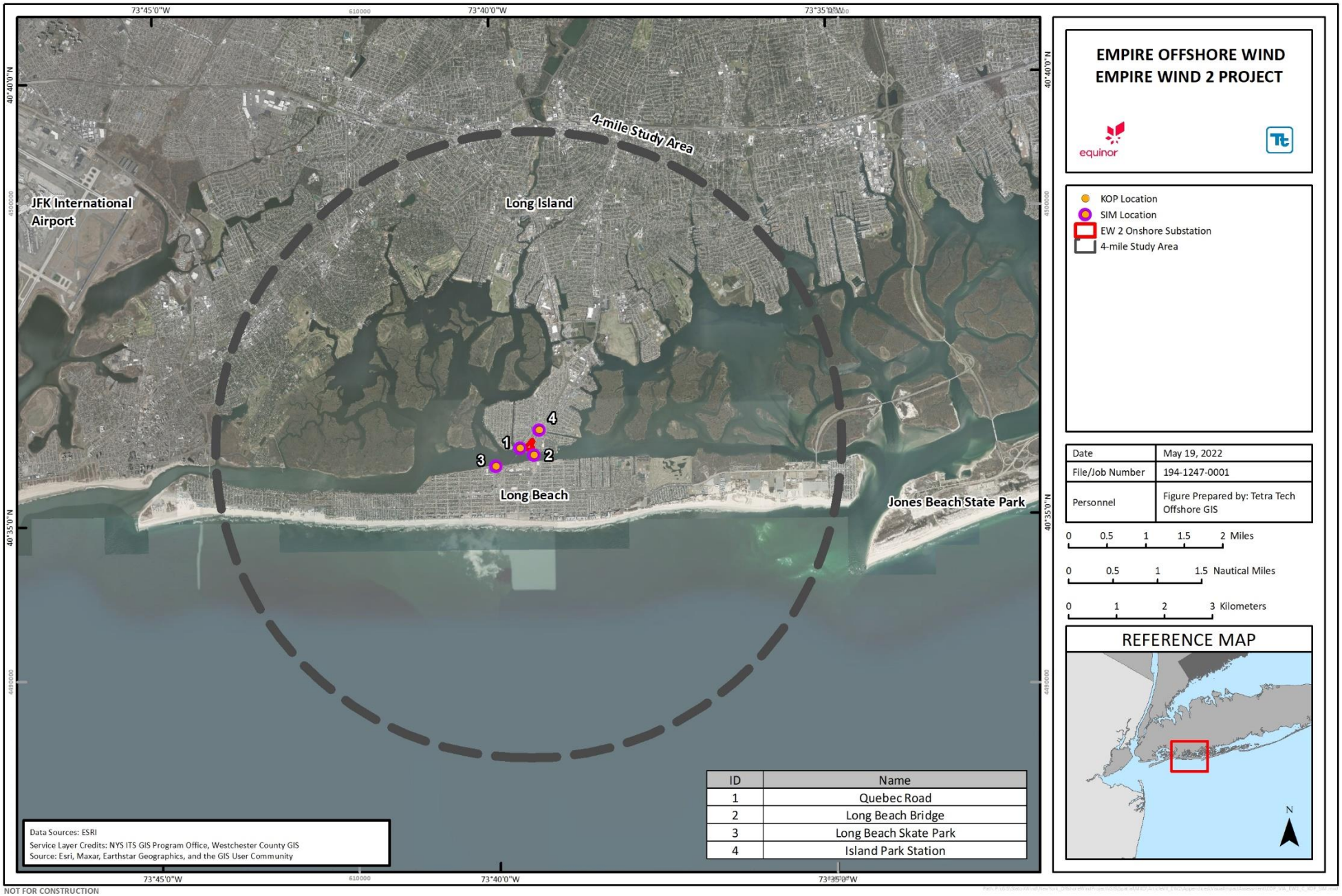


Figure I-4 Key Observation Points within the Visual Study Area

I.4.6.2 Long Beach Bridge

This KOP is located along Long Beach Boulevard at the Long Beach Bridge, which crosses the Wreck Lead Channel. This location is approximately 0.09 mi (0.15 km) east of the onshore substation and is bounded by the Channel on the east and west, Island Park, New York to the north, and Long Beach, New York to the south.

Existing View

This KOP is within the Atlantic Coastal Pine Barrens ecoregion. The landscape surrounding this location is typical of this ecoregion and is characterized by a gently undulating low-elevation coastal plain with sandy, droughty, infertile soils with extensive pine-oak woodlands. Views from this location include Wreck Lead Channel and commercial, industrial, and residential development along the shoreline of Island Park and Long Beach in the foreground/middleground; developed features include marinas, parks, and residential and commercial development along the Channel. Vegetation includes low grasses, dispersed trees mainly associated with residential development, and lawn or short grass covering the parks and commercial/industrial development.

View with the NY Project

This location represents travelers along the Long Beach Boulevard Bridge. Views toward the onshore substation site are open. The large geometric forms and light color of the proposed building will contrast with the dark green, irregular forms of the exiting vegetation. The onshore substation will be seen in the context of existing streetlights and utility lines in the foreground. Although existing structures and utilities are visible in the view, the NY Project will be a dominant feature in the view due to the proximity of the onshore substation to the viewpoint and the large scale and light color of the buildings. As such, it is anticipated that the NY Project will introduce strong visual contrast in views from the southeast.

I.4.6.3 Long Beach Skate Park

This KOP is located at the skate park in the Long Beach Park Area located adjacent to the Wreck Lead Channel west of Long Beach Boulevard in Long Beach, New York. This location is approximately 0.43 mi (0.69 km) southwest of the onshore substation and is bounded by Wreck Lead Channel to the north and recreation, residential, and industrial/commercial development to the south, east, and west.

Existing View

This KOP is within the Atlantic Coastal Pine Barrens ecoregion. The landscape surrounding this location is typical of this ecoregion and is characterized by a gently undulating low-elevation coastal plain with sandy, droughty, infertile soils with extensive pine-oak woodlands. Views from this location include Island Park and Wreck Lead Channel in the foreground and development along the shoreline and surrounding this location in the foreground/middleground; developed features include residential, park and commercial development. Vegetation includes low grasses, trees associated with residential development and lined along streets, and lawn or short grass covering the parks and commercial/industrial development.

View with the NY Project

This location represents recreational viewers associated with the skate park and other park facilities in this area, including the residential areas surrounding the park. For this view, the onshore substation buildings appear to have a similar shape and size to the existing train bridge structure which is currently dominate along the Wreck Lead Channel (see simulations in **Appendix I**). The upper three-quarters of the proposed onshore substation buildings will be visible but will be seen in the context of existing development, including the train bridge and

power lines. The onshore substation buildings will be comparable in height to the existing train bridge in the foreground. At a distance of 0.43 mi (0.69 km), the onshore substation buildings will appear as a co-dominant feature. As such, the NY Project will introduce moderate visual contrast at this KOP.

