Empire Offshore Wind LLC

Empire Wind 1 Project

Article VII Application

Appendix I

Visual Impact Assessment

June 2021

Empire Wind 1 Project

Appendix I
Visual Impact Assessment

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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
CIRES	Cooperative Institute for Research in Environmental Sciences
CMP	Coastal Management Program
ConEdison	Consolidated Edison Company of New York, Inc.
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
HRWC	Hudson River Water Conservancy
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
NYC	N ew York City

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 the Gowanus 345-kV Substation
Project	EW 1 Project transmission facilities in New York
PSL	New York Public Service Law
SASS	Scenic Areas of Statewide Significance
SBMT	South Brooklyn Marine Terminal
VIA	Visual Impact Assessment
VRM	Visual Resource Management
VSA	Visual Study Area
WRP	Waterfront Revitalization Program

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 1 (EW 1) Article VII Application. Empire proposes to construct and operate the EW 1 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 1 Project transmission system located within the State of New York (collectively the Project) pursuant to Article VII of the New York Public Service Law (PSL).

The Project will interconnect to the New York State Transmission System operated by the New York Independent System Operator, Inc. (NYISO) at the Gowanus 345-kilovolt (kV) Substation (the point of interconnection, or POI). The Gowanus 345-kV Substation is owned by the Consolidated Edison Company of New York, Inc. (ConEdison). The Project's onshore facilities, including the onshore cable route, onshore substation, and the POI, are located entirely within Brooklyn, Kings County, New York.

The Article VII components of the EW 1 Project include:

- Two three-core 230-kV high-voltage alternating-current (HVAC) submarine export cables located within an approximately 15.1-nautical mile (nm, 27.9-kilometer [km])-long, submarine export cable corridor from the boundary of New York State waters 3 nm (5.6 km) offshore to the cable landfall in Brooklyn, New York;
- A 0.2-mile (mi, 0.3-km)-long onshore cable route and substation including:
    - Two three-core 230-kV HVAC EW 1 onshore export cables buried underground from the cable landfall either directly to the cable terminations or to a vault within the onshore substation;
    - An onshore substation located at the South Brooklyn Marine Terminal (SBMT), which will increase the voltage to 345 kV for the onshore interconnection cables; and
    - Two 345-kV cable circuits, each with three single-core HVAC onshore interconnection cables, buried underground from the onshore substation to the POI.

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

The U.S. Bureau of Ocean Energy Management (BOEM) will review the Construction and Operations Plan (COP) for the full offshore wind energy project (Empire Wind Project, including Empire Wind 1 [EW 1] and Empire Wind 2 [EW 2]). The Construction and Operations Plan (COP) for the Empire Wind Project contains a visual analysis of all related onshore and offshore facilities. This assessment is focused on the Project, which is the portion of EW 1 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 cables

[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.

included in the Project will be entirely submerged underwater or buried underground and therefore not visible, this VIA primarily focuses on the onshore substation.

The VIA contained herein includes a detailed description of the 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 (a 4-mi [6.4-km] buffer drawn around the aboveground onshore substation) and inventory visual resources potentially affected by the construction and operation of the 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 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 Historic Preservation Office (NYSHPO), the New Jersey State Historic Preservation Office (NJHPO), New Jersey Department of Environmental Protection (NJDEP) and New York State Department of Environmental Conservation (NYSDEC).

For the purposes of this VIA, the Project Area refers to the onshore substation and associated underground components as 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 H Analysis of Visual Effects to Historic Properties**.

I.2 Project Description

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

- Two three-core 230-kV high-voltage alternating-current (HVAC) submarine export cables located within an approximately 15.1-nm (27.9-km)-long, submarine export cable corridor from the boundary of New York State waters 3 nm (5.6 km) offshore to the cable landfall in Brooklyn, New York;
- A 0.2-mi (0.3-km)-long onshore cable route and substation including:
    - Two three-core 230-kV HVAC EW 1 onshore export cables buried underground from the cable landfall either directly to the cable terminations or to a vault within the onshore substation;
    - An onshore substation located at the South Brooklyn Marine Terminal (SBMT), which will increase the voltage to 345 kV for the onshore interconnection cables; and
    - Two 345-kV cable circuits, each with three single-core HVAC onshore interconnection cables, buried underground from the onshore substation to the POI.

The EW 1 onshore export cables and the interconnection cables associated with the proposed onshore substation site will be entirely underground. The submarine export cables will be entirely submerged underwater.

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

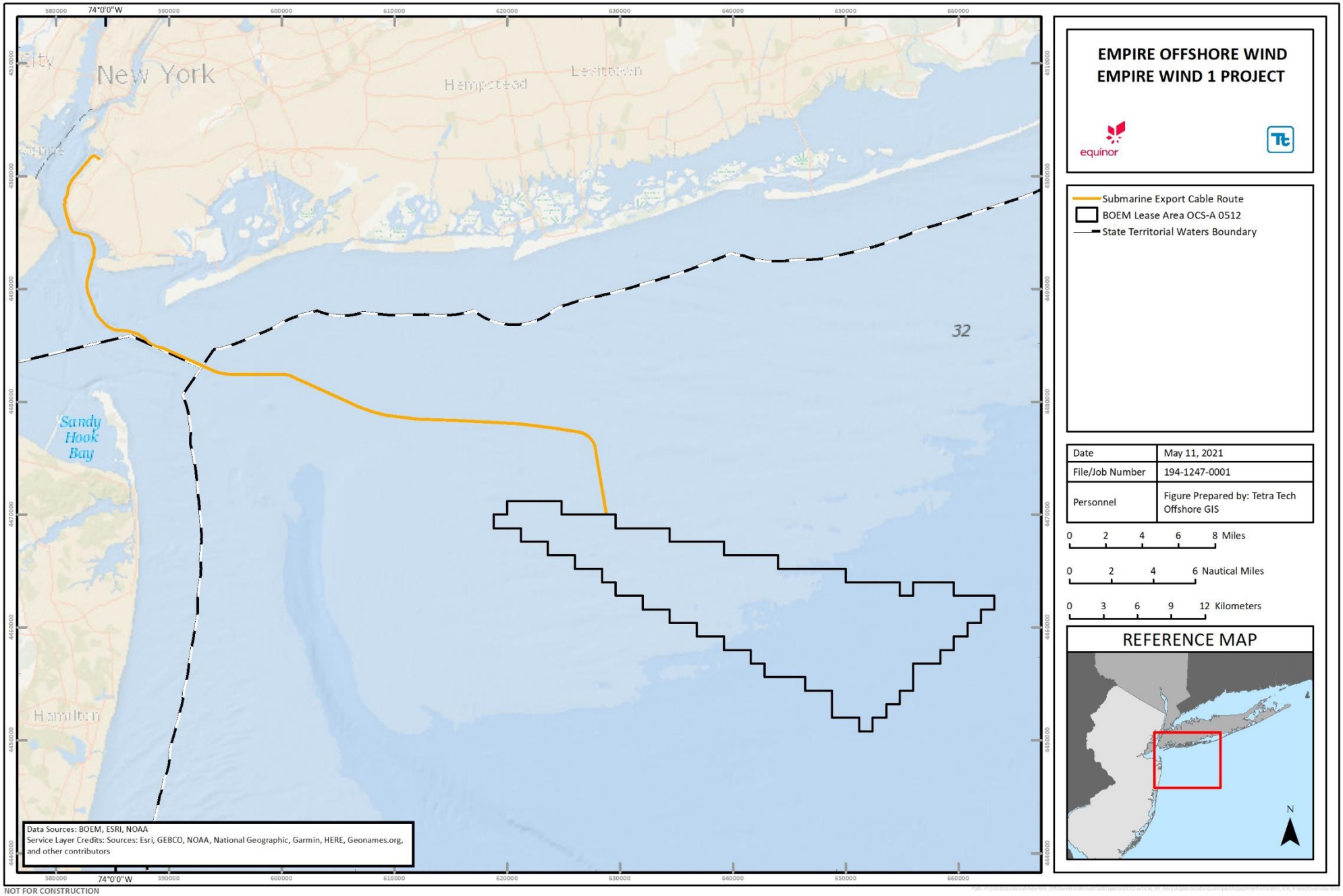

Figure I-1 Project Overview Map

I.2.1 Substation Indicative Layout

The onshore substation is located at the north end of the SBMT in the Sunset Park Neighborhood in Brooklyn, New York, adjacent to 1st Ave/2nd Avenue. The SBMT is located on the east side of Upper Bay within New York Harbor. While there are several existing buildings located within SBMT, including a recycling center and warehouses, there are no buildings on the portion of the site where the onshore substation would be located. The site is bisected at the northern end by an existing railroad track that turns and runs along the southeastern boundary of the site. Beyond the railroad track to the southeast are parking lots; to the south is a warehouse and parking lot; and to the west is a recycling center and Gowanus Bay.

The onshore substation will be designed to comply with applicable state and federal building codes, 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 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 4.8-ac (1.9-ha) portion of the property, with a maximum main building height of 49 ft (15 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 indicative layout used in the visual assessment is shown on **Figure I-2**.

I.3 Regulatory Setting

Several federal and state agencies have regulatory authority over the Project, based on the location of the different Project components. The submarine export cables, onshore cables and onshore substation will be located in New York.

[2] In the event that certain standards cannot be met, variances will be sought through the appropriate regulatory mechanisms.