I.4.6.4 Island Park Station

This KOP is located at the Island Park Train Station in Island Park, New York located between Long Beach Road and Austin Boulevard. This location is approximately 0.19 mi (0.31 km) south of the onshore substation site and is bounded by residential homes to the north and recreation, residential, and industrial/commercial development to the south, east, and west.

Existing View

This KOP is within the Atlantic Coastal Pine Barrens ecoregion. The landscape surrounding this location is typical of this ecoregion and is characterized by a gently undulating low-elevation coastal plain with sandy, droughty, infertile soils with extensive pine-oak woodlands. Views from this location include Island Park in the foreground; developed features include residential and commercial development. Vegetation includes low sparse grasses and trees associated with commercial and residential development and lined along streets.

View with the NY Project

This location represents travelers and residential viewers associated with the train station and nearby residences. Views toward the onshore substation site are partially screened by existing buildings. The upper portion of the proposed onshore substation buildings will be visible but will be seen in the context of existing development, including the existing buildings and power lines. The onshore substation buildings will be slightly taller than the existing buildings in the foreground. At a distance of 0.19 mi (0.31 km), the onshore substation buildings at the onshore substation site will appear as a co-dominant feature. As such, the NY Project will introduce moderate visual contrast at this KOP.

I.5 Impact Analysis

I.5.1 Impact Analysis Methodology

Public enjoyment of a scenic resource is subjective and highly dependent on the viewer's perception of beauty and scenery. The addition of the NY Project facilities into a view may be detrimental to one viewer's enjoyment of a location but may have a negligible effect for a different viewer. Therefore, a process using the concept of "contrast" based on the BLM VRM system is often used to objectively measure potential changes to landscape features of inventoried sensitive resources (BLM 1986a, 1984). Concepts from the BLM VRM system are widely used for a variety of projects and, with some modifications, have been applied successfully to projects that do not occur on lands under the jurisdiction of the BLM. In the BLM VRM system, potential visual effects are assessed by considering the level of contrast the NY Project facilities introduce to the existing landscape. The BLM's visual contrast rating process (Manual 8431-1 Visual Resource Contrast Rating [BLM. 1986a]) was used as the basis for reviewing potential landscape changes resulting from the NY Project. A form adapted from the BLM's Visual Contrast Rating Worksheet (BLM Form 8400-4; **Attachment I-2**) was used to assess the degree of contrast the NY Project will introduce to the existing landscape.

I.5.1.1 Visual Contrast Rating

Assessing the degree of visual contrast is a means to evaluate the level of modification to the existing landscape features that would result from an action. In the context of the NY Project, existing landscape scenery is defined by the visual characteristics (form, line, color, and texture) associated with the landform (including water),

vegetation, and existing facilities within and adjacent to the NY Project. Descriptions of each visual character element are listed below:

- Form—The shape and mass of landforms or structures;
- Line—The edge of shapes or masses, silhouettes, or bands;
- Color—The property of reflecting light of a particular intensity of wavelength that the eye can see; and
- Texture—The nature of the surface of landforms, vegetation, or structures.

The level of visual contrast introduced by an action can be measured by changes in form, line, color, and texture. The greater the difference between these character elements found within the landscape and the NY Project components, the greater the level of visual contrast, which typically increases perceived contrast.

The degree of contrast introduced to a particular viewpoint by NY Project facilities, in combination with the sensitivity of viewers at that viewpoint, will determine the level of visual effect. The following general criteria are used by the BLM when rating the degree of contrast and are utilized here to describe the visibility/noticeability of the NY Project onshore components:

- None—The element contrast is not visible or perceived;
- Weak—The element contrast can be seen but does not attract attention;
- Moderate—The element contrast begins to attract attention and begins to dominate the characteristic landscape; and
- Strong—The element contrast demands attention, will not be overlooked, and is dominant in the landscape (BLM 1986b).

Contrast ratings were prepared for each of the KOPs using a form adapted from the BLM's Visual Contrast Rating Worksheet (Form 8400-4) and the results are included in **Attachment I-2**.

I.5.1.2 Environmental Factors Affecting NY Project Visibility

The theoretical limit of visibility is determined by the distance between the viewer and the structure, the height of the structure, the elevation of the viewer, and the curvature of the earth (BOEM 2007). However, the theoretical limit of visibility often exceeds the actual visibility or what is experienced in real life. Limits to human visual acuity also reduce the ability to discern objects at great distances. Other factors affecting the visibility include color and reflectivity of the object and the level of contrast with the visual background under varying lighting conditions (BOEM 2007). General descriptions of viewer distance, curvature of the earth and atmospheric refraction, angle of observation, and meteorological conditions are defined below.

Viewer Distance

Viewer distance from an area is a key factor in determining the level of visual effect, with perceived impact generally diminishing as distance between the viewer and the affected area increases (BOEM 2007). The BLM VRM categorizes views into foreground/middleground, background, and seldom seen distance zones. These distance zones provide a frame of reference for classifying the degree to which details of the viewed NY Project will affect visual resources.

For the onshore substation site, onshore NY Project components will be primarily within the foreground/middleground distance zone (0 to 5 mi [8 km]) for most viewers. Due to dense urban development surrounding the onshore substation site, it is anticipated that there will be no views of the onshore NY Project components in the background and seldom seen distance zones (5 mi to 15 mi [8 to 24 km] and beyond 15 mi [24 km], respectively).

Curvature of the Earth and Atmospheric Refraction

In general, objects or features that are closer to a viewer's location will appear more detailed and more dominant. As the distance from the viewing location to the object increases, less of the object will be visible. In addition, a viewer's line of sight curves downward at large distances because of the refraction of light in the Earth's atmosphere. This effectively lessens the impact of the earth's curvature on the relative height of an object.

Angle of Observation

Angle of observation refers to the angle between the viewer's line of sight and an object's location. Angles of observation are typically described as inferior (in which viewers are situated at a lower elevation than the object), level (in which viewers are at the same elevation as the object), and superior (in which viewers are situated at a higher elevation than the object).

Meteorological Conditions

Visibility can be reduced by daytime and nighttime meteorological conditions such as haze, fog, rain, snow, or a combination thereof.

I.5.1.3 Photographic Simulations

Photographic simulations (simulations) were created to depict the NY Project components and their potential changes to the existing landscape. The simulations were used to determine the level of contrast between the existing landscape and the expected landscape after the NY Project is implemented. Four KOPs were selected for development of simulations to demonstrate how the constructed NY Project will appear to future viewers, primarily those representing locations with high viewer sensitivity and high potential for impacts to existing visual resources. Simulation locations are included in **Attachment I-3**. Simulations depict actual weather conditions at the time photography was taken during the field visits.

Simulations depicting the onshore substation site were created using a general building (i.e., simple block form that is uniform in color and materials) and arrangement of outdoor electrical, internal drive and parking areas and perimeter security fence on the site. Although the onshore substation design may be refined during permitting, the simulations depicting building masses on site and general equipment arrangement show potential changes to the existing landscape and were used to determine the level of contrast between the existing landscape and the expected landscape after the NY Project is implemented using a conservative conceptual layout.

A digital single lens reflex (dSLR) camera was used to take the photographs used in the simulations. The camera was equipped with a "normal lens," which means that it most closely approximates the field of vision of the human eye. In photographs taken using this lens, the size and scale of objects in the background and foreground are depicted proportionately and are not distorted. At each photo point, a panorama, or an overlapping series of photographs, was captured. A global positioning system (GPS) device is used to record the latitude, longitude, elevation, date and time of each photo point location.

The simulations were created using geographic information system (GIS) software, Autodesk 3D Studio Max®, and rendering and Photoshop software. To create the simulations, the location data captured by the GPS device were transferred to ArcMap, where it was combined with GIS data of the preliminary layouts of NY Project components and facilities. A map showing the data was exported at true scale and imported into 3D Studio Max®. Using this scaled map as a base, 3D models of the offshore and onshore NY Project Areas were created to scale. These 3D models of the NY Project features, previously modeled to scale in 3D Studio Max®, were added in their appropriate locations and elevations. The views from the existing digital photographs were then

matched in the 3D model using virtual cameras with the same focal length and field of view as the dSLR camera setting. After date- and time-specific lighting was added to the 3D model, renderings from the virtual cameras were created. These renderings were then blended into the existing conditions photographs in Adobe Photoshop software. Any necessary modifications to the existing landscape were completed in Photoshop as well. This process of creating a 3D model at true scale and rendering images using the same specifications used by the camera ensures that the spatial relationships of the landscape, NY Project features, and viewer perspective are accurate and match the existing site photographs. Each simulation was then scaled to be viewed at a specified distance.

Simulations for onshore NY Project components are included in **Attachment I-3**.

I.5.2 Potential Effects to Visual Resources

Where visible and noticeable, the NY Project facilities have the potential to create visual effects. Sections below describe potential visual effects anticipated from the construction and operation of onshore components of the NY Project. At the end of the NY Project's operational life, it will be decommissioned in accordance with a detailed NY Project decommissioning plan that will be developed in compliance with applicable laws, regulations, and best management practices at that time.

I.5.2.1 Construction

Offshore

During construction, project-related vessels will be present within and transiting along the submarine export cable route. As vessel traffic is common along the Atlantic Coast, it is anticipated that the vessels required will not substantially increase traffic around the southern shore of Long Island. Most of the vessels used for NY Project construction will be similar in size and form to existing commercial vessels.

Short-term visual effects will occur during construction of the offshore submarine export cable corridors and will result from visual evidence of construction activities and the presence of construction equipment and work crews. Installation of the submarine export cables in nearshore waters will introduce project-related vessels relatively close to shore along the southern coast of Long Island, New York and in the areas near the cable landfall. While these vessels will be easily visible from shore, it is not uncommon to see vessel traffic in this area and it is anticipated they will not remain in any area for more than several months. Because of the relatively short duration that they will be in any single location, these project-related installation vessels are not anticipated to adversely affect visual resources.

Onshore

The onshore export and interconnection cables associated with the NY Project will be entirely underground, with the exception of the portion of the interconnection cable route, which will cross Barnums Channel via a cable bridge. During construction, short-term visual impacts will occur. Construction areas associated with underground cable installation will be restored to a condition similar to that before construction and no significant long term visual impacts are anticipated.

Short-term visual effects will occur during construction of the onshore facilities and will result from visual evidence of construction activities and the presence of construction equipment and work crews. Construction activities associated with the onshore NY Project Area will include surveying; clearing the construction site (of either pavement and/or vegetation) and linear right-of-way; stockpiling top soil; grading; forming and construction of the buildings and outdoor electrical equipment foundations; placement and erection of buildings and electrical equipment; placement of perimeter security fencing; and restoration and landscaping

installation (if required). It is anticipated that contrast will be introduced during NY Project construction primarily for viewers adjacent to the NY Project Area, where the presence of construction equipment, materials, and crews will be dominant in the foreground.

For the construction of onshore substation buildings, this includes viewers associated with commercial and industrial buildings primarily along Long Beach Road. Viewers associated with the cable bridge include commercial and industrial development in the area. However, these visual effects will be short-term because construction equipment and crews will be removed once construction is complete.

The cable bridge crossing is bordered to the east by the existing LIRR corridor, to the south by the E.F. Barrett Power Station, to the west by a body of water, and to the north by commercial development which includes a gas station and parking lot. Visibility is limited to industrial workers to the south and east, residents/travelers at the gas station, and a large waterbody to the west. Viewers that may see the cable bridge construction include commercial and industrial buildings primarily between Long Beach Road and Daly Boulevard. Additionally, LIRR commuters may see a glimpse of the bridge construction while commuting. However, these visual effects will be short-term because construction equipment and crews will be removed once construction is complete. Views of NY Project construction from areas not immediately adjacent to the cable bridge will be mostly screened by commercial or industrial buildings, vegetation and/or topography. Visual effects to these viewers will be mostly limited to seeing construction traffic on local roads and boats and/or equipment in the water.

Views of NY Project construction from areas not immediately adjacent to the onshore substation site and cable bridge will be mostly screened by residential, commercial or industrial buildings, vegetation and/or topography. Visual effects to these viewers will be mostly limited to seeing construction traffic on local roads.

Roads will be repaired and repaved post-construction. Unless paving of the entire roadway occurs, contrast in color (new vs. old paving) may be noticeable however contrast is expected to be minimal and viewers are unlikely to notice significant changes in an urban environment.

I.5.2.2 Operation and Maintenance

Long-term visual effects during operation of the onshore substation will result from the visibility of the aboveground components associated with the onshore substation buildings, outside electrical equipment, static masts, and perimeter security fence. The onshore substation buildings will introduce tall, rectangular forms and vertical and geometric structures into the landscape setting. Maintenance workers may be required to work in the onshore substation area or along the onshore export and interconnection cable corridors infrequently, which could cause some minor visual effects. Potential effects to visual resources associated with the proposed onshore substation site are described below.

The onshore substation site is located within a landscape setting that has been modified by residential, commercial, and industrial development. The footprint of the onshore substation buildings would be located in an area that is currently developed with a restaurant, other commercial buildings, and a small vacant area. Based on the results of the viewshed analysis and field visit, potential views of the onshore substation site will be primarily within the immediate vicinity of the proposed site, from the north and northeast along Long Beach Road, which is adjacent to the onshore substation site. Views to the south are partially blocked by the LIRR bridge across Reynolds Channel, Long Beach Bridge, and existing buildings and vegetation. Views to the west and north are screened by development and vegetation. From Long Beach Road near the onshore substation site, the large rectangular form and light color of the potential buildings will contrast with the dark green, irregular forms of the existing vegetation. The onshore substation buildings will be seen in the context of existing streetlights and utility lines in the foreground. Although existing structures and utilities are visible in

the view, the NY Project will be a dominant feature in the view due to the proximity of the onshore substation site to the viewpoint and the large scale and light color of the potential buildings. As such, it is anticipated that the NY Project will introduce strong visual contrast in views from the southeast.