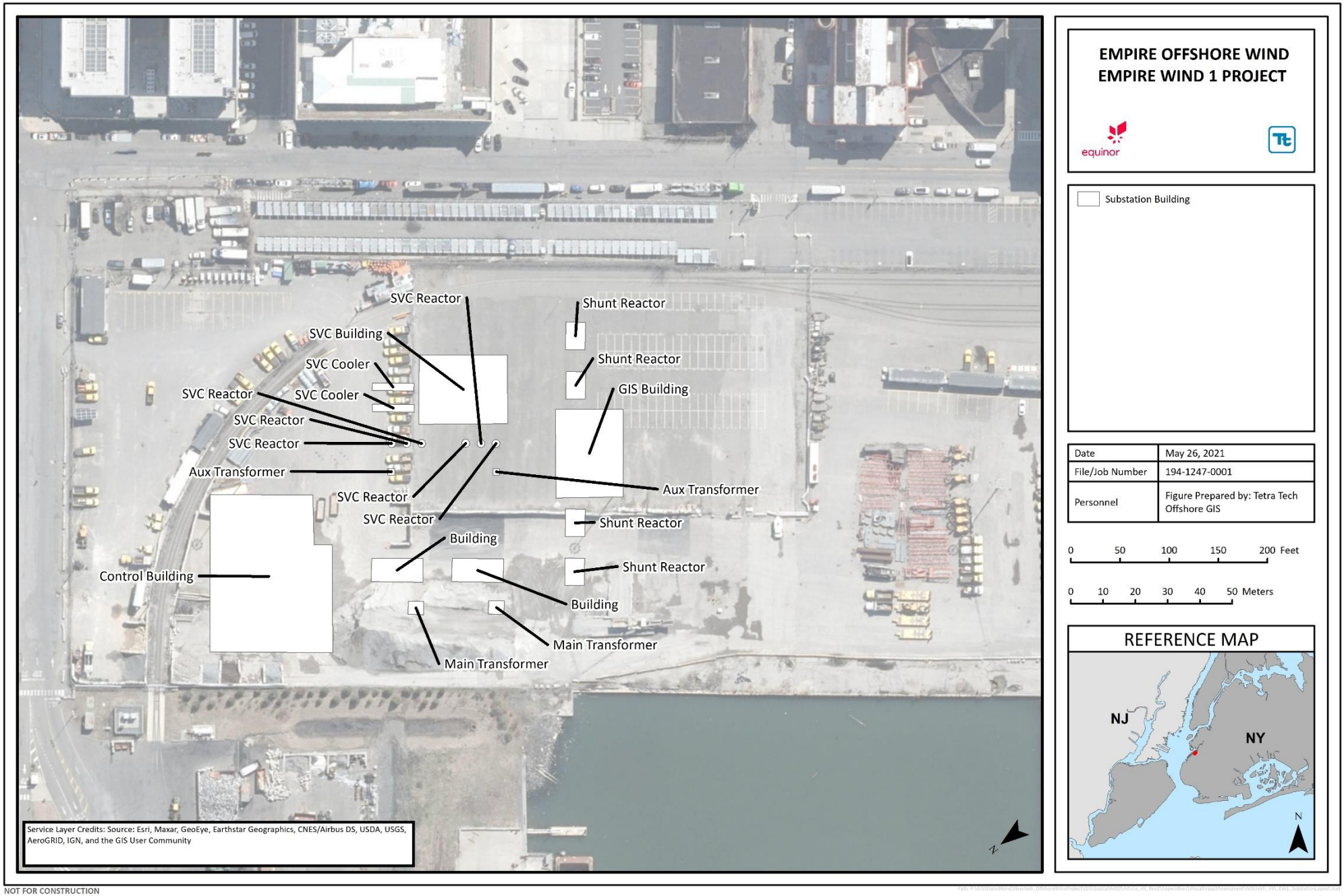

Figure I-2 Onshore Substation – Indicative Layout

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 Project.

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 1 Project, including the scope, as well as the methodology proposed to identify, inventory and evaluate visual resources. Stakeholder feedback was used to inform the Visual Study Area, 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. As the Project is located within the boundaries of the New York City Waterfront Revilalization Program, the NYSDOS will need to confirm that the Project complies with both the policies outlined in the New York State Coastal Management Program and the New York City Waterfront Revilalization Program. **Appendix C 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 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 Visual Study Area for 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 SASS 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 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. Local waterfront revitalization programs were identified within the Visual Study Area and are discussed in Section I.3.2.

I.3.2 Local Land Use Plans and Guidance

Development of the onshore facilities in the Project Area will be guided by applicable land use plans, the substantive provisions of which will be applied by the Commission under Article VII. Land use plans with relevant guidelines and policies for visual resources include:

- *Vision 2020: New York City Comprehensive Waterfront Plan* (NYC 2011); and
- *Waterfront Revitalization Program* (NYC 2016).

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.3.2.1 Vision 2020: New York City Comprehensive Waterfront Plan

The Vision 2020: New York City Comprehensive Waterfront Plan, updated every ten years, provides guidance on expanding the use of New York City waterfront areas for parks, housing and economic development and opening up the waterways for transportation, recreation and natural habitat. The plan provides citywide policies and site-specific recommendations and is organized into eight overarching goals with strategies for achieving them. Goals associated with enhancing visual and scenic resources include:

- **Goal 1**: **Expand public access to the waterfront and waterways on public and private property for all New Yorkers and visitors alike.** Parks, piers, esplanades, beaches, and other kinds of publicly accessible spaces on the shoreline provide opportunities for recreation, relaxation, sightseeing, and waterfront events. New York City has dramatically expanded publicly accessible waterfront space since 1992, and it plans to secure even more waterfront access, taking full advantage of New York's unique geography and allowing residents and visitors to experience the city as a waterfront metropolis. Not only is it desirable to have more places where people can reach the water's edge, it is also necessary to incorporate additional spots where people can gain access to the water itself.
- **Goal 6: Enhance the public experience of the waterways that surround New York – The Blue Network.** Vision 2020 proposes to better connect people with New York City's waterway resources—physically, visually, and culturally. Increasing waterborne transportation, promoting water recreation, and creating the waterfront infrastructure needed for events, cultural activities, and educational programs will allow residents and visitors to engage more fully with the Blue Network and help New York realize its potential as a great waterfront city.

The plan also includes several neighborhood reach[3] strategies. The reach strategies include specific projects that will enhance public access, maritime industry, water recreation, the natural environment, new development, and other activities (NYC 2011). The onshore substation site is located within Sunset Park, which falls within Reach 14 south (Brooklyn Upper Bay South). Neighborhood strategies for Sunset Park are primarily focused on providing access to the waterfront where feasible and enhancing the marine and industrial use within the area.

I.3.2.2 Waterfront Revitalization Program

The New York City Waterfront Revitalization Program (WRP) establishes the city's policies for waterfront planning, preservation, and development projects to ensure consistency over the long term. The goal of the WRP is to maximize the benefits derived from economic development, environmental conservation, and public

[3] The *Comprehensive Waterfront Plan* of 1992 divided the city's waterfront into 22 segments or reaches (a nautical term for a continuous expanse of water). The Vision 2020 plan includes strategies for enhancing public access, maritime industry, water recreation and other activities.

use of the waterfront, while minimizing any potential conflicts among these objectives (NYC 2019b). Policy Nine of the WRP is intended to "protect scenic resources that contribute to the visual quality of the New York City coastal area." This includes:

9.1 Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.

A. Ensure that new buildings and other structures are compatible with and add interest to existing scenic elements, such as landmarks, maritime industry, recreational boating facilities, natural features, topography, landforms, and the botanic environment. Among the measures that may be considered are grouping or orienting structures to preserve open space and maximize views to and from the coast and incorporating sound existing structures into development that are harmonious with their surroundings.
B. Where feasible and practicable, provide views of visually interesting elements of water dependent uses.
C. New development should be compatible with the scenic elements defining the character of the area. The New York City Zoning Resolution provides standards for waterfront landscaping.
D. Preserve existing vegetation or establish new vegetation where necessary to enhance scenic quality.
E. Minimize introduction of uses that would be discordant with existing scenic elements, and screen unattractive aspects of uses that detract from the visual quality of nearby public parks and waterfront open spaces.
F. Provide public viewing at and interpretive signage of industrial uses where compatible and appropriate.

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, which complies with the NYC DEP-00-2 policy. 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[4], 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 provides a list of resources, which was searched for this Project.

The majority of the types of aesthetic resources of statewide significance defined in NYSDEC's Program Policy DEP-00-2 are not found within the Visual Study Area. Within the Visual Study Area, there are two properties on or eligible for inclusion in the National Register of Historic Places (NRHP), (these properties with potential views are discussed in **Appendix H**); one state park was identified with no potential views; seven National Parks, Recreation Areas, Seashores, or Forests were identified, four of which have potential views of the Project; two resources of statewide or regional significance were identified, both of which have potential views; and

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

eight locally important resources were identified, six of which had potential views of the Project. **Table I-1** illustrates the scenic and aesthetic resources of statewide significance within the Visual Study Area.