Viewers not directly adjacent to the onshore substation site, such as in the residential neighborhood along Quebec Road located approximately 0.07 mi (0.11 km) to the west, will have views toward the NY Project that vary from mostly to completely screened by vegetation and/or residential development. Based on review of aerial imagery, from residential backyards adjacent to LIRR and the substation site, views are anticipated to be mostly screened by vegetation. For residential backyard viewers, the upper portions of the substation building may be visible above existing vegetation. However, the portion of the potential building that is visible will be seen in the context of residential development, power lines, and a commuter railroad corridor that splits the two areas. The substation buildings at the onshore substation site will appear as a subordinate feature in the landscape setting. As such, the NY Project will introduce none to weak visual contrast in this area. Views toward the onshore substation site from residences farther west and north in the residential neighborhood are anticipated to be completely screened by residential development and will experience no visual contrast.

Along the north side of Long Beach Island, west of Long Beach Boulevard and the train bridge, views toward the NY Project will vary between completely screened to partially screened by topography and vegetation. Views to the north from the south are partially blocked by the train bridge, Long Beach Bridge, and existing buildings and vegetation except immediately south of the onshore substation site. Facilities at the onshore substation site that may be visible include the upper portion of the potential building, which will be seen in the context of existing development such as power lines, streetlights, and the train bridge. At a distance of 0.43 mi (0.69 km) from the onshore substation site, although existing structures and utilities are visible in the view, the NY Project will be a co-dominant feature with the train bridge in the view due to the proximity of the site to the viewpoint and the large scale and light color of the potential buildings. As such, it is anticipated that the NY Project will introduce moderate visual contrast in views from the south.

The onshore export and interconnection cable route for the onshore substation is approximately 3.2 mi (5.1 km) long between the export cable landfall and the POI. There is no significant vegetation along the route and impacts to buildings or other structures are not anticipated, except at the onshore substation site where existing buildings will be demolished. No significant changes to the visual environment are anticipated as the route will be located underground, except at the cable bridge across Barnums Channel discussed below, and there will be no significant impacts to vegetation, no grading along the route, and the areas disturbed during construction will be restored according to state and local permit requirements. Results are discussed in detail for each KOP in Section 1.4.6. Simulations depicting the onshore substation buildings as seen from the surrounding area are included in **Attachment I-3**.

Table I-3 provides a summary of the level of contrast (i.e., strong, moderate, weak, none) for each KOP for the onshore NY Project components. Contrast Rating Worksheets for each KOP are located in **Attachment I-2**.

Table I-3 Summary of Contrast Rating of Key Observation Points for Onshore NY Project Components

Map ID Number a/	Name	Location	Distance to Project Site (mi [km])	Contrast Rating b/	Simulation Created for KOP c/
1	Quebec Road/Residential Neighborhood	Island Park, NY	0.07 (0.11)	Weak/None d/	Yes
2	Long Beach Bridge	Island Park, NY	0.09 (0.15)	Strong	Yes
3	Long Beach Skate Park	Long Beach, NY	0.43 (0.69)	Moderate	Yes
4	Island Park Station	Island Park, NY	0.19 (0.31)	Moderate	Yes

Notes:
a/ Map ID numbers correspond to the maps shown in **Figure I-4**.

b/ Visual Contrast Rating Worksheets for each KOP is included in **Attachment I-2**. Contrast Rating Worksheets for each KOP appear in the same order as they are listed in **Table I-2**.

c/ Visual simulations are included in **Attachment I-3**.

d/ Viewpoint is not visible from the public right-of-way (see simulations in Appendix I); however, there may be partial views from residences adjacent to the substation site.

The cable bridge crossing over Barnum Channel is located within a landscape setting that has been modified by commercial and industrial development. The cable bridge crossing is bordered to the east by the existing LIRR corridor, to the south by the E.F. Barrett Power Station, to the west by a body of water, and to the north by commercial development which includes a gas station and parking lot. Visibility is limited to LIRR commuters, industrial workers to the south and east, residents/travelers at the gas station, and a large waterbody to the west. Viewers that may see the cable bridge include commercial and industrial buildings primarily between Long Beach Road and Daly Boulevard.

Long-term visual effects during operation of the cable bridge will result from the visibility of the aboveground components associated with the Barnum Channel crossing. The cable bridge crossing will introduce linear geometric forms into the landscape setting which is already highly developed with similar forms and structures, including the LIRR crossing. Additionally, LIRR commuters may see a glimpse of the bridge while commuting. The cable bridge will be seen in the context of an existing train bridge and an overhead pedestrian bridge on the south side of Barnum Channel. The presence of the aboveground infrastructure associated with the proposed cable bridge would represent a long-term visual impact; however, that impact is expected to be minor due to limited areas of visibility and the proximity to other existing industrial infrastructure.

I.5.2.3 Nighttime Lighting

Nighttime construction activities are proposed to occur within the NY Project Area. Navigation lights associated with large vessels (i.e., barges and jack-up vessels) and lights necessary to perform construction activities may be visible from coastal vantage points. However, visual effects resulting from nighttime construction activities will be limited to only those locations where construction is to occur. These visual effects will also be short-term, as the large vessels and lights necessary to perform construction activities will not be present overnight once construction is complete.

Proposed nighttime lighting associated with the onshore NY Project components includes security lighting installed along substation perimeter security fencing and at building entrances. Security lighting will be directed downward and shielded to avoid light pollution impacts. The amount of light generated by the security lights will be consistent with existing sources produced by human-made structures near the proposed onshore

substation site. For the onshore substation site this includes residences, commercial and industrial development, and streetlights.

I.5.3 Mitigation

The undergrounding of the onshore export and interconnection cables will mitigate many of the potential visual effects of the NY Project that would otherwise occur with overhead transmission lines. For the onshore aboveground NY Project components, which include the onshore substation buildings and the cable bridge, the following mitigation measures that will minimize visual contrast will be incorporated into the NY Project design:

- Construction Phase:
  - A Fugitive Dust Control Plan will be implemented to minimize dust (visual pollution);
  - The onshore NY Project Area will be maintained free of debris, trash, and waste to the extent possible during construction; and
  - Areas temporarily disturbed during construction will be restored.

- Operation Phase:
  - The onshore export and interconnection cables and joint bays will be located underground, and will not be a visible during NY Project operation and maintenance, with the exception of potential discoloration of old vs new paved areas in the roadway;
  - Buildings will be a combination of cladded steel frame and concrete buildings, designed to match the style and visual character of the surrounding urban landscape, and are proposed to be painted a light gray or white color. Empire will continue to work with local stakeholders throughout the permitting process and will submit final building architectural design details in the Environmental Management and Construction Plan as part of the Article VII approval process for the NY Project;
  - The onshore substation site will have minimal presence of crews and equipment conducting maintenance activities; and
  - Lighting at the onshore substation site will be designed to reduce light pollution where feasible (e.g., downward lighting, motion-detecting sensors).

As site design progresses, the Applicant will consider mitigation measures to reduce visual contrast, such as repetition of form, line, color, and texture based on other existing elements around the site.

I.6 Conclusions

Overall, the onshore NY Project components would result in changes to the landscape conditions that vary from strong to none for viewers within the VSA (**Table I-3**). On a short-term basis during the construction period for each of the onshore NY Project components, viewers would be able to observe construction equipment, laydown areas and crews. Varying degrees of visual contrast will occur when equipment and construction crews are present; however, contrast will be short-term since equipment and support facilities will be removed once construction is complete. Long-term visual effects during operation of the onshore substation will result from the visibility of the aboveground components associated with the substation buildings, outside electrical equipment, static masts, and perimeter fence and from the occasional presence of crews and equipment for maintenance activities. The onshore substation buildings will introduce tall, rectangular forms and vertical and geometric structures into landscape settings that in many cases have been heavily modified by commercial, industrial and/or residential development.

Views of the onshore substation site are limited primarily to viewers adjacent to the east and south, with minimal views to the north and west. Viewers adjacent to the site (i.e., along Long Beach Boulevard and Bridge) and south of the site in Long Beach will perceive a change in the landscape, and it is anticipated that the contrast created by the change will vary from strong to weak. Perceived change will be higher from areas close to the site, such as from along Long Beach Boulevard/Bridge, where the substation buildings will introduce strong contrast. Perceived change will be reduced to moderate for viewers along the north side of Long Beach Island, where views toward the site will partially screened by topography, vegetation, and/or existing development. Views from the west, north,[6] and northeast will be screened by development, vegetation, and topography and will not be materially changed by the NY Project.

Views of the cable bridge are limited primarily to viewers adjacent to the Barnums Channel, with minimal views to the west towards a large waterbody. Viewers adjacent to the bridge will perceive a change in the landscape, and it is anticipated that the contrast created by the change will be weak. Perceived change will be higher from areas close to the site, such as from commercial and industrial development immediately surrounding Barnums Channel.

[6] This refers to viewers farther north beyond the Island Park Station.

I.7 References

BLM (Bureau of Land Management).1984. BLM Manual 8400 – Visual Resource Management. Available online at: http://blmwyomingvisual.anl.gov/docs/BLM_VRM_8400.pdf. Accessed November 11, 2018.

BLM. 1986a. BLM Manual 8410-1 – Visual Resource Inventory. Available online at: http://blmwyomingvisual.anl.gov/docs/BLM_VRI_H-8410.pdf. Accessed November 11, 2018.

BLM. 1986b. BLM Manual 8431 – Visual Resource Contrast Rating. Available online at: https://www.blm.gov/sites/blm.gov/files/program_recreation_visual%20resource%20management_quick%20link_BLM%20Handbook%20H-8431-1%2C%20Visual%20Resource%20Contrast%20Rating.pdf

BLM. 2018. Visual Resources: Visual Impact Assessment Methodologies for Other Federal Agencies. Available online at: http://blmwyomingvisual.anl.gov/assess-simulate/other-federal/. Accessed November 11, 2018.

BOEM (Bureau of Ocean Energy Management). 2007. Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternative Use of Facilities on the Outer Continental Shelf – Final Environmental Impact Statement, Section 5 Potential Impacts of Alternative Energy Development. Available online at: https://www.boem.gov/renewable-energy/guide-ocs-alternative-energy-final-programmatic-environmental-impact-statement-eis. Accessed May 23, 2019.

BOEM. 2016. Guidelines for Information Requirements for a Renewable Energy Construction and Operations Plan. United States Department of the Interior Office of Renewable Energy Programs, Bureau of Ocean Energy Management. Available online at: https://www.boem.gov/sites/default/files/renewable-energy-program/COP-Guidelines.pdf.

CMP. 2001. Long Island South Shore Estuary Reserve Comprehensive Management Plan 2021. Available online at: https://dos.ny.gov/system/files/documents/2021/10/draft-li-sser-cmp-update-2021.pdf. Accessed February 3, 2022.

NOAA (National Oceanic and Atmospheric Administration). 2019. Office for Coastal Management: Coastal Zone Management Act. Available online at: https://coast.noaa.gov/czm/act/. Accessed November 11, 2019.

NYC. 2019a. New York State Coastal Management Program. Available online at: https://www.dos.ny.gov/opd/programs/WFRevitalization/coastmgmtprog.html. Accessed November 26, 2019.

NYC Open Data. 2019. Building Footprints. Available online at: https://data.cityofnewyork.us/Housing-Development/Building-Footprints/nqwf-w8eh.

NYSDEC (New York State Department of Environmental Conservation). 2019. Assessing and Mitigating Visual Impacts (DEP-00-2). New York State Department of Environmental Conservation. Available online at: https://www.dec.ny.gov/permits/115147.html (accessed March 10, 2021).

NYSDOS (New York State Department of State). 2017. State Coastal Policies. New York State Department of State. Available online at: https://www.dos.ny.gov/opd/programs/pdfs/CoastalPolicies.pdf. Accessed November 26, 2019).

NYSDOS. 2019. Geographic Information Gateway. Office of Planning and Development. Available online at: http://opdgig.dos.ny.gov/#/map. Accessed November 26, 2019.

Rath, W.R., C.P. Kelly, and K.A. Beahm. 2018. *Oceanfront State Coastal Management Program*. Law and Policy White Paper Series. Center for Energy and Environmental Law, UCONN School of Law, May 1. Available online at: https://circa.uconn.edu/wp-content/uploads/sites/1618/2018/03/Oceanfront-State-Coastal-Management-Programs.pdf. Accessed November 27, 2019.

Attachment I-1 Visual Resource Inventory

- Table I-1-1 Visual Resource Inventory within the Onshore Visual Study Area
- Figure I-1-1 Visual Resource Inventory Map – Onshore Substation
- Visual Resource Inventory Photo Log (Visual Study Area)