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

Site	Location	Distance to Project Site (mi [km])	Project Visibility
Properties on or eligible for inclusion in the National Register of Historic Places or State Register of Historic Places a/			
Green-Wood Cemetery	Brooklyn, NY	0.5 (0.8)	Possible Views
Bush Terminal Piers Park	Brooklyn, NY	0.1 (0.2)	Possible Views
State Parks			
Hudson River Park	Manhattan, NY	3.7 (5.9)	No Views
New York State Heritage Areas (formerly Urban Cultural Parks)			
Battery Park	Manhattan, NY	2.5 (4.0)	Possible Views
Empire Fulton Ferry	Brooklyn, NY	2.9 (1.8)	No Views
Harbor Waters	Brooklyn, NY	0 (0)	Possible Views
Pier A	Manhattan, NY	2.8 (4.5)	Possible Views
South St. Seaport	Manhattan, NY	2.8 (4.5)	Possible Views
Sites on the National Park System, including Recreation Areas, Seashores, and Forests			
Castle Clinton National Monument	Manhattan, NY	2.7 (4.3)	Possible Views
African Burial Ground National Monument	Manhattan, NY	3.5 (5.6)	No Views
Governors Island National Monument	Manhattan, NY	1.8 (2.9)	Possible Views
Gateway National Monument	Staten Island, NY	3.7 (6.0)	Possible Views
Statue Of Liberty National Monument	Manhattan, NY	2.4 (3.9)	Possible Views
Federal Hall National Monument	Manhattan, NY	3 (4.8)	No Views
Ellis Island National Monument	Manhattan, NY	2.8 (4.5)	Possible Views
Other Resources of Importance b/			
Fort Hamilton	Brooklyn, NY	2.9 (4.7)	Possible Views
Brookly Veterans Hospital	Brooklyn, NY	3.3 (5.3)	Possible Views
Locally Important Resources b/			
Dyker Beach Park	Brooklyn, NY	2.7 (4.3)	No Views
East River Park	Manhattan, NY	3.4 (5.5)	No Views
Red Hook Park	Brooklyn, NY	0.4 (0.6)	Possible Views
Shore Road Park	Brooklyn, NY	1.3 (2.1)	Possible Views
Prospect Park	Brooklyn, NY	1.3 (2.1)	Possible Views
Staten Island September 11th Memorial	Staten Island, NY	3.1 (5.0)	Possible Views

Site	Location	Distance to Project Site (mi [km])	Project Visibility
Harbor View Park/Teardrop Memorial	Bayonne, NJ	2.7 (4.3)	Possible Views
Columbia Street Esplanade	Brooklyn, NY	0.1 (0.2)	Possible Views

Notes:
a/ Multiple locations can be found in Appendix H, Analysis of Visual Effects to Historic Properties.
b/ These are not considered resources of statewide significance as identified in VI.A Inventory of Aesthetic Resources (NYSDEC 2019), however, they are important local resources.

I.4.1 Visual Study Area

The Visual Study Area was identified based on locations from which onshore Project components 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 Project facilities but is engaged in activities at locations with potential views of the Project, such as hiking, driving on a scenic road, or relaxing near the water.

A 4-mi (6.4-km) Visual Study Area was used to review potential visibility of the onshore Project facilities. Typically, for an onshore substation proposed in a relatively flat area that is heavily developed, such as the one proposed for the Project, a smaller visual study area of 2 miles would be used to assess potential visibility. The use of a 4-mi (6.4-km) Visual Study Area for this Project was determined by the location of the onshore substation adjacent to open water (i.e., Upper Bay). The use of a larger visual study area captures the western shore of the bay, where visual receptors may have unobstructed views toward the Project across open water.

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 49 ft (15 m)[5] to determine areas with potential visibility. The site perimeter and height were used as a worst case, 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 New York City, Suffolk County, and Nassau County in New York and Monmouth County in New Jersey to identify areas within the Visual Study Area where potential screening may be provided by buildings[6]. Potential visibility results based on the viewshed analysis that was conducted for the onshore substation is shown in **Figure I-3**.

[5] The use of 49 ft (15 m) building height was based on the tallest proposed building used for each of the conceptual substation layout.
[6] Vegetation was not accounted for in the viewshed due to the lack of vegetation and the dense urban landscape surrounding the site. Buildings are more likely to provide screening than the limited vegetation found in the Visual Study Area.

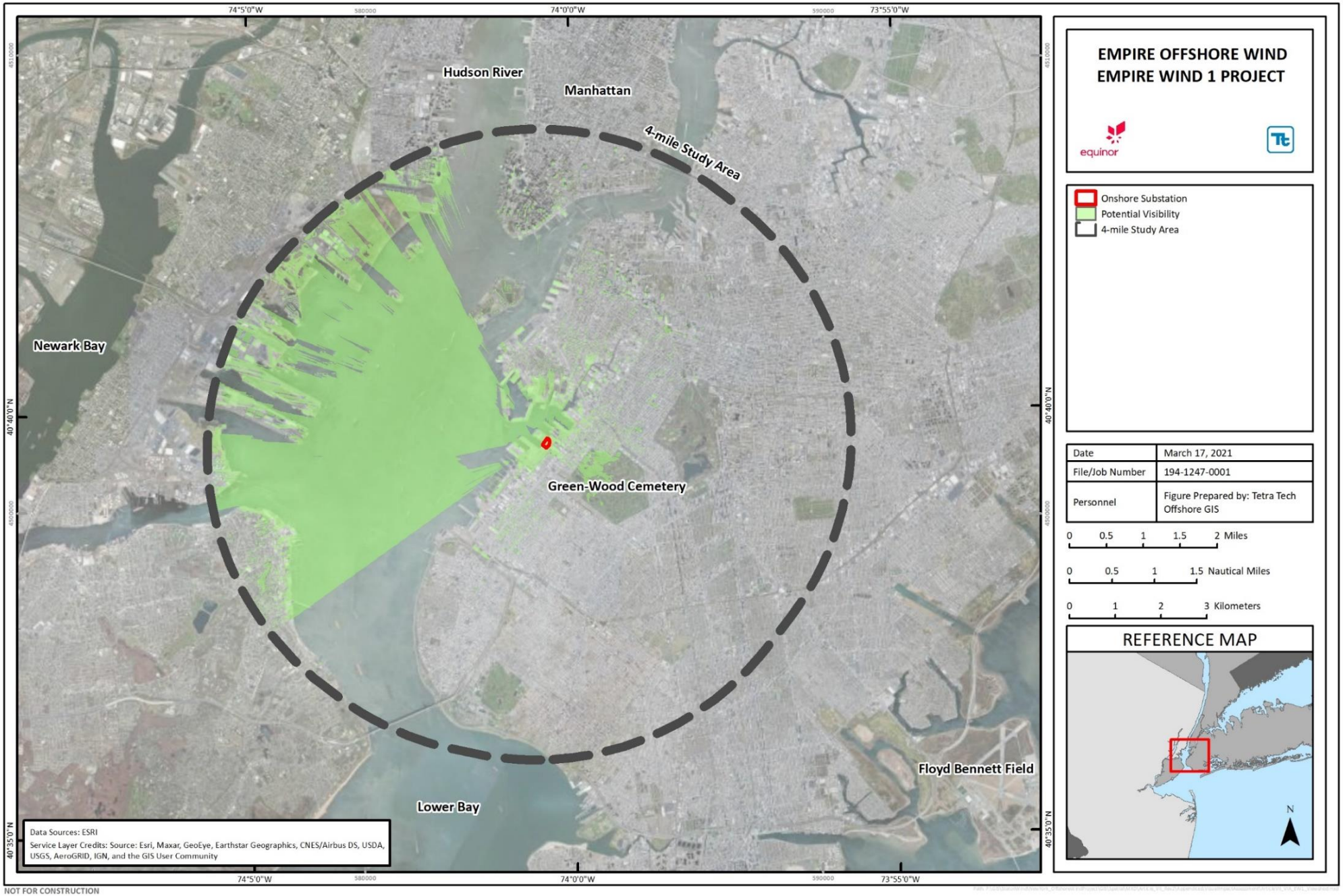

Figure I-3 Onshore Substation Indicative Layout Refined Viewshed Analysis

I.4.3 Inventory Components

The inventory of visual resources included the existing landscape and scenery and the viewers and KOPs within the Visual Study Area. 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 is comprised of 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 Visual Study Area 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

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 Project. In this regard, viewing locations are typically associated with key travel routes, recreation areas, and residential areas. Key observation points 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 that 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 Visual Study Area was conducted on September 18, 2019 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 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** 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 Visual Study Area.

I.4.4 Summary of Inventory Results

The following sections describe the existing environment in the Visual Study Area. 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.

U.S. Environmental Protection Agency Level IV ecoregions of New York and New Jersey were used to develop a description of the existing landscape character within the Visual Study Area. 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 IV ecoregions of New York and New Jersey that cross the Visual Study Area include the Southern New England Coastal Plains and Hills, Glaciated Triassic Lowlands, and Long Island Sound Coastal Lowland ecoregion. Landscape conditions within these Level IV ecoregions are discussed below.

Southern New England Coastal Plains and Hills

The northern portion of the Visual Study Area in New York is within the Southern New England Coastal Plains and Hills ecoregion which is characterized by irregular plains with some low hills. Ponds, small lakes, reservoirs, streams and wetlands are abundant throughout the ecoregion (Bryce et al. 2010). Elevation for this ecoregion ranges between 40 to 800 ft (12.2 to 243.8 m) above mean sea level (aMSL). Vegetation type consists of Appalachian oak-pine forests and hardwoods, swamps, and vegetation associated with small river floodplains, including oak, sycamore and maples. Cultural modifications include urban, suburban, and rural residential land, and some crop lands.