Table I-1.2: Visual Resource Inventory within the Visual Onshore Study Area

Inventory ID [a/]	Name	Location	Resource Type	Description
1	Harbor Isle Bridge	Island Park, NY	Travel Way	Harbor Isle Bridge is a thoroughfare primarily for residential and recreational traffic. Residential houses, beach areas, and marinas can be seen from this bridge.
2	Warwick Bridge	Island Park, NY	Travel Way	Warwick Bridge is a thoroughfare primarily for residential and recreational traffic. Residential houses, beach areas, and marinas can be seen from this bridge.
3	Island Park Station	Island Park, NY	Travel Way	Island Park Train Station is public transportation serving residential communities in the area. It is surrounded by the Grand Rehabilitation and Nursing at South Point, mixed commercial and industrial development, and residential development.
4	Quebec Road	Island Park, NY	Residential, Travel Way	Quebec Road is a public road that serves a nearby residential community. It is bordered by the proposed facility, the Island Park Train Station, and mixed commercial and industrial use.
5	Railroad Place	Island Park, NY	Public Recreation	Road adjacent to a boat maintenance shop which is adjacent to Pop's Seafood Shack and Grill. Residential development, train, and mixed commercial and industrial use are located nearby.
6	Barnum Landing Shopping Center	Island Park, NY	Travel Way, Residential	Shopping center located east of Pop's Seafood Shack and Grill includes several stores and a large parking area. Residential development and mixed commercial and industrial use are located nearby.
7	Long Beach Boulevard	Island Park, NY	Travel Way	Long Beach Boulevard is a thoroughfare for commercial, industrial and residential traffic. Development along Long Beach Boulevard includes a commercial strip mall, residential areas, and the Grand Rehabilitation and Nursing at South Point.
8	Long Beach Bridge	Island Park, NY	Travel Way	Long Beach Bridge is a thoroughfare for commercial, industrial and residential traffic. Development along Long Beach Bridge includes a commercial strip mall, residential areas, and the Grand Rehabilitation and Nursing at South Point in Island Park, New York, as well as recreation, residential, and mixed commercial uses in Long Beach, New York.
9	Wreck Lead Channel	Long Beach, NY	Travel Way	Dispersal area near Long Beach Bridge, nearby to roads and mixed commercial and industrial uses. Residential development also located nearby.
10	Riverside Road	Long Beach, NY	Travel Way, Residential	Riverside Road is a thoroughfare primarily serving residential communities, public recreation, and mixed commercial and industrial uses.
11	Long Beach Skate Park	Long Beach, NY	Public Recreation	Long Beach Park includes a fishing pier, dog park, skate park, ice arena, and recreational center which sits along Wreck Lead Channel. Adjacent to the park areas are a wastewater treatment plant, soup kitchen, and residential development.

Notes:

a/ The Inventory ID corresponds to the Visual Study Area Visual Resource Inventory map for the onshore substation.

Acronyms:

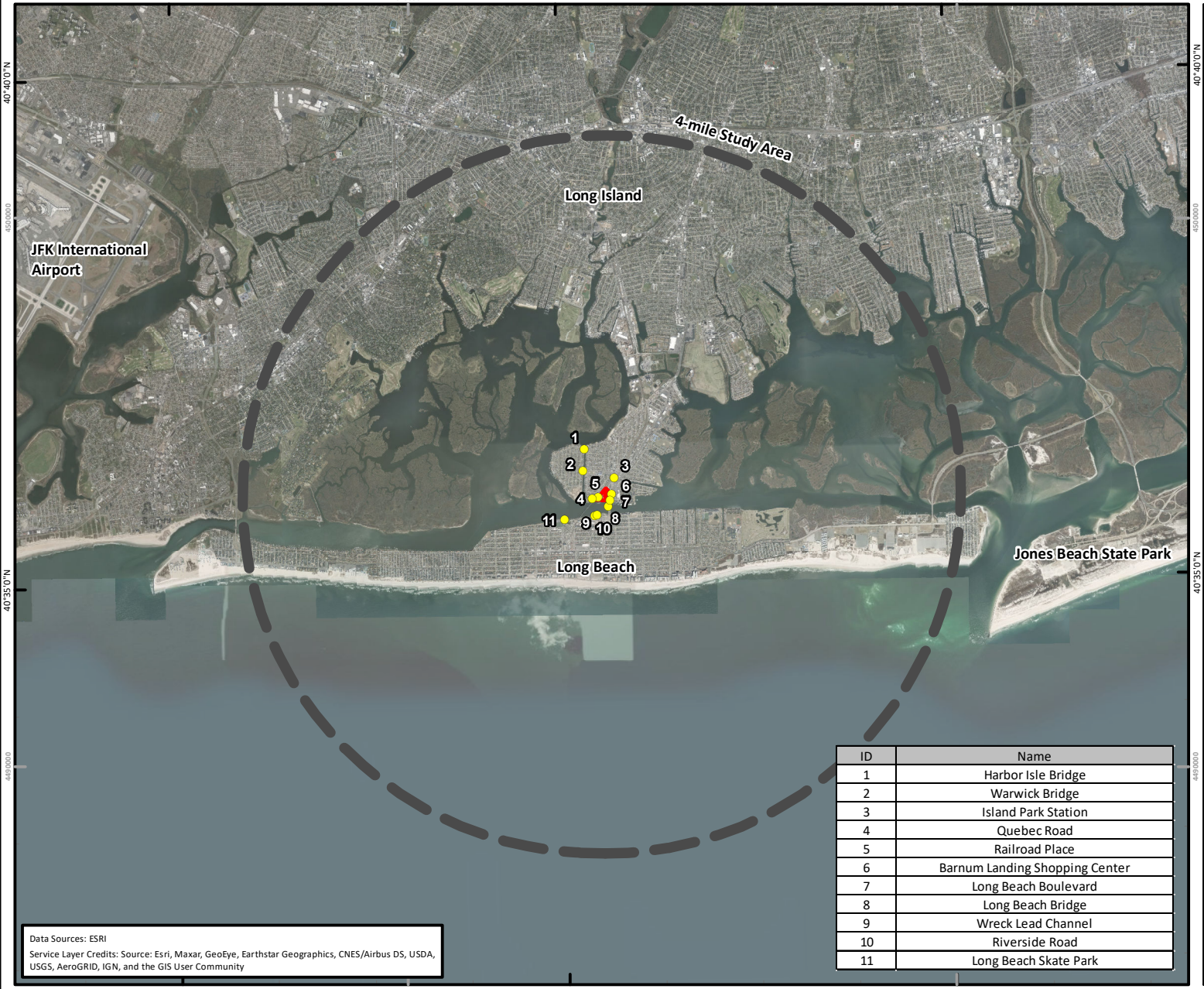
NPS (National Parks Service)

NHL (U.S. National Historic Landmark)

NJRHP (New Jersey Register of Historic Places)

NRHP (U.S. National Register of Historic Places)

NYC (New York City)



ID	Name
1	Harbor Isle Bridge
2	Warwick Bridge
3	Island Park Station
4	Quebec Road
5	Railroad Place
6	Barnum Landing Shopping Center
7	Long Beach Boulevard
8	Long Beach Bridge
9	Wreck Lead Channel
10	Riverside Road
11	Long Beach Skate Park

Data Sources: ESRI

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

EMPIRE OFFSHORE WIND
EMPIRE WIND 2 PROJECT

equinor

- Inventory Location
- EW 2 Onshore Substation C
- 4-mile Study Area

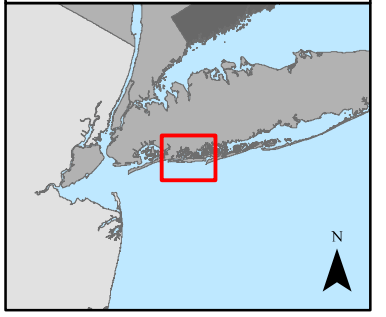
Date	March 9, 2022
File/Job Number	194-1247-0001
Personnel	Figure Prepared by: Tetra Tech Offshore GIS

0 0.5 1 1.5 2 Miles

0 0.5 1 1.5 Nautical Miles

0 1 2 3 Kilometers

REFERENCE MAP



NOT FOR CONSTRUCTION

1. Harbor Isle Bridge, NY

2. Warwick Bridge, NY

3. Island Park Station, NY

4. Quebec Road, NY

5. Railroad Place, NY

6. Barnum Landing Shopping Center, NY

7. Long Beach Boulevard, NY

8. Long Beach Bridge, NY

9. Wreck Lead Channel, NY

10. Riverside Road, NY

11. Long Beach Skate Park, NY

Attachment I-2 Visual Contrast Rating Worksheets

Visual Contrast Rating Worksheets for NY Project Components:

- Quebec Road/Residential Neighborhood
- Long Beach Bridge
- Long Beach Skate Park
- Island Park Station

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

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PROJECT INFORMATION	
KOP: Onshore Substation – Quebec Road/Residential Neighborhood	**Reviewers Name: S. Brooks**
Distance to nearest Project component: 0.07 mi (0.11 km)	**Date: 9/12/2021**
Latitude: 40.597048° N	**Longitude: -73.660342° W**
Angle of Observation: *Level* ☒ *Inferior* ☐ *Superior* ☐	**Visibility:** *Screened* ☒ (Partially/Completely) *Backdropped* ☐ *Skylined* ☐

Type of User:	**Visual Sensitivity:**			
	User Expectation:	*Duration of View:*	*Use Volume:*	*Overall Sensitivity:*
Residential/Travel Way	High	High	Low	High

Has a Photo Simulation Been Created for KOP? ☒ *Yes* ☐ *No*	**If yes, Figure Number:**	Attachment I-3

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground (FG): Flat, level Middleground/Background (MG/BG): not applicable (N/A) Seldom Seen (SS): N/A	FG: small, patchy	FG: blocky (buildings); tall thin, horizontal thin (utility lines/poles); flat narrow (road); long horizontal, vertical strip solid (fence)
Line	FG: horizontal straight, curved, vertical	FG: irregular	FG: multiple, thin horizontal slightly curving; tall thin; rectangular; straight, horizontal (road); short, thin
Color	FG: tan, brown	FG: green, dark green, brown, tan	FG: gray, white, black, tan
Texture	FG: fine to medium	FG: fine, stippled to course, dense	FG: fine to medium

REPRESENTATIVE PHOTOGRAPH

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

PROPOSED ACTIVITY DESCRIPTION			
	Land/Water	**Vegetation**	**Structures**
Form	N/A	N/A	N/A
Line	N/A	N/A	N/A
Color	N/A	N/A	N/A
Texture	N/A	N/A	N/A

CONTRAST RATING

Level of Contrast

Features

Elements	Degree of Contrast	Land/Water				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
	Form				X				X				X
	Line				X				X				X
	Color				X				X				X
	Texture				X				X				X

Overall Level of Contrast: None

Contrast Rating Criteria

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Weak	The element contrast can be seen but does not attract attention.
None	The element contrast is not visible or perceived.

Additional Comments:

The EW 2 Onshore Substation will be completely screened by residential development and vegetation. Residences backing to the onshore substation may have minimal views over the row of existing vegetation.

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

PROJECT INFORMATION	
KOP: EW 2 Onshore Substation – Long Beach Bridge	**Reviewers Name: S. Brooks**
Distance to nearest Project component: 0.09 mi (0.15 km)	**Date: 9/12/2021**
Latitude: 40.595684° N	**Longitude: -73.656966° W**
Angle of Observation: *Level* ☒ *Inferior* ☐ *Superior* ☐	**Visibility:** *Screened* ☐ (Partially/Completely) *Backdropped* ☐ *Skylined* ☒

Type of User:	**Visual Sensitivity:**			
	User Expectation:	*Duration of View:*	*Use Volume:*	*Overall Sensitivity:*
Travel Way	Moderate	Moderate	High	Moderate

Has a Photo Simulation Been Created for KOP? ☒ *Yes* ☐ *No*	**If yes, Figure Number:** Attachment I-3

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground/Middleground (FG/MG): Flat, level Background (BG): not applicable (N/A) Seldom Seen (SS): N/A	FG/MG: irregular patches; strips	FG/MG: blocky (buildings); tall thin, horizontal thin (utility lines/poles); flat narrow (road/sidewalk, railroad)
Line	FG/MG: horizontal straight	FG/MG: horizontal, angular, rounded	FG/MG: multiple, thin horizontal; tall thin; rectangular; straight, horizontal (road); short, thin
Color	FG/MG: gray	FG/MG: green, dark green, brown	FG/MG: gray, white, black, red, brown, tan
Texture	FG/MG: rippled	FG/MG: fine, stippled; course	FG/MG: fine to course; even, ordered

REPRESENTATIVE PHOTOGRAPH

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

PROPOSED ACTIVITY DESCRIPTION			
	Land/Water	**Vegetation**	**Structures**
Form	N/A	N/A	FG: narrow strip
Line	N/A	N/A	FG: straight horizontal, vertical
Color	N/A	N/A	FG: tan, light gray/white
Texture	N/A	N/A	FG: fine, medium
CONTRAST RATING			
Level of Contrast			

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

Features

Elements: Degree of Contrast	Land/Water				Vegetation				Structures			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form				X				X	X			
Line				X				X	X			
Color				X				X	X			
Texture				X				X	X			

Overall Level of Contrast: Strong

Contrast Rating Criteria

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Weak	The element contrast can be seen but does not attract attention.
None	The element contrast is not visible or perceived.

Additional Comments:

The EW 2 Onshore Substation will be located in the foreground and can be seen in the context of existing development, such as streetlights, utility lines, and residential development. Although existing development and utilities are visible in the view, due to the close proximity of the EW 2 Onshore Substation to the viewpoint and the scale of the facility it is anticipated that the Project will introduce strong visual contrast.