The portion of the Visual Study Area that is within this ecoregion includes Manhattan Island, New York. This area is heavily developed with small pockets of dispersed natural areas and parks.

Long Island Sound Coastal Lowland

The eastern half of the Visual Study Area is within a portion of the Long Island Sound Coastal Lowland ecoregion which is characterized by flat to irregular plains, coastal beaches, bays, tidal flats, and low gradient streams (Bryce et al. 2010). Elevation is less than 250 ft (76.2 m) aMSL. Vegetation types consists of oak-hickory or oak-tulip forests in upland areas, and red maple, sweet gum and pin oak occur in wetter areas. Coastal bluffs consist of pitch pine, eastern red cedar, oaks and hickory. Low dunes consist of beach grass and goldenrod, and low marshes consist of cordgrass and spike grass. Cultural modifications include urban, dense suburban and some rural residential development. Coastal resorts and development associated with coastal tourism and sport and commercial fishing also occur in this ecoregion.

Portions of the Visual Study Area that are within this ecoregion include the western portion of Brooklyn and Governors Island, New York. This area is heavily developed with pockets of dispersed natural areas and parks.

Glaciated Triassic Lowlands

The western portion of the Visual Study Area in New Jersey is within the Glaciated Triassic Lowlands ecoregion which consists of flat to irregular plains, moist depressions, low hills, ridges and streams (Bryce et al. 2010). Vegetation type consist of fragmented woodlands transitional between Appalachian oak forest and hemlock-northern hardwood forests, serpentine barrens-grassland-savanna communities, and swamps with cottonwood and oaks. Cultural modifications include mostly urban areas in New Jersey, with some agriculture and nursery crops.

The portion of the Visual Study Area that is within this ecoregion includes New Jersey. This area is heavily developed with small pockets of dispersed natural areas and parks.

Onshore Project Area

The onshore substation site is an approximately 4.8-ac (1.9-ha) area located at the north end of SBMT, which is located west of 2nd Avenue between 29th and 39th streets in Brooklyn, New York. The existing Gowanus 345-kV Substation, which will support the interconnection of the Project to the existing electrical grid, is located approximately 400 ft (122 m) to the northeast of SBMT. The topographic character of the Project Area is relatively flat. The onshore substation ranges from approximately 5.9 ft (1.8 m) to 10.8 ft (3.3 m) elevation NAVD88 (CIRES 2014). The parcel on which the onshore substation is proposed to be located consists of paved parking lot and storage area. The onshore substation site is surrounded by a large warehouse to the north, a parking lot, 2nd Avenue and commercial and industrial buildings to the east, open asphalt area and warehouse to the south, and Upper Bay to the west. A railroad also runs along the eastern boundary of the onshore substation. Vegetation is limited in and adjacent to the onshore substation site, and includes scattered green grasses and bushy shrubs along the shore of the bay ranging from approximately 10 to 15 ft (3 to 5 m) in height and 3 to 8 ft (0.9 to 2.4 m) in width, and weeds that have grown up through cracks in the pavement. The onshore substation site is in a highly urbanized area that is characterized by several warehouses, 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 Visual Study Area who might experience the visual effects of the 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 Visual Study Area 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 Visual Study Area. 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 Project components.

Regardless of their residence location, local residents may have similar reactions to views of the Project facilities. 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 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 analysis area view the landscape from motor vehicles on their way to work or other business destinations. Commuting activity occurs all throughout the Visual Study Area since much of the area is developed and in or near New York City, a major metropolitan area. Commuters 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 or 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 Visual Study Area were selected for detailed study. Criteria used to select KOPs for onshore Project components included:

- Locations representing the most critical viewpoints (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 Visual Study Area.

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

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

Map ID Number	Name	Location	Resource Type	Distance to Project Site mi (km)	Project Visibility
1	2nd Avenue	Brooklyn	Travel way	100 ft (30.5 m)	Visible
2	Columbia Street Esplanade	Brooklyn	Public Recreation	0.4 (0.6)	Partially Visible
3	Hudson River Waterfront Walkway	Hoboken, New Jersey	Public Recreation	3.7 (6.0)	Visible
4	Statue of Liberty	New York City	Tourist Destination, Historic (National Monument, NRHP, NYC Landmark, NJRHP)	2.8 (4.5)	Partially Visible

I.4.6.1 2nd Avenue

This KOP is located on the corner of 2nd Avenue and 32nd Street in Brooklyn, New York within the commercial/industrial area directly east of the onshore substation. The 2nd Avenue KOP begins just north of 28th Street and extends south-southwest approximately 2 mi (3.2 km) to the Belt Parkway and provides access to several commercial and industrial developments along the waterfront. The landscape surrounding this local road is densely urban and includes heavy industrial and commercial development. Upper Bay is located approximately 0.6 mi (1 km) to the west.

Existing View

This KOP is within the Long Island Sound Coastal Inland ecoregion. The landscape surrounding this location is characterized by dense urban development. Views from this location toward the Project include industrial buildings, a recycling center, a parking lot and associated lighting, a perimeter chain-link fence and a wind turbine in the foreground with peekaboo views of the Upper Bay and buildings in lower Manhattan in the background. Vegetation is limited to scattered trees within the South Brooklyn Marine Terminal.

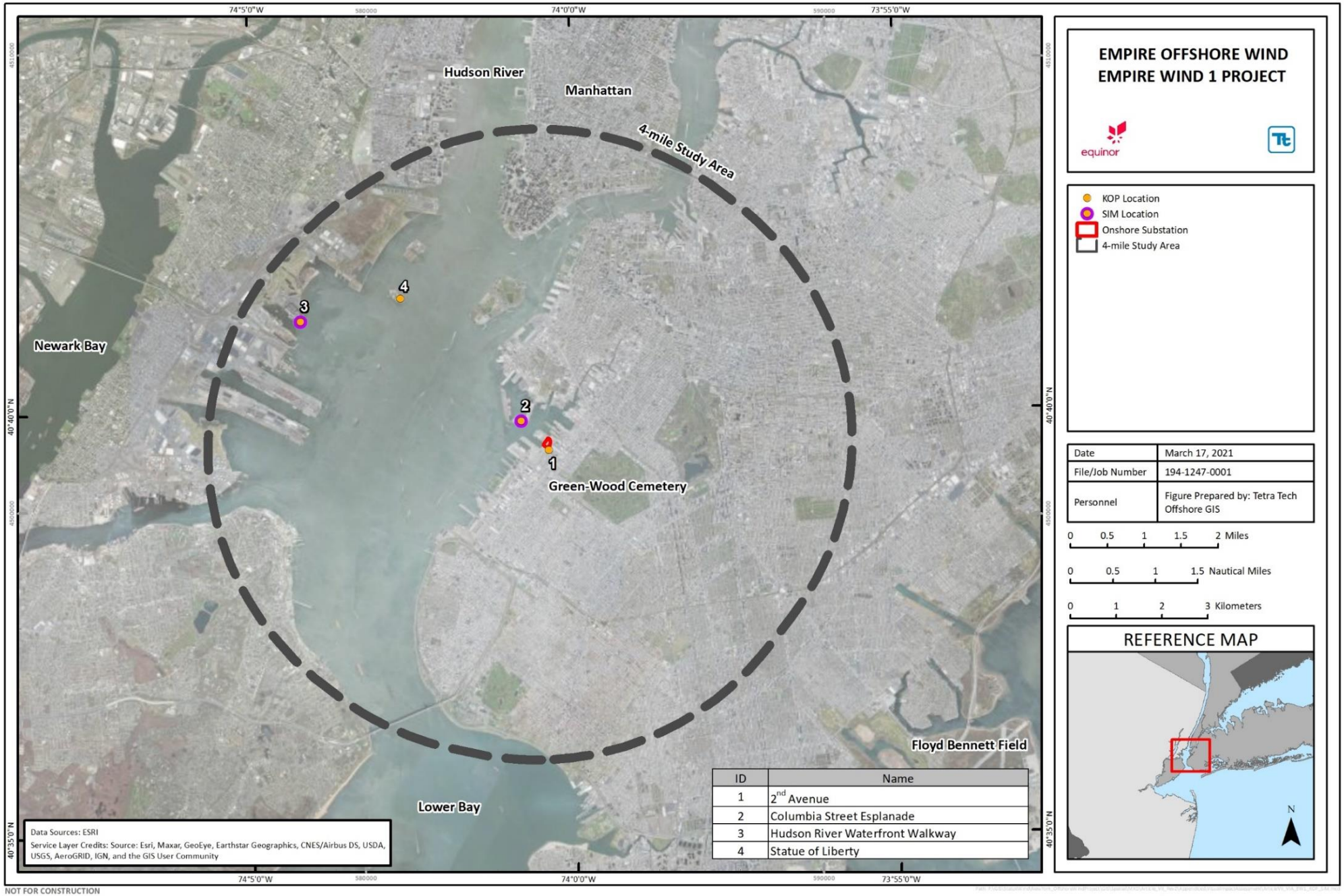

Figure I-4 Key Observation Points within the Visual Study Area

View with the Project

This location represents drivers along 2nd Avenue and viewers in adjacent buildings[7]. Views towards the onshore substation from this location are unobstructed. The substation will be seen in the context of other existing development including a recycling center, parking lot, warehouse, an onshore wind turbine, and lighting associated with parking areas. Although the surrounding area is heavily developed, the area within the South Brooklyn Marine Terminal primarily includes paved areas with one warehouse located south of the onshore substation. The proposed buildings associated with the onshore substation will be larger than the existing warehouse to the south. Furthermore, the proposed substation will be seen in front of the recycling center and closer to potential viewers on 2nd Avenue. Due to the proximity of the proposed substation to the road (approximately 100 ft (31 m) and the size of the proposed buildings, the onshore substation will attract attention and dominate the view. As such, the Project will introduce strong visual contrast.

I.4.6.2 Columbia Street Esplanade

Columbia Street Esplanade is located at the end of Columbia Street in Brooklyn, New York. The esplanade is a walkway that runs along the east side of a pier that extends out into Gowanus Bay. Amenities include benches, lighting, and a bikeway. The esplanade is privately owned and maintained but is open and accessible to the public (NYC 2019). The landscape surrounding the esplanade includes warehouses along the pier to the west and north and Gowanus Bay and east and south, with the South Brooklyn Marine Terminal located on the eastern side of the bay.

Existing View

This KOP is within the Long Island Sound Coastal Inland ecoregion. The landscape surrounding this location is characterized by open water and dense urban development. Because of the dense development along the eastern side of Gowanus Bay, views from the esplanade are limited primarily to buildings and other development in the foreground. However, the Green-Wood Cemetery, Sunset Park, and some taller buildings can be seen in the middleground rising above some of the development along the coast. Vegetation includes trees and shrubs scattered along the shoreline of the bay and trees associated with Green-Wood Cemetery and Sunset Park. From this KOP views toward the onshore substation are partially screened by development.

View with the Project

This location represents recreational viewers associated with the esplanade. Views toward the onshore substation from this location are partially screened by the existing recycling center that is located directly west of the site. Portions of the proposed buildings that rise above or extend beyond the recycling center will be visible. The light beige color and rectangular form of the buildings within the onshore substation will be similar in form and color to several other warehouses and commercial buildings along the coast. The scale of the proposed buildings will also be similar to several of the existing buildings. The outdoor electrical equipment will mostly be screened by the recycling center and portions that are visible will not be noticeable or perceived. Substation facilities that are visible will be seen in the context of the recycling center, which is a prominent feature in the view, and other commercial and industrial development along the western shoreline of Brooklyn, New York. At a distance of 0.4 mi (0.6 km), although the substation buildings will attract attention the recycling center located closer to the viewer will remain a dominant feature. As such, the Project will create weak visual contrast.

[7] This view represents viewers at the ground level of adjacent buildings, it does not represent views from upper stories of nearby buildings.

A simulation representing the view of the substation buildings from this location is included in **Attachment I-3**.

I.4.6.3 Hudson River Waterfront Walkway

This KOP is located along the Hudson River Waterfront Walkway, specifically at the eastern end of Chapel Avenue in New Jersey. The Hudson River Waterfront Walkway is a 30-ft (9.1-m)-wide, paved pathway that extends 18.5 mi (29.8 km) along the western shore of the Upper Bay and Hudson River from Bayonne, New Jersey to the George Washington Bridge. The walkway follows the general contour of the shoreline and traverses residential, commercial, and industrial development, including re-developed piers, and wetlands. The walkway was developed to provide connectivity between municipalities and to provide public access to the water's edge. There are several parking areas and points of interest along the walkway route. According to the Hudson River Waterfront Conservancy[8], "The walkway was adopted into New Jersey Administrative Law in 1988. It requires the construction and maintenance of the Walkway by the owner of the waterfront land. It also requires free, unobstructed access to the Walkway 24 hours a day. An easement conveys the conservation restriction to the NJ Department of Environmental Protection which is responsible for the enforcement of the regulation." (HRWC 2019). The landscape surrounding the walkway includes the Upper Bay and Hudson River to the east and a variety of land uses to the west, including industrial, residential, and commercial.

Existing View

This KOP is within the Glaciated Triassic Lowlands ecoregion. The landscape surrounding this location is characterized by open water and dense urban development. Expansive views of the water and the skyline of New York, including Brooklyn, can be seen from the walkway. From this KOP views toward the onshore substation are primarily unobstructed. However, the bay is heavily traveled by large marine vessels, including cargo ships, cruise ships, and ferries, and the eastern shoreline is sometimes screened by passing ships.

View with the Project

This location represents viewers associated with the walkway, such as pedestrians, bikers and anglers. Views across the Upper Bay toward the Project are unobstructed; however, the northern portion of the onshore substation will be partially screened by the recycling center located directly west of the site. Portions of the onshore substation that are visible include the outdoor electrical equipment area and buildings to be located near the southern portion of the site. The large light beige color and rectangular form of the buildings within the onshore substation will be similar in form and color to several warehouses and commercial buildings along the coast. The scale of the proposed buildings will also be similar to several of the existing buildings. The outdoor electrical equipment, which will consist of transformers and shunt reactors, will most likely be surrounded by fire walls that will screen most of the equipment itself. The firewalls will be gray and appear rectangular in form and will be smaller in size than the proposed buildings. Substation facilities on the onshore substation that are visible will be seen in the context of other commercial and industrial development along the western shoreline of Brooklyn, New York. At a distance of approximately 4 mi (6.4 km), the substation facilities will blend into the existing landscape setting. Due to the distance of the onshore substation and the densely developed industrial/commercial coastline, the substation may attract attention but would appear as a subordinate feature in the heavily developed landscape setting and will not change the characteristic of the view. As such, the Project will introduce weak visual contrast. Marine vessels, including cargo and cruise ships, may

[8] The Hudson River Waterfront Conservancy is a non-profit organization that works with the New Jersey Department of Environmental Protection to monitor the construction, maintenance, and usage of the walkway.

also temporarily screen the onshore substation as they travel to and from port. A simulation representing the view of the substation buildings from this location is included in **Attachment I-3**.

I.4.6.4 Statue of Liberty

This KOP is located on the southeast side of the Statue of Liberty, which is on Liberty Island within New York Harbor. The Statue of Liberty is a copper statue that was a gift from the people of France to the people of the United States. The statue was dedicated on October 28, 1886. The statue is part of the Statue of Liberty National Monument, which is comprised of the statue and Ellis Island. The statue is owned and operated by the National Park Service and was listed on the NRHP in September 2017 (NPS 2017). The statue is also designated as a UNESCO World Heritage Site, U.S. National Monument, NJ/NRHP, and New York City Landmark. The landscape surrounding this location includes open water with dense urban development along the mainland of New York and New Jersey.

Existing View

This KOP is within the Long Island Sound Coastal Lowland ecoregion. The landscape surrounding this location is characterized by open water and dense urban development. Expansive views of the water and the New York and New Jersey skyline can be seen from Liberty Island. Vegetation is limited to parks and vegetation along the waterfront. From this KOP views toward the onshore substation are partially obstructed by piers and other development along the southern coast of Brooklyn.

View with the Project

This location represents views from tourists visiting a widely known and highly popular landmark. Views from this location across Upper Bay toward the Project are partially obstructed. A pier that extends out into the water is located between the Liberty Island and the Project. The New York Police Department Erie Auto Pound is located on the pier, as is the Columbia Street Esplanade. There is also an existing recycling center located directly west of the onshore substation site that will partially screen the proposed substation buildings. Portions of the proposed buildings that rise above or extend beyond the recycling center will be visible. The light beige color and rectangular form of the buildings within the onshore substation will be similar in form, scale and color to several warehouses and commercial buildings along the coast. The outdoor electrical equipment will be mostly screened by the recycling center, and portions that are visible will not be noticeable or perceived. Substation facilities at the onshore substation site that are visible will be seen in the context of other commercial and industrial development along the western shoreline of Brooklyn, New York. At a distance of approximately 2.8 mi (4.5 km) the substation facilities will blend into the existing landscape setting. Due to the distance of the onshore substation from the viewer and screening by existing development, the substation will not attract attention or be perceived. Therefore, the Project will not change the characteristic of the view. As such, the Project will introduce no visual contrast.

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 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 Project facilities introduce to the existing landscape. The BLM's visual contrast rating process (Manual 8431-1 Visual Resource Contrast Rating) was used as the basis for reviewing potential landscape changes resulting from the 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 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 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 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 Project components, the level of visual contrast becomes more apparent, which typically increases perceived contrast.

The degree of contrast introduced to a particular viewpoint by 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 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 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).

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 Project will affect visual resources.

For the onshore substation site, onshore 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 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 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 Project is implemented. Half of the KOPs were selected for development of simulations to demonstrate how the constructed 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 were created using a generic building (i.e., simple block form that is uniform in color and materials) and a general arrangement of outdoor electrical, internal drive and parking areas and perimeter security fence on the site. Since detailed plans for the onshore substation have not been finalized, the simulations depicting outdoor electrical equipment (i.e., shunt reactors, transformers, static masts) are based on the indicative substation layout (see Section I.2.1). Although the onshore substation design will 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 Project is implemented using conservative indicative 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 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 Project Areas were created to scale. These 3D models of the 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, 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 Project components are included in **Attachment I-3**.

I.5.2 Potential Effects to Visual Resources

Where visible and noticeable, the 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 Project. At the end of the Project's operational life, it will be decommissioned in accordance with a detailed 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

The onshore cables associated with the Project will be entirely underground. 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 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 Project construction primarily for viewers adjacent to the Project Area, where the presence of construction equipment, materials, and crews will be dominant in the foreground.

For the onshore substation, this includes viewers associated with commercial and industrial buildings along the east side of 2nd Avenue, Columbia Street Esplanade[9], and marine vessels in Gowanus Bay. However, these visual effects will be short-term because construction equipment and crews will be removed once construction is complete. Views of Project construction from areas not immediately adjacent to the onshore substation 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 substation buildings, outside electrical equipment, static masts, and perimeter security fence. The onshore substation 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 cable corridor infrequently, which could cause some minor effects. Potential effects to visual resources associated with the proposed onshore substation site is described below.

The onshore substation site is located within a landscape setting that has been heavily modified by commercial and industrial development. Furthermore, the site on which the onshore substation will be located has also been modified. Based on the results of the viewshed analysis and subsequent field visit (see Section I.4.2 and Section I.4.3.3, respectively), potential views of the onshore substation will be primarily from the northwest, west and southwest. Areas to the north, east and south of the onshore substation will be screened by dense development associated with Brooklyn, New York. Viewers adjacent to the onshore substation along 2nd Avenue and in buildings[10] to the east will have views that are mostly unobstructed. The onshore substation will be seen in the context of other existing development including a recycling center, parking lot, warehouse, an onshore wind turbine, and lighting associated with parking areas. The surrounding area is heavily developed and the area within SBMT, where the onshore substation is located, primarily includes paved areas with a warehouse located just south of the onshore substation. The proposed buildings associated with the onshore substation will be larger than the existing warehouse to the south. Furthermore, the onshore substation will be located in front of the recycling center and closer to 2nd Avenue and potential viewers. Due to the proximity of the onshore substation to the road (approximately 100 ft [30.5 m]) and the size of the proposed buildings, the onshore substation will attract attention and dominate the view. As such, the Project will introduce strong visual contrast in views from the east.

Viewers located to the west, within the Upper Bay and along the western side of the Upper Bay on the coast of New Jersey, will have views that range from unobstructed to partially screened by development. The light beige color and large rectangular form of the buildings within the onshore substation will be similar in form, color, and scale to other warehouses and commercial buildings along the coast. The outdoor electrical equipment, which will consist of transformers and shunt reactors, will most likely be surrounded by fire walls that will mostly screen views of the equipment itself. Due to the distance of the onshore substation to the New Jersey coastline (approximately 3.0 mi [4.8 km] or more) and the densely developed industrial/commercial

[9] Columbus Street Esplanade is a boardwalk along Columbus Street which is located on Gowanus Bay approximately 0.4 mi (0.6 km) west of the EW 1 onshore substation site.
[10] This view represents viewers at the ground level of adjacent buildings; it does not represent views from upper stories of nearby buildings.

coastline, an onshore substation at SBMT would appear as a subordinate feature in the heavily developed landscape setting and will not change the characteristic of the view. As such, the Project will introduce weak visual contrast.

The onshore cable route for the onshore substation is adjacent to the substation site at landfall. There is no vegetation along the route and impacts to buildings or other structures are not anticipated. The entire length of the line will be placed underground. No significant changes to the visual environment are anticipated as the route will be located underground and there will be no significant impacts to vegetation, no grading along the route, and the areas disturbed during construction will be restored.

Results are discussed in detail for each KOP in Section 1.4.6. Simulations depicting the onshore substation 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 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 Project Components

Map ID Number a/	Name	Location	Distance to Project Site (mi [km])	Contrast Rating b/	Simulation Created for KOP c/
1	2nd Avenue	Brooklyn, NY	100 ft (30.5 m)	Strong	-
2	Columbia Street Esplanade	Brooklyn, NY	0.4 (0.6)	Weak	Yes
3	Hudson River Waterfront Walkway	Jersey City, NJ	3.7 (6.0)	Weak	Yes
4	Statue of Liberty	New York, NY	2.8 (4.5)	None	-

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**.

I.5.2.3 Nighttime Lighting

Proposed nighttime lighting associated with the onshore 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. For the onshore substation site this includes security lighting within the SBMT and nearby industrial and commercial facilities, the existing Gowanus POI, streetlights, and lights on marine vessels.

I.5.3 Mitigation

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

- Construction Phase:
  - A Fugitive Dust Control Plan will be implemented to minimize dust (visual pollution);
  - The onshore 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 cables and joint bays will be located underground, and will not be a visible during Project operation and maintenance, with the exception of potential discoloration of old vs new paved areas in the roadway;
  - The onshore substation will have minimal presence of crews and equipment conducting maintenance activities; and
  - Lighting at the onshore substation 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.
  - The onshore substation site is located within the jurisdiction of the New York City's Waterfront Revitalization Program; therefore, a pre-engineered building system with prescribed architectural elements incorporated into the design will be used to ensure the Project meets the Waterfront Revitalization Program policies (see Section I.3.2.2).

I.6 Conclusions

Overall, the onshore Project components would result in changes to the landscape conditions that vary from strong to none for viewers within the Visual Study Area. On a short-term basis during the construction period for each of the onshore 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 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 will be limited primarily to viewers directly adjacent to the site, including from local roads and commercial buildings, and viewers across Upper Bay along the New Jersey coast. Viewers adjacent to the site and along the New Jersey coast will perceive a change in the landscape, and it is anticipated that the contrast created by the change will vary from strong to none. Perceived change will be higher along roads and from buildings that are closest to the site on the west, where the proposed buildings and outdoor electrical equipment will be located in an open paved area. Perceived change will be less for viewers to the west of the site along the New Jersey coast, where views of the site will be seen in the context of the downtown Manhattan skyline, dense urban development along the coast of Brooklyn, New York, and marine vessels within the Upper Bay. Due to the distance of the onshore substation and the densely developed landscape in which the proposed substation would be seen, it is anticipated that the Project will introduce weak contrast or not be perceived within views from New Jersey. Views from areas to the north, east, and south of the site will be screened by dense industrial and commercial development.

I.7 References

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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 – EW 1 Onshore Substation
- Visual Resource Inventory Photo Log (Visual Study Area)

Table I-1-1 Visual Resource Inventory within the Visual Study Area

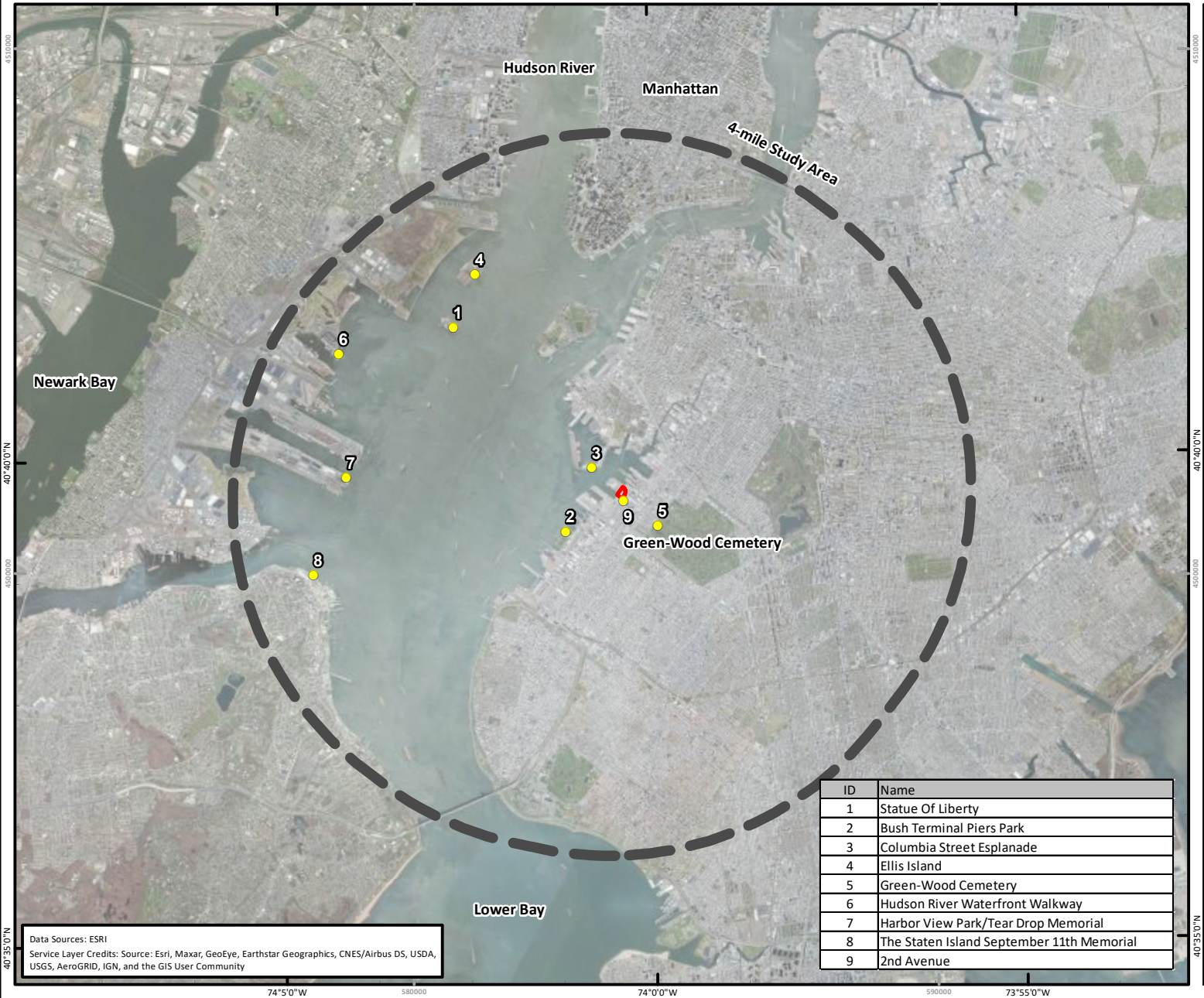
Inventory ID [a/]	Name	Location	Resource Type	Description
1	Statue of Liberty	New York City, NY	Tourist Destination, Historic (National Monument, NRHP, NYC Landmark, NJRHP)	The Statue of Liberty is a copper statue that was a gift from the people of France to the people of the United States. The statue was dedicated on October 28, 1886. The statue is part of the Statue of Liberty National Monument which is comprised of the statue and Ellis Island. The statue is owned and operated by the National Park Service and was listed on the NRHP in September 2017. The statue is also designated as a UNESCO World Heritage Site, U.S. National Monument, NJNRHP, and New York City Landmark. The landscape surrounding this location includes open water with dense urban development along the mainland of New York and New Jersey.
2	Bush Terminal Piers Park	Brooklyn, NY	Public Recreation	Bush Terminal Piers Park is a 14-ac (5.7 ha) waterfront park located in the industrial section of Sunset Park in Brooklyn, New York. The park is located west of 1st Avenue between 43rd and 51st streets and offers views of the area's tidal pools and the Bay Ridge Channel. The site was once a port complex but was reclaimed and turned into a public park, which opened in 2014. The park is owned and managed by the New York City Department of Parks and Recreation. The park includes baseball and soccer fields, seating and a walking trail. The landscape surrounding this location includes the Upper Bay to the west, piers to the northeast and southwest and dense urban development to the east.
3	Columbia Street Esplanade	Brooklyn, NY	Public Recreation	Columbia Street Esplanade is located at the end of Columbia Street in Brooklyn, New York. The esplanade runs along the east side of a pier that extends out into Gowanus Bay. Amenities include benches, lighting and a bikeway. The esplanade is privately owned and maintained but is open and accessible to the public. The landscape surrounding the esplanade includes warehouses along the pier to the west and north and Gowanus Bay and east and south with the South Brooklyn Marine Terminal located on the eastern side of the bay.
4	Ellis Island	New York City, NY	Tourist Destination, Historic (National Monument, NRHP, NYC Landmark, NJRHP)	Ellis Island is located within New York Harbor and is the former immigration inspection station operating between 1892 and 1954. The island is part of the Statue of Liberty National Monument and was designated a U.S. National Monument in May 1965. The island is also designated as a NRHP (October 1966), NJRHP (May 1971), and NYC Landmark (November 1993). The island includes the Ellis Island Immigration Museum and the Wall of Honor, a 770-panel wall including approximately 800,000 names. The island is owned and maintained by the National Park Service.
5	Green-Wood Cemetery	Brooklyn, NY	Tourist Destination, Historic (NRHP, NHL)	The Green-Wood Cemetery is a 478-acre cemetery located in Brooklyn, New York City, and lies several blocks south of Prospect Park. The cemetery was founded in 1838 and was one of the first rural cemeteries in America. The park consists of hills, valleys, several ponds, walking paths, and an arboretum. The cemetery was listed on the NRHP March 1997 and designated an NHL in September 2006. The cemetery is maintained by the Green-Wood Historic Fund.
6	Hudson River Waterfront Walkway	Hoboken, NJ	Public Recreation	The Hudson River Waterfront Walkway is a 30-ft (9.1-m) wide pathway that extends 18.5 mi (29.8 km) along the western shore of the Upper Bay and Hudson River between Bayonne to the George Washington Bridge on the New Jersey shore. The walkway follows the general contour of the shoreline and traverses residential, commercial, re-developed piers, wetlands, and industrial development. The walkway was developed to provide connectivity between municipalities and to provide public access to the water's edge. There are several parking and points of interest along the walkway route. According to the Hudson River Waterfront Conservancy[1] "The walkway was adopted into New Jersey Administrative law in 1988. It requires the construction and maintenance of the Walkway by the owner of the waterfront land. It also requires free, unobstructed access to the Walkway 24 hours a day. An easement conveys the conservation restriction to the NJ Department of Environmental Protection which is responsible for the enforcement of the regulation." The landscape

[1] The Hudson River Waterfront Conservancy is a non-profit organization that works with the New Jersey Department of Environmental Protection to monitor the construction, maintenance and usage of the walkway.

Table I-1-1 Visual Resource Inventory within the Visual Study Area

Inventory ID [a/]	Name	Location	Resource Type	Description
				surrounding the walkway includes the Upper Bay and Hudson River to the east and a variety of land uses to the west, including industrial, residential, and commercial.
7	Harbor View Park/Tear Drop Memorial	Bayonne, NJ	Tourist Destination, Public Recreation	Harbor View Park is a 2 ac (0.8 ha) public park and is the location of the Tear Drop Memorial (also known as To the Struggle Against World Terrorism and the Tear of Grief). The memorial is a 10-story sculpture given to the United States as a gift from the Russian Government as a memorial to the victims of the September 11 attacks (The Peninsula 2019). The park is owned and maintained by the City of Bayonne, New Jersey. The landscape surrounding the location includes a terminal and Cape Liberty (a year-round cruise port) to the north, Upper Bay to the east and industrial development associated with cargo/shipping to the south and east.
8	The Staten Island September 11th Memorial	Staten Island, NY	Tourist Destination, Public Recreation	The Staten Island September 11th Memorial is located along Staten Island's North Shore Waterfront Esplanade. The memorial resembles a pair of wings reaching skyward. The esplanade includes a walking/biking path and benches. The park is owned and maintained by the NYC parks department.
9	2nd Avenue	Brooklyn, NY	Travel way	2nd Avenue beings just north of 28th Street and extends south-southwest approximately 2 mi (3.2 km) to the Belt Parkway and provides access to several commercial and industrial developments along the waterfront. The landscape surrounding this local road is densely urban and includes heavy industrial and commercial development. Upper Bay is located approximately 0.6 mi (1 km) to the west.

Notes:
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	Statue Of Liberty
2	Bush Terminal Piers Park
3	Columbia Street Esplanade
4	Ellis Island
5	Green-Wood Cemetery
6	Hudson River Waterfront Walkway
7	Harbor View Park/Tear Drop Memorial
8	The Staten Island September 11th Memorial
9	2nd Avenue

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 1 PROJECT

equinor

- Inventory Location
- Onshore Substation
- 4-mile Study Area

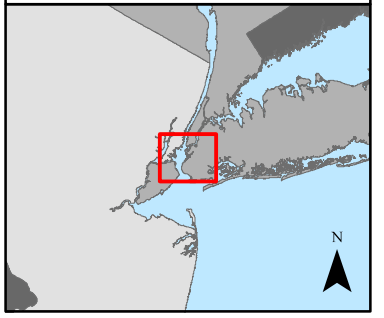
Date	March 17, 2021
File/Job Number	194-1247-0001
Personnel	Figure Prepared by: Tetra Tech Offshore GIS

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. Statue Of Liberty, NY

2. Bush Terminal Piers Park, NY

3. Columbia Street Esplanade, NY

4. Ellis Island, NY

5. Green-Wood Cemetery, NY

6. Hudson River Waterfront Walkway, NJ

7. Harbor View Park/Tear Drop Memorial, NJ

8. The Staten Island September 11th Memorial, NY

9. 2nd Avenue, NY

Attachment I-2 Visual Contrast Rating Worksheets

Visual Contrast Rating Worksheets for Project Components:

- 2nd Avenue
- Columbia Street Esplanade
- Hudson River Waterfront Walkway
- Statue of Liberty

PROJECT INFORMATION

KOP: SBMT Onshore Substation – 2nd Avenue	**Reviewers Name: Lori Davidson**
Distance to nearest Project component: 100 ft (31 m)	**Date: 9/19/2019**
Latitude: 40.659049° N	**Longitude: -74.006444 °W**
Angle of Observation: *Level* ☒ *Inferior* ☐ *Superior* ☐	Visibility: *Screened* ☐ (Partially/Completely) *Backdropped* ☐ *Skylined* ☒

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

Has a Photo Simulation Been Created for KOP? ☐ *Yes* ☒ *No* **If yes, Figure Number:** n/a

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground/Middleground (FG/MG): Flat, level Background (BG): not discernible Seldom Seen (SS): not applicable (n/a)	n/a	FG/MG: tall, thin; geometric (utility poles), transparent and solid (fence/building); large contiguous (parking lot) BG/SS: n/a
Line	FG/MG: straight horizontal	n/a	FG/MG: straight vertical and horizontal, angular; tall, thin; short thin BG/SS: n/a
Color	FG/MG: not discernible	n/a	FG/MG: brown, light and dark gray, black, white, orange, red BG/SS: n/a
Texture	FG/MG: not discernible	n/a	FG/MG: fine, ordered; course BG/SS: n/a

REPRESENTATIVE PHOTOGRAPH

PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	n/a	n/a	FG/MG: large, rectangular
Line	n/a	n/a	FG/MG: vertical and horizontal, straight, long, thin
Color	n/a	n/a	FG/MG: light beige, gray
Texture	n/a	n/a	FG/MG: medium

CONTRAST RATING

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 attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments: Although the surrounding area is heavily developed, the area within the South Brooklyn Marine Terminal is primarily includes paved areas with one warehouse located south of the SBMT onshore substation. The proposed buildings associated with the SBMT onshore substation will be larger than the existing warehouse to the south. Furthermore, the proposed substation will be located in front of the recycling center and closer to 2nd Avenue and potential viewers. Due to the close proximity of the proposed substation to the road (approximately 100 ft (31 m) and the size of the proposed buildings the SBMT onshore substation will attract attention and dominate the view.

PROJECT INFORMATION	
KOP: SBMT Onshore Substation – Columbia Street Esplanade	**Reviewers Name: Lori Davidson**
Distance to nearest Project component: 0.4 mi (0.6 km)	**Date: 9/19/2019**
Latitude: 40.664841° N	**Longitude: -74.013545° 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	Moderate	Moderate to Low	Low	Moderate

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

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground/Middleground (FG/MG): Flat, level (water/land) Background (BG): not applicable (n/a) Seldom Seen (SS): n/a	FG/MG: large irregular patch; rounded	FG/MG: vertical, tall and thin; large rectangular and angular, transparent and solid; (buildings); small rectangular
Line	FG/MG: horizontal straight, strong (shoreline)	FG/MG: horizontal irregular; narrow strip (along shoreline)	FG/MG: straight vertical and horizontal, angular; tall vertical narrow; square
Color	FG/MG: grayish/blue (water); not discernible (land)	FG/MG: light and dark green, brown	FG/MG: beige, white, brown, gray, red, black, brown
Texture	FG/MG: fine, stippled, glossy (water); not discernible (land)	FG/MG: fine to medium	FG/MG: smooth, fine to rough

REPRESENTATIVE PHOTOGRAPH

PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	N/A	N/A	FG/MG: solid, large and small, rectangular; vertical, narrow; short geometric, transparent.
Line	N/A	N/A	FG/MG: vertical and horizontal, straight; straight, thin; short
Color	N/A	N/A	FG/MG: light beige, light gray
Texture	N/A	N/A	FG/MG: fine, smooth

CONTRAST RATING

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: Weak

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 attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments: Portions of the SBMT Site that are visible will be seen in the context of the recycling center which is a prominent feature in the view and other commercial and industrial development along the western shoreline of Brooklyn, New York. At a distance of 0.4 mi (0.6 km) the buildings associated with the SBMT Site will attract attention, however the recycling center which is located between the SBMT Site and the viewer will remain a dominant feature for viewers.

PROJECT INFORMATION	
KOP: SBMT Onshore Substation – Hudson River Waterfront Walkway	**Reviewers Name: Lori Davidson**
Distance to nearest Project component: 3.7 mi (6.0 km)	**Date: 9/19/2019**
Latitude: 40.684785° N	**Longitude: -74.070244° 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	Moderate	Moderate to Low	Moderate to High	Moderate

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

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground/Middleground (FG/MG): Flat, level Background (BG): gently rolling Seldom Seen (SS): N/A	FG/MG: n/a BG: large irregular patch; short linear	FG/MG: narrow strip; low thin (vessels) BG: small, large, blocky; vertical tall and thin (buildings)
Line	FG/MG: horizontal straight; short vertical repetitive BG: strong (shoreline); horizontal irregular (land)	FG/MG: n/a BG: horizontal irregular; short narrow strip	FG/MG: straight horizontal; short, parallel; short narrow strips (vessels) BG: rectangular; short thin
Color	FG/MG: grayish/blue BG: not discernible	FG/MG: n/a BG: dark green	FG/MG: tan, gray, brown BG: beige, tan, white, brown, gray, red, black, yellow
Texture	FG/MG: fine, stippled, glossy BG: not discernible	FG/MG: n/a BG: fine, stippled	FG/MG: fine, simple BG: course, dense

REPRESENTATIVE PHOTOGRAPH

PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	N/A	N/A	BG: small geometric
Line	N/A	N/A	BG: rectangular, straight
Color	N/A	N/A	BG: light beige
Texture	N/A	N/A	BG: smooth

CONTRAST RATING

Elements

Features

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: Weak

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 attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments: Portions of the SBMT onshore substation that are visible will be seen in the context of other commercial and industrial development along the western shoreline of Brooklyn, New York. At a distance of approximately 4 mi (6.4 km) the SBMT onshore substation will blend in to the existing landscape setting. Due to the distance of the SBMT onshore substation and the densely developed industrial/commercial coastline the SBMT onshore substation may attract attention but would appear as a subordinate feature in the heavily developed landscape setting.

PROJECT INFORMATION

KOP: SBMT Onshore Substation – Statue of Liberty	**Reviewers Name: Lori Davidson**
Distance to nearest Project component: 2.8 mi (4.5 km)	**Date: 9/19/2019**
Latitude: 40.689148° N	**Longitude: -74.044451° 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:*
Tourist	Moderate	Moderate to Low	High	Moderate

Has a Photo Simulation Been Created for KOP? ☐ *Yes* ☒ *No* **If yes, Figure Number:** n/a

CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Foreground/Middleground (FG/MG): Flat, level (water)/flat, to gently rolling (land) Background (BG): Not Applicable (N/A) Seldom Seen (SS): N/A	FG/MG: thin, narrow strip BG: large irregular patch	BG: small, large, blocky; vertical tall and thin; low thin, narrow
Line	FG/MG: horizontal straight, strong (shoreline); BG: horizontal straight, and irregular	FG/MG/BG: horizontal irregular	BG: geometric; short thin; short narrow strips
Color	FG/MG: grayish/blue BG: not discernible	FG/MG/BG: dark green	BG: brown, tan, gray, black
Texture	FG/MG: fine, stippled, glossy BG: not discernible	FG/MG/BG: fine, dense	BG: course, dense

REPRESENTATIVE PHOTOGRAPH

PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	N/A	N/A	BG: not discernible
Line	N/A	N/A	BG: not discernible
Color	N/A	N/A	BG: not discernible
Texture	N/A	N/A	BG: not discernible

CONTRAST RATING

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 attracts attention and begins to dominate or appears as a co-dominant feature in the characteristic landscape
Weak	The element contrast can be seen and may attract attention but appears subordinate in the characteristic landscape.
None	The element contrast is not visible or perceived.

Additional Comments: Portions of the SBMT onshore substation that are visible will be seen in the context of other commercial and industrial development along the western shoreline of Brooklyn, New York. At a distance of approximately 2.8 mi (4.5 km) the SBMT onshore substation will blend in to the existing landscape setting. Due to the distance of the SBMT onshore substation from the viewer and that most of the site will be screened by existing development, the SBMT onshore substation will not attract attention or be perceived.

Attachment I-3 Visual Simulations

Single-Frame Daytime Photographic Simulations:

- EW 1 Onshore Substation Site, NY – Columbia Street Esplanade
- EW 1 Onshore Substation Site, NY – Hudson River Waterfront Walkway

Panoramic Photograph

Vicinity Map

Photograph Information

Viewpoint Location:	Columbia Street Esplanade
Date of Photograph:	September 18, 2019
Time of Photograph:	4:45 PM (EDT)
Weather Condition:	Partly Cloudy
Latitude:	40.664841° N
Longitude:	-74.013545° W
Viewing Direction:	Southeast
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).

Empire Offshore Wind: Empire Wind 1 Project

EW 1 Onshore Substation | Columbia Street Esplanade

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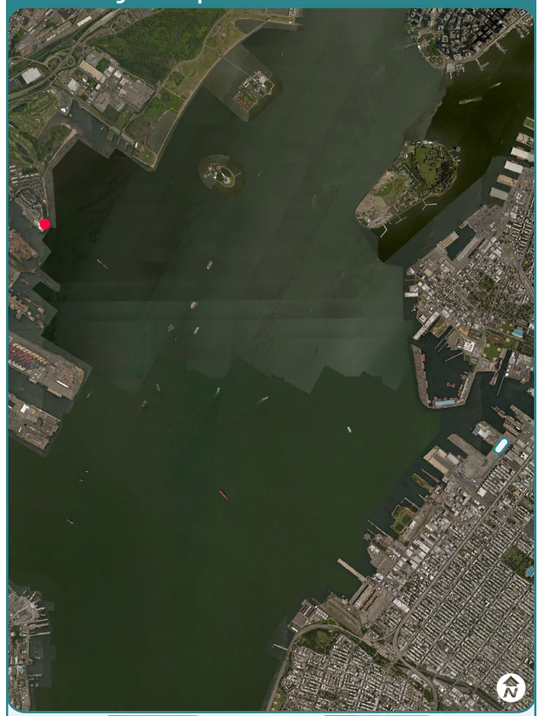
Panoramic Photograph

Vicinity Map



Photograph Information

Viewpoint Location:	Hudson River Waterfront Walkway
Date of Photograph:	September 18, 2019
Time of Photograph:	4:45 PM (EDT)
Weather Condition:	Partly Cloudy
Latitude:	40.684785° N
Longitude:	-74.070244° W
Viewing Direction:	Southeast
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

Empire Offshore Wind: Empire Wind 1 Project | EW 1 Onshore Substation | Hudson River Waterfront Walkway

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).

Empire Offshore Wind: Empire Wind 1 Project

EW 1 Onshore Substation | Hudson River Waterfront Walkway

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