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

equinor

PROJECT INFORMATION	
KOP: EW 2 Onshore Substation– Long Beach Skate Park	**Reviewers Name: S. Brooks**
Distance to nearest Project component: 0.43 mi (0.69 km)	**Date: 9/12/2021**
Latitude: 40.593785° N	**Longitude: -73.666107° W**
Angle of Observation: *Level* ☒ *Inferior* ☐ *Superior* ☐	**Visibility:** *Screened* ☒ (Partially/Completely) *Backdropped* ☐ *Skylined* ☐

Type of User:	**Visual Sensitivity:**			
	User Expectation:	*Duration of View:*	*Use Volume:*	*Overall Sensitivity:*
Recreation	High	Moderate	High	High

Has a Photo Simulation Been Created for KOP?	☒ *Yes* ☐ *No*	**If yes, Figure Number:**	Attachment I-3

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground/Middleground (FG/MG): flat, level Background (BG): not applicable (N/A) Seldom Seen (SS): N/A	FG/MG: narrow triangular patch	FG/MG: tall, narrow, thin; short and long thin, small blocky
Line	FG/MG: horizontal straight	FG/MG: straight, horizontal, vertical; slightly curving	FG/MG: multiple, thin horizontal and vertical straight lines; paralleling
Color	FG/MG: tan/brown (land); grayish-blue (water)	FG/MG: green, dark green	FG/MG: brown, white, blue
Texture	FG/MG/BG: fine to medium, choppy	FG/MG: fine, stippled	FG/MG: fine to moderate

REPRESENTATIVE PHOTOGRAPH

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	N/A	N/A	FG/MG: large, blocky
Line	N/A	N/A	FG/MG: rectangular
Color	N/A	N/A	FG/MG: light beige, gray
Texture	N/A	N/A	FG/MG: fine, medium

CONTRAST RATING

Level of Contrast

Features

Elements: Degree of Contrast	Land/Water				Vegetation				Structures			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form				X				X		X		
Line				X				X		X		
Color				X				X		X		
Texture				X				X		X		

Overall Level of Contrast: Moderate

Contrast Rating Criteria

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Weak	The element contrast can be seen but does not attract attention.
None	The element contrast is not visible or perceived.

Additional Comments:

Approximately three-quarters of the EW 2 Onshore Substation will be visible but will be seen in the context of the existing train bridge and other commercial and industrial development. At this distance, the EW 2 Onshore Substation will appear as a co-dominate feature with moderate contrast.

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

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PROJECT INFORMATION	
KOP: EW 2 Onshore Substation– Island Park Station	**Reviewers Name: S. Brooks**
Distance to nearest Project component: 0.19 mi (0.31 km)	**Date: 9/12/2021**
Latitude: 40.600392° N	**Longitude: -73.655512° W**
Angle of Observation: *Level* ☒ *Inferior* ☐ *Superior* ☐	**Visibility:** *Screened* ☒ (Partially/Completely) *Backdropped* ☐ *Skylined* ☐

Type of User:	**Visual Sensitivity:**			
	User Expectation:	*Duration of View:*	*Use Volume:*	*Overall Sensitivity:*
Residential	Moderate	Moderate	High	Moderate

Has a Photo Simulation Been Created for KOP? ☒ *Yes* ☐ *No*	**If yes, Figure Number:** Attachment I-3

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground/Middleground (FG): flat, level Middleground/Background (MG/BG): not applicable (N/A) Seldom Seen (SS): N/A	FG: scattered	FG: tall, narrow, thin; short and long thin, small blocky, wide
Line	FG: horizontal straight	FG: straight, horizontal, vertical	FG: multiple, thin horizontal and vertical straight lines; paralleling
Color	FG: tan/brown	FG: green, dark green	FG: brown, green
Texture	FG: fine to medium	FG: medium	FG: fine to moderate

REPRESENTATIVE PHOTOGRAPH

VISUAL CONTRAST RATING WORSHEET

Empire Offshore Wind: Empire Wind 2 Project (EW 2)

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PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	N/A	N/A	FG/MG: large, blocky
Line	N/A	N/A	FG/MG: rectangular
Color	N/A	N/A	FG/MG: light beige, gray
Texture	N/A	N/A	FG/MG: fine, medium

CONTRAST RATING

Level of Contrast

Features

Elements: Degree of Contrast	Land/Water				Vegetation				Structures			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form				X				X		X		
Line				X				X		X		
Color				X				X		X		
Texture				X				X		X		

Overall Level of Contrast: Moderate

Contrast Rating Criteria

Degree of Contrast	Rating Criteria
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Weak	The element contrast can be seen but does not attract attention.
None	The element contrast is not visible or perceived.

Additional Comments:

The EW 2 Onshore Substation will be partially screened by several existing buildings. Portions of the EW 2 Onshore Substation that will be visible between the existing buildings which include the upper portion of the proposed building, which will be seen in the context of existing commercial and industrial development. At this distance, the EW 2 Onshore Substation will appear as a co-dominate feature with moderate contrast.

Attachment I-3 Visual Simulations

Single-Frame Daytime Photographic Simulations:

- Onshore Substation Site, NY – Quebec Road/Residential Neighborhood
- Onshore Substation Site, NY – Long Beach Bridge
- Onshore Substation Site, NY – Long Beach Skate Park
- Onshore Substation Site, NY – Island Park Station

Panoramic Photograph

Vicinity Map

Photograph Information

Viewpoint Location:	Long Beach Road
Date of Photograph:	September 1, 2021
Time of Photograph:	12:45 PM (EDT)
Weather Condition:	Overcast
Latitude:	40.595684° N
Longitude:	-73.656966° W
Viewing Direction:	Northwest
Ground Elevation + Tripod Height:	30 feet

Viewing Instructions

The single-frame simulations on the following pages should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Preliminary Substation Design

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

EmpireO shore Wind: Empire Wind 2 Project (EW 2)

EW 2 Onshore Substation | Long Beach Road

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CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION

Panoramic Photograph

Vicinity Map

Photograph Information

Viewpoint Location:	Quebec Road
Date of Photograph:	September 1, 2021
Time of Photograph:	2:55 PM (EDT)
Weather Condition:	Overcast
Latitude:	40.597048° N
Longitude:	-73.660342° W
Viewing Direction:	Northeast
Ground Elevation + Tripod Height:	10 feet

Viewing Instructions

The single-frame simulations on the following pages should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Preliminary Substation Design

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

The view of the Onshore Substation is blocked by the existing buildings and vegetation

EmpireO shore Wind: Empire Wind 2 Project (EW 2)
EW 2 Onshore Substation | Quebec Road

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CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION

Panoramic Photograph

Vicinity Map

Photograph Information

Viewpoint Location:	Long Beach Park
Date of Photograph:	September 1, 2021
Time of Photograph:	2:10 PM (EDT)
Weather Condition:	Overcast
Latitude:	40.593714° N
Longitude:	-73.666350° W
Viewing Direction:	Northeast
Ground Elevation + Tripod Height:	8 feet

Viewing Instructions

The single-frame simulations on the following pages should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Preliminary Substation Design

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

EmpireO shore Wind: Empire Wind 2 Project (EW 2)
EW 2 Onshore Substation | Long Beach Park

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CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION

Panoramic Photograph

Vicinity Map

Photograph Information

Viewpoint Location:	Island Park Station
Date of Photograph:	September 1, 2021
Time of Photograph:	12:30 PM (EDT)
Weather Condition:	Overcast
Latitude:	40.600392° N
Longitude:	-73.655512° W
Viewing Direction:	Southwest
Ground Elevation + Tripod Height:	12 feet

Viewing Instructions

The single-frame simulations on the following pages should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches).

If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

Preliminary Substation Design

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

EmpireO shore Wind: Empire Wind 2 Project (EW 2)

EW 2 Onshore Substation | Island Park Station

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CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION