SOUTHCOAST WIND

Appendix T. Visual Impact Assessment

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Visual Impact Assessment (VIA)

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Quality Information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	2/15/21	COP Submittal	Yes	Nancy Palmstrc	Project Manager
1	10/22/21	Revised to include changes in Falmouth Project Design Envelope and in response to BOEM comments	Yes	Kristen Durocher	Deputy Project Manager
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Abbreviations and Acronyms

Abbreviation or Acronym	Definition
3D	three dimensional
ADLS	Aircraft Detection Lighting System
AIS	Air-insulated substation
APE	Area of Potential Effect
APVI	Area of Potential Visual Impact
AVEHP	Analysis of Visual Effects to Historic Properties
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DC	Direct Current
DEIS	Draft Environmental Impact Statement
DEM	digital elevation model
DPU	Department of Public Utilities
DSM	digital surface model
EDIC	Economic Development & Industrial Corporation
EFSB	Energy Facilities Siting Board
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FLT	Falmouth Land Trust
FPM	Flashes per minute
ft	foot/feet
GIS	gas-insulated substation
GIS	geographic information system
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, Third Edition
ha	hectare(s)
HAT	Highest Astronomical Tide
HDD	Horizontal Directional Drilling
HVDC	high-voltage direct current
IEMA	Institute of Environmental Management and Assessment
km	kilometer
KOP	Key Observation Point
kV	kilovolt
Lease Area	Lease Area OCS-A 0521
LED	light emitting diode

Abbreviation or Acronym	Definition
LI	Landscape Institute
LiDAR	light imaging, detection, and ranging
LCA	Landscape character area
m	meter(s)
MDS	Maximum Development Scenario
MGL	Massachusetts General Law
mi	statue mile(s)
MLLW	Mean Lower Low Water
NCF	Nantucket Conservation Foundation
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NLB	Nantucket Land Bank
NLC	Nantucket Land Council
nm	Nautical Mile
OCA	Ocean character area
OCS	Outer Continental Shelf
OSP	Offshore Substation Platform
POI	Point of Interconnection
Project	SouthCoast Wind offshore wind renewable energy generation project
ROW	Right of Way
SCA	Seascape character area
SLCA	Seascape/landscape character area
SLIA	Seascape/landscape impact assessment
SLVIA	Seascape/Landscape Visual Impact Assessment
SouthCoast Wind	SouthCoast Wind Energy LLC
TCP	Traditional Cultural Property
U.S.	United States
USCB	U.S. Census Bureau
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VAF	Visibility Analysis Form
VCS	Vineyard Conservation Society
VIA	Visual Impact Assessment
WTG	Wind Turbine Generator

1.0 Introduction

SouthCoast Wind Energy LLC (SouthCoast Wind) proposes an offshore wind renewable energy generation project (Project) located in federal waters off the southern coast of Massachusetts in the Outer Continental Shelf (OCS) Lease Area OCS-A 0521 (the Lease Area). The Project will deliver electricity to the regionally administered transmission system via export cables with landings in Falmouth, Massachusetts (MA) and at Brayton Point in Somerset, MA. The focus of this Visual Impact Assessment (VIA) is on the Lease Area and the Falmouth Onshore Project Area, which includes all onshore facilities located in Falmouth, MA. An addendum to this VIA has been submitted to Bureau of Ocean Energy Management (BOEM) which addresses the Brayton Point Onshore Project Area (COP Appendix T.1).

1.1 Assessment Objectives

If a project is visible from shore, a VIA is required by BOEM to support the National Environmental Policy Act (NEPA) review process. A VIA is a technical analysis of the visual impacts, adverse or beneficial, of a proposed project. This report provides a VIA that evaluates potential changes to scenic resources that could result from the Project.

Visual impacts are expected to be of interest for communities nearest to the Project. For this assessment, the SouthCoast Wind study area includes locations where one or more onshore or offshore Project components could possibly be viewed, including Upper Cape Cod, Martha's Vineyard, Nantucket, and associated smaller islands, including Nomans Land, Esther, Tuckernuck, and Muskeget, as well as the Elizabeth Islands off Cape Cod.

The objectives of this VIA are to identify potential visibility of the Project from a range of viewer locations and conditions; and objectively characterize the changes in landscape quality with the Project in place.

This VIA report is intended to assist regulatory agencies, interested stakeholders, and the general public in their review of the Project, in accordance with applicable regulatory requirements.

For this VIA, AECOM:

- Developed a baseline assessment of visual conditions from which visual change resulting from the Project can be measured and evaluated;
- Using a digital surface model (DSM), documented the Area of Potential Visual Impact (APVI), which is the area within which the Project elements are likely to be visible based on topography, screening due to existing vegetation and structures, distance and factoring in curvature of the earth;
- Characterized the landscape and seascape by identifying character types within areas with similar natural and cultural features;
- Quantified the area within the landscape/seascape and ocean character types where the Project is potentially visible.
- Evaluated the sensitivity of seascape/landscape types based on susceptibility to change and its value to society.
- Characterized the magnitude of change to seascape/landscape types and characterized the potential seascape/landscape impacts associated with onshore and offshore project elements.
- Identified representative Key Observation Points (KOPs) in the APVI which encompass the full range of viewer experiences, conditions, and characteristics under which the Project may be seen;
- Selected a subset of KOP locations for development of representative visual simulations of the Project
- Identified viewer groups and characterized sensitivity of such viewers to visual change.
- Used the simulations, detailed parameters of the Project and other data for evaluation of the potential effect of the Project on a viewer’s experience from different locations;

- Provided an opinion of impact combining viewer sensitivity with the visual contrast of Project elements (BOEM will make a final determination of impacts) and;
- Identified potential mitigation measures to reduce apparent visual effects should such mitigation be necessary.

1.2 Report Organization

This report includes a general Project overview (Section 2.0), a description of the federal and state regulatory framework (Section 3.0), and an explanation of the VIA methodology used (Section 4.0). Section 5.0 provides the results of the VIA for the Offshore Project Area and Section 6.0 provides the Falmouth Onshore Project Area VIA results. References are provided in Section 7.0.

2.0 Project Description

2.1 Project Overview

The SouthCoast Wind Project includes a Lease Area located in federal waters south of Martha's Vineyard and Nantucket (Figure 2-1). Wind turbine generators (WTGs) constructed within the Lease Area will deliver power via inter-array cables to the offshore substation platforms (OSPs). Submarine offshore export cables will be installed within offshore export cable corridors (ECCs) to carry the electricity from the OSPs within the Lease Area to the onshore transmission systems via up to two different ECCs. The preferred ECC for both Project 1 and Project 2 is the Brayton Point ECC, which will make landfall at Brayton Point in Somerset, Massachusetts. The Falmouth ECC, making landfall in Falmouth, Massachusetts, is considered a variant option, which will be utilized in the event that technical, logistical, grid interconnection, or other unforeseen challenges arise during the design and engineering phase that prevent Project 2 from making interconnection at Brayton Point. The offshore export cables will make landfall via horizontal directional drilling (HDD). The preferred Brayton Point ECC will run north and west from the Lease Area through Rhode Island Sound to the Sakonnet River. It will then run north up the Sakonnet River, cross land at Aquidneck Island to Mount Hope Bay, and then north into Massachusetts state waters to Brayton Point. Landfall will be made via HDD at one of two potential landing locations in Somerset on the western side of Brayton Point from the Lee River (preferred) or the eastern side via the Taunton River (alternate). The variant Falmouth ECC will extend from the Lease Area through Muskeget Channel into Nantucket Sound to three potential landing location(s) in Falmouth including Worcester Avenue, Central Park, or Shore Street.

As stated above, the Brayton Point ECC includes an overland portion where underground onshore export cables will be installed to cross the northern portion of Aquidneck Island (Figure 2-3). Three route options for the crossing of the island are under consideration, all route options include HDD for entry and exit on/off the island. At Brayton Point, the onshore underground export cables will traverse the site from the landing to the location of a new high voltage direct current (HVDC) converter station (converter station). Underground transmission cable(s) will be constructed from the converter station to the Brayton Point POI, the adjacent existing National Grid substation. The Offshore Project Area includes the Lease Area, Falmouth and Brayton Point ECCs, and the HDD at the landfall locations.

In Falmouth, the underground onshore export cables will extend from the landfall location(s) to an onshore substation and will be installed within and beneath existing public roadways, shoulders, and grassy open space (Figure 2-2). The new Falmouth onshore substation will transform the voltage to 345 kilovolts (kV) to enable connection to either an overhead transmission line (preferred) or an underground transmission route (alternate). The selected landfall location will determine the route of the underground onshore export cables between the landfall and the new onshore substation. The proposed Falmouth point of interconnection (POI) to the regional transmission system is an existing switching station (Falmouth Tap). SouthCoast Wind anticipates that upgrades to Falmouth Tap will be undertaken by the interconnecting transmission owner, as part of a larger reliability project, which is independent of the SouthCoast Wind Project. The overhead transmission line will be designed, permitted, and built by the interconnecting transmission owner to provide interconnection at Falmouth Tap. The alternate underground transmission route would be constructed within local roadway and/or shoulder extending from the onshore substation to the POI at Falmouth Tap.

As stated in Section 1.0, this assessment addresses only the Offshore and Falmouth Onshore Project Areas. The Brayton Point Onshore Project Area is addressed in COP Appendix T.1.

2.2 Specific Project Details

Each primary Project component relevant to this assessment is briefly described below in Table 2-1. Additional details may be found in the Construction and Operations Plan (COP) Section 3 – Description of Proposed Activities.

Table 2-1. Key Project Details

Project Attribute	Description
Lease Area Size	127,388 acres (51,552 hectares [ha])
Layout and Project Size	Up to a total of 149 WTG/OSP positions Comprised of up to 147 WTGs and up to 5 OSPs without exceeding the total of 149 WTG/OSPs
WTGs	Rotor diameter: 721.7 – 918.6 feet (ft) (220.0 – 280.0 meters [m]) Blade length of 351.0 – 452.8 ft (107.0 – 138.0 m) Hub height above Mean Lower Low Water (MLLW): 418.7 – 605.1 ft (127.6 – 184.4 m) Tip height above MLLW 779.5 - 1,066.3 ft (237.6- 325.0 m)
OSPs	Top of topside height above MLLW: 160.8 – 344.5 ft (49.0 – 105.0 m)
WTG/OSP Substructures	Monopile, piled jacket, and/or suction-bucket jacket Seabed penetration: 0 – 295.3 ft (0 – 90.0 m) Scour protection for up to all positions
Inter-Array Cables	Nominal inter-array cable voltage: 60 kV to 72.5 kV Length of inter-array cables beneath seafloor: 124.3 – 497.1 miles (mi) (200 – 800 km) Target burial depth (below level seabed): 3.2 – 8.2 ft (1 – 2.5 m)
Offshore Export Cables	Falmouth ECC Cable Type: high voltage alternating current (HVAC) or high voltage direct current (HVDC) Number of export cables: up to 5 Nominal export cable voltage: 200 – 345 kV (AC) or ±525 kV (DC) Length per export cable beneath seabed: 51.6 – 87.0 mi (83 – 140 km) Cable crossings: up to 9 Target burial depth (below level seabed): 3.2 – 13.1 ft (1 – 4 m) Brayton Point ECC Cable Type: HVDC Number of export cables: up to 6 Up to 4 export power cables and up to 2 communication cables Nominal export cable voltage: ±320 kV Length per export cable beneath seabed: 97 – 124 mi (156 – 200 km) Cable/pipeline crossings: up to 16 (total) Target burial depth (below level seabed): 3.2 – 13.1 ft (1 – 4 m)
Landfall Location(s)	Falmouth, MA Three locations under consideration: Worcester Avenue (preferred), Central Park, and Shore Street Somerset, MA Two locations under consideration: the western (preferred) and eastern (alternate) shorelines of Brayton Point Aquidneck Island, Portsmouth, RI Several locations under consideration for intermediate landfall across the island
Onshore Export Cables	Falmouth, MA HVAC or HVDC; Nominal underground onshore export cable voltage: 200 – 345 kV (AC) or ±525 kV (DC) Up to 12 onshore export power cables and up to five communications cables Length: Up to 6.4 statute miles (mi) (10.3 kilometers [km]) Brayton Point, Somerset, MA HVDC; Nominal underground onshore export cable voltage: ±320 kV Up to 4 export power cables and up to 2 communication cables Length: Up to 3,940 ft (1,200 m) on Brayton Point Aquidneck Island, RI

Project Attribute	Description
	HVDC; Nominal underground onshore export cable voltage: ±320 kV Up to 4 onshore export power cables and up to 2 communication cables Up to 3 mi (4.8 km) across Aquidneck Island
Onshore Substation/ HVDC Converter Station	Falmouth, MA Type: Transform to 345-kV; Air-insulated substation (AIS) or gas-insulated substation (GIS) Location: Two locations under consideration: Lawrence Lynch (preferred), and Cape Cod Aggregates (alternate) Area: Up to 26 acres (10.5 hectares [ha]) Fencing: 8-ft (2.4-m) high surrounding the substation; includes 7-ft (2.1-m) high chain-link fence with galvanized fabric with 1-ft (0.3-m) high barbed wire top barrier. 4 ft (1.2 m) chain-link fence surrounding the infiltration basins 85-ft (26-m) high lightning masts Brayton Point, Somerset, MA Type: HVDC Converter Station Location: On the Brayton Point property area under consideration Area: Up to 7.5 acres (3.0 ha)
Transmission from Onshore Substation/ Converter Station to POI	Falmouth, MA New, 345-kV overhead transmission line along existing utility right of way (ROW) (preferred) (to be designed, permitted, and built by the interconnecting transmission owner) Up to 5.1 mi (8.2 km) in length New, 345-kV underground transmission route (alternate) Up to 2.1 mi (3.4 km) in length Brayton Point, Somerset, MA New 345-kV underground transmission route to National Grid substation HVAC; nominal underground transmission cable voltage: up to 345 kV Up to 2,788 ft (850 m) on Brayton Point property
POI	Falmouth, MA Falmouth Tap (new or upgraded substation to be designed, permitted, and built by the interconnecting transmission owner) Brayton Point, Somerset, MA Existing National Grid substation

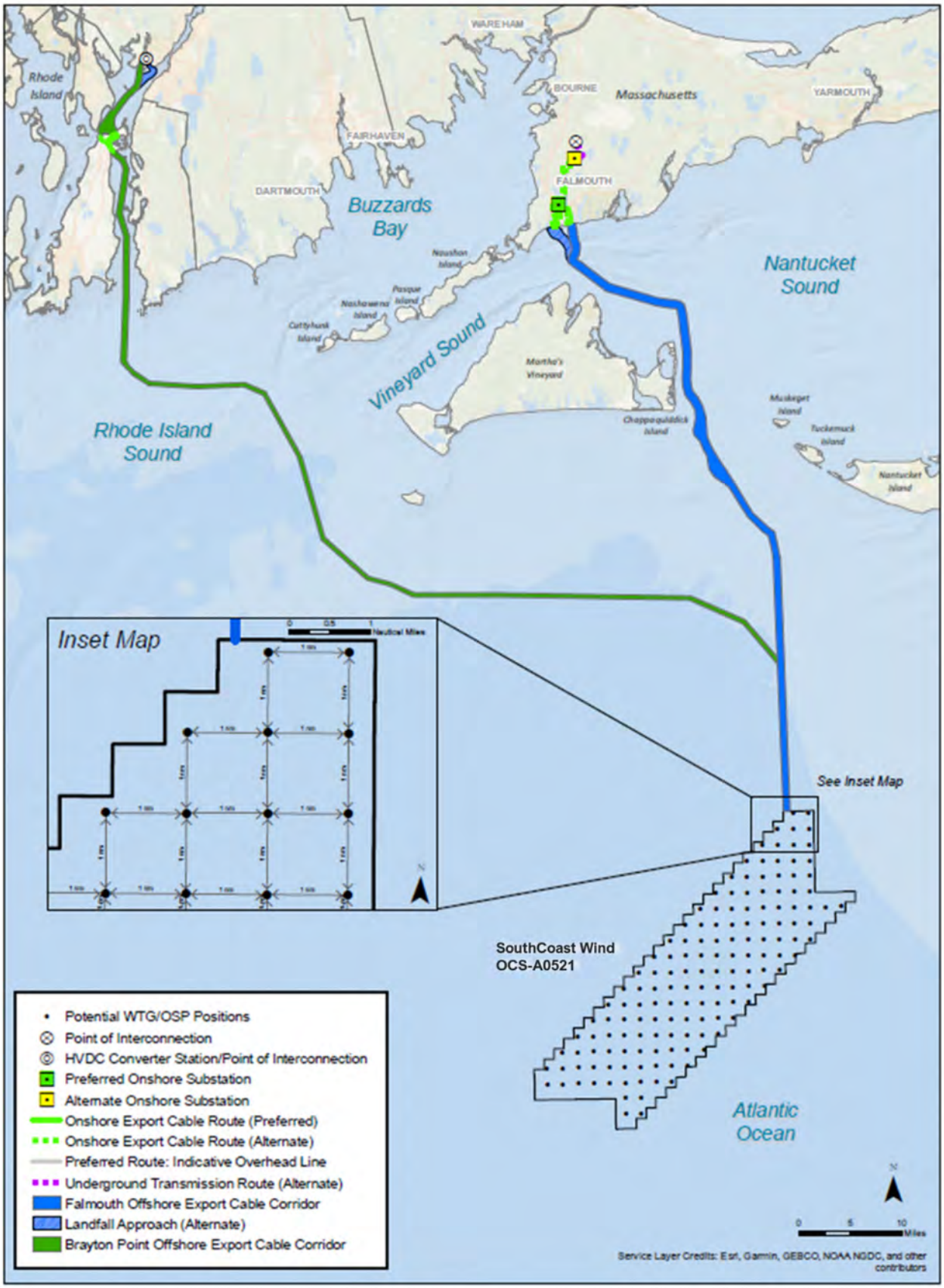


Figure 2-1. Location of SouthCoast Wind Offshore Wind Renewable Energy Generation Project

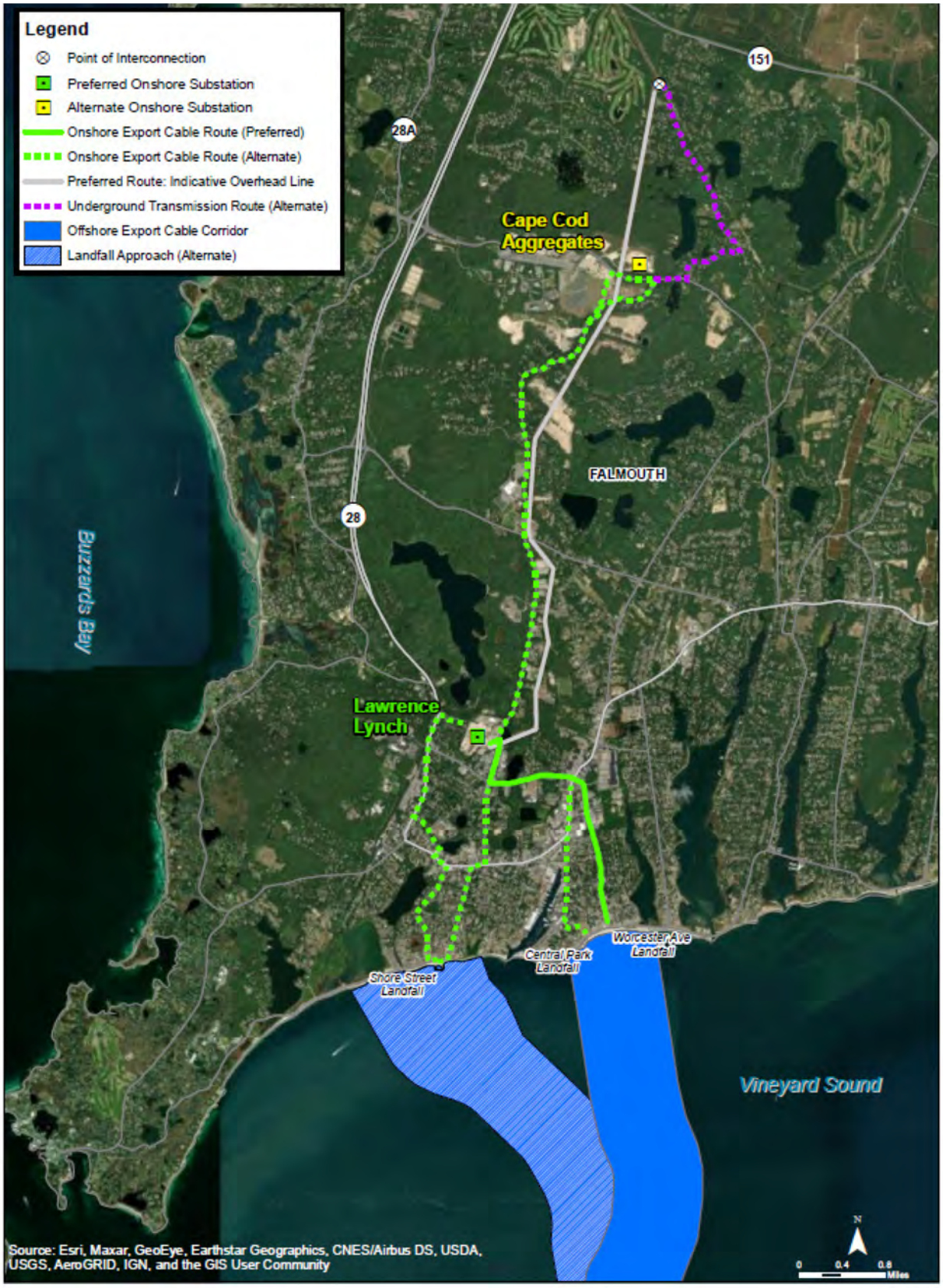


Figure 2-2. Location of SouthCoast Wind Falmouth Onshore Project Area

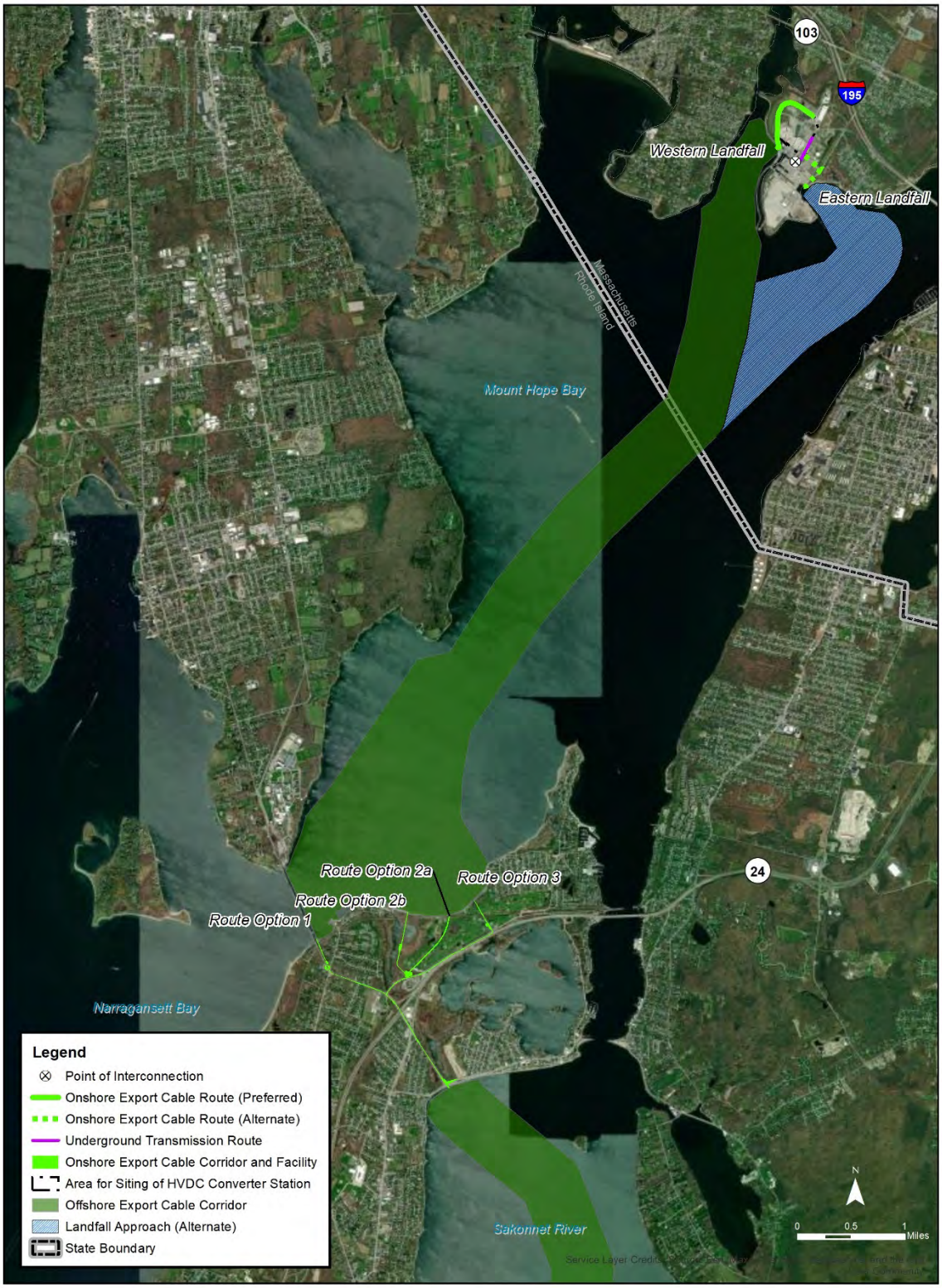


Figure 2-3. Location of SouthCoast Wind Brayton Point Onshore Project Area

3.0 Regulatory and Management Framework

The VIA is being completed within the context of the regulatory frameworks described below.

3.1 Federal Regulatory Framework

With the passage of the Energy Policy Act of 2005, BOEM acquired regulatory authority for renewable energy activities on the OCS. In 2009, final regulations were issued for the OCS Renewable Energy Program, which provide a framework for issuing leases, easements, and ROWs for OCS activities that support the production and transmission of renewable energy. This includes offshore wind, ocean wave energy, and ocean current energy.

BOEM's *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)* (BOEM, 2020) notes that a VIA may be needed to satisfy requirements under 30 Code of Federal Regulations (CFR) 585.627(a)(6) Archaeological Resources and 30 CFR 585.627(a)(7) Social and Economic Resources and to support the NEPA process.

The results of this VIA are used to assess potential visual effects on historic properties (see COP Appendix S, Analysis of Visual Effects on Historic Properties) in order to assist the BOEM in meeting its obligations under Section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800) and NEPA. In meeting these obligations, BOEM will be implementing the NEPA Substitution Process for Section 106 Review for Renewable Energy COPs. Substitution under 36 CFR 800.8c authorizes agencies to use procedures and documentation required for the NEPA process to comply with Section 106 in lieu of the procedures in 36 CFR 800.3 through 36 CFR 800.6 (Council on Environmental Quality Executive Office of the President and Advisory Council on Historic Preservation, 2013).

The BOEM COP guidance does not require use of specific methods for the VIA. Therefore, SouthCoast Wind submitted a memorandum describing the planned methodology for the VIA to satisfy the BOEM COP guidelines. The memorandum was revised based on comments received from BOEM. A copy of the final memorandum is provided in Attachment 1.

After SouthCoast Wind submitted the initial report to BOEM, the BOEM Seascape Landscape Visual Impact Assessment (SLVIA) Guidance (BOEM, 2021a) was published. This report has since been updated to include the suggested methodology and evaluation within that document.

3.2 State Regulatory Framework

This Project will work to satisfy the Massachusetts and Rhode Island Energy Facilities Siting Board (EFSB) requirements, supported by the Massachusetts Department of Public Utilities (DPU) and Rhode Island Public Utilities Commission (PUC), by providing a reliable energy supply with a minimum impact on the environment at the lowest possible cost. Pursuant to Massachusetts General Laws (MGL) Chapter 164, Section 69J (MGL 164 69J), SouthCoast Wind will file with the EFSB a petition to construct the Project. Pursuant to MGL 164 72, SouthCoast Wind will also file a petition with the DPU seeking approval of the onshore cables. Lastly, pursuant to MGL 40A, 3, SouthCoast Wind will file a petition seeking individual zoning exemptions and a comprehensive zoning exemption from the local zoning bylaws.

For Rhode Island jurisdictional Project components, SouthCoast Wind will submit an application to the EFSB for a license to construct and alter major energy facilities within the State of Rhode Island, pursuant to the applicable provisions of Rhode Island General Laws (R.I.G.L.) §§ 42-98-1, et seq. and the EFSB Rules of Practice and Procedure, as amended ("EFSB Rules"). Pursuant to the requirements of R.I.G.L. § 42 -98-1, *et seq.*, the Project is: necessary to meet the needs of the region for the renewable

4.0 Methodology

Research and practice in VIAs have evolved over the last 50 years to address a range of changes to valued land and seascapes. Federal land and program managers have developed alternative methodologies for conducting VIAs, including United States (U.S.) Forest Service, U.S. Bureau of Land Management (BLM), Federal Highway Administration, National Park Service, and U.S. Army Corps of Engineers. BOEM developed SLVIA Guidelines for the unique offshore environment for which they are responsible (BOEM, 2021a). VIA methods have also been developed at the state level, particularly the northeastern U.S. Other countries have distinct VIA approaches and methods, particularly the United Kingdom, which also has addressed offshore development through its *Guidelines for Landscape and Visual Assessment, Third Edition* (GLVIA3) (Landscape Institute and Institute of Environmental Management and Assessment [LI and IEMA], 2013).

VIA methods have several common features, including:

- Viewshed analysis: determining from where a project can potentially be seen;
- Seascape/landscape and ocean character analysis: evaluating underlying scenic attributes of the affected environment;
- Key views: determining important points or corridors from which people can view the project;
- Visual Sensitivity analysis: determining the degree to which people are concerned about visual change; and
- Impact measurement: includes methods for determining the degree of adverse or beneficial visual change.

AECOM used a methodology based on the *GLVIA3* (LI and IEMA, 2013) and *Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States* (BOEM, 2021a) and included a modified contrast rating system that helps evaluate visual change and impact. As noted in the guidance, the GLVIA3 is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource and on people's views and visual amenity.

Based on AECOM's discussions with BOEM, AECOM modified the BLM contrast rating system known as the *Visual Resource Contrast Rating Handbook H-8431-1* (1986) to add elements to the evaluation criteria to help expand considerations needed to compare baseline information to any potential change to the visual condition for application to the offshore Project elements. These methods were detailed in a memorandum to BOEM and were updated based on comments received from BOEM (see Figure 4-1). Each phase is summarized below and described in greater detail in the sections that follow.

1. Establishment Phase – This phase establishes the foundation or basis for the VIA and includes the compilation and development of information to support subsequent phases in the VIA process. Additional details of work completed under this phase are provided in Section 4.1.
2. Baseline Inventory Phase – This phase begins with a field assessment of potential KOPs identified during the Establishment Phase, and includes collection of data necessary to inventory, delineate, and describe the landscape/seascape/ocean areas, identify viewer groups and viewer characteristics, and supports the selection of representative KOPs, and the development of simulations for those representative KOPs.
3. Visual Analysis Phase – In this phase, data collected in the field assessment is used to complete Parts A and B of the Visibility Analysis Form (VAF) in conjunction with the analysis of the potential future conditions based largely, but not entirely on photo simulations and variable conditions. Part C of the VAF is used to rate the post-development simulation for each KOP with respect to the apparent visual compatibility in association with the landscape/seascape and ocean character types (also called landscape, seascape or ocean character areas [LCA,SCAs, or OCA]) and contrast (e.g., similarity/dissimilarity) to form, line, color, texture, vertical and horizontal scale, motion, and lighting as it relates to landscape/seascape and ocean (e.g., landform, ocean, inland waterbodies, vegetation, and structure) within the context of visual compatibility to arrive at a Visibility Level. The

Visual Sensitivity separately considers the sensitivity of a seascape/landscape impact receptor and is dependent on its susceptibility to change and its perceived value to society (BOEM 2021). Perceived value is also discussed as "view sensitivity". The Visibility Level and Visual Sensitivity provide the basis for characterizing visual impact.

4. Mitigation Phase – In this phase, available options by which the level of impact may be reduced are considered. The visual analysis is repeated incorporating selected mitigation measures to provide a post-mitigation characterization of visual impact. For the purposes of this VIA, mitigation is discussed in concept.
5. Finding of Visual Impacts – Within the context of BOEM's COP review process, BOEM will use the information provided in this VIA and input received via public engagement under NEPA to make a finding of visual impact on historic and/or scenic resources. BOEM will determine if a finding of no adverse impact or of adverse impact is appropriate. Because this phase is undertaken by BOEM, it is included for completeness, but not otherwise discussed in this report.

Several terms are used in the VIA to discuss the area of study or viewshed for the VIA. These include:

- **Digital Elevation Model (DEM)** – a model used to determine where Project components may be visible which incorporates bare earth topography only.
- **Digital Surface Model (DSM)** - a model used to determine where Project components may be visible which incorporates the topography plus potential screening from vegetation or buildings.
- **Viewshed analysis** – the process by which the maximum extent of visibility (viewshed) is determined based on structure height, either DEM, and the curvature of the earth. This VIA used a 43 mile (mi) (69.2 kilometer [km]) limit.
- **Viewshed** – an area of potential visibility defined based on a viewshed analysis; a generic term which may include bare earth visible area or visible area with influence of screening from structures and vegetation.
- **Area of Potential Visual Impact (APVI)** – Viewshed determined based on DEM and DSM which accounts for the influence of screening provided by structures and vegetation.

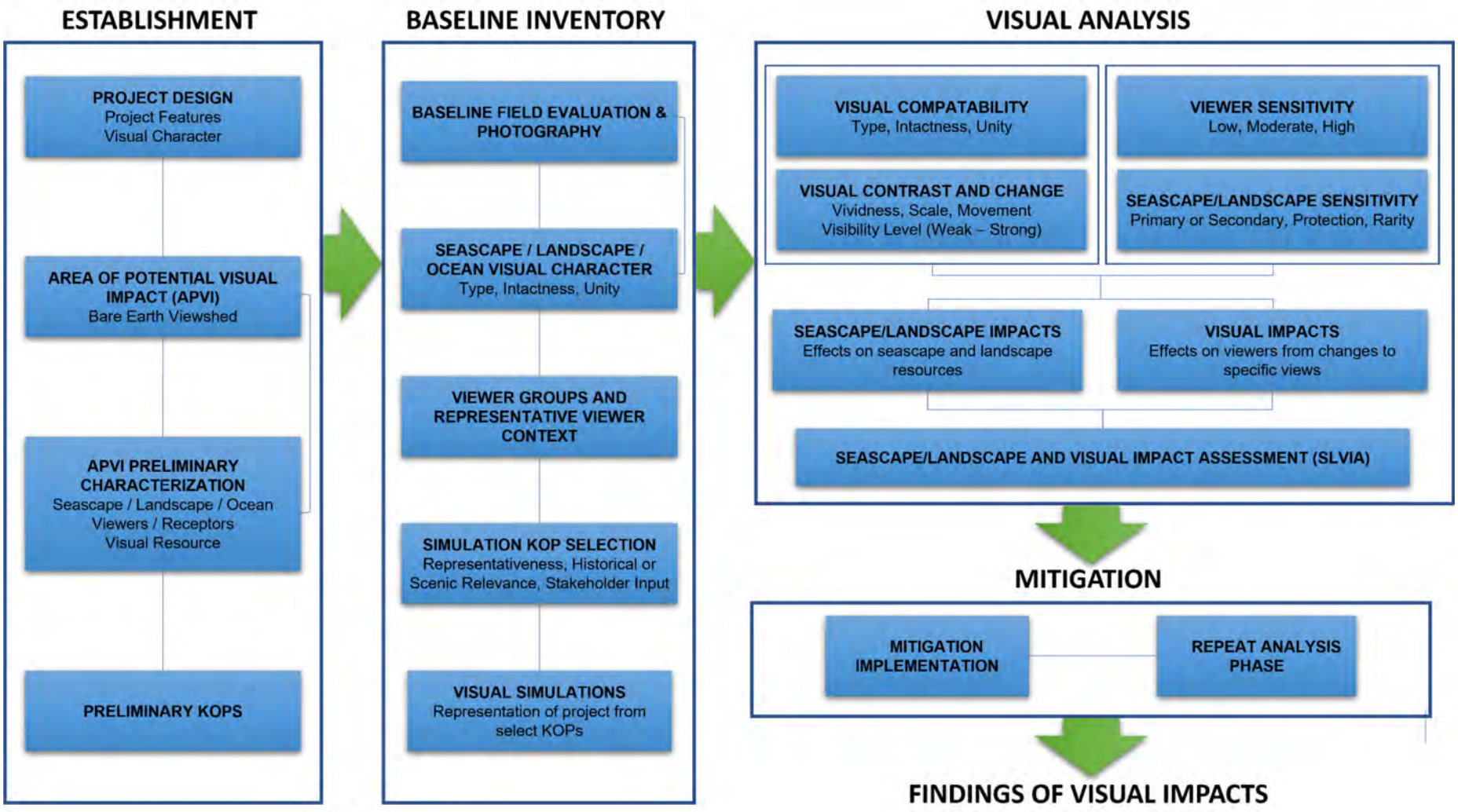


Figure 4-1. Visual Impact Assessment Process Diagram

4.1 Establishment

The following sections describe the approach used to establish the basis for the VIA and include the compilation and development of information to support subsequent phases in the VIA process.

4.1.1 Project Design

Detailed design assumptions provided by SouthCoast Wind serve as the basis for the VIA and are summarized in Sections 5.1.1 and 6.1.1 for the offshore and onshore Project components, respectively.

For the purposes of the VIA, one Project alternative, called the Maximum Development Scenario (MDS) was evaluated within the context of the federal and state regulatory framework as described in Section 3.0. For the Offshore Project Area, the MDS includes the greatest number of WTGs/OSPs and the largest potential size for the offshore Project components, as presented in Table 5-1. The onshore MDS includes an onshore substation as presented in Table 6-1. As noted previously, the overhead transmission line from the onshore substation to the Falmouth POI will be designed, permitted and constructed by the interconnecting transmission owner, and as such, is not included in the onshore VIA evaluation.

4.1.2 Area of Potential Visual Impact

The APVI describes the area within which the Project may be visible and, therefore, could be seen and contribute a level of visual change within an existing setting. A viewshed analysis was completed for both the onshore and offshore Project components[1]. Maximum design heights and bare earth topography (i.e., no benefit of screening from intervening vegetation or other structures) were used to develop a conservative delineation of the APVI (a digital elevation model [DEM]). The DEM was also created from United States Geologic Survey (USGS) 3DEP elevation data at a horizontal resolution of 6.6 feet (2.0 m), representing bare earth conditions. Figures representing the Onshore and Offshore DEM developed by ICF are provided as Figure 4-2 and Figure 4-4, respectively.

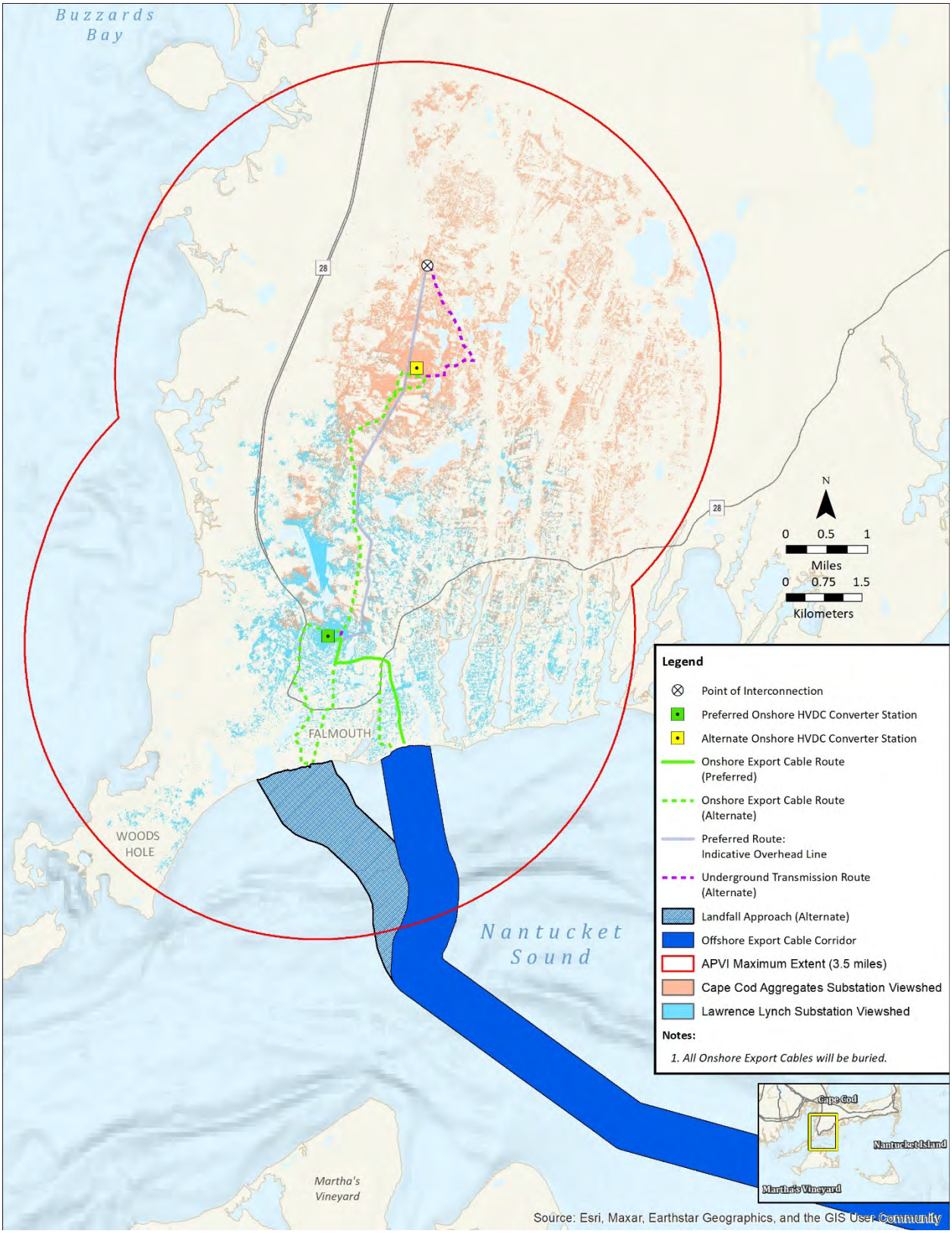
Light, imaging, detection, and ranging (LiDAR) LAZ files (USGS 2013) were downloaded to cover land areas within 43 mi of potential Project WTG locations and within 4 mi of onshore facilities within the Falmouth and Brayton Point Onshore Project Areas. LAZ files were converted to LAS files using ArcGIS Pro and the Convert LAS tool. This conversion was needed as LAZ files are not usable within ArcGIS Pro or ArcGIS Desktop. To create the bare-earth DEM and DSM needed for the viewshed analyses, an LAS Dataset was created using the converted LAS files. The LAS Dataset allows for filtering of LiDAR point cloud classifications. Inspection and reclassification of possible classification errors within LAS files were performed before creation of DEM and DSM rasters.

Creation of the DEM required filtering of the LiDAR point cloud to only points classified as Ground. Once filtered, the point cloud is converted to a raster DEM using the ArcGIS Pro tool LAS Dataset to Raster. Settings for this tool utilized elevation values with interpolation type set to binning, cell assignment of average, and void fill method of linear. Cell size was specified to be 10 ft or 3.048 meters (m). LiDAR point cloud data is collected only for land masses. The remaining study area was reclassified from NoData to zero to emulate the surface of the ocean using the ArcGIS Pro tool Raster Calculator function Con.

DSM creation used the same process used for the DEM with some exceptions. Filtering of the LiDAR point cloud utilized categories of Ground, Low Vegetation, Medium Vegetation, High Vegetation, and Building. Creation of the DSM utilized elevation values with interpolation type set to binning, cell assignment of maximum, and void fill method of linear. The snap raster environment was set to the DEM. The reason for this being that the DEM and DSM rasters would be aligned with each other. This is important during the following steps of the analysis. Figure 4-3 and Figure 4-5 illustrate the DSM viewshed for the Falmouth onshore and the offshore Project components.

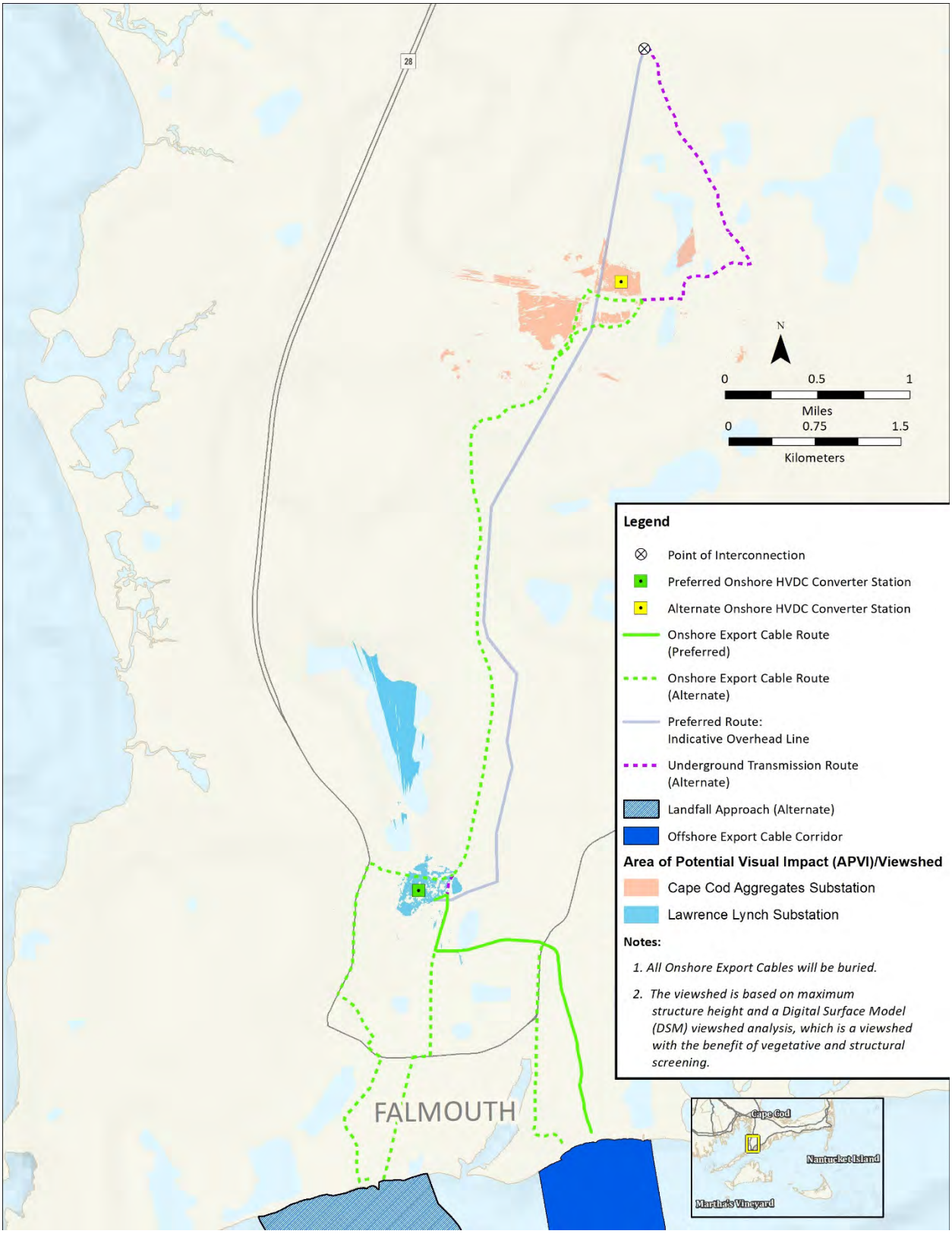
Three sets of DEM and DSM rasters were created for separate study areas of the Project: a 43-mi buffer of WTG locations; the Falmouth onshore Project components; the Brayton Point onshore Project components.

[1] The viewshed was developed by ICF and provided to SouthCoast Wind in digital format.



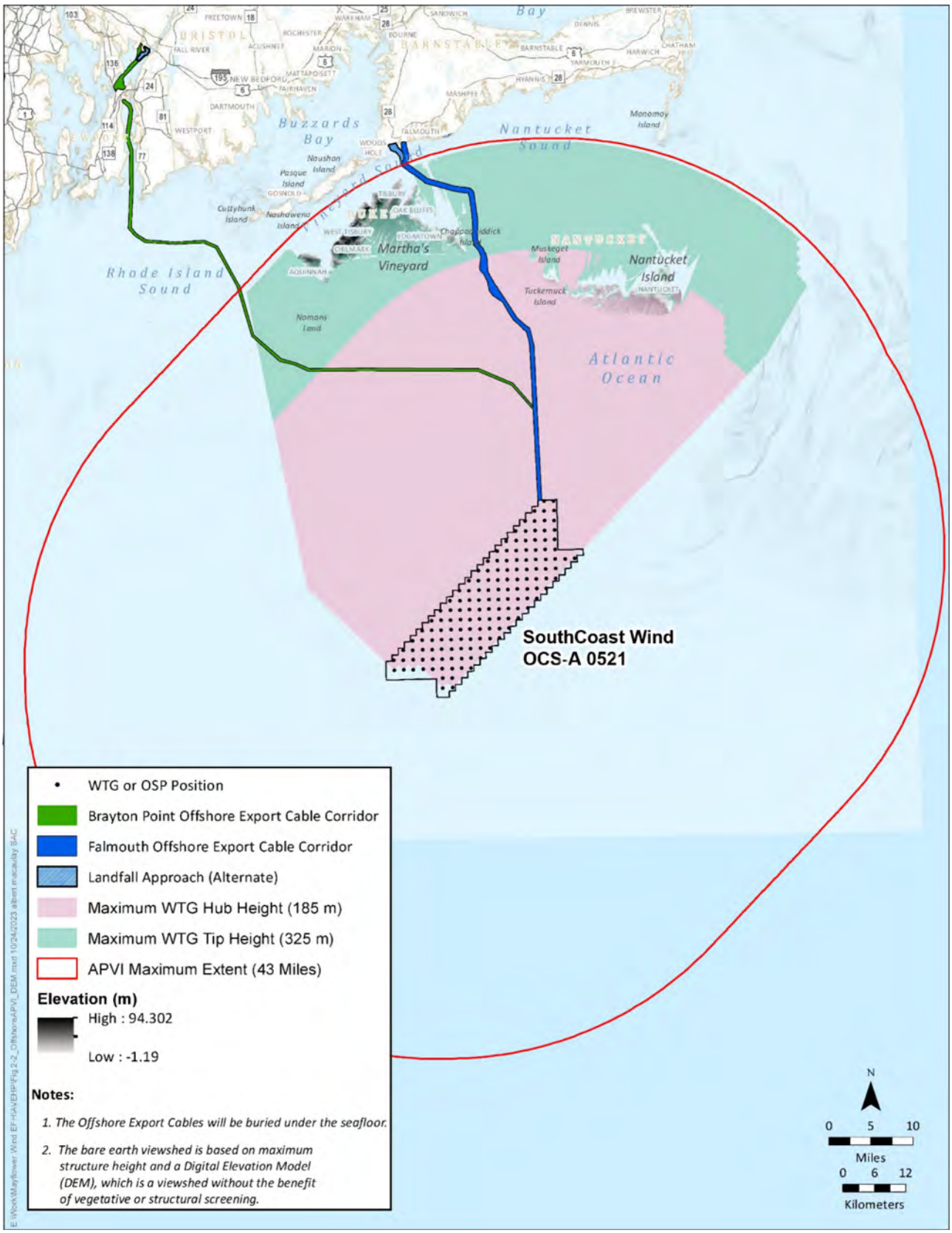
DEM (bare earth) viewshed is depicted as provided by ICF.

Figure 4-2. Onshore DEM (Bare Earth) Viewsheds: Overview Map



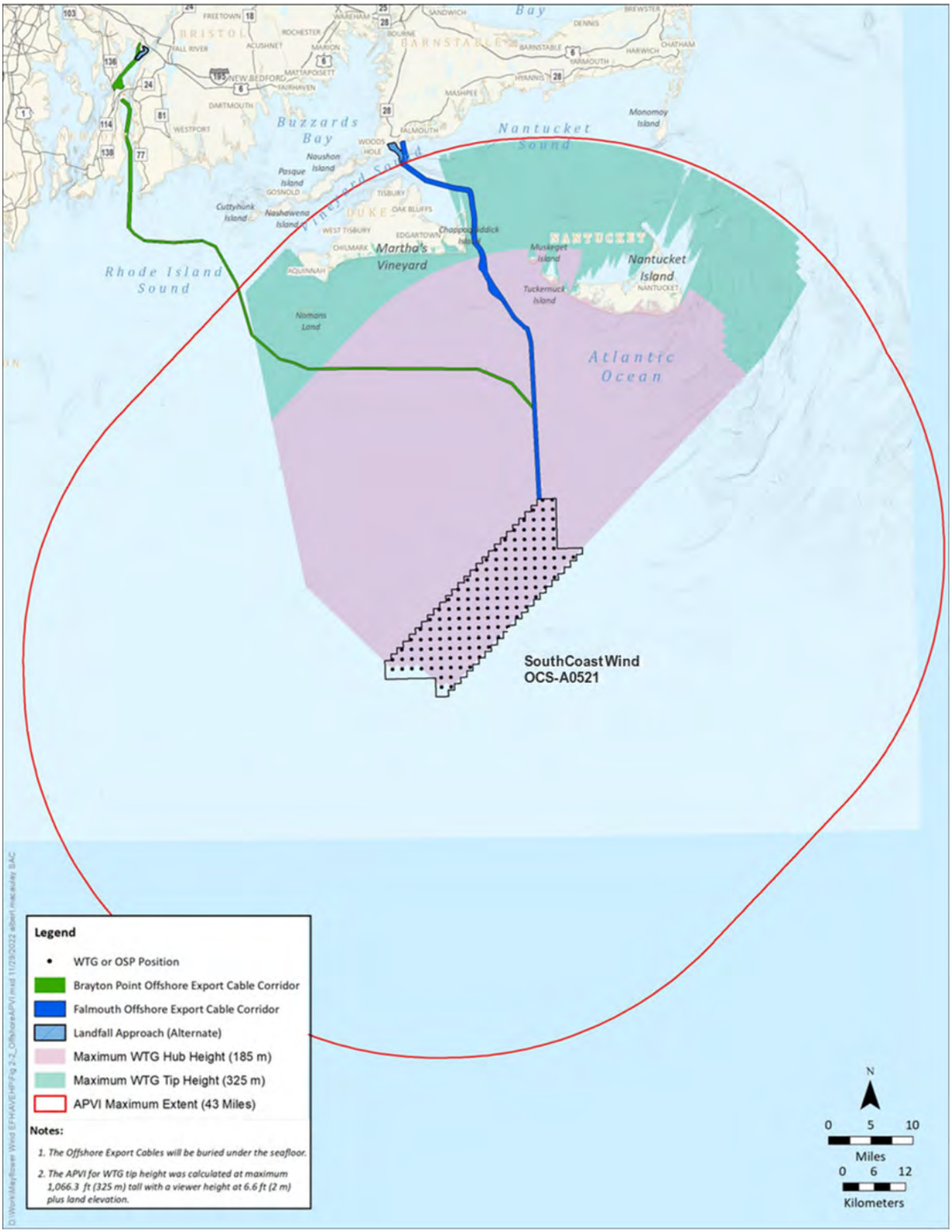
DSM viewshed is depicted as provided by ICF.

Figure 4-3. Onshore DSM Viewsheds



DEM viewshed is depicted as provided by ICF.

Figure 4-4. Offshore DEM Viewshed: Overview Map



DSM viewshed is depicted as provided by ICF.

Figure 4-5. Offshore DSM Viewshed: Overview Map

The viewsheds in this analysis are intended to show potential visibility by a person at ground level. Filters were created to emulate areas of buildings and vegetation with the purpose of removing areas that would show as visible but were not. For example, the crown of a tall tree or the roof of a house may show visible but in actuality no one would be standing in those locations. These filters remove areas that are not feasibly seen by a person standing at ground level.

Two filters were created. The first filter calls out both buildings and vegetation. This is accomplished by finding the difference in height between the DEM and DSM using the ArcGIS Pro Raster Calculator and subtracting the DEM raster from the DSM raster. The resulting raster shows the height of features in the DSM relative to the DEM. In this analysis, it was assumed anything to have a difference of 8.2 ft (2.5 m) or greater to be buildings or vegetation. Using the Reclassify tool, the analyst assigned values of <8.2 ft (2.5 m) to 1 and values >8.2 ft (2.5 m) to 0. The second filter removes buildings from the building and vegetation filter leaving only vegetation. To create the building filter, building footprints (MassGIS 2022) were turned into a 10-ft (3.1-m) resolution raster using the DEM as the snap raster with all buildings given a value of 1 and all other parts of the raster a value of 0. Using ArcGIS Pro Raster Calculator, the building raster was added to the building and vegetation filter. The resulting raster was reclassified to keep all 0 values as 0 and all values >0 equal to 1. This final raster is a vegetation only filter.

Viewsheds were created using ArcGIS Pro Viewshed tool. Two WTG viewsheds were created, one for top of WTG tip (1,066.27 ft [325 m]) and the other for hub height (607 ft [185 m]). Settings for each run were as follows in Table 4-1.

Table 4-1. Inputs to the Viewshed Model

Attribute	Turbine Tip	Hub Height	Onshore Facilities
OFFSETA (Turbine height)	1066.27 ft (325 m)	607 ft (185 m)	25.9 m (85 ft)
OFFSETB (Target height, e.g., a tall person)	6.6 ft (2 m)	6.6 ft (2 m)	6.6 ft (2 m)
AZIMUTH1	315°	315°	0°
AZIMUTH2	45°	45°	360°
RADIUS1	0	0	0
RADIUS2	48.2 mi (68.9 km)	30 mi (48.3 km)	3.5 mi (5.6 km)

Settings for azimuth were used to reduce the viewshed runtime by only calculating viewshed for areas on land. All area outside the azimuth setting is ocean. Radius settings determine the distance from observation points the viewshed will be run.

Resulting viewsheds show a cell by cell value for number of observer points are predicted to be seen. To apply the filters, the viewshed rasters are multiplied by the filter rasters using ArcGIS Pro Raster Calculator. Final viewshed polygons are created by using the ArcGIS Pro Reclassify tool to reclassify values of 0 to NoData and values >0 to 1, then using the ArcGIS Pro Raster to Polygon tool to convert the raster data to polygon.

The assumptions specific to the delineation of the APVI for offshore and onshore Project components are described in Section 5.1.2 and Section 6.1.3, respectively. Factors that influence visibility are atmospheric conditions, screening by other projects (i.e., Vineyard Wind WTGs may screen SouthCoast Wind WTGs from the view at KOPs on Martha's Vineyard), vegetation, and buildings are discussed in later sections.

4.1.3 Consideration of Meteorological and Atmospheric Conditions

Meteorological and atmospheric conditions may reduce Project visibility when rain, haze, or fog are present within the Offshore Project Area. These conditions play a lesser role in visibility for the onshore Project components. As such, meteorological and atmospheric conditions are evaluated for the offshore Project

components but not for the onshore Project components. Meteorological data from the BOEM Meteorological Report (Wood et al., 2014) serves as the basis for this analysis.

4.1.4 APVI Preliminary Characterization

Based upon the delineation of the onshore and offshore APVI, the APVIs were characterized with respect to landscape/seascape/ocean character types, viewers/receptors, and visual resources based on available documentation. Additionally, the acres and percent of the individual character within the APVI was quantified. The purpose of this characterization was to develop sufficient understanding of the APVI to support the selection of KOPs that will be evaluated in the field as part of the Baseline Inventory (Section 4.2).

4.1.5 Identification of Preliminary KOPs

SouthCoast Wind developed preliminary lists of KOPs for the offshore and onshore APVIs. The KOPs include historic structures and buildings, significant landscapes, recreation areas, scenic roads, overlooks and vistas, public beaches, town centers, residential communities, and estates. Sites selected as KOPs reflect importance to the scenic, social, cultural, and economic resources, and include the entire oceanfront facing the Project.

The Vineyard Wind project included an inventory of visually sensitive resources documented within Historic Properties Visual Impact Assessment reports (Vineyard Wind, 2018). These assessments covered a comprehensive inventory of properties located on Martha's Vineyard and Nantucket. Based on a review of past projects and a historic sites analysis was completed (see COP Appendix S, Analysis of Visual Effects to Historic Properties), many of these locations identified for the Vineyard Wind project are relevant to the SouthCoast Wind VIA, given the proximity of the projects. The delineation of the APVI for the offshore Project components eliminated some KOPs from the Vineyard Wind list, while others were added based on the viewshed area for the Project. KOPs were established within each landscape/seascape and the ocean character type.

A list of KOPs for the Offshore Project Area was used as a starting point to recognize places of visual significance to the community within the APVI and was reviewed with key stakeholders on Nantucket (Town of Nantucket, Nantucket Conservation Foundation [NCF], Madaket Residents Association, and Nantucket Land Bank [NLB]). The final KOP list included sites recommended by these stakeholders.

Similarly, a preliminary list of KOPs was developed for the Falmouth Onshore Project Area. Efforts have also been made by SouthCoast Wind to meet with local officials within the Project Area to discuss issues and concerns about the proposed onshore substation and Project infrastructure (see COP Appendix A, Agency Correspondence).

Specific KOPs evaluated for this analysis are described for the offshore and onshore Project components in Section 5.1.5 and Section 6.1.3, respectively.

4.2 Baseline Inventory

The VIA methodology includes an extensive collection of baseline information to help analyze the relationship between the existing physical landscape and seascape conditions, identification of KOPs, and the sensitivity to change by the key viewers, also called receptors. The baseline data provide a framework that describes existing conditions and allows proposed changes to be measured and evaluated for potential impacts.

4.2.1 Field Evaluation and Documentation

The baseline inventory built upon the work completed in the Establishment Phase and began with the field assessment of KOPs. An AECOM Visual Assessment Team completed the initial field review of KOPs in June 2020, with two follow up visits in July 2020 and November 2020 to complete the analysis of the full list of KOPs as well as to visit some additionally identified KOPs relevant based on Project design. The following actions were completed for each KOP:

- Made detailed observations and notes regarding the KOP to support completion of Parts A and B of the VAF.

- Photographed the KOP to document landscape, seascape and ocean character areas (LCA, SCA, and OCA), viewer groups, and the visual resource.
- Secured measured, geo-referenced photos were taken, to the extent possible, in clear weather conditions, from the KOPs with potential visibility to the offshore and/or onshore facilities.

Photographs were taken, using standards common to the practice, as described in the GLVIA3 guidance (LI and IEMA, 2013). Panoramic images were taken from many sites on Martha's Vineyard and Nantucket for the offshore Project components and on Cape Cod for the onshore Project components. A photo log is provided in Attachment 2 for selected KOPs not otherwise selected for simulations.

4.2.2 Viewer Groups and Experience

Viewers are the people who ultimately will see the Project and experience its effects.

4.2.2.1 Viewer Groups

Viewer groups are the constituent groups for whom potential change to the visual conditions may occur and are involved with defining the visual quality of the landscape. Viewer groups may differ in their perceptions of visual quality. For this VIA, viewer groups were primarily identified based on visual observations of people's activities during the review of KOPs, based on input from stakeholders, and supplemented with a review of information from local Chamber of Commerce offices and local planning documents, including the *Nantucket Master Plan* (Nantucket Planning Board, 2009) and *Wind Energy Plan for Dukes County* (Martha's Vineyard Commission, 2012). Meetings with Nantucket stakeholders were held in June 2020 with the Nantucket Conservation Foundation, a Madaket resident who serves on the Nantucket Conservation Commission, Nantucket Planning & Economic District Commission, Coastal Resiliency Committee, and the Offshore Wind Task Force, and the Town and County of Nantucket, MA Planning Office. Additional meetings were held with the Town and County of Nantucket, MA Planning Office and the Miacomet Golf Course manager in July 2020. Email exchanges with the Executive Director of the Martha's Vineyard Chamber of Commerce and Tourism, the Falmouth Chamber of Commerce, and the Cape Cod Chamber of Commerce provided insight on tourism and other groups of people present during on and off-season times of the year. Viewer groups are identified in Sections 5.2.2 and 6.2.2 for offshore and onshore Project components, respectively.

It is important to note that viewer groups are not exclusive, nor are "groups" the actual viewers. Individuals do the viewing, and they may be part of one or more groups. For example, a year-round resident may also have a boat and at times be a recreation or commercial-oriented mariner. Year-round and seasonal residents may also be recreation-oriented "visitors" on weekends when they go to the beach or cycle across an island.

4.2.2.2 Viewer Context

Viewer context describes the predominant activity the viewer is engaged in, how that activity influences their experience of the landscape, and the viewer geometry. The viewer's activity may include moving past the landscape (e.g., driving), engaging in recreational activities in an area with the landscape as a backdrop (e.g., visiting a beach for the day), or enjoying the landscape as the view (e.g., scenic overlooks). Viewer geometry refers to the spatial relationship of viewer to the viewed object (i.e., the Project), including both the vertical and horizontal angles of view. The vertical angle of view refers to the viewer's elevation relative to the viewed object. For example, a person standing on a lower elevation access road would be described as having an inferior viewing angle relative to an object on top of a hillside. A person viewing that same facility from a similar elevation as the facility would have a vertical viewing angle that was "at grade" or "level." A view is considered superior when the viewer is at an elevated viewpoint relative to the object being viewed. The horizontal angle of view refers to the compass direction of the view from the viewer to the object. For example, the viewing position set directly in front of the object will be at 0 degrees, the oblique position at 45 degrees, and the right angle at 90 degrees. Therefore, horizontal viewer geometry is described as direct, oblique, or a right angle.

4.2.3 KOP Selection for Simulations

Based on observations made during the field visits to KOPs, the visibility analysis identified areas that likely will have visual exposure to the Project. It includes data such as distance, number of facilities visible, and

mitigating factors (i.e., partial screening). Representative simulation viewpoints were selected to represent key views that highlight a diversity of viewer experiences from different vantage points, view angles, or site characteristics. Details for the selection of KOPs for simulations for the offshore and onshore Project components are provided in Section 5.2.3 and 6.2.3.

4.2.4 Visual Simulations

Simulations were created using Autodesk's 3ds Max Design program. Three dimensional (3D) models of the above ground/sea surface structures (e.g., WTGs/OSPs and onshore substation) were created on each of the locations. Visual simulations are developed using the geo-referenced, measured photos that integrate the built infrastructure in scale based on the distances of structures from the KOP. To the extent feasible, the simulations have been completed for clear sky and atmospheric conditions. This is generally referred to as the "worst case" scenario for visual impact analysis, even though at times Project facilities will be obscured.

Using the known location of where the measured, geo-referenced photo was taken, as well as the height of the camera (ground elevation plus eye height), a camera in the program was created at this location using a 2 inch (50 millimeter) focal length. For offshore simulations, the viewpoint of the camera was set to the middle of the WTG/OSP array. Its view parameters set using the calculated distance to the horizon and calculated visible heights above the horizon of the nearest WTG. For the onshore simulations, the camera was set at spot within the KOP and directed toward the Project.

For each time period modeled, the program's daylight parameters were set to the date of the photo and the time the photo was taken. This provided the correct sun angle and intensity for the rendering. For other weather conditions, the light parameters in the model were adjusted to reflect the light conditions (i.e., no sun for cloudy conditions). The final rendering is a composite of the modeled structures and photo.

4.3 Seascape/Landscape Impact Assessment

For consistency with BOEM guidelines (BOEM, 2021), a Seascape/Landscape Impact Assessment (SLIA) has been completed for the Project for both onshore and offshore elements. The SLIA characterizes the compatibility of the character of the Project with the aspects that contribute to the distinctive character of the seascape and landscape areas from which the Project is visible. This analysis is separate from the analysis of effects on the view experience (i.e., VIA). The visibility of the Project (onshore and offshore elements) may affect the aesthetic, perceptual, and experiential aspects of the seascape or landscape and thus, its distinctive character. As such, the visibility of the Project as evaluated from particular viewpoints as presented in the VIA informs the SLIA analysis. SLIA impacts from specific viewpoints (KOPs) are considered as indicative of impacts to the character areas as a whole.

The SLIA describes and assesses the seascape and landscape receptors which are the potentially affected SCAs, LCAs, and OCAs, collectively referred to as seascape/landscape character areas (SLCAs). The SLCAs are discrete areas of seascape or landscape, each with its own character and identity, as expressed through similar geology, topography, drainage patterns, vegetation, historical land use and settlement patterns, and perceptual and aesthetic attributes within the area.

Perceptual attributes that contribute to the visual experience of landscapes/seascapes and ocean include:

- Scenic quality: landscapes/seascapes and ocean that are known to have broad appeal to aesthetic senses;
- Rarity: natural or cultural elements that are unique or in short supply;
- Recreation: places where recreational activities occur or are available;
- Experiential: wildness, tranquility, solitude; and
- Associations: places where historic figures or events occurred.

An important part of the landscape/seascape and ocean character analysis is identifying how land and shoreline units are visually tied/connected to the open sea unit. While the offshore Project components will not directly change physical conditions on land-based character areas, they may change the visual experience to the extent they are visually connected. Landscapes and seascapes have a combination of

elements that influence perception, including the visual connectivity/relationship between land and sea. Development, or lack of development, may diminish or increase the scenic value of adjacent or visually connected units. The ocean character type has the unique experience of the open, uninterrupted ocean view.

Physical factors that influence landscape/seascape character and visual experience include:

- Landform: geology, soils, landform, drainage ways;
- Land cover: vegetation (natural and human influenced), sand bars, barren areas (beaches, rock);
- Edge conditions: shorelines, bays, cliffs, riprap, outcrops, built environments;
- Horizontal and vertical expanse: open ocean, horizon, as well as sky; and,
- Land uses: built environments, industrial buildings, towns, agricultural fields, edges, conserved lands.

The following character analysis describes the physical and perceptual attributes of the setting that intersect and create a relationship between terrestrial landscapes and the seascape environment.

The information from the SLCA receptor evaluation is then used to identify potential effects from the Project. The impact assessment is based on the sensitivity of the receptor (the potentially affected SLCA) and the magnitude of SLCA changes brought about by the Project. The sensitivity of the receptor is determined, based on its susceptibility to impact and its perceived value, and the magnitude of the impact is determined by considering the size and scale of the change to existing conditions caused by the Project, the geographic extent of the area subject to the Project's effects, and the effects' duration and reversibility. After the nature and magnitude of the impact have been determined, its impact level is evaluated.

The SLIA identifies and assesses positive, negative, temporary, and permanent effects of the Project including:

- Change or complete or partial loss of elements, features, or aesthetic, perceptual, or experiential aspects that contribute to the distinctive character of the SLCA;
- Addition of new elements and/or features that may affect the distinctive character of the SLCA; or
- Change in the overall character of the SLCA resulting from the combined impacts of the changes, losses, or additions described above.

Assessing the impact level of SLCA effects is ultimately a matter of professional judgment. In general, a large loss or irreversible adverse impact over an extensive area, on elements and/or aesthetic and perceptual aspects that are key to the character of highly valued seascapes or landscape, is likely to be considered a major impact. Reversible adverse impacts of short duration over a restricted area, on elements and/or aesthetic and perceptual aspects that contribute to but are not key characteristics of the distinctive character of SLCAs of lower value, are likely to be judged to be less important. The impact level is a function of both the impact receptor and the nature of the impact. The key factors are referred to as the sensitivity of the receptor and the magnitude of the effect.

In accordance with the BOEM SLVIA Methodology, each factor and its components are rated on an ordinal scale with three levels, which in some cases use different terms for semantic reasons but are considered equal in importance; in other words, a rating of "high" is considered equivalent in importance to a rating of "large" or "good." Similarly, a rating of "low" is considered equivalent to a rating of "small" or "poor." These relationships are shown in Table 4-2.

Table 4-2. Impact rating factors, components, and importance levels

Factor	Component	Importance level
Receptor sensitivity		High, medium, low
	Susceptibility	High, medium, low
	Value	High, medium, low
Impact magnitude		
	Size and scale of effect	Large, medium, small
	Geographic extent of effect	Large, medium, small
	Duration and reversibility	Good, fair, poor

Character types for the offshore and onshore Project Areas are identified and described in Section 5.2.1 and Section 6.2.1, respectively. The SLIA, including characterization of sensitivity to effects and magnitude of impact, is provided in Sections 5.3 and 6.3 for the offshore and onshore Project Areas, respectively.

4.4 Visual Analysis

Using the visual simulations developed in the previous Baseline Inventory phase, AECOM completed a visual analysis to characterize the visual impact associated with the Project. The Visual Analysis phase (Figure 4-1) includes three primary steps.

- Evaluate Visual Change – rate the degree of change in visual condition considering both the visual compatibility and visual contrast of the Project within the existing landscape/seascape or ocean character.
  - Use the "Visibility" rating scale by Sullivan (2013) to generate a score for each simulation between 0 (not visible) to 6 (visually dominant)
  - Apply a modified visual contrast rating, adapted from the BLM (1986) to simulations to identify compatibility of Project design and components with visual characteristics of land and seascapes.
  - Compare baseline to projected visual conditions in relation to the seascape, landscape, and ocean character.
  - Quantify Visual Changes to the KOPs (number of facilities in view, distances, height, field of view).
- Characterize Visual Sensitivity – rank viewer susceptibility to visual change and the value of seascape/landscape receptors.
  - Characterize the viewer groups and their susceptibility to change and rank as high, medium, or low based on the ability to accommodate impacts without substantial change to existing characteristics of the landscape/seascape.
  - Characterize and rank the value of the seascape/landscape, and rank as high, medium, or low based on the distinctiveness or recognition by a special designation.
  - Anticipate receptor/viewer sensitivity based on the combined influence of viewer susceptibility to change and the valued seascape/landscape for each KOP.
- Characterize visual impact – integrate the degree of Visual Change with Visual Sensitivity to characterize the visual impact

Each of the above steps are described in the sections that follow.

4.4.1 Visual Change

In order to understand the level of visual change caused by the Project, an analysis of visual compatibility (type of setting, intactness, and unity) is compared to the visual contrast elements of form, line color, texture, horizontal and vertical scale, motion, and lighting to define the level of visible change (weak-strong) based on the BLM's *Visual Resource Contrast Rating Handbook H-8431-1* (1986), which ascribes Visibility Levels ranging from 1 to 6 in Part C of the VAF.

4.4.1.1 Visual Compatibility

Visual compatibility considers compatibility of the Project with its surroundings. Compatibility considers how the Project features fit within the visual resource, and considers the:

- Unity of the Project shape or form with existing features of the resource;
- Influence of the Project on the intactness of views;
- Scale of the Project relative the scale of the visual resource; and
- Dominance or prominence of the Project in the resource.

Compatibility is based on the capacity of the visual resource to absorb changes due to its form and variability.

4.4.1.2 Visual Contrast

Visual contrast is described as the extent to which a project appears different from the surrounding visual environment. It is measured using the four basic visual design elements of form, line, color, and texture (USDA, 1995).

- Form: Form is defined in the US Forest Service Scenery Management System as the "Structure, mass, or shape of a landscape or object…defined by edges or outlines of landforms, rock forms, vegetation patterns, or water forms, or the enclosed spaces created by these attributes".
- Line: Line is defined as an intersection of two planes; a point that has been extended, or the silhouette of a form. Ridges, skylines, structures, changes in vegetation (i.e. forest meeting meadow), the ocean horizon, or the beach meeting the ocean, may all be perceived by the viewer as lines.
- Color: Color is the property of reflecting light of a particular wavelength that enables an observer to differentiate objects that may otherwise be indistinguishable. A hue (i.e., red, green, blue, etc.) is contrasted with a value, such as black, white, or grey.
- Texture: Texture is a visual interplay of light and shadow created by variations in the surface of an object. The grain or "nap" of a landscape, a repetitive pattern of tiny forms. Visual texture ranges along a gradient from smooth (i.e. flat water surface) to coarse.

In addition to the above visual design elements, the characterization of visual contrast also considers horizontal scale, vertical scale, motion, and lighting, which may also affect visibility. In the case of the offshore Project, these elements are compared to both the horizontal and vertical scales that may contrast against the natural character of the existing setting. For example, a dark color horizon line is a defining visual characteristic in a seascape setting. The vertical scale and light color of the WTGs may contrast with the strong horizontal line and darker color of the ocean horizon line meeting the sky. Motion in offshore WTGs has been documented to increase visibility and draw viewer attention to the feature (Sullivan et al., 2013). Finally, the mandatory lighting of structures for air and marine navigation safety into the landscape may likewise increase visibility and draw viewer attention when lights are in operation.

The modified VAF were used to determine the degree of change within the setting. The form is used to compare the proposed development illustrated in the simulation against the existing conditions image. The two images are compared using the elements of form, line, color, texture, horizontal scale, vertical scale, motion, and lighting against physical characteristic of landform, ocean (offshore only), enclosed waterbodies, vegetation, and structures, and ranked using Sullivan's Scale of Visibility (Levels 1 through 6) as outlined below:

- **Visibility Level 1.** Visible only after extended, close viewing. Otherwise invisible.
- **Visibility Level 2.** Visible when scanning in the general direction of the study subject, otherwise likely to be missed by casual observers.
- **Visibility Level 3.** Visible after a brief glance in the general direction of the study subject and unlikely to be missed by casual observers.
- **Visibility Level 4.** Plainly visible, so could not be missed by casual observers, but does not strongly attract attention or dominate the view because of its apparent (small) size.
- **Visibility Level 5.** Strongly attracts the visual attention of views in the general direction of the study subject. Attention may be drawn by strong contrast in form, line, color, texture, luminance, or motion.
- **Visibility Level 6.** Dominates the view because the study subject fills most of the visual field for views in its general direction. Strong contrasts in form, line, color, texture, luminance, or motion may contribute to view dominance.

The goal of applying the visual contrast method is to create an objective measure of visual change as perceived by sensitive viewers. This analysis provides one metric for evaluating and characterizing the level of visual change to the characteristic landscape that could result from a proposed project and how that change would be perceived at different representative KOPs.

A VAF was completed and accompanies the simulation for each selected KOP. The form includes descriptive and location information for the KOP in Part A, characterizes the existing conditions with respect to form, line, color, and texture for each physical feature (i.e., landform, ocean, enclosed waterbodies, vegetation, and structures) in Part B, and rates degree of contrast (ranging from 1 to 6) between the post-development and existing conditions with respect to form, line, color, texture, horizontal and vertical scale, motion, and lighting for each, physical attribute. These individual ratings are then aggregated to arrive at an overall Visibility Level rating for visual contrast. The ratings as applied are intended to reflect the experience of a sensitive viewer and incorporates visual compatibility. The aggregate visibility ratings are in most cases expressed as a range to reflect differences in contrast that may be attributed to visual acuity of the viewer, meteorological and atmospheric conditions, and time of day (lighting angle). The aggregate *Visibility Level* rating for each KOP simulation communicates a range of visibility for that KOP and other similar locations represented by the selected KOP.

According to BOEM SLVIA, "Visual simulations are typically the primary basis for determining the visual contrasts .....although they are not the only basis for contrast assessment" (BOEM 2021a). The SouthCoast Wind analysis relies heavily on simulations to understand what the Project will look like from important vantage points on the islands. Simulations do not tell the entire picture. They only capture a moment in day and are mostly stationary (they do not show blade movement). There is a wide range of daylight and atmospheric conditions, and simulations cannot reflect all of them.

However, simulations give a good indication of visibility, scale, pattern, and visual contrast. By comparing simulations from close by vantage points taken at different times of day, with varying atmospheric conditions, the range of visibility and visual contrast can be determined. AECOM has experience observing wind farms in the field, and members of the VIA team spent weeks scouting viewpoints and taking photos.

Thus, simulations are one tool in this analysis, albeit a very important one. In evaluating each sim, the following is considered:

- Whether blade movement will be detected
- What lighting conditions are optimal for visibility
- How contrast can vary with sun direction, cloud presence, and other conditions
- How people at other viewpoints near a simulated one might see the Project

For example, if the greatest visibility and highest contrast from a given area occurs in clear sky, morning conditions, the VIA team tried to visualize what another view might be like in these conditions, even if the sim shows gray skies or afternoon lighting.

Simulations are imperfect representations of the Project, but they are essential, and very useful if variability is accounted for.

4.4.2 Visual Sensitivity

Visual sensitivity was determined based on two components: viewer susceptibility to change and the value of seascape/landscape receptors.

4.4.2.1 Viewer Susceptibility to Change

The susceptibility of a seascape/landscape receptor to change is its ability to accommodate the impacts of the proposed project without substantial change to the basic existing characteristics of the seascape/landscape (BOEM 2021). Viewer sensitivity for the offshore and onshore VIA are discussed in Sections 5.4.2 and **Error! Reference source not found.**, respectively.

4.4.2.2 Value of Seascape/Landscape Receptors

Seascapes/landscapes are considered valued when their character is distinctive and where scenic quality, natural or cultural heritage features make a particular contribution to the seascape or landscape, or their components are based on special designations (BOEM 2021). Visual resource sensitivity for the offshore and onshore VIA are discussed in Sections 5.4.2 and **Error! Reference source not found.**, respectively.

4.4.3 Visual Impact Characterization

The process for analyzing visual impact for both onshore and offshore Project components is based on the evaluation of visual compatibility and contrast with viewer sensitivity and the view sensitivity (i.e., character of the existing setting/view).

Variables that influence visual effects of the Project (Sullivan et al., 2013) include:

1. Visual Acuity: Human eyesight combined with the effect on visibility from atmospheric and meteorological conditions. The strength (or weakness) of the visual contrast of the Project from KOPs.
2. Viewer Location and place: The number of KOPs from which the Project is visible, the position of the viewer at the KOP (superior, level, or subordinate) and the relationship of the viewer from their position at the KOP to the ocean.
3. Sensitivity: Sensitivity includes the importance to the viewer of their experience and activity, the time of viewing (day or night), and/or season.
4. Project Scale: The scale of the project related to the vertical and horizontal massing within the frame of view.
5. Distance: How far is the project offshore and how does curvature of the earth effect how much of the feature can be seen.
6. Time of day: Visibility varies based on how sunlight reflects off of the WTGs. Front lighting results in light, nearly white appearance. Back lighting results in a dark gray appearance. These are viewed differently depending on the background (sky) color.
7. Atmospheric conditions: Visibility is highly dependent on the conditions of the atmosphere, including cloud cover, humidity, haze, and fog. Clear conditions with relatively low humidity likely create the most optimal conditions for seeing the WTGs and OSPs,
8. For this VIA, Visual Change was characterized by aggregate *Visibility Levels* for each KOP where *Visibility Levels 5* and *6* indicate strong contrast, *Visibility Levels 3* and *4* indicate medium contrast, and *Visibility Levels 1* or *2* indicate weak contrast (see Section 4.4.1.2). The *Visibility Levels* for the simulated KOPs were considered in the broader context as representative of other similar KOPs.

Visual Sensitivity was characterized as ranging from **Low** to **Very High** based on the combined influence of viewer susceptibility to change and the value of the seascape/landscape receptors.

The combination of Visual Change and Visual Sensitivity characterizes the potential for impact associated with the Project; the potential for impact is characterized as **Low, Medium/Low, Medium, High/Medium, or High** (Figure 4-6).

This VIA provides a rating of visual impact but does not characterize whether the degree of impact is acceptable or unacceptable. These determinations will be made by BOEM through the NEPA process.

VISUAL IMPACT ASSESSMENT			
VISUAL CHANGE	VISUAL SENSITIVITY		
	HIGH	MEDIUM	LOW
STRONG	High	High/Medium	Medium
MEDIUM	High/Medium	Medium	Medium/Low
WEAK	Medium	Medium/Low	Low
NONE	None	None	None

Note:
Visibility Levels 1 and 2 = Weak Visual Change
Visibility Levels 3 and 4 = Medium Visual Change
Visibility Levels 5 and 6 = Strong Visual Change

Figure 4-6. Impact Assessment Chart

4.4.4 3D Animated Day-Night Simulation

SouthCoast Wind developed a 3D animated simulation to illustrate the Federal Aviation Administration (FAA)-required aviation safety lighting for the SouthCoast Wind offshore Project components with the proposed Aircraft Detection Lighting System (ADLS). The ADLS activates when an aircraft flies within three nautical miles (nm) of the wind facility area at an altitude of 1,000 ft above any obstruction (COP Appendix Y3, Aircraft Detection Lighting System Efficacy Analysis). The MDS described for the Project includes a maximum turbine height of 1,067 ft (325 m) above mean sea level.

The simulation shows a mid-sized jet flying at an altitude of 2,000 ft above sea level and a ground speed of 460 knots approaching the wind facility from the south and continuing north. Simulated conditions:

- uses representative conditions on November 13, 2023, a moonless night to maximize potential visibility of the aviation safety lights,
- uses static water which minimizes visual distraction and maximizes potential visibility of the aviation safety lights, and
- includes ADLS activation under twilight conditions (video timestamp 1:42 [5:30:11 PM] and ends at timestamp 2:48 [5:31:19 PM]) and a full darkness activation (video timestamp 3:21 [12:00:12 AM] and ends at timestamp 4:25 [12:01:16 AM]).

A compass provided in the lower left corner of the simulation illustrates the movement of the aircraft into the ADLS detection zone and through the Lease Area. The clock in the lower right hand corner of the simulation shows time elapsing. The ADLS activation is simulated in real time, whereas the time period before and after the ADLS activation occurs in time lapse.

To develop nighttime visual simulations, the image was manipulated from an original photograph taken during the day which was then composited into a 3D environment containing the turbine and topographic landscape models within 3ds Max. A physical sun and coordinate system within the V-Ray render engine was used to show the progression of the sun across the view over a 24-hour simulated period. The final animated frames were compiled and composited in Adobe After Effects for final export to a mp4 video file. A link to the final video is provide in Section 5.4.4.

4.4.5 Cumulative Effects of Reasonably Foreseeable Planned Actions

The SouthCoast Wind Project is located in one of nine offshore wind energy lease areas in the Massachusetts/Rhode Island Wind Energy Area. The cumulative impacts analysis represents the SouthCoast Wind Project within the context of the other potential developments based on the “Effects of Reasonably Foreseeable Planned Actions.”

A final determination of cumulative impact for reasonably foreseeable future actions will be completed by BOEM within the Environmental Impact Statement (EIS) during the NEPA process.

4.5 Mitigation

Depending on the impact level, mitigation measures may be proposed to offset adverse impacts. Section 16 of the COP describes some proposed mitigation measures for the Project. According to BOEM in their article titled, *An Overview of Visual Impact Analysis for Offshore Wind Energy*, mitigation factors will consider “cost, practicality and support from the affected public and developers” (Warner, 2018). Options for mitigation are discussed in this report and will be addressed in consultation with SouthCoast Wind and BOEM throughout the NEPA process.

5.0 Offshore Visual Impact Analysis

The Project is one of nine lease areas within the Massachusetts/Rhode Island Wind Energy Area where the development of offshore wind is anticipated. It should be noted that development within other lease areas closer to shore may render parts of the SouthCoast Wind Project less distinctly visible from some vantage points due to screening; therefore, this assessment is conservative. As noted in Section 4.4.4 and described in the methodology memo submitted to BOEM (Attachment 1), cumulative impacts will be addressed after COP submittal, based on additional guidance to be provided by BOEM.

5.1 Establishment - Offshore

This section details the Project design, delineation of the APVI, and preliminary research and characterization of the Project setting that will serve as the basis for the offshore VIA.

5.1.1 Offshore Project Design

The MDS (Table 5-1, Figure 5-1, and Figure 5-2) was used for the offshore VIA based on the Project maximum design assumptions to support a conservative analysis of visual impacts.

Table 5-1. WTG/OSP Maximum Design Parameters Used in Visual Simulations

Design Parameter	Measurement / Value
Rotor diameter	918.6 ft (280.0 m)
Blade length	452.8 ft (138.0 m)
Tip height above MLLW	1,066.3 ft (325.0 m)
Hub height above MLLW	605.1 ft (184.4 m)
Tip clearance (air gap) above Highest Astronomical Tide (HAT)	53.8 ft (16.4 m) (minimum)
Maximum number of WTGs	149
Maximum number of OSPs	five
OSP height	344.5 ft (105.0 m) above MLLW (for Direct Current [DC] converter OSP), Maximum platform topside height is 164 ft (50 m)
OSP color	Yellow
Marking and Lighting	Consistent with applicable regulations and BOEM Guidelines (BOEM, 2021b) lighting will have the following characteristics: • Red wavelength light emitting diode (LED) lighting in the infrared portion of the spectrum between 800 and 900 nanometers; • Photometric values of a Federal Aviation Administration (FAA) Type L-810, L-864, and L-885 medium-intensity red obstruction light; • Flash simultaneously at 30 flashes per minute; • Visible in all directions in the horizontal (i.e., visible spread from 360 degrees); • Placed at the highest point of the turbine nacelle, and mid-mast lighting; • Every turbine should be outfitted with a light, but not all turbine lights need to be turned on as long as there are no unlit separations or gaps of

Design Parameter	Measurement / Value
	more than 0.5 mi (805 m) around the perimeter of the entire facility (or cluster of turbines within the facility); and • Note: SouthCoast Wind will implement the use of an Aircraft Detection Lighting System (ADLS), which will activate the lighting system on the Project WTGs based on approaching air traffic. Offshore structures will include lighting consistent with latest *Offshore Structure Private Aids to Navigation Permit Recommendations* from the U.S. Coast Guard (USCG, 2020): • Lighting will be placed on all structures and synchronized by structure location within the field of structures. • Lighting will be visible throughout a 360-degree arc from the water's surface. • Quick flashing yellow lighting energized at a five nm (9.26 km) range will be included for corner towers and significant peripheral structures. • Outer boundary towers will include 2.5-second flashing yellow lights energized at a three nm (5.6 km) range • Interior towers will include 6-second or 10-second flashing yellow lights energized at two nm (3.7 km) range

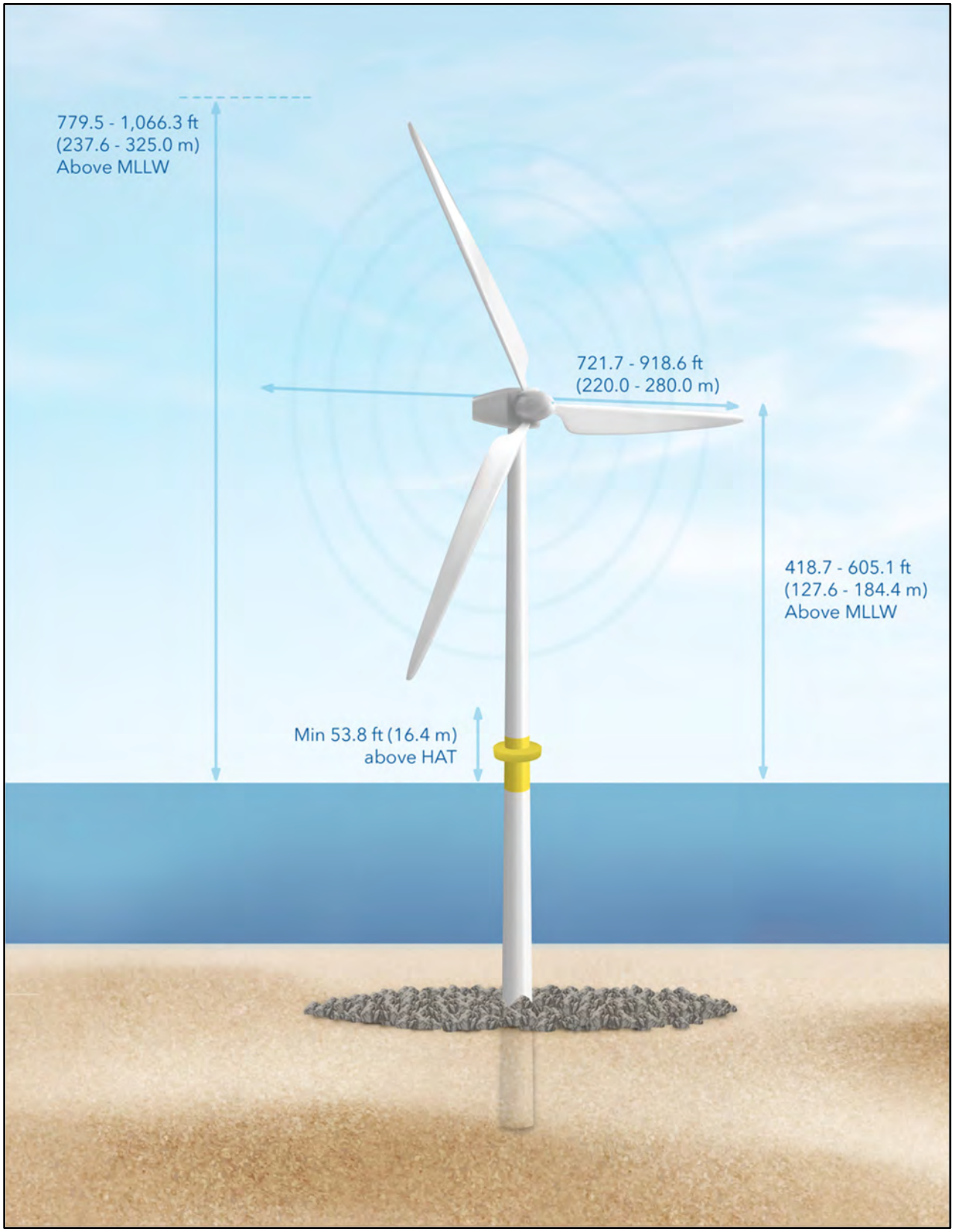


Figure 5-1. Indicative WTG Schematic Drawing with Relevant Measurements

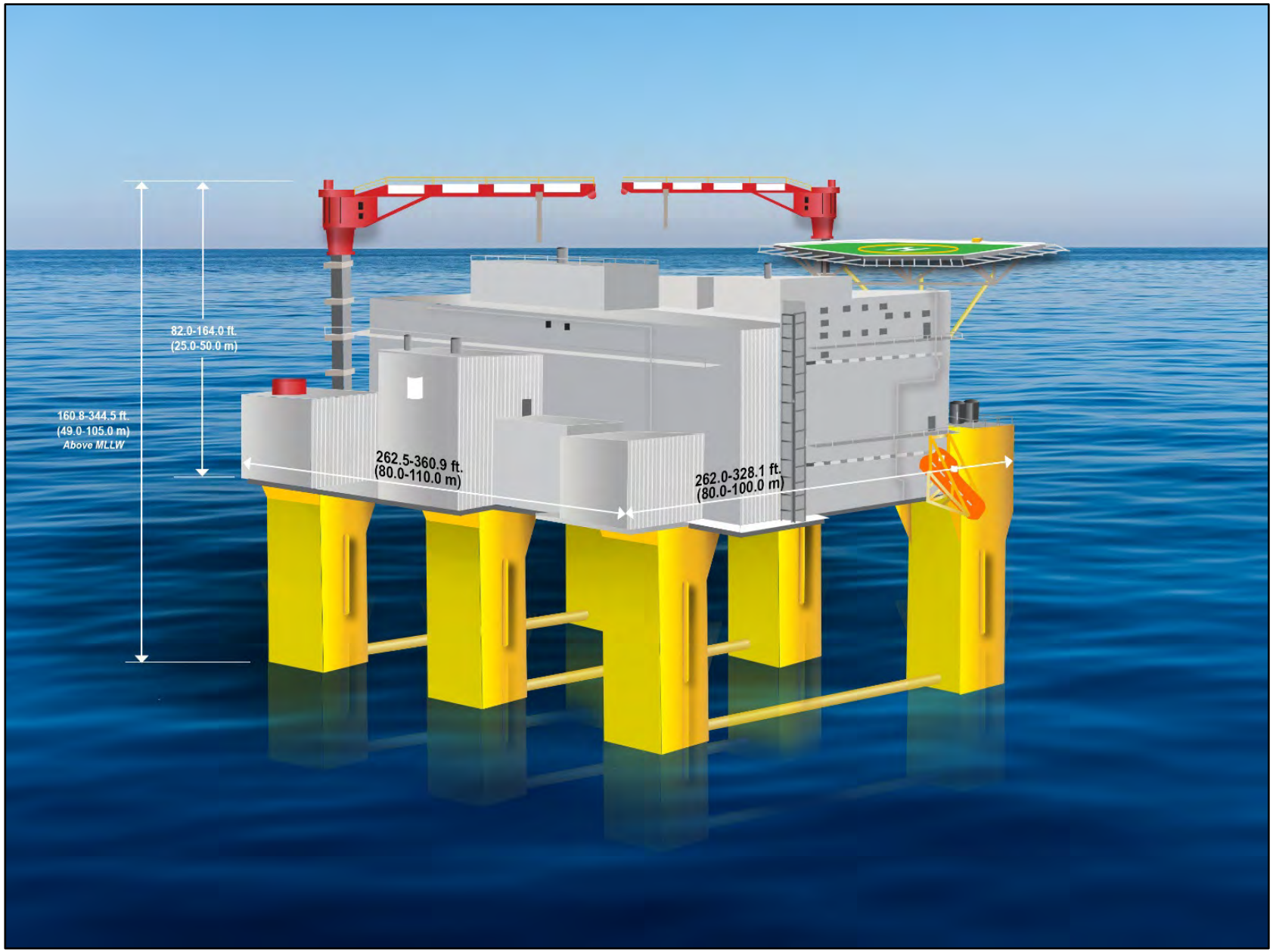


Figure 5-2. Indicative DC Converter OSP Diagram

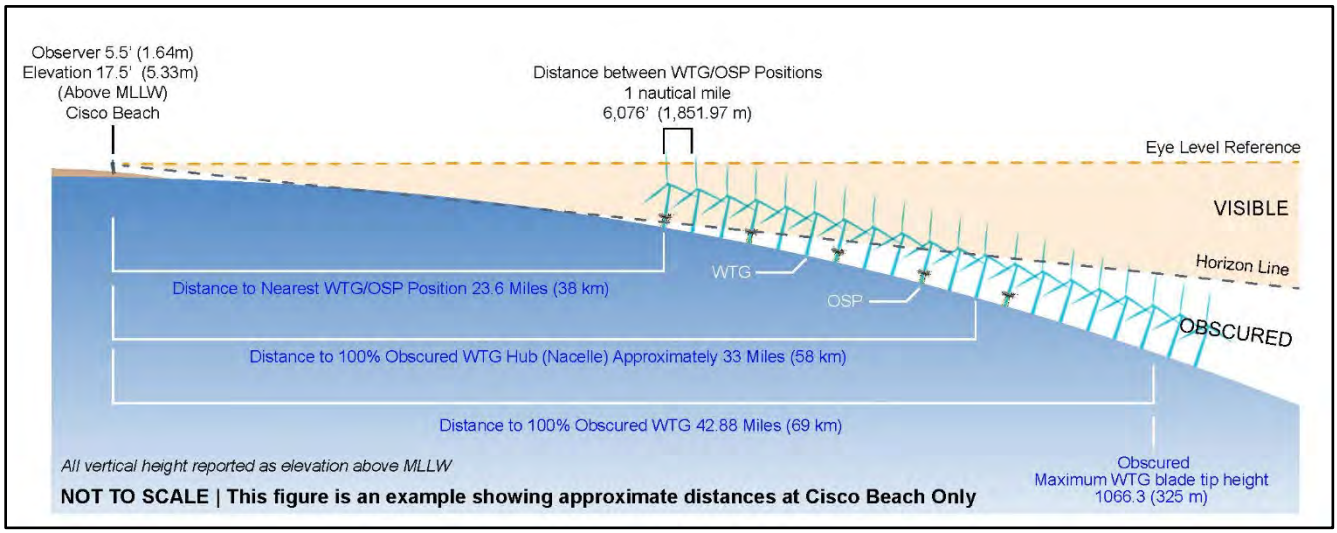
5.1.2 Area of Potential Visual Impact - Offshore

The APVI describes the area within which the Project may be visible and, therefore, could be seen and contribute a level of Visual Change within an existing setting. Factors that influence visibility are distance, earth curvature, atmospheric conditions, topography, and screening by other projects (i.e., Vineyard Wind WTGs may screen SouthCoast Wind WTGs from the view of KOPs on Martha's Vineyard), as well as screening from vegetation and buildings.

A DSM viewshed analysis that included vegetation, building structures and facilities with a LiDAR bare earth underlay was conducted to define the APVI for the Offshore Project Area based on a maximum viewshed limit of 43 mi (69.2 km), the limit of visibility based on the curvature of the earth at sea level with a viewer perspective of 5.5 ft (1.7 m). The analysis assumed an MDS with WTGs or OSPs occupying all possible positions in the 1 x 1 nm (1.9 x 1.9 km) grid layout within the Lease Area. Separate viewsheds were evaluated for the WTG hub center and blade edge tip based on a maximum WTG hub center elevation of 605.1 ft (184.4 m), and WTG blade edge tip of 1,066.3 ft (325.0 m) above mean lower low water (MLLW).

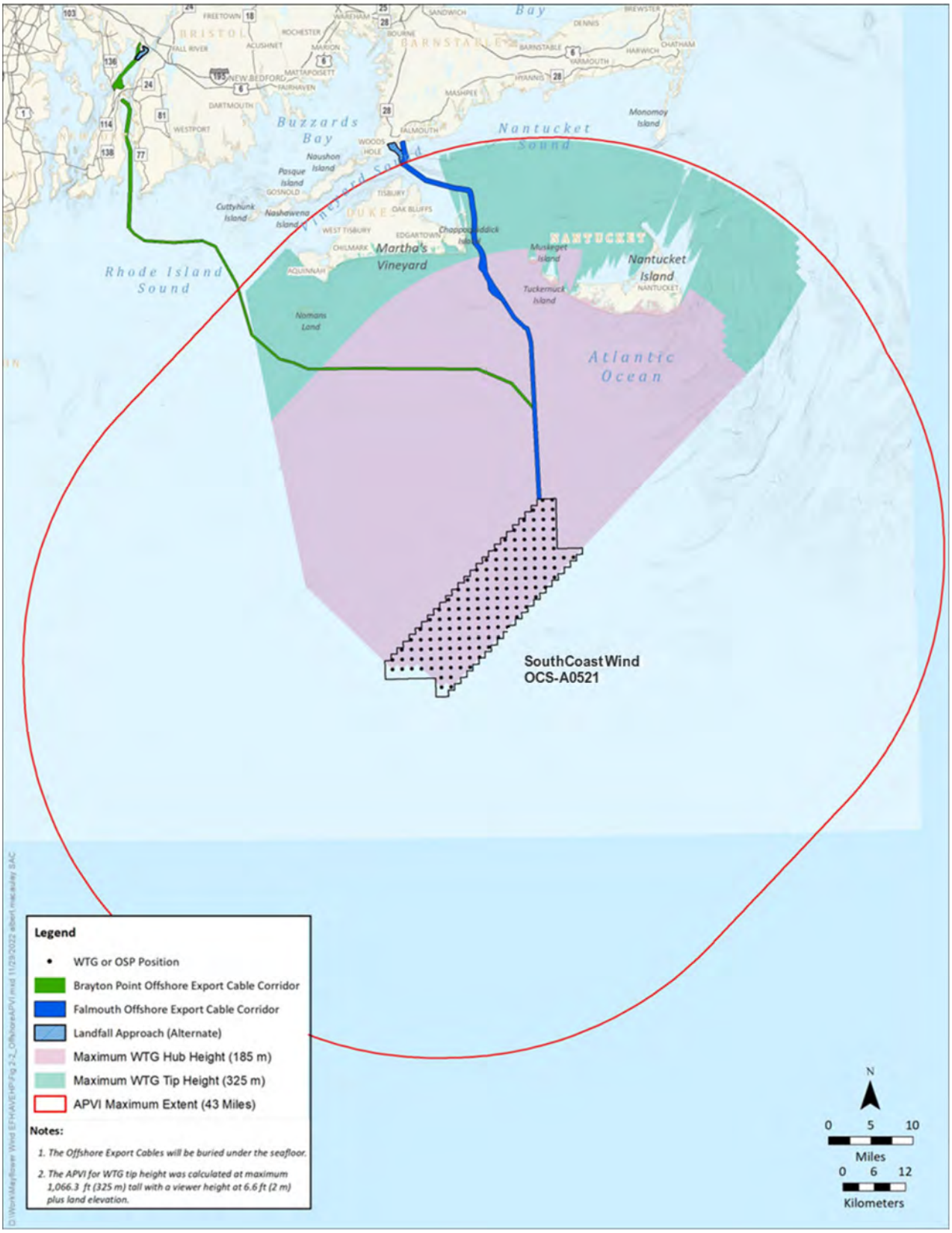
Figure 5-3 illustrates the influence of the curvature of the earth on visibility for a viewer located at Cisco Beach. The WTG hubs are potentially visible to a viewer on Nantucket (Cisco Beach) up to 36 mi (57.9 km) from the viewer position. Because of the curvature of the earth, none of the Project components located more than 45.9 mi (73.9 km) from a viewer on Cisco Beach would be visible. Screening by other structures and/or vegetation will reduce or eliminate visibility at certain locations; the effect of such screening is evaluated for each KOP. The offshore APVI map is presented in Figure 5-4 and illustrates maximum potentially visible area extending out from the Lease Area in all directions.

The APVI map (Figure 5-4) was used to assess the potential visibility of the Project from common and known sensitive viewer locations (i.e., KOPs). Viewer experience will vary. For example, roadway travelers may have intermittent views of the Project where it is not screened by topography or vegetation, while others have longer duration views from fixed points with unobstructed views. As illustrated in Figure 5-4, intervening topography eliminates views of the Project from certain portions of Nantucket and Martha's Vineyard that otherwise fall within the maximum limit of visibility.



Note: The APVI is defined based on digital surface model viewshed analysis and reflects the maximum distances at which the Project features may be visiible.

Figure 5-3. Example Curvature of Earth Diagram



DSM viewshed is depicted as provided by ICF.

Figure 5-4. Offshore Area of Potential Visual Impact for Blade Tip and Hub Height Based on DSM

5.1.3 Meteorological and Atmospheric Conditions

Meteorological data from the BOEM Meteorological Report (Wood et al., 2014) are summarized below and used to discuss the influence of varying atmospheric conditions on the potential visibility of the WTGs. In the BOEM report (Wood et al., 2014), hourly surface observations were evaluated to determine meteorological condition, visibility, wind speed, and direction. In the report, BOEM evaluated the average number of days that there is visibility to 10 nm (19 km), 20 nm (37 km), and 30 nm (56 km). Table 5-2 discusses the average number of days where there is clear visibility out to 10 nm (19 km) and 20 nm (38 km) from Nantucket and Martha's Vineyard for at least 50 percent and 75 percent of the daylight hours.

The BOEM Report also discusses the frequency of reported visibility from two locations on Martha's Vineyard and Nantucket airports during different times of the day (daylight/night) and during the winter, spring, summer, fall, and the annual average (Wood et al., 2014) (Table 5-3 and Table 5-4). Visibility as reported at these two airport locations exhibits very limited seasonal variation.

Table 5-2. Estimated Visibility to 10 nm (19 km) and 20 nm (38 km)

Location	% of Daylight Hours	Estimated Days per Year >10 nm Visibility	Estimated Days per Year >20 nm Visibility
Nantucket (multiple sites)	50	171	80
	75	103	40
Martha's Vineyard (multiple sites)	50	207	113
	75	117	50

Table 5-3. Estimated Visibility to 10 nm (19 km) or Greater from Martha's Vineyard Airport

Time	Winter	Spring	Summer	Fall	Annual
Day (% of total hours, average)	80	82	80	84	81
Night* (% of total hours, average)	0	0	0	0	0
Total (% of total hours, average)	40	41	40	42	41

Source: Wood et al., 2014

**Unlit objects will not be visible at >10 nm (19 km) at night. The use of ADLS lighting system would reduce expected nighttime lighting to less than 5 hours/year, which is 0.1 percent of annual nighttime hours and is rounded to 0% in this table.*

Table 5-4. Estimated Visibility to 10 nm (19 km) or Greater from Nantucket Airport

Time	Winter	Spring	Summer	Fall	Annual
Day (% of total hours, average)	71	71	69	76	72
Night* (% of total hours, average)	0	0	0	0	0
Total (%of total hours, average)	35	36	35	38	36

Source: Wood et al., 2014

**Unlit objects will not be visible at >10 nm (19 km) at night. The use of ADLS lighting system would reduce expected nighttime lighting to less than 5 hours/year, which is 0.1 percent of annual nighttime hours and is rounded to 0 percent in this table.*

5.1.4 Offshore APVI Preliminary Characterization

As described in Section **Error! Reference source not found.**, the landscape/seascape and ocean character types, viewers/receptors, and visual resources were characterized based on available documentation to allow for the selection of KOPs for field evaluation.

5.1.5 Selection of Preliminary Offshore KOPs

Representative KOPs were selected based on the methods described in Section 4.1.4. As described in Section 5.2 each KOP was evaluated with respect to its landscape/seascape and ocean character types and viewers.

5.2 Offshore Baseline Inventory

The baseline landscape and visual conditions are important components of the analysis. These include a detailed description of criteria listed in Section 4.2 of the methodology.

5.2.1 Offshore Seascape, Landscape and Ocean Character

The offshore APVI includes the islands of Martha's Vineyard, Nantucket, and smaller neighboring islands. These islands are highly valued for their scenic and historic attributes and have long been popular destinations for tourists, as well as communities for year-round and seasonal residents. The visual and other sensory linkages of land and water is a draw, along with a high degree of "naturalness" and compatible historic and more modern well-designed buildings and townscapes.

Due to the high degree of "naturalness" historical character, and the compatibility of existing development, the landscape/seascape and the ocean condition of the perceptual and physical attributes of the APVI is mostly visually intact. Intact landscapes/seascapes and the open ocean tend to have higher perceived value to people.

5.2.1.1 Context (Perceptual Attributes and Physical Factors)

The SouthCoast Wind APVI includes Upper Cape Cod, Martha's Vineyard, Nantucket, and associated smaller islands, including Nomans Land, Esther, Tuckernuck, and Muskeget, as well as the Elizabeth Islands off Cape Cod. Cape Cod and the surrounding islands are located within the physiographic province, Level III Ecoregion "Northeastern Coastal Zone". This province includes the whole eastern half of Massachusetts and islands, all of Rhode Island, and Connecticut, excluding the northwestern corner. The Environmental Protection Agency (EPA) ecoregion subset classifies the Project Area and surrounding context as the "84. Atlantic Coastal Pine Barrens," which includes parts of New England and the northeast coast south to New Jersey (Griffith et al., 2009). This ecoregion, where it is not developed or converted to urban uses, includes a mix of low-stature forest or scrub, dominated by pine and oak growing on sandy, nutrient-poor soils, heath moors, grassy plains, sand dunes, salt marshes, freshwater wetlands, and open water (World Wildlife Fund, 2020). Most of the APVI is comprised of saltwater ocean environments, including partly enclosed bays, inlets, salt marshes, Nantucket Sound, and the vast open Atlantic Ocean.

Sandy beaches and coastal dunes border the oceanfront, particularly on the south and southwestern shores of the islands. Terrain is low, generally at or below 100 ft (30 m) above sea level, except for higher hills and sea cliffs on Martha's Vineyard that reach 300 ft (91 m) at the town of Aquinnah, Nashaquitsa Pond, and Squibnocket Beach. The ecological significance of this area is high. Nearly 90 percent of the world's remaining sandplain grassland occurs on Nantucket, Martha's Vineyard, Cape Cod National Seashore, and a slice of Long Island (Oktay, 2008).

The landscape/seascape character of the APVI is highly valued by the inhabitants and visitors, reflected by significant attention and resources dedicated to the conservation of lands and preservation of cultural resources. Much of the lands of Nantucket, Martha's Vineyard, and Cape Cod have been protected through public agencies, regulatory authorities, private land conservancies, and land trusts. A wide variety of

landscape/seascape character types have been protected, from ocean beaches to open moors to upland forests. Examples of the commitment to preservation on the islands and Upper Cape Cod include, but are not limited to: measures to finance preservation through real estate transfer fees and property tax surcharges (Nantucket and Martha's Vineyard), the actions of various organizations focused on conservation and preservation (e.g., NLB, NCF, Nantucket Land Council [NLC], Massachusetts Audubon Society, Nature Conservancy, Martha's Vineyard Land Bank, Vineyard Open Land Foundation, The Trustees of Reservations (Nantucket and Martha's Vineyard), Sheriff's Meadow Foundation, Committee Land Trust and others), and the overall extent of land preservation achieved (more than 14,900 acres on Nantucket (NCF, 2018; Trustee of Reservations, 2021; NLC, 2021; Mass Audubon, 2021; Smart Preservation, 2021; NLB, 2021; more than 19,995 acres on Martha's Vineyard (Vineyard Conservation Society [VCS], 2021), and more than 11,000 acres near Falmouth and Mashpee (Falmouth Land Trust [FLT], undated; Pruetz, 2011).

5.2.1.2 Landscape/Seascape/Ocean Character Types

The SLIA describes and assesses the seascape and landscape receptors which are the potentially affected SCAs, LCAs, and OCA, collectively referred to as SLCAs The SLCAs are discrete areas of seascape or landscape, each with its own character and identity, as expressed through similar geology, topography, drainage patterns, vegetation, historical land use and settlement patterns, and perceptual and aesthetic attributes within the area.

Landscape/seascape/ocean character types explain the unique combination of elements and features that make landscapes distinctive by mapping and describing character types and areas. They also show how the landscape is perceived, experienced and valued by people. Landscape/seascape/ocean character types found within the Project Area include:

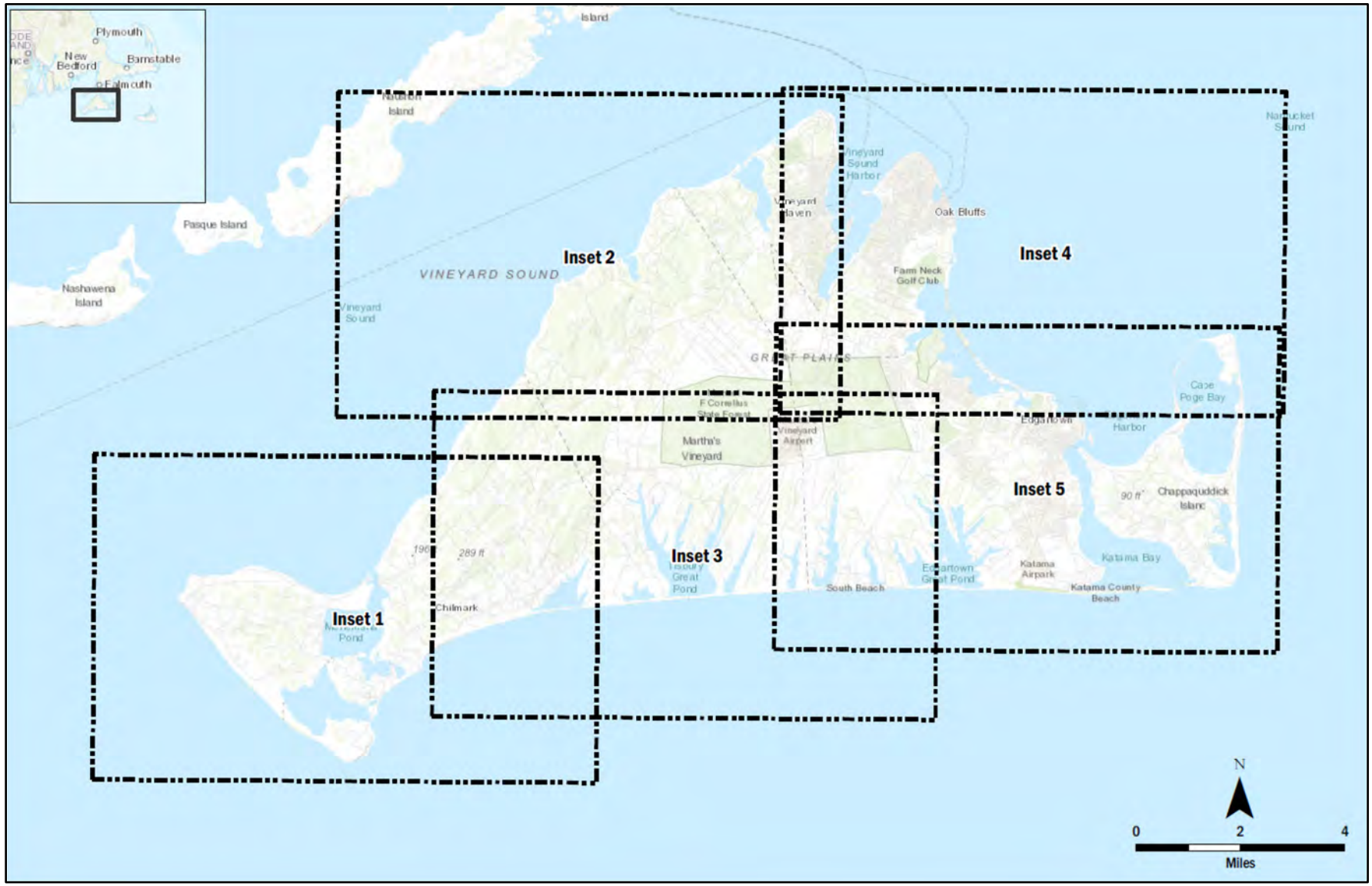
- Open Ocean;
- Ocean Beach;
- Dunes;
- Coastal Scrub;
- Ponds/Tidal Marsh;
- Coastal Bluffs;
- Rural/Suburban Residential;
- Commercial;
- Light Industrial;
- Village/Town;
- Fields/Meadows;
- Parks/Developed Recreation; and
- Forests/Woodlands.

These character types are provided as a baseline of physical landscapes found within in the APVI for the VIA. The prevalence and location of each character type are provided for Martha's Vineyard (Figure 5-5) and Nantucket (Figure 5-11). Descriptions and representative photos of each character type are provided in Figure 5-16 through Figure 5-27. The total area and percent of each character type where the Project is potentially visible is provided in Table 5-5. The description of each KOP includes identification of the landscape/seascape and ocean character types associated with that KOP (see Table 5-6 and Table 5-7). It should be noted that the presentation of these character types is to provide important context for the views and viewer groups associated with each KOP. No construction activities are anticipated to occur on either Nantucket or Martha's Vineyard.

5.2.1.3 Historic Districts

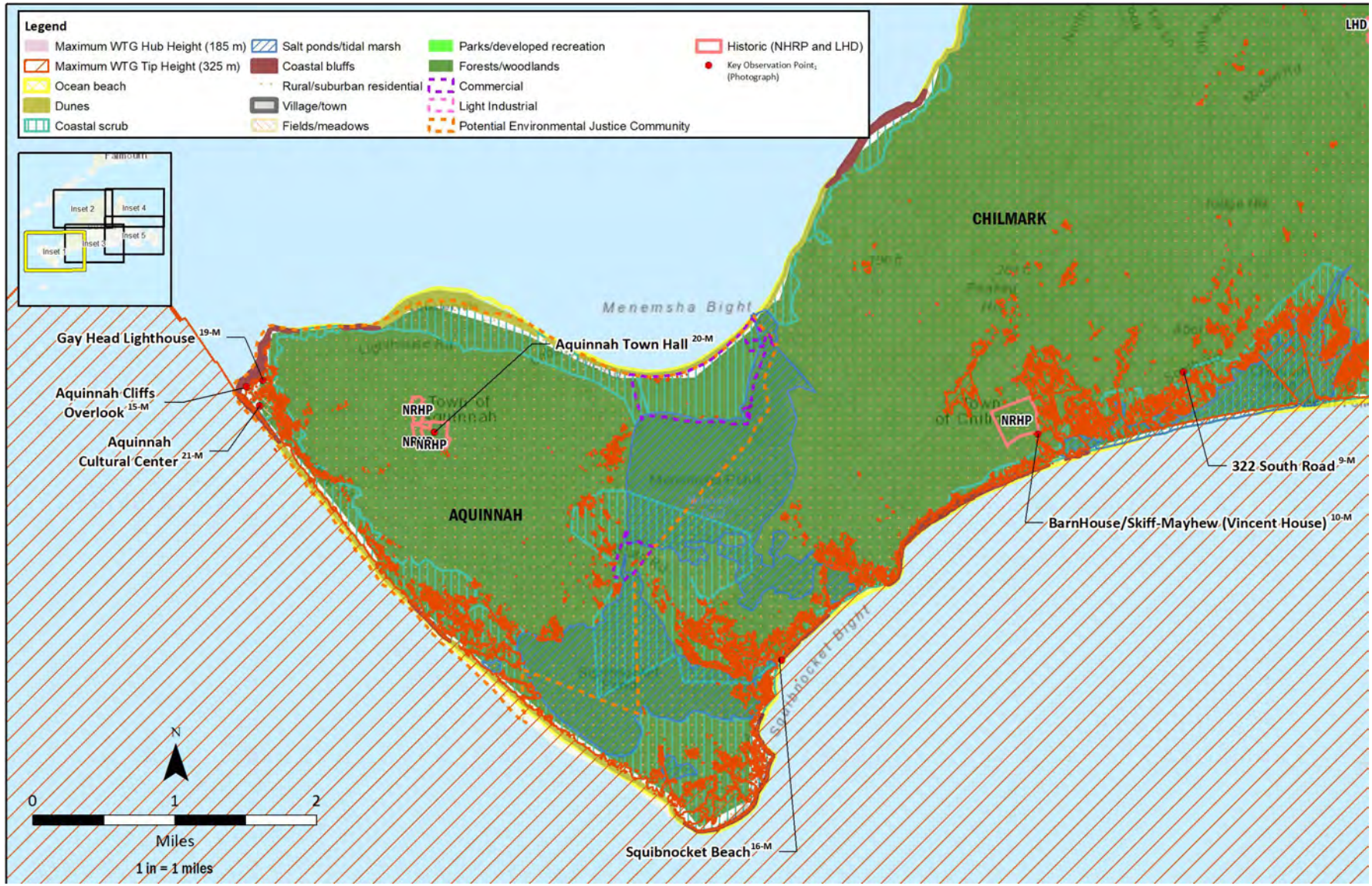
Landscape/seascape character type areas within the Historic Districts of Martha's Vineyard and Nantucket are important to evaluate as these areas are significant and often visually and culturally sensitive. The whole island of Nantucket is designated as a Historic District, therefore all of the character types listed in the section above are relevant when discussing the Historic Districts. All of the KOPs taken into consideration on Nantucket accounted for the historical significance that is presented throughout the island.

There are eight areas designated as Historic Districts on Martha's Vineyard, as displayed in Figure 5-6 through Figure 5-9, some of which intersect with Potential Environmental Justice Communities. The Historic Districts on Martha's Vineyard are located in Aquinnah, Chilmark, West Tisbury, Tisbury, Vineyard Haven, Oak Bluffs, and Edgartown. Half of the Historic Districts are characterized as forests/woodlands and natural areas, while the other half are located in Villages/Town centers (Edgartown, Vineyard Haven, Oak Bluffs, and Tisbury). The Historic Districts within the viewshed were visited and evaluated for visibility, but the Project will not be visible from any of the Historic Districts on Martha's Vineyard. The areas are highlighted in Figure 5-5 and quantitative data concerning visibility of the Project Area are contained in Table 5-5.



Data sources: ESRI, 2020

Figure 5-5. Landscape/Seascape and Ocean Character Types Martha's Vineyard: Index Map

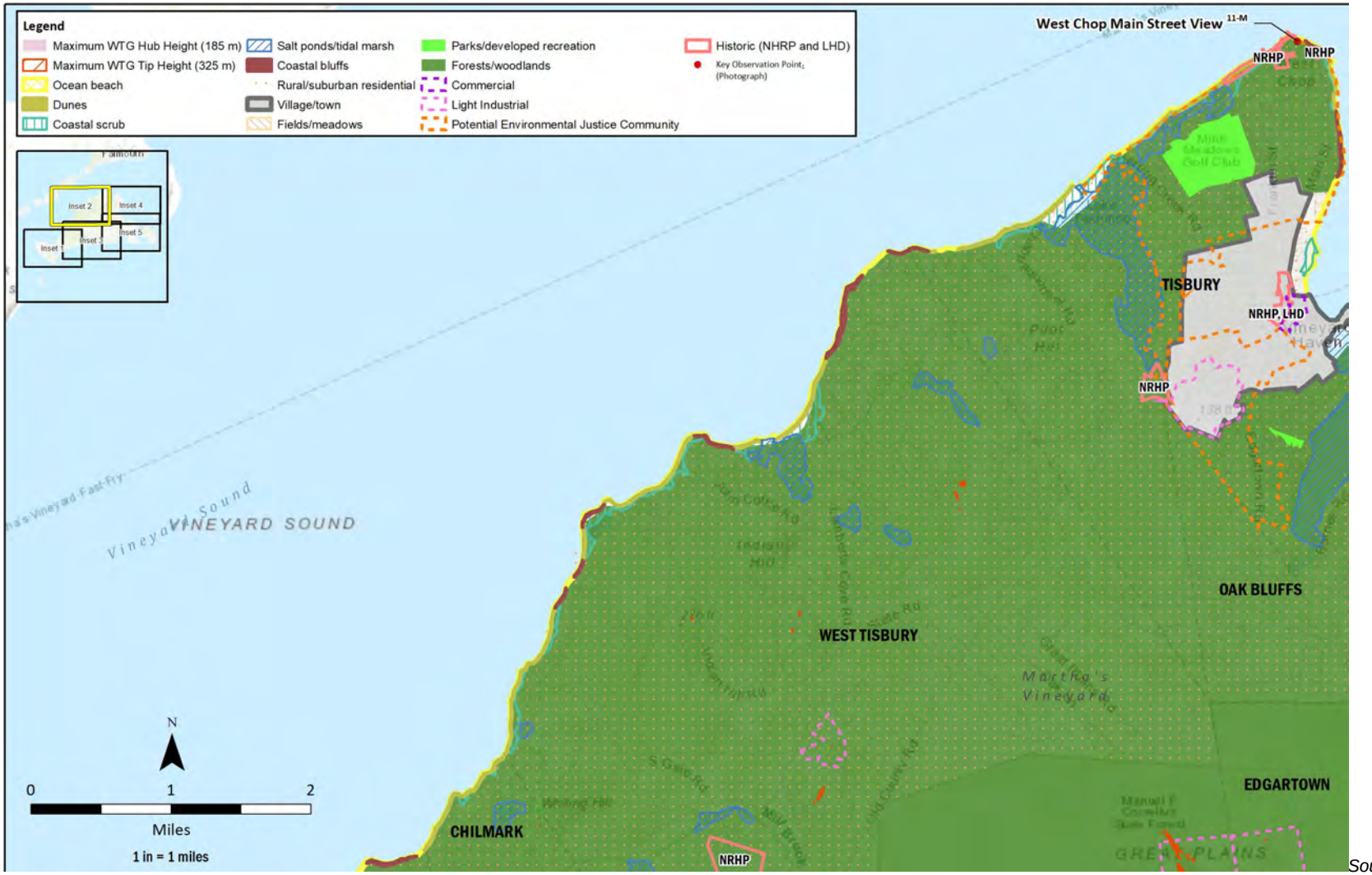


Sources: ESRI, 2020; Dukes County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

WTG Blade Tip Height DSM is shown with red diagonal hatching with a red outline; this appears as diagonal hatching (over the water) and in the landward extents onshore it appears as red shading at this map scale because of the density of individual polygons. DSM viewshed is depicted as provided by ICF.

Figure 5-6. Landscape/Seascape and Ocean Character Types Martha's Vineyard with Blade Tip and Hub Height DSM Viewsheds: Inset 1



Sources: ESRI, 2020; Dukes County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

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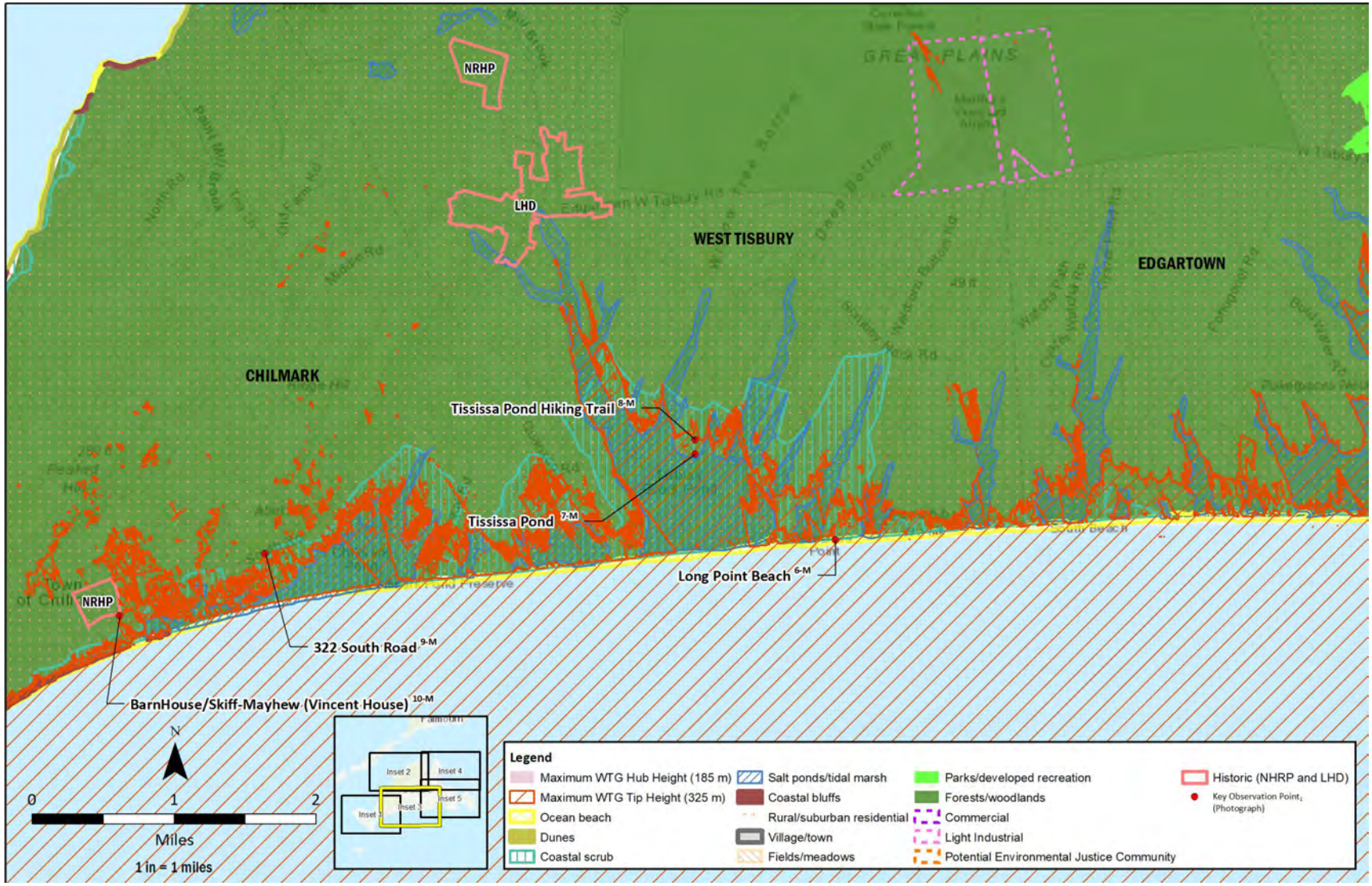
Figure 5-7. Landscape/Seascape and Ocean Character Types Martha's Vineyard with Blade Tip and Hub Height DSM Viewsheds: Inset 2



Sources: ESRI, 2020; Dukes County GIS, 2021, MassGIS, 2021; MACRIS, 2021

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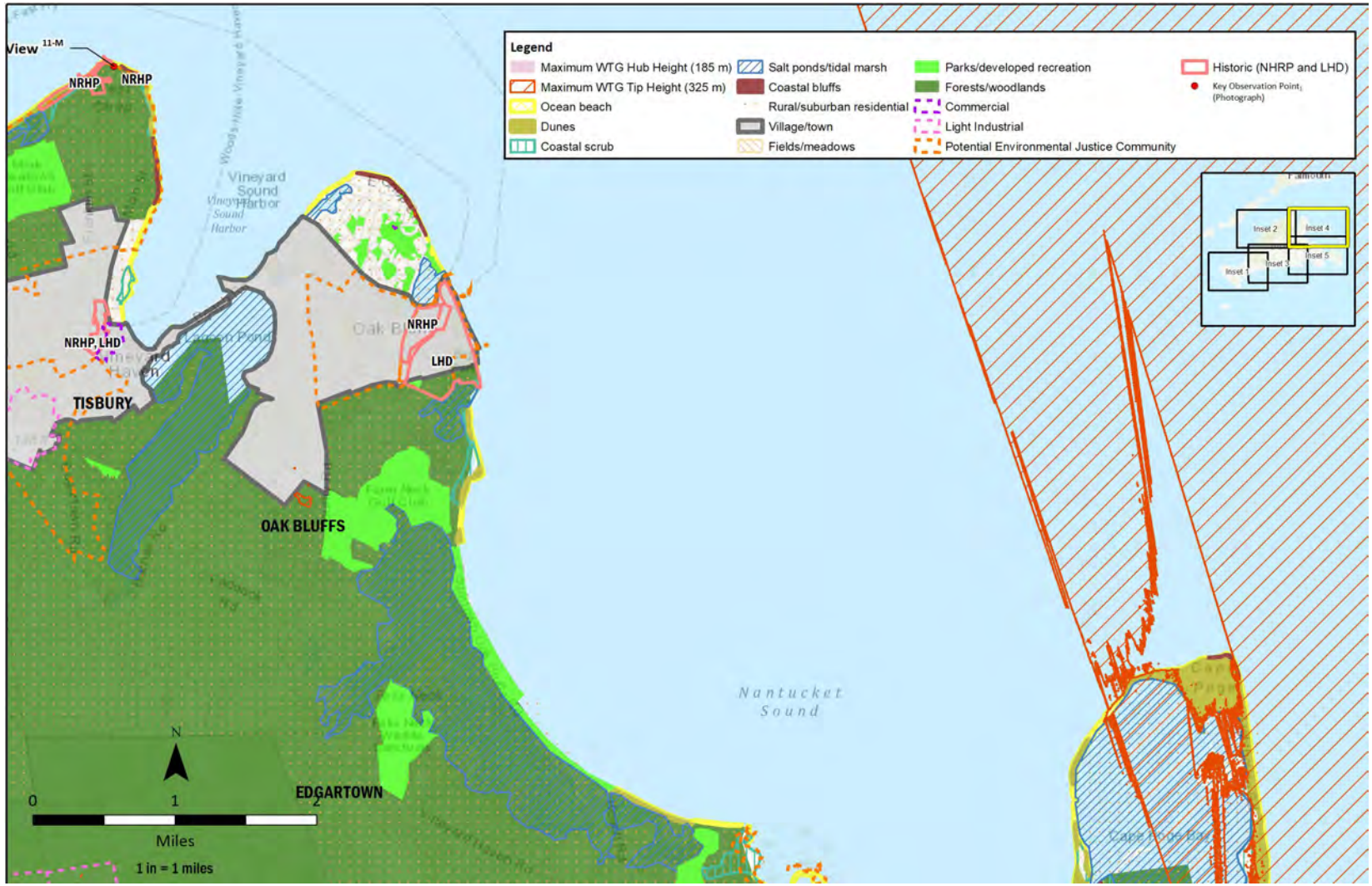
DSM viewshed is depicted as provided by ICF.

Figure 5-8. Landscape/Seascape and Ocean Character Types Martha's Vineyard with Blade Tip and Hub Height DSM Viewsheds: Inset 3



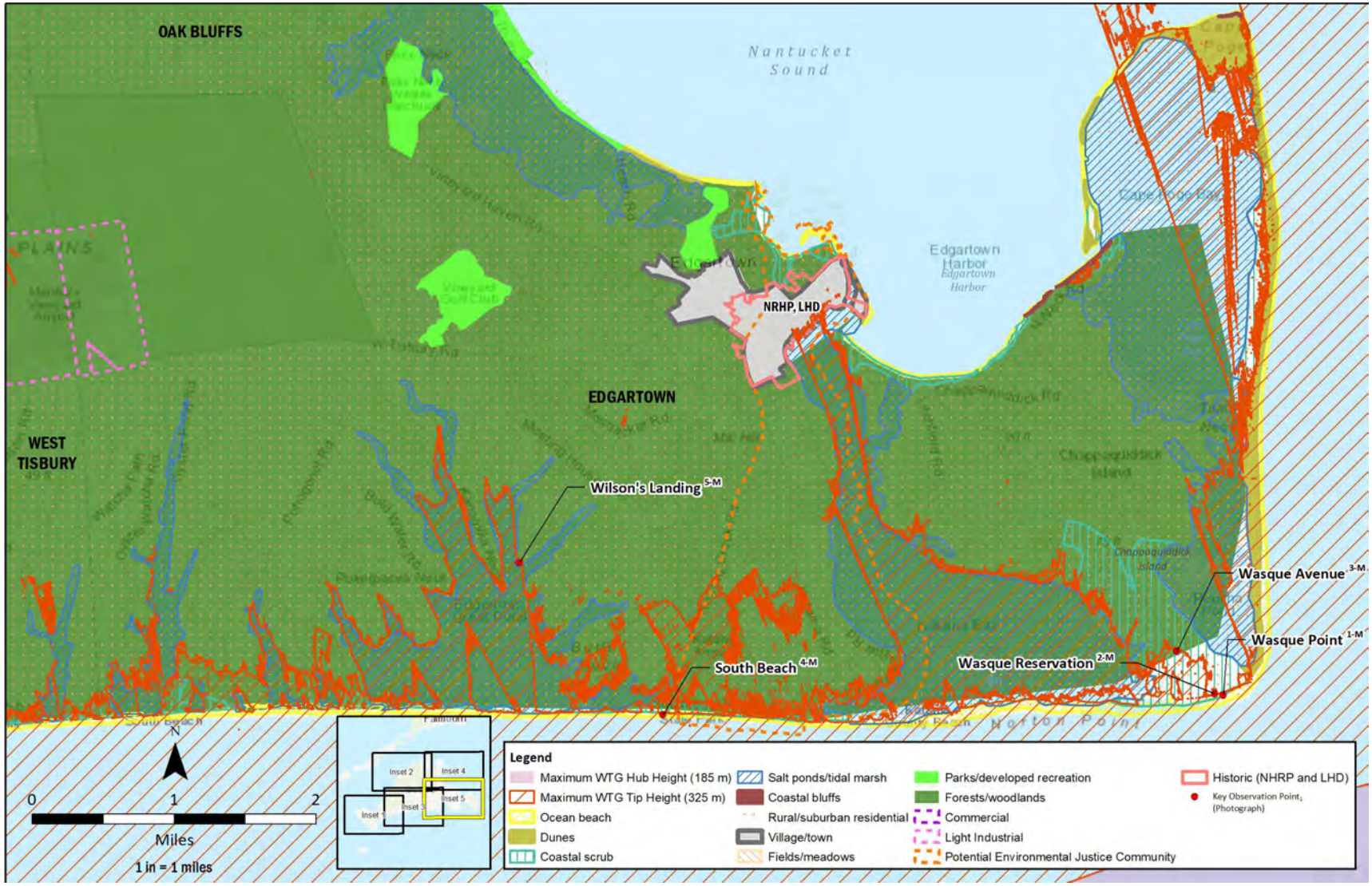
Sources: ESRI, 2020; Dukes County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

WTG Blade Tip Height DSM is shown with red diagonal hatching with a red outline; this appears as diagonal hatching (over the water) and in the landward extents onshore it appears as red shading at this map scale because of the density of individual polygons.

DSM viewshed is depicted as provided by ICF.

Figure 5-9. Landscape/Seascape and Ocean Character Types Martha's Vineyard with Blade Tip and Hub Height DSM Viewsheds: Inset 4

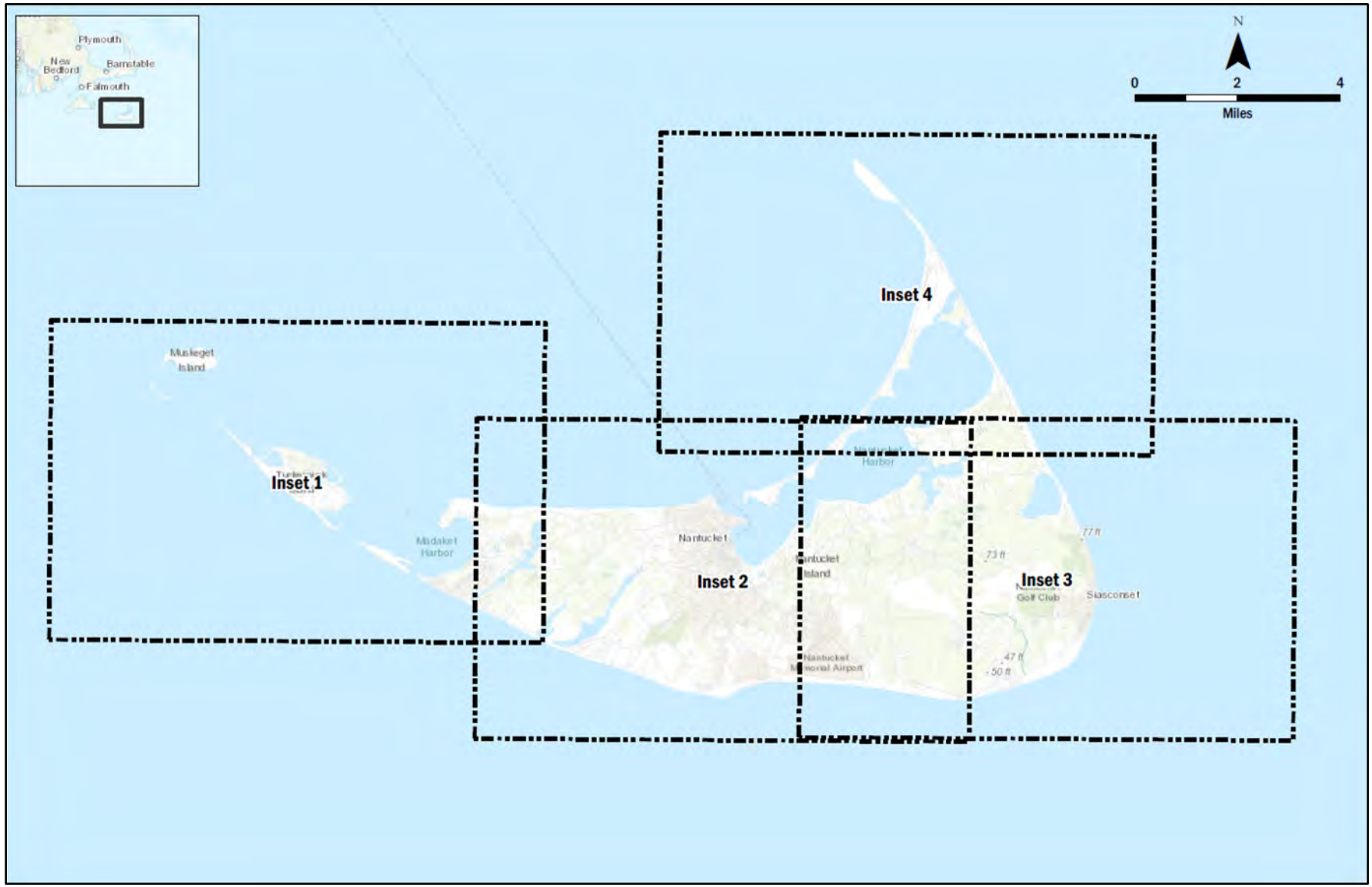


Sources: ESRI, 2020; Dukes County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

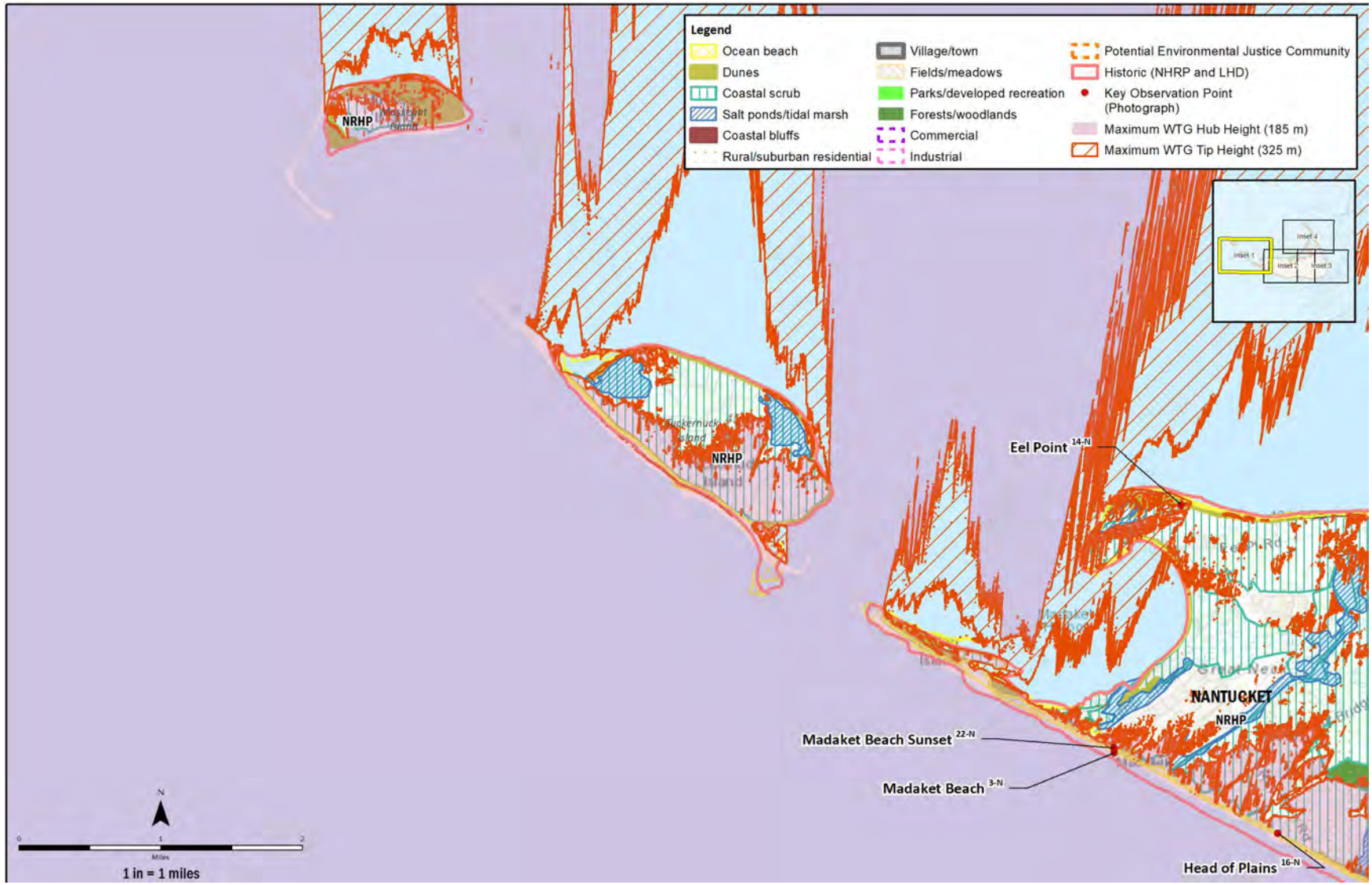
WTG Blade Tip Height DSM is shown with red diagonal hatching with a red outline; this appears as diagonal hatching (over the water) and in the landward extents onshore it appears as red shading at this map scale because of the density of individual polygons. DSM viewshed is depicted as provided by ICF.

Figure 5-10. Landscape/Seascape and Ocean Character Types Martha's Vineyard with Blade Tip and Hub Height DSM Viewsheds: Inset 5



Data sources: ESRI, 2020

Figure 5-11. Landscape/Seascape and Ocean Character Types Nantucket: Index Map



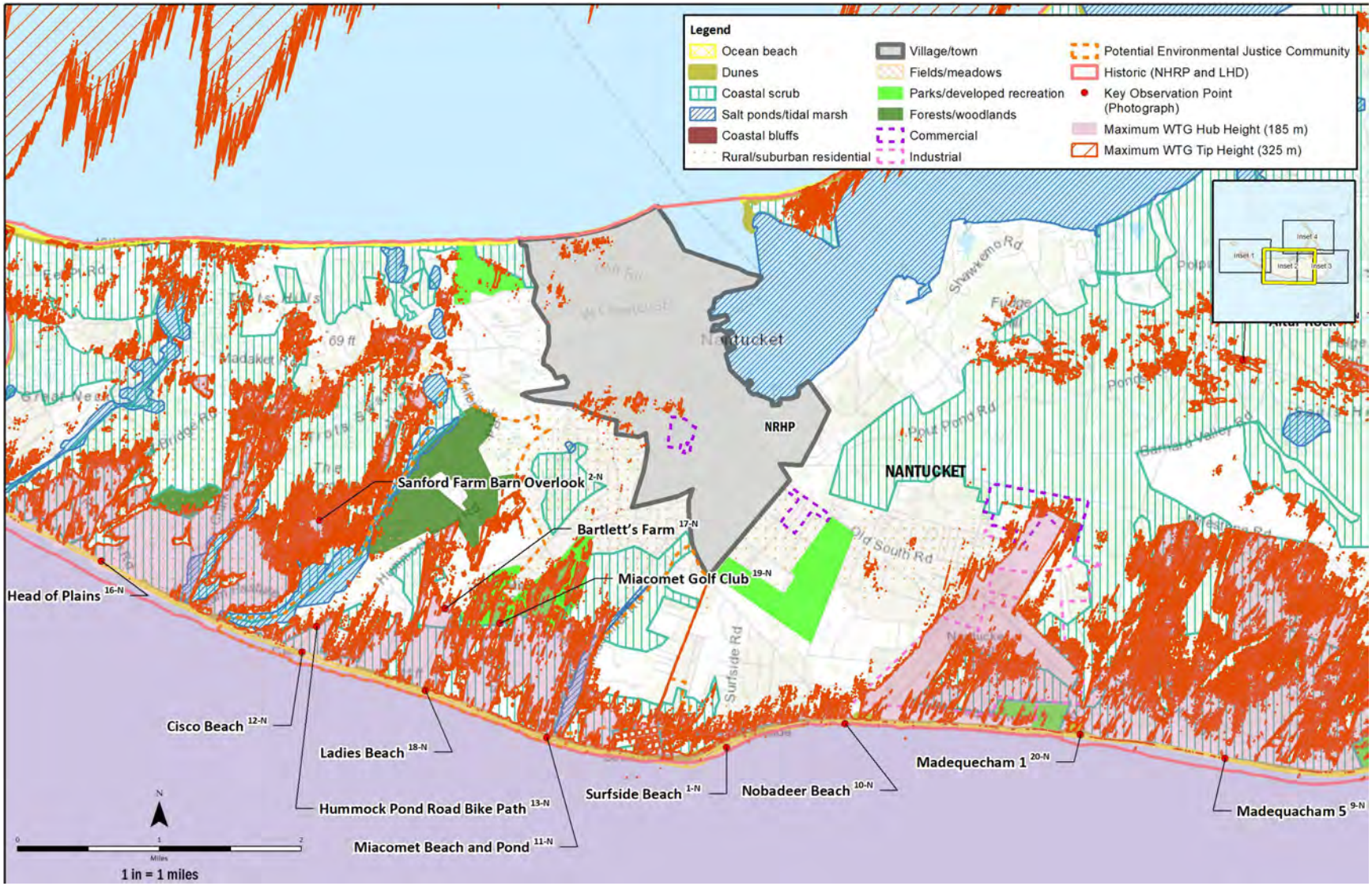
Sources: ESRI, 2020; Nantucket County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

WTG Blade Tip Height DSM is shown with red diagonal hatching with a red outline; this appears as diagonal hatching (over the water) and in the landward extents onshore it appears as red shading at this map scale because of the density of individual polygons.

DSM viewshed is depicted as provided by ICF.

Figure 5-12. Landscape/Seascape and Ocean Character Types Nantucket with Blade Tip and Hub Height DSM Viewsheds: Inset 1



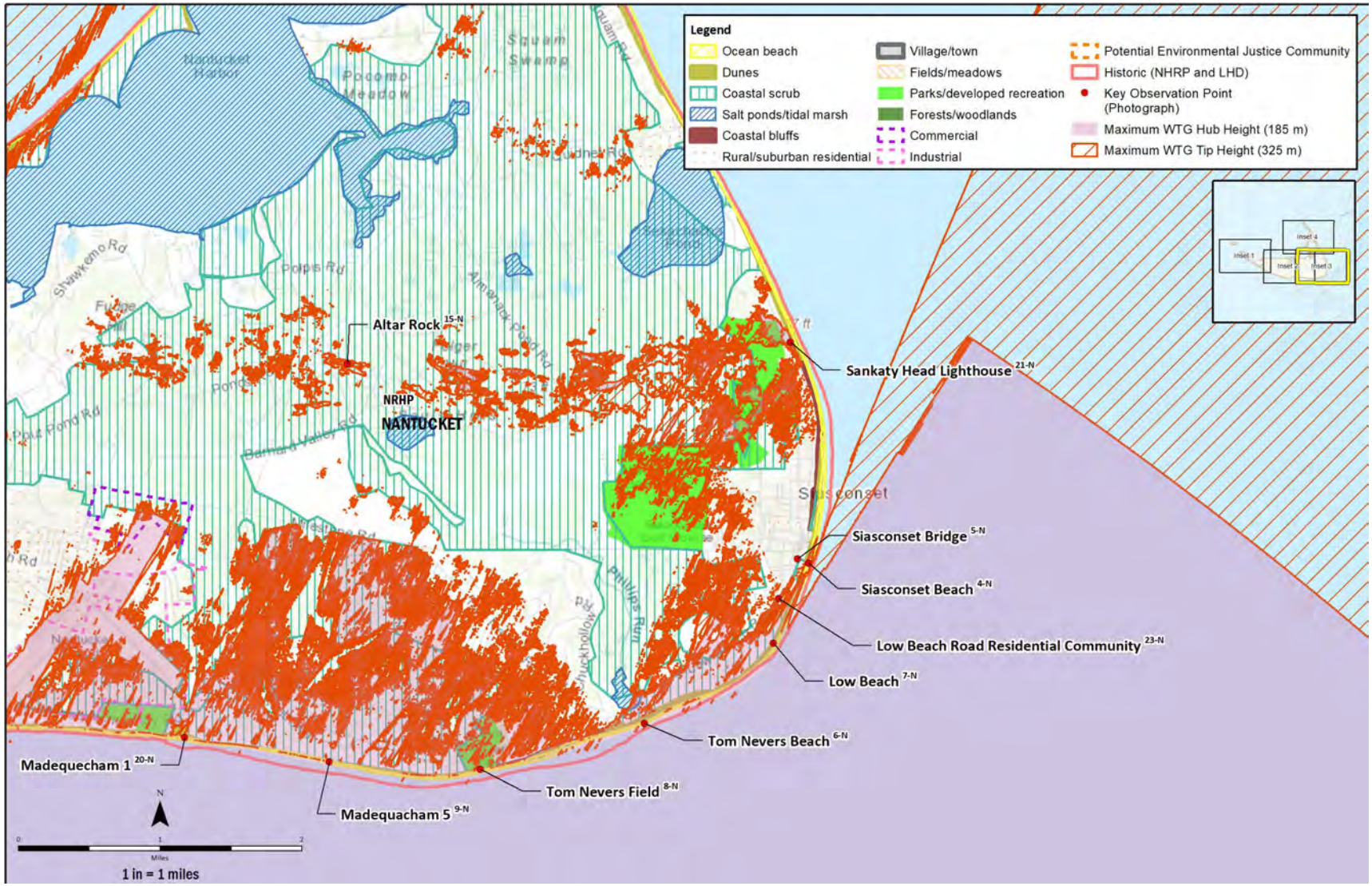
Sources: ESRI, 2020; Nantucket County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

WTG Blade Tip Height DSM is shown with red diagonal hatching with a red outline; this appears as diagonal hatching (over the water) and in the landward extents onshore it appears as red shading at this map scale because of the density of individual polygons.

DSM viewshed is depicted as provided by ICF.

Figure 5-13. Landscape/Seascape and Ocean Character Types Nantucket with Blade Tip and Hub Height DSM Viewsheds: Inset 2

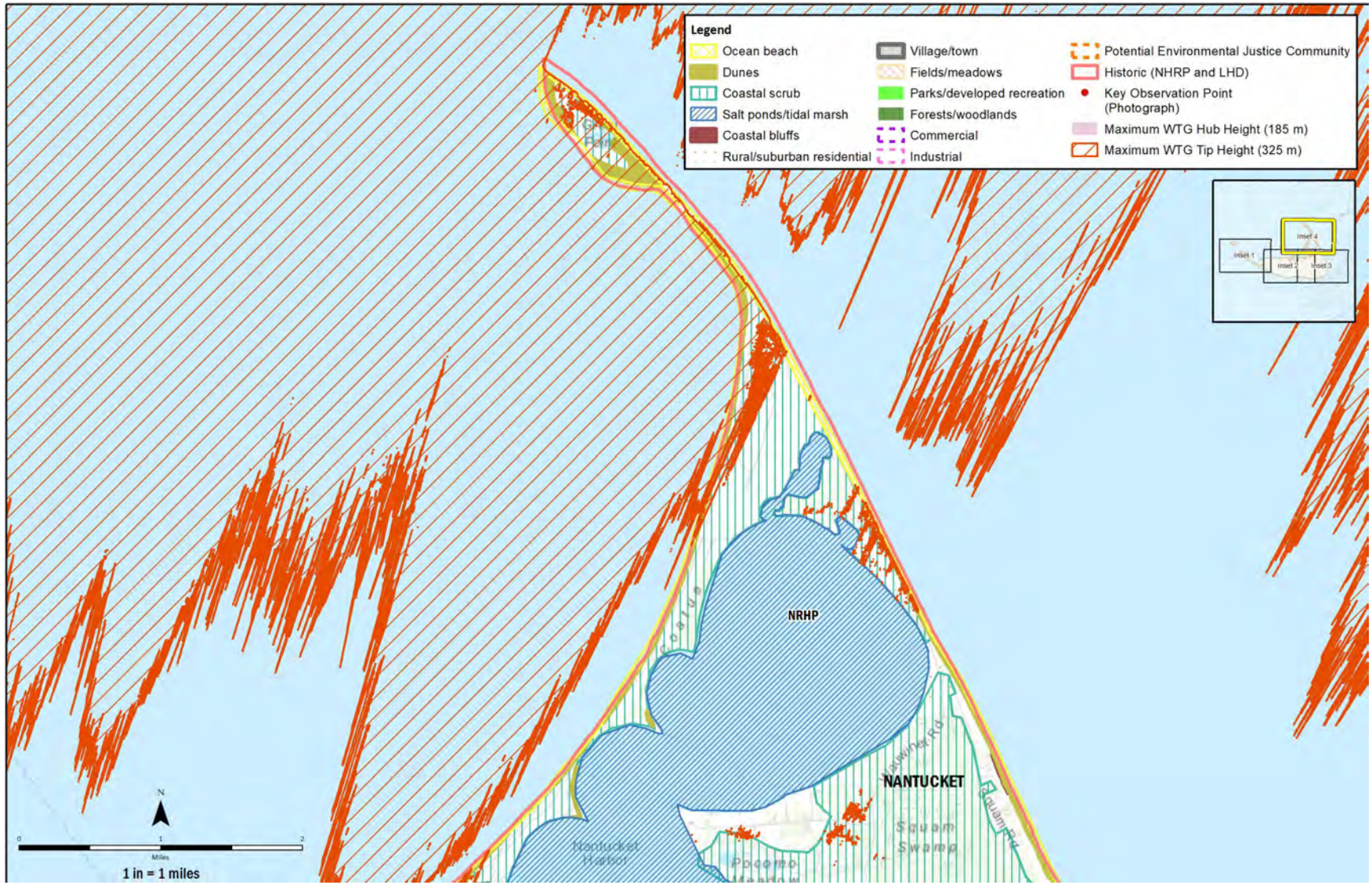


Sources: ESRI, 2020; Nantucket County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

WTG Blade Tip Height DSM is shown with red diagonal hatching with a red outline; this appears as diagonal hatching (over the water) and in the landward extents onshore it appears as red shading at this map scale because of the density of individual polygons. DSM viewshed is depicted as provided by ICF.

Figure 5-14. Landscape/Seascape and Ocean Character Types Nantucket with Blade Tip and Hub Height DSM Viewsheds: Inset 3



Sources: ESRI, 2020; Nantucket County GIS, 2021, MassGIS, 2021; MACRIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties.

WTG Blade Tip Height DSM is shown with red diagonal hatching with a red outline; this appears as diagonal hatching (over the water) and in the landward extents onshore it appears as red shading at this map scale because of the density of individual polygons. DSM viewshed is depicted as provided by ICF.

Figure 5-15. Landscape/Seascape and Ocean Character Types Nantucket with Blade Tip and Hub Height DSM Viewsheds: Inset 4

Table 5-5. Area of Landscape/Seascape and Ocean Character Types within the Offshore Project Area Viewsheds

Landcover / Open Ocean	Acres (hectares) of SLCAs	Acres (hectares) of SLCAs within APVI	Percentage of SLCAs in APVI
Martha's Vineyard Viewshed			
Coastal Bluffs	100.92 (40.77)	31.81 (12.87)	31.52
Coastal Scrub	5,873.36 (2,372.84)	1,534.77 (621.10)	26.13
Commercial	278.91 (112.68)	0.41 (0.17)	0.15
Dunes	396.73 (160.28)	183.78 (74.37)	46.32
Environmental Justice Community	8,246.23 (3,331.48)	1315.42 (532.33)	15.95
Fields/Meadows	22.6 (9.13)	19.47 (7.88)	86.15
Forests/Woodlands	59,350.69 (23,977.68)	4,237.71 (1,714.94)	7.14
Historic	866.03 (349.88)	4.02 (1.63)	0.46
Light Industrial	866.59 (350.1)	1.56 (0.63)	0.18
Ocean Beach	469.48 (189.99)	469.48 (189.99)	64.20
Rural/Suburban Residential	56,058.02 (22,647.44)	5,461.30 (2,210.11)	9.74
Ponds/Tidal Marsh	10,221.75 (4,129.59)	3,340.65 (1,351.91)	32.68
Village/Town	2,254.34 (910.75)	2.85 (1.16)	0.13
Nantucket Viewshed			
Coastal Bluffs	38.14 (15.41)	5.35 (2.17)	14.03
Coastal Scrub	17,529.77 (7,082.03)	4,331.89 (1,753.05)	24.71
Commercial	158.77 (64.14)	23.55 (9.53)	14.83
Dunes	500.4 (202.16)	363.07 (146.93)	72.56
Environmental Justice Community	2,287.93 (924.32)	236.79 (95.83)	10.35
Fields/Meadows	208.8 (84.35)	97.64 (39.52)	46.76
Forests/Woodlands	371.52 (150.1)	6.03 (2.44)	1.62
Historic	36,160.62 (14,608.89)	7,208.19 (2,917.05)	19.93
Light Industrial	631.99 (255.32)	458.88 (185.70)	72.61
Ocean Beach	677.76 (273.81)	393.93 (159.42)	58.12
Parks/Developed Recreation	1,157.75 (467.73)	335.89 (135.93)	29.01
Rural/Suburban Residential	3,800.08 (1,535.23)	867.69 (351.14)	22.83
Ponds/Tidal Marsh	5,620.06 (2,270.51)	104.94 (42.47)	1.87
Village/Town	1,694.94 (684.76)	9.73 (3.94)	0.57
Ocean Character Type			
Open Ocean	5,200,000 (2,100,000)	5,200,000 (2,100,000)	-

Notes:
The percentage of open ocean and the ocean character type was not calculated. The APVI is not limited on the open ocean by any topographic relief, vegetation or structures. Therefore, all open ocean within the 43-mile (69.2 km) limit of the viewshed analysis is in the APVI.

5.2.1.4 Environmental Justice Communities

Environmental Justice (EJ) communities on Martha's Vineyard and Nantucket (see Figure 5-5 to Figure 5-14) are within the APVI. These areas have been mapped by the Massachusetts Bureau of Geographic Information based upon the 2021 Climate Act demographic criteria using data compiled from the U.S. Census Bureau's (USCB's) 2015-2019 American Community Survey 5-Year Estimates (MassGIS, 2021). Areas are identified as EJ Population if a neighborhood meets one or more of the following:

- The annual median household income is not more than 65 percent of the statewide annual median household income;
- Minorities comprise 40 percent or more of the population;
- Twenty-five percent or more of households lack English language proficiency; and/or
- Minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

These areas are identified using data at the census block group level, which is generally defined to contain between 600 to 3,000 people and 240 to 1,200 housing units.

Six EJ focus areas were identified on Martha's Vineyard. Two of these groups, located in Tisbury, meet the first criteria for an EJ community, with an income that is 60 percent less than the statewide annual median household income. The neighboring town of Oak Bluff has a similar EJ community with 56 percent less than the statewide annual median household income. Because these communities are located in the northern portion of the island in an area with relatively low elevation, these neighborhoods are mostly outside of the APVI. The three remaining groups meet the second criterion for EJ populations with minority populations making up 40-62 percent of the total population. The EJ community located in the southwest portion of the island in Aquinnah is largely made up of the Wampanoag Tribe of Gay Head. Approximately 300 of the 901 remaining tribal members live in this area (Wampanoag, 2021). A significant portion of this area is within the APVI as the EJ community located in Edgartown (see Figure 5-30). Overall, 33.5 percent of the areas designated as EJ Communities are within the APVI (see Table 5-5).

In Nantucket one EJ focus area was identified west in the western portion of the island (see Figure 5-12 to Figure 5-14). This area meets the second criteria for an EJ community where 42 percent of the population is a minority. According to data provided by the United States Census, a majority of people in this block group identified as White (58.1 percent) and a smaller, yet still significant portion of the community identified as Black (26.6 percent) or two or more races (15.3 percent), compared to Nantucket as a whole, reporting 87.3 percent of the population identifying as White, 7.8 percent of the population identifying as Black, and 3.1 percent of the population identifying as two or more races. As shown in Table 5-5, 69 percent of this area is within the APVI.

Figure 5-16. Open Ocean – Atlantic Ocean View from Lady's Beach Nantucket

Open ocean (Figure 5-16) is the most extensive and dominant character type in the study area. It includes the open Atlantic Ocean south, west, and east of the Islands, as well as the more enclosed waters of Nantucket Sound, Vineyard Sound, and Buzzards Bay. The dominant visual impression is the broad, flat expanse of water, the blue or gray color reflecting the sky, the smooth or choppy texture of the water surface, and the distant horizon line. Scenic integrity is high, with few or no existing visual intrusions. Numerous commercial fishing and recreational boats are seasonally found in the waters of the study area, and views of the Project can be from any point on the ocean surface on the south and west sides of the islands. Conditions range from flat water to choppy to rolling swells. Ferry boats are limited to inland waters on the side of the islands away from the Offshore Project Area. The open ocean character type is represented in all Offshore KOPs (Table 5-6 and Table 5-7).

Figure 5-17. Ocean Beach – Madaket Nantucket

Cape Cod and the islands are famous for their long, sandy beaches (Figure 5-17), particularly along the south-facing shorelines. These beaches are strong attractions for recreational users, including year-round residents, seasonal residents, and tourists. In summer, beaches can be quite crowded, while they can be nearly empty off season. The beaches are strongly visually connected to the inland dunes that abut them, and to the open ocean near shore extending to the horizon line. Views to the ocean are uninterrupted but for other people (and their gear) on the beach. Large stretches of beach afford little or no views of buildings or development, while some areas do have views to residential buildings. Beaches have a slight curvilinear form, with strong lines where they meet the tidal edge along the open water, cliffs, or the transition to the vegetated dunes. The color is tan to gray, and the texture grainy. Inland views are to dunes, scrub vegetation, and in places tidal basins, marshes, and coastal forest. Most of the area beaches are sandy, though some rocky beaches and outcrops exist on Martha's Vineyard. People come to the beach for recreational uses and personal experiences. Recreational uses include sunbathing, playing, walking, wading, or swimming, beach combing, fishing, surfing, and related activities. The beach setting also provides opportunities to experience fresh air and ocean breezes, the texture of the sand, and the feeling of the cool water and the calming sounds of the ocean tide. The ocean beach character type is represented by nine KOPs on Martha's Vineyard (Table 5-6) and nineteen KOPs on Nantucket (Table 5-7).

Figure 5-18. Dunes – Long Point Beach Martha's Vineyard.

Open and grassy low-stature Dunes (Figure 5-18) often border beaches, particularly on the south-facing shorelines. These dunes rise to approximately 20 ft (6.1 m) at their highest point. Much of the dune area is partially covered by grasses and native shrubs and traversed by paths that link the beach to homes, towns, and roads in the interior. The dunes are often tall and vegetated enough to block ocean views from the inland side but afford sweeping views of the ocean at their crests. They are visually linked to the interior scrub or short forest, as well as to the beaches and open ocean. Dunes have rounded forms, with a tan to green to seasonal vegetation color, and a fine patchy texture. Lines can be weak or strong where the dunes meet ocean beaches. Scenic integrity is of high ecological value, providing natural character with few visual intrusions other than sporadic residential buildings and fencing. Strong linear road passages can be found cutting through the dunes, linking one beach access point to another. The dunes are used primarily by recreational users coming to and from the beaches and heighten the anticipation of seeing and reaching the shore. The coastal dunes character type is represented by five KOPs on Martha's Vineyard (Table 5-6) and seven KOPs on Nantucket (Table 5-7).

Figure 5-19. Coastal Scrub – Long Point Preserve Martha's Vineyard.

Behind the dunes, inland from the beaches, is an extensive Coastal Scrub brush vegetation matrix of stunted pine, oak, shrubs, and grassland (Figure 5-19). The terrain is gentle, flat to slightly rolling, with low hills and shallow depressions. The vegetation can be dense and difficult to traverse where there are no defined trails or roads. Views to the open ocean are often blocked or obscured, except for places where the terrain is high, and the woody vegetation is interrupted by grassland. Coastal scrub areas have coarse to fine texture, changing seasonal color, indistinct lines, and a rolling form. Scenic integrity is very high and can include historic buildings, fencing, paths, and other compatible cultural features. The coastal scrub character type is represented by four KOPs on Martha's Vineyard (Table 5-6) and four KOPs on Nantucket (Table 5-7).

Figure 5-20. Ponds/Tidal Marsh – Long Pond Nantucket

Ponds (mostly salt ponds) and Tidal Marshes (Figure 5-20) are numerous on the islands and Cape Cod. They are spaced behind the beaches and dunes, mostly closed off from the ocean except during extreme high-water events. Some are connected by tidal channels. They are shallow, brackish, and fringed by salt-tolerant grasses and shrubs. They vary greatly in size. Most have shallow water, and those with channels that connect to the ocean have fluctuating water levels depending on the tide. Some have exposed mud flats. Wildlife can be abundant, attracting residents, clam diggers, recreational scallop harvesters, bird watchers, and recreational boats that take advantage of the quiet, sheltered waters. Colors vary seasonally and even daily. Texture tends to be smooth with coarser edges. Forms are flat, or low and irregular. Lines can be strong, with open water giving way to mudflats sandy beach edges, to grasses, then to shrubs or trees based on slight elevation changes. Scenic integrity varies depending on the amount and type of development that often fringes these areas. Views may be open to the ocean or screened depending on adjacent landforms and vegetation height. Housing is often visible on the shorelines of the open water tidal ponds. The Pond/Tidal Marsh character type is represented by one KOP on Martha's Vineyard (Table 5-6) and three KOPs on Nantucket (Table 5-7).

Figure 5-21. Coastal Bluffs - Aquinnah Head, Martha's Vineyard

Coastal Bluffs (Figure 5-21) are primarily found along the shores of Martha's Vineyard and Nantucket at Siasconset, Gay Head, Aquinnah, Oak Bluffs, Wasque Point, and East Chop. The bluffs rise steeply to 100 ft (30 m) or more. They are strongly connected to the open sea, allowing far vistas from high viewpoints. Experiencing the views from them is a popular activity for residents and visitors alike. Forms are irregular, with steep, eroded side slopes giving way to flat tops and bases. Color is highly contrasting, with light colored, sandy barrens intermingling with green grasses and shrubs. Textures range from very smooth to rough, depending on underlying geology and exposure. Lines can be strong, with horizontal lines at the top and bottom, sharp descending lines along the slopes. Scenic integrity is very high, and can include historic buildings, lighthouses, and the shingled restaurant perched on Gay Head. The coastal bluff character type is represented by five KOPs on Martha's Vineyard (Table 5-6) and two KOPs on Nantucket (Table 5-7).

Figure 5-22. Rural/Suburban Residential Area in Nantucket

Residential development is a common character type near the shores of the islands and Cape (Figure 5-22). There is a range of scale and density, from small cottages to mansions. Some areas are developed to town-type densities, while others are more spread out and rural, such as the south shores of Martha's Vineyard and Nantucket. Vegetation is often patchy low scrub and woodland, with open grass areas that facilitate views of the ocean, dunes, and marshes. Building styles range from historic to neo-traditional to contemporary, and sport traditional features such as shingled exteriors, steep-sloping roofs, and widow walks. Privet hedges and picket or rail fences provide a homey character to some neighborhoods. Terrain is typically flat to rolling. Colors include the gray shingled exterior of homes and outbuildings, green grass, and seasonal foliage of trees and shrubs. Linear horizontal and vertical features are visually evident within the built setting and influence the aesthetic within the constructed setting. Cobblestone roads, gravel and paved driveways, low wood picket fences, vegetated hedge rows used for privacy and delineation of property lines and property boundaries, and utility lines influence edge conditions and direct the viewer attention. Forms are irregular. Textures range from smooth (roofs, lawns) to rough (tree and shrub patches). Visual integrity ranges from high in historic areas, to lower where development is not compatible with the less developed surroundings. Large trees are rare on Nantucket, but more common on Martha's Vineyard. The residential area character type is represented by two KOPs on Nantucket (Table 5-7).

Figure 5-23. Village/Town, Nantucket Village. Nantucket

Villages and Towns such as Nantucket (Figure 5-23), Falmouth, Woods Hole, Oak Bluffs, Edgartown, and Vineyard Haven are denser and more built up, with multiple use areas, and residential communities. These are village settings, some with highly-valued historic features and character. Architecture varies in style and age, but buildings typically do not exceed two floors. The landscape is typically manicured. Colors are dominated by the gray, white, red, and orange of the buildings, brick sidewalks, and cobblestone streets. Lines are strong, with streets, trees, and buildings reinforcing each other. Texture is rich and grainy. Forms are rectilinear and angular, shaped by the buildings and their roof lines. Visual integrity is mostly very high as these areas are dominated by historic buildings, or compatible ones. The villages/towns function as ports, either pleasure boat or commercial, and so they have strong linkages to the sea. However, views out from the villages to the open ocean are rare or non-existent. The village/town character type is represented by four KOPs on Martha's Vineyard (Table 5-6) and three KOPs on Nantucket (Table 5-7).

Figure 5-24. Fields/Meadows, Sanford Farm at Historic Barn Overlook, NCF

Fields and Meadows (Figure 5-24) are limited in extent. Work has gone into preserving remnant farms through conservation easements or land purchases. Remaining farms often have a historic character and are in the interior of the islands and Cape Cod. Distant views to the open ocean are available in a few locations, where the terrain is relatively high. The land is kept open, including Bartlett's Farm on Nantucket and the Allen Farm on Martha's Vineyard. The Field/Meadow character type is represented by one KOP on Martha's Vineyard (Table 5-6) and two KOPs on Nantucket (Table 5-7).

Figure 5-25. Forests/Woodlands, Tisbury Great Pond Martha's Vineyard

Forests and Woodlands (Figure 5-25) were once more common on the islands and are recovering from past disturbances. They are found mostly in the interior of the islands, particularly on Martha's Vineyard (Manuel Collins State Forest) and on Cape Cod. Topography is rolling. Views are enclosed, restricted by forest vegetation in most areas. Forests are low- to mid-stature, mixed conifer and hardwood, typically with trees no more than 50 ft (15.2 m) tall, often combined with, or integrated with, other character types, including residential land, fields, and coastal scrub. The forest/woodland character type is represented by two KOPs on Martha's Vineyard (Table 5-6).

Figure 5-26. Light Industrial, Nantucket Memorial Airport

Industrial areas (Figure 5-26) are limited on Nantucket and Martha's Vineyard. Both islands put effort in limiting the build out of industrial development. Industrial areas are mainly located around the airports and town centers (Figure 5-7, Figure 5-8, and Figure 5-13).

Figure 5-27. Commercial, Nantucket Meat and Fish Market

Commercial areas (Figure 5-27) are limited on Nantucket and Martha's Vineyard. As with the Light Industrial landscape units, commercial facilities are mainly within the interior portions of the islands, some on the outskirts of the airport or incorporated within the town centers. KOPs were evaluated on Martha's Vineyard and Nantucket within commercial areas for potential visibility, but in most cases, the commercial structures were outside of the viewshed or screened visibility towards the Project.

5.2.2 Receptors/Viewers - Offshore

Viewers are the people who ultimately will see the Project and experience its effects. Other receptors may include locations of historical importance. The viewer groups and context associated with the Offshore Project Area are described in the sections that follow. Viewer groups are identified for each KOP and are summarized for each in Table 5-6 and Table 5-7.

5.2.2.1 Offshore Viewer Groups and Contexts

Viewers associated within the viewing area of the Project include the communities of Martha's Vineyard and Nantucket, and are made up of recreational users, tourists, year-round and seasonal residents, and workers. Viewers engage in many aspects of passive and active recreation including hiking, cycling, running, beach recreation, surfing, swimming, and experiencing scenic panoramic views of the open ocean. On clear days, views extend to the horizon with sporadic glimpses of recreational and commercial vessels in the ocean (Figure 5-28).

The landscape character within the APVI varies from natural to cultural, depending on viewer position, the type of activity the viewer is engaged in, and the level of exposure to the Project. This variability in character and the quality of the setting for where the viewer is seeing the Project is a defining attribute of the landscape/seascape and open ocean setting.

Receptors are the people who ultimately will see the Project and experience its effects. The majority of viewer receptors were determined to be sensitive to visual changes from KOPs on Nantucket, Martha's Vineyard, and the other islands (Table 5-6 and Table 5-7; Attachment 2). This assessment is based on public input on previous projects in the area, discussions with key stakeholders, and the field-based evaluation of viewer susceptibility at KOPs. The KOPs were selected to represent the following viewer groups located on the islands of Martha's Vineyard and Nantucket:

Figure 5-28. Residents and Tourists Visiting Madaket Beach at Dusk for the Sunset

- Year-round residents;
- Seasonal residents;
- Scenery-oriented tourists;
- Recreation-oriented tourists;
- Tourism-related businesses;
- Recreational mariners; and
- Commercial mariners.

5.2.2.1.1 Year-Round Residents

Martha's Vineyard has a population of approximately 17,000 year-round residents. Nantucket has a population of approximately 11,000 year-round residents. Residents live either in one of the small towns that characterize the area, or outside the towns in rural to semi-rural settings. It is assumed that all or nearly all residents will spend time at places where Project features will be visible, including beaches, parks, conserved areas, trails, and/or historic sites.

5.2.2.1.2 Visitors and Tourism

The islands of Nantucket and Martha's Vineyard are a major attraction and contribute to the growing population in the summer months. In addition to the year-round residents, summer visitors and seasonal residents bring the population to more than 200,000 on Martha's Vineyard and more than 50,000 on Nantucket. According to the Martha's Vineyard Chamber of Commerce, approximately 55 percent of visitors come for vacation, 25 percent come to visit family and friends, and 20 percent come for an event (wedding, conference, etc.). Martha's Vineyard has approximately 65,000 seasonal homeowners (Martha's Vineyard Chamber of Commerce, 2020).

The height of the tourist season is July through August, during the traditional summer vacation season. Ferries, hotels, rentals, and beaches are busy during these months. According to the Nantucket Chamber of Commerce, tourist-related businesses make most of their annual income in this short period. Visitors come for many reasons: ocean scenery, historic buildings, towns and sites, active recreation, nature, or an escape from summer heat. It can be presumed that scenery, including the beaches and ocean, is an important factor. Active recreational users, such as surfers, boaters, water skiers, and swimmers, may have less interest in viewing scenery while they are recreating, but the setting may contribute to why they are drawn to the area. It is assumed that many, if not most, tourists will visit places from which the Project features will be visible, particularly ocean beaches.

According to the 2019 U.S. Census Bureau, Martha's Vineyard has 1,203 total employer establishments and Nantucket has 1,092. Approximately 35 of the businesses on Martha's Vineyard are at least 75 percent dependent on tourism (Martha's Vineyard Commission, 2006). Offshore wind development may contribute to the tourist economy within the Project Area. According to the article *Sustainability and tourism: the effect of the United States first offshore wind farm on the vacation rental market* (Carr-Harris and Lang, 2019), tourism on Block Island has increased by 19 percent since the installation and construction of offshore wind development.

5.2.2.2 Historical Importance

The historical value of properties around Cape Cod, Nantucket, and Martha's Vineyard are important to take into consideration for both the local communities and BOEM. Section 106 of the NHPA of 1966 (54 U.S. Code Section 300308) defines historic properties as "any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register, including artifacts, records, and material remains relating to the district, site, building, structure, or object." "Time Depth" describes visible links to cultural heritage, human influence, and historic character (LI and IEMA 2013). Some landscapes and seascapes within and around the Project Area contain many layers of history. Historically-valued properties, particularly those that are listed in or eligible for listing in the National Register of Historic Places (NRHP) were identified in COP Appendix S, Analysis of Visual Effects to Historic Properties (AVEHP) and researched in order to understand the value that these properties hold and the role they play in defining an area.

Within the Area of Potential Effect (APE) defined in the AVEHP report (COP Appendix S, Analysis of Visual Effects on Historic Properties), there are 88 previously documented historic properties in the offshore APE. Of these, four historic properties are on Nantucket and 82 historic properties are on Martha's Vineyard. The entire island of Nantucket is a National Historic Landmark (NHL) district, but the island also contains two light stations and one individual resource that are considered NRHP historic properties. Martha's Vineyard contains six historic districts, six individual resources, four light stations, and one Traditional Cultural Property (TCP; Chappaquiddick Island). Two other TCPs are present in the offshore APE: Nantucket Sound comprises the waters between both islands and mainland Cape Cod and Vineyard Sound and Moshup's Bridge TCP is located on the northwestern side of Martha's Vineyard, extending from Wood's Hole to Cuttyhunk Island. An example of an historic property on Nantucket is the Sankaty Head Lighthouse located on the east side of Nantucket. It is significant for its association with maritime navigation and its architecture. The Sankaty Head Lighthouse fell within the viewshed, and the site was visited in the field and determined to have a potential view of the Offshore Project Area. On Martha's Vineyard, Chappaquiddick Island was inhabited by a branch of the Wampanoag Indian Tribe into the nineteenth century and members are currently settled on the island's interior land. This island is in the viewshed of offshore Project components and was evaluated in the field for potential to view the Project.

5.2.3 Selection of Offshore KOPs

KOPs represent both common and sensitive views that fall within the APVI as represented in the Viewshed Analysis. KOPs are used to assess potential changes to landscape/seascape and ocean character that could result from the Project and serve as representative locations from which to assess components of visual sensitivity (susceptibility and value). The selection of KOPs includes viewer distance to nearest WTGs (Figure 5-29).

The KOP list includes a broad selection of view types. KOPs represent views of the Project from multiple angles, distances, vantages, and viewers (residents, tourists, and economic interests). The KOPs evaluated in this analysis are provided in Table 5-6 (Martha's Vineyard) and Table 5-7 (Nantucket). Maps showing KOPs evaluated on Martha's Vineyard and Nantucket are shown in Figure 5-30 through Figure 5-34 and Figure 5-35 through Figure 5-38, respectively.

The KOPs were assessed for potential visibility to the SouthCoast Wind Lease Area. These were analyzed using the following criteria (the numbers following each criterion are referenced in Table 5-6 (Martha's Vineyard) and Table 5-7 (Nantucket).

- Distance to the nearest WTGs (1);
- View exposure (degree of foreground screening) (2);
- Level of use (3);
- Iconic views (4);
- Sensitivity of users to view change (5);
- How well the site may represent additional typical views (6);
- Historic or cultural importance of the site (7);
- Tourism importance of the site (8);
- Uniqueness (9);
- Type of viewpoint: stationary (i.e., designated point, historic site), area based (i.e., beach, town), and corridor (i.e., trail, scenic road) (10);
- Topography: Include high points, low points, common elevations (11);
- Public interest (12); and
- Viewer experience (13).

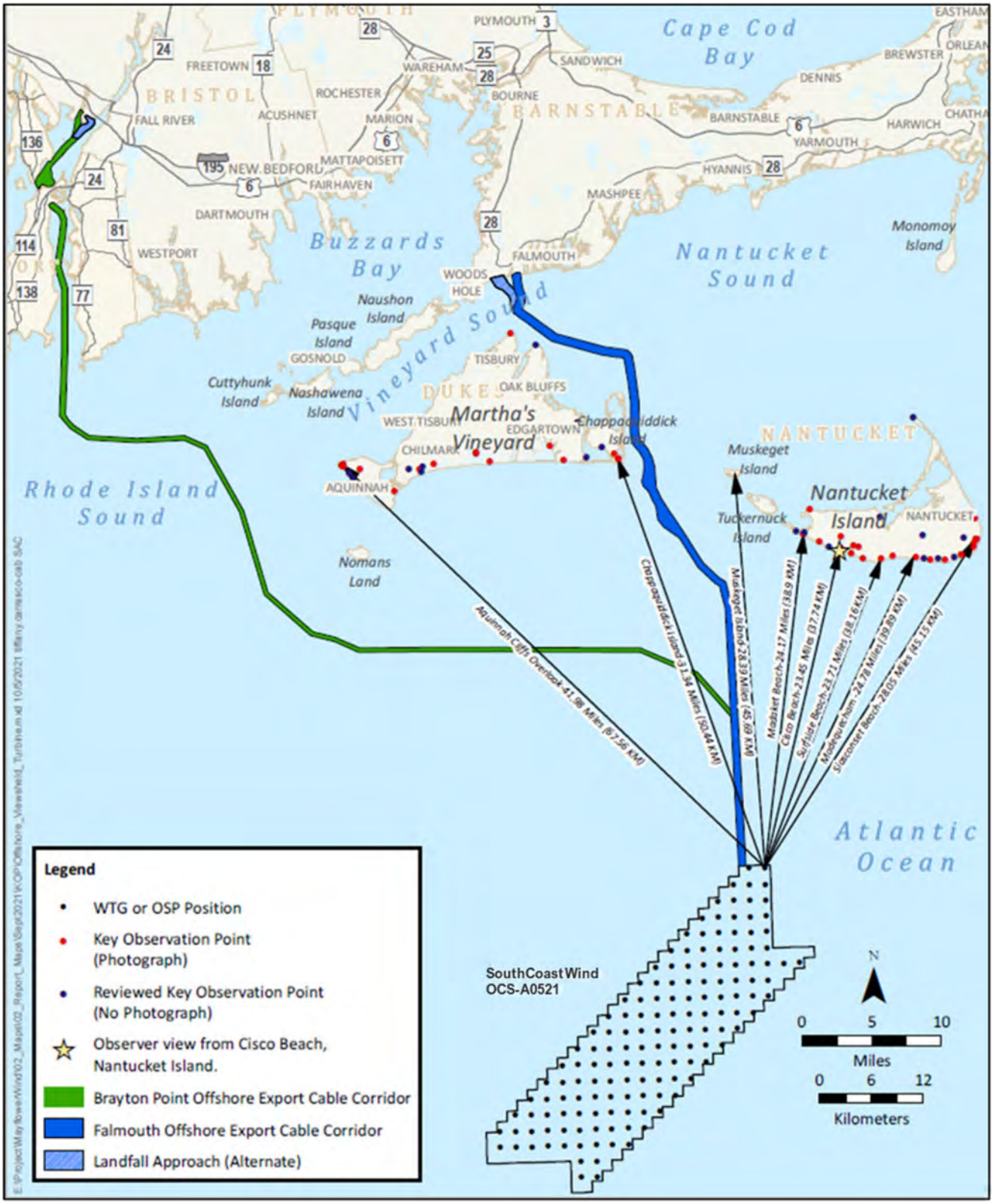


Figure 5-29. Offshore KOP Selection Overview Map

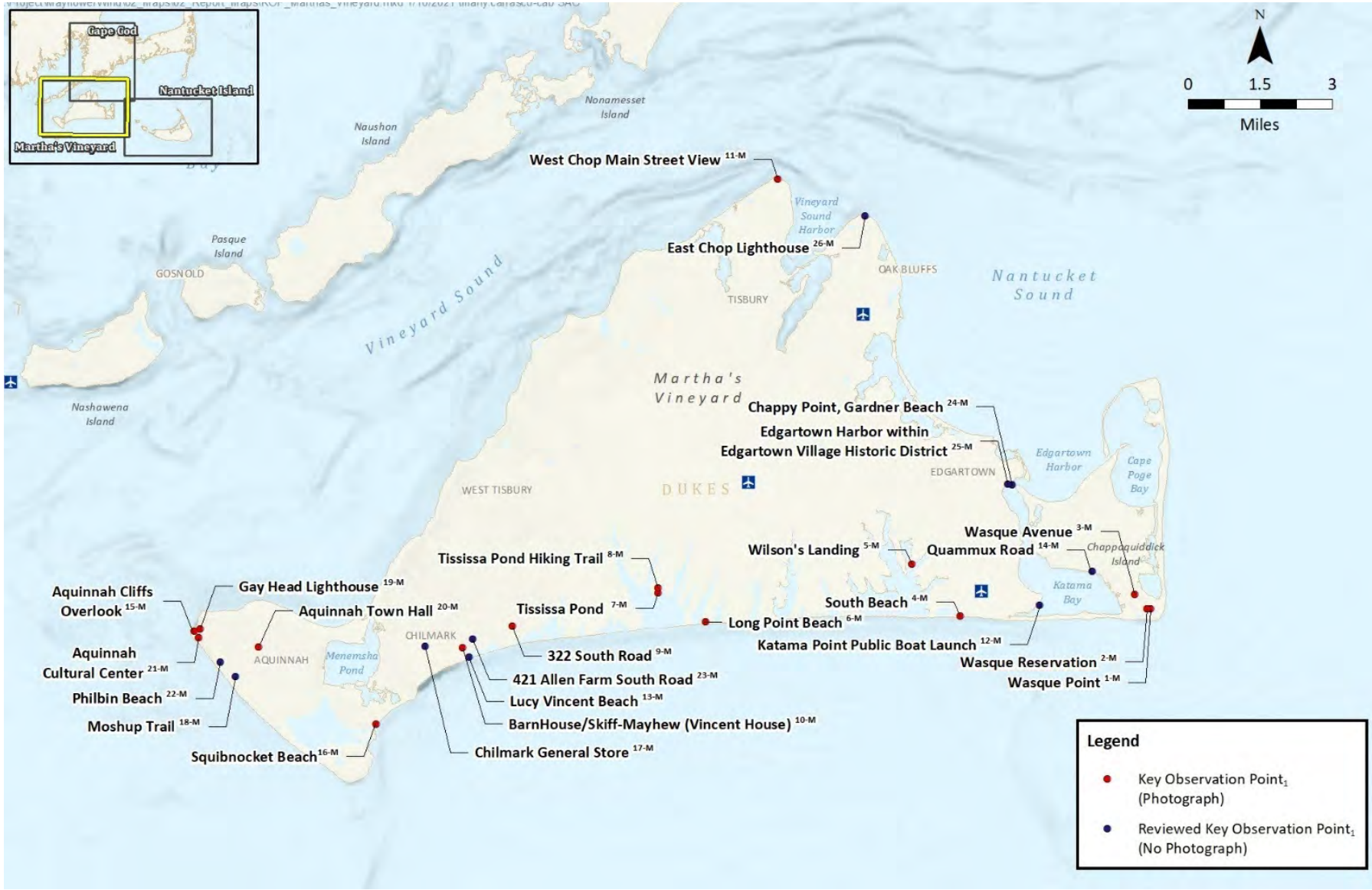
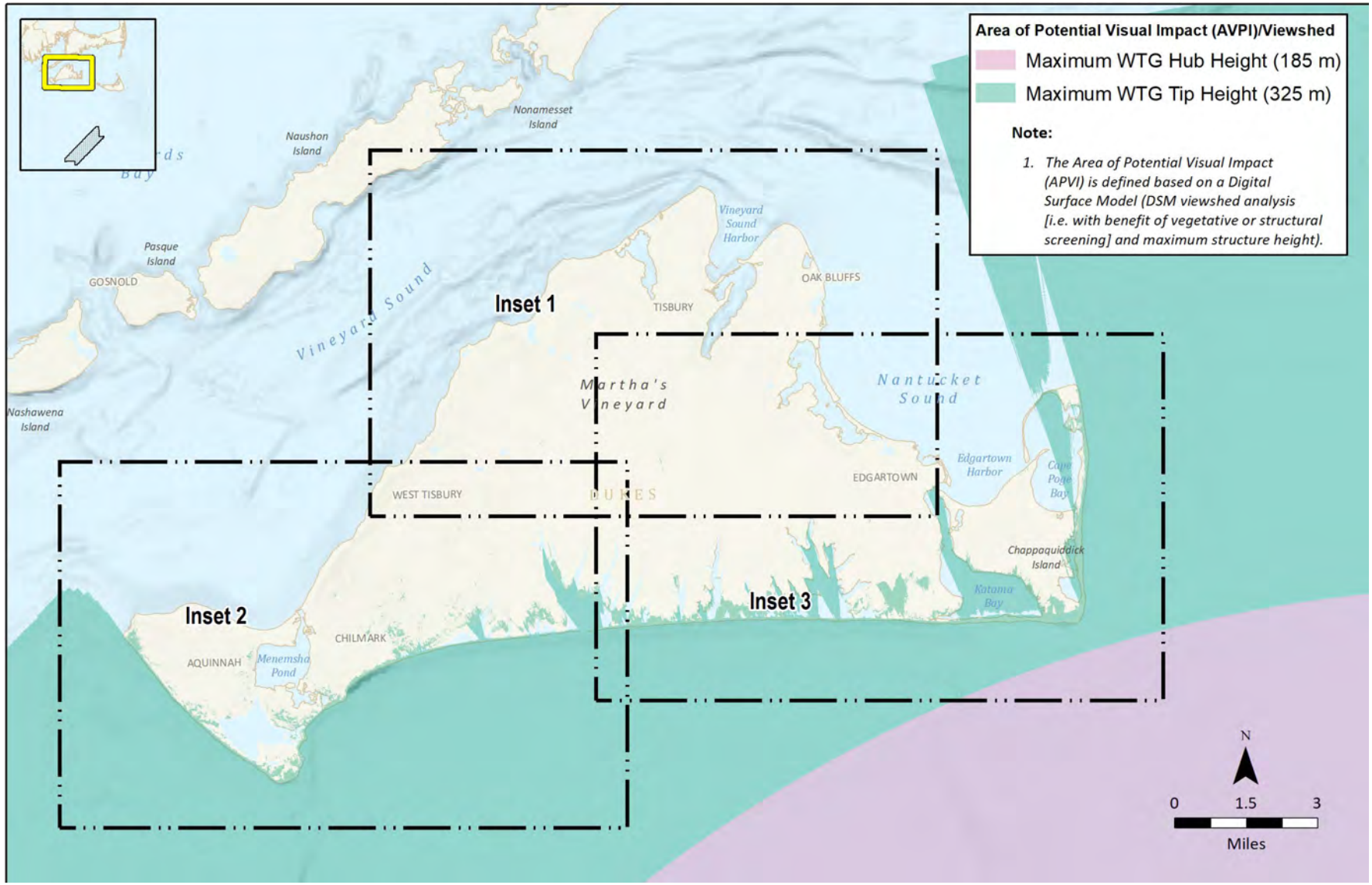
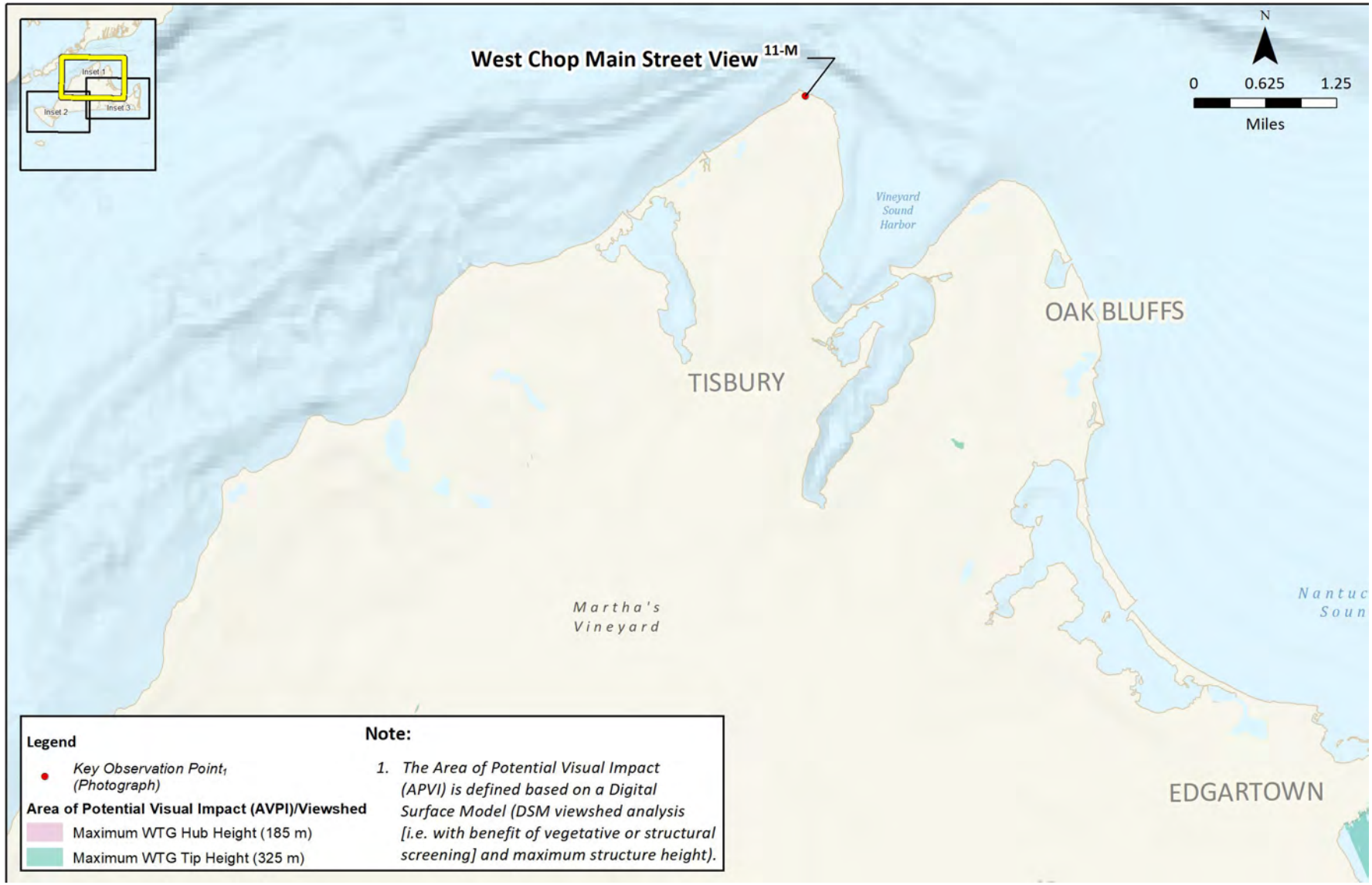


Figure 5-30. KOPs on Martha's Vineyard



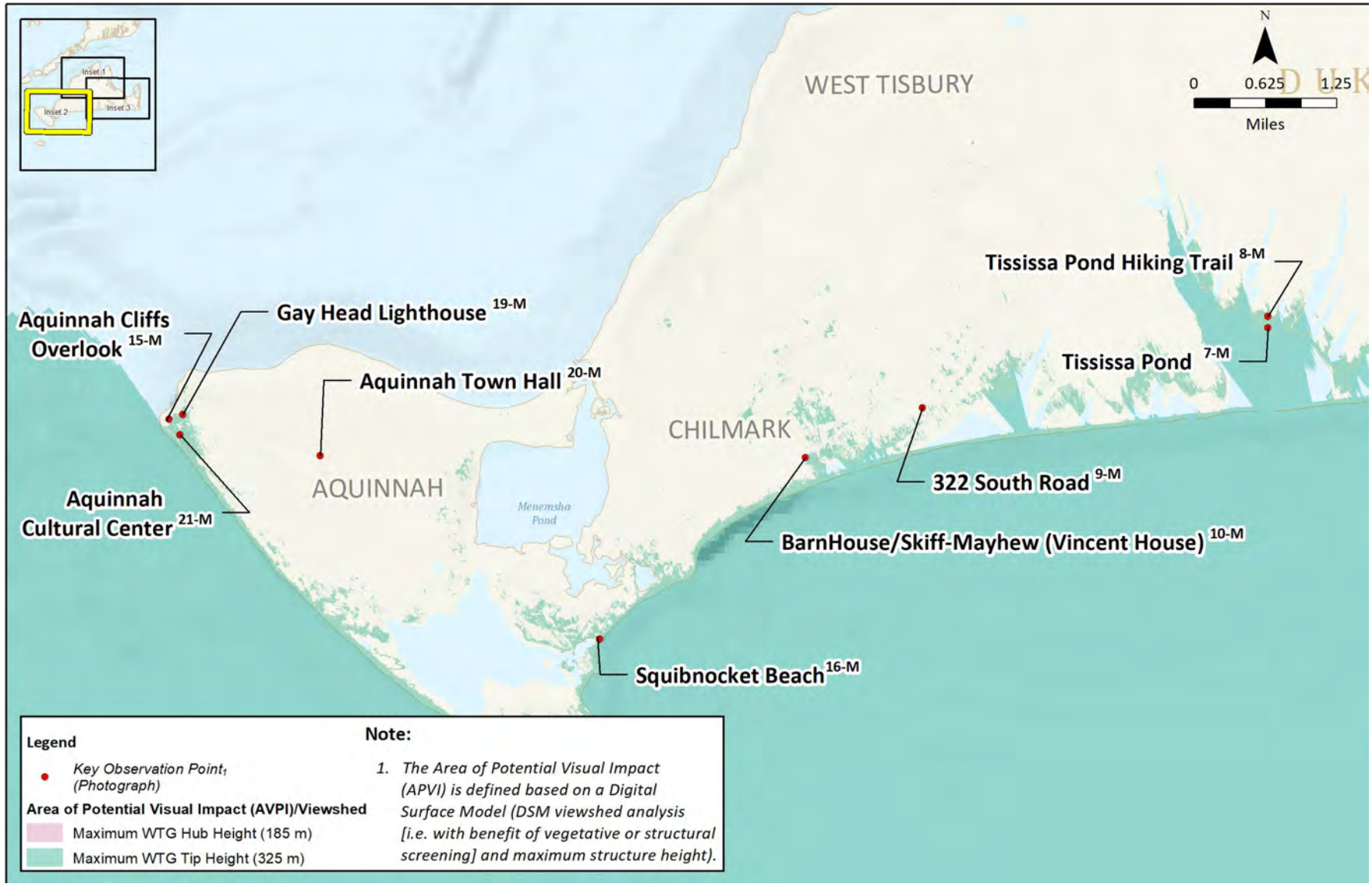
DSM viewshed is depicted as provided by ICF.

Figure 5-31. Martha's Vineyard KOP with Blade Tip and Hub Height DSM Viewsheds: Index Map



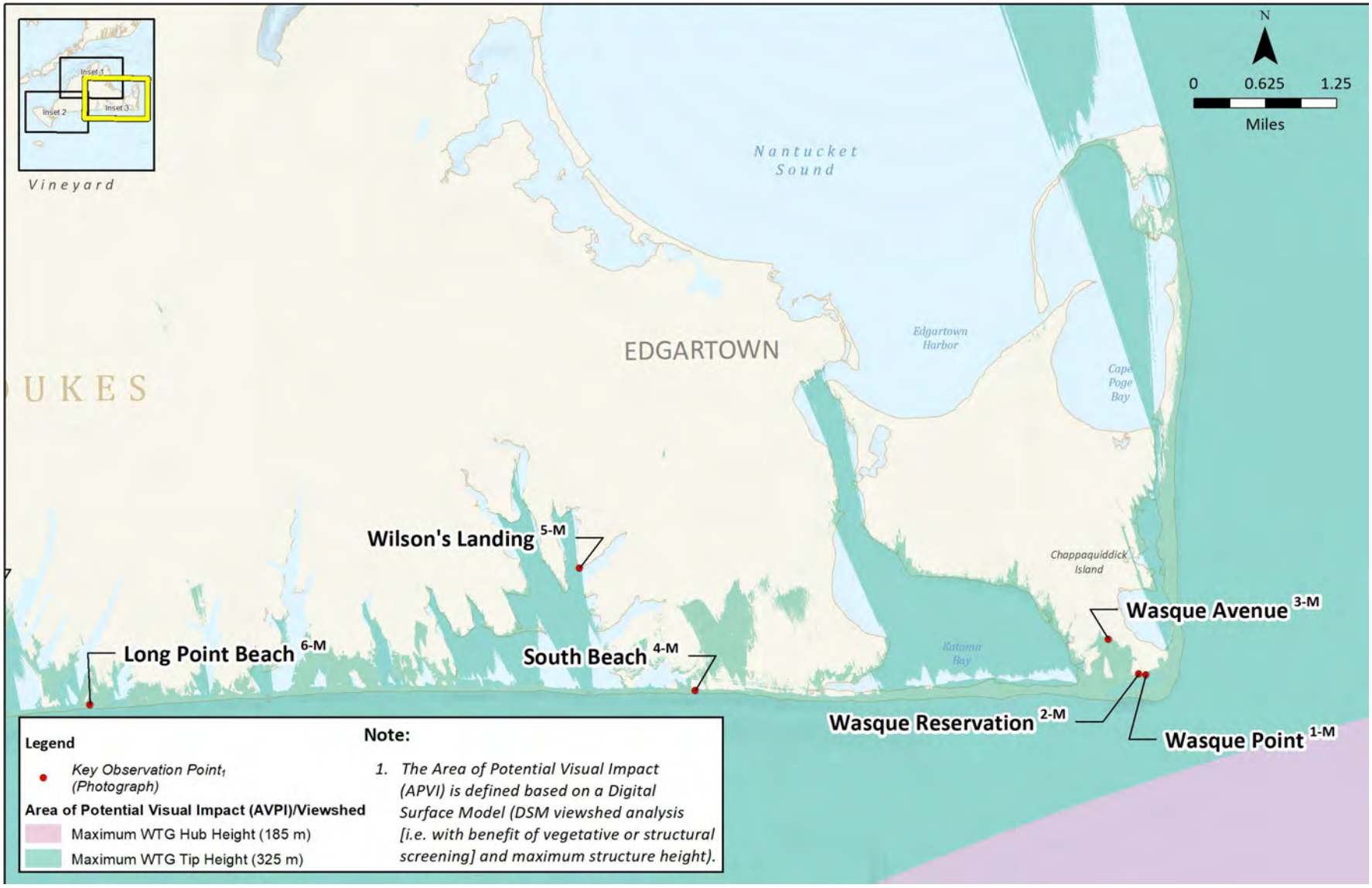
DSM viewshed is depicted as provided by ICF.

Figure 5-32. Martha's Vineyard KOP Map with Blade Tip and Hub Height DSM Viewsheds: Inset 1



DSM viewshed is depicted as provided by ICF.

Figure 5-33. Martha's Vineyard KOP Map with Blade Tip and Hub Height DSM Viewsheds: Inset 2



DSM viewshed is depicted as provided by ICF.

Figure 5-34. Martha's Vineyard KOP Map with Blade Tip and Hub Height DSM Viewsheds: Inset 3

Table 5-6. Martha's Vineyard KOPs for Offshore Project Components

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape and Ocean Character Type	Viewer Groups	Susceptibility to Change / Value of Seascape[1]	Visual Sensitivity [1]	Selection Factors[2]	Distance to Nearest WTGs (mi [km])	In / Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
1-MV	Wasque Point	Edgartown	Open Space Conservation; Chappaquiddick Island TCP/NRHP Historic Property	Ocean Beach, Costal Scrub, , Rural/Residential	Recreational Users, Residents, Tourists	High/ High	High	1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 13	31.19 (50.20)	In Viewshed	Not applicable	Yes
2-MV	Wasque Point Reservation	Edgartown	Open Space Conservation; Chappaquiddick Island TCP/NRHP Historic Property	Open Ocean, Ocean Beach, Coastal Scrub, Rural/Residential	Recreational Users, Residents, Tourists	High/ High	High	1, 2, 7, 8, 9, 10, 11, 13	31.21 (50.23)	Outside Viewshed	Not applicable	Yes
3-MV	Wasque Avenue	Edgartown	Public Road, Open Space Conservation; Chappaquiddick Island TCP/NRHP Historic Property	Coastal Scrub, Rural/Residential, Open Ocean, Ocean Beach	Recreational Users, Residents, Tourists	Medium/High	High	1, 7, 8, 10, 11	31.59 (50.84)	In Viewshed	Not applicable	Yes
4-MV	South Beach	Edgartown	Public Open Space	Open Ocean, Ocean Beach, Coastal Scrub, Rural/Residential	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 3, 5, 6, 8, 10, 11, 12, 13	32.49 (52.30)	In Viewshed	Not applicable	Yes
5-MV	Wilson's Landing	Edgartown	Public Open Space	Ocean Beach, Coastal Scrub	Residents, Tourists, Recreational Users			1, 9, 10, 11	34.08 (56.00)	In Viewshed	3-MV, 4-MV, 6-MV	Yes
6-MV	Long Point Beach	West Tisbury	Wildlife Refuge, Recreation	Open Ocean, Ocean Beach, Coastal Scrub, Ponds/Tidal Marsh	Residents, Recreational Users, Tourists	High/ High	High	1, 2, 3, 5, 6, 8, 10, 11, 12, 13	34.93 (56.21)	In Viewshed	Not applicable	Yes
7-MV	Tississa Pond (beach at end of hiking trail)	West Tisbury	Recreation	Coastal Scrub	Residents			1, 9, 10, 11	32.69 (52.60)	In Viewshed	3-MV, 4-MV, 9-MV	Yes
8-MV	Tississa Pond Hiking Trail	West Tisbury	Recreation	Ocean Beach	Residents			1, 9, 10, 11	36.37 (58.53)	Outside Viewshed	4-MV, 6-MV, 9-MV	Yes
9-MV	322 South Road	Chilmark	Residential	Open Ocean, Coastal Scrub, Forests/Woodland, Dunes, Tidal Marsh	Residents, Tourists	High/ High	High	1, 5, 6, 9, 10, 11	37.17 (59.83)	In Viewshed	Not applicable	Yes
10-MV	Barn House/ Skiff-Mayhew (Vincent House)	Chilmark	NRHP Historic Property	Coastal Scrub	Residents, Recreational Users			1, 7, 10, 12	37.88 (60.96)	In Viewshed	2-MV, 3-MV, 4-MV, 9-MV	Yes
16-MV	Squibnocket Beach	Aquinnah	Public Recreation	Open Ocean, Ocean Beach	Residents, Recreational Users	High/ High	High	1, 2, 3, 5, 6, 10, 11, 12, 13	37.94 (61.05)	In Viewshed	Not applicable	Yes
						Reviewed for Visibility						
12-MV	Katama Point Public Boat Launch	Edgartown	Public Recreation	Ocean Beach	Residents, Recreational Users			1, 10, 11, 12	32.18 (51.78)	In Viewshed	1-MV, 2-MV, 3-MV, 4-MV	No visibility Screened by existing vegetation, buildings and vegetated dune

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape and Ocean Character Type	Viewer Groups	Susceptibility to Change / Value of Seascape[1]	Visual Sensitivity [1]	Selection Factors[2]	Distance to Nearest WTGs (mi [km])	In / Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
13-MV	Lucy Vincent Beach	Chilmark	Recreation	Ocean Beach, Dunes	Residents, Recreational Users			1, 2, 3, 5, 11, 12, 13	37.65 (60.59)	In Viewshed	2-MV, 3-MV, 4-MV	Yes (no access due to private beach)
14-MV	Quammox Road	Edgartown	Public Road	Village/Town Center	Residents			1, 5, 10, 11	32.42 (52.17)	In Viewshed	Not applicable	No visibility due to enclosure within existing vegetation
15-MV	Aquinnah Cliffs Overlook	Aquinnah	National Natural Landmark	Coastal Bluffs	Tourists			3, 4, 7, 8, 9, 10, 11, 12, 13	41.98 (67.56)	Outside Viewshed	Not applicable	No
17-MV	Chilmark General Store	Chilmark	Town	Village/Town Center	Residents, Tourists			1, 3, 12	38.42 (52.17)	Outside Viewshed	Not applicable	No Screened by existing vegetation and residential structures
18-MV	Moshup Trail	Aquinnah	Public Recreation	Ocean Beach	Residents, Tourists			3, 8, 10, 11	40.72 (65.53)	Outside viewshed	1-MV, 2-MV, 3-MV	No visibility due to landform
19-MV	Gay Head Lighthouse	Aquinnah	NRHP Historic Property	Coastal Bluffs	Tourists			3, 4, 7, 8, 9, 10, 11, 12	41.93 (67.47)	Outside Viewshed	Not applicable	No (ground level); Yes (observation platform)
20-MV	Aquinnah Town Hall	Aquinnah	NRHP Historic Property; within Aquinnah Town Center Historic District	Coastal Bluffs	Residents, Tourists			7	40.81 (67.28)	Outside Viewshed	Not applicable	No Distance to Project is estimated to be below horizon line
21-MV	Aquinnah Cultural Center	Aquinnah	NRHP Historic Property	Coastal Bluffs	Tourists			3, 7, 8	41.82 (67.30)	Outside Viewshed	Not applicable	No distance to Project is estimated to be below the horizon line
22-MV	Philbin Beach	Aquinnah	Public Recreation	Ocean Beach	Residents, Tourists			3, 6, 10, 11, 12, 13	41.15 (67.14)	Outside Viewshed	1-MV, 2-MV, 3-MV	No visibility due to landform
23-MV	421 Allen Farm South Road	Chilmark	Residential, Recreation	Agricultural, Open Fields	Residents, Tourists			1, 9, 10, 11	37.88 (60.96)	Outside Viewshed	Not applicable	No visibility due to vegetation and landform
24-MV	Chappy Point, Gardner Beach	Edgartown	Public Recreation	Village/Town Center	Residents, Tourists, Recreational Users			1, 3, 5, 8, 10, 11, 12, 13	34.71 (55.86)	In Viewshed	Not applicable	No visibility due to existing structure and landform
25-MV	Edgartown Harbor within Edgartown Village Historic District	Edgartown	NHRP	Village/Town Center	Residents, Tourists			1, 3, 7, 8, 10, 12	34.75 (55.92)	Outside Viewshed	Not applicable	No visibility due to existing structures

KOPs selected for the development of representative simulations are identified with gray shaded rows; KOPs selected for simulation include: 1-MV, 2-MV, 3-MV, 4-MV, 6-MV, 9-MV, and 16-MV.

[1]Susceptibility to change, value of seascape, and visual sensitivity evaluated for KOPs with simulations.

[2]See bulleted list in Section 5.2.3 for associated factors for KOP selection.

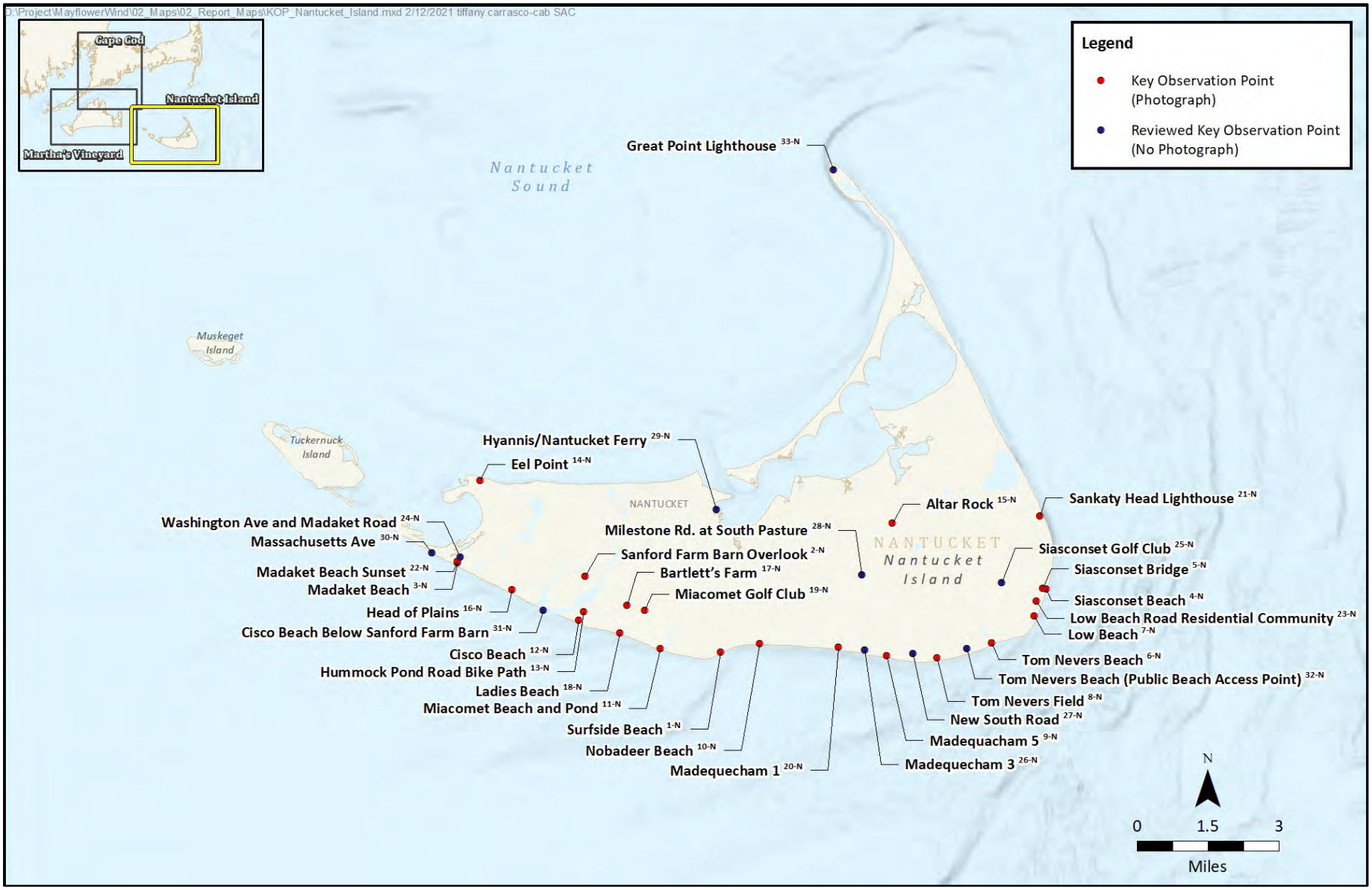
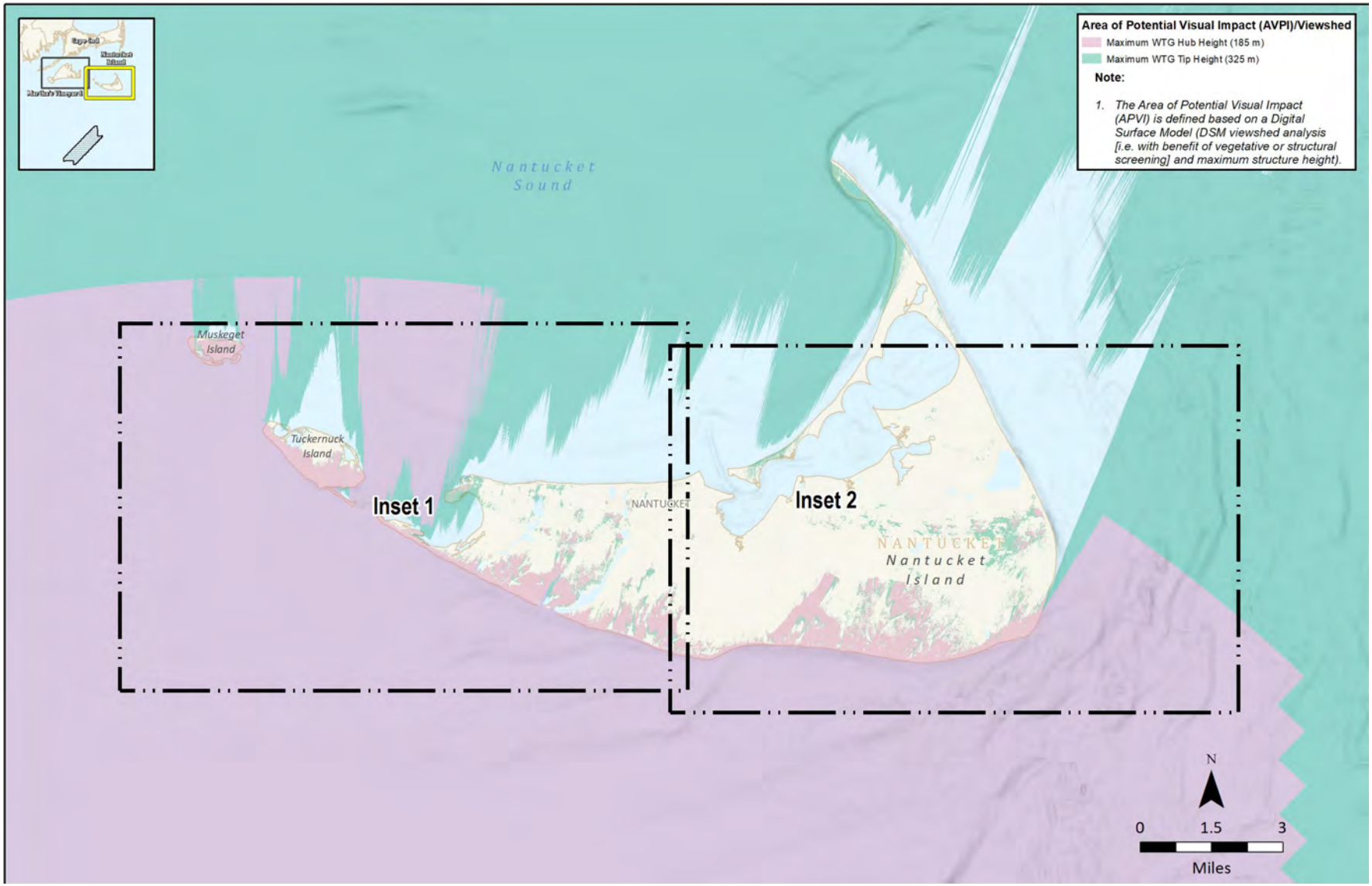
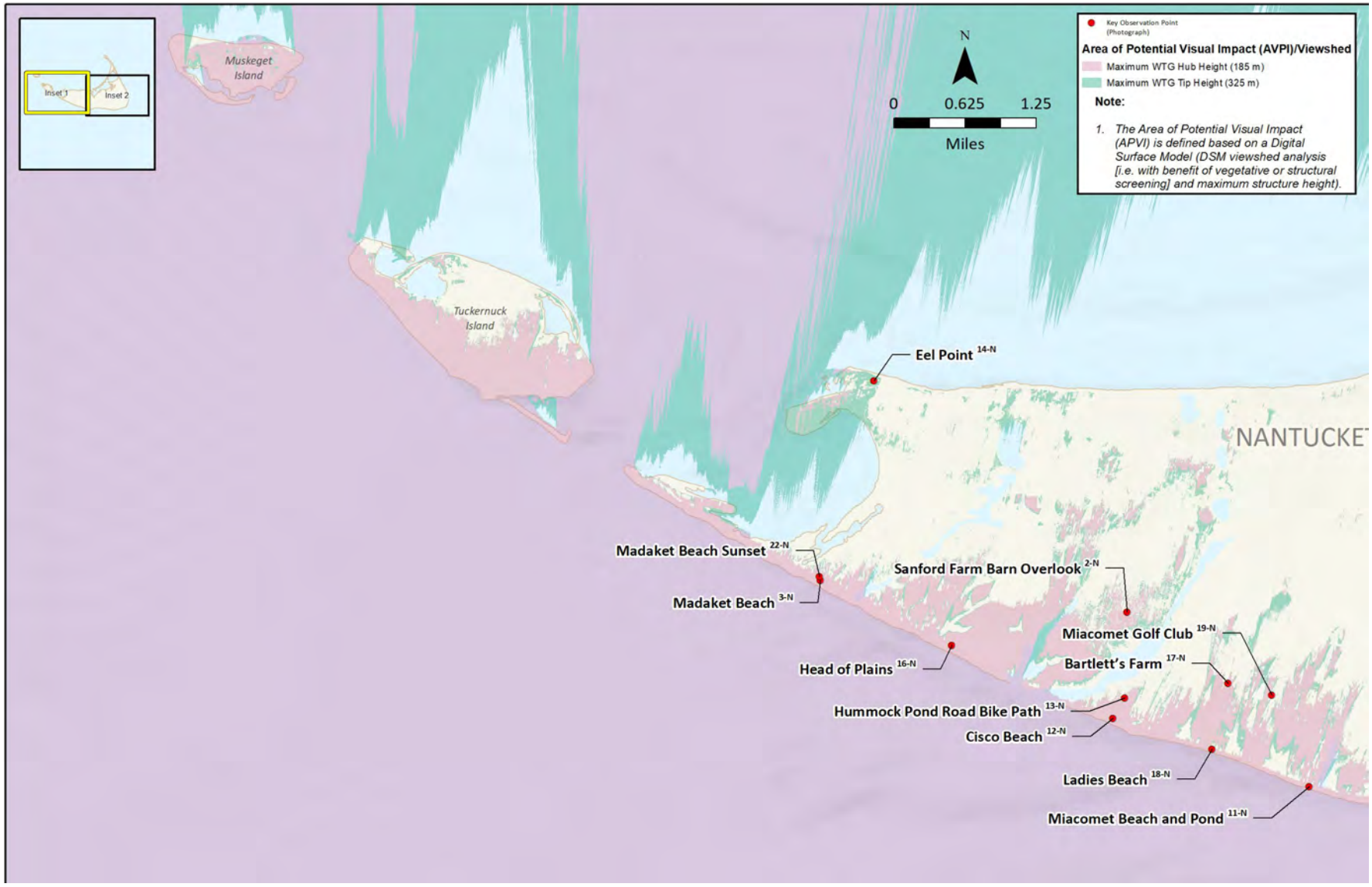


Figure 5-35. KOPs on Nantucket



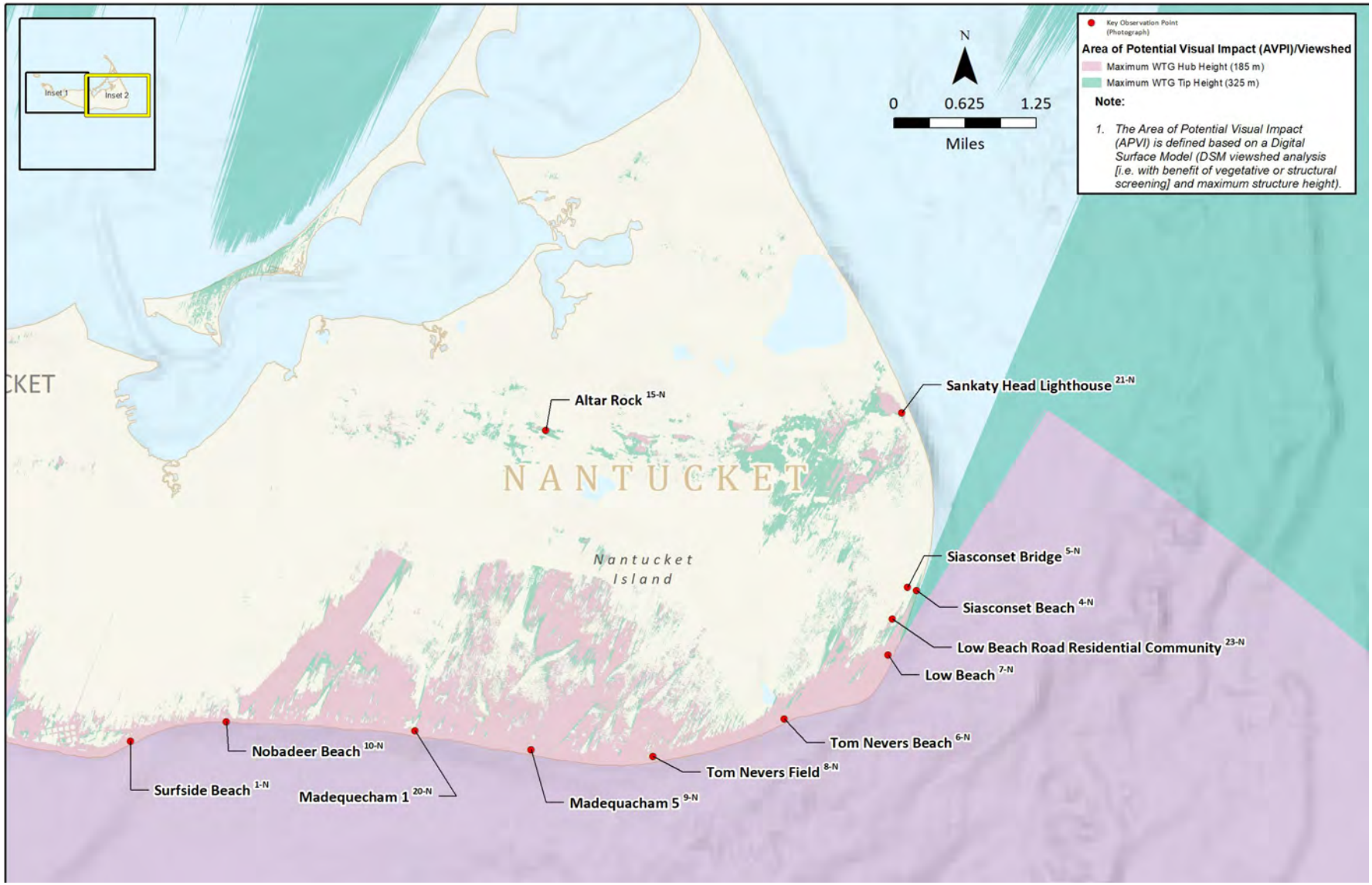
DSM viewshed is depicted as provided by ICF.

Figure 5-36. Nantucket KOP Index Map with Offshore Blade Tip and Hub Height DSM Viewsheds



DSM viewshed is depicted as provided by ICF.

Figure 5-37. Nantucket KOP Map with Blade Tip and Hub Height DSM Viewsheds: Inset 1



DSM viewshed is depicted as provided by ICF.

Figure 5-38. Nantucket KOP Map with Blade Tip and Hub Height DSM Viewsheds: Inset 2

Table 5-7. Nantucket KOPs for Offshore Project Components

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape and Ocean Character Type	Viewer Groups	Susceptibility to Change / Value of Seascape[1]	Visual Sensitivity[1]	Selection Factors[2]	Distance to Nearest WTGs (mi [km])	In / Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
1-N	Surfside Beach	Nantucket	Public Recreation	Ocean Beach, Dunes	Residents, Recreational Users			1, 2, 3, 4, 5, 6, 10, 11, 12, 13	23.71 (38.15)	In Viewshed	10-N, 11-N	Yes
2-N	Sanford Farm Barn Overlook	Nantucket	Public Open Space Conservation	Coastal Scrub, Open Ocean, Pond/Tidal Marsh, Fields/Meadows, Rural/Residential	Residents, Tourists, Recreational Users	Low/ High	Medium	1, 2, 3, 5, 7, 9, 10, 11, 12	24.37 (39.22)	In Viewshed	Not Applicable	Yes
3-N	Madaket Beach (Haze)	Nantucket	Public Recreation	Ocean Beach, Dunes	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13	24.39 (39.25)	In Viewshed	Not Applicable	Yes
4-N	Siasconset Beach	Nantucket	Public Recreation	Ocean Beach	Residents			1, 2, 3, 5, 6, 10, 11, 12, 13	28.07 (45.17)	In Viewshed	6-N, 21-N	Yes
5-N	Siasconset Bridge	Nantucket	Public Recreation	Ocean Beach	Residents			1, 2, 3, 5, 9, 10, 11, 12	28.05 (45.14)	Outside Viewshed	Not Applicable	No Enclosed between ridge, vegetation, and residence
6-N	Tom Nevers Beach	Nantucket	Public Recreation	Ocean Beach, Open Ocean, Dunes	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 4, 6, 10, 11, 12, 13	26.56 (42.77)	In Viewshed	Not Applicable	Yes
7-N	Low Beach	Nantucket	Town	Ocean Beach	Residents			1, 2, 6, 10, 11, 13	27.46 (44.19)	In Viewshed	6-N, 21-N	Yes
8-N	Tom Nevers Field	Nantucket	Public Recreation	Open Ocean, Coastal Bluffs, Dunes, Coastal Scrub	Residents, Recreational Users, Tourists	High/ High	High	1, 2, 3, 6, 9, 10, 11, 12, 13	25.68 (41.33)	In Viewshed	Not Applicable	Yes
9-N	Madequecham 5	Nantucket	Public Recreation	Ocean Beach	Residents, Recreational Users			1, 2, 5, 6, 10, 11, 12, 13	25.13 (40.44)	In Viewshed	8-N, 10-N	Yes
10-N	Nobadeer Beach	Nantucket	Public Recreation	Open Ocean, Ocean Beach, Dunes, Residential	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 3, 5, 6, 8, 10, 11, 12, 13	23.31 (37.51)	In Viewshed	Not Applicable	Yes
11-N	Miacomet Beach and Pond	Nantucket	Public Recreation	Open Ocean, Dunes, Ponds, Tidal Marsh, Residential	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 5, 6, 10, 11, 12, 13	23.49 (37.80)	In Viewshed	Not Applicable	Yes
12-N	Cisco Beach (Clear Skies)	Nantucket	Public Recreation	Open Ocean, Ocean Beach, Dunes, Ponds/Tidal Marsh, Residential	Residents, Tourists, Recreational Users	High /High	High	1, 2, 3, 5, 6, 8, 10, 11, 12, 13	23.61 (38.00)	In Viewshed	Not Applicable	Yes
12-N	Cisco Beach (Overcast Skies)	Nantucket	Public Recreation	Open Ocean, Ocean Beach, Dunes, Ponds/Tidal Marsh, Residential	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 3, 5, 6, 8, 10, 11, 12, 13	23.61 (38.00)	In Viewshed	Not Applicable	Yes

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape and Ocean Character Type	Viewer Groups	Susceptibility to Change / Value of Seascape[1]	Visual Sensitivity[1]	Selection Factors[2]	Distance to Nearest WTGs (mi [km])	In / Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
13-N	Hummock Pond Road Bike Path	Nantucket	Recreation	Open Ocean, Pond/Tidal Marsh, Field/Meadow, Coastal Shrub, Rural/Residential	Residents, Tourists, Recreational Users	Medium/ Medium	Medium	1, 3, 10, 11, 12	23.82 (38.33)	In Viewshed	Not Applicable	Yes
14-N	Eel Point	Nantucket	Public Recreation	Dunes, Nantucket Sound	Residents, Recreational Users, Tourists			1, 10, 11	25.96 (41.77)	In Viewshed	Not Applicable	No View is screened behind coastal dunes and residential structures toward the Project
15-N	Altar Rock	Nantucket	Public Recreation	Coastal Shrub	Recreational Users, Tourists			1, 4, 9, 10, 11	27.67 (60.62)	In Viewshed	Not Applicable	No
16-N	Head of Plains	Nantucket	Public Recreation	Ocean Beach, Open Ocean, Dunes	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 5, 6, 10, 11, 12, 13	23.98 (38.59)	In Viewshed	Not Applicable	Yes
17-N	Bartlett's Farm	Nantucket	Residential, Tourist	Agricultural, Open Fields	Residents, Tourists			1, 3, 9, 10, 12	24.01 (38.64)	In Viewshed	Not Applicable	No; View obscured behind coastal dune and topography rises from Viewpoint to the dune
18-N	Ladies Beach	Nantucket	Public Recreation	Ocean Beach, Open Ocean, Dunes, Coastal Scrub	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 5, 6, 10, 11, 12, 13	23.01 (37.03)	In Viewshed	Not Applicable	Yes
19-N	Miacomet Golf Club	Nantucket	Public Recreation	Coastal Scrub, Forests/Woodland, Parks/Developed Recreation	Tourists, Residents, Recreational Users			1, 3, 9, 10, 12	24.17 (38.90)	Outside Viewshed	Not Applicable	No
20-N	Madequecham 1	Nantucket	Public Recreation	Ocean Beach, Open Ocean, Dunes, Coastal Scrub	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 5, 6, 10, 11, 12, 13	24.91 (40.09)	In Viewshed	Not Applicable	Yes
21-N	Sankaty Head Lighthouse	Nantucket	Public Recreation NRHP Historic Property	Coastal Scrub, Residential, Developed Recreation, Coastal Bluff	Residents, Tourists, Recreational Users	High/ High	High	1, 3, 4, 7, 8, 10, 11, 12	29.38 (47.28)	In Viewshed	Not Applicable	Yes
22-N	Madaket Beach at Sunset (Clear Skies)	Nantucket	Public Recreation	Open Ocean, Ocean Beach, Coastal Dune	Residents, Tourists, Recreational Users	High/ High	High	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13	24.20 (38.94)	In Viewshed	Not Applicable	Yes
23-N	Low Beach Road Residential Community	Nantucket	Residential	Residential	Residents			1, 3, 5, 10, 11, 12	27.75 (44.65)	In Viewshed	Not Applicable	No; Enclosed behind coastal vegetation

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape and Ocean Character Type	Viewer Groups	Susceptibility to Change / Value of Seascape[1]	Visual Sensitivity[1]	Selection Factors[2]	Distance to Nearest WTGs (mi [km])	In / Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
24-N	Washington Ave and Madaket Road	Nantucket	Public Roads	Residential	Residents, Tourists			1, 3, 10, 11	24.29 (39.09)	In Viewshed	Not Applicable	No; Direction of view is directed down the road toward the southwest away from the Project.
25-N	Siasconset Golf Club	Nantucket	Private Recreation	Meadow	Residents, Recreational Users			1, 3, 10, 11	27.69 (44.56)	Outside Viewshed	Not Applicable	No; The location is set low in the topography with no view of the Project
26-N	Madequecham 3	Nantucket	Public Recreation	Ocean Beach	Residents, Recreational Users			1, 2, 5, 6, 10, 11, 12, 13	25.00 (40.23)	In Viewshed	8-N	Yes
27-N	New South Road	Nantucket	Residential	Town	Residents, Tourists, Recreational Users			1, 10	25.43 (40.92)	Outside Viewshed	Not Applicable	No; Enclosed behind existing vegetation
28-N	Milestone Rd. at South Pasture	Nantucket	Public Road	Town	Residents, Tourists			1, 10	26.41 (42.22)	Outside Viewshed	Not Applicable	No; Low in the landscape and enclosed by existing vegetation
29-N	Hyannis/ Nantucket Ferry	Nantucket	Port/Harbor	Town	Residents, Tourists			1, 8, 10	26.51 (42.66)	Out of Viewshed	Not Applicable	No; Faces toward Nantucket Sound away from Project. The site sits on the opposite side of the island from the Project and is screened by existing buildings, topography, and vegetation
30-N	Massachusetts Avenue	Nantucket	Residential/ Recreation beach access	Ocean Beach	Residents, Tourists, Recreational Users			1, 5, 10, 11	24.32 (39.13)	In Viewshed	3-N, 22-N	Yes
31-N	Cisco Beach Below Sanford Farm Barn	Nantucket	Conservation Area	Shrub Scrub	Residents, Tourists, Recreational Users			1, 2, 5, 6, 10, 11, 12, 13	23.48 (37.78)	In Viewshed	12-N	Yes; No photograph -trail link between barn overlook and beach view
32-N	Tom Nevers Beach (Public Beach Access Point)	Nantucket	Recreation	Ocean Beach	Residents			1, 2, 4, 6, 10, 11, 12, 13	26.11 (43.09)	In Viewshed	6-N, 8-N	Yes

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape and Ocean Character Type	Viewer Groups	Susceptibility to Change / Value of Seascape[1]	Visual Sensitivity[1]	Selection Factors[2]	Distance to Nearest WTGs (mi [km])	In / Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
33-N	Great Point Lighthouse	Nantucket	Recreation, NRHP Property	Ocean Beach, Dunes, Nantucket Sound	Tourists, Recreational Users			4, 7, 12	34.25 (55.12)	Outside Viewshed	Not Applicable	No; View toward the Project is hidden by topography in the center of the island

** The entire island of Nantucket is a National Historic Landmark (NHL) District. All KOP photos were taken within the NHL*

KOPs selected for the development of representative simulations are identified with gray shaded rows; KOPs selected for simulation include: 2-N, 3-N, 6-N, 8-N, 10-N, 11-N, 12-N, 13-N, 16-N, 18-N, 20-N, 21-N, and 22-N

[1]Susceptibility to change, value of seascape, and visual sensitivity evaluated for KOPs with simulations.

[2]See bulleted list in Section 5.2.3 for associated factors for KOP selection.

5.2.4 Offshore Visual Simulations

Photographic simulations of the WTGs/OSPs, were developed to communicate the potential for change from existing visual conditions. The KOPs selected for the development of simulations are identified in Table 5-6 for Martha's Vineyard and Table 5-7 for Nantucket, with gray highlighting. Efforts were made to secure all KOP photos under clear sky conditions. However, this was not possible in all cases. And as such, the simulations reflect a range of visual contrast possible under differing conditions (e.g., overcast/cloudy, haze, clear). Similarly, KOP photos were intended to capture a range of lighting conditions (side lit, back lit, front lit) at different times of the day (e.g., from morning through sunset). Existing condition photos and simulations are provided in Attachment 3.

5.3 Seascape/Landscape Impact Analysis

The SLIA analyzes and evaluates sensitivity, susceptibility, and magnitude of change in consideration of impacts on both the physical elements and features that make up a landscape, seascape, or open ocean; and the aesthetic, perceptual, and experiential aspects of the landscape, seascape, or open ocean that make it distinctive. These impacts affect the "feel," "character," or "sense of place" of an area of landscape, seascape, or open ocean, rather than the composition of a view from a particular place. In the SLIA, the impact receptors (the entities that are potentially affected by the proposed Project) are the seascape/open ocean/landscape itself and its components, both its physical features and its distinctive character.

Table 5-5 presents the acreages of character areas overall in the offshore geographic analysis area and within the offshore wind farm viewshed.

5.3.1 SLCA Sensitivity and Magnitude of Change

When susceptibility to change and value to society are combined (Table 5-8), the sensitivity of a character area is determined based on the SLVIA guidance (BOEM 2021). When the size or scale of the change associated with the proposed Project, the geographic extent of the change, and the duration and reversibility of the change are combined, the magnitude of change results. Magnitude of impact to character areas is determined when sensitivity and magnitude of seascape/landscape change are combined, as shown in Table 5-10.

5.3.1.1 Character Area Sensitivity

The sensitivity of SLCAs is assessed based on two components: susceptibility and value. The susceptibility of an ocean/seascape/landscape character area to change is its ability to accommodate the impacts of the proposed Project. Susceptibility factors include both overall and individual elements and particular aesthetic, experiential, and perceptual features of the character area. In the evaluation of value, special consideration is given to, those components that contribute significantly to the distinctive character of the SLCA.

In the Draft Environmental Impact Statement (DEIS) Appendix H Seascape, Landscape, and Visual Impact Assessment for the Project (BOEM 2023) the susceptibility and value of the ocean, seascape and landscape character units were characterized. These characterizations have been included in this analysis and these character units are described in Section 5.2.1.

Table 5-8. Character Area Sensitivity - Susceptibility to Change and Value to Society Combined

Susceptibility to Change	Value to Society		
	High	**Medium**	**Low**
High	High[1]	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Low

[1] *outcome per SLVIA guidance (BOEM, 2021)*

The susceptibility of the SLCAs were ranked in Appendix H Seascape, Landscape, and Visual Impact Assessment of the Draft Environmental Impact Statement for the Project and have been included in Table 5-9. These are as follows: **high** (Open Ocean, Nantucket Seascape Ocean, Nantucket Seascape Beach and Nantucket Landscape) and **medium** (Martha's Vineyard Seascape Ocean, Martha's Vineyard Seascape Beach and Martha's Vineyard Landscape) (BOEM 2023). In the DEIS, BOEM characterized the value of ocean, seascape and landscape character units with visibility to the Project as **high** (BOEM 2023).

Table 5-9. Character Area Sensitivity

Character Area	Susceptibility	Value	Sensitivity
Open Ocean	High	High	High
Nantucket Seascape Ocean	High	High	High
Nantucket Seascape Beach	High	High	High.
Nantucket Landscape	High	High	High
Martha's Vineyard Seascape Ocean	Medium	High	High
Martha's Vineyard Seascape Beach	Medium	High	High
Martha's Vineyard Landscape	Medium	High	High

5.3.1.2 Magnitude of Change

BOEM (2023) characterized the magnitude of change based on size and scale, geographic extent, and duration and reversibility. The magnitude of change is a character area's ability to accommodate the effects of the proposed Project. The rating is based on the size or scale of the change associated with the proposed Project, the geographic extent of the change, and the duration and reversibility of the change (Table 5-10 and Table 5-11).The magnitude of change has three components: the size and scale of the change to existing conditions caused by the Project, the geographic extent of the area subject to the Project's effects, and the duration and reversibility of effects.

Table 5-10. Character Area Size and Scale and Geographic Extent

Size and Scale	Geographic Extent		
	Large	**Medium**	**Small**
Large	Large[1]	Large	Large
Medium	Large	Medium	Medium
Small	Large	Medium	Small

[1] *outcome per SLVIA guidance (BOEM, 2021)*

Table 5-11. Character Area Duration and Reversibility, Size and Scale, and Geographic Extent

Duration and Reversibility	Size and Scale and Geographic Extent		
	Large	**Medium**	**Small**
Poor	Large[1]	Large	Medium
Fair	Large	Medium	Small
Good	Small	Small	Small

[1] *outcome per SLVIA guidance (BOEM, 2021)*

BOEM (2023) characterized the size and scale as ranges from faint, apparent, conspicuous, and prominent to dominant. Size and scale are rated as large, medium, or small. Prominent vertical structures in the otherwise horizontal seascape environment would be characteristic of a large-scale change.

The assessment of impact magnitude also includes consideration of the geographic extent over which the effect will be experienced. For the offshore Project, the geographic extent of SLCA impacts relates to the visibility of the Project. BOEM (2023) characterized the visibility of the nearest WTG of the open ocean as follows:

- Unavoidably dominant features in the offshore view between 0 and 5 mi (0–8 km) distance;
- Strongly pervasive features in the onshore to offshore view between 5 and 12 mi (8–19.3 km) distance;
- Clearly visible features in the onshore to offshore view between 12 and 28 mi (19.3–45.1 km) distance;
- Low on the horizon, but persistent features in the onshore to offshore view between 28 and 31 mi (45.1–49.9 km) distance;
- Intermittently noticed features in the onshore to offshore view between 31 and 42.8 mi (49.9–68.9 km) distance; and,
- Below the horizon beyond 42.8 mi (68.9 km) distance.

BOEM characterized the Project visibility for the open ocean character unit as **dominant**; for the Nantucket seascape (ocean and beach) and landscape character units as **substantial**, and the Martha's Vineyard seascape (ocean and beach) and landscape character units as **low.**

Duration is characterized as short term (less than 5 years), long term (5–30 years), or considered permanent (more than 30 years). Given the expected operating life of the Project, the duration is considered **permanent**. Because all visible offshore structures will be removed in decommissioning without residual effect on SLCAs, the effects are **fully reversible**.

5.3.2 Impacts to Character Areas

Finally, to determine overall visual impact to SLCAs, Character Area sensitivity and magnitude of change are combined to determine magnitude of SLIA impacts (Table 5-12). Impacts are defined by the BOEM Guidance Document (BOEM, 2021) as Negligible, Minor, Moderate, and Major. In practice, negligible visual impacts would correspond to unseen or imperceptible visual effects wherein the project is barely visible at most, or the area of potential effect is quite small, combined with medium or low values of other metrics.

Table 5-12. Character Area Sensitivity and Magnitude of Visual Change Combined

Sensitivity Rating	Magnitude of Change		
	Large	**Medium**	**Small**
High	Major[1]	Major to Moderate	Moderate to Minor
Medium	Major to Moderate	Moderate	Minor
Low	Major to Moderate	Moderate to Minor	Minor

[1] *outcome per SLVIA guidance (BOEM, 2021)*

As outlined in Section 6 of the BOEM Guidance Document (BOEM 2021), the effects or impact to a character area is determined by combining values for both sensitivity and magnitude of change. Impacts are scored on a scale of *minor*, *moderate*, and *major*. A finding of **negligible** impact is warranted when there are minimal impacts; that is, the project is not visible or is barely visible, or the potentially affected area is very small, and the other metrics are at medium or low values. A finding of major impact is warranted when introduced features that have dominant levels of visual prominence, the introduced feature(s) a visual character that is inconsistent with the character of the area, which may have a major negative effect on the area's features, elements, or key qualities. The concern for change (combination of susceptibility/value) to the area is high.

Table 5-9 summarizes the sensitivity, susceptibility, and magnitude of change impacts on the seascape, open ocean, and landscape character units throughout the geographic analysis area as determined by BOEM (BOEM 2023).

Table 5-13. Impact on Seascape Character, Open Ocean Character, and Landscape Character

Level of Impact	Seascape Open Ocean and Landscape Character Units
Major	SLIA: Open Ocean Character Unit
Moderate	SLIA: Seascape Character Units and Landscape Character Units within the viewshed and within 28 miles of WTGs
Minor	SLIA: Seascape Character Units and Landscape Character Units within the viewshed and beyond 28 miles of WTGs
Negligible	SLIA: Seascape Character Units and Landscape Character Units outside of the WTG viewshed

Source: BOEM (2023) SouthCoast Wind Draft Environmental Impact Statement

5.4 Offshore Visual Analysis

Based on the simulations developed in the Baseline Inventory phase (Section 5.2), Visual Change and Visual Sensitivity were identified to support the characterization of potential impacts. The anticipated Visual Change associated with the Project and viewer sensitivity are discussed in the sections below. In turn, the potential for impact (see Section 5.4.5) is characterized based on the inter-relationship between Visual Change and Visual (viewer and visual resource) Sensitivity.

Visual impact during construction and installation of the offshore Project components would be limited to partially built WTGs or OSPs and vessels working out in the Atlantic Ocean and travelling back and forth between mainland ports. Construction of the WTGs and OSPs may require use of jack-up barges with mobile cranes and other large construction vessels. Structural components may be delivered via large watercraft.

The larger construction vessels will be a visible feature within the maximum theoretical area of nacelle visibility. The majority of construction is expected to occur during daylight hours, but nighttime activity may also occur. Construction vessels will have nighttime lights in accordance with U.S. Coast Guard (USCG) regulations. During dawn and dusk periods, particularly on cloudy days, work lights may be required for worker safety as well as to improve visibility on construction vessels. Work lights are generally downward directed and would not typically be oriented horizontally where visibility on shore would be increased.

A summary and description of the vessels anticipated to be used during the construction phase are provided in Sections 3.3.2.1, 3.3.3.4, 3.3.5.4, and 3.3.14 of Volume I of the COP and summarized in Table 5-14. The COP provides the overall dimension of marine vessels, the number of vessels, number of trips, and the number of days on the water per vessel type. None of the vessels exceed 328 ft (100 m) in height including all structures on the vessel. The vessels with the most number of trips during construction are smaller support vessels. These vessels will transit west of Martha's Vineyard in established shipping lanes, as practicable (COP Appendix G, Figure 3-2). Once on site in the Lease Area, the vessels will be mostly obscured by the curvature of the earth; some diffuse light may be visible on the horizon at night. Along the ECCs during installation of the export cables, vessels will be visible as they transit through Muskeget Channel, in particular.

Visual impact associated with construction and installation operations, in general, would be minor as construction equipment would only be in use temporarily during the construction and decommissioning periods. Construction-related visual impacts will be relatively brief and are not expected to result in adverse prolonged visual change nor impact since vessels would not be seen once in the Lease Area due to earth curvature, and vessels transiting past land are in established shipping lanes. Some visual effects may be noticed during the installation of cables; however, the duration of installation is anticipated to cause only short term effects. The analysis of offshore Visual Change and Visual Sensitivity in the sections below is limited to the operational and maintenance phase of the Project.

Table 5-14. Indicative Vessels and Trips Anticipated for Use During Construction

Vessel Type	Length Overall (m)	Maximum Structure/Deck height (m)	Number of Vessels	Total Number of Days	Total Number of Trips
Anchor Handling Tug	67.4	14.6	4	673	33
Cable Lay Barge	122.2	15.0	2.0	330	26
Cable Transport and Lay Vessel	99	20.8	3	611	32
Crew Transfer Vessel	25.1	7.1	2	1478	413
DP Accommodation Vessel	111	50.7	1	203	7
Dredging Vessel	120.35	18.4	1	479	81
Heavy Lift Crane Vessel	231	92.4	4	1458	30
Heavy Transport Vessel	275	50.7	2	250	7
Jack-up Accommodation Vessel	87.5	28.8	1	810	27
Multipurpose Support Vessel	93.4	22.9	34	10353	2712
Scour Protection Installation Vessels	158.6	26.5	3	2210	1548
Service Operations Vessel	84	17.4	3	1478	208
Survey Vessel	80.4	18	1	75	5
Tugboat	47.5	12	18	5809	1519
Helicopter	N/A	N/A	6	1411	1211

5.4.1 Visual Change - Offshore

As noted in Figure 4-1, Visual Change, as measured by the reported Visibility Levels, accounts for both visual compatibility (e.g., type, intactness, unity) and visual contrast (e.g., vividness, scale, and movement). AECOM applied the modified contrast ratings for the offshore KOPs, according to the methods described in Section 4.4.1.2. Within the contrast rating scale, *Visibility Levels 5 and 6* indicate **Strong** Visual Change, *Visibility Levels 3 and 4* **Medium** Visual Change, and *Visibility Levels 1 or 2*, **Weak** Visual Change. Ratings have been applied in a conservative manner and are typically represented by a range. A range is used to reflect the varying degrees of contrast possible at a given location based on atmospheric/meteorological and/or lighting conditions that might result in greater or lesser levels of contrast than are reflected in the actual simulated condition. The goal of applying the visual contrast method is to create an objective measure of Visual Change as would be perceived by sensitive viewers.

The simulations evaluated for this analysis reflect a range of meteorological and atmospheric conditions that may affect the visibility or appearance of the Project features. The results of this analysis assume meteorological conditions allowing visibility of the Project features. Based on the analysis of meteorological and atmospheric conditions data presented in Section 5.1.3, atmospheric and meteorological conditions may influence visibility on certain days or portions of days.

The VAF provides a detailed characterization of existing conditions. The basis for contrast ratings is paired with respective offshore existing conditions photos and simulations in Attachment 3. Table 5-15 and Table 5-16 summarize the aggregate Visibility Level for Martha's Vineyard and Nantucket KOPs, respectively.

The analysis of KOPs for Martha's Vineyard (Table 5-15) revealed varying degrees of Visual Change viewed from different locations. The distances from the nearest Project structure for Martha's Vineyard KOPs range from approximately 31 to 38 mi (50 to 60 km). Two KOPs (9-MV 322 South Road and 16-MV Squibnocket

Beach) were rated as *Visibility Level 1 to 2* (**Weak**). One KOP (3-MV Wasque Ave) was rated *as Visibility Level 3 to 4* (**Medium**). The remainder of the Martha's Vineyard KOP simulations were rated *as Visibility Level 2 to 3* (**Weak** to **Medium**). The median rating for the Project from Martha's Vineyard was *Visibility Level 2 to 3,* which reflects **Weak** to **Medium** levels of Visual Change. A **Weak** to **Medium** rating indicates that the Project is visible only after scanning the horizon and could be missed by a casual observer. However, under certain lighting and atmospheric conditions documented in some simulations, the Project may be visible after a brief glance in the general direction of the Project; unlikely to be missed by casual observers. The Project would not be visually dominant from any Martha's Vineyard viewpoint due primarily to distances from KOPs to the Project, resulting in an apparent small scale even in optimal viewing conditions.

Table 5-15. KOP Visibility Level Ratings for Offshore Simulations – Martha's Vineyard

KOP Number	Name	Distance to Nearest WTGs (mi [km])	Visibility Level Rating	Visual Change
1-MV	Wasque Point	31.19 (50.220)	[2] - [3]	Weak to Medium
2-MV	Wasque Reservation	31.21 (50.23)	[2] - [3]	Weak to Medium
3-MV	Wasque Avenue	31.59 (50.84)	[3] - [4]	Medium
4-MV	South Beach	32.49 (52.30)	[2] – [3]	Weak to Medium
6-MV	Long Point Beach	34.93 (56.21)	[2] - [3]	Weak to Medium
9-MV	322 South Road	37.17 (59.83)	[1] - [2]	Weak
16-MV	Squibnocket Beach	37.94 (61.05)	[1] – [2]	Weak

Visibility Levels 5 and 6 indicate strong visual change, Visibility Levels 3 and 4 medium visual change, and Visibility Levels 1 or 2 weak visual change.

Martha's Vineyard, in addition to being farther away from the Project than Nantucket, has more tall vegetation that provides screening from many viewpoints. The overall Visual Change that will be experienced by viewers on Martha's Vineyard is thus much less than from Nantucket. Visibility to the Project is primarily from the southeast part of the Vineyard, near Wasque Point and South Beach. Many additional potential viewpoints were evaluated but found to be well screened by topography, vegetation, or both.

Fifteen simulations were created for thirteen KOPs; two simulations were prepared for both the Cisco Beach (12-N overcast and 12-N clear skies) and Madaket Beach (3-N and 22-N) locations. Of the thirteen KOP locations, eleven have clear, unobstructed views to the Lease Area from Nantucket. Most of these are along the beach or not far from it. There was no visibility of the Project from two KOPs (19-N Miacomet Golf Club). Generally, visibility decreases as one rounds the curve at the east end of the island near Siasconset and moves inland from the beach. The distances from the nearest Project structure for the simulated Nantucket KOPs ranged from approximately 23 to 29 mi (37 to 47 km). There is no Project visibility from the north and east sides of the Island.

For Nantucket (Table 5-16), six KOP simulations (2-N Sanford Barn Farm Overlook, 3-N Madaket Beach [haze], 6-N Tom Nevers Beach, 10-N Nobadeer Beach, 11-N Miacomet Beach and Pond, and 20-N Madequecham) were rated between *Visibility Level 3* and *Visibility Level 4*, representing a **Medium** Visual Change. Two KOPs were rated at *Visibility Level 2-3* (8-N Tom Nevers Field and 16-N Head of Plains), corresponding to a **Weak** to **Medium** Visual Change. Five KOP simulations on Nantucket between Madaket to Ladies Beach (12-N Cisco Beach [clear skies], 12-N Cisco Beach [overcast skies], 13-N Bike Path at Hummock Pond, 18-N Ladies Beach), were rated at *Visibility Level 4 to 5*, corresponding to a **Medium** to **Strong** Visual Change. One KOP (21-N Sankaty Head Lighthouse) was rated between *Visibility Level 1* and *Visibility* Level 2 corresponding to **Weak** Visual Change**.**

On Nantucket, which is closer to the Project and has an unencumbered view of the Lease Area, the Visual Change that will be experienced is greater than for Martha's Vineyard. The higher rated KOPs are mostly along the southwest-facing beach or within a short distance of the beach. Due to the predominantly low, open

vegetation and gentle topography, the Project can also be seen from interior sites on the southwest side of the Island.

Table 5-16. KOP Visibility Level Ratings for Offshore Simulations – Nantucket

KOP Number	Name	Distance to Nearest WTGs (mi [km])	Visibility Level Rating	Visual Change
2-N	Sanford Farm Barn Overlook	24.37 (39.22)	[3] - [4]	Medium
3-N	Madaket Beach (Haze)	24.39 (39.25)	[3] - [4]	Medium
6-N	Tom Nevers Beach	26.56 (42.77)	[3] – [4]	Medium
8-N	Tom Nevers Field	25.68 (41.33)	[2] – [3]	Weak to Medium
10-N	Nobadeer Beach	23.31 (37.51)	[3] - [4]	Medium
11-N	Miacomet Beach and Pond	23.49 (37.80)	[3] - [4]	Medium
12-N	Cisco Beach (Clear Skies)	23.61 (38.00)	[4] - [5]	Medium to Strong
12-N	Cisco Beach (Overcast Skies)	23.61 (38.00)	[4] - [5]	Medium to Strong
13-N	Hummock Pond Road Bike Path	23.82 (38.33)	[4] - [5]	Medium to Strong
16-N	Head of Plains	23.98 (38.59)	[2] - [3]	Weak to Medium
18-N	Ladies Beach	23.01 (37.03)	[4] - [5]	Medium to Strong
20-N	Madequecham 1	24.91 (40.09)	[3] - [4]	Medium
21-N	Sankaty Head Lighthouse	29.38 (47.28)	[1] - [2]	Weak
22-N	Madaket Beach at Sunset (Clear Skies)	24.20 (38.94)	[4] - [5]	Medium to Strong

Visibility Levels 5 and 6 indicate strong visual change, Visibility Levels 3 and 4 medium visual change, and Visibility Levels 1 or 2 weak visual change

Based on the above analysis, the primary contrasting elements of the Project within the views which typically contributed to Visual Change included:

- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The variation in color contrast of the WTGs from the changing sun angles against a visually changing backdrop;
- The apparent density of visible structures arrayed across the horizon line as well as the extent of the visible horizon occupied by the Project;
- An apparent lack of visual order of the Project from the viewer position;
- The scale of the rectangular OSPs; and
- Circular blade motion along the horizon line which
  - Occurs in a different plane from the horizon.
  - Does not correspond with the natural back and forth motion of the waves.

  - Is not synchronized (e.g., rotation speed and blade positions may vary among the visible WTGs).

The degree of importance of such contrasting elements differs by KOP location. Specific contrasting elements associated with each simulation are detailed in the Visual Analysis Forms in Attachment 3.

KOP 12-N includes simulations under both overcast and clear skies conditions and Madaket Beach has two KOP simulations (3-N and 22-N) reflecting hazy daylight conditions and sunset, respectively. A comparison of these simulations reflecting differing conditions from the same KOP provides insight regarding the range of visual contrast that may be observed at any given location. A holistic consideration of all the simulations is considered indicative of the range of potential Visual Change that may be evident across various locations, weather conditions, and lighting conditions.

5.4.2 Visual Sensitivity - Offshore

As described in Section 5.2, the islands are popular places to live and vacation, and there is evidence that people are drawn by the unique maritime setting, historic features, and high level of naturalness. Viewer concern for the scenic condition of landscapes, seascapes, and open ocean can depend on a range of factors, including types of users, amount of use, demonstrated public interest, and protective designations (i.e., conservation or historic sites). These factors suggest that most people who will view the Project from Nantucket and Martha's Vineyard (i.e., permanent residents, seasonal residents, tourists, recreational users, and others) assign a high value to the seascape/landscape. Coupled with a high susceptibility to change in the seascape/landscape from most KOPs, viewer sensitivity is considered **High (**Table 5-6 and Table 5-7**)**. The high visual sensitivity does not preclude the potential for some viewers to find the presence of WTGs on the horizon visually interesting or have a positive impression associated with clean energy, even if they notice aesthetic changes have occurred.

5.4.3 Visual Impact Characterization - Offshore

AECOM used "visibility level ratings" as a surrogate for visual change. For example, ratings of 1-2 are indicative of weak visual change, 3-4 reflects a medium visual change, and 5-6 would be indicative of strong visual change. People's enjoyment of places on the islands may be impacted corresponding to the visibility of the Project from highly valued places, including the beaches, lighthouses, historic sites, etc.

As described in Section 4.4.3, the combination of Visual Change and Visual Sensitivity characterizes the potential for impact associated with the Project; the potential for impact is characterized as **Low, Medium/Low, Medium, High/Medium,** or **High**. As noted in Section 5.4.2, Visual Sensitivity was characterized as **High** for the purposes of this assessment.

Generally, the anticipated overall level of Visual Change would be **Medium** from Nantucket under the MDS, with four out of 13 viewpoints (five of 14 simulations) along the south shore characterized as **Medium** to **Strong**, six characterized as **Medium**, two characterized from **Weak to Medium**, and one characterized as **Weak**. Therefore, for higher sensitivity viewer groups on Nantucket, there is conservatively a **Medium** to **Medium/High** potential for impact under clear sky conditions. Because the most extreme scenarios are limited (fewer numbers of locations where the Project is visible and varying atmospheric conditions) the overall rating of the Project is **Medium** with **High/Medium** impact rarely occurring.

From Martha's Vineyard, the Project is largely not seen, or seen at a distance great enough that Visual Change is **Weak** to **Medium**. The potential for visual impacts resulting from the Project on Martha's Vineyard viewers will be **Medium to High/Medium.** However, the frequency of visibility and distance from the Project is minimal while vegetation screening along with the range in topography is substantial. Consequently, the characterization of impacts is considered **Medium** with **High/Medium** impact potential at only a small number of locations.

A number of factors contribute to the assigned level of potential impact. Important contributing factors include:

- The effects of earth curvature result in WTGs "disappearing" over the horizon line. The closer they are, the more one sees, and the farther away, the less one sees (see Figure 5-3). Due to the great distance of the WTGs from the places where most people congregate and value, the visual changes that will be experienced are indirect, occurring in the background view.

- Location on the islands of Nantucket and Maratha's Vineyard with a viewing aspect to the southwestern ocean horizon allows views of the WTGs and OSPs. The Project introduces vertical structure into the open ocean horizon where no vertical elements currently exist. However, given the great distance between viewers and the WTGs, the scale of vertical change is small. While the WTGs appear small from the viewing distances, they take up a large portion of the visible horizon line. In most cases, the available view is panoramic or wide angle. The field of WTGs stretches across approximately one-third of the visible horizon (120 degrees) from most viewpoints.
- The uniform layout pattern of WTGs and OSPs (a 1 x 1 nm [1.9 x 1.9 km] grid), is mostly not detectable. In some cases, rows of WTGs are discernible, but they are not seen as part of a larger pattern. The five OSPs stand out in some views as dark, horizontal figures distinct from the WTGs Their distinct form and dark color make them stand out in some lighting conditions.
- The color of the WTGs was not particularly noticeable. At most times of day, they appear as dark gray figures. When front lit, the white color is evident and creates a strong contrast with the dark ocean and blue skies. The simulations show that the blades are visible from most viewpoints on Nantucket and their motion will attract some level of attention. The simulations include a range of lighting conditions, with WTGs appearing from white to dark gray. While color contrast is mostly weak, either light or dark figures stand out against the horizon line.
- Two simulations include night lighting. Based on research for land-based wind turbines, it is anticipated that if standard FAA night lighting is used, visual impacts will be extended throughout dawn, dusk, and evening hours when atmospheric conditions permit. SouthCoast Wind will implement the use of an ADLS on the Project WTGs. See COP Appendix Y3, Aircraft Detection Lighting System Efficacy Analysis for further details. Due to earth curvature and distance, nautical navigation lighting (near the ocean surface) will likely not be visible from shore.
- Landscape character types on the islands are not directly impacted by offshore Project components due to distance. However, viewsheds are impacted, and viewers will (conditions permitting) experience some change to their experience on shore where they are visually connected to the ocean horizon. The only landscape/seascape character type that is directly affected by the Project is the open ocean character type, over 20 nm (37 km) from the nearest onshore character area. Boaters will experience closer views of the Project if they approach it, with visual dominance, particularly vertical dominance, increasing the nearer a boater gets to the Project. Beaches are the landscape character type most impacted from the standpoint of visual linkage; that is, the beaches are more directly connected to the open ocean unit by proximity and the unobstructed view.

In conclusion, views and the viewer experience may be affected by introducing the Project into the ocean setting especially for those on or near the south shore of Nantucket, particularly those who use the beaches.

5.4.4 Potential for Visual Effects with Changing Light Conditions

As described in Section 4.3.4, SouthCoast Wind developed a 3D animated simulation to illustrate differences in visibility of the offshore facilities under varying daylight and nighttime conditions, including the activation of the ADLS aviation safety lighting. The video is available for viewing at the link below:

SouthCoast Wind Offshore Wind Farm 24-hour 3D Animated Simulation with ADLS Activation

5.4.4.1 Changing Sun Angle

Changing sun angle may result in variations in the visibility of offshore structures based on differences highlighting and shadowing as the sun transits across the sky. The video simulation developed by SouthCoast Wind illustrates potential visual changes associated with sun angle in a time lapse video. Still simulations (see Section 5.2.4 and Attachment 3) also illustrate turbine visibility from a variety of locations and daylight and meteorologic conditions. The visual change assessment (Section 5.4.1) characterization provided in 5.4.3 account for visibility under maximum visibility conditions.

5.4.4.2 Aviation Safety Lighting

The FAA has regulatory requirements for the lighting of offshore structures within 12 nm of the shoreline (see 14 CFR part 77). While the SouthCoast Wind Lease Area falls outside of the FAA jurisdiction, BOEM recommends aviation safety lighting consistent with FAA requirements (BOEM, 2021b). Three requirements of note with respect to potential visual effects include:

- Lights should flash simultaneously at 30 flashes per minute (FPM);
- Structure lights should be visible in all directions in the horizontal (i.e., visible spread from 360 degrees); and
- All turbines above 499 ft (152 m) should remain lit during nighttime hours unless connected to an approved ADLS.

Aviation safety lighting represents a potential visual impact to viewers. SouthCoast Wind has proposed the use of ADLS to minimize the potential for effect associated with aviation safety lighting.

As noted above, SouthCoast Wind developed a video simulation to illustrate the potential visual effect associated with the use of ADLS. SouthCoast Wind analyzed one year of flight data near the Lease Area. Based on these data, only two flights were identified that would interact with the ADLS detection zone (see COP Appendix Y3, Aircraft Detection Lighting System Efficacy Analysis). The total estimated activation time for the ADLS lighting is less than 5 minutes per year. Additional military flights may occur within the detection zone but are not typical overnight.

Based on the video simulation, during activation, there is limited visibility of aviation safety lights under twilight and dark conditions. This combined with the infrequent likelihood of activation, suggest that use of ADLS will prevent negative visual effects associated aviation safety lighting.

5.4.5 Cumulative Impact of Reasonably Foreseeable Future Actions - Offshore

The cumulative impact analysis considers potential impacts on scenic resources that could result from the Project under the MDS (conducted herein) combined with past, present, and reasonably foreseeable future actions. As discussed in Section 4.4.4, BOEM does not require this analysis for the COP, but provides guidance on what materials are needed to assist BOEM in decision-making on the impacts from Reasonably Foreseeable Future Actions within the NEPA process.

SouthCoast Wind has provided simulations, geographic information system (GIS), and other data to BOEM for their use in determining cumulative impacts under the EIS for this the Project. Additional materials and information will be provided as necessary throughout the NEPA process.

As BOEM points out in its new SLVIA, NEPA requires that projects be considered within the context of reasonably foreseeable additional projects. As of this writing one nearby offshore wind project, Vineyard Wind 1, has been approved for development. Other projects (eight total) are in various stages of design or review within the vicinity of SouthCoast Wind (Figure 5-39). Ultimately more than one project will likely be in view from some or all of the KOPs considered in this VIA. In some cases, WTGs from one project may "hide" fully or partially the WTGs from another. SouthCoast Wind is one of the farthest projects from shore in this vicinity. Hence it may have less visibility and impact than several other projects.

Since the types of WTGs that may be built by different developers will vary to an extent, and projects will likely be built at different times, cumulative impacts are likely to be incremental and additive. The VIA anticipates that the greatest effect will be from additional WTGs along the horizon line as more projects are constructed.

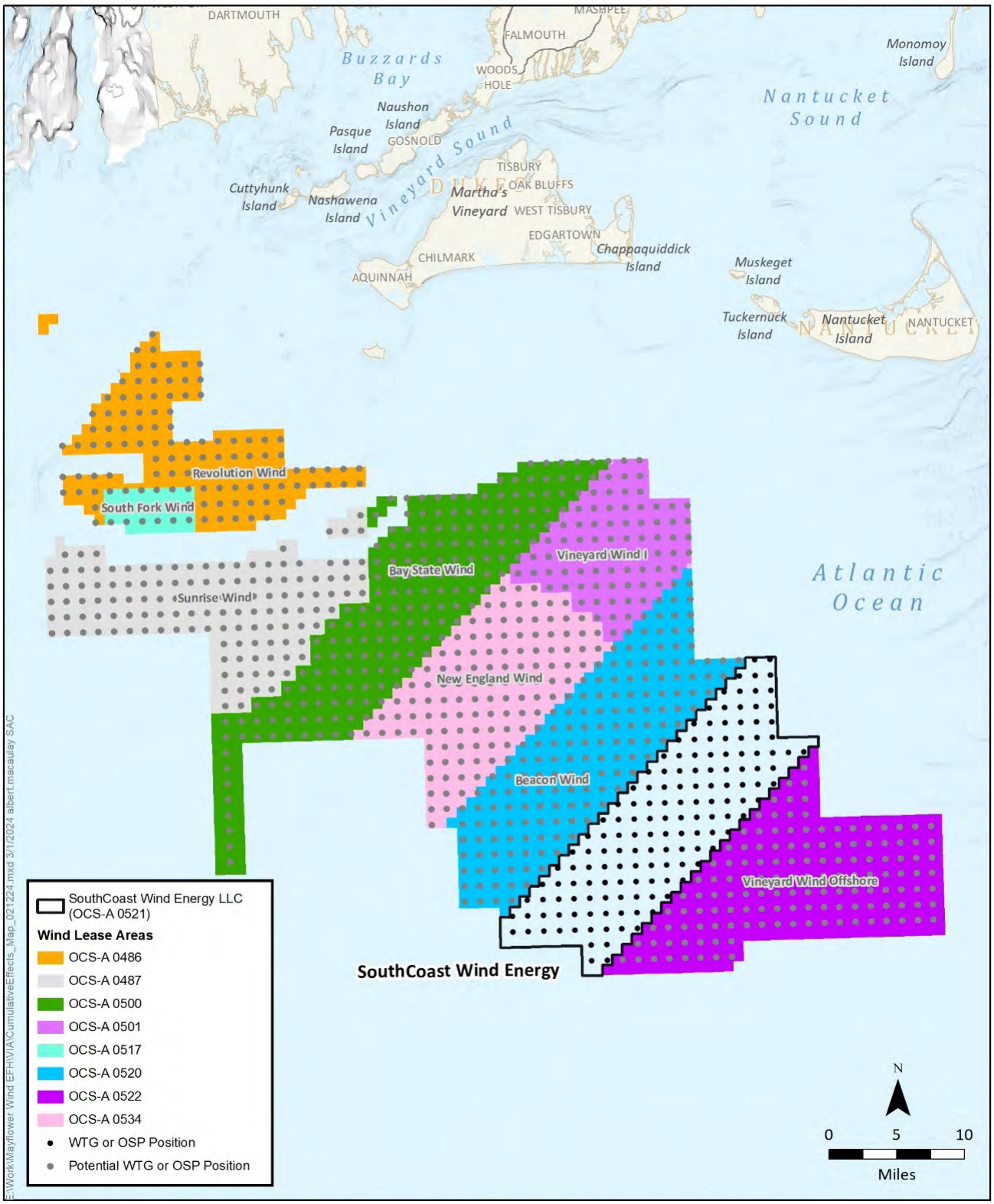


Figure 5-39. Rhode Island/Massachusetts Wind Energy Area Lease Areas

5.5 Mitigation - Offshore

Mitigation is a requirement of the BOEM VIA for the purpose of offsetting potential unacceptable levels of adverse impact. This analysis concludes that the MDS considered in this VIA would generate **Medium to Medium/High** potential for visual impacts from Nantucket and a **Low to Medium** potential for impacts from Maratha's Vineyard.

There are some factors that may be somewhat mitigated by reducing visual contrast or visibility of the offshore facilities. These include turbine color and a night lighting system consistent with FAA requirements.

Some Project elements may not allow for mitigation measures. These include blade motion and the positions of the turbines within a 1 x 1 nm (1.9 x 1.9 km) grid agreed to across the BOEM lease areas. While the size and scale of the turbines could be reduced, doing so would potentially reduce power generation and may make the Project economically inviable.

SouthCoast Wind will paint the WTGs a color that falls within the BOEM-recommended paint color range (BOEM, 2021b) to reduce the level of visual contrast, to the extent practicable. The proposed color of the towers and blades will be painted a color no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey, according to the latest BOEM and USCG guidelines. Grey somewhat absorbs the color of its surroundings. However, at certain times of day and lighting conditions, a light grey color may appear nearly white. Depending on sky color, white may have a higher visual contrast than grey (e.g., white clouds against a blue sky). The selection of color will seek to better balance the turbines within the surroundings (average day), reduce reflectivity, and improve blending into the typical colors of its setting. This approach for color selection will not hide the feature but will lower visual contrast.

Current BOEM requirements follow FAA guidelines that require flashing red lights positioned on the turbines. SouthCoast Wind will implement ADLS, which is radar activated. Instead of blinking continuously, lights only come on if there is an aircraft detected in the vicinity. ADLS lighting will avoid extending visual impacts into twilight and nighttime hours and substantially reduce visual impacts (BOEM, 2021b). See COP Appendix Y3, Aircraft Detection Lighting System Efficacy Analysis, for further details.

6.0 Onshore Visual Impact Analysis

The potential for visual impact associated with the onshore components of the Project are discussed in the sections that follow. The methodology used for the analysis is described in Section 4.0. The onshore Project components are described in Section 2.2, with additional detail available in COP Section 3, Description of Proposed Activities.

6.1 Establishment - Onshore

6.1.1 Onshore Project Design

The MDS design parameters for the onshore substation are summarized in Table 6-1. The assessment is based on the Project maximum design assumptions to support a conservative analysis of maximum visual impacts.

Table 6-1. Maximum Design Parameters Used in Onshore Visual Simulations

Project Attribute	Description
Onshore Substation	Two locations under consideration: Lawrence Lynch (preferred) and Cape Cod Aggregates (alternate) Up to 26 acres (10.5 ha) for the substation yard Fencing: 8-ft (2.4-m) high surrounding the substation; includes 7-ft (2.1-m) high chain-link fence with galvanized fabric with 1-ft (0.3-m) high barbed wire top barrier. 4 ft (1.2 m) chain-link fence surrounding the infiltration basins Limited vegetation clearing will occur Structure heights: lightning masts – up to 85 ft (26 m) Color Used in Simulation: RAL 7035 Light Gray (Hex #C5c7c4; r 197, g 199. b 196; c 20, m 10, y 15, k 5)

6.1.2 Onshore APVI Preliminary Characterization

As described in Section 6.2.1,, the landscape/seascape character types, viewers/receptors, and visual resources were characterized based on available documentation to allow for the selection of KOPs for field evaluation. Ocean character type is not directly applicable to the onshore APVI.

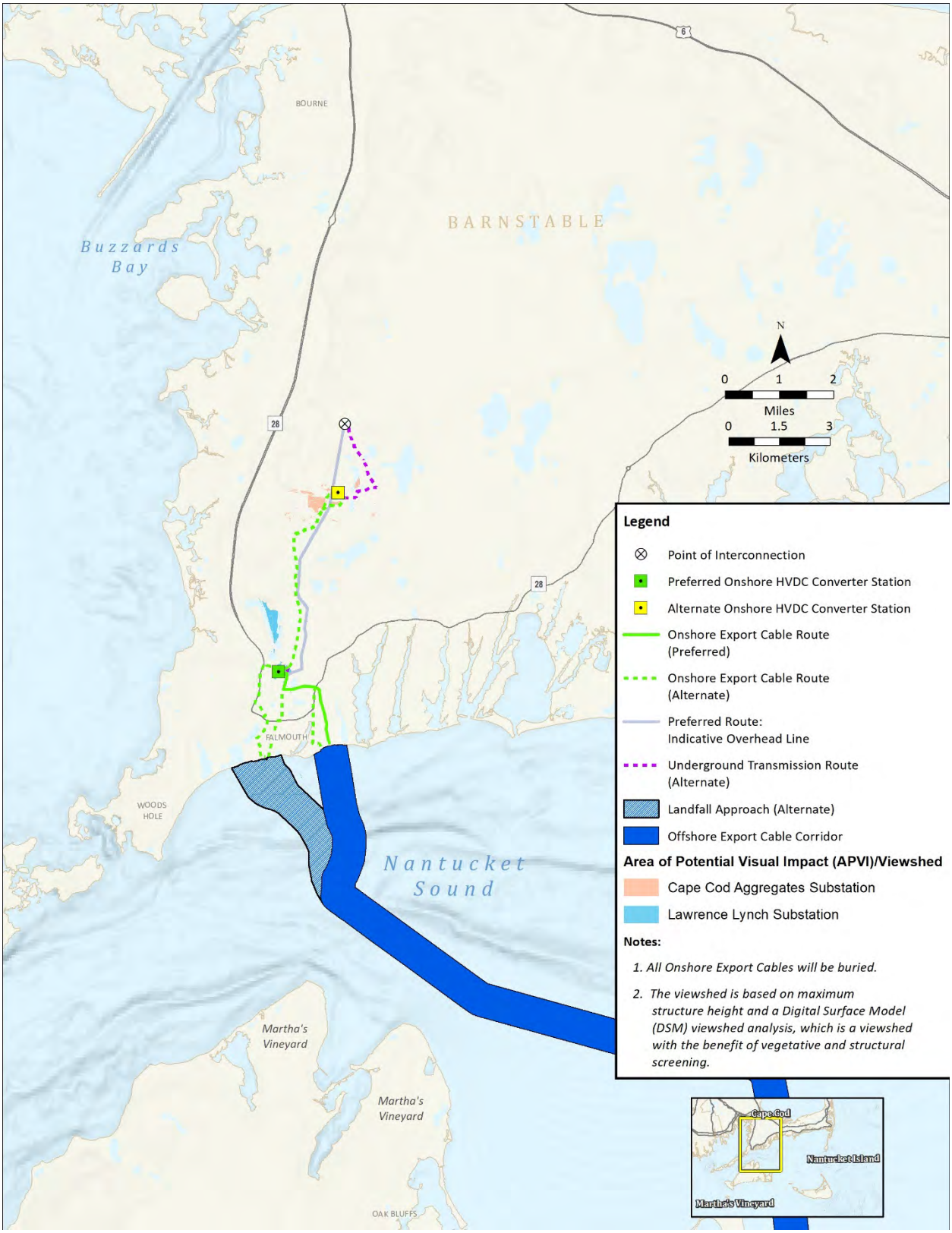
6.1.3 Area of Potential Visual Impact - Onshore

The viewsheds/visibility analysis describes the area within which the onshore substation may be visible, and thus could be seen and contribute a level of visual change within an existing setting. Factors that influence visibility are distance, vegetation, topography, and buildings. For the purposes of delineating the APVI, a DSM analysis was completed which considers the potential screen provided by intervening vegetation or structures (Figure 6-1). The viewshed analysis assumes maximum structure height (lightning protection masts) at the substation of 85 ft (26 m). Given the amount of vegetative screening and relatively level topography, the APVI was extended a maximum of 3.5 mi (5.6 km) in all directions from above ground Project components under consideration. Sullivan (2014) indicates that 3.5 mi (5.6 km) is an appropriate APVI for the viewshed of transmission towers, which are taller than the substations. The APVI of 3.5 mi (5.6 km) is therefore a reasonable distance to consider for impacts from the substation facilities.

The resulting APVI was used to assess the potential visibility of the substation from common and known sensitive viewer locations (i.e., KOPs). Viewer experience will depend on their activity and means of travel. Roadway travelers may have intermittent views of the Project, where a wildlife viewer along a trail may have a sustained view of part of a feature.

6.1.4 Selection of Preliminary Onshore KOPs

Representative KOPs were selected based on the methods described in Section 1.0. As described in Section 4.2, each KOP was evaluated with respect to its landscape/seascape character types and viewers.



Note: KOPs which fall within the orange and blue shaded areas are within the viewshed based on the digital surface model (DSM). Not all KOPs within the viewshed will have visibility to the substation.

DSM viewshed is depicted as provided by ICF.

Figure 6-1. Onshore Viewshed Analysis Map Based on DSM

6.2 Onshore Baseline Inventory

The baseline landscape and visual conditions are important components of the analysis. These include a detailed description of:

- Potential visibility;
- Landscape character attributes;
- Receptors/viewer sensitivity;
- Historical significance/relationships of potential key viewing areas;
- Selection and evaluation of KOPs; and
- Field photography and analysis from selected KOPs.

Baseline conditions were documented by first dividing the analysis area into landscape/seascape character types based on prevailing topography/landform, vegetation, water forms, level of development, historic places, and management framework. KOPs were established within each analysis unit, and data on the following attributes were collected. When describing the distance of a KOP relative to the Project, the following conventions were used: Foreground (0 to 0.5 mi [0.8 km]); Middle Ground (0.5 mi to 4 mi [0.8 km to 6.4 km]); and Background (4 mi [6.4 km] to horizon).

6.2.1 Onshore Landscape Character Types

Cape Cod is part of the seaboard lowlands section of the New England Physiographic Province (USGS, 1993), Level III Ecoregion “Northeastern Coastal Zone”. This Physiographic Province is low in elevation and includes the whole eastern half of Massachusetts and islands, all of Rhode Island, and Connecticut, excluding the northwestern corner. Cape Cod’s ecoregion is classified as the “84. Atlantic Coastal Pine Barrens”, which includes parts of New England and the northeast coast south to New Jersey (Griffith et al., 2009). This ecoregion, where it is not developed or converted to urban uses, is described as a traditional coastal plain with a mild maritime climate, stunted pine and oak forests growing on sandy, nutrient-poor soils, open ocean, kettle ponds, and unique habitats in salt and freshwater marshes, swamps, bogs, and sand dunes. Typical vegetation and wildlife communities found in these areas are provided in COP Appendix J, Terrestrial Wildlife and Vegetation.

Within the 84 classification, Cape Cod is more specifically part of the “84a. Cape Cod/Long Island Ecoregion”. In this ecoregion, elevation is typically less than 150 ft (45.72 m), with relief less than 60 ft (18.28 m). The lands of Cape Cod were made by the continental glacial ice sheet, resulting in terminal moraines, outwash plains, and coastal deposits, whose dominant landform features are reshaped by the dynamic coastal environment with continual changes due to wind, wave, and tidal energy (Griffith et al., 2009).

The ecological significance of the onshore APVI is high because of the unique variety of landscapes and habitat regions within Cape Cod. The abundant inlets, ocean bays including Buzzards Bay, ocean sounds including the Vineyard Sound and Nantucket Sound, and historic districts play into the significance of the study area. The onshore study area of the Project includes the western side of Cape Cod. Much of the study area comprises roadways, residential areas, and public recreation spaces including walking paths and biking trails and parks.

The study area has a high visual integrity, resulting from the interactions of the natural setting and the visible human history. This is a visually rich setting, highly valued by residents and visitors. Local citizens and governments have provided efforts to protect and preserve resources dedicated to the conservation of lands and preservation of cultural resources. Much of the land on Cape Cod has been protected through public agencies, regulatory authorities, private land conservancies, and land trusts.

A wide variety of landscape character types have been protected, from ocean beaches to upland forests. Landscape character types in the surrounding study area are visualized below in Figure 6-2. The Mashpee National Wildlife refuge covers nearly 6,000 acres (2,400 ha) near Mashpee, which is telling of the strong conservation efforts within Cape Cod. Additionally, Waquoit Bay National Estuarine Research Reserve includes open waters, beaches, marshlands, and uplands near Falmouth and Mashpee (Pruetz, 2011).

6.2.1.1 Landscape Character Types

Landscape character types found within the Project Area were mapped within the APVI for the onshore substation. These include:

- Coastal Scrub,
- Commercial,
- Fields/Meadows,
- Light Industrial,
- Nantucket Sound (Ocean Beach);
- Rural/suburban residential;
- Ponds/Tidal Marsh,
- Village/Town;
- Parks/Developed Recreation;
- Dunes, and
- Forests/Woodlands.

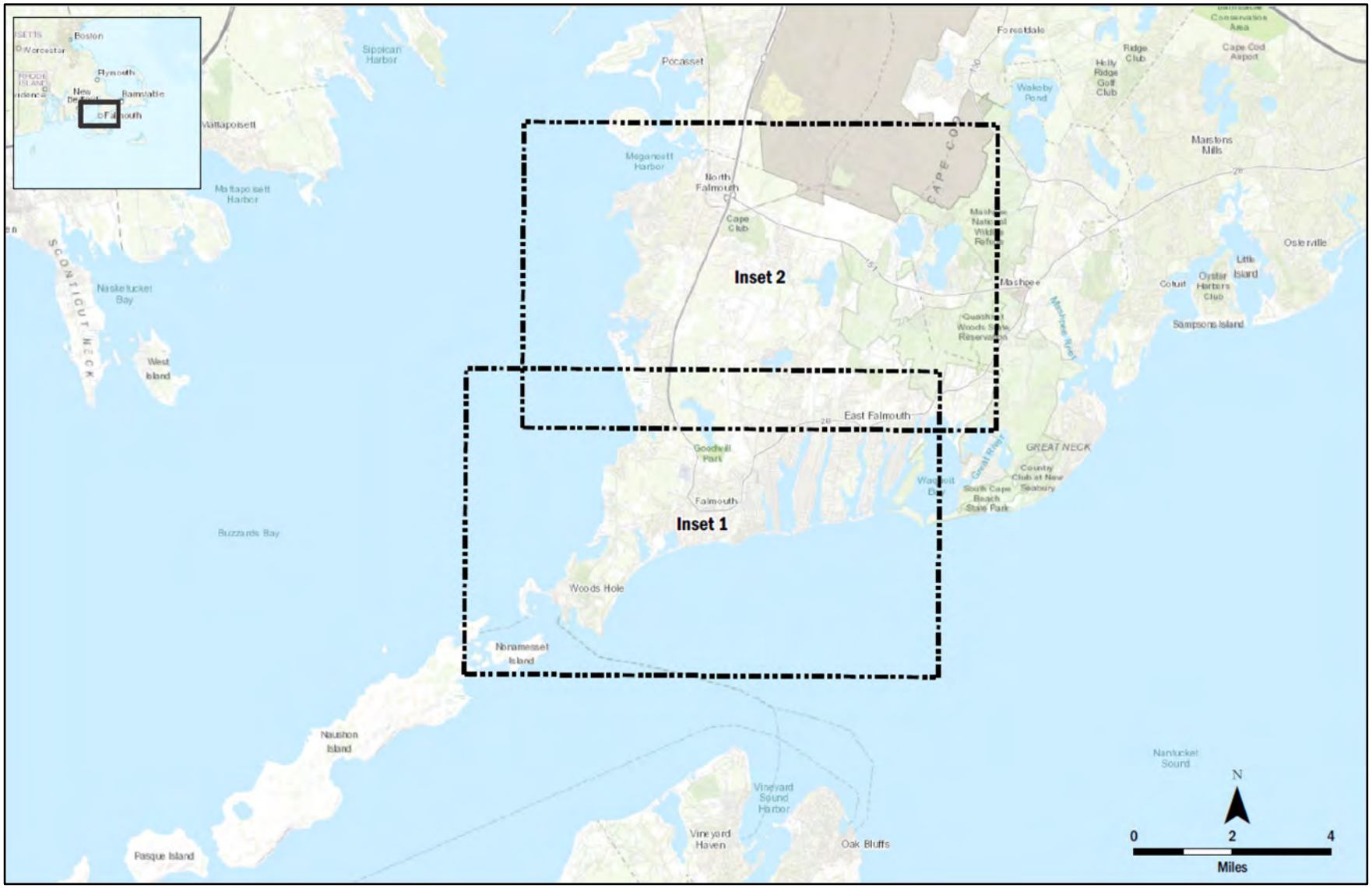
These character types are provided as a baseline for the onshore VIA. The prevalence and location of each character type are provided in Figure 6-2 through Figure 6-4. Some of these character types are also found in the Offshore APVI (Section 5.2.1.2) and examples are shown in Figure 5-16 through Figure 5-27. A description of the Onshore APVI character types is provided in Figure 6-5 through Figure 6-15.

6.2.1.2 Historic Districts

The landscape/seascape character areas within the Historic Districts on Cape Cod are an important part of their preserved history and settings. There are five areas designated as Historic Districts spread across the western side of Cape Cod in Woods Hole, Falmouth, East Falmouth, West Falmouth, and North Falmouth, as displayed in Figure 6-3 and Figure 6-4, some of which intersect with Potential Environmental Justice Communities. The Historic District in Falmouth falls within the SLCUs of rural/suburban residential, the town/village center of Falmouth, light industrial, and commercial. The long stretch of Historic District in West and North Falmouth includes the SLCUs of Rural/Suburban Residential, Village/Town, Coastal Scrub, Ponds/Tidal Marshes, and Forests/Woodlands. The onshore export cable routes avoid the Historic District within Falmouth.

6.2.1.3 Environmental Justice Communities

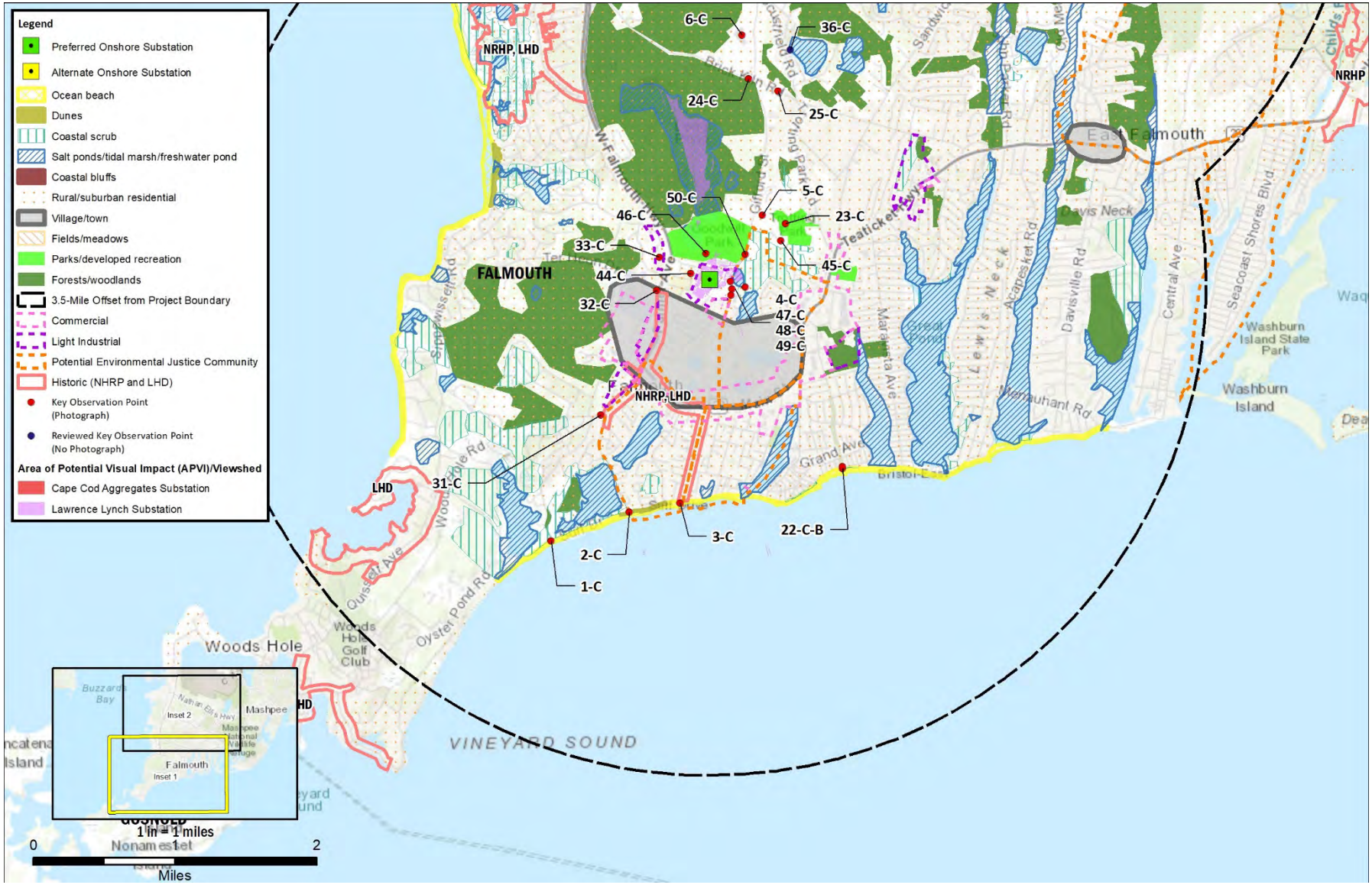
Ten EJ Communities located in the towns of Falmouth, Mashpee, Sandwich, and Bourne have been identified within the APVI of the two substation locations under consideration (MassGIS, 2021b). The Lawrence Lynch substation site is located adjacent to an EJ Community where 27 percent of the population identifies as a minority. The Cape Cod Aggregates substation site neighbors three EJ Communities where the total income ranges from 25-50 percent of the Massachusetts median income. Approximately the same percentage of total acreage of EJ Communities within the APVI is present for each substation location: 0.19 percent for the Lawrence Lynch site and 0.39 percent for the Cape Cod Aggregates site.



Source: ESRI, 2020

Note: Viewshed based on DSM and Landscape/Seascape Character Types for the Substation Site at Lawrence Lynch (Inset 1) is provided in Figure 6-3; Viewshed based on DSM and Landscape/Seascape Character Types for the Substation Site at Cape Cod Aggregates (Inset 2) is provided in Figure 6-4

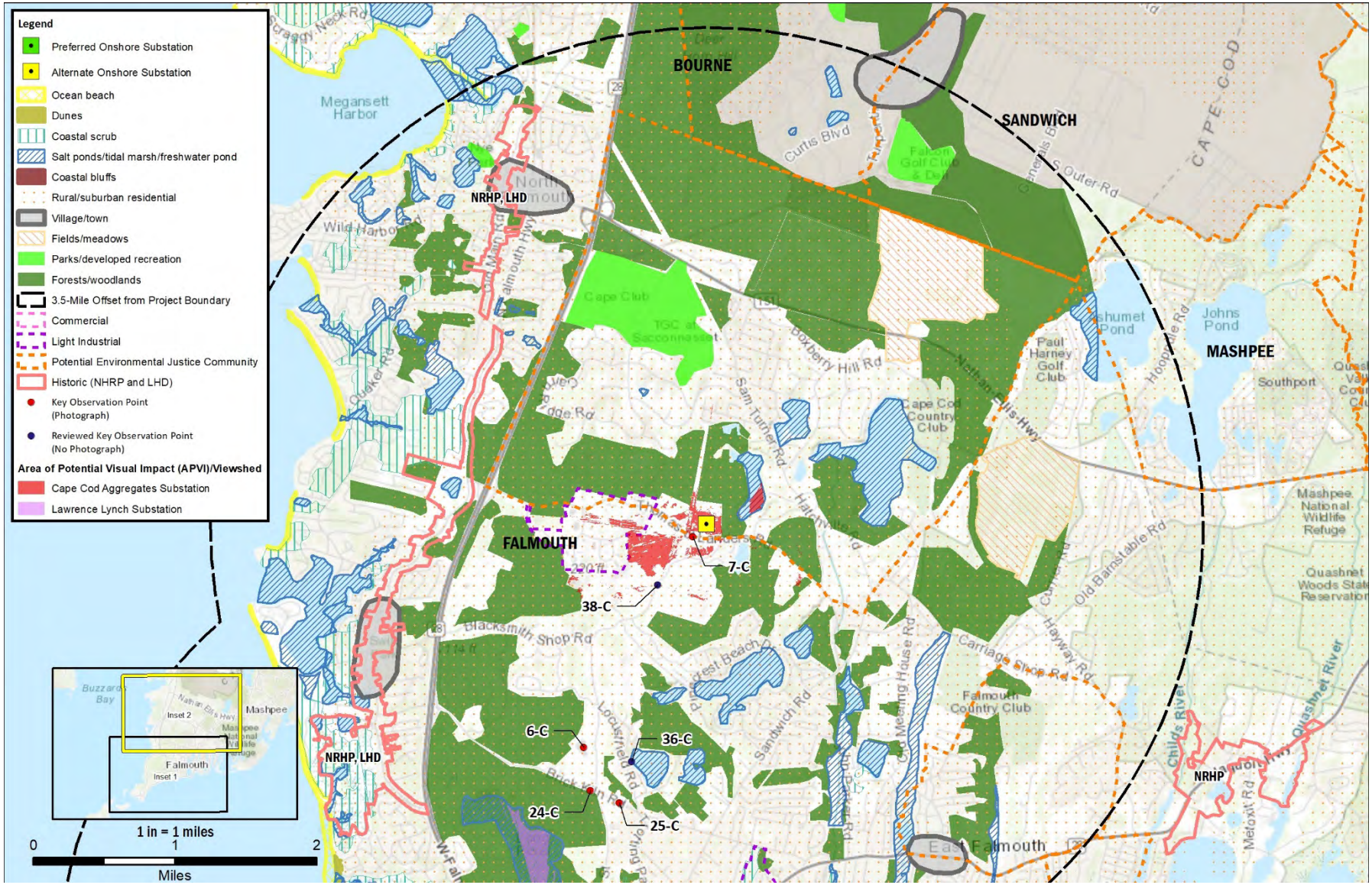
Figure 6-2. Onshore Landscape/Seascape Character Types: Index Map



Source: ESRI, 2020; MACRIS, 2021, MassGIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties. DSM viewshed is depicted as provided by ICF.

Figure 6-3. Landscape/Seascape Character Types for the Substation Site at Lawrence Lynch with DSM Viewshed: Inset 1



Source: ESRI, 2020; MACRIS, 2021, MassGIS, 2021

Note: "Historic" includes all properties and resources listed in MACRIS. Details provided in COP Appendix S, Analysis of Visual Effects to Historic Properties. DSM viewshed is depicted as provided by ICF.

Figure 6-4. Landscape/Seascape Character Types for the Substation Site at Cape Cod Aggregates with DSM Viewshed: Inset 2

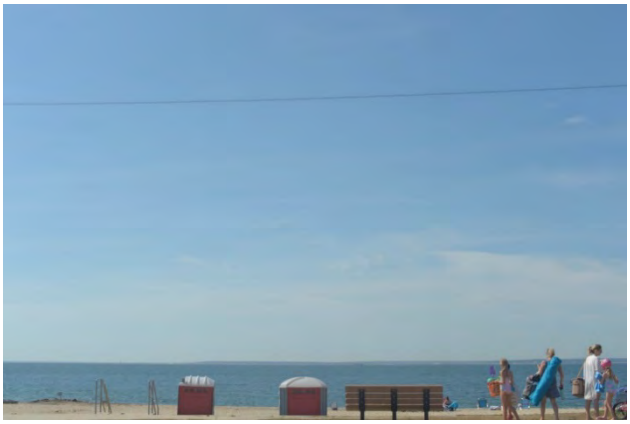


Figure 6-5. Nantucket Sound

The Nantucket Sound (Figure 6-5) includes the enclosed waters between Martha's Vineyard, Nantucket, and the southern shores of Cape Cod. The dominant visual impression is the broad, flat expanse of water, the blue or gray color reflecting the sky, the smooth or choppy texture of the water surface, and the distant horizon line. Scenic integrity is high, with few or no existing visual intrusions. Conditions range from flat water to choppy to rolling swells. Nantucket Sound is represented by the coastal KOPs on Cape Cod (Table 6-2).

Figure 6-6. Freshwater Ponds

Freshwater ponds (Figure 6-6) are abundant within Cape Cod's land mass, covering over 11,000 acres (4,452 ha). They were formed by glaciers during the ice age that, when melted, formed depressions in the earth called kettle holes. These ponds are critical habitat areas supporting a variety of fish, avian, and terrestrial wildlife (Paskakarnis, 2003). Often walking trails and parks will be developed around these ponds for recreational users, residents, visitors, and tourists to enjoy. They are also often part of conservation efforts. Views around most freshwater ponds include forested woodlands, residential areas, and sometimes buildings or development. The texture tends to be smooth with coarser edges. Forms are flat, or low and irregular, and lines can be strong. The color is often a blue gray due to the water and open sky, with browns and greens due to the surrounding forests. The freshwater pond character type was represented by one KOP on Cape Cod (Table 6-2).

Figure 6-7. Rural/Suburban Residential

Residential development (Figure 6-7) is a common character type specific to the Cape Cod style of home. There is a range of scale and density, from small cottages to mansions; however, in the Project Area, average-sized homes are the dominant type. The Cape Cod style of home is a low, broad, single-story building with steep-pitched gable roof, a large chimney, and simple but refined details. Siding consists of gray/untreated wooden shake. Some areas are developed to town-type densities, while others are more spread out. Vegetation is often taller woodlands between 25 and 50 ft (8 and 15 m) in height. The average building height in Falmouth is 35 ft (10.6 m) (Town of Falmouth, 2020). The residential character type was represented by six KOPs on Cape Cod (Table 6-2**)**.

Figure 6-8. Historic Districts

There are many historic districts containing historic buildings and homes around the APVI. Some landscapes within and around the Falmouth Onshore Project Area contain many layers of history. The historic property character type was represented by two KOPs on Cape Cod (Table 6-2). Additional information is provided in COP Appendix S, Analysis of Visual Effects on Historic Properties.

Figure 6-9. Village/Town

The village and town areas (Figure 6-9) tend to be denser and more built up, with multiple use areas including Falmouth and Woods Hole. These are small village settings, some with highly valued historic features and character. Architecture varies in style and age, but buildings typically do not exceed two stories. The landscape is manicured. Colors vary depending on the area, but they may be dominated by the gray, white, red, and orange of the buildings, and some brick sidewalks and stone parking lots. Lines are strong, with streets, trees, and buildings reinforcing each other. Texture is rich and grainy. Forms are rectilinear and angular, shaped by the buildings and their roof lines. Visual integrity is mostly very high as these areas are dominated by historic buildings, or compatible ones. The village/town character type was represented by seven KOPs on Cape Cod (Table 6-2).

Figure 6-10. Highways/Roadways

There are several highways (Figure 6-10) that run north to south on Upper Cape Cod, one of which falls within the vicinity of the onshore substation. Along these major roadways are branching neighborhoods, markets, grocery stores, retail stores, and town centers. The existing utility-owned ROW crosses a number of roadways. Colors are typically dominated by grays due to the road, browns and greens due to surrounding forests, and blue or gray due to the open sky. Lines are strong with the roadway cutting a clear path along the tree line. The texture is smooth on the roadway and sky, and grainy and coarse along the tree edges. The highway/roadway character type was represented by eight KOPs on Cape Cod (Table 6-2).

Figure 6-11. Parks/Developed Recreation

Within Cape Cod, there are many parks and recreation areas (Figure 6-11) including playgrounds, ponds, walking trails, bike paths, sports fields, and camping sites. These are used by residents, recreational users, tourists, and visitors. Some appear more heavily used than others. These parks contribute to the open space value of the area and provide public access. Recreation areas like ballparks are often set between the roadways and a forested woodland. These open spaces provide a good place for greenways and corridors to run near. The texture of recreation spaces varies but may tend to be smooth with coarser edges if there are trails. Forms are flat, or low and irregular, and lines can be strong. The color is often a blue gray with browns and greens due to the surrounding forests. The parks and developed recreation character type was represented by seven KOPs on Cape Cod (Table 6-2).

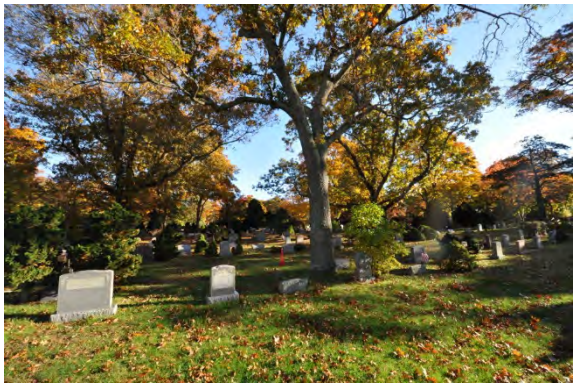


Figure 6-12. Cemeteries

There are many small-scale cemeteries on Cape Cod, some of which are on the National Historic Registry list (Figure 6-12). Some cemeteries are neatly manicured with roadways and walking paths, while others are natural appearing with legacy trees and native plants. The natural-appearing cemeteries provide habitat connectivity within greenways. Cemeteries often contribute to open space values and the historical value and preservation within an area. These cemeteries are 100 to 200 years old. Some are located off main roads while others are within residential neighborhoods. Tourists, residents, and visitors come here for visiting or recreation purposes. Colors tend to be greens and browns with grays and blues. Forms are sometimes flat and low, or hilly, and they typically have strong lines. The texture ranges from smooth to coarse. The cemetery character type was represented by two KOPs on Cape Cod (Table 6-2).

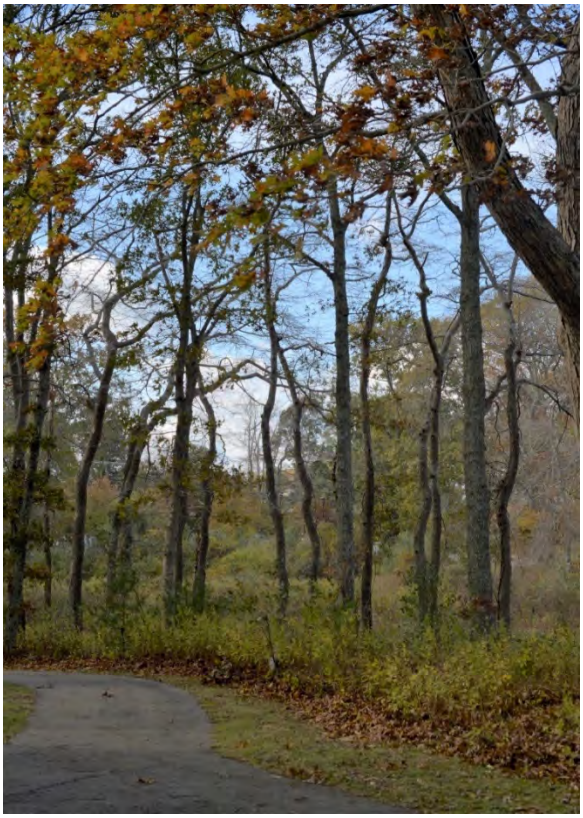


Figure 6-13. Forests/Woodlands

Forests and woodlands (Figure 6-13) are very dominant on Cape Cod. Topography is rolling. Views are enclosed, restricted by forest vegetation in most areas. Forests are low- to mid-stature, mixed conifer and hardwood, typically with trees no more than 50 ft (15 m) tall, often combined with, or integrated with, other character types, including residential land, fields, and coastal scrub. Cape Cod is dominated by maritime vegetation communities including a variety of early successional vegetation. This is due to the shifting coastal weather patterns, creating a dynamic system. Conservation efforts on Cape Cod have worked to restore and protect land for the ecological value and to improve public access to these spaces. Greens and browns are visually dominant with a coarse texture. The forest/woodland character type was represented by seven KOPs on Cape Cod (Table 6-2).

Figure 6-14. Light Industrial, Lawrence Lynch Corporation

Light Industrial development (Figure 6-14) is fairly limited on Cape Cod, especially in Falmouth near the onshore Project components. Light Industrial tends to be surrounded by Rural/Suburban Residential, Forests/Woodlands, and Commercial landscape characteristics. Colors tend to be tans and grays surrounded by greens and browns. Textures are smooth to rough with varying shapes depending on the development. The Light Industrial character type is represented only by the Lawrence Lynch Corporation where the preferred onshore substation will be located.

Figure 6-15. Commercial

Commercial areas (Figure 6-15) are limited on the portion of Cape Cod where the onshore Project components will be located. Most commercial developments on Cape Cod have grey shingled buildings and are smaller scaled with vertical and horizontal lines. The majority of commercial landscapes on this portion of Cape Cod are consistent with the Falmouth Village center (Figure 6-3). A small commercial park is located just south of the preferred substation site off Gifford Street (Figure 6-3).

6.2.2 Receptors/Viewers - Onshore

Viewers are the people who ultimately will see the Project and experience its effects. Other receptors may include locations of historical importance. The viewer groups and context associated with the onshore Project components are described in the sections that follow. Viewer groups are identified for each KOP and are summarized for each in Table 6-2**Table** 6-2**.**

6.2.2.1 Viewer Groups and Context

Receptors are the people who directly see and interface with the Project. The Falmouth Onshore Project Area stretches from the southern coast to a point approximately 1.5 miles (2.4 km) south of the northern Town boundary. The proximity of land and water, nature and culture, make these areas highly appealing aesthetically. The area has been a tourist destination since the 19th century.

Viewers within the viewshed of the onshore substation include residents, workers and visitors in Falmouth. These communities comprise a diverse set of year-round and seasonal residents, recreational users, tourists, and workers. Viewers likely engage in many aspects of passive and active recreation, including:

- Hiking;
- Jogging;
- Fishing;
- Boating;
- Cycling;
- Swimming;
- Wildlife viewing; and
- Beach recreation.

For the onshore portion of the Project, the following groups represent the anticipated receptors/viewers to interface within the Falmouth Onshore Project Area:

- Residents of the local communities (year-around residents and seasonal residents);
- Tourists and Tourist-related businesses; and
- Recreational Users.

The landscape character within the APVI varies from mostly natural to cultural, depending on viewer position, the type of activity in which the viewer is engaged and the level of exposure to the Project. This variability in character and the quality of the setting where the viewer is seeing the Project is a defining attribute of the landscape setting. See Table 6-2 for details specific to each KOP.

Residents of Local Communities

Local Communities consist of year-round and seasonal residents. Communities have done much to conserve the existing visual and historic character of the area. The Falmouth Onshore Project Area includes designated historic districts, traditional neighborhoods, industrial sites, parks, and cemeteries. In addition to conserving historic sites, these communities have protected natural areas for conservation spaces.

The year-round population of Falmouth is 30,993 with a seasonal population of more than 105,000 (U.S. Census Bureau, 2019). Residents, both year-round and seasonal, live either in one of the small towns within semi-rural natural mixed hardwood forests or beach environments. It is assumed that all or nearly all residents, year-round and seasonal, are concerned about visual quality and resources and will spend time at places where Project features will be visible, including beaches, parks, conserved areas, parks, trails, and historic sites.

Residents within local communities, and tourists visit Cape Cod for the diverse culture, history, and setting such as the ocean scenery, historic buildings, towns and sites, active recreation, nature, or an escape from

summer heat. Visitors will also likely use the main highways and roadways during their travel. It can be presumed that scenery is an important factor and that many if not most tourists will visit places from which the Project features will be visible.

Tourists and Tourist-Related Businesses

Cape Cod is a major tourist attraction that contributes to the growing population in the summer months. In addition to the year-round residents, summer tourists and seasonal residents bring the population to 105,000 in Falmouth alone (Falmouth Economic Development & Industrial Corporation [EDIC], 2019).

The height of the tourist season is July through August during the traditional summer vacation season. Hotels, rentals, and beaches are crowded at this time. Tourist-related businesses likely make most of their annual income in this short period.

Visitors come for many reasons: ocean scenery, historic buildings, towns and sites, active recreation, nature, or an escape from summer heat. Visitors will also likely use the main highways and roadways during their travel. It can be presumed that scenery is an important factor and that many if not most tourists will visit places from which the Project features will be visible.

Recreational Users

People who live, work in, and visit the area take advantage of the setting to engage in specific recreational activities. Active recreational users, such as bikers, runners, boaters, water skiers, kayakers, paddle boarders, and swimmers, may be less likely to view scenery while they are recreating, but the setting may contribute to what they are doing and why they are drawn to the area. Many people also come to Cape Cod for more passive recreation and vacationing, such as spending the day on the beach and enjoying the views while others take advantage of the many biking and walking trails, ball parks, and conservation spaces, which have their own unique views. We can assume that many if not most recreational users will visit places from which the Project features will be visible.

6.2.2.2 Historical Importance

The APVI includes a portion of the Town of Falmouth. Within the APVI, there are: ten resources in Falmouth, two NRHP-eligible districts and eight resources that are individually NRHP-eligible. Many of the onshore resources were evaluated in the field for potential visibility of the Project. However, only one resource (Oak Grove Cemetery) has visibility to the preferred substation site.

Historically valued properties were identified in the AVEHP (COP Appendix S) and researched to understand the value that these properties hold and the role they play in defining the area.

6.2.3 Selection of Onshore KOPs

KOPs represent both common and sensitive views that fall within the APVI as represented in the Viewshed Analysis in Section 6.1.2. KOPs are used to assess potential changes to landscape character that could result from the Project.

A list of KOPs was identified including historic structures and buildings, significant landscapes, recreation areas, scenic roads, overlooks and vistas, public beaches, town centers, residential communities, and estates. Sites selected as KOPs reflect importance to the scenic, social, cultural, and economic resources. A desktop analysis of the potential KOPs within the viewshed was field checked for potential visibility of the Project from the KOPs. If the Project was not visible from the KOP, it was indicated as such.

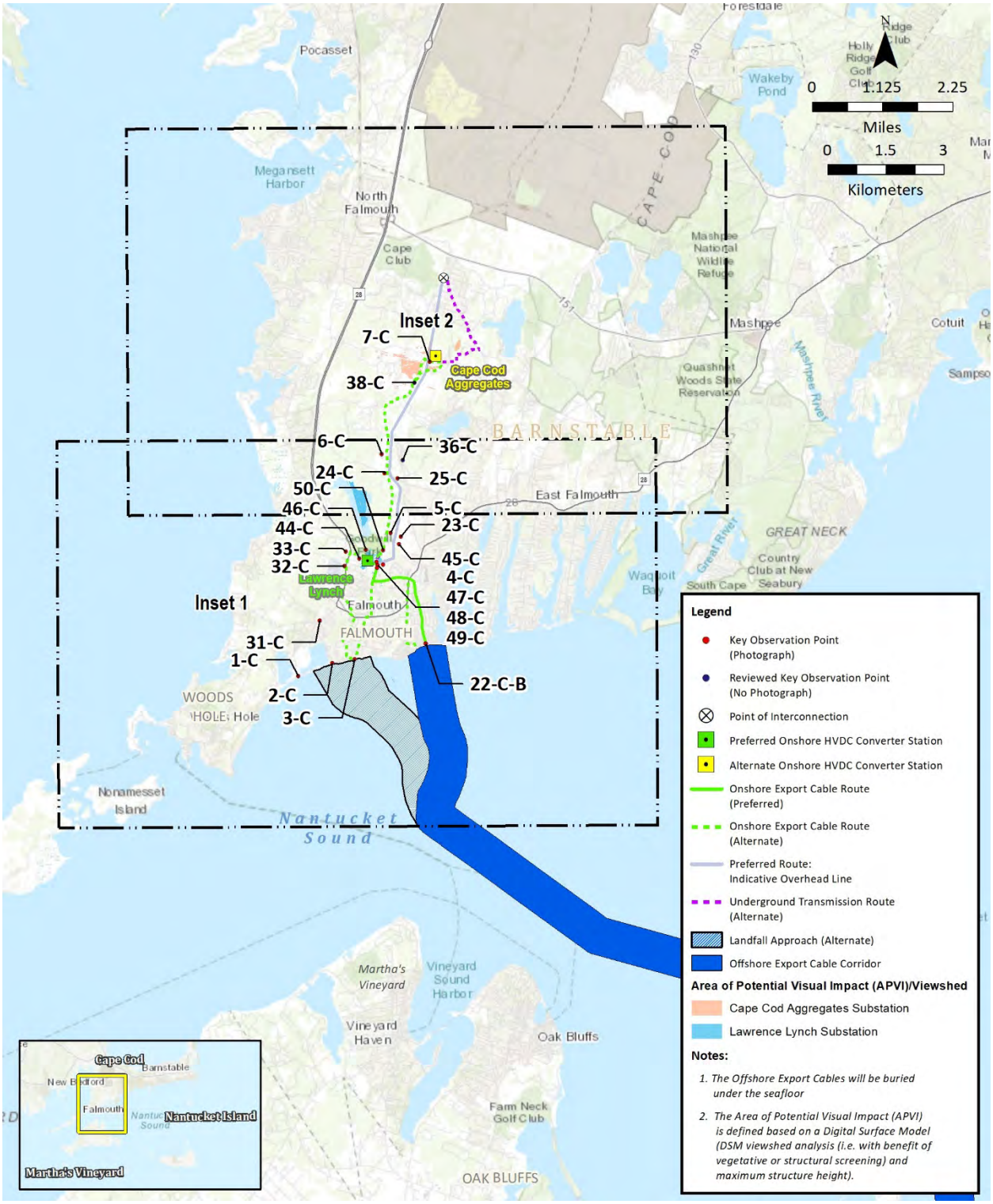
The KOP list includes a broad selection of locations representing views of the Project from multiple angles, distances, vantages, and interests (residential, tourism, and economic). Locations were then referenced for historic importance and researched to conclude whether they are listed on the National Historic Register. The AVEHP (COP Appendix S) provides significant detail and history on the relevance of these places.

The proposed KOPs were assessed for potential visibility to the onshore substation. These were analyzed using the following criteria:

- Distance from the KOP to the onshore substation (1);
- View exposure (degree of foreground screening) (2);
- Level of use by the receptor (3);
- Iconic views (4);
- Sensitivity of the viewer to view disruption or change (5);
- How well the site may represent additional typical views (6);
- Historic or cultural importance of the site and documentation of NRHP (7);
- Tourism importance of the site (8);
- Uniqueness (9);
- Type of viewpoint: stationary (i.e., designated point, historic site), area based (i.e., beach, town), and corridor (i.e., trail, scenic road) (10);
- Topography: Include high points, low points, common elevations (11);
- Public concern (12); and
- Viewer experience (13).

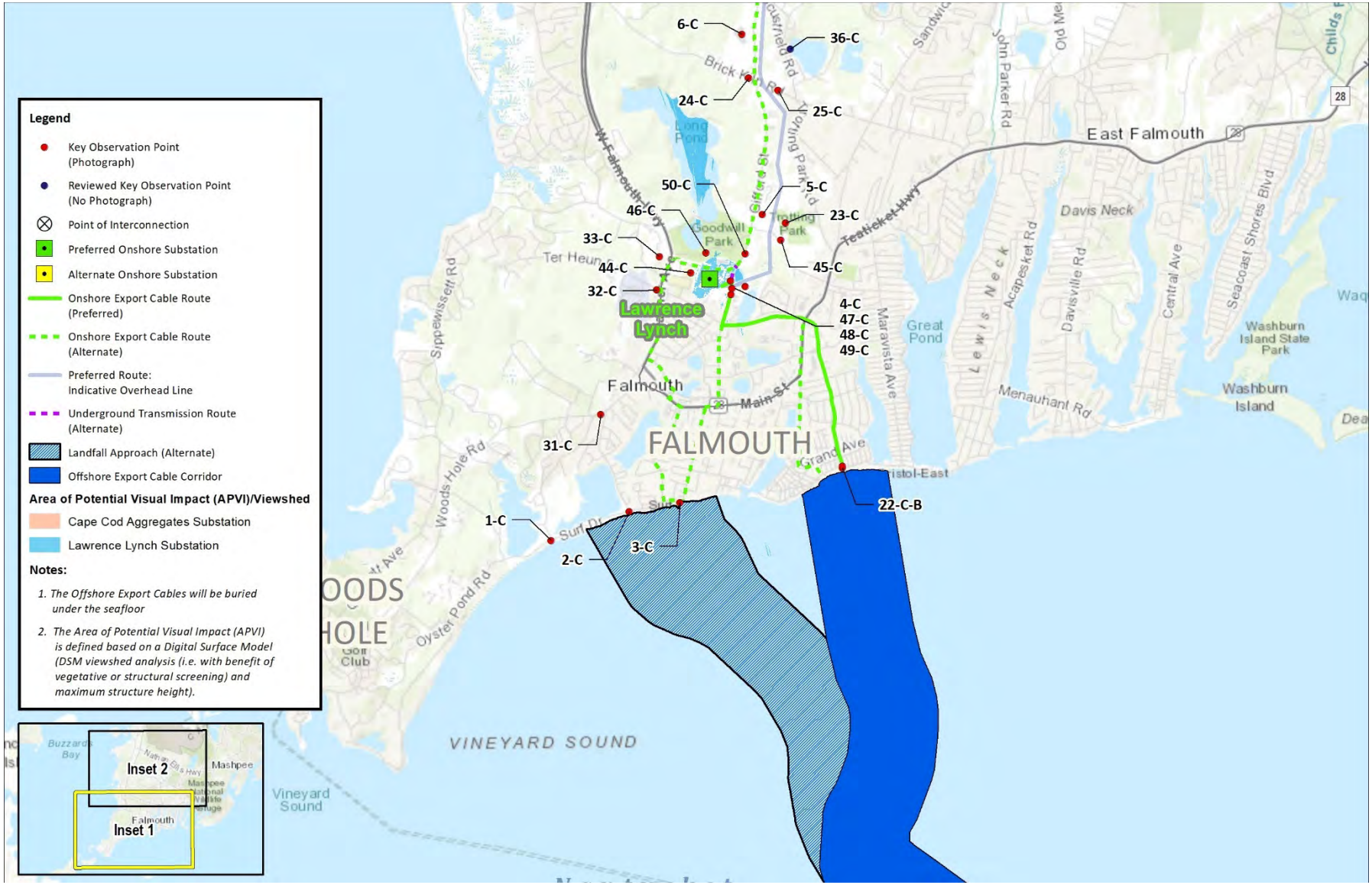
6.2.4 Onshore Visual Simulations

Photographic simulations of the onshore substation were developed to communicate the potential for change from existing visual conditions. A visual depiction of the location of the selected KOPs has been created (Figure 6-16), with reference to Table 6-2 and for a more detailed list. Figure 6-17 and Figure 6-18 provide a more detailed view of the KOPs within the onshore viewshed. KOP photos were intended to capture a range of lighting conditions (side lit, back lit, front lit) at different times of the day (e.g., from morning through sunset). Existing condition photos and simulations are provided in Attachment 4 .



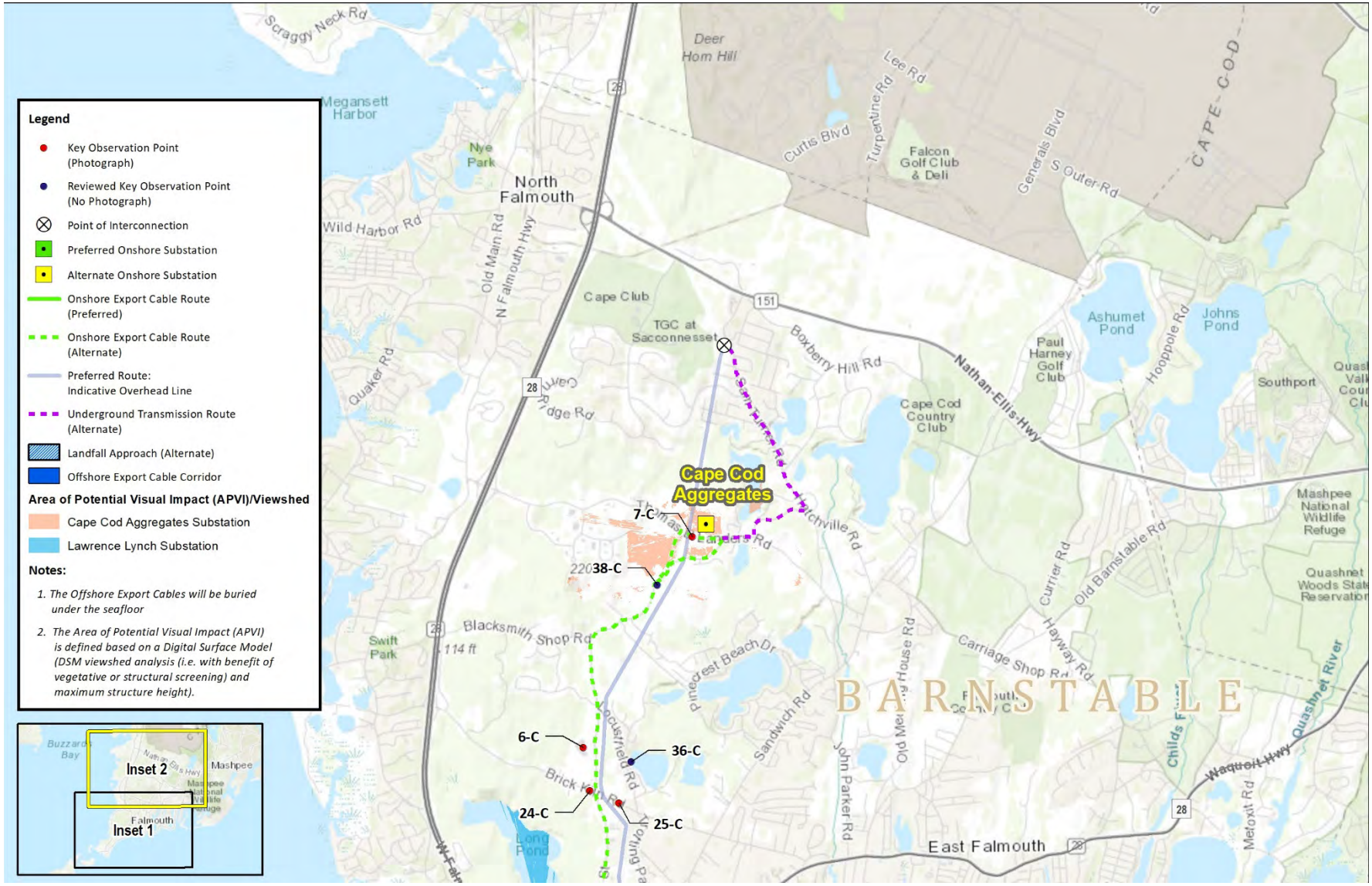
DSM viewsheds are depicted as provided by ICF.

Figure 6-16. Onshore KOPs with DSM Viewsheds: Index Map



DSM viewshed is depicted as provided by ICF.

Figure 6-17. KOPs Map for the Substation Site at Lawrence Lynch with DSM Viewshed: Inset 1



DSM viewshed is depicted as provided by ICF.

Figure 6-18. KOPs Map for the Substation Site at Cape Cod Aggregates with DSM Viewshed: Inset 2

Table 6-2. Cape Cod KOPs for Onshore Project Facilities

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape Character Type	Viewer Groups	Susceptibility to Change / Value of Landscape[1]	Visual Sensitivity[1]	Selection Factors[2]	Distance to Substation[3] (mi [km])	In/Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
Field Reviewed – With Visibility to Substation												
44-C	Oak Grove Cemetery	Falmouth	Public Park, NHRP eligible	Village/Town	Residents, Tourists	Medium/ High	High	1, 7	0.14 (0.22)	Outside Viewshed	Not applicable	Yes
46-C	Goodwill Park	Falmouth	Public Park	Village/Town, Parks/Developed Recreation, Forests/Woodlands	Residents, Tourists, Recreational Users	Medium/Medium	Medium	1, 3, 10, 11, 12,13	0.19 (0.30)	Outside Viewshed	Not applicable	Yes
47-C	Lawrence Lynch Site – Gifford Street Substation*	Falmouth	Public Road	Roadways, Village/Town, Forests/Woodlands, Light Industrial	Residents, Tourists	Medium/Low	Medium	1, 2, 3, 10, 11	0.17 (0.28)	Outside Viewshed	Not applicable	Yes
49-C	Two Ponds	Falmouth	Public Recreation	Ponds, Forest/Woodland	Residents, Recreational Users, Tourists	Medium/High	Medium	1, 2, 10, 11, 12, 13	0.26 (0.41)	Outside Viewshed	Not applicable	Yes
Field Reviewed – No Visibility of Substation												
1-C	Elm Road	Falmouth	Public Road, Recreation	Ocean Beach, Residential, Nantucket Sound	Residents, Tourists, Recreational Users			1, 5, 10, 12	2.16 (3.47)	Outside Viewshed	47-C, 49-C	No (no view due to enclosed tree canopy)
2-C	Mill Road	Falmouth	Public Road, Recreation	Ocean Beach, Residential, Nantucket Sound	Residents Tourists, Recreational Users			1, 5, 10, 12	1.74 (2.80)	Outside Viewshed	47-C 49-C	No (no view due to enclosed tree canopy)
3-C	Shore Street	Falmouth	Public Road, Recreation	Ocean Beach, Residential, Nantucket Sound	Residents, Tourists, Recreational Users			1, 5, 10, 12	1.59 (2.56)	Outside Viewshed	47-C 49-C	No (no view due to enclosed tree canopy)
4-C	Gifford Street	Falmouth	Public Road	Rural/suburban Residential	Residents			1, 5, 10, 12	0.15 (0.24)	In Viewshed	47-C	No (no view due to enclosed tree canopy)
5-C	Falmouth Youth Baseball Fields at Trotting Park	Falmouth	Public Recreation	Parks/Developed Recreation, Forests/Woodlands, Village/Town	Residents, Tourists, Recreational Users			1, 3, 10, 11, 12	0.59 (0.94)	Outside Viewshed	49-C	No (no view due to enclosed tree canopy)
6-C	Falmouth High School	Falmouth	Public School	Village/Town, Forests/Woodlands, Roadway	Residents			1, 3, 10, 11, 12	1.77 (2.79)	Outside Viewshed	Not applicable	No (no view due to enclosed tree canopy)
7-C	Thomas Landers Road	Falmouth	Public Road	Rural/suburban Residential	Residents			1, 10, 11, 12	3.36 (5.40)	Outside Viewshed	47-C	No (no view due to enclosed tree canopy)
22-C-B	Falmouth Heights Town Beach; Facing Worcester Ave	Falmouth	Public Recreation	Ocean	Residents, Tourists, Recreational Users			1, 3, 5, 10, 11, 12	1.62 (2.61)	Outside Viewshed	49-C	No (no view due to enclosed tree canopy)
23-C	Trotting Park from Access Road	Falmouth	Public Recreation	Park/Developed Recreation	Recreational Users			1, 3, 10, 11, 12	0.66 (1.07)	Outside Viewshed	49-C	No (no view due to enclosed tree canopy)
24-C	Brick Kiln Road (West)	Falmouth	Public Road	Roadway	Residents, Tourists			1, 3, 10, 11	1.44 (2.32)	Outside Viewshed	47-C	No (no view due to enclosed tree canopy)

KOP Number	Name	Municipality	Resource Type	Landscape/ Seascape Character Type	Viewer Groups	Susceptibility to Change / Value of Landscape[1]	Visual Sensitivity[1]	Selection Factors[2]	Distance to Substation[3] (mi [km])	In/Out of Viewshed	Representative KOP with Simulation	Project Visible from KOP?
25-C	Brick Kiln Road (East)	Falmouth	Public Road	Roadway	Residents, Tourists			1, 3, 10, 11	1.41 (2.27)	Outside Viewshed	47-C	No (no view due to enclosed tree canopy)
32-C	Ter Heun Drive at Bike Path	Falmouth	Public Road, Public Recreation	Parks/Developed Recreation	Recreational User			1, 3, 5, 10, 11, 12	0.38 (0.61)	Outside Viewshed	47-C 49-C	No (no view due to enclosed tree canopy)
33-C	Carlson Lane at Park near Bike Path	Falmouth	Public Road, Public Recreation	Parks/Developed Recreation	Recreational User			1, 3, 5, 10, 11, 12	0.38 (0.62)	Outside Viewshed	47-C 49-C	No (no view due to enclosed tree canopy)
38-C	Breivogel Ponds Conservation Area	Falmouth	Public Recreation	Parks/Developed Recreation	Residents, Recreational User			1, 10	0.89 (0.55)	Outside Viewshed	49-C	No (no view due to enclosed tree canopy)
45-C	Woodview Drive	Falmouth	Public Road	Rural/suburban Residential, Village/Town	Residents			1, 3, 5, 10, 11	0.57 (0.92)	Outside Viewshed	47-C	No (no view due to enclosed tree canopy)
48-C	Gifford Street*	Falmouth	Public Road	Forests/Woodlands	Residents, Tourists			1, 3, 10, 11, 12	0.19 (0.30)	Outside Viewshed	47-C	No (no view due to enclosed tree canopy)
50-C	St. Joseph Cemetery*	Falmouth	Public Road, Public Park	Forests/Woodlands, Village/Town, Cemeteries	Residents, Tourists, Recreational Users			1, 3, 10, 11, 12	0.30 (0.49)	Outside Viewshed	46-C, 47-C	No (no view due to enclosed tree canopy)
Reviewed: No Visibility or No Access												
31-C	Woods Hole Road at Bike Path Crossing	Falmouth	Public Road, Public Recreation	Parks/Developed Recreation	Recreational User			3, 10, 12	1.23 (1.97)	Outside Viewshed	47-C 49-C	No
36-C	Mares Pond Landing	Falmouth	Public Road, Public Recreation	Rural/suburban Residential	Residents			1, 10, 11, 12	1.71 (2.76)	Outside Viewshed	47-C 49-C	No (no access to public landing; enclosed canopy)

KOPs selected for the development of representative simulations are identified with gray shaded rows; KOPs selected for simulations include: 44-C, 46-C, 47-C, 49-C

** KOPs denoted with an asterisk indicate KOPs with views of the Lawrence Lynch substation site.*

[1]Susceptibility to change, value of landscape, and visual sensitivity evaluated for KOPs with simulations.

[2]See bulleted list in Section 6.2.3 for associated factors for KOP selection

[3]Distances are to the Lawrence Lynch (preferred) substation site

See Figure 6-16 for KOP locations.

6.3 Seascape/Landscape Impact Analysis

The SLIA assesses impacts on the physical elements and features that make up a seascape or landscape and the aesthetic, perceptual, and experiential aspects of the seascape or landscape that contribute to its distinctive character. These impacts affect the “feel,” “character,” or “sense of place” of an area of seascape or landscape, rather than enjoyment of a particular view. Effects on view experience are assessed in the VIA. The visibility of offshore wind developments may affect the aesthetic, perceptual, and experiential aspects of the seascape or landscape and thus, its distinctive character. As such, the visibility of the Project as evaluated from particular viewpoints as presented in the VIA informs the SLIA analysis with SLIA impacts from specific viewpoints considered as indicative of impacts to the character areas as a whole.

The information from the SLCA receptor evaluation is then used to identify potential effects from the project. The impact assessment is based on the sensitivity of the receptor (the potentially affected SLCA) and the magnitude of SLCA changes brought about by the project. For the OCA, and for each affected SCA and any affected LCAs, the sensitivity of the receptor is determined, based on its susceptibility to impact and its perceived value, and the magnitude of the impact is determined by considering the size and scale of the change to existing conditions caused by the project, the geographic extent of the area subject to the project’s effects, and the effects’ duration and reversibility. After the nature and magnitude of the impact have been determined, its impact level is evaluated.

6.3.1 SLCA Sensitivity and Magnitude of Change

The sensitivity factor of the SLCA receptor has two components: susceptibility and value.

6.3.1.1 Susceptibility

The susceptibility of a seascape/landscape character area to change is its ability to accommodate the impacts of the proposed project. Susceptibility factors include both overall and individual elements and particular aesthetic, experiential, and perceptual features of the character area.

Professional judgment is used to rate the SLCA receptor susceptibility to the type of development proposed on a scale of *high*, *medium* or *low* based on an interpretation of a combination of parameters including:

- the scale and pattern of the landscape and its elements/features and how this may be affected by elements of the type of Project proposed;
- the degree of simplicity or complexity of the landscape and how this may be affected by elements of the type of Project proposed;
- the nature of skylines and they may be affected by elements of the type of Project proposed (onshore and offshore elements);
- landscape quality or condition (integrity);
- existing land use and the consistency with the type of Project proposed;
- visual enclosure/openness of views and degree of potential visibility/influence of the type of Project proposed; and
- the extent and configuration of artificial light sources present in the baseline SLCA.

The receptor susceptibility ratings applied to the SLCAs are presented in Table 6-3.

Table 6-3. SLCA Susceptibility Ratings

Character Area	Susceptibility Ratings
Lawrence Lynch Substation Site (preferred)	
Coastal Scrub	High
Commercial	Low
Forests/Woodlands	Medium
Historic	High
Light Industrial	Low
Parks/Developed Recreation	High
Rural/Suburban Residential	High
Ponds/Tidal Marsh	Medium
Village/Town	Medium
Cape Cod Aggregates Substation Site (alternate)	
Coastal Scrub	High
Fields/Meadows	Medium
Forests/Woodlands	Medium
Historic	High
Light Industrial	Low
Ocean Beach	High
Parks/Developed Recreation	High
Rural/Suburban Residential	High
Ponds/Tidal Marsh	Medium
Village/Town	Medium

6.3.1.2 Value

In the evaluation of value, special consideration is given to key characteristics—that is, those components that contribute significantly to the distinctive character of the SLCA. Professional judgment is used to rate the SLCA receptor value on a scale of *high*, *medium* or *low* based on an interpretation of its distinctiveness based on a combination of parameters including:

- formal designation or classification;
- seascape/landscape quality and condition;
- scenic Integrity;
- scenic quality;

- rarity;
- representativeness;
- conservation interest;
- recreational value;
- perceptual aspects; and
- cultural associations.

The receptor value ratings applied to the SLCAs are presented in Table 6-13.

Table 6-4. SLIA Value Ratings

Character Area	Value Ratings
Lawrence Lynch Substation Site (preferred)	
Coastal Scrub	High
Commercial	Low
Forests/Woodlands	High
Historic	High
Light Industrial	Low
Parks/Developed Recreation	High
Rural/Suburban Residential	High
Ponds/Tidal Marsh	High
Village/Town	Medium
Cape Cod Aggregates Substation Site (alternate)	
Coastal Scrub	High
Fields/Meadows	High
Forests/Woodlands	High
Historic	High
Light Industrial	Low
Ocean Beach	High
Parks/Developed Recreation	High
Rural/Suburban Residential	High
Ponds/Tidal Marsh	High
Village/Town	Medium

6.3.2 Overall Sensitivity Rating

When susceptibility to change and value to society are combined (Table 6-5), the sensitivity of a character area is determined based on the SLVIA guidance (BOEM 2021). When the size or scale of the change associated with the proposed project, the geographic extent of the change, and the duration and reversibility of the change are combined, the magnitude of change results. Magnitude of impact to character areas is determined when sensitivity and magnitude of seascape/landscape change are combined, as shown in Table 6-5.

Table 6-5. BOEM Matrix for Combining Sensitivity Components

Value Rating	Susceptibility Rating		
	High	**Medium**	**Low**
High	Sensitivity = High	Sensitivity = High	Sensitivity = Medium
Medium	Sensitivity =High	Sensitivity = Medium	Sensitivity = Low
Low	Sensitivity = Medium	Sensitivity = Low	Sensitivity = Low

BOEM 2021

Table 6-6 below shows the value and susceptibility ratings assigned to each of the affected SLCA receptors.

Table 6-6. SLCA Sensitivity Ranges

Character Area	Susceptibility	Value	Sensitivity
Lawrence Lynch Substation Site (preferred)			
Coastal Scrub	High	High	High
Commercial	Low	Low	Low
Forests/Woodlands	Medium	High	High
Historic	High	High	High
Light Industrial	Low	Low	Low
Parks/Developed Recreation	High	High	High
Rural/Suburban Residential	High	High	High
Ponds/Tidal Marsh	Medium	High	High
Village/Town	Medium	Medium	Medium
Cape Cod Aggregates Substation Site (alternate)			
Coastal Scrub	High	High	High
Fields/Meadows	Medium	High	High
Forests/Woodlands	Medium	High	High
Historic	High	High	High

Light Industrial	Low	Low	Low
Ocean Beach	High	High	High
Parks/Developed Recreation	High	High	High
Rural/Suburban Residential	High	High	High
Ponds/Tidal Marsh	Medium	High	High
Village/Town	Medium	Medium	Medium

6.3.3 Magnitude of Change

The magnitude of change is a character area's ability to accommodate the effects of the proposed Project. The rating is based on the size or scale of the change associated with the proposed project, the geographic extent of the change, and the duration and reversibility of the change (Table 6-7 and Table 6-8).The magnitude factor has three components: the size and scale of the change to existing conditions caused by the Project, the geographic extent of the area subject to the Project's effects, and the duration and reversibility of effects. These components are described below.

Table 6-7. BOEM Matrix for Combining Size and Scale and Geographic Extent

Size and Scale	Geographic Extent		
	Large	**Medium**	**Small**
Large	Large[1]	Large	Large
Medium	Large	Medium	Medium
Small	Large	Medium	Small

[1] outcome per SLVIA guidance (BOEM, 2021)

Table 6-8. BOEM Matrix for Combining Duration and Reversibility, Size and Scale, and Geographic Extent

Duration and Reversibility	Size and Scale and Geographic Extent		
	Large	**Medium**	**Small**
Poor	Large[1]	Large	Medium
Fair	Large	Medium	Small
Good	Small	Small	Small

[1] outcome per SLVIA guidance (BOEM, 2021)

6.3.3.1 Size and Scale of Change

Professional judgment is made regarding the degree of change from loss, addition, or alteration of character, features, elements, or aesthetic, experiential, or perceptual aspects of the affected SLCAs and rated on a scale of *large*, *medium*, *small*. Considerations include changes to the physical elements of the SLCA; its aesthetic, experiential, and perceptual aspects; and to the key characteristics of the SLCA critical to its distinctive character. The viewer's perception of the Project Area would be small.

6.3.3.2 Geographic Extent

The assessment of impact magnitude also includes consideration of the geographic extent over which the effect will be experienced. For seascape/landscape impacts from onshore wind projects, the geographic extent of SLCA impacts relates to the visibility of the Project.

Table 6-9shows the total geographic area of each SLCA within the viewshed, and the percent of that SLCA geographic area located within those areas that would be visible. That visibility calculation across the SLCAs has been employed to record the geographic extent of SLCA impacts on a scale *large*, *medium*, *or small.*

Table 6-9. SLCA Geographic Extent

Character Area	Acres (hectares) of SLCAs within APVI	Percentage of SLCAs in APVI[1]	Geographic Extent Rating
Lawrence Lynch Substation Site (preferred)			
Coastal Scrub	0.004 (0.002)	<0.01	Not visible
Commercial	0.25 (0.101)	0.06	Not visible
Forests/Woodlands	53.74 (21.748)	1.85	Small
Historical	0 (0.000)	0.00	Not visible
Light Industrial	19.28 (7.802)	5.37	Small
Parks/Developed Recreation	1.36 (0.550)	0.99	Small
Rural/Suburban Residential	74.31(30.072)	3.48	Small
Ponds/Tidal Marsh	59.79 (24.196)	0.62	Small
Village/Town	0.43 (0.174)	0.06	Not visible
Cape Cod Aggregates Substation Site (alternate)			
Coastal Scrub	0 (0.000)	0.00	Not visible
Fields/Meadows	0 (0.000)	0.00	Small
Forests/Woodlands	1.44 (0.583)	0.02	Not visible
Historic	0 (0.000)	0.00	Not visible
Light Industrial	9.53 (3.857)	3.32	Small
Ocean Beach	0 (0.000)	0.00	Not visible
Parks/Developed Recreation	0 (0.000)	0.00	Not visible
Ponds/Tidal Marsh	7.47 (3.023)	0.50	Small
Rural/Suburban Residential	91.92 (37.199)	0.48	Small
Village/Town	0 (0.000)	0.00	Not visible

1 – Percentage expressed as area of character type within the APVI divided by the total area of the character type within the Geographic Area of Analysis (GAA); set at 3.5 miles from the onshore facility site.

6.3.3.3 Duration and Reversibility

The third element of assessing the magnitude of a particular effect is the consideration of its duration and reversibility, that is, the length of time over which the impact is likely to occur and the degree to which the currently existing conditions are restored after the impact ceases.

Duration is recorded on an ordinal scale of short term (less than 5 years), long term (5–30 years), or considered permanent (more than 30 years). The judgment regarding duration should take into consideration any residual impacts remaining after decommissioning. Reversibility is recorded on a verbal scale of nonreversible, partially reversible, or fully reversible.

Reversibility has been determined to be not reversible. The assessment of duration and reversibility impacts considered in combination has been determined to be poor given the permanent duration and no reversibility.

6.3.3.4 Overall Magnitude Rating

The overall magnitude ratings are established through BOEM's matrix for combining the size and scale, geographic extent, and duration/reversibility ratings detailed above (BOEM 2021). Table 6-8 presents the matrix for combining magnitude components. Error! Reference source not found. below shows the magnitude rating of each SLCA within the study area.

Table 6-10. SLCA Magnitude of Effect Matrix

Character Area	Size and Scale Rating	Geographic Extent Rating	Duration Rating	Magnitude Rating
Lawrence Lynch Substation Site (preferred)				
Coastal Scrub	Small	Not visible	Permanent	Small
Commercial	Small	Not visible	Permanent	Small
Forests/Woodlands	Small	Small	Permanent	Small
Historical	Small	Not visible	Permanent	Small
Light Industrial	Small	Small	Permanent	Small
Parks/Developed Recreation	Small	Small	Permanent	Small
Rural/Suburban Residential	Small	Small	Permanent	Small
Ponds/Tidal Marsh	Small	Small	Permanent	Small
Village/Town	Small	Not visible	Permanent	Small
Cape Cod Aggregates Substation Site (alternate)				
Coastal Scrub	Small	Not visible	Permanent	Small
Fields/Meadows	Small	Small	Permanent	Small
Forests/Woodlands	Small	Not visible	Permanent	Small
Historic	Small	Not visible	Permanent	Small
Light Industrial	Small	Small	Permanent	Small
Ocean Beach	Small	Not visible	Permanent	Small
Parks/Developed Recreation	Small	Not visible	Permanent	Small
Rural/Suburban Residential	Small	Small	Permanent	Small
Ponds/Tidal Marsh	Small	Small	Permanent	Small
Village/Town	Small	Not visible	Permanent	Small

6.3.4 Impact to Character Area

As outlined in Section 6 of the BOEM SLVIA guidance, the effects or impact to a character area is determined by combining values for both sensitivity and magnitude of change (BOEM, 2021). The BOEM SLVIA guidance includes a matrix for combining receptor sensitivity and magnitude of impact ratings to derive an overall SLCA impact rating, which is "...recommended but [is] subject to change in consideration of individual project circumstances" and is scored on a scale of *minor*, *moderate*, and *major* (BOEM 2021). A finding of *negligible* impact is warranted when there are minimal impacts; that is, the project is not visible or is barely visible, or the potentially affected area is very small, and the other metrics are at medium or low values. Table 6-11 provides a general guideline for combining these two factors. Table 6-12 shows the overall impact rating of each SLCA within the study area.

Table 6-11. BOEM Matrix for Combining Sensitivity and Magnitude to Identify Impact Levels

Sensitivity Rating	Magnitude of Change		
	Large	**Medium**	**Small**
High	Impact Level = Major[1]	Impact Level = Major	Impact Level = Moderate
Medium	Impact Level = Major	Impact Level = Moderate	Impact Level = Minor
Low	Impact Level = Moderate	Impact Level = Minor	Impact Level = Minor

[1]*Outcome per SLVIA guidance (BOEM 2021), including range of GAA-specific impact.*

Table 6-12. SLCA Overall Impact Rating

Character Area	Sensitivity Rating	Magnitude Rating	Overall Impact Rating[1]
Lawrence Lynch Substation Site (preferred)			
Coastal Scrub	High	Small	Negligible
Commercial	Low	Small	Negligible
Forests/Woodlands	High	Small	Moderate
Historical	High	Small	Negligible
Light Industrial	Low	Small	Minor
Parks/Developed Recreation	High	Small	Moderate
Rural/Suburban Residential	High	Small	Moderate
Ponds/Tidal Marsh	High	Small	Moderate
Village/Town	Medium	Small	Negligible
Cape Cod Aggregates Substation Site (alternate)			
Coastal Scrub	High	Small	Negligible
Fields/Meadows	High	Small	Moderate
Forests/Woodlands	High	Small	Negligible
Historic	High	Small	Negligible
Light Industrial	Low	Small	Minor
Ocean Beach	High	Small	Negligible
Parks/Developed Recreation	High	Small	Negligible
Rural/Suburban Residential	High	Small	Moderate
Ponds/Tidal Marsh	High	Small	Moderate
Village/Town	Medium	Small	Minor

[1] *The finding of negligible is applied to character areas where the substation is not visible.*

For the Lawrence Lynch substation site, the magnitude of visual impact would be *negligible* in the coastal scrub, commercial, historic, and village/town character areas because the substation would not be visible.

The magnitude of visual impact would be *minor* in the light industrial character area and *moderate* in the forests/woodland, parks/developed recreation, rural/suburban residential, and ponds/tidal marsh character areas and further diminish to negligible as distance increases and screening effects increase from topography, structures, and vegetation.

For the Cape Cod Aggregates substation site, the magnitude of visual impact would be *negligible* in the coastal scrub, forest/woodlands, historic, ocean beach, parks/developed recreation, and village/town character areas because the substation would not be visible. The magnitude of visual impact would be *minor* in the light industrial and village/town character areas and *moderate* in the field/meadows, rural/suburban residential, and ponds/tidal marsh character areas and further diminish to negligible as distance increases and screening effects increase from topography, structures, and vegetation.

6.4 Onshore Visual Impact Analysis

Short-term visual effects will occur during construction of the onshore Project components and will result from visual evidence of construction activities and the presence of construction equipment and work crews. Construction activities associated with the onshore export cables, substation, and underground transmission route will include surveying; clearing the construction site (of pavement, existing buildings and/or vegetation depending on the site) 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 site and underground export and underground transmission cables, where the presence of construction equipment, materials, and crews will be dominant in the foreground. The onshore export and underground transmission cables will be installed underground within existing public roadways, shoulders, and grassy open space. Roads will be restored upon completion of construction. Views of Project construction from areas not immediately adjacent to the onshore substation site 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.

Visual impact associated with onshore construction and installation operations, in general, would be minor as construction equipment would only be in use temporarily during the construction and decommissioning periods. The analysis of onshore Visual Change and Visual Sensitivity in the sections below is limited to the operational and maintenance phase of the Project.

6.4.1 Visual Change - Onshore

The analysis of KOPs determined that the onshore substation is likely visible from some KOPs within the foreground (<0.5 mi [0.8 km]). Not all KOPs which are mapped within the viewshed, have visibility to the Project because the locations are either enclosed within existing vegetation, screened by buildings, or the viewer position is set low in the topography as noted in Table 6-2.

As noted in Figure 4-1, Visual Change, as measured by the reported Visibility Levels accounts for both visual compatibility (e.g., type, intactness, unity) and visual contrast (e.g., vividness, scale, and movement). AECOM applied the modified contrast ratings for the onshore KOPs, according to the methods described in Section 4.4.1.2. Within the contrast rating scale, *Visibility Levels 5 and 6* indicate **Strong** Visual Change, *Visibility Levels 3 and 4* **Medium** Visual Change, and *Visibility Levels 1 or 2* **Weak** Visual Change. The ratings have been applied in a conservative manner and are represented by a range intended to reflect the varying degrees of contrast possible at a given location based on atmospheric/meteorological and/or lighting conditions that might result in greater or lesser levels of contrast than are reflected in the actual simulated condition. The goal of applying the visual contrast method is to create an objective measure of visual change as would be perceived by sensitive viewers.

The VAF and simulations for the onshore APVI are presented in Attachment 4 . Simulations were developed for four KOPs. Summary of results is found in Table 6-13.

The Visual Change for the KOPs with views of the substation range from **Weak** (*Visibility Level 1*) to **Medium** to **Strong** (*Visibility Level 4 -5*). The substation buildings and infrastructure are viewed at close distance and

are only partially screened. As simulated, they are modern metal buildings that are not compatible with the traditional architecture and materials common on Cape Cod.

Table 6-13. KOP Visibility Level Ratings for Onshore Simulations

KOP Number	Name	Distance to Substation mi (km)	Visibility Level Rating	Visual Change
44-C	Oak Grove Cemetery	0.14 (0.22)	[4] - [5]	Medium to Strong
46-C	Goodwill Park	0.19 (0.30)	[2] - [3]	Weak to Medium
47-C	Lawrence Lynch Site - Gifford Street Substation	0.17 (0.28)	[3] – [4]	Medium
49-C	Two Ponds	0.26 (0.41)	[1]	Weak

Note: Visibility Levels 5 and 6 indicate strong visual change, Visibility Levels 3 and 4 medium visual change, and Visibility Levels 1 or 2 weak visual change.

6.4.2 Visual Impact Characterization - Onshore

As described in Section 4.4.3, the combination of Visual Change and Visual Sensitivity characterizes the potential for impact associated with the Project; the potential for impact is characterized as **Low, Medium/Low, Medium, High/Medium, or High**. Visual Sensitivity was characterized as **Medium** to **High** for the purposes of this assessment and Visual Change was characterized as predominantly **Weak** to **Strong.**

The potential for Visual Impact of the Project is characterized as **Medium to Medium/High**, based on the following factors:

- Medium visual contrast of main Project elements;
- High Visual Sensitivity;
- Partial vegetative screening from KOPs; and
- Small Project extent (single site).

The above characterization does not account for mitigation. Depending on which mitigation measures are included, and to what extent, it is possible to substantially lower the visual impact.

6.4.3 Cumulative Impact of Reasonably Foreseeable Future Actions - Onshore

This analysis did not consider additional proposed or foreseeable future projects in the vicinity. But compared with existing conditions, the Project adds cumulative impacts to other existing visual disturbances in the study area.

6.5 Mitigation - Onshore

The onshore substation would be visible from a few KOPs. Since these are already developed as industrial sites, visual integrity is low. Landscape enhancements keep the impact from the development low or neutral compared with existing conditions. Further mitigation is possible however, if local authorities request it during the local permitting process. Mitigation measures for the onshore Project components under consideration, include:

- Conform to landscape codes and edge treatments (i.e. visual buffers) to improve site aesthetics and screen new development from view. In areas where vegetation removal needs to occur to support construction, new landscaping should be provided and maintained.

- Design buildings to blend in and consider local aesthetic; minimize the number of separate elements. The buildings and substation electrical components (e.g., transformers, overhead power line towers, etc.) will be color treated in a single, non-reflective color/surface coating with a non-reflective matte to semi-gloss finish to reduce visual contrast, such as BLM Environmental Color Chart CC001 Yuma Green, or Shadow Gray , unless consultation with the Town of Falmouth results in the selection of an alternative color.
- Locate several substation components inside the building(s) to minimize outdoor features and reduce the quantity of lightning masts.
- Revised proposed building design to better fit village context. For example, use pitched roofs and painted wood siding to better match local Cape Cod vernacular design. The buildings associated with onshore substation development will match local Cape Cod design standards. The design of the substation buildings will relate to the local design context and guidelines.
- Construct the Project facility lightning protection masts at the minimum height and diameter required for safety and function.

The potential for impact can be reduced, possibly substantially, depending on the feasibility of incorporating the above described mitigation measures.

7.0 Technical References

Bureau of Land Management (BLM). 1986. Visual Resource Management System. Available on-line: http://blmwyomingvisual.anl.gov/vr-overview/blm/. Accessed April 2018.

Bureau of Ocean Energy Management (BOEM). 2020. Information Guidelines for a Renewable Energy Construction and Operations Plan (COP).

BOEM. 2021a. Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States. April 2021.

BOEM. 2021b. Guidelines for Providing Information on Lighting and Marking of Structures Supporting Renewable Energy Development. April 28, 2021

BOEM. 2023. Mayflower Wind Project Draft Environmental Impact Statement OCS EIS/EA BOEM 2023-0011. February 2023.

Carr-Harris, Andrew & Lang, Corey. 2019. "Sustainability and tourism: the effect of the United States' first offshore wind farm on the vacation rental market," Resource and Energy Economics, Elsevier, vol. 57(C), pages 51-67.

Council on Environmental Quality Executive Office of the President and Advisory Council on Historic Preservation. 2013. NEPA and NHPA: A Handbook for Integrating NEPA and Section 106. March 2013. Available online: https://www.achp.gov/sites/default/files/2017-02/NEPA_NHPA_Section_106_Handbook_Mar2013_0.pdf

Dukes County GIS, 2021. Available online: https://data-dukescountygis.opendata.arcgis.com/. Accessed October 1, 2021.

ESRI, 2020. ESRI World Topo Map and World Imagery files. https://support.esri.com/en/technical-article/000012040.

Falmouth Economic Development & Industrial Corporation (EDIC). 2019. Demographics. Available on-line: https://www.falmouthedic.org/demographics. Accessed November 2020.

Falmouth Land Trust (FLT). 2020. Falmouth Land Trust – Properties. Falmouth Land Trust. Available at: https://falmouthlandtrust.org/properties-1. Accessed 2/6/21.

Griffith, G.E., Omernik, J.M., Bryce, S.A., Royte, J., Hoar, W.D., Homer, J.W., Keirstead, D., Metzler, K.J., and Hellyer, G., 2009, Ecoregions of New England (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,325,000). Available at: http://ecologicalregions.info/data/vt/new_eng_front.pdf

Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA). 2013. Guidelines for Landscape and Visual Impact Assessment, Third Edition.

Lothian, A., 2017. The science of scenery. *South Carolina: CreateSpace Independent Publishing Platform*. Martha's Vineyard Commission. 2007. Maratha's Vineyard Cost of Living Index for 2006. Available at: https://www.mvcommission.org/sites/default/files/docs/Cost_of_Living_Index___Fall_2006.pdf

Martha's Vineyard Commission. 2012. Wind Energy Plan for Dukes County. Regional Planning Agency of Dukes County. Oak Bluffs, MA.

Massachusetts Historic Commission Massachusetts Cultural Resource Information System Maps (MACRIS). 2021. Available online: https://maps.mhc-macris.net/. Accessed October 1, 2021.

Massachusetts Audubon (Mass Audubon). 2021. About Sesachacha Heathlands – Massachusetts Audubon Society, Available at: https://www.massaudubon.org/get-outdoors/wildlife-sanctuaries/sesachacha-heathlands/about. Accessed 2/6/21.

MassGIS. 2021. 2020 Environmental Justice Populations in Massachusetts. June 2021. Available: https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts Accessed: 4 October 2021.

MassGIS. 2022. Building Structures (2-D), https://www.mass.gov/info-details/massgis-data-building-structures-2-d, accessed November 10, 2022.

Nantucket County GIS. 2021. Available online: https://www.nantucket-ma.gov/151/GIS-Maps. Accessed October 1, 2021.

Nantucket Land Council (NLC). 2021. Preserved Open Space - Nantucket Land Council. Available at: https://www.nantucketlandcouncil.org/land-protection/preserved-open-space/. Accessed 2/6/21.

Nantucket Land Trust (NLT). 2021. Featured Properties and Trails - Nantucket Land Bank. Available at: https://www.nantucketlandbank.org/properties/featured-properties-and-trails/. Accessed 2/6/21.

Nantucket Planning Board. 2009. Nantucket Master Plan Prepared in Accordance with M.G.L CH 41, Section 81D.

Otkay, S. 2008. Sand Plain Grassland. Yesterday's Island, Today's Nantucket. Available on-line: https://yesterdaysisland.com/2008/features/grasslands.php.

Paskakarnis, Tim. 2003. Cape Cod Commission, Pond Atlas. https://www.capecodcommission.org/our-work/ponds-and-lakes

Pruetz, R. 2011. Cape Cod, Massachusetts. Smart Preservation. Available on-line: https://smartpreservation.net/green-successes/cape-cod-massachusetts/. Published on-line November 14, 2011.

Smart Preservation. 2021. Nantucket, Massachusetts | Smart Preservation. Available at: https://smartpreservation.net/green-successes/nantucket-massachusetts/. Accessed 2/6/21.

Sullivan, R. G., L. B. Kirchler, J. Cothren, and S. L. Winters. 2013. Offshore Wind Turbine Visibility and Visual Impact Threshold Distances. Environmental Practice, 15:1, 33-49.

Sullivan, R. G., J. M. Abplanalp, S. Lahti, K.J. Beckman, B.L. Cantwell and P. Richmond. 2014, Electric transmission visibility and visual contrast threshold distances in western landscapes. Conference Proceedings of the 39th Annual NAEP Conference. April 7 – 10, 2014, St. Petersburg, FL.

Town of Falmouth. 2020. Zoning Bylaw. Town Code Chapter 20. Articles 1-14. P. 92. Available on-line: http://www.falmouthmass.us/DocumentCenter/View/8559/Falmouth-Zoning-Bylaw-Recodification-Clean-Copy-for-April-2021-Town-Meeting?bidId=.

Trustee of Reservations. 2021. Coskata-Coatue Wildlife Refuge - The Trustees of Reservations, Available at: https://thetrustees.org/place/coskata-coatue-wildlife-refuge/. Accessed 2/6/21.

United States Coast Guard (USCG). 2020. Local Notice to Mariners 33-20 Special Notice. ME, NH, MA, RI, CT, NY, NJ-Atlantic Ocean-Offshore Structure PATON Marking Guidance. Department of Homeland Security, U.S. Coast Guard, District 1. August 19, 2020.

Unites States Department of Agriculture (USDA) Forest Service. 1995. Landscape Aesthetics: A Handbook for Scenery Management. Agricultural Handbook Number 701.

United States Geological Survey (USGS). 1993. Environmental Setting. Available on-line: https://pubs.usgs.gov/wri/wri984249/pdf/4envirsettings.web.pdf. Accessed November 2020.

USGS. 2013. 3D Elevation Program LiDAR Point Cloud, https://apps.nationalmap.gov/downloader/, accessed November 10, 2022.

USGS. 2019. National Land Cover Database. Available at https://data.usgs.gov/datacatalog/data/USGS:60cb3da7d34e86b938a30cb9. Accessed 7/12/22.

Vineyard Conservation Society (VCS). 2021. Open Space Protected Through VCS Action - Vineyard Conservation Society. Available at: http://www.vineyardconservation.org. Accessed 2/6/21.

Vineyard Wind. 2018. Vineyard Wind Historic Properties Visual Impact Assessment. Vineyard Wind Offshore Wind Farm Project. Prepared by Epsilon Associates, Inc., Maynard, MA.

Wampanoag Tribe of Gay Head (Aquinnah). Wampanoag History. Available at: https://wampanoagtribe-nsn.gov/wampanoag-history. Accessed: 4 October 2021.

Warner, R. A. 2018. An Overview of Visual Impact Analysis for Offshore Wind Energy. In: Gobster, Paul H.; Smardon, Richard C., eds. 2018. Visual resource stewardship conference proceedings: landscape and seascape management in a time of change. Gen. Tech. Rep. NRS-P-183. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station: 38-43.

Wood, S., J. Purdum, and B. Egan. 2014. Visualization Simulations for Offshore Massachusetts and Rhode Island Wind Energy Area, Meteorological Report. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2017-037.

World Wildlife Fund. 2020. Atlantic Coastal Pine Barrens. Available on-line: https://www.worldwildlife.org/ecoregions/na0504.

Attachment 1 – Visual Impact Assessment Methodology Memorandum to BOEM

AECOM Imagine it. Delivered.

Project name:
Mayflower Wind Renewable Energy Project

Project ref:
60620428

From:
Dean Apostol and Jordan Secter

Date:
November 2, 2020

Response to BOEM Comments:
December 14, 2020

To:
Ms. Jennifer Flood
Mayflower Wind Energy LLC
2 Drydock Avenue
Boston, MA 02210

CC:
Nancy Palmstrom, AECOM
Kristen Durocher, AECOM

Revised Memo

Subject: Visual Impact Analysis Methodology for BOEM Review – Rev 2

Mayflower Wind Proposed Visual Impact Assessment Methodology

Executive Summary

Mayflower Wind Energy LLC (Mayflower Wind) proposes an offshore wind renewable energy generation project (Project) located in federal waters off the southern coast of Massachusetts in the Outer Continental Shelf (OCS) Lease Area OCS-A 0521 (the Lease Area) which will deliver electricity to the regionally administered transmission system via export cables with a landing point in Falmouth, Massachusetts and onshore transmission system extending to the point of interconnection (POI) in Bourne, Massachusetts (the Project).

The Lease Area is located south of Martha's Vineyard and Nantucket (Figure 2-1). Wind turbine generators (WTGs) will be constructed within the Lease Area to deliver power via inter-array cables to up to 5 offshore substation platforms (OSPs). The WTG and the OSP positions have been established based on a 1 x 1 nautical mile (1.9 x 1.9 kilometer [km]) grid oriented along the cardinal directions to maintain a uniform spacing of WTGs/OSPs across multiple lease areas within the Massachusetts/Rhode Island Wind Energy Area.

Assessment Objective

Visual impacts are expected to be an important concern for communities nearest to offshore wind energy development. Public understanding and acceptance of wind development is partly dependent on visual and scenic issues being clearly identified, objectively evaluated, and if possible mitigated through accepted processes. The construction and operation of an offshore wind energy development project may affect the visual landscape and experience of those to whom the Project is visible. If a project is likely to be visible from the shoreline, a Visual Impact Assessment (VIA) is required by the Bureau of Ocean Energy Management (BOEM) to support the National Environmental Policy Act (NEPA) review process.

The VIA for the Mayflower Wind project will:

- Develop a baseline assessment of visual conditions from which visual change resulting from the Project can be measured and evaluated
- Document the area of Theoretical Area of Visual Impact (TAVI), which is the area within which the Project elements are likely to be visible based on distance and factoring in curvature of the earth;
- Characterize the landscape/seascape by identifying character types within areas with similar natural and cultural features;
- Identify representative Key Observation Points (KOPs) which encompass the full range of viewer experiences, conditions and characteristics under which the Project may be seen;
- Choose a sample of KOPs locations to develop visual simulations of the proposed Project development;
- Use the simulations and other data to evaluate the potential effect of the Project on a viewer's experience from different locations, as measured by applying a contrast rating/visibility analysis on landscape, seascape and ocean character. The evaluation will consider the various of contrast throughout the time of day related to specific conditions such as sun angles, viewer position and atmospheric conditions.
- Provide an opinion of effects on the individuals viewer experience and by combining viewer sensitivity with the visual contrast of Project elements (BOEM will make a final determination of impacts) and,
- If necessary, identify potential mitigation measures to reduce apparent visual impacts.

Methodology Summary

AECOM proposes to employ the methodology summarized below and provided in greater detail in **Attachment 1** in anticipation of the issuance BOEM Visual Assessment Guidelines and Procedures in winter of 2021. AECOM expects that the BOEM procedures will be based on the *Guidelines for Landscape and Visual Impact Assessment Third Edition* (Landscape Institute and Institute of Environmental Management & Assessment; LI/IEMA, 2013) and will include a modified contrast rating system (Bureau of Land Management; BLM) that helps evaluate visual change and impact (Sullivan and Cothren, 2013). Modification of the contrast rating table focuses on the addition of element to the evaluation criteria to help expand considerations needed to compare baseline information to any potential change to the visual condition.

Table: Visual Resources Assessment Inventory and Contrast Rating Form

<table>
<tr><th colspan="6">VISUAL RESOURCES ASSESSMENT INVENTORY AND CONTRAST RATING FORM</th></tr>
<tr><th colspan="6">A. Visual Resource Assessment</th></tr>
<tr><td>KOP Number:</td><td colspan="2">Name KOP:</td><td>Date:</td><td>Time:</td><td>Weather:</td></tr>
<tr><td colspan="6">Location Description:</td></tr>
<tr><td colspan="3">Landscape Character Types:</td><td colspan="3">Scenic Integrity:</td></tr>
<tr><td colspan="6">Visual Absorption Capability:
Dominant Landscape Attributes:</td></tr>
<tr><td>Relevant Viewer Groups:</td><td colspan="3">Viewer Context:</td><td colspan="2">Viewer Position</td></tr>
<tr><td colspan="4">Visual Connection to the project:</td><td colspan="2">Viewing distance</td></tr>
</table>

B. Landscape/Seascape Character Description					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Water**	**Vegetation**	**Structures**
Form					
Line					
Color					
Texture					

Summary

Existing Landscape/Seascape Character Description:

VISUAL RESOURCES ASSESSMENT INVENTORY AND CONTRAST RATING FORM

C. Contrast Rating ☐Short Term ☐Long Term

		Features																			
		Landform				**Ocean**				**Water**				**Vegetation**				**Structures**			
Degree of Contrast		**Strong**	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**
Elements	**Form**																				
	Line																				
	Color																				
	Texture																				
	Horizontal Scale (% field of view)																				
	Vertical (Height of Object against the horizon)																				
	Motion																				
	Lighting																				

Overall Visual Contrast Rating: [ ]

Based on the Visual Contrast Rating Scale

- Level 1: Visible only after extended, close viewing.
- Level 2: Visible when scanning in the general direction of the project facilities.
- Level 3: Visible after only a brief glance in the direction of the project facilities.
- Level 4: Plainly visible, but not dominant.
- Level 5: Strongly attracts visual attention. Prominent.
- Level 6: Dominates the view. Occupies most of the visual field.

The proposed Mayflower Wind methodology is designed to understand both the extent of change to visual resources and change to the experience of the affected viewers.

The VIA study is divided into 5 sections:

1. Collection of Baseline Information
2. Analysis of Visual Impacts and Evaluation Procedures
3. Analysis of Cumulative Impacts based on “Effects of Reasonably Foreseeable Planned Actions”
4. Environmental Consequences
5. Mitigation

Collection of Baseline Information

The VIA methodology includes an extensive collection of baseline information to understand the relationship between the existing physical landscape and seascape conditions, identification of KOPs and the sensitivity to change by the key viewers, also called receptors. The baseline data provides a framework that describes existing conditions and allows proposed changes to be measured and evaluated for potential impacts. Baseline information collected for this study includes the following:

- Define the Area of Potential Impact
- Description of the landscape/seascape inventory, delineate, and describe seascape and landscape character areas
- Description of viewers/receptors and expected sensitivity to visual change
- Characterize the historical significance/relationships of potential key viewing areas
- Selection and evaluation of Key Observation Points (KOPs), (including consultation and input with local communities). Note: KOPs refer to a general area, like a beach or park. Representative photo points are taken within each KOP.
- Field photography from specific points within selected KOPs

Analysis of Impacts

A visibility analysis identifies areas that likely will have visual exposure to the Project. It includes data, such as; distance, number of project related facilities visible, and mitigating factors (i.e., partial screening). Simulation viewpoints have been selected to represent key views that highlight a diversity of viewer experiences from different vantage points, view angles or range of site characteristics.

The process for analyzing impacts is as follows:

- Select simulation points within KOPs based on historical significance, visual exposure to the Project, viewer experiences and landscape character
- Build one or more simulations based on the maximum anticipated development based on design envelope provided by Mayflower Wind. Include, where possible, clear, non-hazy atmospheric conditions and varying times of day.
- Apply a modified visual contrast rating, adapted from the Bureau of Land Management and Sullivan (2013), to simulations to assess contrast and level of dominance of offshore and onshore Project components.
- Compare baseline to projected visual conditions in relation to the seascape and landscape conditions (seascape and landscape character areas)
- Quantify visual changes to all viewpoints (number of facilities in view, distances, height, field of view)
- Anticipate receptor/viewer response based on sensitivity to changes to visual conditions based on the effects to the viewer experience as related to viewer activity(s) within the KOP
- Determine likely level of impact by combining sensitivity and contrast/visibility level

Environmental Consequences

The VIA report will provide a preliminary analysis of visual impacts of the Project. A final determination of impact will be completed within the BOEM NEPA process. The VIA report will describe the level of contrast applied to selected simulations, assuming maximum development scenario, and the expected effect on sensitive viewers at those locations. In addition, KOPs and viewpoints not simulated will be analyzed for impact based on visibility, distance, and proximity to simulated points.

Cumulative Impacts

The Mayflower Wind Project is located in one of 8 offshore wind energy lease areas in the MA/RI WEA. The cumulative impacts analysis represents the Mayflower Wind Project within the context of the other potential developments based on the “Effects of Reasonably Foreseeable Planned Actions”. BOEM will provide guidance on cumulative impact requirements and how to address the determination post-COP submission.

Mitigation

Depending on the impact level, mitigation measures may be proposed. These will be done in consultation with Mayflower Wind and BOEM after COP submission.

Attachment 1: VIA Detailed Methodology

Project Description

A description of the proposed action including the locations, number and size of wind turbine generators (WTGs), offshore substation platforms (OSPs) and the location, number, and size of onshore transmission facilities will be provided. For the purposes of the Visual Impact Assessment (VIA) to accompany the Mayflower Wind Construction and Operations Plan (COP), we anticipate describing and evaluating a single project alternative, the *Maximum Development Scenario*. This includes the greatest anticipated number of WTGs, the largest potential size, and the largest size and maximum number of onshore transmission structures. As the Project design proceeds to greater detail, future modifications are expected to be in the direction of less, rather than more visual impact.

Conduct Baseline Studies

The characterization of the baseline landscape and visual conditions is an important component of the analysis. The baseline is the basis for measuring the visual effects or impacts.

Baseline includes descriptions of:

- Atmospheric and meteorological influence
- Landscape/seascape conditions - delineate and describe landscape and seascape character and ocean areas.
- Historical Significance
- Selection and Evaluation of Key Observation Points (including consultation and input with local communities)
- Field Photography from Key Observation Points
- Identification of Key Views and Receptors based on descriptions of viewer experiences and activities

Describing the Area of Potential Impact

Viewsheds/visibility and Area of Potential Impact (API) are various ways to describe the area within which the Project may be visible, and thus could be impacted. In the case of the Mayflower Wind Project, factors that influence visibility include; distance, earth curvature, atmospheric conditions, topography, and potential screening by other nearby projects (i.e., Vineyard Wind turbines may screen Mayflower Wind turbines from portions of Martha's Vineyard). Additionally, topography, vegetation, and buildings may screen views of WTGs and transmission towers from land-based viewpoints.

Based on information derived from previous projects and preliminary visibility analyses, at least some maximum-sized Mayflower Wind WTGs will likely be visible at far background distances (greater than 20 miles) from multiple viewpoints, particularly Nantucket beaches on the southwestern shore.

Atmospheric Conditions

Atmospheric Conditions refer to low cloud cover, fog, or haze that when present, obscure or restrict views of the Project. These vary by time of year and day and provide information regarding how often the Project will likely be visible. Previous atmospheric condition analyses for other projects in the vicinity indicate that offshore turbines may be visible approximately half the time during daylight hours, with some seasonal variability.

Landscape/Seascape Character Assessment

Landscapes and seascapes can be defined as a distinct and recognizable pattern of elements, or characteristics, that make one place visually and aesthetically different from another. The question is not better or worse, but rather what is it that makes one place distinct. *Landscape Character Assessment* is a process that identifies and describes variation in the landscape. It is an effort to identify and explain the unique combination of elements and features (characteristics) that make landscapes distinctive

Understanding what is distinct about a landscape/seascape, what makes it special, establishes a baseline for measuring changes to it, whether these are positive, neutral, or negative.

An important part of the landscape/seascape character analysis in this Project is identifying how land and shoreline character areas are visually tied to the open sea where the Project will be located. All landscapes and seascapes have a

combination of elements that make them what they are and influence how they appear. Various factors that influence landscape/seascape character include:

- Physical factors: geology, soils, landform, drainageways
- Cover: vegetation, barren areas (beaches, rock)
- Shorelines and erosional features, bays, cliffs
- Scale, such as the open ocean
- Human activities: land use, buildings, towns, field and forest patterns, historic and contemporary

Landscape/seascape character is the basis for aesthetic perception. Places vary with respect to scale, complexity, openness, human influence, and wildness. Generally, people prefer landscape character types that include: naturalness, historic buildings or townscapes, complex, fine grained field patterns, views of open water, and panoramic (wide angle) views. Our preliminary observations are that all or nearly all of the landscape/seascape of the Project Area has these qualities in abundance. *Regional ecotypes* are often the foundation for landscape/seascape character description, even where these are no longer dominant.

Preliminary List of Landscape/Seascape Character Units:

- Open ocean
- Open sand beaches
- Coastal dunes
- Coastal bluffs
- Tidal marshes & salt ponds
- Grasslands, fields and meadows
- Scrub-shrub plant communities
- Forests and Woodlands
- Residential (may include subtypes)
- Village/Townscape

We will map landscape character types with lines drawn where one meets another. We recognize that people's experience of these types is often inclusive, that is one may be standing within a grassland or field that is adjacent to tidal marshes, and includes residential areas, but also has a view to the open ocean. Adjacent scenery influences scenery within the near view. We plan to use Bureau of Land Management methods for determining the degree of influence, particularly the distant ocean, on terrestrial character types where they are visually connected.

Desktop studies set the stage for landscape/seascape character assessment.

Historical Significance

Historical Significance is important to the local communities and BOEM. "Time Depth" is a phrase used to describe visible links to cultural heritage, human influence, and historic character. Some landscape/seascapes display many layers of history, while others have no obvious links to the past, though these may be hidden. While a separate analysis of historic resources is being done for the Project, the VIA will consider historical influences on landscape/seascape character types, as well as visual influences or connections between the Project and historic sites.

Key Observations Points

Key Observation Points (KOPs) represent both common and sensitive views within the analysis area. These locations are being used to assess potential changes to landscape/seascape character that could result from the Project.

A list of KOPs was identified from the Vineyard Wind Visual Impact Assessment and has been used as a starting point to recognize places of visual significance to the community within the area of potential visual effects. These KOPs include historic structures and buildings, significant landscapes, recreation areas, scenic roads, overlooks and vistas, public beaches, town centers, residential communities and estates.

A desktop analysis of the potential viewshed of the Mayflower Wind Project eliminated some KOPs from the initial list. Consultations with the communities on Nantucket, Martha’s Vineyard, and Falmouth resulted in adding other sites. Selected KOPs reflect importance to scenic, social, cultural and economic resources, and include the entire oceanfront facing towards the Project.

KOPs should be thought of as use areas that may have a visual connection to the Project. A KOP can be a single point, or it can be a broader place, like Madaket Beach, or Bartlett's Farm located on Nantucket. As such, a visitor to a KOP may have a visual experience that begins on the way there, may include an entry area, parking, and a walk to a viewpoint or use area. The visual experience changes along the way. At times the Project may be screened, while at other times it is a focal point. Within these broad KOPs, specific photo points will be selected that provide representative, or best views toward the Project. The final KOP list includes a broad selection of view types while avoiding duplication. KOPs are selected to adequately represent views of the Project from multiple angles, distances, vantages, and viewer types (residents, tourists, economic interests).

Field Photography

Measured, geo-referenced photos have been taken, to the extent possible, in clear weather conditions, from all KOPs, using standards common to the practice, described in the Land and Visual Impact Assessment (LVIA), and to meet the anticipated expectations of reviewers. Panoramic images were taken from multiple sites. Some, but not all of these will be selected as simulation points to explore Project visibility and contrast in greater detail.

Receptors/Viewers

Receptors are the people who ultimately will see the Project and experience its effects. For the Mayflower Wind Project, given its position off the coast of the islands of Martha's Vineyard and Nantucket, we anticipate the following groups of receptors/viewers:

- Year around residents
- Seasonal residents
- Scenery oriented tourists
- Tourist related businesses
- Recreation oriented tourists and vacationers
- Recreational mariners
- Commercial mariners

It is important to note that receptor/viewer groups are not exclusive, nor are "groups" the actual viewers. Individuals do the viewing, and they may be part of one or more groups. For example, a year around resident may also have a boat and at times be a recreation or commercial oriented mariner. Year around and seasonal residents may also be recreation oriented "tourists" on weekends when they go to the beach or cycle across an island.

There is an expectation at the outset that most receptors of the Project will be very sensitive to visual changes from key observation points on Cape Cod, Nantucket and Martha’s Vineyard resulting from offshore wind development and related land-based facilities. This expectation is based on public input on previous projects in the area, as well as direct discussions with local stakeholders. The focus of our analysis will be on quantifying and qualifying these viewer groups, but we do not anticipate a deep analytical dive into differentiating sensitivity levels.

Summary, Baseline Studies include:

- Viewsheds/visibility/study area
- Atmospheric conditions
- Landscape/seascape character descriptions
- Key View analysis and selection: (Includes input from local stakeholders – Nantucket, Martha’s Vineyard, Falmouth) – Mayflower Wind continues to execute their public engagement plan
- Field photography
- Identification of likely receptors/viewers: type, numbers, season, sensitivity

Analysis of Visual Impacts & Analysis Procedure

We assume that receptors/viewers are highly sensitive to the visual environment. Nantucket receptors will be more visually exposed to the offshore Project elements than those on Martha's Vineyard due to distance. Cape Cod viewers will not be exposed to offshore facilities due to distance and expected screening but will be somewhat exposed to transmission facilities onshore.

General process:

- Select simulation points based on historical significance, viewer experiences and landscape character
- Evaluate maximum anticipated development based on design envelope provided by Mayflower Wind
- Compare baseline to projected visual conditions. Note change, positive or negative.
- Quantify visual changes to all viewpoints (number of facilities in view, distances, height, field of view)
- Anticipate receptor/viewer response based on sensitivity and changes to visual conditions
- Perform visual contrast rating independently (2 or more visual quality experts).
- Combine sensitivity with visual contrast to gage impacts on a qualitative scale (low to high) from each simulated point.
- Where possible, extrapolate to KOP/photo points that were not simulated, but can be predicted based on their proximity or similarity to simulations (angle, distance, character type, etc.).
- Analyze the overall impact based on number of KOPs affected, and the degree of effect.

The visibility analysis has identified areas that likely will have visual exposure to the Project. It includes data, such as distance, number of facilities visible, and mitigating factors (i.e., partial screening). Simulation viewpoints are being selected to represent key views that highlight a diversity of viewer experiences from different vantage points, view angles or site characteristics.

Sixteen photo points have been selected for simulations of offshore facilities. Most of these are on Nantucket Island, which has a higher degree of visual exposure, and is more proximate to the Project. In addition to the photographic simulations, one video that includes both daytime and nighttime views will be developed to capture safety lighting, blade motion, and shifting daylight effects. A set number of simulations of offshore views, onshore views and one video simulation will be developed for submittal with the COP.

Analysis will substantially rely on a modified Visual Contrast Rating system applied to the simulated views. The rating scale that will be used was developed by Robert Sullivan, Argonne Lab in a paper (2013) on offshore wind turbine visibility*, summarized as follows:

- Level 1: Visible only after extended, close viewing.
- Level 2: Visible when scanning in the general direction of the project facilities.
- Level 3: Visible after only a brief glance in the direction of the project facilities.
- Level 4: Plainly visible, but not dominant.
- Level 5: Strongly attracts visual attention. Prominent.
- Level 6: Dominates the view. Occupies most of the visual field.

Modified BLM visual resources assessment and contrast rating form will be used to guide the analysis. Visual contrast is a useful indicator of impact, assuming sensitive receptor/viewers. In the scale above, levels 5 and 6 indicate high impact, 3 and 4 moderate impact, and 1-2 no or low impact. However, impact is also dependent on other factors, including number of viewpoints affected and viewer sensitivity.

In addition, wind turbines sometimes have an "associative aesthetic," meaning people like or accept their appearance because they link them to clean energy production, supported by many people. To the extent feasible, the simulations will be completed for clear sky and atmospheric conditions. This is generally referred to as "worst case" scenario for visual impact analysis, even though at times facilities will be obscured.

***Table: Significance of Landscape Impacts* (Sullivan 2013)**

Assessment of Significance of Landscape Impacts Red cells represent significant adverse impacts Green cells represent significant beneficial impacts Blue cells represent impacts that are not significant			**Landscape Receptor Sensitivity**		
			High	**Medium**	**Low**
			Landscape with important components or of a particularly distinctive character, susceptible to relatively small changes of the type proposed.	Landscape with relatively ordinary, moderately valued characteristics reasonably tolerant of changes of the type proposed.	A relatively unimportant landscape with few features of value or interest, potentially tolerant of substantial change of the type proposed.
Magnitude of Landscape Impact	**Major adverse**	Significant adverse changes, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness for more than 2 years	High adverse significance	High/Medium adverse significance	Medium adverse significance
	Moderate adverse	Noticeable but not significant adverse changes for more than 2 years or significant adverse changes for more than 6 months but less than 2 years, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness.	High/Medium adverse significance	Medium adverse significance	Low adverse significance
	Slight adverse	Noticeable adverse changes for less than 2 years, significant adverse changes for less than 6 months, or barely discernible adverse changes for any length of time.	Medium adverse significance	Low adverse significance	Neutral
	Neutral	Any change would be negligible, unnoticeable or there are no predicted changes.	Neutral	Neutral	Neutral
	Slight benefit	Noticeable beneficial changes for less than 2 years, significant beneficial changes for less than 6 months, or barely discernible beneficial changes for any length of time.	Medium beneficial significance	Low beneficial significance	Neutral
	Moderate benefit	Noticeable but not significant beneficial changes for more than 2 years or significant beneficial changes for more than 6 months but less than 2 years, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness.	High/Medium beneficial significance	Medium beneficial significance	Low beneficial significance
	Major benefit	Significant beneficial changes, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness for more than 2 years	High beneficial significance	High/Medium beneficial significance	Medium beneficial significance

Environmental Consequences

The VIA report will not provide a complete determination of visual impact. The report will describe the level of contrast based on the scale above and applied to the simulation points, assuming the expected effect on sensitive viewers at those locations. This will provide an indication of likely impact level using a qualitative scale. An environmental impact statement done later by BOEM may use these findings as is, or may choose to re-evaluate impacts.

Likely effects/impacts will depend on a range of factors, including:

- Visibility, seasonality, atmospheric conditions
- Proportion of the Project elements in view
- Number of viewpoints affected
- Viewing distance
- Nature of the views (duration, movement, screening)
- Scale and magnitude of the proposed facilities within the view
- Geographic extent of the project within the visual context
- Night lighting systems used
- Sensitivity and number of viewers
- Value attached to views

The level of impact combines magnitude and sensitivity to visual change. We expect that sensitivity is high, therefore much of the analysis is aimed at determining the magnitude of the visual change to the environment rather than determining sensitivity.

Mitigation

Appendix A - Best Management Practices of the BOEM guidance for COP development (BOEM, 2020) notes that developers should consider the following for visual resources:

- Address key design elements, including visual uniformity, use of tubular towers, and proportion and color of turbines.
- Use appropriate viewshed mapping, photographic and virtual simulations, computer simulation, and field inventory techniques to determine, with reasonable accuracy, the visibility of the proposed project. Simulations should illustrate sensitive and scenic viewpoints.
- Comply with FAA and USCG requirements for lighting in accordance with BOEM's "Draft Proposed Guidelines for Providing Information on Lighting and Marking of Structures Supporting Renewable Energy Development," dated October 2019, available at https://www.boem.gov/guidance, and should minimize visual impacts through appropriate application.
- Seek public input in evaluating the visual site design elements of proposed wind energy facilities.
- Use directional aviation lights that minimize visibility from shore (within FAA guidelines).

Mayflower Wind will consider and incorporate, where appropriate, the above BMPs for visual resources as part of the design process. As noted above, the VIA will evaluate the *Maximum Development Scenario*.

Cumulative Impacts

Our understanding is that BOEM will provide guidance on criteria associated with "Effects of Reasonably Foreseeable Planned Actions" within the Wind Energy Area. We assume this will include:

- At least one simulation from a key viewpoint that incorporates other anticipated offshore wind development near the Mayflower Wind Project
- Mayflower Wind will provide an overview map that will define the Lease Area and WTG positions that may be visible from one or more of the existing KOPs.
- Mayflower Wind will provide an inset map with each cumulative simulation which identifies the WTG positions included, including with and without the Mayflower Wind WTGs, and those from other projects.
- A list of assumptions related to the Mayflower Wind turbine positions within the lease area, the number of proposed turbines and methods used in mapping and modeling of the simulations.

We anticipate that BOEM will provide Mayflower Wind with specific direction as to the assumed heights, foundation types, color and other pertinent information for turbines and offshore substation platforms located in neighboring lease areas. It is Mayflower Wind's expectation that BOEM will request the development of and provide the required information for cumulative impact simulations after COP submittal and prior to issuance of the National Environmental Policy Act (NEPA) Draft Environmental Impact Statement (DEIS).

Reporting

Using the above described methodology AECOM will prepare the Visual Impact Assessment Report for inclusion with the COP. That report will fully document the assessment methodology employed, complete description of the baseline landscape and visual conditions, and resultant findings based on a Maximum Development Scenario.

References

BOEM. 2020. Information Guidelines for a Renewable Energy Construction and Operations Plan (COP). Version 4.0. May 27.

LI/IEMA. 2013. Guidelines for Landscape and Visual Impact Assessment, Third edition (GLVIA 3). Landscape Institute and Institute of Environmental Management & Assessment, Routledge, London.

Sullivan, Robert G., and Jackson Cothren, 2013. Offshore Wind Turbine Visibility and Visual Impact Threshold Distances. Environmental Practice, March 2013.

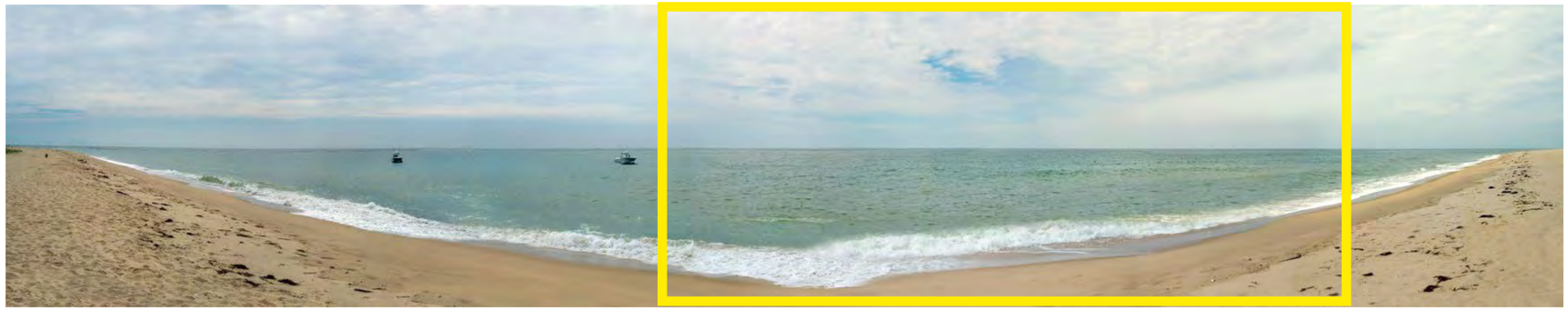
Epsilon Associates Inc. 2020. Vineyard Wind LLC, Draft Construction and Operations Plan Volume III Appendices.

Preparer	**Reviewer 1**	**Reviewer 2**
Dean Apostal / Jordan Secter		Nancy Palmstrom
X		**X**

Attachment 2 – KOP Photo Log

Existing Conditions Key Observation Point 1-MV – Wasque Point

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 2-MV – Wasque Reservation

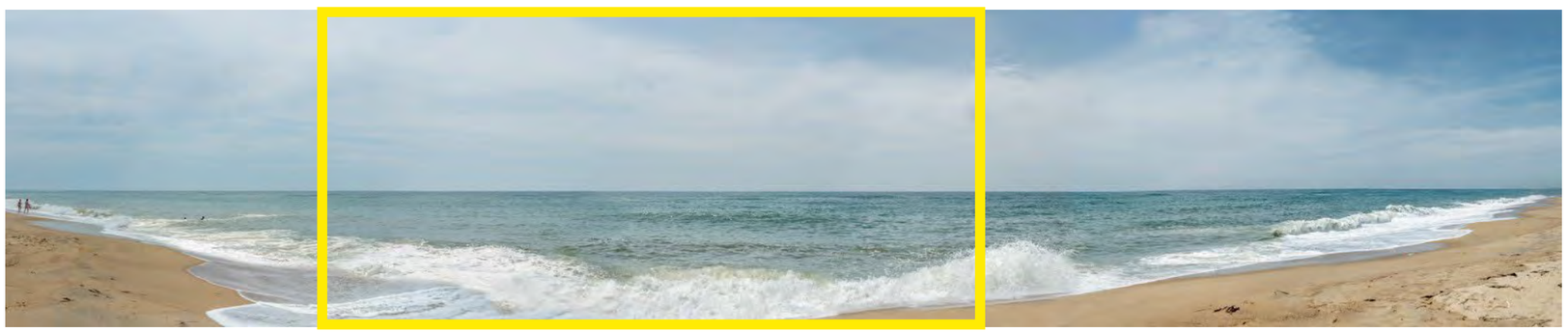
Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 3-MV – Wasque Avenue

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 4-MV – South Beach

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 5-MV – Wilson’s Landing

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 6-MV – Long Point Beach

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 7-MV – Tississa Pond (beach at end of hiking trail)

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 8-MV – Tississa Pond Hiking Trail

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 9-MV – 322 South Road

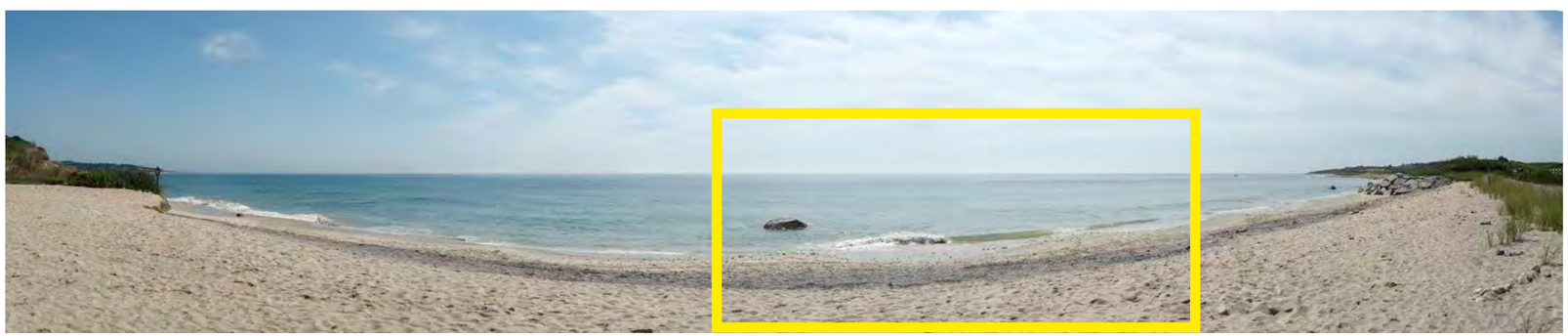
Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 10-MV – Barn House/Skiff-Mayhew- Vincent House

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

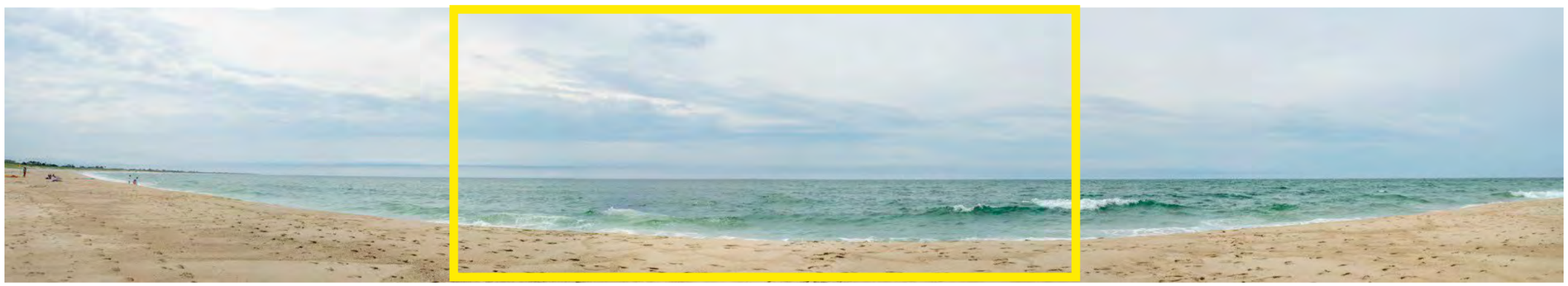
Existing Conditions Key Observation Point 16-MV – Squibnocket Beach

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 1-N – Surfside Beach

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 2-N – Sanford Farm Barn Overlook

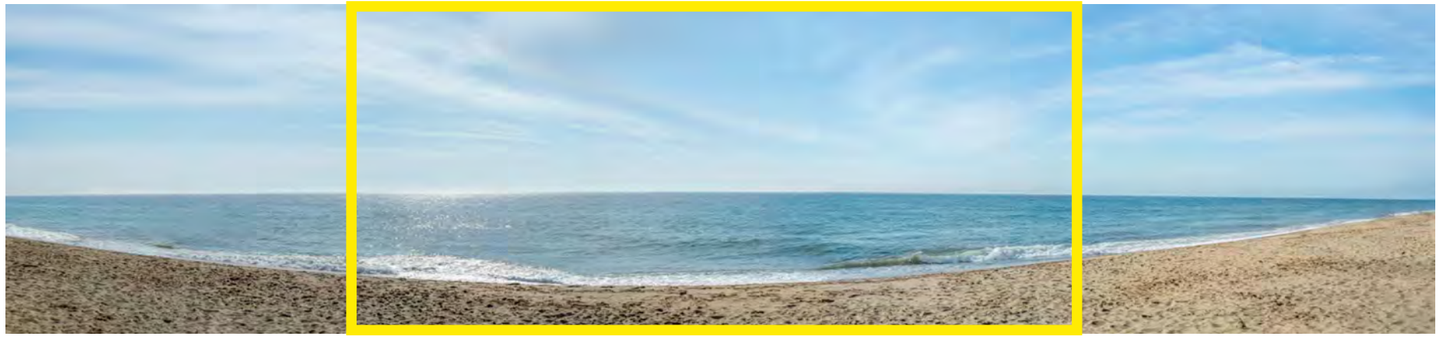
Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 3-N – Madaket Beach

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

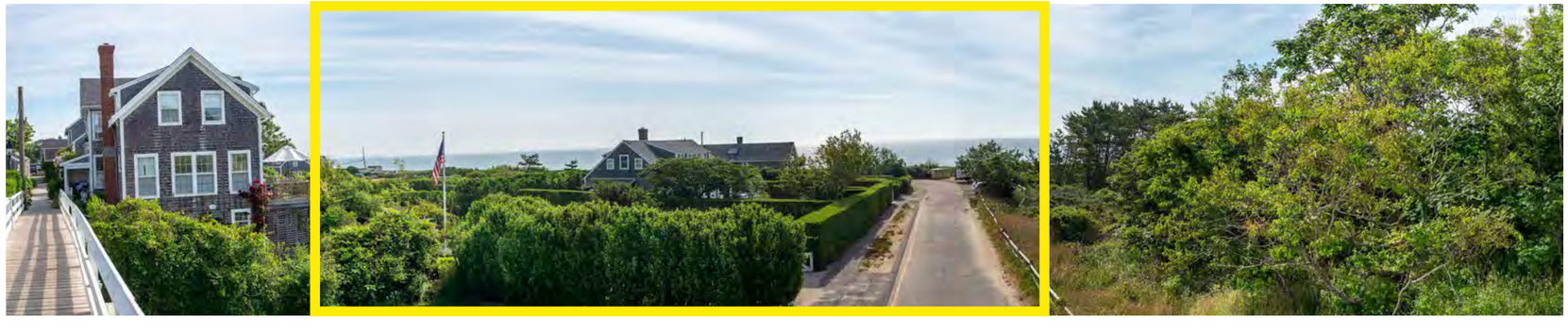
Existing Conditions Key Observation Point 4-N – Siasconset Beach

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



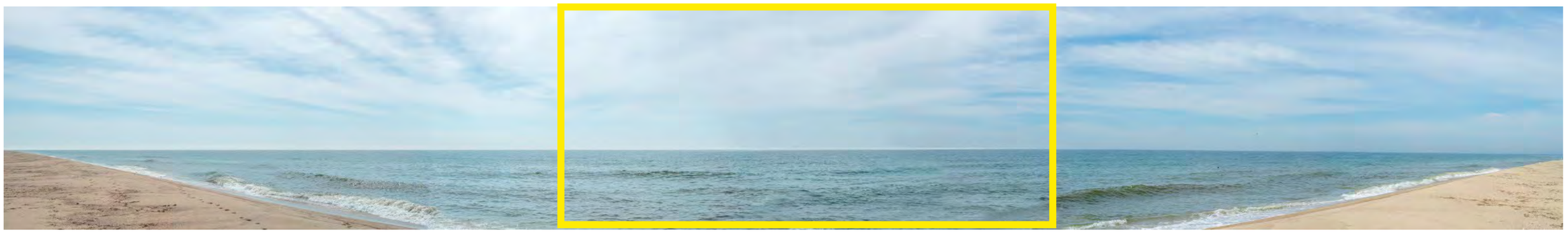
Existing Conditions Key Observation Point 5-N – Siasconset Bridge

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



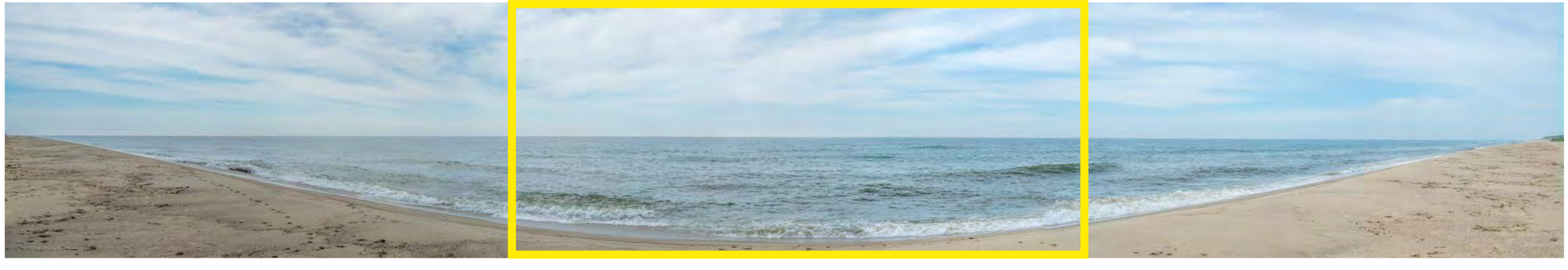
Existing Conditions Key Observation Point 6-N – Tom Nevers Beach

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



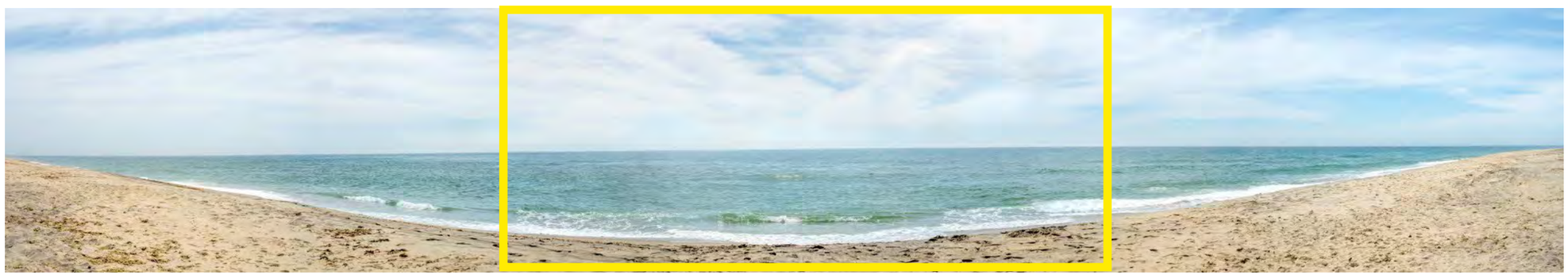
Existing Conditions Key Observation Point 7-N – Low Beach

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



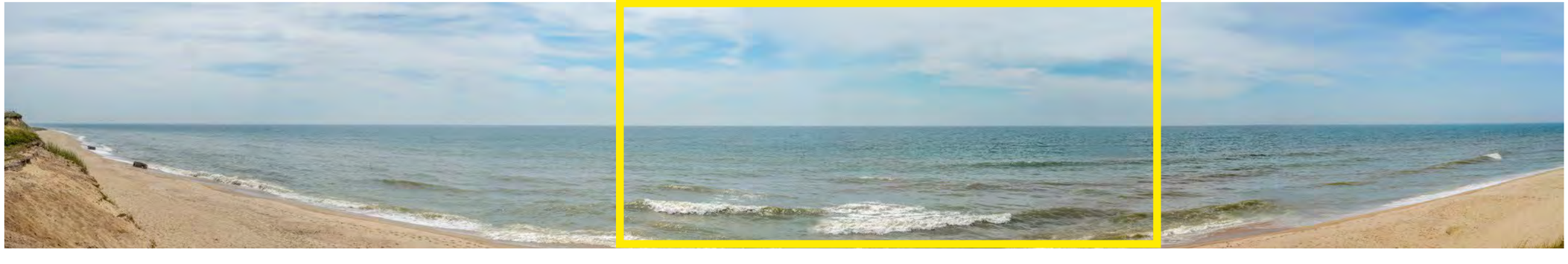
Existing Conditions Key Observation Point 8-N – Tom Nevers Field

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 9-N – Madequecham 5

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 10-N – Nobadeer Beach

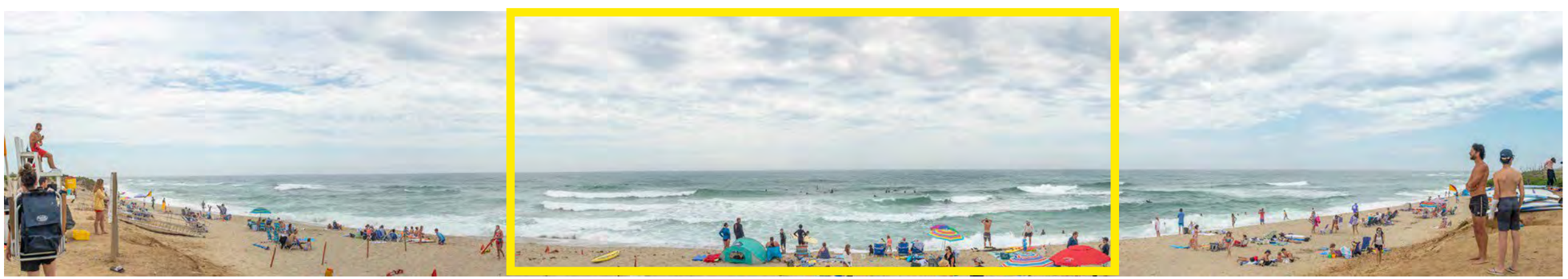
Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 11-N – Miacomet Beach and Pond

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 12-N – Cisco Beach

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 12-N – Cisco Beach

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 13-N – Hummock Pond Rd Bike Path

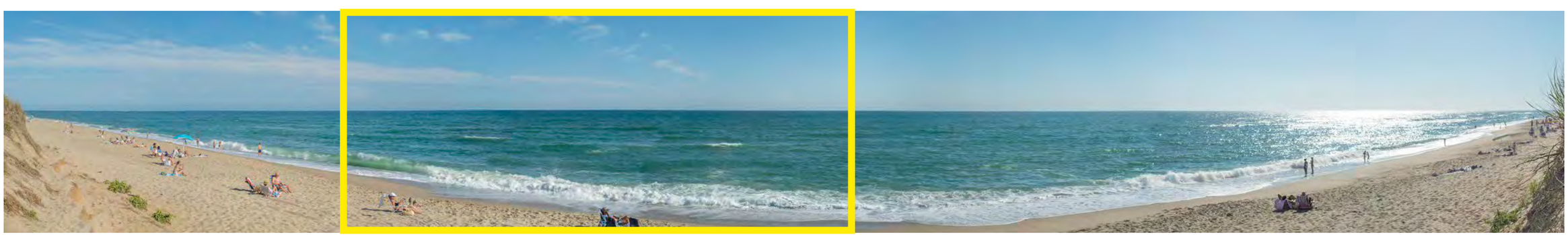
Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Existing Conditions Key Observation Point 15-N – Altar Rock

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

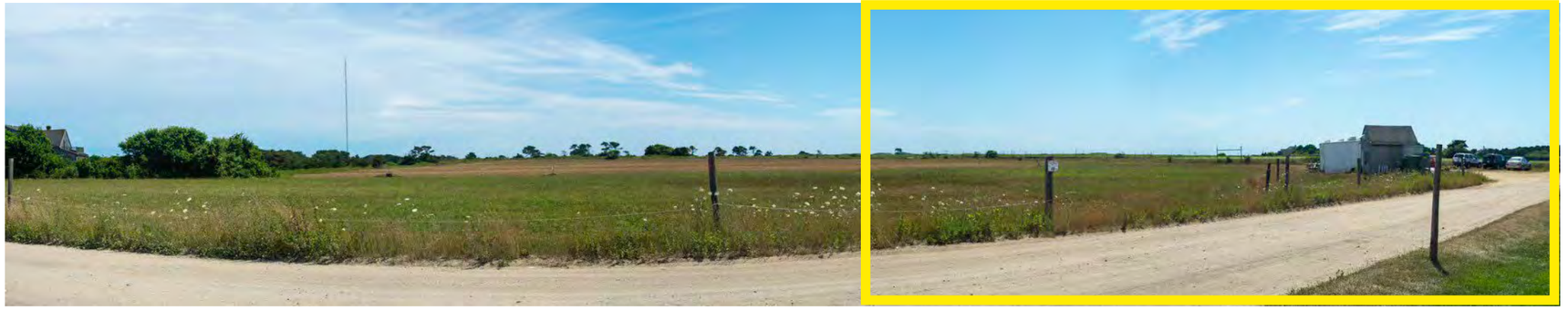
Existing Conditions Key Observation Point 16-N – Head of Plains

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



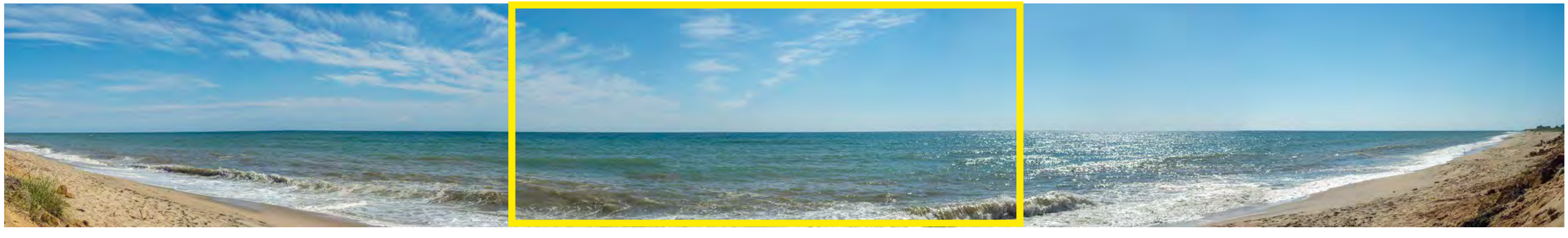
Existing Conditions Key Observation Point 17-N – Bartlett's Farm

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 18-N – Ladies Beach

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

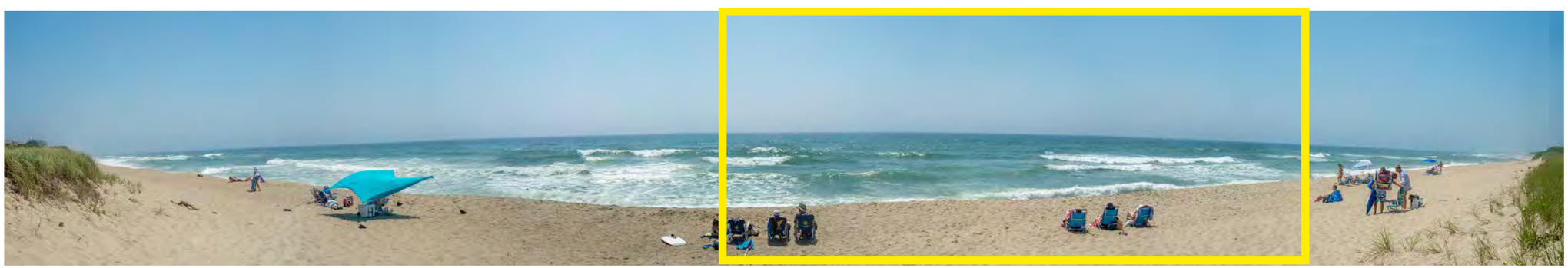


Existing Conditions Key Observation Point 19-N – Miacomet Golf Club

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

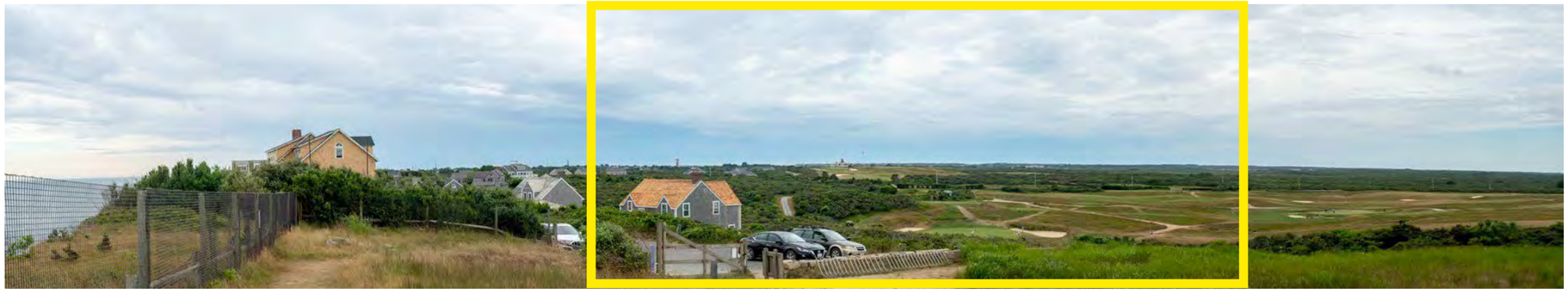
Existing Conditions Key Observation Point 20-N – Madequecham 1

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 21-N – Sankaty Head Lighthouse

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Existing Conditions Key Observation Point 22-N – Madaket Beach Sunset

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 1-C – Elm Road

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 2-C – Mill Road

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

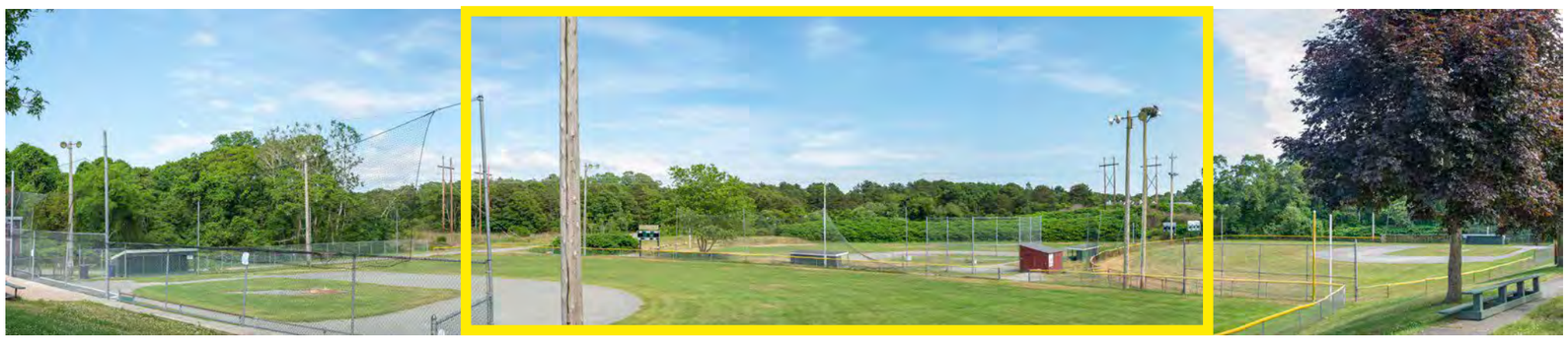
Key Observation Point 3-C – Shore Street

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 4-C – Gifford Road

Key Observation Point 5-C – Falmouth Youth Baseball Fields at Trotting Park

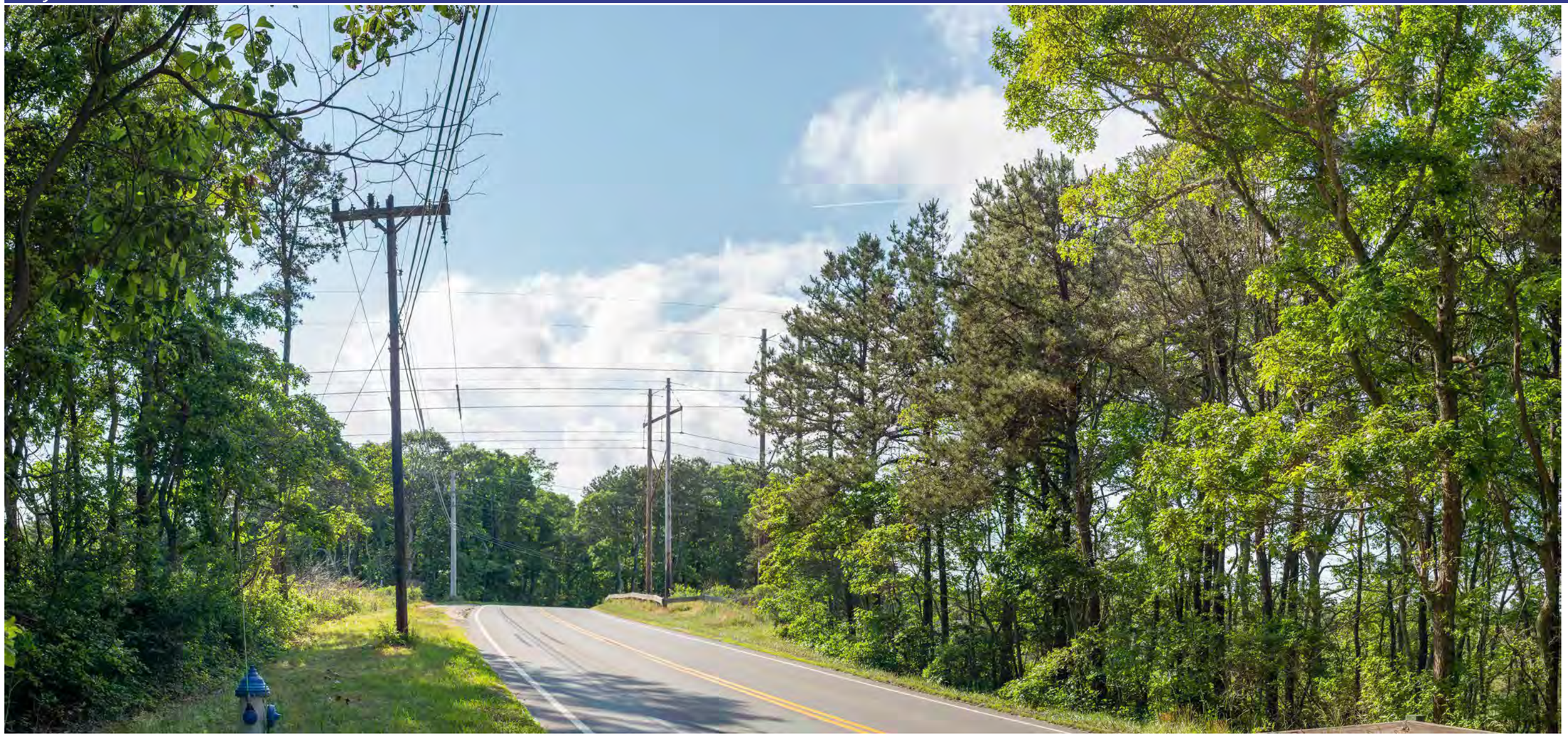
Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Key Observation Point 6-C – Falmouth High School

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 7-C – Thomas Landers Road



Key Observation Point 22-C-B – Falmouth Heights Beach; Facing Worcester Ave

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 23-C – Trotting Park from Access Road

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 24-C – Brick Kiln Road (West)

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 25-C – Brick Kiln Road (East)

Key Observation Point 31-C – Woods Hole Road at Bike Path Crossing

Key Observation Point 31-C – Woods Hole Road at Bike Path Crossing

Key Observation Point 33-C – Carlson Lane at Park near Bike Path

Key Observation Point 33-C – Carlson Lane at Park near Bike Path

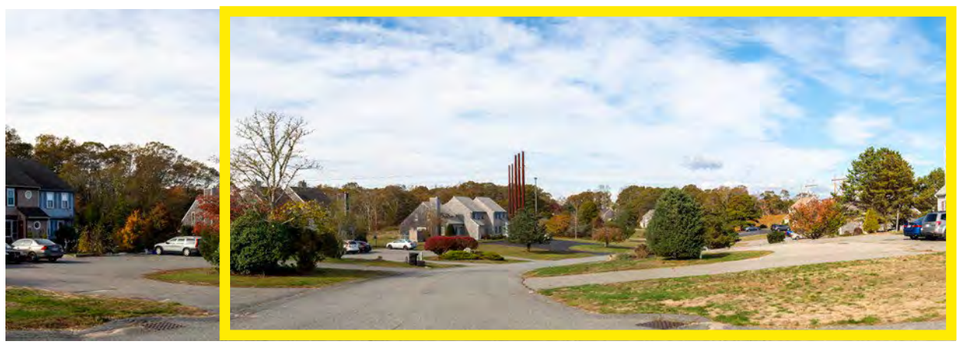
Key Observation Point 33-C – Carlson Lane at Park near Bike Path

Key Observation Point 44-C – Oak Grove Cemetery

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

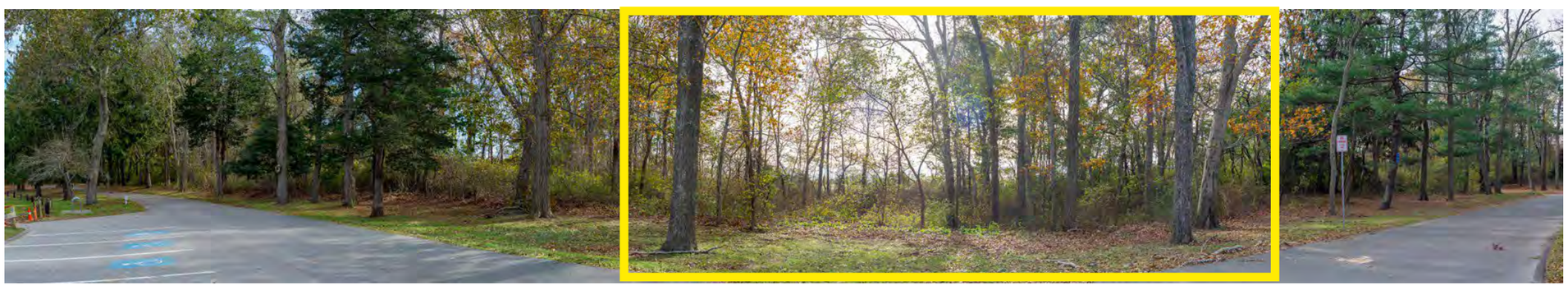
Key Observation Point 45-C – Woodview Drive looking Northwest

Photograph above is intended to be viewed approximately 15" from viewer's eyes when printed on 11" x 17" paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



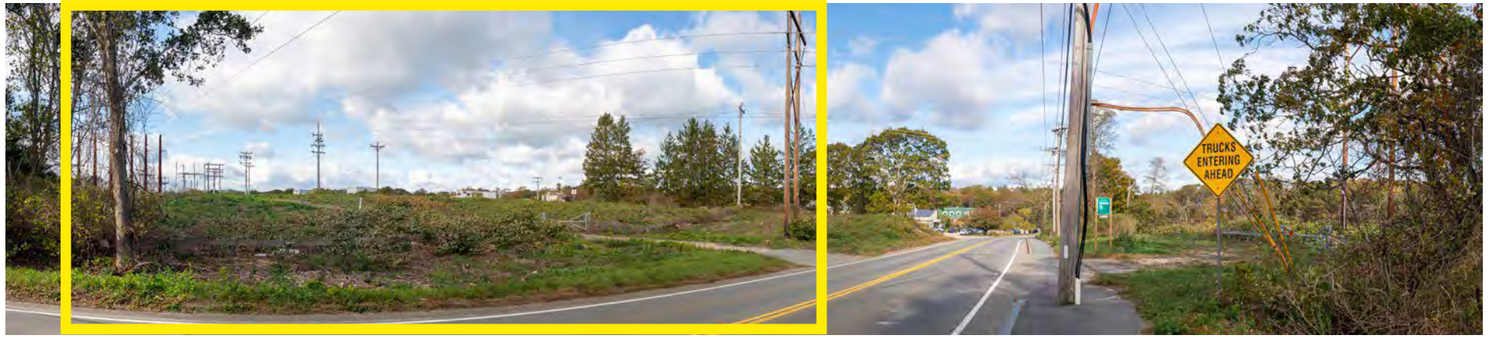
Key Observation Point 46-C – Goodwill Park

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Key Observation Point 47-C – Lawrence Lynch Site – Gifford Road Substation

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Key Observation Point 48-C – Gifford Road

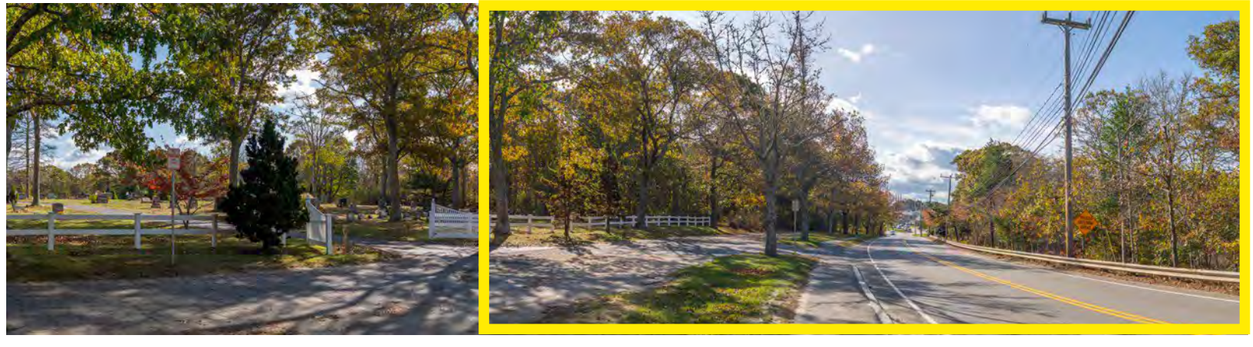
Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 49-C – Two Ponds

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.

Key Observation Point 50-C – St. Joseph Cemetery

Photograph above is intended to be viewed approximately 15” from viewer’s eyes when printed on 11” x 17” paper. The photograph below was cropped, left and right, to show a wide-angle view of the area; the area in yellow depicts the location of the above imagery.



Attachment 3– Offshore Visual Analysis Forms and Photo Simulations for Martha's Vineyard and Nantucket

Attachment 3 Offshore Visibility Analysis Forms

Tables

Martha's Vineyard

Table 1. KOP Number 1-MV

A. KOP Information				
KOP Number: **1-MV**	**KOP Name:** Wasque Point	**Date:** June 25, 2020	**Time:** 9:00 AM	**Weather**: Sun, partly cloudy with haze band
Location Description: Wasque Point Beach is part of a 200-acre nature reserve located on the southeastern end of Chappaquiddick Island.				
Landscape Character Description: Open Ocean, Ocean Beach, Coastal Scrub, Rural/Residential	**Scenic Integrity:** Scenic integrity is high due to the remote location and the beach; the setting appears mostly natural. The beach and active dunes appear natural. The view to the horizon is unobstructed.			
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Open ocean, sandy beach and eroding dunes.			
Relevant Viewer Groups: Recreational User, Residents, Tourists	**Viewer Context:** Viewer groups visit Wasque Point to recreate and experience the natural character of Chappaquidick. Recreation includes surf cast fishing, hunting, ice-skating on inland ponds, swimming, hiking, mountain biking, horseback riding and photography.	**Viewer Position:** Level with Project (on beach)		
Visual Connection to Project: Visual connection to the open ocean is unencumbered.	**Viewing distance: Statue Miles (mi) (mi) and Kilometers (km)** 31.19 mi 50.20 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 1-MV]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Level to slightly sloping sandy beach, steep tidal beach break. Eroding vertical cliff dune.	Linear and regular, fills in the negative space in the scene, indistinguishable from the sky	None	None	None
Line	Strong undulating line where coastal tidal edge meets the water tan sandy beach.	The ocean is flat with even to irregular lines of the moving water.	None	None	None
Color	Sand, brown, gray	Very light gray/blue	None	None	None
Texture	Fine to course	Smooth	None	None	None

Existing Landscape/Seascape Character Description:

Wasque Point Beach is comprised of terraced sandy beaches connected to shifting sandbars that are constantly changing due to strong wind and ocean currents. Above the beach, dry soils support native pine oak forests, sandplain grasslands, and heathlands. The area is owned and managed by the one of five preservation trusts called the Trustees of Reservations. Lands are managed as ecological preserves and recreation areas supporting residents and seasonal tourists. Unimproved roads connect with primitive parking areas that lead to trails with staircases leading to the beaches. During the summer season, visitors are required to purchase seasonal or day passes to park and access the trails and beaches.

The dominant visual elements are comprised of natural vegetation, dunes. the flat expanse of ocean, the blue or gray color reflecting the sky, smooth or choppy texture of the water surface, and the distant horizon line. Scenic integrity is high, with few or no existing visual intrusions. The dark horizon line provides a distinct linear break between the ocean and the sky. Ocean evaporation from warm summer temperatures often creates grayish white band of haze between the ocean and the blue sky. Conditions range from flat water to choppy to rolling swells.

The viewer position to the ocean is from the beach near the main access point. The long, linear, tan sandy beach contrasts strong variable edge where the ocean tide meets the dry sand of the beach.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 1-MV] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color			X				X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA			X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak to Moderate

Visibility Level Rating: [2] - [3]

[2] Visible when scanning in the general direction of the project facilities.

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance.

Contrast rating is a range of weak to moderate. The conditions of the simulations present an overcast haze that somewhat reduces the visibility of the elements in the view. In clearer conditions, visibility would likely be closer to a 3, with the project visible only after a brief glance, but not plainly visible given the distance. Turbine details, blade movement for example, would be difficult to see due to the distance.

Contrasting Elements:

- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- Array of turbines and platforms along the horizon line.
- The apparent density of visible structures arrayed across the horizon line as well as the extent of the visible horizon occupied by the Project; An apparent lack of visual order of the Project from the viewer position;
- Circular blade motion along the horizon line which
    - Occurs in a different plane from the horizon.
    - Does not correspond with the natural back and forth motion of the waves.
    - Is not synchronized (e.g., rotation speed and blade positions may vary among the visible WTGs).
    - May be visible when visual acuity is not diminished from atmospheric conditions.
    - Does not relate to any existing features.
- The vertical turbines contrast with the linear flat form of the ocean and the dark horizontal line of the horizon.

VISIBILITY ANALYSIS FORMS

Mitigating Factors:

- Due to distance, much of the turbine height is below the horizon line and only a small section is in view above the horizon line.
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated Aircraft Detection Light System (ADLS), if approved by FAA. This system is activated only when aircraft penetrates the radar field.

KOP 1-MV - Wasque Point

Martha's Vineyard

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 9:01 AM	Viewing direction: South (163°)
Date of photograph: 6-25-20	Latitude: 41.351077°N
L/SCA: Ocean Beach, Costal Scrub, Rural/Residential	Longitude: 70.454821°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 77° F
Humidity: 58%
Wind Dir & Speed: SSW 14mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 20.5 ft / 6.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Trustees of Reservation Property (access fee), recreation parking area
Scenic Resources: Open ocean, ocean beach, coastal dunes
Adjacent Amentities: Trustees of Reservation entry kiosk
Adjacent Areas: Pocha Pond, Wasque Point Beach, Edgartown South Beach, Katama Bay, East Beach, residential structures
Adjacent L/SCAs: Ocean beach, open ocean, coastal scrub bush, coastal dunes, bays and ponds, low density residential structures
Adjacent KOPs: KOP 14-M Quammux Road, KOP 2-M Wasque Reservation, KOP 1-M Wasque Point

KOP 1-MV - Wasque Point

Martha's Vineyard

EXISTING CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

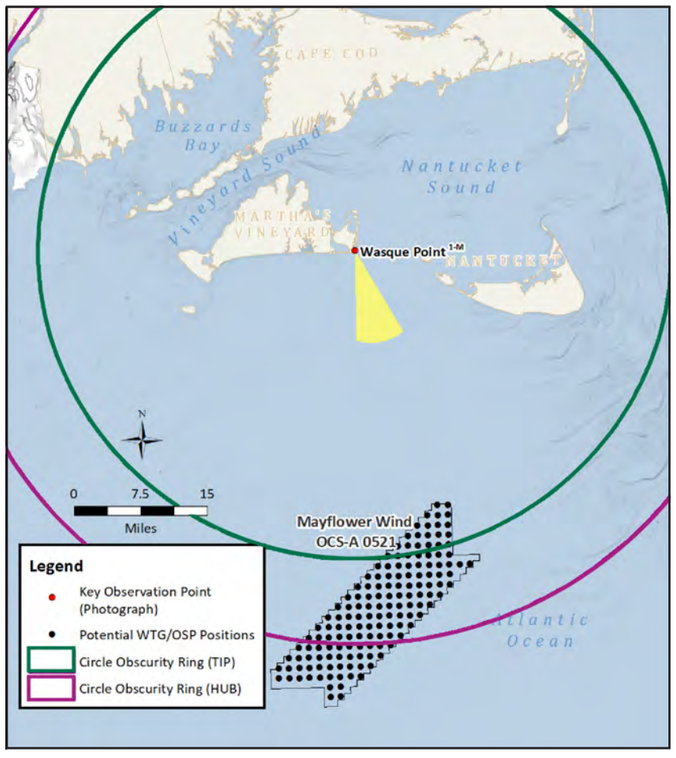
KOP 1-MV - Wasque Point

Martha's Vineyard

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 9:01 AM	Viewing direction: South (163°)
Date of photograph: 6-25-20	Latitude: 41.351077°N
L/SCA: Ocean Beach, Costal Scrub, Rural/Residential	Longitude: 70.454821°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 77° F
Humidity: 58%
Wind Dir & Speed: SSW 14mph
Weather Condition: Cloudy

CAMERA

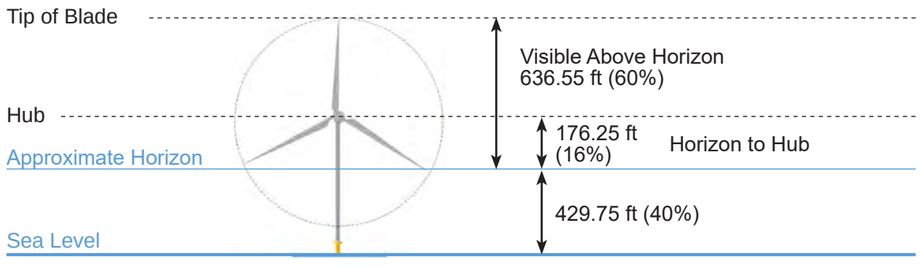
Camera Elevation: 20.5 ft / 6.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 51.9 mi / 83.5 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 106
Nearest WTG: 31.2 mi / 50.2 km	Potential Number of WTGs Not Visible: 43

VISIBILITY OF CLOSEST TURBINE



KOP 1-MV - Wasque Point

Martha's Vineyard

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Table 2. KOP Number 2-MV

A. KOP Information				
KOP Number: **2-MV**	**KOP Name:** Wasque Point Reservation (from trail)	**Date:** June 25, 2020	**Time:** 9:12 AM	**Weather**: Sun, partly cloudy with haze band
Location Description: Wasque Point is part of a 200-acre nature reserved located on the Southeastern end of Chappaquidick Island. Long winding trails follow the top of vegetated cliffs through the scrub and dunes with views of the open ocean				
Landscape Character Description: Open Ocean, Ocean Beach, Coastal Scrub, Rural/Residential	**Scenic Integrity:** Scenic integrity is high due to the remote location. The beach setting is mostly natural. The beach and dunes appear natural and the view to the horizon is largely unobstructed. Views from the trail to the ocean provide dramatic scenery in a remote setting			
Visual Absorption Capability: Low – the view from the beach to an open ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Flat, even shrub heathlands with patches of pine forest. The vast open ocean is visible to the horizon.			
Relevant Viewer Groups: Recreational User, Residents, Tourists	**Viewer Context:** Viewer groups visit Wasque Point to recreate and experience the natural character of Chappaquiddick. Recreation includes surf cast fishing, hunting, ice-skating on inland ponds, swimming, hiking, mountain biking, horseback riding, and photography.	**Viewer Position:** Slightly Viewer Superior (from Trail)		
Visual Connection to Project: Visual connection to the open ocean is unencumbered	**Viewing distance: Statue Miles (mi) (mi) and Kilometers (km)** 31.21 mi 50.23 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 2-MV]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Level to slightly sloping Exposed sandy earthy soils. Steep Eroding vertical cliff dune.	Linear and regular, fills in the negative space in the scene, indistinguishable from the sky.	None	Vertical short scrubby vegetation	None
Line	Strong undulating line where coastal tidal edge meets the water tan sandy beach	The ocean is flat with even to irregular lines of the moving water.	None	None	None
Color	Sand, brown, gray	Very light gray/blue	None	Tan, light to dark gray blue	None
Texture	Fine to course	Smooth	None	Fine texture grassland, course texture coastal scrub	None

Existing Landscape/Seascape Character Description:

Wasque Point is comprised of terraced sandy beaches connected to shifting sandbars that are constantly changing due to strong wind and ocean currents. Above the beach are pine oak forests, sandplain grasslands, and heathlands. The area is owned and managed by the one of five preservation trusts called the Trustees of Reservations. Lands are managed as ecological preserves and recreation areas for residents and seasonal tourists. Unimproved roads connect with primitive parking areas that lead to trails with staircases leading to the beaches. Summer season requires visitors to purchase seasonal or day passes to park and access the trails and beaches.

The dominant visual elements are the flat expanse of water, the blue or gray color reflecting the sky and haze, the smooth or choppy texture of the water surface, and the distant horizon line. Scenic integrity is high, with no existing visual intrusions. The dark horizon line provides a distinct linear break between the ocean and the sky. Ocean evaporation from warm summer temperatures creates grayish white band of haze between the ocean and the warm blue sky. Conditions range from flat water to choppy to rolling swells.

The viewer position is from the trail, set back from the water's edge.

C. Contrast Rating [KOP 2-MV] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X				X			NA	NA	NA	NA		X			NA	NA	NA	NA
	Line		X				X			NA	NA	NA	NA			X		NA	NA	NA	NA
	Color			X				X		NA	NA	NA	NA		X			NA	NA	NA	NA
	Horizontal Scale (% field of view)				X		X			NA	NA	NA	NA		X			NA	NA	NA	NA
	Vertical (Height of Object against the horizon)				X			X		NA	NA	NA	NA		X			NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak to Moderate

Visibility Level Rating: [2] - [3]

[2] Visible when scanning in the general direction of the project facilities.

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance.

The contrast rating is a range of weak to moderate depending on conditions. The current conditions of the simulations present an overcast haze influencing the visibility of the elements in the view. With somewhat hazy atmospheric conditions visibility is a 2, likely to be missed by casual observers. In clear conditions, the Project is at a level 3, visible only after a brief glance. Details would not be seen due to the distance effecting the viewer's acuity.

Contrasting Elements:

- Vertical elements introduced into a flat horizontal seascape scene;
- The apparent density of visible structures arrayed across the horizon line as well as the extent of the visible horizon occupied by the Project;
- An apparent lack of visual order;
- Circular blade motion may be visible along the horizon line which
    - Occurs in a different plane from the horizon.
    - Does not correspond with the natural back and forth motion of the waves.
    - Is not synchronized (e.g., rotation speed and blade positions may vary among the visible WTGs).
    - May be visible when visual acuity is not diminished from atmospheric conditions.
    - Does not relate to any existing features
- The vertical turbines contrast with the **l**inear flat form of the ocean and the dark horizontal horizon line.

VISIBILITY ANALYSIS FORMS

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduced apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA. This system is activated only when aircraft penetrates the radar field.

KOP 2-MV - Wasque Reservation

Martha's Vineyard

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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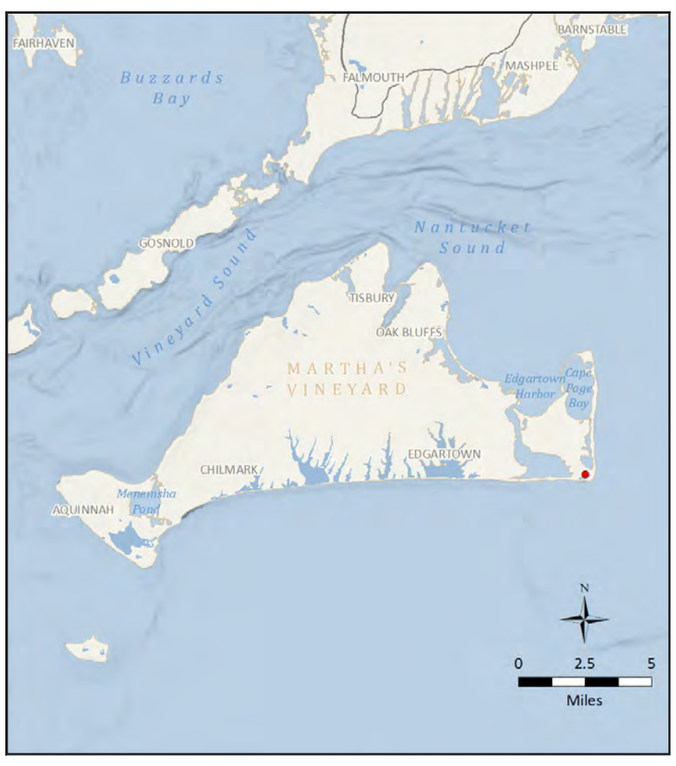
ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 9:12 AM	Viewing direction: South (163°)
Date of photograph: 6-25-20	Latitude: 41.351077°N
L/SCA:Ocean Beach, Coastal Scrub, Ocean Beach, Rural/Residential	Longitude: 70.454821°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 77° F
Humidity: 58%
Wind Dir & Speed: SSW 14mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 27.5 ft / 8.4 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Trustees of Reservation Property (access fee), recreation parking area

Scenic Resources: Ocean beach, open ocean, scrub shrub landscape, coastal dunes

Adjacent Amentities: Trustees of Reservation entry kiosk

Adjacent Areas: Pocha Pond, Wasque Point Beach, Edgartown South Beach, Katama Bay, East Beach, residential structures

Adjacent L/SCAs: Ocean beach, open ocean, coastal scrub bush, coastal dunes, bays and ponds, medium density residential structures

Adjacent KOPs: KOP 14-M Quammux Road, KOP 2-M Wasque Reservation, KOP 1-M Wasque Point

KOP 2-MV - Wasque Reservation

Martha's Vineyard

EXISTING CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

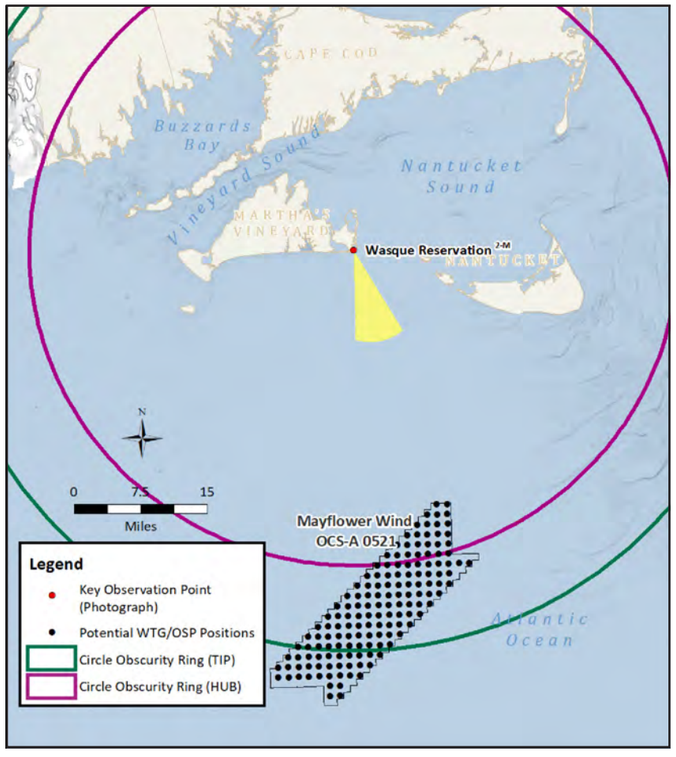
KOP 2-MV - Wasque Reservation

Martha's Vineyard

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 9:12 AM	Viewing direction: South (163°)
Date of photograph: 6-25-20	Latitude: 41.351077°N
L/SCA: Ocean Beach, Coastal Scrub, Ocean Beach, Rural/Residential	Longitude: 70.454821°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 77° F
Humidity: 58%
Wind Dir & Speed: SSW 14mph
Weather Condition: Cloudy

CAMERA

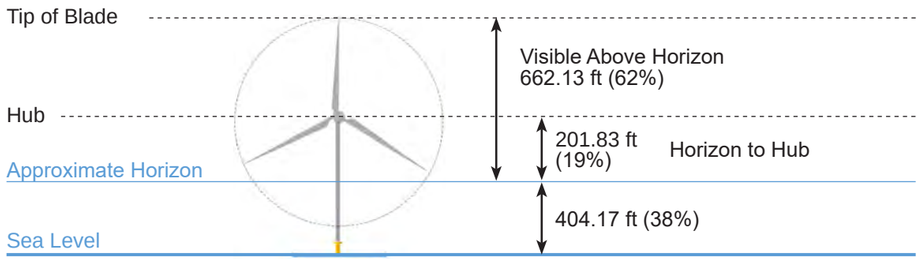
Camera Elevation: 27.5 ft / 8.4 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 105°	Furthest WTG: 51.7 mi / 83.2 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 114
Nearest WTG: 31.2 mi / 50.2 km	Potential Number of WTGs Not Visible: 35

VISIBILITY OF CLOSEST TURBINE



KOP 2-MV - Wasque Reservation

Martha's Vineyard

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Table 3. KOP Number 3-MV

A. KOP Information				
KOP Number: **3-MV**	**KOP Name:** Wasque Avenue (viewpoint at entry kiosk)	**Date:** June 25, 2020	**Time:** 9:37 AM	**Weather**: Sun, partly cloudy with haze band
Location Description: Wasque Avenue viewpoint is located next to the kiosk at the entry to Wasque Point Beach on Chappaquiddick Island.				
Landscape Character Description: Coastal Scrub, Rural/Residential, Open Ocean, Ocean Beach,	**Scenic Integrity:** Scenic integrity is high due to the remote location of the beach. Setting is mostly natural. View to the horizon is largely unobstructed.			
Visual Absorption Capability: Low to moderate – the view from scrub vegetation and small batches of pine trees provides some buffer to the vertical elements of the Project		**Dominant Landscape Attributes:** Flat topography, even shrub heathlands with patches of pine forest. The open ocean is visible across the horizon.		
Relevant Viewer Groups: Recreational User, Residents, Tourists	**Viewer Context:** Viewer groups visit Wasque Point to recreate and experience the natural character of Chappaquiddick. Recreation includes surf cast fishing, hunting, ice-skating on inland ponds, swimming, hiking, mountain biking, horseback riding, and photography.	**Viewer Position:** Viewer superior/elevated		
Visual Connection to Project: Visual connection to the open ocean is largely unencumbered.		**Viewing distance: Statue Miles (mi) (mi) and Kilometers (km)** 31.59 mi 50.84 km		

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 3-MV]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation (backdrop to the ocean view)**	**Structures**
Form	Level to slightly sloping, landform is not exposed covered in scrub shrub vegetation	Linear and regular, fills in the negative space in the land and the sky	None	Vertical short scrubby vegetation	Rectangular small with sloping roof, road is linear and cuts across the center of the site.
Line	Strong level, horizontal	The ocean is flat with even to irregular lines of moving water.	None	Irregular clusters, stippled treetops	Linear, cubic
Color	Sand, tan	Very light to dark gray/blue	None	Light to dark greens, gray and yellow, tan brown	Tan, gray, brown
Texture	Fine to smooth	Smooth	None	Fine texture grassland, course texture coastal scrub	Smooth

Existing Landscape/Seascape Character Description:

The viewpoint at Wasque Avenue is located at the transition between the pine oak forest, coastal scrub and heathland. The view across the coastal scrub abruptly ends at the top of steep eroding dunes above the beach. Access roads cut across the scrub shrub leading to recreation trails and beach access parking areas. Ocean trails area located at the top of the dune and run horizontally across the landscape. The area is owned and managed by the one of five preservation trusts called the Trustees of Reservations. Lands are managed as ecological preserves and recreation area supporting residents and seasonal tourists. Unimproved roads connect with primitive parking areas that lead to trails with staircases leading to the beaches. During the summer season, visitors are required to purchase seasonal or day passes to park and access the trails and beaches.

The dominant visual elements include pine oak forest, scrub shrub and brown, tan road cuts through the vegetation. The background is a flat expanse of water, the blue or gray color reflecting the sky and haze. The ocean texture appears smooth as the gray blue color fills in the negative space between the dark horizon line and the sky. Scenic integrity is high, with no visual intrusions.

The photo position is located at viewpoint above the entry pay kiosk to Trust Lands site.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 3-MV] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X				X			NA	NA	NA	NA		X					X	
	Line			X		X				NA	NA	NA	NA			X				X	
	Color			X				X		NA	NA	NA	NA		X					X	
	Horizontal Scale (% field of view)	X				X				NA	NA	NA	NA			X				X	
	Vertical (Height of Object against the horizon)		X			X				NA	NA	NA	NA			X			X		
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate

Visibility Level Rating: [3] – [4] depending on atmospheric conditions and time of day

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance.

[4] Plainly visible, but not dominant

The contrast rating is Moderate. The simulations present an overcast haze influencing the Project. With this atmospheric condition visibility closer to a 3, and the project may be visible only after a brief glance. In clear conditions at certain times of day, the project would likely be plainly visible from this viewpoint and nearby areas. Project details would not be seen due to the distance. Blade movement would be detectible.

Contrasting Elements:

- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The apparent density of visible structures arrayed across the horizon line as well as the extent of the visible horizon occupied by the Project;
- An apparent lack of visual order (overlapping turbines);
- Circular blade motion may be visible along the horizon line during very clear conditions which
  - Occurs in a different plane from the horizon.
  - Does not correspond with the natural back and forth motion of the waves.
  - Is not synchronized (e.g., rotation speed and blade positions may vary among the visible WTGs).
- The vertical turbines contrast with the **l**inear flat form of the ocean and the dark horizontal horizon line.

Mitigating Factors:

- Distance to nearest turbine over 20 miles.
- Wide panorama reduces apparent horizontal scale of project.

- Due to distance much of the turbine dip below the horizon line.
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 3-MV - Wasque Ave

Martha's Vineyard

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 9:37 AM
Date of photograph: 6-25-20
L/SCA: Coastal Scrub, Rural/Residential, Open Ocean, Ocean Beach
Viewing direction: South (163°)
Latitude: 41.355645°N
Longitude: 70.461041°W
Lighting Direction: Backlit diffused

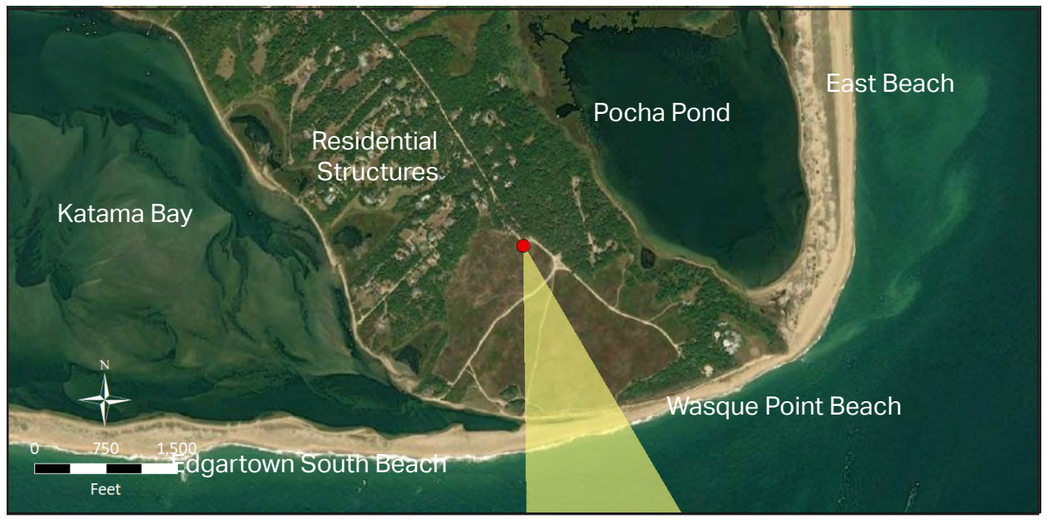
ENVIRONMENT

Temperature: 78° F
Humidity: 58%
Wind Dir & Speed: SSW 14mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 42.5ft / 13 m
Nikon D4
Nikon 50mm
ISO: 100
Fstop: f/7.1
Shutter: 1/1250 sec
Aperture priority
Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Trustees of Reservation Property (access fee)
Scenic Resources: Scrub shrub landscape
Adjacent Amentities: Trustees of Reservation entry kiosk
Adjacent Areas: Pocha Pond, Wasque Point Beach, Edgartown South Beach, Katama Bay, East Beach, residential structures
Adjacent L/SCAs: Ocean beach, open ocean, coastal scrub bush, coastal dunes, bays and ponds, medium density residential structures
Adjacent KOPs: KOP 14-M Quammux Road, KOP 2-M Wasque Reservation, KOP 1-M Wasque Point

KOP 3-MV - Wasque Ave

Martha's Vineyard

EXISTING CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

KOP 3-MV - Wasque Ave

Martha's Vineyard

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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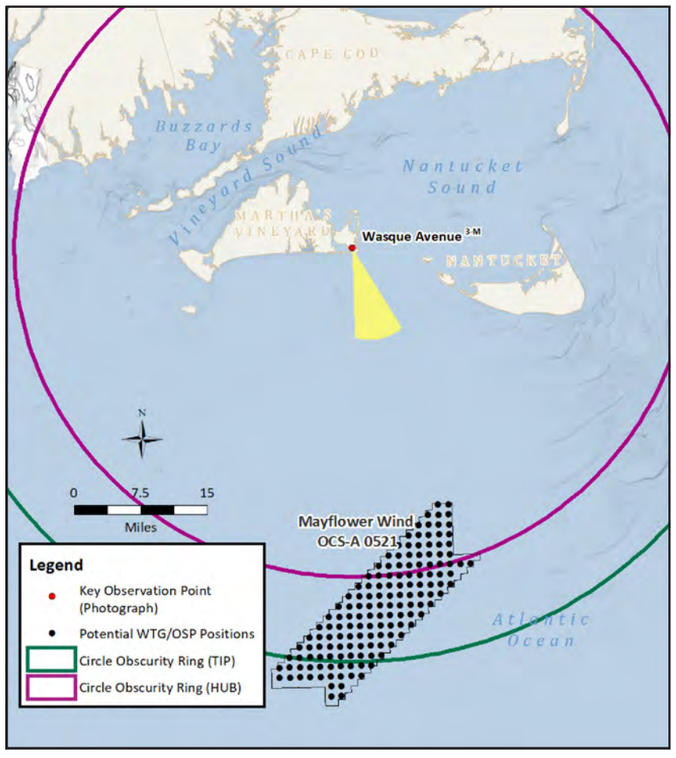
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 9:37 AM	Viewing direction: South (163°)
Date of photograph: 6-25-20	Latitude: 41.355645°N
L/SCA: Coastal Scrub, Rural/Residential, Open Ocean, Ocean Beach	Longitude: 70.461041°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 78° F
Humidity: 58%
Wind Dir & Speed: SSW 14mph
Weather Condition: Cloudy

CAMERA

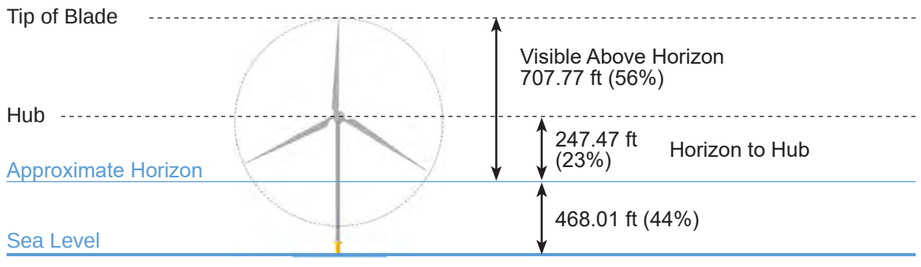
Camera Elevation: 42.5ft / 13 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 52.0 mi / 83.7 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 126
Nearest WTG: 31.6 mi / 50.9 km	Potential Number of WTGs Not Visible: 23

VISIBILITY OF CLOSEST TURBINE



KOP 3-MV - Wasque Ave

Martha's Vineyard

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Table 4. KOP Number 4-MV

A. KOP Information				
KOP Number: **4-MV**	**KOP Name:** South Beach	**Date:** June 25, 2020	**Time:** 10:26 M	**Weather**: Sun, partly cloudy with haze band
Location Description: The South Beach Katama KOP is located on the beach at the end of Herring Creek Road and Atlantic Drive in Edgartown on Martha's Vineyard. Access to the beach is from two small developed parking areas and a path through the dunes. Permitted beach vehicles are allowed access to the beach and often drive east to along South Beach to Norton Point. A small gap separates Norton Point from Wasque Point.				
Landscape Character Description: Open Ocean, Ocean Beach, Coastal Scrub, Rural/Residential	**Scenic Integrity:** Scenic integrity is high due to the remote location of the beach. The setting is mostly natural. Residential structures and the Edgartown airport are integral parts of the setting. Grassy dunes line the back of the beach. Unobstructed view of the ocean.			
Visual Absorption Capability: Low – the view from the remote beach is to a vast horizon. There are no structural elements within the existing setting.	**Dominant Landscape Attributes:** Open ocean, sandy beach and eroding dunes.			
Relevant Viewer Groups: Recreational User, Residents, Tourists	**Viewer Context:** Viewer groups visit South Beach Katama to recreate and experience the beach setting. South Beach is very busy due to its location near the village of Edgartown. The beach maybe accessed by car along the main road or by bicycle along the pedestrian/bike path leading to the beach from the center of town. Recreational activities on South Beach include beach driving, sun bathing, and picnicking.	**Viewer Position:** Beach Level		
Visual Connection to Project: Visual connection to the open ocean is unencumbered.	**Viewing distance: Statue Miles (mi) and Kilometers (km)** 32.49 mi 52.30 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 4-MV]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Level to slightly sloping, sand, rolling and sloping dunes	Linear, flat, smooth, rolling, choppy,	None	None	None
Line	Strong level, horizontal line	Strong dark horizon line	None	None	None
Color	Sand, tan, brown	Very light to dark gray/blue	None	None	None
Texture	Fine to smooth	Smooth, ripples, chop	None	None	None

Existing Landscape/Seascape Character Description:

The broad, flat expanse of water, the blue or gray color reflecting the sky, the smooth or choppy texture of the water surface, and the distant horizon line dominate the setting. Scenic integrity is high, with few or no visual intrusions. The beach is very popular due to its proximity to the village of Edgartown and is easily accessible by road and pedestrian trail. Temporary visual intrusion can occur from vehicles accessing the beach to drive to Norton Point and from traditional recreation activities on the beach.

The dark horizon line is visible providing a distinct linear break between the ocean and the sky. Ocean evaporation from warm summer temperatures often creates grayish white band of haze between the ocean and the blue sky. Commercial fishing and recreational boats are seasonally found in the waters of the study area, and views of the project can be at any point on the ocean surface on the south and west sides of the islands. Conditions range from flat water to choppy to rolling swells.

The photo position is located on the beach at the top of the high tide zone.

C. **Contrast Rating [KOP 4-MV]** ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line		X			X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)			X		X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)			X			X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion					X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting					X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak to Moderate

Visibility Level Rating: [2] - [3]

[2] Visible when scanning in the general direction of the project facilities.

[3] Visible after only a brief glance in the direction of the project facilities.

The contrast rating is Weak to Moderate. The atmospheric conditions at the time of the photo used for simulation present an overcast haze limiting the visibility of the Project elements. Vertical lines created by the turbines introduce contrast with the unbroken horizontal line of the horizon; however, contrast would be insufficient to strongly attract visual attention because it would occupy only a small portion of the observer's visual field and would be subordinate to major landscape/seascape elements. With the atmospheric condition in the photo, visibility is closer to a [2] with the Project visible when scanning in the general direction. In clear conditions the Project would may be visible only after a brief glance but would not be dominant consistent with Visibility Level Rating [3]. Details would not be noticeable due to the distance.

Contrasting Elements:

- Vertical elements introduced into the horizontal seascape scene which are visually evident against the unbroken horizon line;
- An perceived lack of visual order of the Project from the viewer position;
- Blade motion may be visible along the horizon line during clear conditions

Mitigating Factors:

- Distance to nearest turbines over 30 miles
- Wide panorama reduces apparent horizontal scale of project
- The visible Project would be subordinate to major landscape/seascape elements
- Due to distance much of the turbine height is below the horizon line and only a small section is in view above the horizon line.
  Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 4-MV - South Beach

Martha's Vineyard

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 10:26 AM	Viewing direction: South (156°)
Date of photograph: 6-25-20	Latitude: 41.349757°N
L/SCA: Open Ocean, Ocean Beach, Coastal Scrub, Rural/Residential	Longitude: 70.530786°W
	Lighting Direction: Backlit diffused

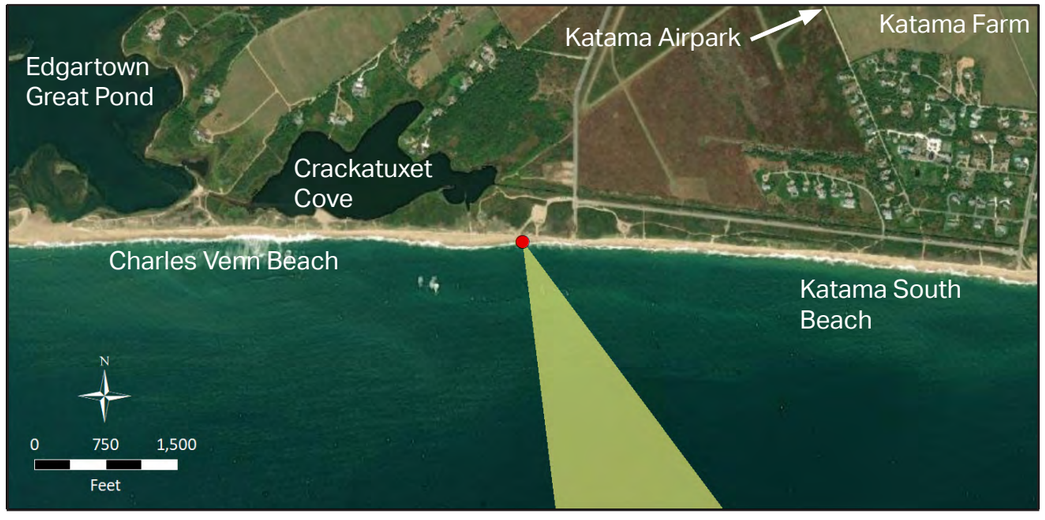
ENVIRONMENT

Temperature: 78° F
Humidity: 58%
Wind Dir & Speed: SW 18mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 22.5ft / 6.9 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, coastal dunes, open ocean, scrub scrub landscape

Adjacent Amentities: Hotel, restaurants, public restroom and changing facilities

Adjacent Areas: Katama Farm, Katama Airpark, Charles Venn Beach, Norton Point Beach, Katama Bay, residential homes

Adjacent L/SCAs: Ocean beach, coastal dunes, coastal scrub bush, medium density residential structures, agricultural/open fields

Adjacent KOPs: KOP 5-M Wilson's Landing, KOP 12-M Katama Point Public Boat Launch, KOP 6-M Long Point Beach

Comparable KOPs: KOP 7-N Low Beach

KOP 4-MV - South Beach

Martha's Vineyard

EXISTING CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

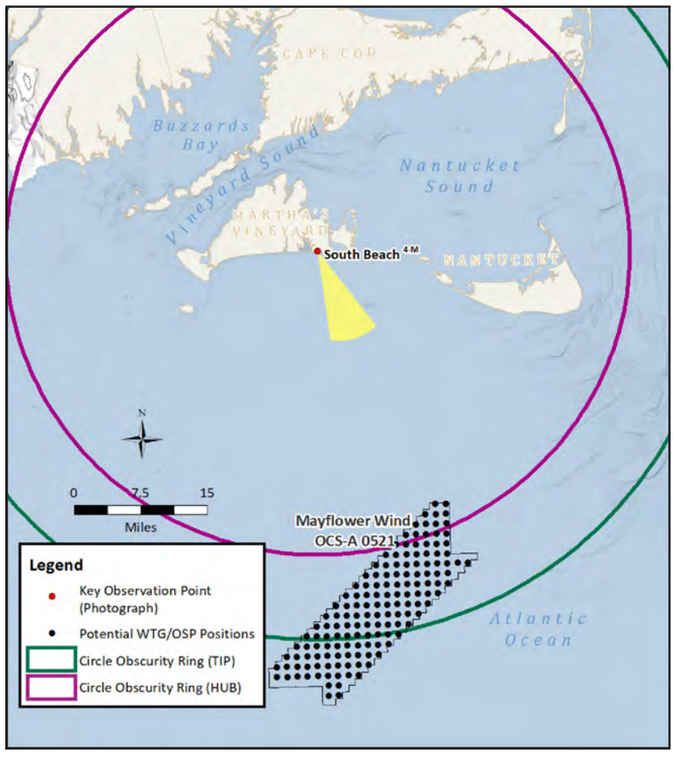
KOP 4-MV - South Beach

Martha's Vineyard

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 10:26 AM	Viewing direction: South (156°)
Date of photograph: 6-25-20	Latitude: 41.349757°N
L/SCA: Open Ocean, Ocean Beach, Coastal Scrub, Rural/Residential	Longitude: 70.530786°W
	Lighting Direction: Sidelit diffused

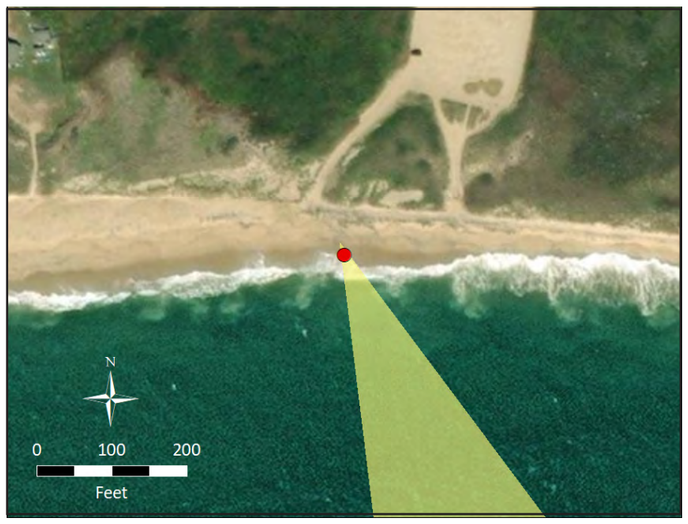
ENVIRONMENT

Temperature: 78° F
Humidity: 58%
Wind Dir & Speed: SW 18mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 22.5ft / 6.9 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

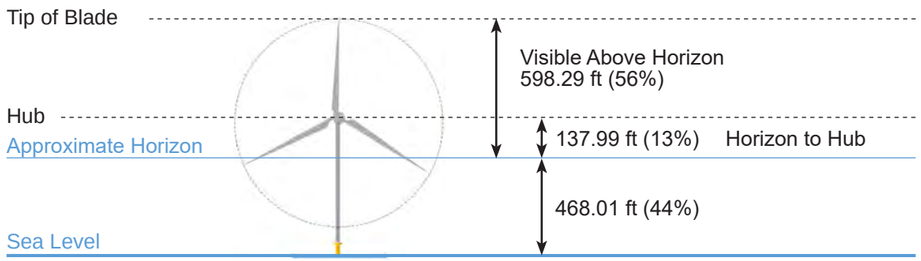
SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 51.7 mi / 83.2 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 104
Nearest WTG: 32.5 mi / 52.3 km	Potential Number of WTGs Not Visible: 45

VISIBILITY OF CLOSEST TURBINE



KOP 4-MV - South Beach

Martha's Vineyard

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Table 5. KOP Number 6-MV

A. KOP Information				
KOP Number: **6-MV**	**KOP Name:** Long Point Beach	**Date:** June 25, 2020	**Time:** 12:23 M	**Weather**: Sun, partly cloudy with haze band
Location Description: Long Point Beach is located within the largest publicly accessible Wildlife Preserve on Martha's Vineyard. The landscape is comprised of inland freshwater ponds, pine oak forests, scrub shrub plant communities and saltwater tidal marshes, grassy dunes, and long pristine sandy beaches. The land is managed by Martha's Vineyard Trustees.				
Landscape Character Description: Open Ocean, Open Beach, Coastal Scrub, Salt Ponds/Tidal Marshes	**Scenic Integrity:** Scenic integrity is high due to the remote location of the beach and the pristine condition of the ecological features within the wildlife preserve.			
Visual Absorption Capability: Low – the view from the remote beach is to a vast horizon. There are no structural elements within the setting.	**Dominant Landscape Attributes:** Open ocean, sandy beach and grassy dunes			
Relevant Viewer Groups: Recreational User, Residents, Tourists	**Viewer Context:** Viewer groups visit the wildlife preserve to experience the scenic integrity and beauty of the native ecology of the area, and to view wildlife. The beaches are remote and there is a feeling of being in nature.	**Viewer Position:** Beach Level		
Visual Connection to Project: View visual connection to the open ocean is unencumbered.	**Viewing distance: Statue Miles (mi) and Kilometers (km)** 34.93 mi 56.21 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 6-MV]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies (Not in view but behind the viewpoint)**	**Vegetation (backdrop to the ocean view)**	**Structures**
Form	Level to slightly sloping, sand, rolling and sloping dunes	Linear, flat, smooth, rolling, choppy,	Irregular	Vertical short scrubby vegetation	Rectangular small with sloping roof, road is linear and cuts across the center of the site.
Line	Strong level, horizontal line	Strong dark horizon line	Curvilinear	Irregular clusters, of low growing flat to erect, woody	Linear, cubic
Color	Sand, tan, brown	Very light to dark gray/blue	Blue, green gray	Light to dark greens, gray and yellow, reds, yellow, tan brown	Tan, gray, brown
Texture	Fine to smooth	Smooth, ripples, chop	Smooth, ripples, wavy	Fine texture grassland, course texture coastal scrub	Smooth

Existing Landscape/Seascape Character Description:

The broad, flat expanse of water, the blue or gray color reflecting the sky, the smooth or choppy texture of the water surface, and the distant horizon line dominate this setting. Scenic integrity is high, with few or no existing visual intrusions. The beach is very popular due to its proximity to the village of Edgartown and is easily accessible by road and pedestrian trail. Visual intrusion periodically occurs from vehicles accessing the beach to drive to Norton Point and from traditional recreation activities on the beach.

The dark horizon line is predominantly visible providing a distinct linear break between the ocean and the sky. Ocean evaporation from warm summer temperatures creates grayish white band of haze between the ocean and the blue sky. Commercial fishing and recreational boats seasonally use the waters of the study area, and views of the Project can be from any point on the ocean surface on the south and west sides of the islands. Conditions range from flat water to choppy to rolling swells.

The photo position is located on the beach at the top of tide.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 6-MV] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA		X			NA	NA	NA	NA
	Line		X			X				NA	NA	NA	NA			X		NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA		X			NA	NA	NA	NA
	Horizontal Scale (% field of view)			X		X				NA	NA	NA	NA			X		NA	NA	NA	NA
	Vertical (Height of Object against the horizon)			X			X			NA	NA	NA	NA			X		NA	NA	NA	NA
	Motion					X				NA	NA	NA	NA		X			NA	NA	NA	NA
	Lighting					X				NA	NA	NA	NA		X			NA	NA	NA	NA

Overall Visual Contrast Rating: Weak - Moderate

Visibility Level Rating: [2] - [3]

[2] Visible when scanning in the general direction of the project facilities.

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance.

The contrast rating is Weak to Moderate. The viewing distance (<35 miles /56 km) to the Project from this viewer position limits the visibility. The Project may be visible when scanning in the direction of the Project. On a perfectly clear day, the Project visible only after a brief glance corresponding to Visibility Level [3]. The top part of the turbines and the width of the blades will be visible above the horizon line. The motion of the blade may draw attention to the Project.

Contrasting Elements:

- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The array of structures visible across the horizon line as well as the extent of the visible horizon occupied by the Project;
- A perceived lack of visual order of the Project from the viewer position;
- Circular blade motion along the horizon line be visible in very clear conditions at certain times of day.

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Only the top third of the blades will be visible above the horizon line due to the distance and the curvature of the earth
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA. This system is activated only when aircraft penetrates the radar field.

KOP 6-MV - Long Point Beach

Martha's Vineyard

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 12:23 AM	Viewing direction: South (148°)
Date of photograph: 6-25-20	Latitude: 41.348779°N
L/SCA: Open Ocean, Ocean Beach, Coastal Scrub, Salt Ponds/TidalMarsh	Longitude: 70.632809°W
	Lighting Direction: Backlit diffused

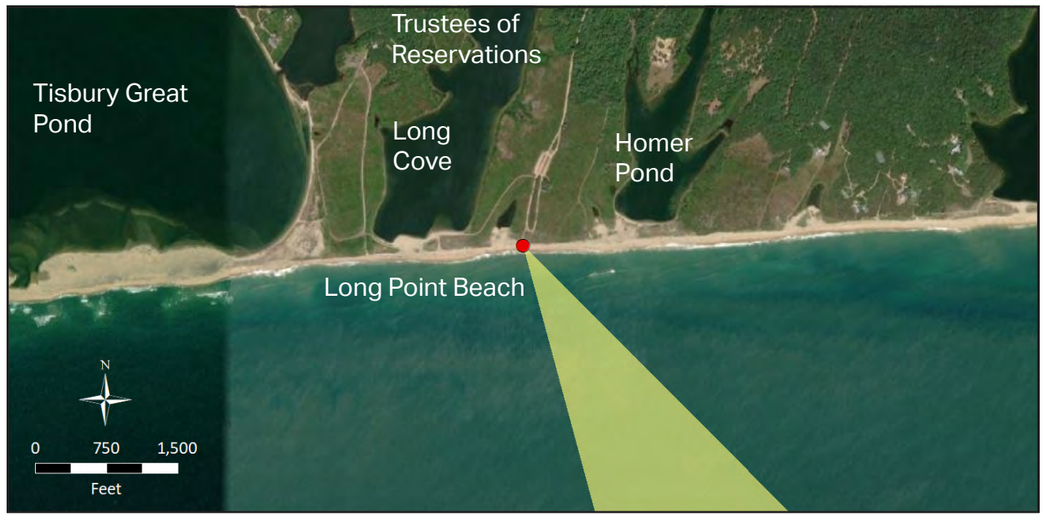
ENVIRONMENT

Temperature: 77° F
Humidity: 71%
Wind Dir & Speed: SSW 12mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 18.5 ft / 5.7 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public beach recreation
Scenic Resources: Ocean beach, coastal dunes, open ocean
Adjacent Amentities: Small parking lot
Adjacent Areas: Trustees of reservation land, multiple coves and ponds
Adjacent L/SCAs: Ocean beach, coastal dunes, coastal scrub bush, forested woodlands, ponds and coves, very low density residential structures
Adjacent KOPs: KOP 7-M Tississa Pond, KOP 8-M Tississa Pond Hiking Trail, KOP 4-M South Beach

KOP 6-MV - Long Point Beach

Martha's Vineyard

EXISTING CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

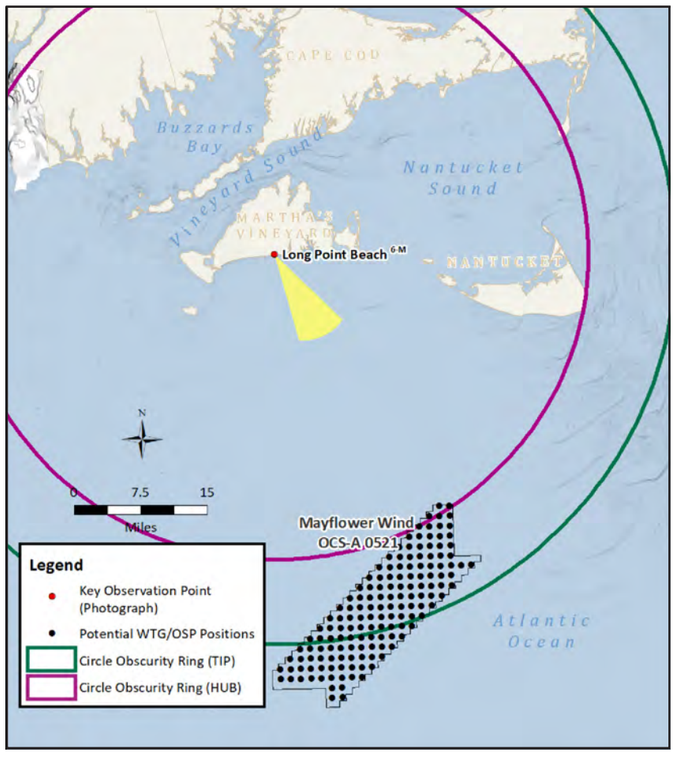
KOP 6-MV - Long Point Beach

Martha's Vineyard

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 12:23 AM	Viewing direction: South (148°)
Date of photograph: 6-25-20	Latitude: 41.348779°N
L/SCA: Open Ocean, Ocean Beach, Coastal Scrub, Salt Ponds/TidalMarsh	Longitude: 70.632809°W
	Lighting Direction: Backlit diffused

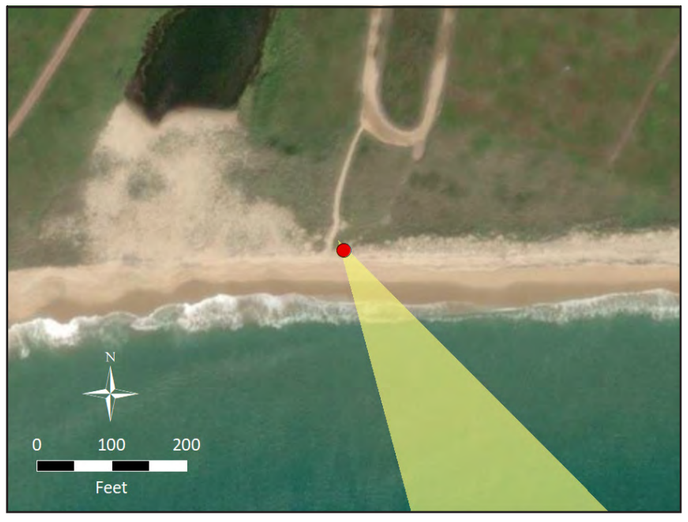
ENVIRONMENT

Temperature: 77° F
Humidity: 71%
Wind Dir & Speed: SSW 12mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 18.5 ft / 5.7 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

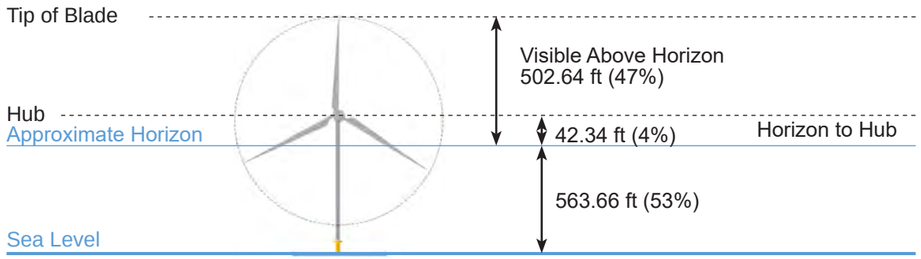
SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 51.49 mi
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 99
Nearest WTG: 34.9 mi / 56.2 km	Potential Number of WTGs Not Visible: 50

VISIBILITY OF CLOSEST TURBINE



KOP 6-MV - Long Point Beach

Martha's Vineyard

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Table 6. KOP Number 9-MV

A. KOP Information				
Number KOP: **9-MV**	**KOP Name:** 322 South Road	**Date:** June 25, 2020	**Time:** 4:17 PM	**Weather**: Sun, partly cloudy with haze band

Location Description:
The location of 322 South Road is at the entry to private residences in the township of Chilmark on Martha's Vineyard. The site was chosen to represent the residential viewer and driver from an elevated position within the landscape. South Road follows a ridge. The forested topography slopes dramatically down to the scrub shrub vegetation to the ocean dunes, coastal shoreline beaches and the expanse of open ocean in the background. Due to the forest vegetation and the undulating road along the ridge there are very few views from inland positions to the ocean.

Landscape Character Description: Open Ocean, Coastal Scrub, Forests/Woodlands, Dunes, Tidal Marshes	**Scenic Integrity:** Scenic integrity is high due to the elevated position of the viewpoint providing a vast view of the ocean horizon. Residences are positioned level with the forest canopy and are therefore screened and do not detract from the integrity of the setting.
Visual Absorption Capability: Low – the view from the remote beach to a vast horizon.	**Dominant Landscape Attributes:** Open ocean, Forest vegetation and scrub shrub, horizon line

Relevant Viewer Groups: Residents, Tourists	**Viewer Context:** Viewers will experience the scene from an unimproved pullout off South Road. This is one of two locations off South Road where the ocean is visible from the inland position. Residences are below the ridge within the forest vegetation.	**Viewer Position:** Viewer superior/ elevated

Visual Connection to Project: Visual connection to the open ocean above forest vegetation and scattered residential homes.	**Viewing distance: Statue Miles (mi) and Kilometers (km)** 38.17 mi 59.83 km

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 9-MV]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation (backdrop to the ocean view)**	**Structures**
Form	Sloping hillside to flat lowland	Linear, flat, smooth,	None	Vertical, erect, medium to short scrubby vegetation	Rectangular small with sloping roof, access road is linear and cuts across the center of the site.
Line	Strong horizontal line	Strong dark horizon line	None	Irregular clusters, of vegetation, clumps	Linear, cubic
Color	Sand, tan, brown	Very light to dark gray/blue	None	Light to dark greens, gray and yellow, tan brown	Tan, gray, brown
Texture	Fine to course textures	Smooth, ripples, chop	None	Fine texture grassland, course texture coastal scrub, sharp stippled edge of broadleaf forest vegetation	Smooth

Existing Landscape/Seascape Character Description:

The viewpoint at 322 South Road is located in the township of Chilmark. The road follows along a ridge that is mostly within pine oak forest and scattered residential homes. From the top of the ridge the topography falls steeply toward the low flat terrace of coastal scrub behind the grassy dunes and ocean. The superior viewer position allows a panoramic view over the landscape toward the ocean. The deep blue gray ocean color dramatically contrasts with the land-based vegetation and residential structures in the foreground and middle ground setting. The coastal scrub abruptly ends at the top of steep eroding dunes above the beach.

The dominant visual elements are the pine oak forest, scrub shrub and brown, tan road cuts through the vegetation and vast ocean scene. The background is comprised of a flat expanse of water, the blue or gray color reflecting the sky and haze. The ocean texture appears smooth as the gray blue color fills in the negative space between the dark horizon line and the sky. Scenic integrity is high, with few or no visual intrusions.

C. Contrast Rating [KOP 9-MV] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA			X			X		
	Line		X					X		NA	NA	NA	NA			X				X	
	Color		X							NA	NA	NA	NA			X				X	
	Horizontal Scale (% field of view)			X				X		NA	NA	NA	NA			X				X	
	Vertical (Height of Object against the horizon)			X				X		NA	NA	NA	NA			X				X	
	Motion							X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting						X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak

Visibility Level Rating: [1] - [2]

[1] Visible only after extended, close viewing. Otherwise invisible.

[2] Visible when scanning in the general direction of the project facilities.

The contrast rating is Weak. The viewing distance to the Project limits the visibility. The Project may be visible when scanning in the general direction of the Project on a perfectly clear day without haze at certain times of the day or Visibility Level [2]..The vertical size of the turbines means that the blades will be slightly visible above the horizon line, but much of the turbine pole will be out of sight. The motion of the blade may draw the attention of the viewer during very clear conditions and thus increase visibility of the turbines.

Contrasting Elements:

- Vertical elements introduced into a flat horizontal seascape scene;
- The array of structures visible across the horizon line as well as the extent of the visible horizon occupied by the Project;
- An perceived lack of visual order from turbine overlap;
- Blade motion may make the Project more visible in very clear conditions.
- The vertical turbines contrast with the **l**inear flat form of the ocean and the dark horizon line.

Mitigating Factors:

- Only the top third of the blades will be visible above the horizon line due to the distance from the KOP and the curvature of the earth
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

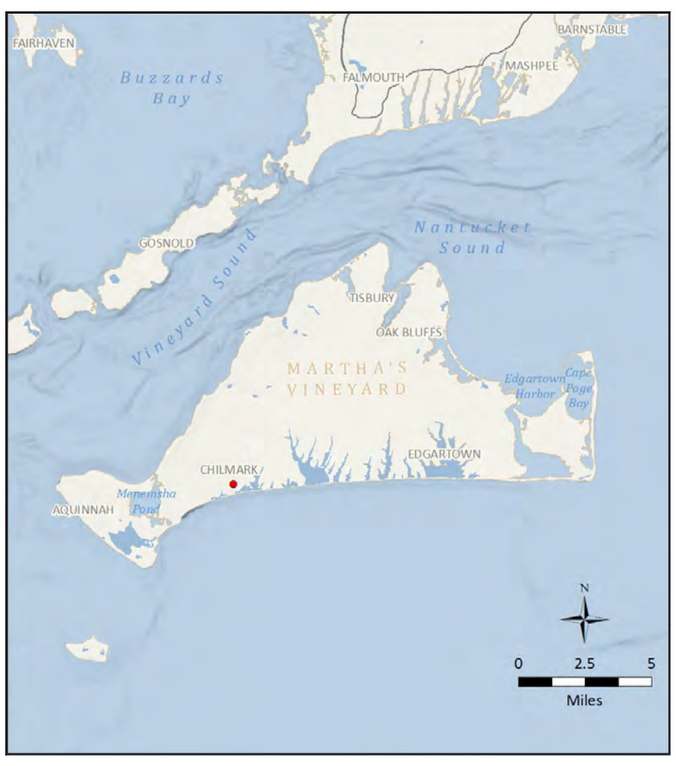
KOP 9-MV - 322 South Road

Martha's Vineyard

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 4:17 PM	Viewing direction: Southeast (143°)
Date of photograph: 6-25-20	Latitude: 41.347932°N
L/SCA: Open Ocean, Coastal Scrub, Forests/Woodland, Dunes, Tidal Marsh	Longitude: 70.710104°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 79° F
Humidity: 64%
Wind Dir & Speed: SSW 10mph
Weather Condition: Hazy

CAMERA

Camera Elevation: 85.0 ft / 26 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public road

Scenic Resources: Forested woodlands, open ocean, scrub shrub landscape, coastal dunes, tidal marsh

Adjacent Amentities: Chilmark town center

Adjacent Areas: Abel Hill Cemetery, Chilmark Pond, residential homes, Fulling Mill Brook Conservation Area

Adjacent L/SCAs: Forested woodlands, tidal ponds, ocean beach, open ocean, coastal scrub bush, medium density residential structures

Adjacent KOPs: KOP 7-M Tississa Pond, KOP 8-M Tississa Pond Hiking Trail, KOP 23-M 421 Allen Farm South Road, KOP 13-M Lucy Vincent Beach, KOP 10-M BarnHouse/Skiff-Mayhew (Vincent House)

KOP 9-MV - 322 South Road

Martha's Vineyard

EXISTING CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

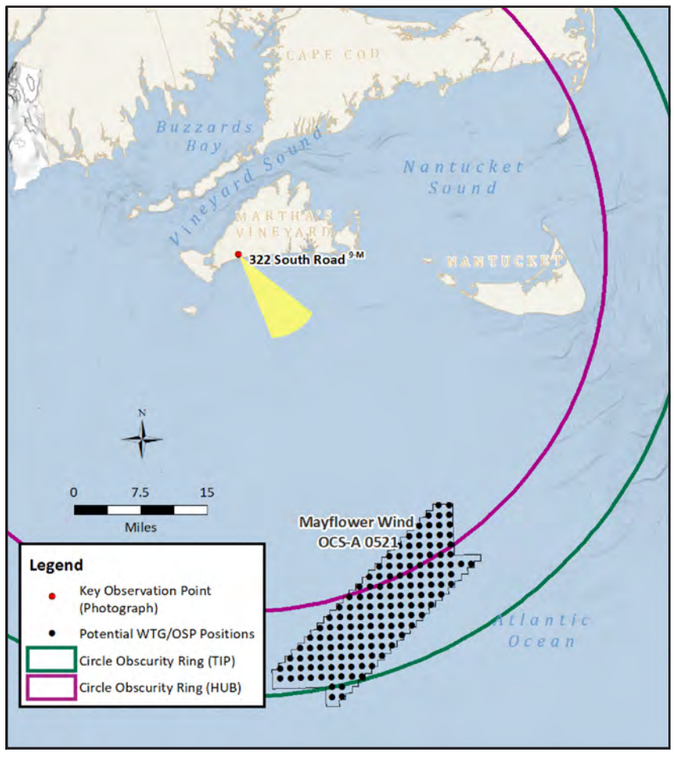
KOP 9-MV - 322 South Road

Martha's Vineyard

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 4:17 PM	Viewing direction: Southeast (143°)
Date of photograph: 6-25-20	Latitude: 41.347932°N
L/SCA: Open Ocean, Coastal Scrub, Forests/Woodland, Dunes, Tidal Marsh	Longitude: 70.710104°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 79° F
Humidity: 64%
Wind Dir & Speed: SSW 10mph
Weather Condition: Hazy

CAMERA

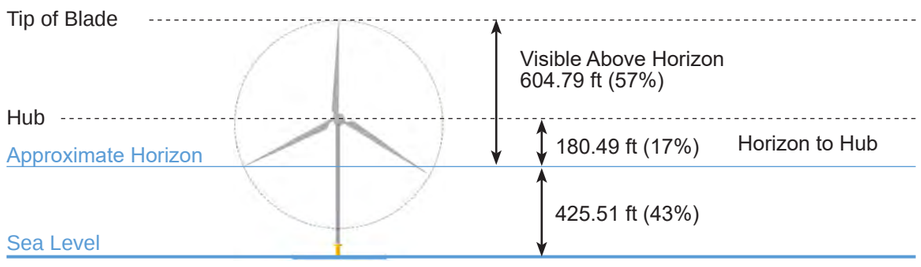
Camera Elevation: 85.0 ft / 26 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 60°	Furthest WTG: 52.4 mi / 84.4 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 145
Nearest WTG: 37.2 mi / 59.8 km	Potential Number of WTGs Not Visible: 4

VISIBILITY OF CLOSEST TURBINE



KOP 9-MV - 322 South Road

Martha's Vineyard

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Table 7. KOP Number 16-MV

A. KOP Information				
Number KOP: **16-MV**	**KOP Name:** Squibnocket Beach	**Date:** Nov 6, 2020	**Time:** 2:08 PM	**Weather**: Hazy
Location Description: Squibnocket Beach is located towards the west end of the island of Martha's Vineyard, just east of Squibnocket Pond. The beach is partially sandy with an abundance of rocks. Residential homes are set back and up from the beach. Beside the stretch of beach are the Nashaquitsa Cliffs, providing a dramatic transition from land to ocean. Public trails lead above the beach and on top the tops of the cliffs, eventually connecting to private backyards.				
Landscape Character Description: Ocean Beach, Open Ocean, Dunes, Coastal Scrub, Forests/Woodlands, Tidal Marshes	**Scenic Integrity:** Scenic integrity is high due to the natural setting and open view of the ocean horizon.			
Visual Absorption Capability: Low – the view from the beach to a horizon is unobstructed	**Dominant Landscape Attributes:** Open ocean, forest vegetation and scrub shrub, horizon line			
Relevant Viewer Groups: Residents, Recreational Users	**Viewer Context:** Viewers will experience the scene from the beach. Residences are behind the beach looking out towards the ocean. Residents and visitors come to recreate at this beach including surfing, swimming, fishing, relaxing, and enjoying the views.	**Viewer Position:** Level		
Visual Connection to Project: Visual connection to the open ocean from beach is unobstructed.	**Viewing distance: Statue Miles (mi) and Kilometers (km)** 37.22 mi 51.49 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 16-MV]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation (backdrop to the ocean view)**	**Structures**
Form	Level to slightly sloping sandy and rocky beach	Linear and regular, fills in the negative space in the scene, indistinguishable from the sky	None	Vertical short grassy vegetation	None
Line	Strong undulating line where coastal tidal edge meets the water.	The ocean is flat with even to irregular lines of the moving water.	None	Vertical	None
Color	Sand, brown, gray	Gray/blue	None	Light green	None
Texture	Fine to coarse sand and rocks	Smooth to choppy	None	Fine texture dune grasses	None

Existing Landscape/Seascape Character Description:
Squibnocket Beach is comprised of coarse sands and cobbles with good surfing conditions. The beach is neighbored by the Squibnocket Pond and salt marsh area to the west and cliffs and hiking trails to the east. Paved roads lead to the large parking area.

The dominant visual elements are comprised of the flat expanse of water, the blue or gray color reflecting the sky and haze, the smooth or choppy texture of the water surface, and the distant horizon line. Scenic integrity is high, with no existing visual intrusions. The dark horizon line provides a distinct linear break between the ocean and the sky. Ocean evaporation from warm summer temperatures often creates grayish white band of haze between the ocean and the warm blue sky. Conditions range from flat water to choppy to rolling swells.

The viewer position to the ocean is from the beach in front the main access point from the parking area. The long, linear, tan sandy beach and vertical cliff contrasts with the variable ocean tide.

C. Contrast Rating [KOP 16-MV] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA			X		NA	NA	NA	NA
	Line		X					X		NA	NA	NA	NA		X			NA	NA	NA	NA
	Color		X							NA	NA	NA	NA			X		NA	NA	NA	NA
	Horizontal Scale (% field of view)			X				X		NA	NA	NA	NA			X		NA	NA	NA	NA
	Vertical (Height of Object against the horizon)			X				X		NA	NA	NA	NA			X		NA	NA	NA	NA
	Motion							X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting						X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak
Visibility Level Rating: [1] – [2]
[1] Visible only after extended, close viewing. Otherwise invisible.
[2] Visible when scanning in the general direction of the project facilities.

The contrast rating is Weak. Only, the turbine blades will be visible above the horizon line. The viewing distance (>35 miles /56 km) to the Project from this viewer position limits the visibility and may require extended viewing to detect the structures corresponding to Visibility Level Rating [1]. The atmospheric conditions at the time of the photo used for simulation present an overcast haze limiting the visibility of the Project elements. On a clear day, the Project may be visible when scanning in the direction of the Project consistent with a Visibility Level Rating [2]. The Project would occupy only a small portion of the observer's visual field.

Contrasting Elements:
- Vertical elements introduced into a flat horizontal seascape scene;
- A perceived lack of visual order from turbine blade overlap;
- Blade motion may make the Project more visible in very clear conditions.

Mitigating Factors:
Only the blades will be visible above the horizon line due to the distance from the KOP and the curvature of the earth
Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA

KOP 16-MV - Squibnocket Beach

Martha's Vineyard

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 2:08 PM	Viewing direction: Southeast (137°)
Date of photograph: 11-6-20	Latitude: 41.318873°N
L/SCA: Ocean Beach, Open Ocean	Longitude: 70.764908°W
	Lighting Direction:Sidelit diffused

ENVIRONMENT

Temperature: 65° F
Humidity: 78%
Wind Dir & Speed: SSW 16mph
Weather Condition: Hazy

CAMERA

Camera Elevation: 16.5 ft / 5.0 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation
Scenic Resources: Ocean beach, open ocean, coastal dunes
Adjacent Amentities: Parking lot
Adjacent Areas: Squibnocket Pond, Nashaquista Cliffs, Squibnocket Point, residential structures
Adjacent L/SCAs: Ocean beach, open ocean, coastal scrub bush, coastal dunes, bays and ponds, medium density residential structures
Adjacent KOPs: KOP-MV04 BarnHouse/Skiff-Mayhew Vincent House, KOP-MV19 Chilmark General Store, KOP-MV20 Moshup Trail
Similar KOPs without SIMs: KOP 13-M Lucy Vincent Beach

KOP 16-MV - Squibnocket Beach

Martha's Vineyard

EXISTING CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

KOP 16-MV - Squibnocket Beach

Martha's Vineyard

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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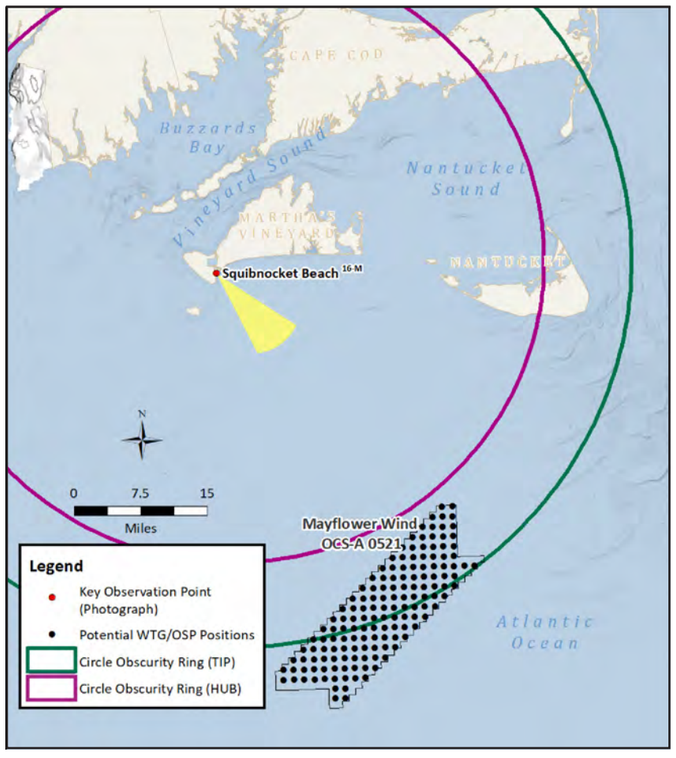
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 2:08 PM	Viewing direction: Southeast (137°)
Date of photograph: 11-6-20	Latitude: 41.318873°N
L/SCA: Ocean Beach, Open Ocean	Longitude: 70.764908°W
	Lighting Direction: Sidelit diffussed

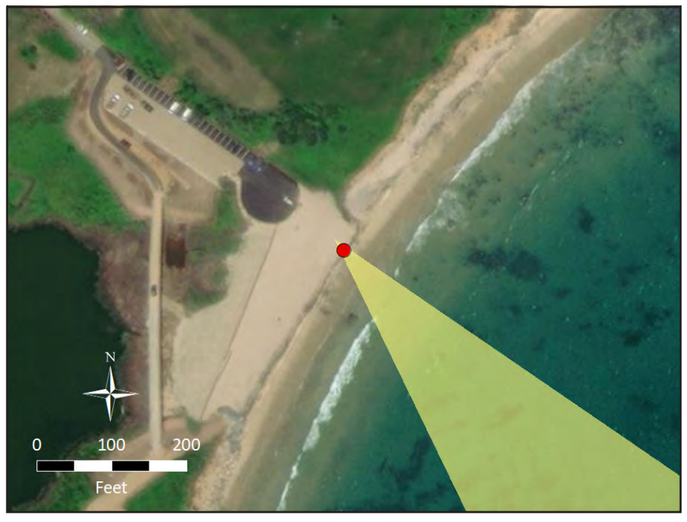
ENVIRONMENT

Temperature: 65° F
Humidity: 78%
Wind Dir & Speed: SSW 16mph
Weather Condition: Hazy

CAMERA

Camera Elevation: 16.5 ft / 5.0 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

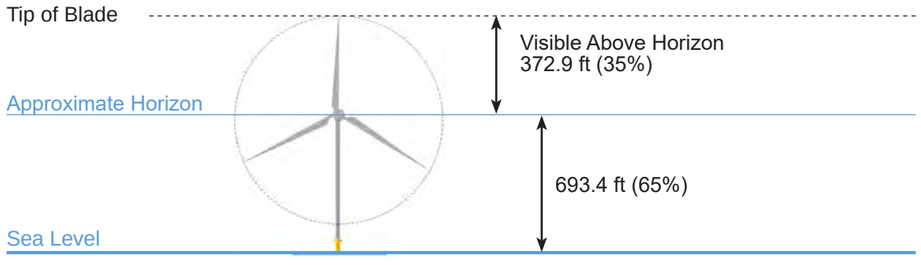
SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 51.49 mi
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 68
Nearest WTG: 37.5 mi	Potential Number of WTGs Not Visible: 81

VISIBILITY OF CLOSEST TURBINE



KOP 16-MV - Squibnocket Beach

Martha's Vineyard

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Nantucket

Table 8. KOP Number 2-N

A. KOP Information				
Number KOP: **2-N**	**KOP Name:** Sanford Farm Barn Overlook (Trail at Barn Viewpoint)	**Date:** June 27, 2020	**Time:** 12:30 PM	**Weather**: Sun, partly cloudy with haze band
Location Description: The Sanford Barn KOP is located along the Barn Walk Trail within the Sanford Farm. Ram Pasture and The Woods properties contain 780 acres of grasslands, shrub thickets, and woodlands. The site contains an extensive cultural history and habitat for rare plants and animals. The properties are owned and managed by the Nantucket Conservation Foundation, a membership-supported, nonprofit organization that is dedicated to permanently conserving, maintaining and managing natural areas and habitats and encouraging an appreciation of and interest in the island's natural resources. (Sanford Trail Guide 2018)				
Landscape Character Description: Open Ocean, Salt Pond/Tidal Marsh, Fields/Meadow, Coastal Scrub, Rural/Residential	**Scenic Integrity:** Scenic integrity is high due to the setting remaining mostly natural. Residential structures are set within the context of the setting.			
Visual Absorption Capability: Moderate - high because there are many built features within the middle ground. Ability to introduce elements without compromising the scene.	**Dominant Landscape Attributes:** Grass lands, shrub, pond, housing and ocean in the background			
Relevant Viewer Groups: Recreational User, Residents, Tourists	**Viewer Context:** Viewer groups visit the Sanford Farm, Ram Pasture and The Woods to use the trail system and open space for scenic value, wildlife viewing, hiking, and biking.	**Viewer Position:** Slightly Viewer Superior		
Visual Connection to Project: Partly screened by the vegetation, dunes and residential housing	**Viewing distance: Statue Miles (mi) and Kilometers (km)** 24.37 mi 39.22 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 2-N]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Level to slightly sloping, rolling terrain, landform is not exposed	Linear and regular, fills in the negative space in the Scene, indistinguishable from the sky	Irregular	Grasses erect low massing; shrubs are low and irregular massed	Triangular roof lines, irregular geometry
Line	None	Horizontal horizon line, irregular line between the structure, vegetation and ocean	Even edge along house, curvilinear edge along vegetates margin of coastal scrub	Irregularly horizontal district line between grassland and coastal shrub, undulating line where coastal shrub meets the water edge	Horizontal, angular
Color	None	Very light gray/blue	Gray to Light blue to reflects the sky condition and cloud color	Tan, light to dark greens, seasonal wildflowers	Gray, brown, tan, white, reddish/orange tint
Texture	None	Smooth	Smooth to choppy	Fine texture grassland, course texture coastal scrub	Not discernable

Existing Landscape/Seascape Character Description:

Sanford Barn is a stopping point along the 3.1-mile Barn Walk Trail within the Sanford Farm Preserve. The dominant visual impression is of the diversity of color, texture and within the vegetation and contrast with the strong linear edge along the inland tidal pond in the foreground view. Rising behind Hummock Pond is the residential community of Cisco. The Cisco community is a newer development on the island. The houses are large but reflect the traditional Cape Code style with gray shingle siding and steeply sloped roofs.

The ocean is visible through the housing development and provides a flat blue-gray back drop to the multiple colors and textures found within the middle ground features. The color of the ocean is reflective of the sky. The dark distant horizon line defines the break between the ocean edge and the sky.

Scenic integrity is high, particularly from the location of the photo point within the Sanford Farm property at the historic barn site. According to locals, this viewpoint is one of the few inland locations that allows a view the ocean from a slightly elevated inland position. It includes the experience of the scrub shrub, inland tidal pond, dunes and open ocean setting in one view. The sunset can also be viewed from the trail and viewpoint to the south west over Madaket southern end of the island.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 2-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X			X				X				X			
	Line	NA	NA	NA	NA		X			X				X					X		
	Color	NA	NA	NA	NA			X			X				X					X	
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X				X				X				X		
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			X				X				X			
	Motion	NA	NA	NA	NA	X				X				X				X			
	Lighting	NA	NA	NA	NA	X				X				X				X			

Overall Visual Contrast Rating: Moderate

Visibility Level Rating: [3] - [4]

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance.

[4] Plainly visible, but not dominant.

The Contrast Rating is Moderate. The turbines are in direct alignment with the view to the ocean setting from this viewer position. Even though the atmospheric condition may often presents some haze and/or clouds, the turbine blades will be visually evident, seen as dark gray against a white or milky blue background. Although the distance and atmospheric haze limits the visibility of the turbines, they will be plainly visible in clear conditions. The rotation of the blades will also draw attention to the viewer.

Contrasting Elements:

- Vertical elements introduced into a horizontal landscape/seascape scene;
- Density of structures arrayed across the horizon line.
- The perceived lack of visual order due to turbine overlap;
- Blade motion is spinning likely visible along the horizontal irregular line accented by the roof lines of the residential structures and rolling edge of the dunes.
    - o Motion of the blades does not relate to any existing feature found within the context of the foreground and middle ground scene
- Scale and forms of the turbine blades and towers contrasts with the forms and scale of the residential structures within the middle ground view.

Mitigating Factors:

- Distance to nearest turbines is more than 20 miles
- built features within the middle ground
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 2-N NCF Sanford Farm Barn

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 10:54 AM	Viewing direction: South (194°)
Date of photograph: 6-26-20	Latitude: 41.265608°N
L/SCA: Ocean Beach, Dunes	Longitude: 70.150001°W
	Lighting Direction: Backlit diffused

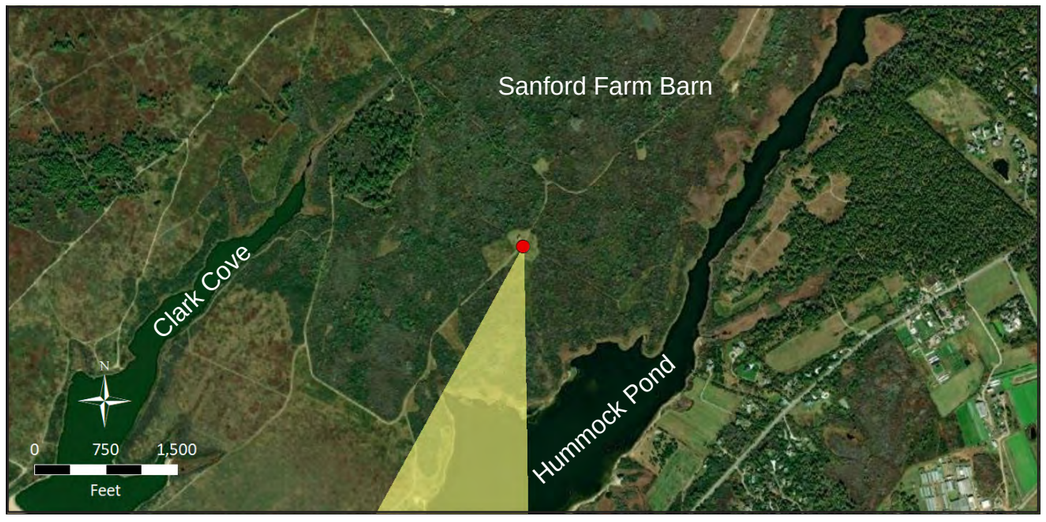
ENVIRONMENT

Temperature: 68° F
Humidity: 81%
Wind Dir & Speed: S 12 mph
Weather Condition: Hazy

CAMERA

Camera Elevation: 50.5 ft /15.4 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public recreation path

Scenic Resources: Scrub shrub landscape overlooking open ocean

Adjacent Amentities: Dirt biking/walking paths

Adjacent Areas: Sanford Farm Barn, Hummock Pond, Clark Cove

Adjacent L/SCAs: Coastal scrub shrub, agricultural fields, low density residential structures

Adjacent KOPs: KOP 17-N Bartlett's Farm, KOP 13-N Hummock Pond Road Bike Path, KOP 31-N Cisco Beach Below Sanford Farm Barn, KOP 12-N Cisco Beach

Comparable KOPs: none

KOP 2-N NCF Sanford Farm Barn

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 2-N NCF Sanford Farm Barn

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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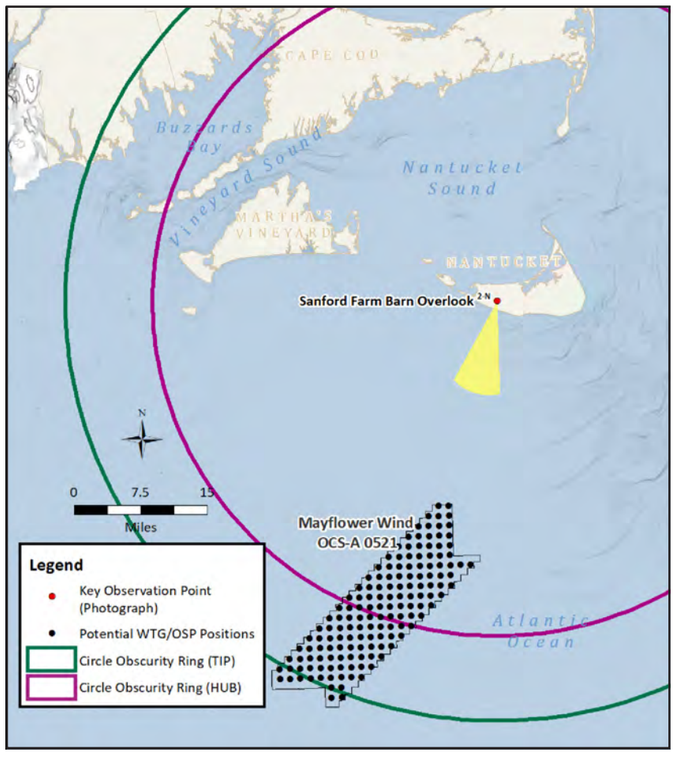
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 10:54 AM	Viewing direction: South (194°)
Date of photograph: 6-26-20	Latitude: 41.265608°N
L/SCA: Ocean beach	Longitude: 70.150001°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 68° F
Humidity: 81%
Wind Dir & Speed: S 12 mph
Weather Condition: Hazy

CAMERA

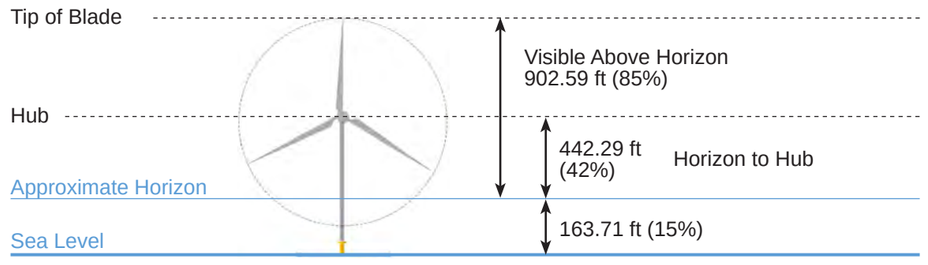
Camera Elevation: 50.5 ft /15.4 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 117°	Furthest WTG: 50.2 mi / 80.9 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 141
Nearest WTG: 24.4 mi / 39.2 km	Potential Number of WTGs Not Visible: 8

VISIBILITY OF CLOSEST TURBINE



KOP 2-N NCF Sanford Farm Barn

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 9. KOP Number 3-N (Haze)

A. KOP Information				
KOP Number: **3-N (Haze)**	**Name KOP:** **Madaket Beach (Haze)**	**Date** July 29, 2020	**Time:** 1:10 PM	**Weather**: Part Sun with haze - Reflective

Location Description:
The neighborhood of Madaket is located on the western end of the island of Nantucket between Madaket Harbor and saltwater marsh of Long Pond. Madaket is known for its pristine sandy beaches and open ocean sunsets. The long linear tan beach is sandwiched between elevated eroding dunes and the variable irregular edge of tide. Public beach access is confined to a large parking area with restrooms. Split rail fence delineates the upland edge of the access area and cement barriers blocking vehicle access to the beach.

The recreation area is a very popular destination with residents and tourists looking to sunbathe and enjoy the beach setting during the day and the sunset over the open ocean during the evening. The parking area is undersized for the level of summer visitation and cars are often parked along the roadway edge.

The photo point is located within the Public Beach Access area at the top of tide. Markers delineate the transition between public and private beach access.

Landscape Character Description: Open Ocean, Dunes	**Scenic Integrity:** No permanent visual intrusions

Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed Ocean. Intermittent views of passing vessels.

Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is popular for sunbathing, picnicking and sunset viewing	**Viewer Position:** Level

Visual Connection to Project: Unobstructed view to Project other than receptors enjoying the beach	**Viewing distance: Statue Miles (mi) and Kilometers (km)** 24.39 mi 39.25 km

B. Landscape/Seascape Character Description [KOP 3-N (Haze)]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat to gently sloped beach	Strongly horizontal, flat to mildly choppy -ripple	NA	NA	NA
Line	Strong line where beach meets the ocean	Horizon line, intermittent line, clouds, Irregular wave lines	NA	NA	NA
Color	Tan sand	Dark horizon line- reflective white and blue, gray to white clouds, slight haze above ocean, blue sky above haze band	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of water, the blue or gray color reflecting the sky, the smooth or choppy texture of the water surface, and the distant horizon line. Scenic integrity is high, with few or no existing visual intrusions. The dark horizon line is predominantly visible providing a distinct linear break between the ocean and the sky. Ocean evaporation from warm summer temperatures often creates a grayish white band of haze between the ocean and the warm blue sky. Commercial fishing and recreational boats are seasonally seen in the waters of the area, and views of the Project can be from any point on the ocean surface on the south and west sides of the islands. Conditions range from flat water to choppy to rolling swells.

The viewer position is primarily from Madaket beach, facing the ocean. The long linear tan sandy beach contrast strong variable edge where the ocean tide meets the dry sand of the beach.

C. Contrast Rating [KOP 3-N (Haze)] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			NA		X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line		X			X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color			X				X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate to Strong
Visibility Level Rating: [3] - [4]
[3] Visible after only a brief glance in the direction of the project facilities.
[4] Plainly visible, but not dominant.

The Contrast Rating is moderate to strong. The Project is in direct view to the ocean setting from the beach. Although the distance and atmospheric haze may partly obscure visibility at times, the Project will plainly visible in clear conditions. Under the lighting conditions shown, project would appear of sufficient size or contrast with other landscape/seascape elements, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of an observer's visual field. Although few in number, the presence of offshore substations also introduces stronger visual contrast than the turbines. The blade rotation will draw the attention of the viewer.

Contrasting Elements:

- Early afternoon sun angle against the blue sky presents the Project color as gray.
- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The density of overlapping structures arrayed across the horizon line as well as the extent of the visible horizon occupied by the Project;
- A perceived lack of visual order of the Project;
- Dark gray color and rectangular form of the platforms contrasts attracts the attention of the viewer within the scene and against the white/blue sky background
- Blade will likely be visible

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 3-N Madaket Beach

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11” x 17” and pan the surrounding panoramic image maintaining the 11” x 17” size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 1:10 PM
Date of photograph: 6-26-20
L/SCA: Ocean Beach, Dunes

Viewing direction: South (187°)
Latitude: 41.269822°N
Longitude: 70.201624°W
Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 69° F
Humidity: 78%
Wind Dir & Speed: S 13 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 6.5 ft /1.9 m
Nikon D4
Nikon 50mm
ISO: 100

Fstop: f/7.1
Shutter: 1/1250 sec
Aperture priority
Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes, scrub shrub landscape

Adjacent Amentities: Small parking lot, Millie's Restaurant, Madaket Town Center

Adjacent Areas: Residential homes, Smiths Point, White Goose Cove, Madaket Harbor

Adjacent L/SCAs: Ocean beach, coastal dunes, coastal scrub bush, medium density residential structures

Adjacent KOPs: KOP 22-N Madaket Beach Sunset, KOP 24-N Washington Ave and Madaket Road, KOP 30-N Massachusetts Ave, KOP 16-N Head of Plains

KOP 3-N Madaket Beach

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

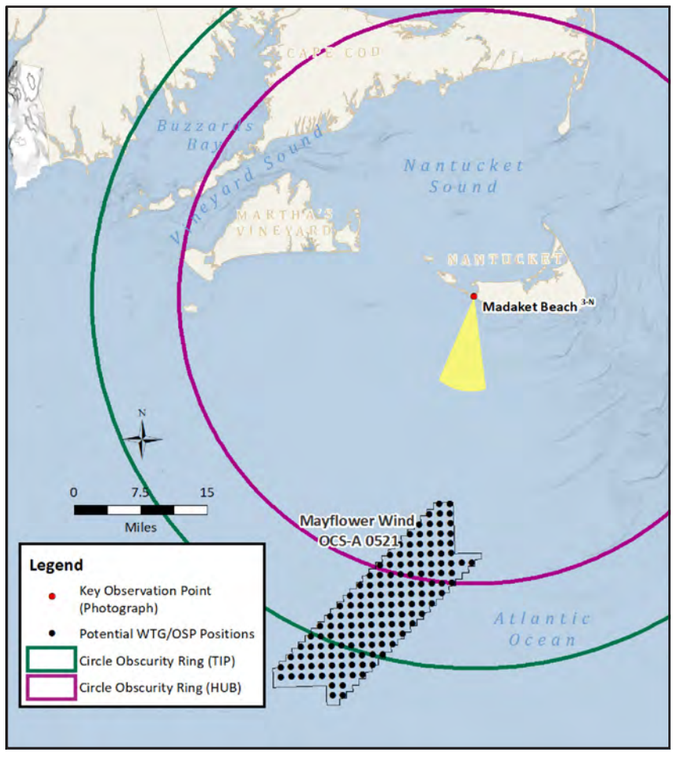
KOP 3-N Madaket Beach

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11” x 17” and pan the surrounding panoramic image maintaining the 11” x 17” size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 1:10 PM	Viewing direction: South (187°)
Date of photograph: 6-26-20	Latitude: 41.269822°N
L/SCA: Ocean Beach, Dunes	Longitude: 70.201624°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 69° F
Humidity: 78%
Wind Dir & Speed: S 13 mph
Weather Condition: Partly Cloudy

CAMERA

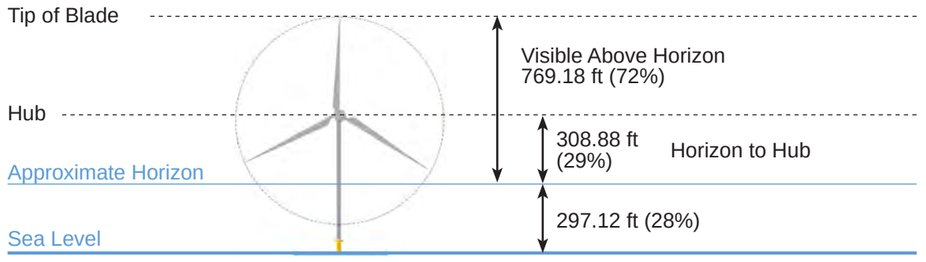
Camera Elevation: 6.5 ft /1.9 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.2 mi / 79.2 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 111
Nearest WTG: 24.4 mi / 39.3 km	Potential Number of WTGs Not Visible: 38

VISIBILITY OF CLOSEST TURBINE



KOP 3-N Madaket Beach

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 10. KOP Number 6-N

A. KOP Information				
KOP Number: **6 N**	**Name KOP:** **Tom Nevers Beach**	**Date** June 27, 2020	**Time:** 8:44 AM	**Weather**: Overcast, partly blue sky

Location Description:
Tom Nevers Beach is a mile-long beach owned and managed by the Nantucket Conservation Foundation. The beach is easily accessible from undeveloped dirt roads and walking trails through shrub/scrub plan communities and grassy dunes. The beach is known for being fairly remote with striking views of the ocean.

The coarse tan sandy beach is a flat upper terrace at the foot of the eroding dune edge, transitioning to sloping and angled drop intersecting with the ocean edge. The strong angle causes heavy surf beach break, and unpredictable currents and undertow. The beach is very popular and accessed primarily by residents and tourists residing in or staying at the Tom Never community. The beach is used for for-beach walking, sunbathing, ocean viewing, and surf casting.

Landscape Character Description: Open Ocean, Open Beach, Dunes	**Scenic Integrity:** No permanent visual intrusions
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed ocean. Intermittent views of passing vessels.

Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is popular for sunbathing, picnicking and sunset viewing	**Viewer Position:** Level

Visual Connection to Project: Unobstructed view to Project other than receptors enjoying the beach	**Viewing distance: Statute Miles and Kilometers (km)** 26.56 mi 42.77 km

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 6-N]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Steep to flat to sharply angled	Strongly horizontal, flat to mildly choppy ripple	NA	NA	NA
Line	Strong formal line at top of dune cliff and at the margin of where cliff meets the beach. An irregular line where beach meets the top of tide	Horizon line, intermittent line, clouds, Regular rolling wave lines	NA	NA	NA
Color	Tan sand	Dark horizon line- reflective white and blue, gray, white clouds	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of open ocean against the blue and gray color of the sky. The dark blue gray ocean surface stretches to the distant horizon line. Scenic integrity is high with no visual intrusions. The dark horizon line is providing a distinct linear break between the ocean and the white clouds in the sky. Ocean conditions range from flat water to choppy to rolling swells.

The viewer position to the ocean ranges from slightly elevated at the top of the dune at Tom Nevers Field to level along the beach. The elevated position provides an expansive field of view of the entire ocean along the horizon degree.

VISIBILITY ANALYSIS FORMS

C. **Contrast Rating [KOP 6-N]** ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X					X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color			X				X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate

Visibility Level Rating: [3] – [4]

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance

[4] Plainly visible. Not dominant.

The contrast rating is **Moderate**. The atmospheric conditions within the simulations present an overcast haze limiting the visibility of the Project. With these atmospheric conditions the visibility rates closer to a [3]. The project may be visible only after a brief glance. In clear conditions the project would likely be plainly visible. The light turbine color is associated with the time of day/sun angle. Details of the turbines would not be noticeable due to the distance. The rotation of the blades will likely be visible and may draw the viewer's attention.

Contrasting Elements:

- The perceived visual connection to features along the horizontal line of the horizon form the viewer position.
- Overcast skies and low morning front light highlights the project as gray against the white to blue back drop of the sky.
- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The apparent density of structures arrayed across the horizon line obscures the view of the open ocean setting;
- A perceived lack of visual order of the Project from the viewer position;
- Blade motion will be visible along the horizontal line. Circular motion of the blades does not correspond with the natural back and forth motion of the waves, and will be non-synchronized, adding visual chaos

Mitigating factors:.

- Project elements are of insufficient size or contrast to compete with major landscape/seascape elements given viewer geometry relative to the Project's configurations (i.e. views are not lateral) and the resulting limited portion of the field of view that would not be occupied by the project.
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 6-N Tom Nevers Beach

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 8:44 AM	Viewing direction: South (212°)
Date of photograph: 6-27-20	Latitude: 41.244577°N
L/SCA: Ocean Beach, Open Ocean, Dunes	Longitude: 69.985046°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 68° F

Humidity: 90%

Wind Dir & Speed: S 10 mph

Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 6.5 ft /1.7 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public field recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes

Adjacent Amentities: Small parking lot

Adjacent Areas: Residential homes, Tom Nevers Pond, Tom Nevers Field

Adjacent L/SCAs: Ocean beach, coastal dunes, scrub shrub landscape, agricultural/open fields, medium density residential structures

Adjacent KOPs: KOP 32-N Tom Nevers Beach (Public Beach Access Point), KOP 7-N Low Beach

KOP 6-N Tom Nevers Beach

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

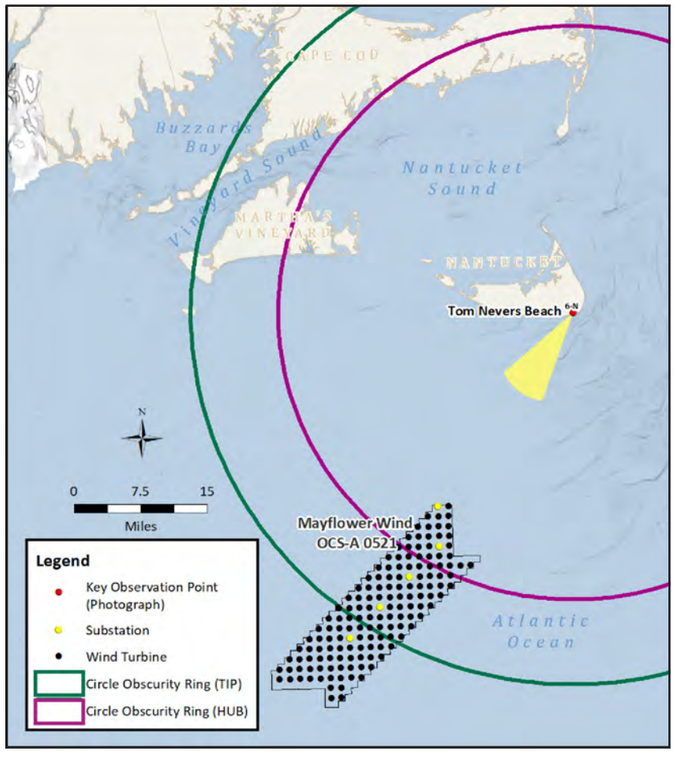
KOP 6-N Tom Nevers Beach

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11” x 17” and pan the surrounding panoramic image maintaining the 11” x 17” size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 8:44 AM	Viewing direction: South (212°)
Date of photograph: 6-27-20	Latitude: 41.244577°N
L/SCA: Ocean Beach, Open Ocean, Dunes	Longitude: 69.985046°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 68° F
Humidity: 90%
Wind Dir & Speed: S 10 mph
Weather Condition:Partly Cloudy

CAMERA

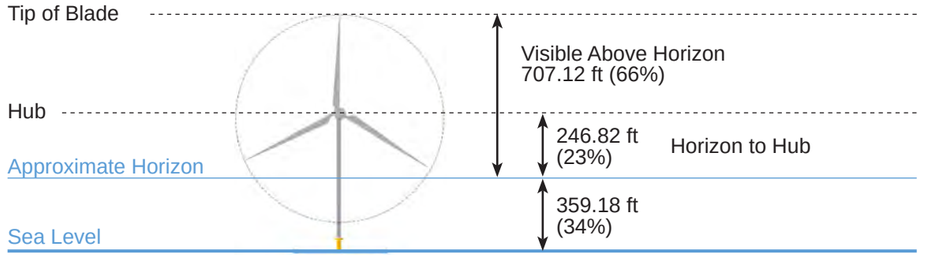
Camera Elevation: 6.5 ft /1.7 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 53.9 mi / 86.8 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 88
Nearest WTG: 26.6 mi / 42.7 km	Potential Number of WTGs Not Visible: 61

VISIBILITY OF CLOSEST TURBINE



KOP 6-N Tom Nevers Beach

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 11. KOP Number 8-N

A. KOP Information				
KOP Number: **8-N**	**Name KOP:** **Tom Nevers Field**	**Date** June 27, 2020	**Time:** 9:36 AM	**Weather**: Overcast, partly blue sky

Location Description:
Tom Nevers Field is a park located between the community of Tom Nevers and Madequecham. The field fronts the mile-long beach owned and managed by the Nantucket Conservation Foundation. The beach is easily accessible from undeveloped dirt roads and walking trails through shrub/scrub plant communities, and the grassy dunes.

The coarse tan sandy beach is a flat upper terrace at the foot of the eroding dune edge, transitioning to a sloping and angled drop intersecting with the ocean edge. The strong angle causes heavy surf beach break, and unpredictable currents and undertow. The beach is very popular and accessed primarily by residents and tourists residing in or staying at the Tom Never community, and is used for for-beach walking, sunbathing, ocean viewing, and surf casting.

Landscape Character Description: Open Ocean, Coastal Bluffs, Dunes, Coastal Scrub	**Scenic Integrity:** No permanent visual intrusions
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed Ocean. Intermittent views of passing vessels.

Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is popular for sunbathing, picnicking and sunset viewing	**Viewer Position:** Slightly Viewer Superior

Visual Connection to Project: Unobstructed view to project other than receptors enjoying the beach	**Viewing distance: Statute Miles and Kilometers (km)** 25.68 mi 41.33 km

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 8-N]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Steep to flat to sharply angled	Strongly horizontal, flat to mildly choppy ripple	NA	NA	NA
Line	Strong formal line at top of dune cliff and at the margin of where cliff meets the beach. An irregular line where beach meets the top of tide	Horizon line, intermittent line, clouds, Regular rolling wave lines	NA	NA	NA
Color	Tan sand	Dark horizon line-reflective white and blue, gray, white clouds	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of open ocean against the blue and gray color of the sky. The dark blue-gray ocean surface stretches to the distant horizon line. Scenic integrity is high with no visual intrusions. The dark horizon line is providing a distinct linear break between the ocean and the white clouds in the sky. Ocean conditions range from flat water to choppy to rolling swells.

The viewer position to the ocean ranges from slightly elevated at the top of the dune at Tom Nevers Field to level along the beach. The elevated position provides an expansive field of view of the entire ocean along the horizon degree.

C. Contrast Rating [KOP 8-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color			X				X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak - Moderate

Visibility Level Rating: [2] - [3]

[2] Visible when scanning in the general direction of the project facilities.

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance

The contrast rating is Weak to Moderate. The atmospheric conditions within the simulations present an overcast haze limiting the visibility of the Project. With these atmospheric conditions visibility rates closer to a [3]. The project may be visible only after a brief glance. In clear conditions the Project would be plainly visible. The light turbine color is reflective of the ocean conditions and lighting. Details of the turbines would not be noticeable due to the distance. The rotation of the blades is expected to be visible and may draw the viewer's attention.

Contrasting Elements:

- Overcast skies and low morning front light highlights the Project as gray against the white to blue back drop of the sky.
- Vertical elements introduced into a flat horizontal seascape scene;
- The density of structures arrayed across the horizon line – obscures views of the open ocean setting;
- A perceived lack of visual order of the Project from the viewer position;
- Blade motion will likely be visible along the horizontal line. Circular motion of the blades does not correspond with the natural back and forth motion of the waves, and will be non-synchronized, adding visual chaos. **Mitigating Factors:**
- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 8-N Tom Nevers Field

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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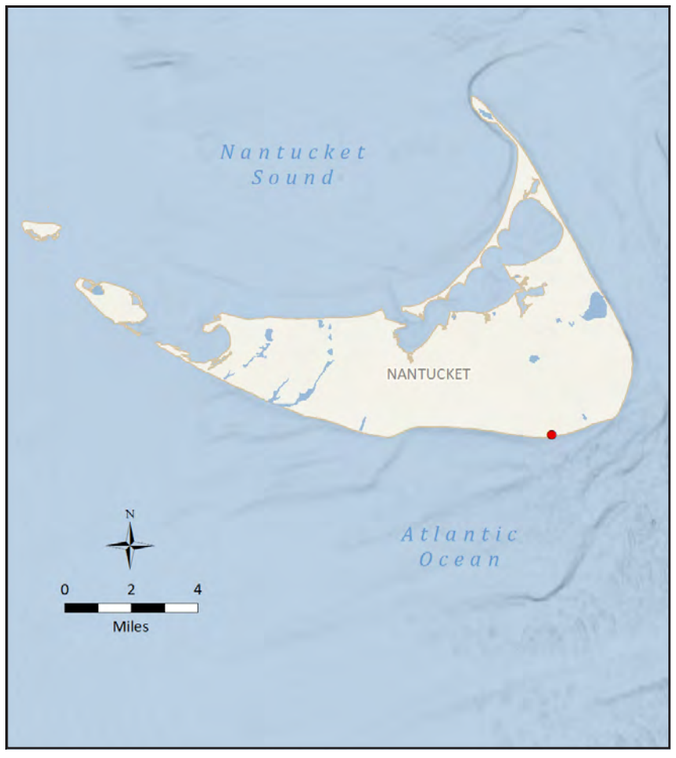
ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 9:36 AM	Viewing direction: South (211°)
Date of photograph: 6-27-20	Latitude: 41.239967°N
L/SCA: Open Ocean, Coastal Bluffs, Dunes, Coastal Scrub	Longitude: 70.007224°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 70° F

Humidity: 81%

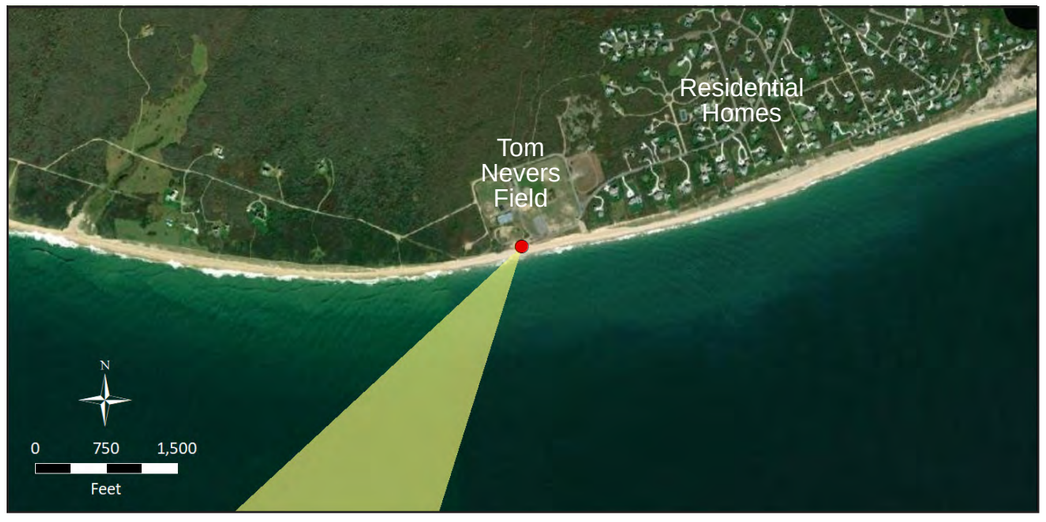
Wind Dir & Speed: SSW 8 mph

Weather Condition: Cloudy

CAMERA

Camera Elevation: 15.0 ft /6.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public park recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes

Adjacent Amentities: Small parking lot

Adjacent Areas: Public park, residential homes

Adjacent L/SCAs: Coastal scrub bush, grassy fields, ocean beach, open ocean, coastal dunes, low density residential structures

Adjacent KOPs: KOP 27-N New South Road, KOP 32-N Tom Nevers Beach (Public Beach Access Point)

KOP 8-N Tom Nevers Field

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 8-N Tom Nevers Field

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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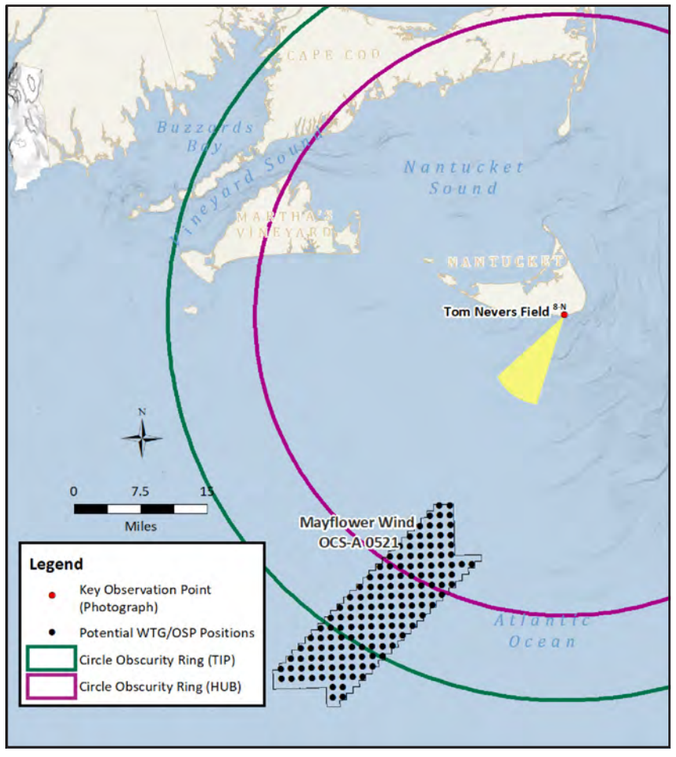
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 9:36 AM	Viewing direction: South (211°)
Date of photograph: 6-27-20	Latitude: 41.239967°N
L/SCA: Open Ocean, Coastal Bluffs, Dunes, Coastal Scrub	Longitude: 70.007224°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 70° F
Humidity: 81%
Wind Dir & Speed: SSW 8 mph
Weather Condition: Cloudy

CAMERA

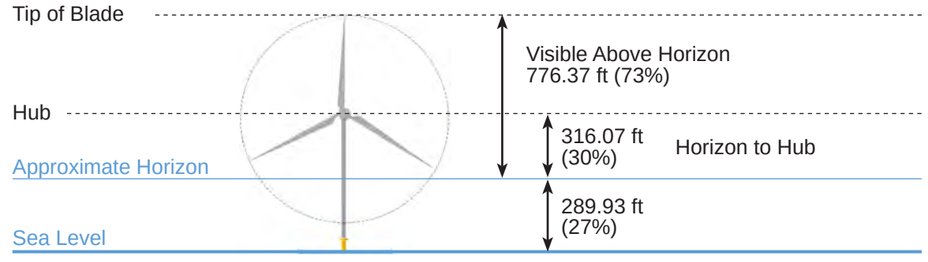
Camera Elevation: 15.0ft / 6.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 53.0 mi / 85.2 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 104
Nearest WTG: 25.7 mi / 41.3 km	Potential Number of WTGs Not Visible: 45

VISIBILITY OF CLOSEST TURBINE



KOP 8-N Tom Nevers Field

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

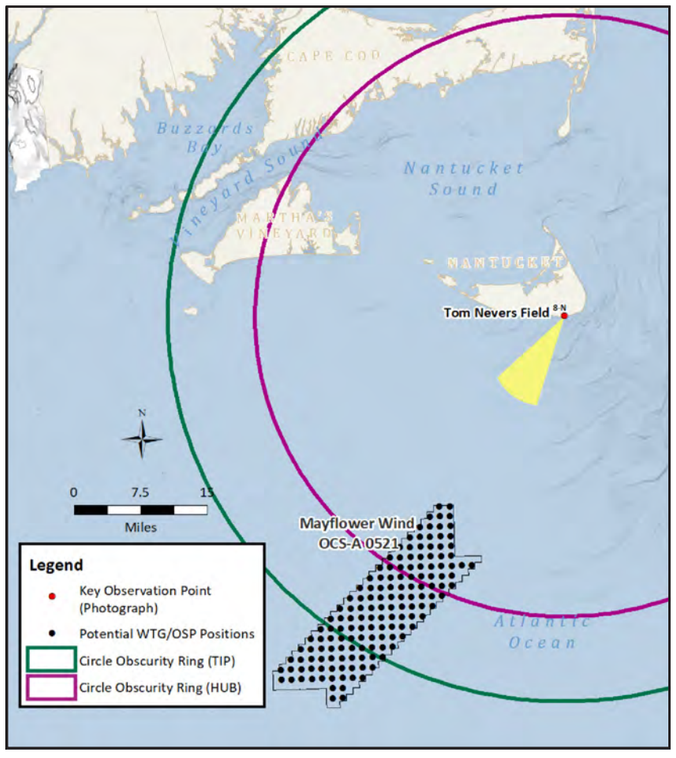
KOP 8-N Tom Nevers Field-nightime

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11” x 17” and pan the surrounding panoramic image maintaining the 11” x 17” size. The yellow area depicts the area on the following page.

ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: Night

Date of photograph: 6-27-20

L/SCA: Open Ocean, Coastal Bluffs, Dunes, Coastal Scrub

Viewing direction: South (211°)

Latitude: 41.239967°N

Longitude: 70.007224°W

Lighting Direction: Night

ENVIRONMENT

Temperature: 70° F

Humidity: 81%

Wind Dir & Speed: SSW 8 mph

Weather Condition: Cloudy

CAMERA

Camera Elevation: 15.0ft / 6.3 m

Nikon D4

Nikon 50mm

ISO: 100

Fstop: f/7.1

Shutter: 1/1250 sec

Aperture priority

Exposure bias: -0.7 step

CONTEXT MAP

Horizontal Field of View: 127°

Vertical Field of View: 39.6°

Nearest WTG: 25.7 mi / 41.3 km

ADJACENT FEATURES

Furthest WTG: 53.0 mi / 85.2 km

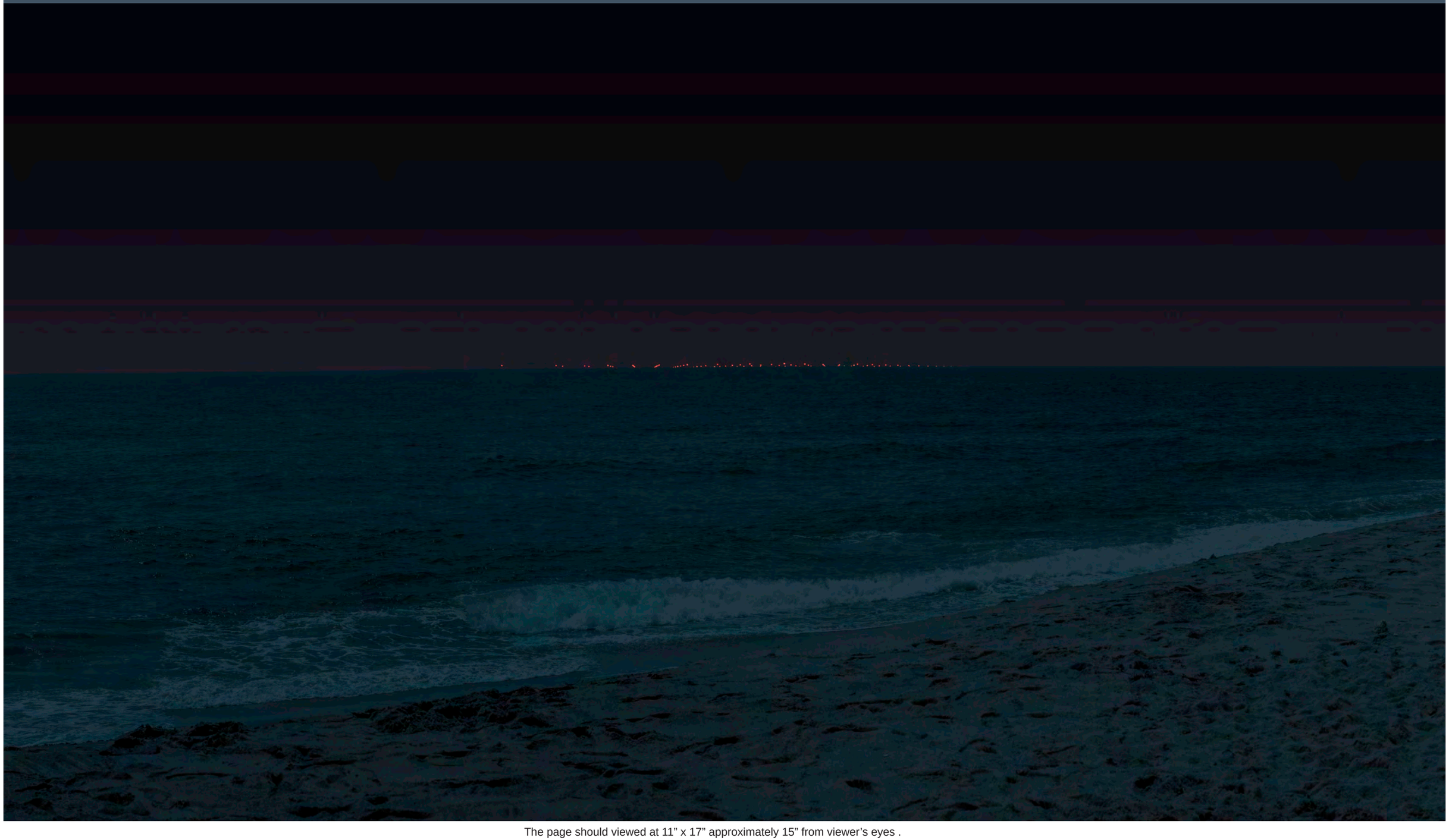
Number of WTGs Visible: 104

Number of WTGs Not Visible: 45

KOP 8-N Tom Nevers Field-nightime

Nantucket

SIMULATED CONDITIONS



The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 12. KOP Number 10-N

A. KOP Information				
KOP Number: **10-N**	**Name KOP:** **Nobadeer Beach**	**Date** June 28, 2020	**Time:** 10:00 AM	**Weather**: Partly Sunny with scattered clouds, blue sky

Location Description:
Nobadeer Beach access is located at the eastern edge of the Nobadeer residential community at the edge of the Nantucket Airport Runway. The residential neighborhood is located within the scrub shrub vegetation community that leads to a steep eroding cliff edge above the beach. The beach is defined by the long linear edge at the base of the cliff and the irregular intermittent line of the beach breach at the top of tide.

The beach is level and allows for vehicle access. This beach is very popular for young people driving, parking and socializing. The beach is also accessed by residents of Nobadeer and used for for-beach walking, sunbathing, ocean viewing, and surf casting. The beach break is very strong with a strong undertow and current.

Landscape Character Description: Open Ocean, Ocean Beach, Dunes, Residential	**Scenic Integrity:** No permanent visual intrusions
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed Ocean. Intermittent views of passing vessels.

Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is popular for sunbathing, picnicking and sunset viewing	**Viewer Position:** Slightly viewer superior

Visual Connection to Project: Unobstructed view to project other than receptors enjoying the beach	**Viewing distance: Statute Miles and Kilometers (km)** 23.18 mi 37.51 km

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 10-N]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat upper terrace to steep eroding cliff face. Flat beach to sharply angled	Strongly horizontal, angled irregular, flat	NA	NA	NA
Line	Strong formal line at top of dune cliff and at the margin of where cliff meets the beach. An irregular line where beach meets the top of tide	Strong prominent Horizon line, intermittent irregular beach break, clouds, Regular rolling wave lines beyond beach break	NA	NA	NA
Color	Tan sand	Dark horizon line-reflective white and blue, gray, white clouds	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of open ocean against the blue and gray color of the sky. The dark blue-gray ocean surface stretches to the distant horizon line. Scenic integrity is high with no existing visual intrusions. The dark horizon line provides a distinct linear break between the ocean and the white clouds in the sky. Ocean conditions range from flat water to choppy to rolling swells and strong beach break.

The viewer position is level along the beach and elevated from private residences within the scrub shrub at the top of the dunes. A strong line defines the character of beach setting. The beach is sandwiched between the eroding cliff face and the tope of tide.

C. Contrast Rating [KOP 10-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X					X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate

Visibility Level Rating: [3] - [4]

[3] Visible after only a brief glance in the direction of the project facilities.

[4] Plainly visible, but not dominant.

The Contrast Rating is Moderate. The view position is in direct alignment of the turbines. Although the distance and atmospheric haze may reduce the clarity of the view of the turbines, the project elements are still plainly visible. Moreover, the rotation of the blades will draw attention of the viewer. The project, particularly substations, would be easily detected after a brief look and would be visible to most casual observers, but within context of full field of view would be of insufficient size or contrast to compete with major landscape/seascape elements.

Contrasting Elements:

- The Project structures appear light to dark gray with the mid-morning sun angle;
- Gray color and rectangular form of the platforms attracts the attention of the viewer within the scene and dark gray against the blue background of the sky;
- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The density of visible structures arrayed across the horizon line as well as the extent of the visible horizon occupied by the Project;
- The perceived lack of visual order of the Project from the viewer position;
- Gray color and rectangular form of the platforms attracts the attention of the viewer within the scene and dark gray against the blue background of the sky
- Blade motion will also be visible along the horizontal line contrasting the natural motion of physical element. Motion of the blades also does not correspond with the natural back and forth motion of the waves and moves with an irregular pattern.

Mitigating Factors:

- Distance to nearest turbines is more than 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 10-N Nobadeer Beach

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PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 10:00 AM
Date of photograph: 6-28-20
L/SCA: Open Ocean, Ocean Beach, Dunes, Residential

Viewing direction: South (202°)
Latitude: 41.244605°N
Longitude: 70.079013°W
Lighting Direction: Sidelit

ENVIRONMENT

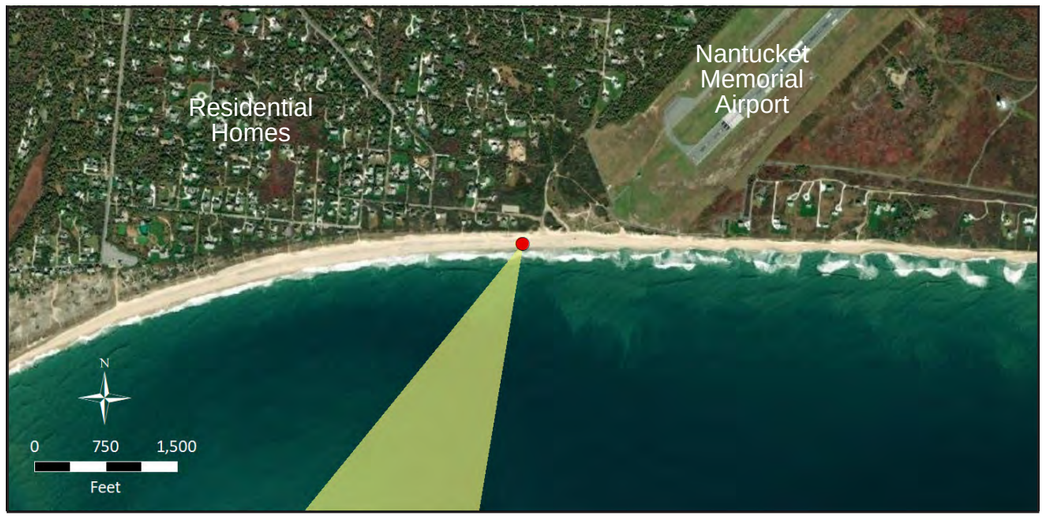
Temperature: 69° F
Humidity: 84%
Wind Dir & Speed: SSW 8 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 6.0 ft / 9.3 m
Nikon D4
Nikon 50mm
ISO: 100

Fstop: f/7.1
Shutter: 1/1250 sec
Aperture priority
Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes

Adjacent Amentities: Moderately sized parking lot with surf rental trucks

Adjacent Areas: Nantucket Memorial Airport, residential homes

Adjacent L/SCAs: Ocean beach, coastal dunes, scrub shrub landscape, medium density residential structures, flat, maintained airport runway

Adjacent KOPs: KOP 20-N Madequacham 1, KOP 1-N Surfside Beach

Comparable KOPs: KOP 1-N Surfside Beach

KOP 10-N Nobadeer Beach

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

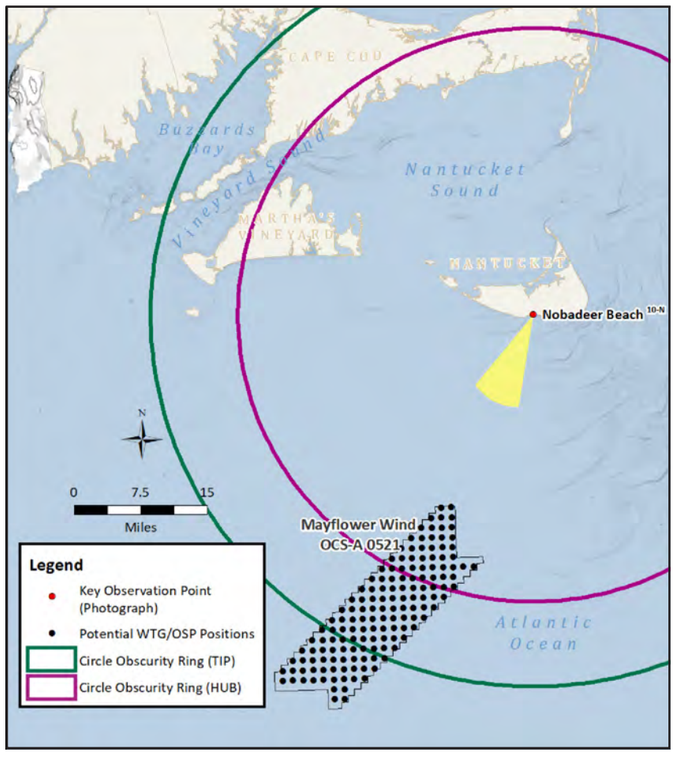
KOP 10-N Nobadeer Beach

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 10:00 AM	Viewing direction: South (202°)
Date of photograph: 6-28-20	Latitude: 41.244605°N
L/SCA: Open Ocean, Ocean Beach, Dunes, Residential	Longitude: 70.079013°W
	Lighting Direction: Sidelit

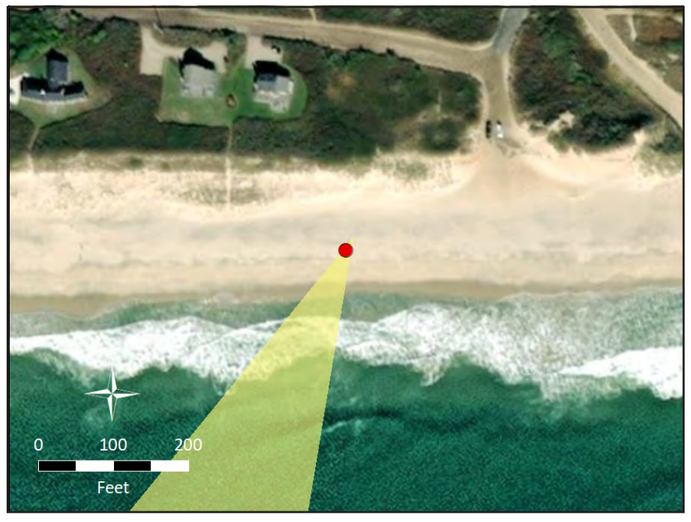
ENVIRONMENT

Temperature: 69° F
Humidity: 84%
Wind Dir & Speed: SSW 8 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 6.0 ft / 9.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

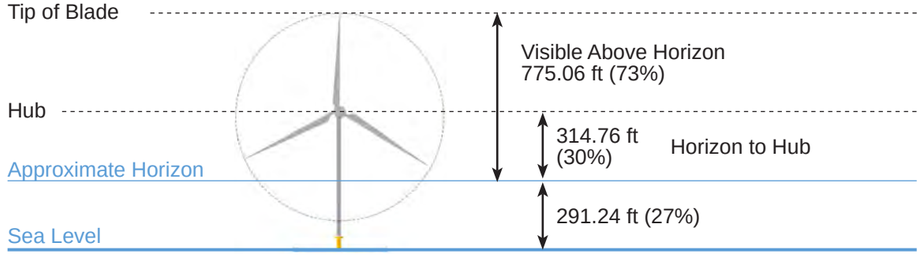
SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 50.9 mi / 81.9 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 104
Nearest WTG: 23.3 mi / 37.5 km	Potential Number of WTGs Not Visible: 45

VISIBILITY OF CLOSEST TURBINE



KOP 10-N Nobadeer Beach

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 13. KOP Number 11-N

A. KOP Information				
KOP Number: **11-N**	**Name KOP:** **Miacomet Beach and Pond**	**Date:** June 28, 2020	**Time:** 11:55 AM	**Weather:** Sunny with light haze and clouds
Location Description: Miacomet Beach is located behind the large eroding bluffs providing a backdrop to the ocean setting. The sparse residential homes are located within the scrub shrub vegetation. The dunes rise above the beach behind the location. Also, behind the beach lies Miacomet Pond. Beach amenities are limited and only includes a small parking area. Miacomet Beach is a lightly developed recreation area and popular destination by residents and tourists looking to sunbathe, swim, and surf in a quiet environment.				
Landscape Character Description: Open Ocean, Dunes, Residential, Salt Pond/Tidal Marsh	**Scenic Integrity:** No permanent visual intrusions			
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of beach framed by the dunes and the ocean edge. Unobstructed view of the open ocean.			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is popular for surfing, sunbathing, picnicking, socializing, and people watching	**Viewer Position:** Level		
Visual Connection to Project: Unobstructed view to project	**Viewing distance: Statute Miles (mi) and Kilometers (km)** 23.49 mi 37.80 km			

B. Landscape/Seascape Character Description [KOP 11-N]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat to gently sloped beach	Flat, Strongly horizontal – mildly choppy -ripple,	NA	NA	NA
Line	Strong line where beach meets the ocean	Horizon line, intermittent line, clouds, Irregular wave lines	NA	NA	NA
Color	Tan sand	Dark horizon line- reflective white and blue, gray to white clouds above ocean, blue sky above	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The visual conditions include a flat expanse of open ocean against the band of white haze and gray overcast clouds of the sky. The reflective dark blue-gray ocean surface stretches along the horizon line. Scenic integrity is high, with visual acuity limited by the influence of the evaporation and the haze. Due to periodic overcast, the horizon line and ocean color begin to integrate with the background. The horizon line remains visually evident, but the color is less distinct. The movement of the ocean ranges from slight ripples to rolling swells to small surf waves and strong beach break. Miacomet Beach is seasonally moderately busy with people recreating, surfing, socializing, and enjoying the beach setting.

C. Contrast Rating [KOP 11-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate

Visibility Level Rating: [3] - [4]

[3] Visible after only a brief glance in the direction of the project facilities. Not dominant due to distance

[4] Plainly visible, but not dominant

The Contrast Rating is Moderate. The viewer position on the beach is in direct alignment with the Project. Although the distance and atmospheric haze reduces the visibility, the Project elements remain plainly visible. The project would be easily detected after a brief look and would be visible to most casual observers [3], but within context of full field of view would be of insufficient size or contrast to compete with major landscape/seascape elements. Moreover, the rotation of the blades will likely draw attention from the viewer. In clear conditions and with blade movement, the Project will be a plainly visible feature and draw attention to the view at Visibility Level [4].

Contrasting Elements:

- Gray color of the OSP(s) is visually evident and dark gray against the white/blue background.
- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The density of visible structures arrayed across the horizon line interrupts the view of the sky above;
- The perceived lack of visual order of the Project from the viewer position;
- Blade motion will also be visible along the horizontal line contrasting the natural motion of physical element. Motion of the blades also does not correspond with the natural back and forth motion of the waves and moves with an irregular pattern

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 11-N Miacomet Beach and Pond

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 10:55 AM	Viewing direction: South (198°)
Date of photograph: 6-28-20	Latitude: 41.243339°N
L/SCA: Open Ocean, Dunes, Salt Ponds, Tidal Marsh, Residential	Longitude: 70.119422°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 70° F

Humidity: 84%

Wind Dir & Speed: S 7 mph

Weather Condition: Cloudy

CAMERA

Camera Elevation: 12.5 ft / 3.8 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes, scrub shrub landscape

Adjacent Amentities: Small parking lot

Adjacent Areas: Miacomet Pond - a coastal tidal pond surrounded by residential homes, scrub schrub and forested landscape

Adjacent L/SCAs: Ocean beach, coastal scrub bush, low density residential structures, pond

Adjacent KOPs: KOP 1-N Surfside Beach, KOP 19-N Miacomet Golf Club, KOP 18-N Ladies Beach

KOP 11-N Miacomet Beach and Pond

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 11-N Miacomet Beach and Pond

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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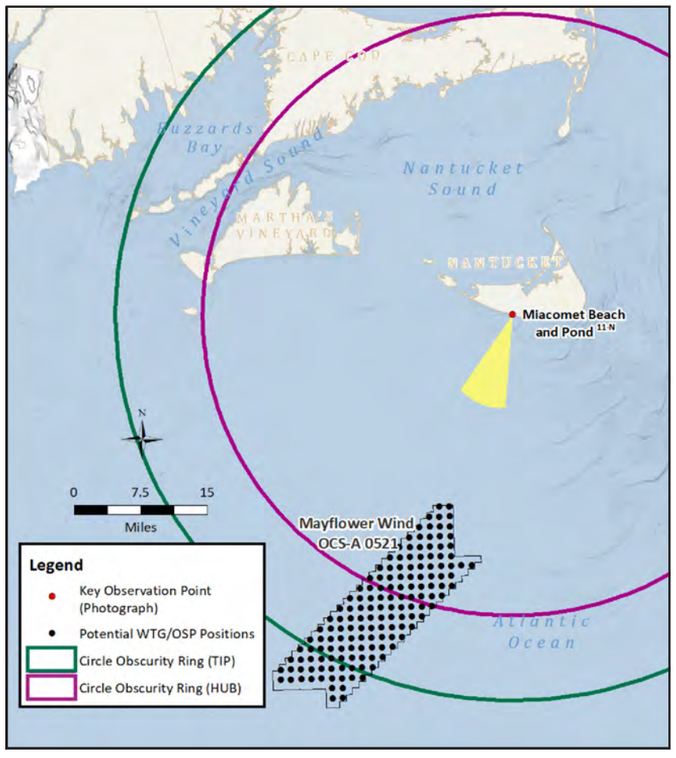
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 10:55 AM	Viewing direction: South (198°)
Date of photograph: 6-28-20	Latitude: 41.243339°N
L/SCA: Open Ocean, Dunes, Salt Ponds, Tidal Marsh, Residential	Longitude: 70.119422°W
	Lighting Direction: Backlit diffused

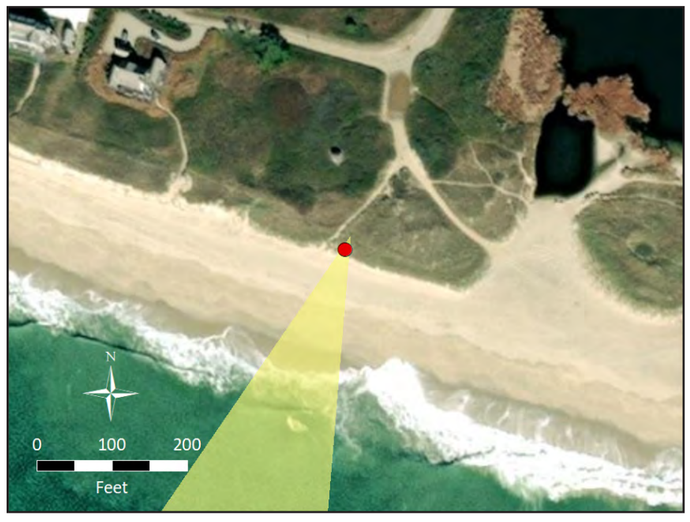
ENVIRONMENT

Temperature: 70° F
Humidity: 84%
Wind Dir & Speed: S 7 mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 12.5 ft / 3.8 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

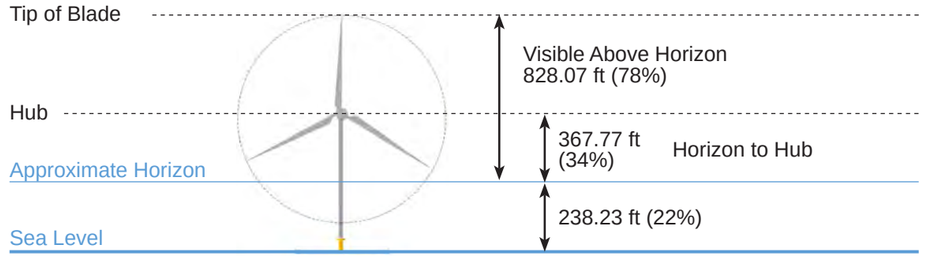
SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.5 mi / 79.6 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 121
Nearest WTG: 23.5 mi / 3.8 km	Potential Number of WTGs Not Visible: 28

VISIBILITY OF CLOSEST TURBINE



KOP 11-N Miacomet Beach and Pond

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 14. KOP Number 12-N (Clear Skies)

A. KOP Information				
KOP Number: **12-N (Clear Skies)**	**Name KOP:** **Cisco Beach (Clear Skies)**	**Date** July 29, 2020	**Time:** 1:25 PM	**Weather**: Sunny with light haze and high clouds
Location Description: Cisco Beach is an expanse of beach located on the southwestern end of Nantucket. The Cisco residential neighborhood is located behind the beach and grassy dunes, next to a saltwater pond. The dunes rise above the beach behind the location. Beach amenities include a large parking area, surfboard rental station, food cart, and temporary toilets with hand washing stations. This is a developed recreation area and popular destination by residents, tourists looking to sunbathe, surf, and socialize.				
Landscape Character Description: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential	**Scenic Integrity:** No permanent visual intrusions			
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of beach framed by the dunes and the ocean edge. Unobstructed view of the open ocean.			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is popular for surfing, sunbathing, picnicking.	**Viewer Position:** Level		
Visual Connection to Project: Unobstructed view to project	**Viewing distance: Statue Miles (mi) or Kilometers (km)** 23.61 mi 38.00 km			

B. Landscape/Seascape Character Description [12-N (Clear Skies)]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat to gently sloped beach	Flat, Strongly horizontal – mildly choppy, ripple	NA	NA	NA
Line	Strong line where beach meets the ocean	Horizon line, intermittent line, clouds, Irregular wave lines	NA	NA	NA
Color	Tan sand	Dark horizon line - reflective white and blue, gray to white clouds above ocean, blue sky above	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of water, the blue or gray color reflecting the sky, the smooth or choppy texture of the water surface, and the distant horizon line. Scenic integrity is high, with few or no visual intrusions. Numerous commercial fishing and recreational boats are seasonally found in the waters of the area, and views of the Project can be from any point on the ocean surface on the south and west sides of the islands. Conditions range from flat water to choppy to rolling swells. Ferry boats are limited to inland waters on the side of the islands away from the project.

Dominant elements of the view are open water, white and reflective color, and dark, strong horizon line. Water breaks on the beach. No visual intrusions other than people surfing.

Cisco beach has a slight curvilinear form, tan color and strong variable edge where the ocean tide meets the beach.

C. Contrast Rating [12-N (Clear Skies)] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color			X				X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate to Strong

Visibility Level Rating: [4] - [5]

[4] Plainly visible, but not dominant

[5] Strongly attracts visual attention. Prominent.

The Contrast Rating is Moderate to Strong. The viewer position on the beach is in direct alignment with the Project within the open ocean setting. Although the distance and atmospheric haze may reduce visibility, the Project elements remain plainly visible most of the time. Moreover, the blade rotation will draw the viewer's attention. In clear conditions, the Project will be a prominent feature and may dominate the view.

Contrasting Elements:

- Gray color of the OSP(s) is visually evident and dark gray against the white/blue background.
- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The density of structures arrayed across the horizon line interrupts the view of the sky above;
- The perceived lack of visual order of the Project from the viewer position;
- - Blade motion is spinning along the horizontal line. Motion of the blades also does not correspond with the natural back and forth motion of the waves.

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 12-N Cisco Beach- clear skies

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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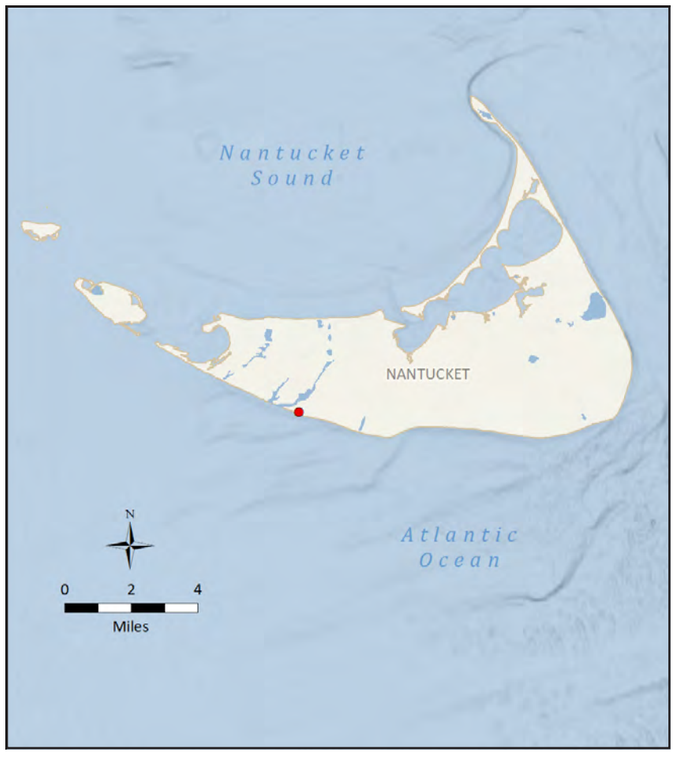
ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 1:25PM	Viewing direction: South (193°)
Date of photograph: 8-20-20	Latitude: 41.252490°N
L/SCA: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential	Longitude: 70.154080°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 61° F

Humidity: 90%

Wind Dir & Speed: N 6 mph

Weather Condition:Partly Cloudy

CAMERA

Camera Elevation: 23.0 ft / 7.0 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, seascape, scrub shrub landscape

Adjacent Amentities: Cisco Bike Path and a moderately sized parking lot with surf rental trucks and food trucks

Adjacent Areas: Hummock Pond - a coastal tidal pond surrounded by residential homes, coastal scrub, and agricultural/ open fields

Adjacent L/SCAs: Coastal scrub bush, coastal dunes, ocean beach, low density residential structures

Adjacent KOPs: KOP 13-N Hummock Pond Road Bike Path, KOP 18-N Ladies Beach, KOP 31-N Cisco Beach Below Sanford Farm Barn

KOP 12-N Cisco Beach- clear skies

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

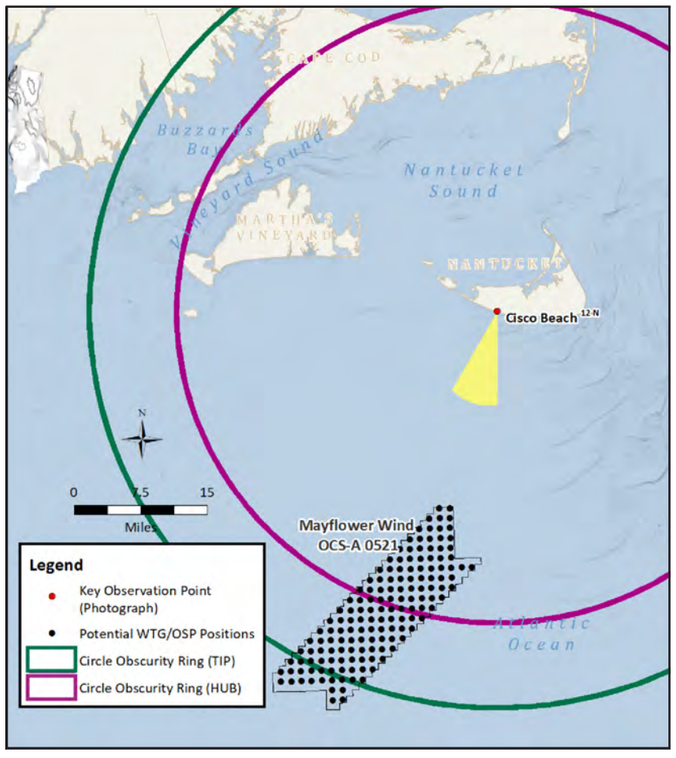
KOP 12-N Cisco Beach - clear skies

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11” x 17” and pan the surrounding panoramic image maintaining the 11” x 17” size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 1:25PM	Viewing direction: South (193°)
Date of photograph: 8-20-20	Latitude: 41.252490°N
L/SCA: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential	Longitude: 70.154080°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 61° F
Humidity: 90%
Wind Dir & Speed: N 6 mph
Weather Condition: Partly Cloudy

CAMERA

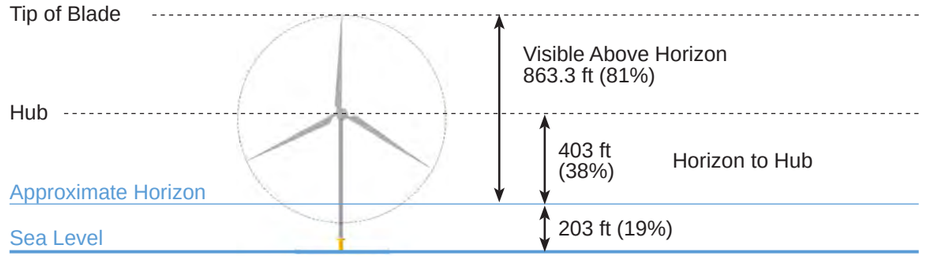
Camera Elevation: 23.0 ft / 7.0 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.5 mi / 79.3 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 131
Nearest WTG: 23.6 mi / 38.0 km	Potential Number of WTGs Not Visible: 18

VISIBILITY OF CLOSEST TURBINE



KOP 12-N Cisco Beach- clear skies

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11" x 17" approximately 15" from viewer's eyes .

Table 15. KOP Number 12-N (Overcast)

A. KOP Information				
KOP Number: **12-N (Overcast)**	**Name KOP:** **Cisco Beach (Overcast Skies)**	**Date** June 28, 2020	**Time:** 11:28 AM	**Weather**: Cloudy overcast skies
Location Description: Cisco Beach is an expanse of beach located on the southwestern end of Nantucket. The Cisco residential neighborhood is located behind the beach and grassy dunes, next to a saltwater pond. The dunes rise above the beach behind the location. Beach amenities include a large parking area, surfboard rental station, food cart, and temporary toilets with hand washing stations. This is a developed recreation area and popular destination by residents, tourists looking to sunbathe, surf, and socialize.				
Landscape Character Description: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential	**Scenic Integrity:** No permanent visual intrusions			
Visual Absorption Capability: NA	**Dominant Landscape Attributes:** Broad expanse of beach framed by the dunes and the ocean edge. Unobstructed view of the open ocean.			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is popular for surfing, sunbathing, picnicking, socializing, and people watching	**Viewer Position:** Level		
Visual Connection to Project: Unobstructed view to project	**Viewing distance: Statute Miles and Kilometers (km)** 23.61 miles 38.00 km			

B. Landscape/Seascape Character Description [12-N (Overcast)]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat to gently sloped beach	Flat, Strongly horizontal – mildly choppy, ripple	NA	NA	NA
Line	Strong line where beach meets the ocean	Horizon line, intermittent line, clouds, Irregular wave lines	NA	NA	NA
Color	Tan sand	Dark horizon line - reflective white and blue, gray to white clouds above ocean, blue sky above	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Summary
Existing Landscape/Seascape Character Description:

The visual conditions include a flat expanse of open ocean against the band of white haze against gray overcast clouds of the sky. The reflective dark blue-gray ocean surface stretches along the horizon line. Scenic integrity is high, with visual acuity limited by the influence of the evaporation and the haze. Due to periodic overcast the horizon line and ocean color begin to integrate with the background. The horizon line remains visually evident, but the color is less distinct. The movement of the ocean ranges from slight ripples to rolling swells to small surf waves and strong beach break. Cisco beach is seasonally busy with people recreating, surfing, socializing and enjoying the beach setting.

C. Contrast Rating [12-N (Overcast)] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate to Strong
Visibility Level Rating: [4] – [5]

[4] Plainly visible, but not dominant.

[5] Strongly attracts visual attention. Prominent.

The Contrast Rating is Moderate to Strong. The viewer position on the beach is in direct alignment with the Project within the open ocean setting. Although the distance and periodic atmospheric haze reduces the visibility, the Project elements remain plainly visible. Moreover, the rotation of the turbine blades will draw attention of the viewer. In clear conditions, the Project will be a prominent feature and may dominate the view.

Contrasting Elements:

- Gray color of the platforms is visually evident and dark gray against the white/blue background
- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The density of visible structures arrayed across the horizon interrupts the view of the sky above;
- The perceived lack of visual order of the Project from the viewer position;

  Blade motion is spinning along the horizontal line. Motion of the blades also does not correspond with the natural back and forth motion of the waves.

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

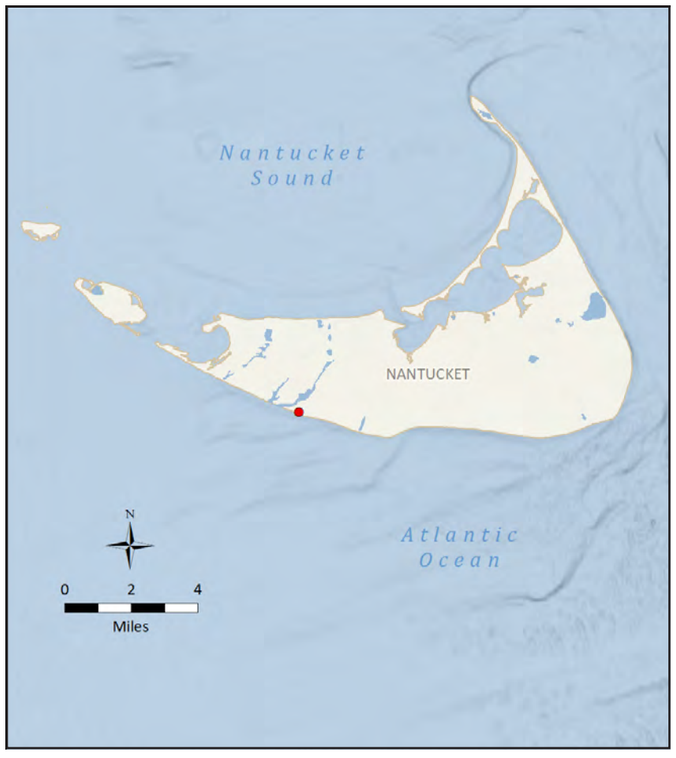
KOP 12-N Cisco Beach- overcast skies

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 11:28 AM
Date of photograph: 6-28-20
L/SCA: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential

Viewing direction: South (193°)
Latitude: 41.252122°N
Longitude: 70.152251°W
Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 71° F
Humidity: 84%
Wind Dir & Speed: S 7 mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 24.5 ft / 7.5 m
Nikon D4
Nikon 50mm
ISO: 100

Fstop: f/7.1
Shutter: 1/1250 sec
Aperture priority
Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, seascape, scrub shrub landscape

Adjacent Amentities: Cisco Bike Path and a moderately sized parking lot with surf rental trucks and food trucks

Adjacent Areas: Hummock Pond - a coastal tidal pond surrounded by residential homes, coastal scrub, and agricultural/ open fields

Adjacent L/SCAs: Coastal scrub bush, coastal dunes, ocean beach, low desnity residential structures

Adjacent KOPs: KOP 13-N Hummock Pond Road Bike Path, KOP 18-N Ladies Beach, KOP 31-N Cisco Beach Below Sanford Farm Barn

KOP 12-N Cisco Beach- overcast skies

Nantucket

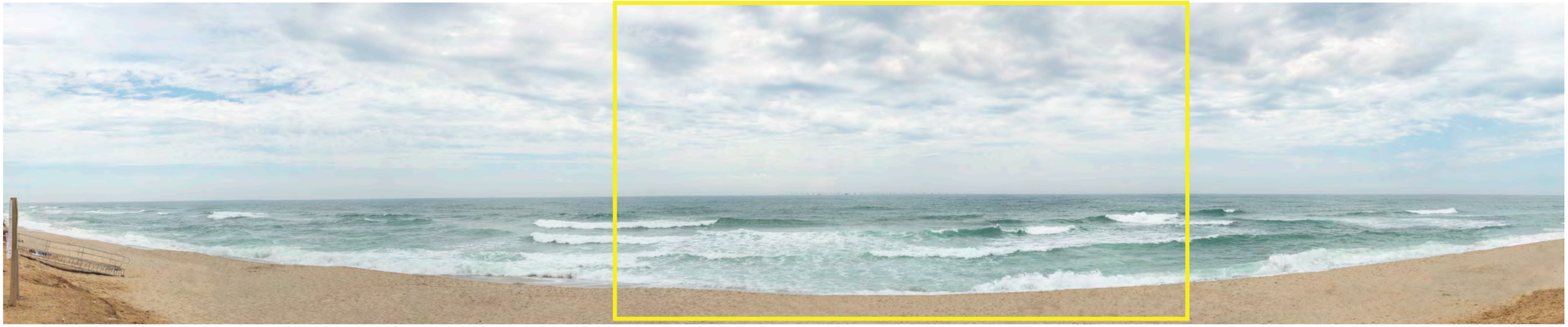
EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 12-N Cisco Beach- overcast skies

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS



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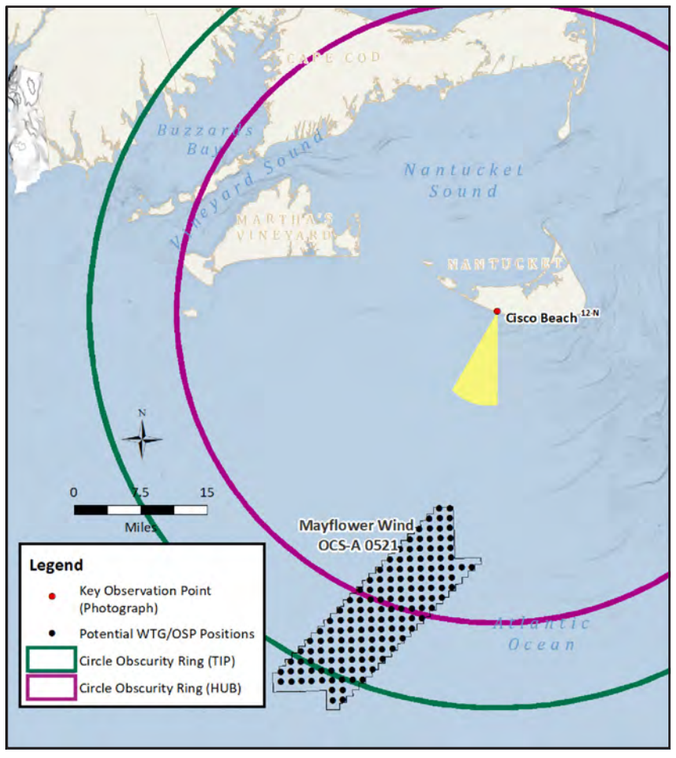
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 11:28 AM	Viewing direction: South (193°)
Date of photograph: 6-28-20	Latitude: 41.252122°N
L/SCA: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential	Longitude: 70.152251°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 71° F
Humidity: 84%
Wind Dir & Speed: S 7 mph
Weather Condition: Cloudy

CAMERA

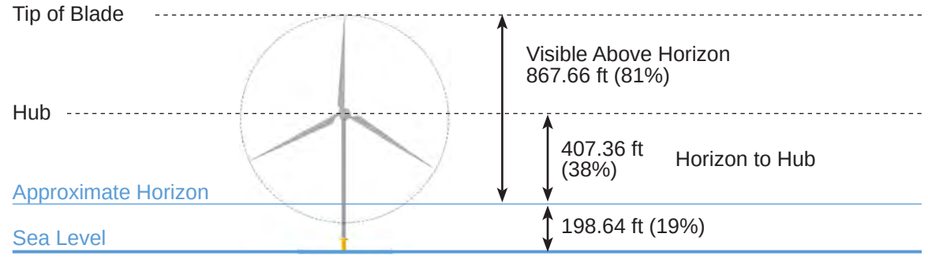
Camera Elevation: 24.5 ft / 7.5 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.3 mi / 79.3 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 131
Nearest WTG: 23.6 mi / 38.0 km	Potential Number of WTGs Not Visible: 18

VISIBILITY OF CLOSEST TURBINE



KOP 12-N Cisco Beach- overcast skies

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 12-N Cisco Beach- stormy skies

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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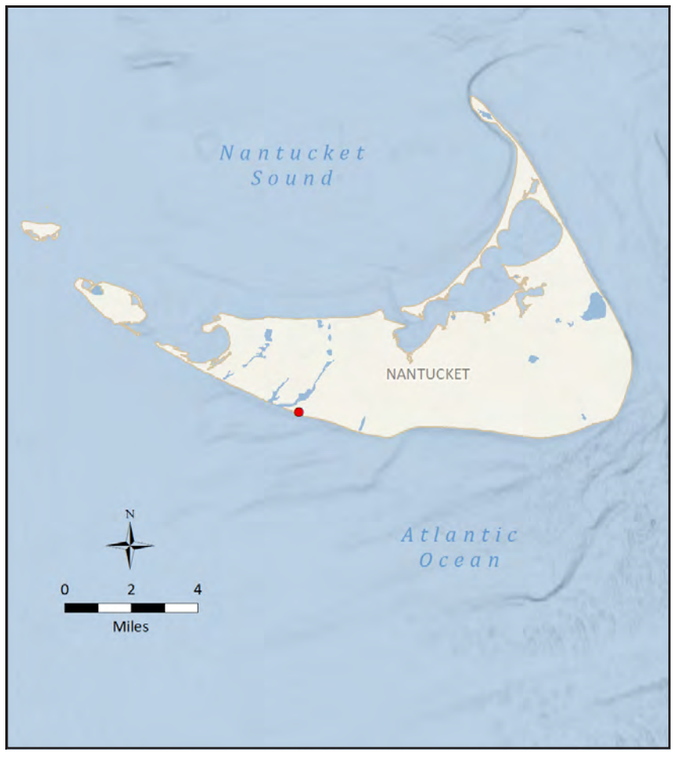
ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 8:30 AM
Date of photograph: 7-29-20
L/SCA: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential

Viewing direction: South (193°)
Latitude: 41.252122°N
Longitude: 70.152251°W
Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 68° F
Humidity: 85%
Wind Dir & Speed: SW 26 mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 24.5 ft / 7.5 m
Nikon D4
Nikon 50mm
ISO: 100

Fstop: f/7.1
Shutter: 1/1250 sec
Aperture priority
Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, seascape, scrub shrub landscape

Adjacent Amentities: Cisco Bike Path and a moderately sized parking lot with surf rental trucks and food trucks

Adjacent Areas: Hummock Pond - a coastal tidal pond surrounded by residential homes, coastal scrub, and agricultural/ open fields

Adjacent L/SCAs: Coastal scrub bush, coastal dunes, ocean beach, low desnity residential structures

Adjacent KOPs: KOP 13-N Hummock Pond Road Bike Path, KOP 18-N Ladies Beach, KOP 31-N Cisco Beach Below Sanford Farm Barn

KOP 12-N Cisco Beach- stormy skies

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 12-N Cisco Beach- stormy skies

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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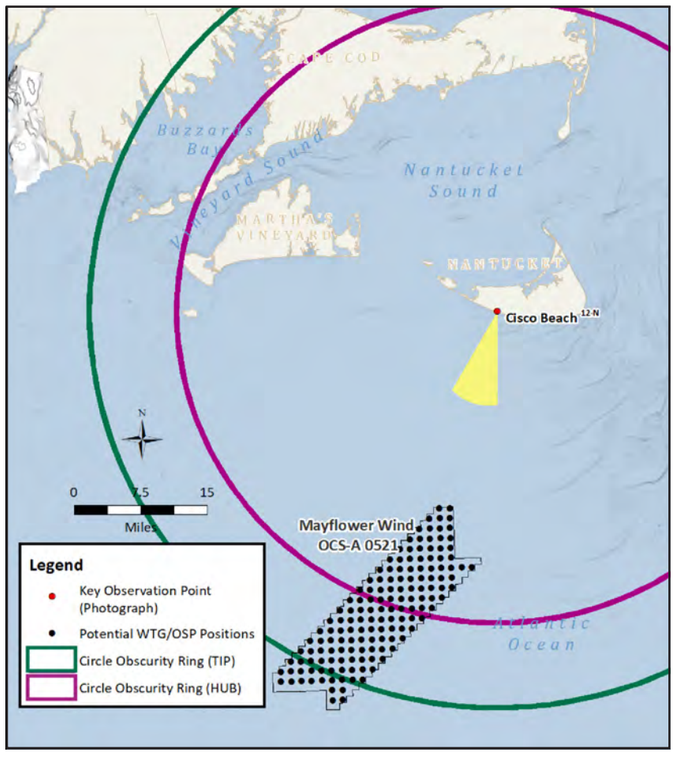
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 8:30 AM	Viewing direction: South (193°)
Date of photograph: 7-29-20	Latitude: 41.252122°N
L/SCA: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential	Longitude: 70.152251°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 68° F
Humidity: 85%
Wind Dir & Speed: SW 26 mph
Weather Condition: Cloudy

CAMERA

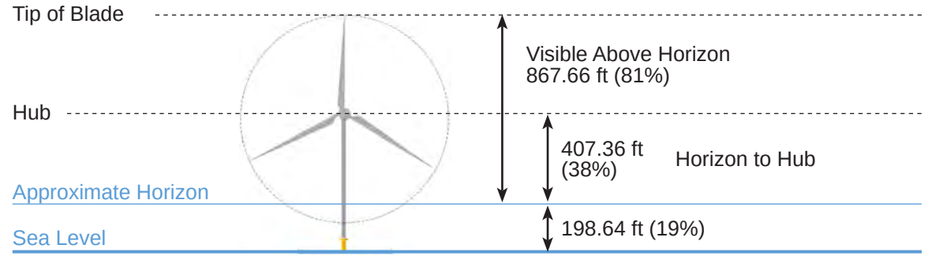
Camera Elevation: 24.5 ft / 7.5 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.3 mi / 79.3 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 131
Nearest WTG: 23.6 mi / 38.0 km	Potential Number of WTGs Not Visible: 18

VISIBILITY OF CLOSEST TURBINE



KOP 12-N Cisco Beach- stormy skies

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 12-N Cisco Beach- nightime

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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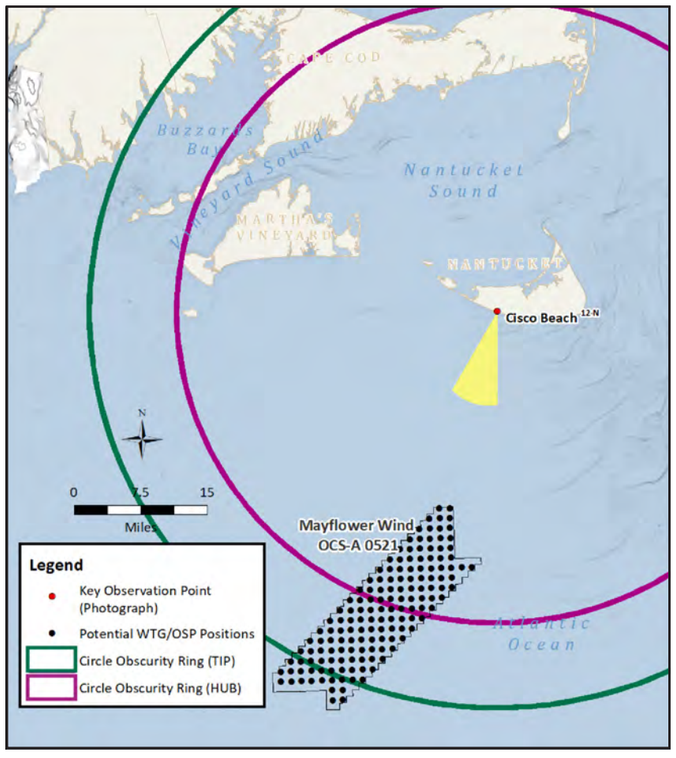
ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: Night

Date of photograph: 7-29-20

L/SCA: Open Ocean, Ocean Beach, Dunes, Salt Ponds/Tidal Marsh, Residential

Viewing direction: South (193°)

Latitude: 41.252122°N

Longitude: 70.152251°W

Lighting Direction: Night

ENVIRONMENT

Temperature: 68° F

Humidity: 85%

Wind Dir & Speed: SW 26 mph

Weather Condition: Cloudy

CAMERA

Camera Elevation: 24.5 ft / 7.5 m

Nikon D4

Nikon 50mm

ISO: 100

Fstop: f/7.1

Shutter: 1/1250 sec

Aperture priority

Exposure bias: -0.7 step

CONTEXT MAP

Horizontal Field of View: 127°

Vertical Field of View: 39.6°

Nearest WTG: 23.6 mi / 38.0 km

ADJACENT FEATURES

Furthest WTG: 49.3 mi / 79.3 km

Potential Number of WTGs Visible: 131

Potential Number of WTGs Not Visible: 18

KOP 12-N Cisco Beach- nightime

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 16. KOP Number 13-N

A. KOP Information				
Number KOP: **13-N**	**KOP Name:** Hummock Pond Road Bike Path	**Date:** October 7, 2020	**Time:** 1:30 PM	**Weather**: Sun, partly cloudy with haze band
Location Description: The Hummock Pond Road Bike Path opened in the Spring of 2013 to provide safe pedestrian and bicycle transportation to the residents and visitors of Nantucket. The bike path ends at the access road to Cisco Beach. The bike path is mostly situated behind tall mature coastal shrub scrub vegetation, residential housing, and pasture. The view opens up at near Cisco Beach providing view across the low growing native scrub. The parcel of land behind the Cisco Beach access area is owned and managed by the Nantucket Conservation Foundation. The coastal shrub scrub vegetation community integrates many textures and colors, and contrasts with the blue ocean setting in the background. The Cisco neighborhood is primarily comprised of angular Cape Cod style homes.				
Landscape Character Description: Open Ocean, Salt Pond/Tidal Marsh, Fields/Meadow, Coastal Scrub, Rural/Residential	**Scenic Integrity:** Scenic integrity is high due to the setting remaining mostly natural. Residential structures are set within the context of the setting and frame the view.			
Visual Absorption Capability: Low to moderate due to the density of the residential buildings adjacent to the viewing position	**Dominant Landscape Attributes:** Grass lands, shrub, pond, housing and ocean in the background			
Relevant Viewer Groups: Recreational User, Residents, Tourists	**Viewer Context:** Jogging, biking, walking	**Viewer Position:** Slightly Viewer Superior		
Visual Connection to Project: Partly screened by the vegetation	**Viewing distance: Statute Miles and Kilometers (km)** 23.82 mi 38.33 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 13-N]					
Landscape Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Level to slightly sloping, landform is not exposed covered in scrub shrub vegetation	Linear and regular, transition between land and horizontal alignment with the sky	Irregular	Grasses erect low massing; shrubs are low and irregular massed	Triangular roof lines, irregular geometry
Line	None	Horizontal horizon line, regular line between the structure, vegetation and ocean	Even edge along house, curvilinear edge along vegetates margin of coastal scrub	Irregularly horizontal district edges and coastal shrub, undulating line where coastal shrub meets the water edge	Horizontal, angular
Color	None	Very light gray/blue	Gray to Light blue to reflects the sky condition and cloud color	Tan, light to dark greens, seasonal wildflowers	Gray, brown, tan, white
Texture	None	Smooth	Smooth to choppy	Fine to course texture coastal scrub	Not discernable

Summary:
Rising behind Hummock Pond is the residential community of Cisco. The Cisco community is considered a newer development on the island. The houses are large in stature and reflect the Cape Cod style with gray shingle siding and angular sloped roofs. The ocean is visible, with the multiple colors and textures found within the foreground vegetation. The dark horizon line is distinct, defining the break between the ocean edge and the sky.

Scenic integrity is high, due to the condition, diversity, and texture of the shrub scrub vegetation and the ocean setting. After being enclosed along the bike path behind tall vegetation, topography and structures, the receptor is awarded an inland opening to the ocean.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 13-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Water				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X						NA	NA	NA	NA	X				X			
	Line	NA	NA	NA	NA		X			NA	NA	NA	NA	X				X			
	Color	NA	NA	NA	NA			X		NA	NA	NA	NA		X					X	
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA		X					X	
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA	X				NA	NA	NA	NA	X					X		
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	X				X		
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	X				X			

Overall Visual Contrast Rating: Moderate to Strong

Visibility Level Rating: [4] – [5]

[4] Plainly visible, but not dominant

[5] Strongly attracts visual attention. Prominent.

The Contrast Rating is Moderate to Strong. As the viewer travels along the bike path, the view opens up across the vegetated foreground and the beach access point to the open ocean setting. This position along the bike path is one of the only clear inland views from the path to the ocean that is not obstructed by vegetation, buildings, or topography. The Project forms the backdrop along the horizon and will be plainly visible in clear conditions.

Contrasting Elements:

- Scale of the turbine blades contrasts the color, texture, form and scale of the vegetation foreground or middle ground view and the ocean.
- Vertical elements introduced into a flat horizontal seascape scene;
- The density of structures arrayed across the horizon line interrupts the view of the sky above;
- The perceived lack of visual order of the Project from the viewer position;
- Blade motion is spinning along the horizontal irregular line accented by the roof lines of the residential structures and rolling edge of the dunes.
- Motion of the blades does not relate to any existing feature found within the context of the foreground and middle ground scene

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

KOP 13-N Hummock Pond Bike Path

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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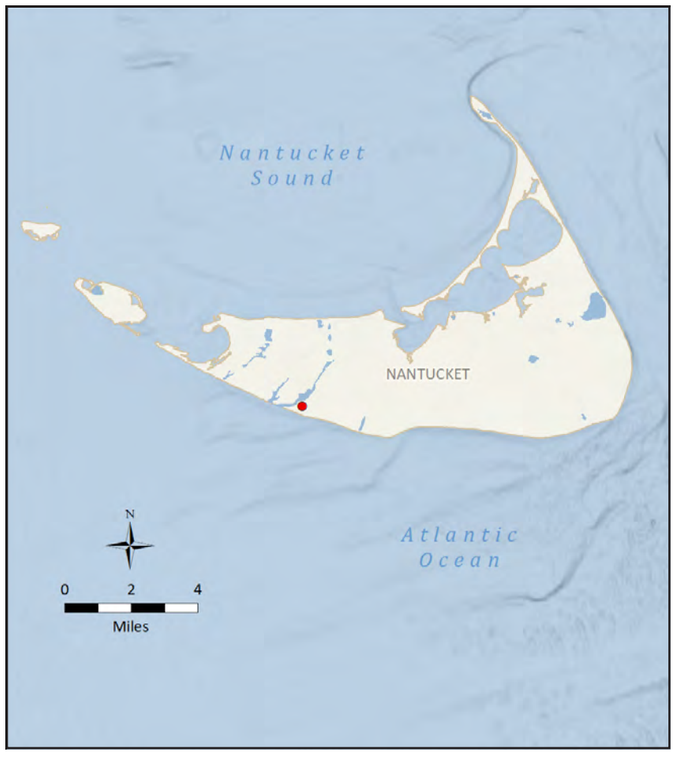
ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 1:31 PM

Date of photograph: 10-7-20

L/SCA: Open Ocean, Salt Pond/Tidal Marsh, Field/Meadow, Coastal Shrub, Rural/Residential

Viewing direction: South (193°)

Latitude: 41.254755°N

Longitude: 70.150408°W

Lighting Direction: Backlit

ENVIRONMENT

Temperature: 68° F

Humidity: 82%

Wind Dir & Speed: SW 26 mph

Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 25.5 ft / 7.8 m

Nikon D4

Nikon 50mm

ISO: 100

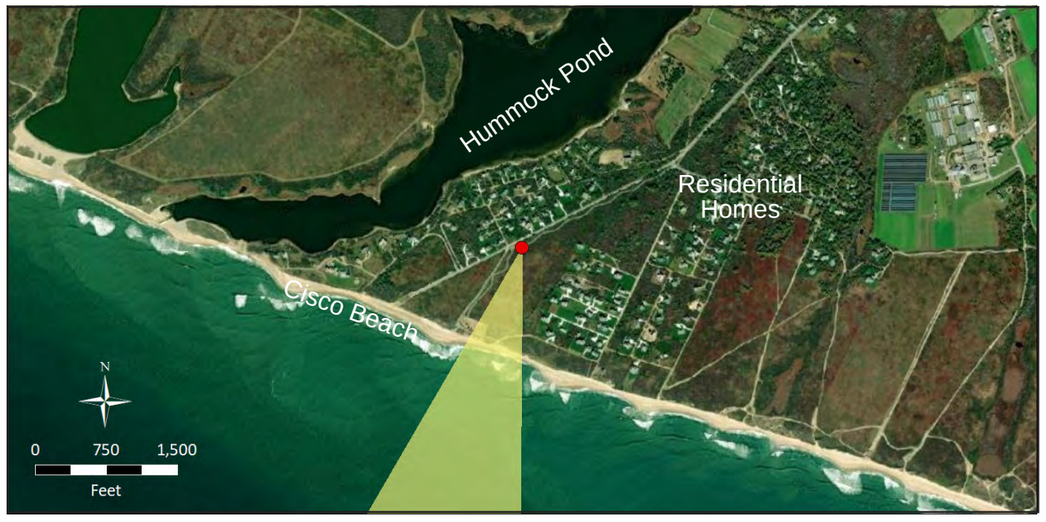
Fstop: f/7.1

Shutter: 1/1250 sec

Aperture priority

Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public recreation path

Scenic Resources: Scrub shrub landscape

Adjacent Amentities: Paved biking/waking path ending at Cisco Beach with food and surf rental trucks

Adjacent Areas: Cisco Beach, Hummock Pond, residential homes

Adjacent L/SCAs: Coastal scrub bush, medium density residential structures

Adjacent KOPs: KOP 12-N Cisco Beach, KOP 18-N Ladies Beach, KOP 17-N Bartlett's Farm, KOP 2-N Sanford Farm Barn Overlook, KOP 31-N Cisco Beach Below Sanford Farm Barn

KOP 13-N Hummock Pond Bike Path

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 13-N Hummock Pond Bike Path

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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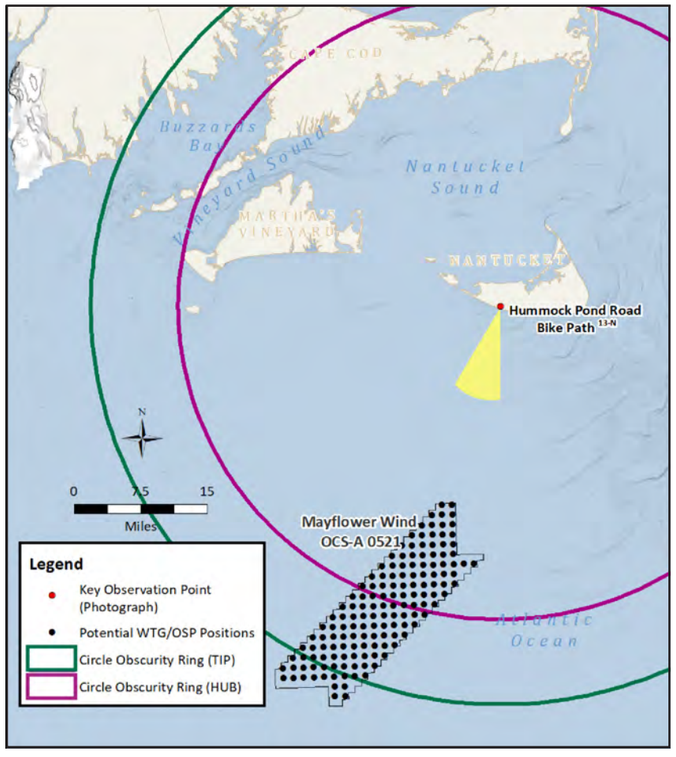
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 1:31 PM

Date of photograph: 10-7-20

L/SCA: Open Ocean, Salt Pond/Tidal Marsh, Field/Meadow, Coastal Shrub, Rural/Residential

Viewing direction: South (193°)

Latitude: 41.254755°N

Longitude: 70.150408°W

Lighting Direction: Backlit

ENVIRONMENT

Temperature: 68° F

Humidity: 82%

Wind Dir & Speed: SW 26 mph

Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 25.5 ft / 7.8 m

Nikon D4

Nikon 50mm

ISO: 100

Fstop: f/7.1

Shutter: 1/1250 sec

Aperture priority

Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 96°

Vertical Field of View: 47°

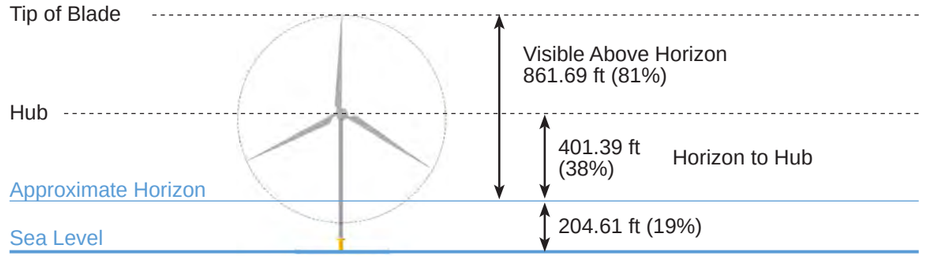
Nearest WTG: 23.8 mi / 38.3 km

Furthest WTG: 49.5 mi / 79.6 km

Potential Number of WTGs Visible: 131

Potential Number of WTGs Not Visible: 18

VISIBILITY OF CLOSEST TURBINE



KOP 13-N Hummock Pond Bike Path

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 17. KOP Number 16-N

A. KOP Information				
KOP Number: **16 N**	**Name KOP:** **Head of Plains**	**Date** October 10, 2020	**Time:** 3:54 AM	**Weather**: Mostly sunny with scattered clouds, blue sky
Location Description: Head of the Plains Beach is managed by the Nantucket Conservation Foundation located between Madaket and Cisco communities. This beach is accessed by an unproved road to a primitive parking site set within the scrub shrub vegetation of the coastal plain. The beach is then accessed along a foot path to the beach. The beach is located within the community the beach setting provides for a semi isolated experience.				
Landscape Character Description: Ocean Beach, Dunes, Open Ocean	**Scenic Integrity:** No permanent visual intrusions			
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed ocean. Intermittent views of passing vessels.			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is less popular than other beaches, providing for a more serene experience. Activities include sunbathing, picnicking, surfing, and swimming	**Viewer Position:** Level		
Visual Connection to Project: Unobstructed view to Project other than receptors enjoying the beach	**Viewing distance**: **Statute Miles and Kilometers (km)** 23.98 mi 38.59 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 16-N]					
Landscape/Seascape Character Form	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat upper terrace to steep eroding sandy dune. Flat narrow beach to sharply angled slope to intersection with ocean edge	Strongly horizontal, angled irregular, flat	NA	NA	NA
Line	Strong formal line at top of dune. An irregular line where beach meets the top of tide	Strong prominent Horizon line, intermittent irregular beach break, clouds, Regular rolling wave lines beyond beach break	NA	NA	NA
Color	Tan sand	Dark horizon line- reflective white and blue, gray, white clouds	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of open ocean against the blue sky and white clouds. The ocean color transitions from green to turquoise to gray to dark blue. The expanse of ocean stretches to the distant horizon black line. Scenic integrity is high as the setting is not interrupted by any visual intrusions. The dark horizon is a distinct linear break between the ocean and the sky. Ocean conditions range from flat water to choppy to rolling swells and strong beach break.

C. Contrast Rating [KOP 16-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line			X			X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak to Moderate

Visibility Level Rating: [2] - [3]

[2] Visible when scanning in the general direction of the Project facilities

[3] Visible after a brief glance in the general direction of the study subject

The Contrast Rating is Weak to Moderate. The viewer position from this KOP is in direct alignment with the Project which will be visible plainly visible in clear conditions {4]. The rotation of the blades and the horizontal and vertical scale against the horizon will draw the attention of the viewer from this location.

Contrasting Elements:

- Afternoon sun produces an apparent structure color of light to light gray contrasting the background setting.
- The scale of the rectangular platforms attracts the attention of the viewer within the scene and light gray against the blue background of the sky and the horizon line.
- Vertical elements introduced into a flat horizontal seascape scene;
- The density of visible structures arrayed across the horizon interupts the view of the sky;
- The perceived lack of visual order of the Project from the viewer position;
- Blade motion will also be visible along the horizontal line. Circular motion of the blades does not correspond with the natural back and forth motion of the waves. Non synchronized blade movement adds to visual chaos.

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime contrast will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA. This system is activated only when aircraft penetrates the radar field.

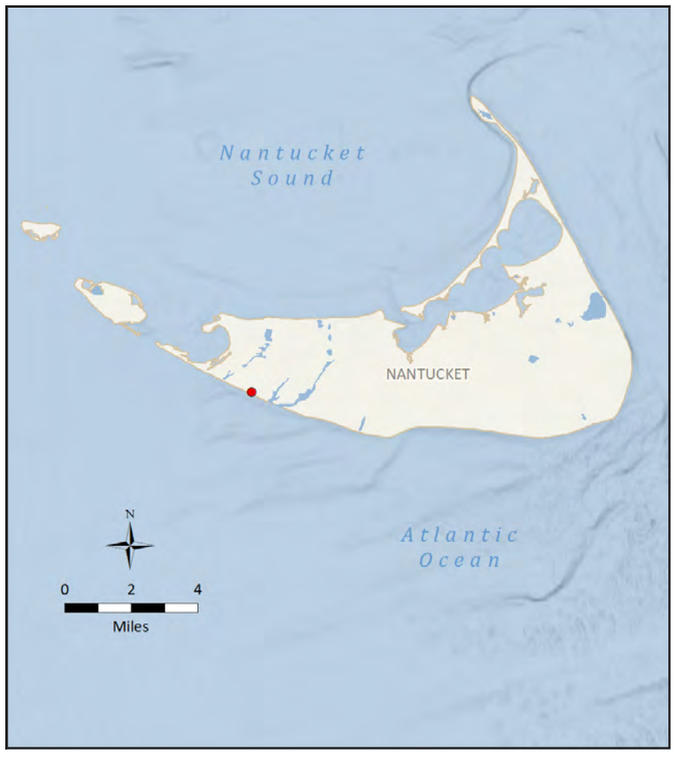
KOP 16-N Head of Plains

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 3:54 PM	Viewing direction: South (190°)
Date of photograph: 10-7-20	Latitude: 41.341724°N
L/SCA: Ocean Beach, Open Ocean, Dunes	Longitude: 70.179524°W
	Lighting Direction: Sidelit

ENVIRONMENT

Temperature: 66° F

Humidity: 81%

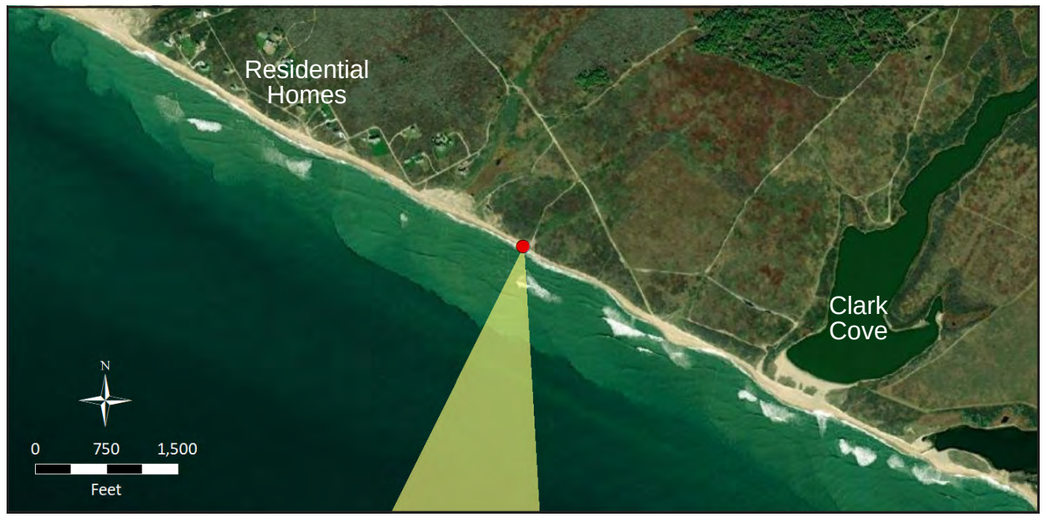
Wind Dir & Speed: SW 21 mph

Weather Condition: Clear

CAMERA

Camera Elevation: 20.5 ft / 6.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes, scrub shrub landscape

Adjacent Amentities: Small parking lot

Adjacent Areas: Madaket, Clark Cove, residential homes

Adjacent L/SCAs: Coastal scrub bush, agricultural/open fields, open ocean, ocean beach, coastal dunes, low density residential structures

Adjacent KOPs: KOP 31-N Cisco Beach Below Sanford Farm Barn, KOP 3-N Madaket Beach, KOP 22-N Madaket Beach Sunset, KOP 24-N Washington Ave and Madaket Road

KOP 16-N Head of Plains

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

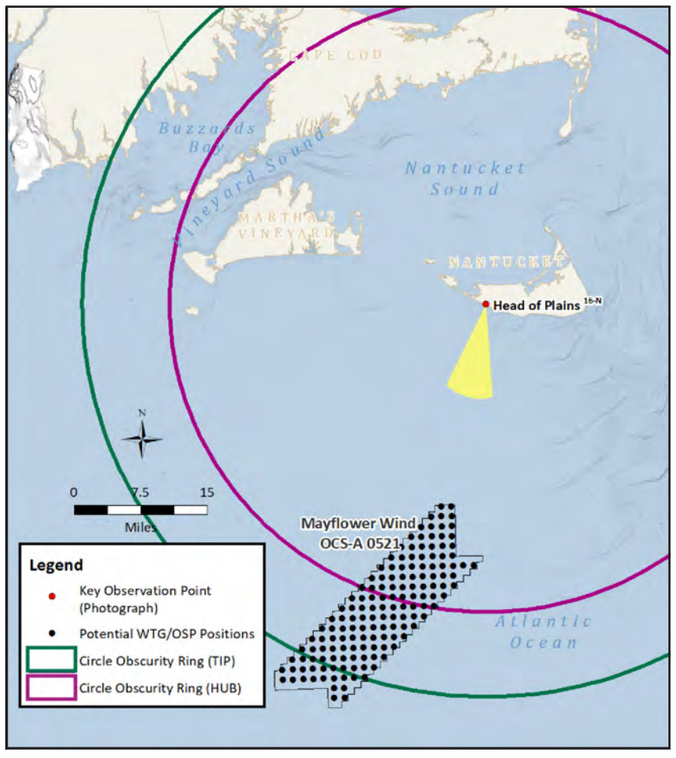
KOP 16-N Head of Plains

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11” x 17” and pan the surrounding panoramic image maintaining the 11” x 17” size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 3:54 PM	Viewing direction: South (190°)
Date of photograph: 10-7-20	Latitude: 41.261513°N
L/SCA: Ocean Beach, Open Ocean, Dunes	Longitude: 70.179524°W
	Lighting Direction: Sidelit

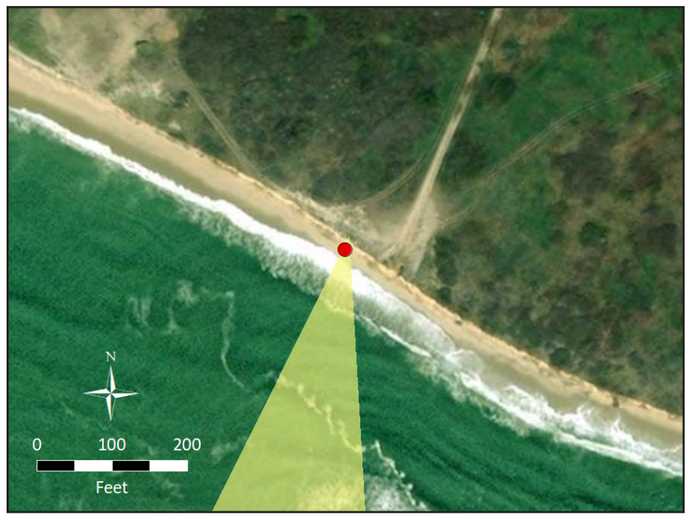
ENVIRONMENT

Temperature: 66° F
Humidity: 81%
Wind Dir & Speed: SW 21 mph
Weather Condition: Clear

CAMERA

Camera Elevation: 20.5 ft /6.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

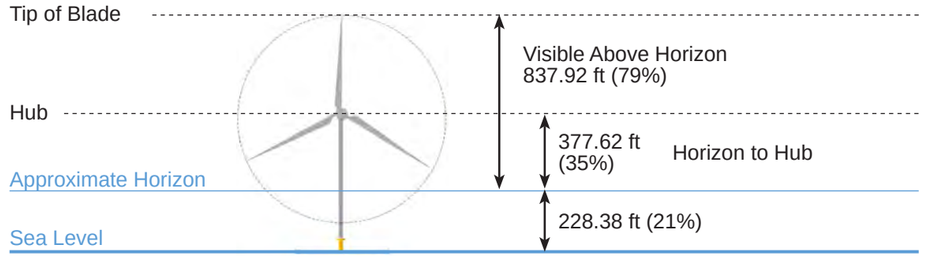
SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.3 mi / 79.3 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 128
Nearest WTG: 37.5 mi / 60.3 km	Potential Number of WTGs Not Visible: 21

VISIBILITY OF CLOSEST TURBINE



KOP 16-N Head of Plains

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 18. KOP Number 18-N

A. KOP Information				
KOP Number: **18-N**	**Name KOP:** **Ladies Beach**	**Date** July 29, 2020	**Time:** 2:52 PM	**Weather**: Mostly sunny with scattered clouds, blue sky
Location Description: Ladies beach is located below Bartlett Farm within the Smooth Hummocks Coastal Preserve. This beach is accessed from a primitive parking lot set within the scrub shrub vegetation, and along a foot path through the grassy dunes. The beach provides for a semi isolated experience. The beach is narrow set below the dunes. The steep angle of the beach provides for a strong beach break and current.				
Landscape Character Description: Coastal Scrub, Dunes, Ocean Beach, Open Ocean	**Scenic Integrity:** No permanent visual intrusions			
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed ocean. Intermittent views of passing vessels.			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is less popular than other beaches providing for a more serene experience. Activities include sunbathing, picnicking, surfing, and swimming.	**Viewer Position:** Level		
Visual Connection to Project: Unobstructed view to Project other than receptors enjoying the beach.	**Viewing distance**: **Statute Miles (mi) and Kilometers (km)** 23.01 mi 37.03 km			

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 18-N]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat upper terrace to steep eroding sandy dune. Flat narrow beach to sharply angled slope to intersection with ocean edge	Strongly horizontal, angled irregular, flat	NA	NA	NA
Line	Strong formal line at top of dune. An irregular line where beach meets the top of tide	Strong prominent Horizon line, intermittent irregular beach break, clouds, Regular rolling wave lines beyond beach break	NA	NA	NA
Color	Tan sand	Dark horizon line- reflective white and blue, gray, white clouds	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of open ocean against the blue sky and white clouds. The ocean color transitions from green to turquoise to gray to dark blue. The expanse of ocean stretches to the distant horizon black line. Scenic integrity is high as the setting is not interrupted by any visual intrusions. The dark horizon is a distinct linear break between the ocean and the sky. Ocean conditions range from flat water to choppy to rolling swells and strong beach break.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 18-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate to Strong

Visibility Level Rating: [4] - [5]

[4] Plainly visible, but not dominant

[5] Strongly attracts visual attention. Prominent.

The Contrast Rating is Moderate to Strong. The viewer position from this KOP is in direct alignment with the Project. The rotation of the blades and the horizontal and vertical scale against the horizon will draw attention from the viewer from this location.

Contrasting Elements:

- The Project as light to light gray in the afternoon sun, contrasting with the background setting.
- The scale of the rectangular platforms attracts the attention of the viewer within the scene and light gray against the blue background of the sky and the horizon line
- Vertical elements introduced into a flat horizontal seascape scene;
- The apparent density of visible structures arrayed across the horizon line as well as the extent of the visible horizon occupied by the Project;
- The perceived lack of visual order of the Project from the viewer position;
- Blade motion will also be visible along the horizontal line. Circular motion of the blades does not correspond with the natural back and forth motion of the waves.

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime contrast will depend on selection of an FAA approved lighting system. The Mayflower Project will use Radar Activated ADLS, if approved by FAA. This system is activated only when aircraft penetrates the radar field.

KOP 18-N Ladies Beach

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 2:52 PM	Viewing direction: South (196°)
Date of photograph: 7-29-20	Latitude: 41.248174°N
L/SCA: Ocean Beach, Open Ocean, Dunes	Longitude: 70.135790°W
	Lighting Direction: Sidelit

ENVIRONMENT

Temperature: 75° F

Humidity: 73%

Wind Dir & Speed: SSW 9 mph

Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 25.5 ft / 7.8 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes, scrub shrub landscape

Adjacent Amentities: Facilities at Bartlett's Farm

Adjacent Areas: Bartlett's Farm, Miacomet Heath, Miacomet Gold Course, residential homes

Adjacent L/SCAs: Coastal scrub bush, ocean beach, open ocean, tidal marshes, coastal dunes

Adjacent KOPs: KOP 11-N Miacomet Beach and Pond, KOP 19-N Miacomet Golf Club, KOP17-N Bartlett's Farm, KOP 13-N Hummock Pond Road Bike Path, KOP 12-N Cisco Beach

KOP 18-N Ladies Beach

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

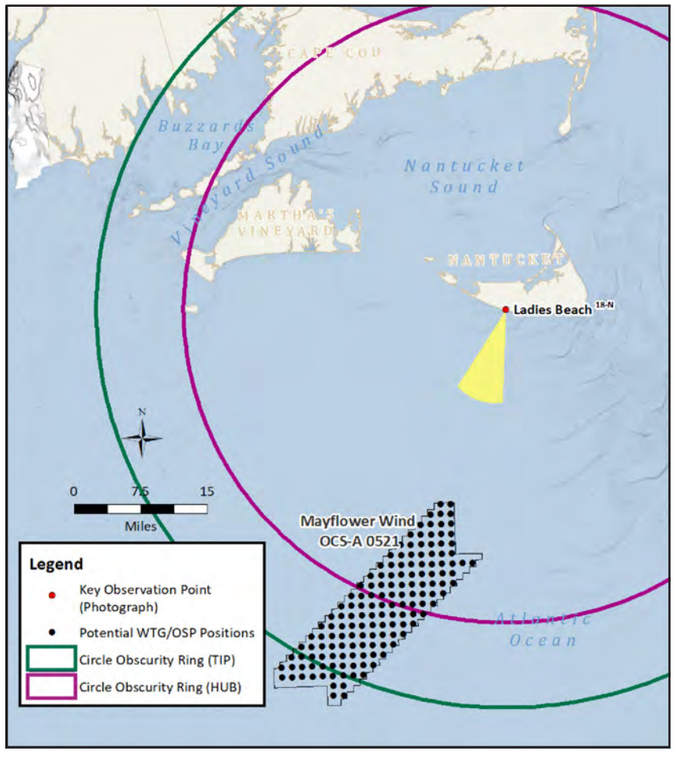
KOP 18-N Ladies Beach

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 2:52 PM	Viewing direction: South (196°)
Date of photograph: 7-29-20	Latitude: 41.248174°N
L/SCA: Ocean Beach, Open Ocean, Dunes, Coastal Scrub	Longitude: 70.135790°W
	Lighting Direction: Sidelit

ENVIRONMENT

Temperature: 75° F
Humidity: 73%
Wind Dir & Speed: SSW 9 mph
Weather Condition: Partly Cloudy

CAMERA

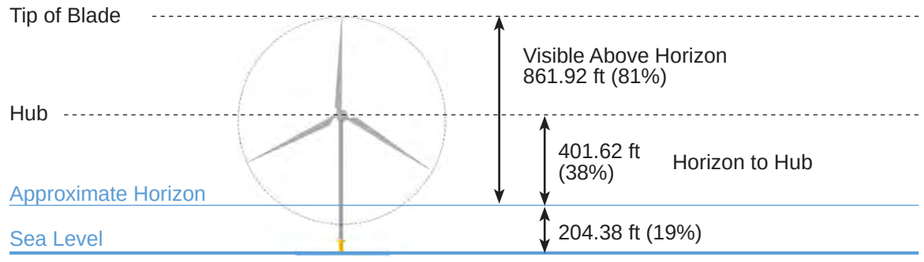
Camera Elevation: 25.5 ft / 7.8 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.4 mi / 79.5 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 131
Nearest WTG: 23.0 mi / 37.0 km	Potential Number of WTGs Not Visible: 18

VISIBILITY OF CLOSEST TURBINE



KOP 18-N Ladies Beach

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 20. KOP Number 20-N

A. KOP Information				
KOP Number: **20-N**	**Name KOP:** **Madequecham 1**	**Date** July 28, 2020	**Time:** 11:50 AM	**Weather**: Mostly sunny with strong haze
Location Description: Madaquecham is a mix of large private estates and conservation land owned by the Nantucket Conservation Foundation. Residential development is sited within the coastal scrub shrub ecosystem and is located mostly along the top of the steep bluff above the beach. The long narrow beach is remote and is accessible by traveling on unimproved roads to remote undeveloped parking areas.				
Landscape Character Description: Coastal Scrub, Dunes, Ocean Beach, Open Ocean	**Scenic Integrity:** No permanent visual intrusions			
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed ocean. Intermittent views of passing vessels.			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** The beach is very remote providing for a quiet more natural experience. Activities include sunbathing, picnicking, surfing, and swimming	**Viewer Position:** Level		
Visual Connection to Project: Unobstructed view to project other than receptors enjoying the beach	**Viewing distance: Statute Miles (mi) and Kilometers (km)** 24.91 mi 40.09 km			

B. Landscape/Seascape Character Description [KOP 20-N]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat rolling upper terrace to steep eroding sandy dune. Flat narrow beach to sharply angled slope to intersection with ocean edge	Strongly horizontal, angled irregular, flat	NA	NA	NA
Line	Strong formal line at top of dune. An irregular line where beach meets the top of tide	Strong prominent horizon line, intermittent irregular beach break, clouds, Regular rolling wave lines beyond beach break	NA	NA	NA
Color	Tan sand	Dark horizon line-reflective white and blue, gray, white clouds	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Summary
Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of open ocean against a partly blue sky and haze, periodically reducing visual acuity. The ocean color varies from turquoise to gray to dark blue. The expanse of ocean stretches to a distant horizon line differentiating the transition between the ocean and the sky. Scenic integrity is high as the setting is not interrupted by any visual intrusions. Ocean conditions range from flat stippled and reflective in the background to water to rolling swells and strong beach break.

C. Contrast Rating [KOP 20-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color		X				X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	5			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Lighting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Overall Visual Contrast Rating: Moderate

Visibility Level Rating: [3] – [4]

[3] Visible after a brief glance in the general direction of the study subject

[4] Plainly visible, but not dominant

The Contrast Rating is Moderate. The viewer position from this KOP is in direct alignment with the Project along with the rotation of the blades and the horizontal and vertical scale against the horizon will draw attention of the viewer. Strong haze contributes to the interruption and clarity of the view. In this condition the project is closer to a [3] and will be noticeable within the general direction of the Project. On a clear day the project will be a [4 plainly visible from the view position along the beach.

Contrasting Elements:

- Afternoon sun represents the Project color light to light gray.
- Gray color and rectangular form of the platforms attracts the attention of the viewer within the scene and dark gray against the blue background of the sky
- Haze can reduce the visibility. Although weather may impact the visual condition at a given moment, the Project will often be strongly visible from this viewer position and will attract visual attention.
- Vertical elements introduced into a flat horizontal seascape scene which are visually evident against the strong horizon line;
- The density of structures arrayed across the horizon interrupts the view of the sky above;
- The perceived lack of visual order of the Project from the viewer position;
- Blade motion will likely be visible along the horizontal line contrasting the natural motion of physical element. Circular motion of the blades does not correspond with the natural back and forth motion of the waves and moves with an irregular pattern.

Mitigating Factors:

- Distance to nearest turbines over 20 miles
- Wide panorama reduces apparent horizontal scale of project

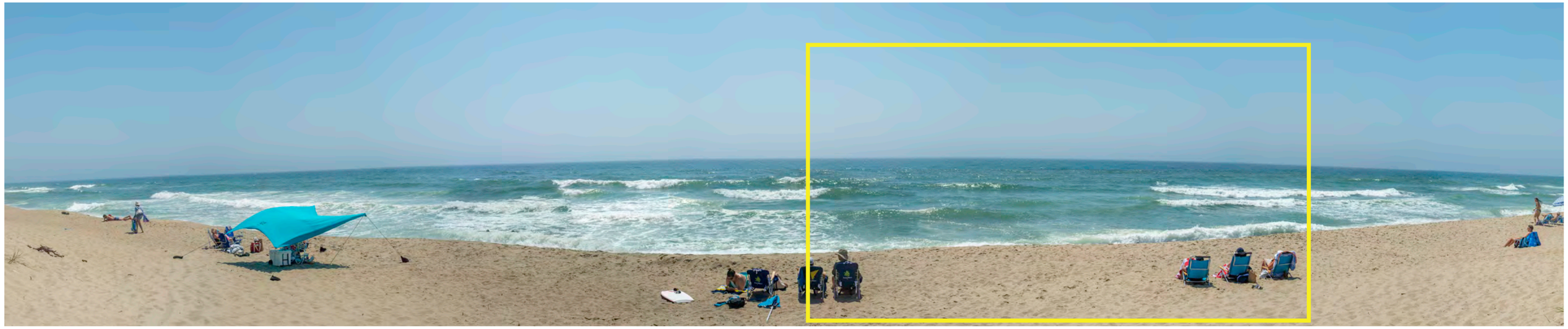
VISIBILITY ANALYSIS FORMS

- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA. This system is activated only when aircraft penetrates the radar field.

KOP 20-N Madequecham 1

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS



This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP

PHOTOGRAPH AND SITE

Time of photograph: 11:50 AM	Viewing direction: South (206°)
Date of photograph: 7-28-20	Latitude: 41.243377°N
L/SCA: Ocean beach	Longitude: 70.047251°W
	Lighting Direction: Backlit diffused

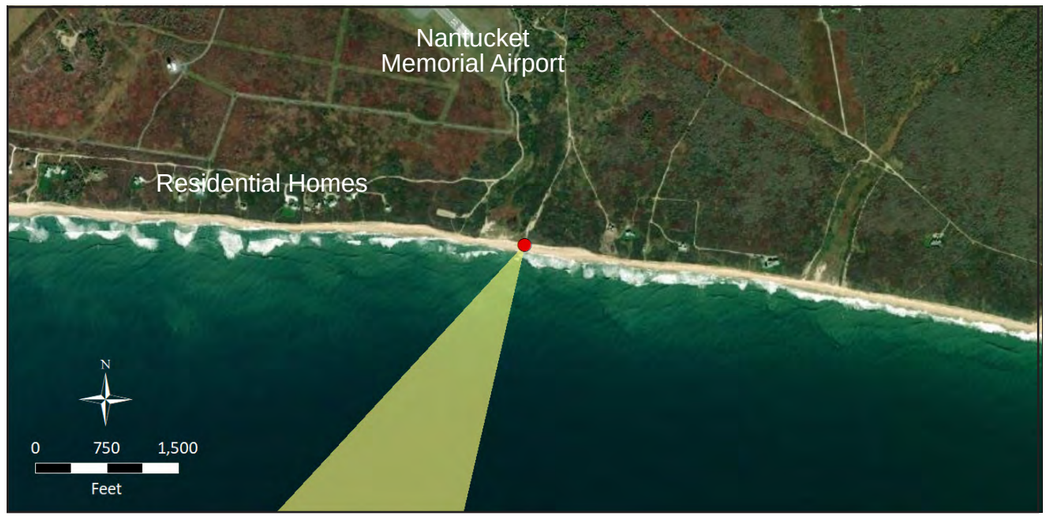
ENVIRONMENT

Temperature: 81° F
Humidity: 77%
Wind Dir & Speed: SW 13 mph
Weather Condition: Hazy

CAMERA

Camera Elevation: 17.5 ft / 5.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes

Adjacent Amentities: Small parking lot

Adjacent Areas: Nantucket Memorial Airport, residential homes

Adjacent L/SCAs: Ocean beach, open ocean, coastal scrub bush, coastal dunes, tidal marshes

Adjacent KOPs: KOP 26-N Madequacham 3, KOP 10-N Nobadeer Beach

Comparable KOPs: KOP 9-N Madequacham 5

KOP 20-N Madequecham 1

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

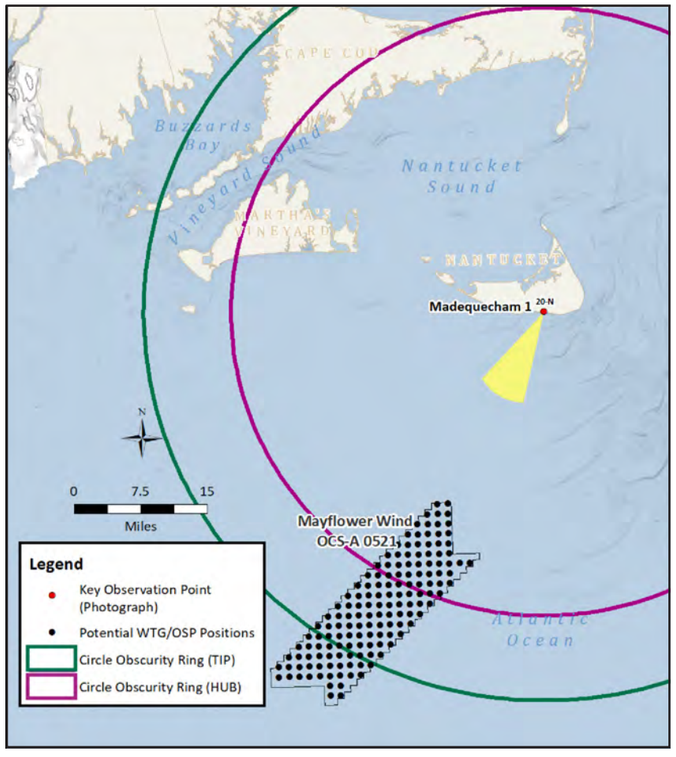
KOP 20-N Madequecham 1

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 11:50 AM	Viewing direction: South (206°)
Date of photograph: 7-28-20	Latitude: 41.243377°N
L/SCA: Ocean beach	Longitude: 70.047251°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 81° F
Humidity: 77%
Wind Dir & Speed: SW 13 mph
Weather Condition: Hazy

CAMERA

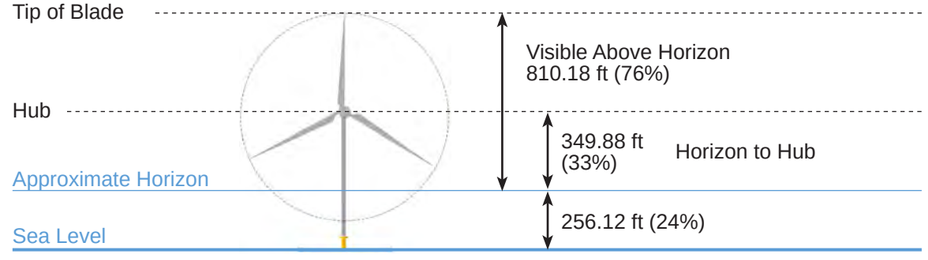
Camera Elevation: 17.5 ft / 5.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 51.9 mi / 83.5 km
Vertical Field of View:41°	Potential Number of WTGs Visible: 112
Nearest WTG: 24.9 mi / 40.0 km	Potential Number of WTGs Not Visible: 37

VISIBILITY OF CLOSEST TURBINE



KOP 20-N Madequecham 1

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 21. KOP Number 21-N

A. KOP Information				
KOP Number: **21-N**	**Name KOP:** **Sankaty Head Lighthouse**	**Date** July 29, 2020	**Time:** 8:10 AM	**Weather**: Sunny Clear Sky
Location Description: Sankaty Head Lighthouse is located on the eastern bluffs of the island of Nantucket. The light house was listed on the National Register of Historic Places in 1987 and in 2007 the Sconset Trust took over ownership. The lighthouse is a primary attraction to locals and visitors to Nantucket who visit the lighthouse to learn about its history and to take advantage of the extensive views of the ocean and the island.				
Landscape Character Description: Coastal Scrub, Residential, Developed Recreation, Coastal Bluff	**Scenic Integrity:** Moderate due to the visual intrusion of the built residential and commercial structure within the viewing corridor to the proposed Project.			
Visual Absorption Capability: Moderate - because there are many built features within the foreground and middle ground. Ability to introduce elements without compromising the scene.	**Dominant Landscape Attributes:** View of the ocean obstructed from vegetation, structure and topography.			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** Elevated position from scenic viewpoint	**Viewer Position:** Viewer superior		
Visual Connection to Project: Obstructed view to the project from vegetation, structures and topography.	**Viewing distance: Statute Miles (mi) and Kilometers (km)** 29.38 mi 47.28 km			

B. Landscape/Seascape Character Description [KOP 21-N]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat to rolling	Horizontal	NA	Vertical, horizontal and irregular	Vertical, erect
Line	Strong formal line along fairway of golf club	Horizontal horizon line	NA	Vertical and irregular	Linear vertical
Color	Gray, green, brown	Gray, blue blends with sky	NA	Light green, dark green, yellow, brown and gray	Gray, yellow
Texture	Smooth, fine textures	Smooth	NA	Fine to course, stippled	Smooth to rough

Existing Landscape/Seascape Character Description:

Vegetation, structures and topography block the view to the ocean and project site. The irregular massing of course textured vegetation along the elevated topography within the foreground blocks and the residential structures interrupt the view to the ocean.

VISIBILITY ANALYSIS FORMS

A. Contrast Rating [KOP 21-N] ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X			X			NA	NA	NA	NA			X			X		
	Line			X			X			NA	NA	NA	NA			X				X	
	Color		X					X		NA	NA	NA	NA			X				X	
	Horizontal Scale (% field of view)			X				X		NA	NA	NA	NA			X				X	
	Vertical (Height of Object against the horizon)			X				X		NA	NA	NA	NA			X				X	
	Motion	NA	NA	NA	NA			X		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak
Visibility Level Rating: [1] – [2]
[1] Visible only after extended, close viewing. Otherwise invisible.
[2] Visible when scanning in the general direction of the project facilities.

The Contrast Rating is Weak. Visible only after extended viewing [1]; turbines can be seen faintly, however, hazy in the distance limits visibility in the simulated condition. Likely visible when scanning in the general direction of the project [2] under clear skies.

Contrasting Elements:

- The project is mostly screened by existing vegetation, structures and topography
- Distance to the project and screening make project barely visible.
- There is little to no visibility or visual contrast.

Mitigating Factors:

- The project is mostly screened by existing vegetation, structures and topography
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA

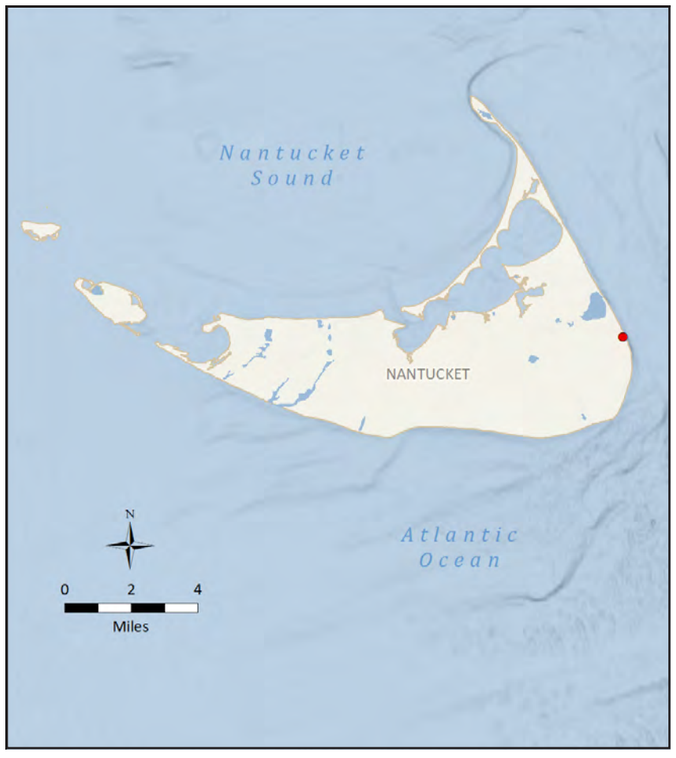
KOP 21-N Sankaty Head Lighthouse

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 8:10 AM	Viewing direction: Southwest (211°)
Date of photograph: 7-29-20	Latitude: 41.283415°N
L/SCA: Ocean beach	Longitude: 69.964935°W
	Lighting Direction: Sidelit diffused

ENVIRONMENT

Temperature: 80° F
Humidity: 58%
Wind Dir & Speed: NW 5 mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 104.5 ft /31.9 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public recreation parking lot

Scenic Resources: Scrub shrub landscape, seascape, coastal bluff

Adjacent Amentities: Lighthouse (historic landmark), dirt walking paths, Town of Siasconset

Adjacent Areas: Residential homes, golf course, Sesachacha Pond

Adjacent L/SCAs: Ocean beach, coastal scrub bush, coastal dunes

Adjacent KOPs: KOP 5-N Siasconset Bridge, KOP 4-N Siasconset Beach, KOP 25-N Siasconset Golf Club, KOP 15-N Altar Rock

KOP 21-N Sankaty Head Lighthouse

Nantucket

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

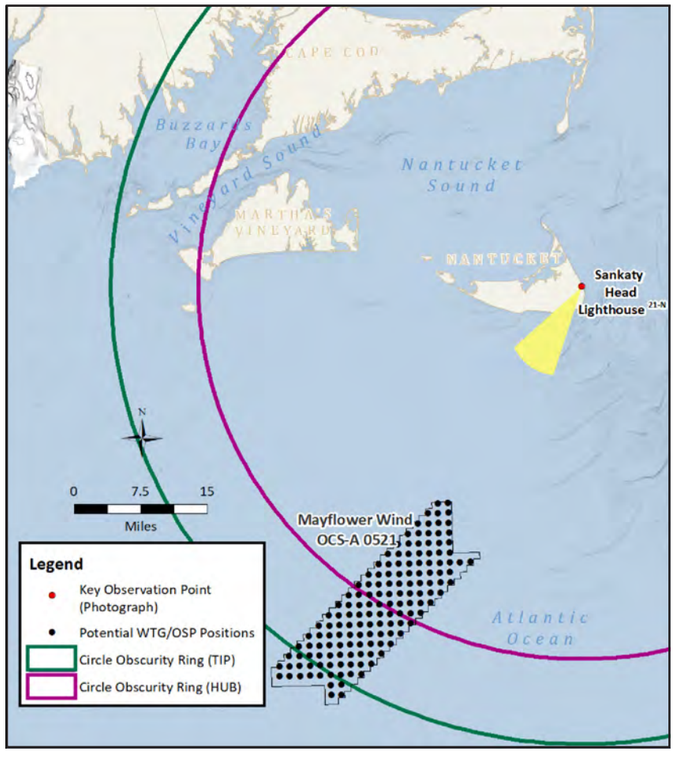
KOP 21-N Sankaty Head Lighthouse

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 8:10 AM	Viewing direction: Southwest (211°)
Date of photograph: 7-29-20	Latitude: 41.283415°N
L/SCA: Ocean beach	Longitude: 69.964935°W
	Lighting Direction: Sidelit diffused

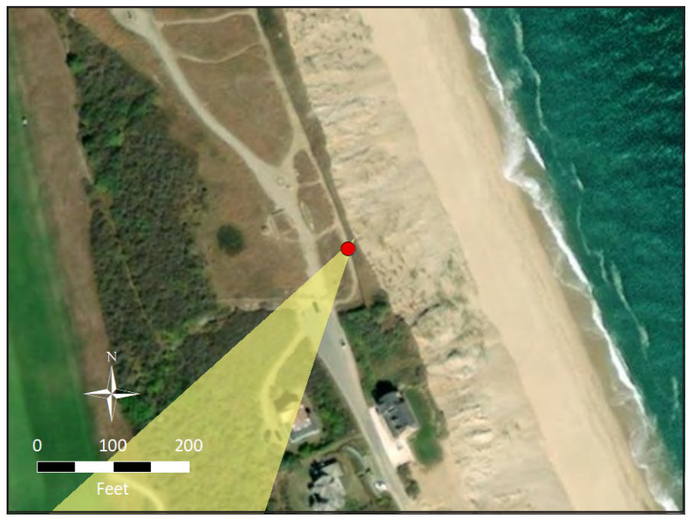
ENVIRONMENT

Temperature: 80° F
Humidity: 58%
Wind Dir & Speed: NW 5 mph
Weather Condition: Cloudy

CAMERA

Camera Elevation: 104.5 ft /31.9 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

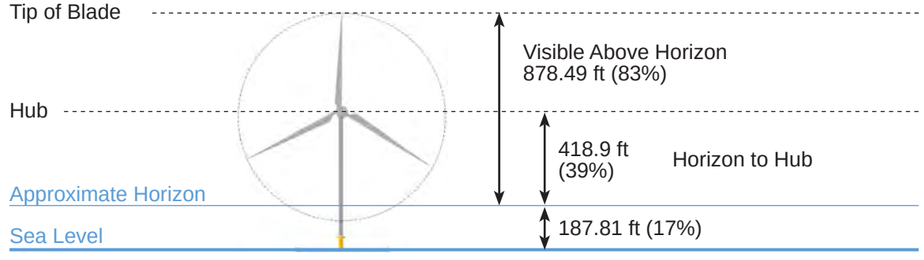
SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 56.7 mi / 91.2 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 133
Nearest WTG: 29.4 mi / 47.3 km	Potential Number of WTGs Not Visible: 16

VISIBILITY OF CLOSEST TURBINE



KOP 21-N Sankaty Head Lighthouse

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Table 22. KOP Number 22-N (Clear Skies/Sunset)

A. KOP Information				
KOP Number: **22-N (Clear Skies/Sunset)**	**Name KOP:** **Madaket Beach at Sunset (Clear Skies)**	**Date** July 29, 2020	**Time:** 6:10 PM	**Weather**: Sunny Reflective

Location Description:
The neighborhood of Madaket is location on the western end of the island of Nantucket between Madaket Harbor and saltwater marsh of Long Pond. Madaket is known for its pristine sandy beaches and open ocean sunsets. The long linear tan beach is sandwiched between elevated eroding dunes and the variable irregular edge of tide. Public beach access is confined to a large parking area with restrooms, and split rail fence delineates the upland edge of the access area and cement barriers blocking vehicle access to the beach.

The recreation area is a very popular destination by residents and tourists looking to sunbathe and enjoy the beach setting during the day and the sunset over the open ocean during the evening. The parking area is undersized for the level of visitation and cars are often parked along the roadway edge.

The photo point is located within the Public Beach Access on the beach in front of the parking area and access ramp. The photo point location was chosen by identifying where most people congregate to experience the sunset.

The image was taken 30 minutes prior to the sunset to capture a time when many people come to the beach for the sunset view. The light quality is at a sharp angle moving to the south and west of the viewpoint. Madaket Beach is a popular place to experience an unstructured open ocean sunset view. This is one of the few locations on the eastern United States affording a sunset over open ocean. This is a developed recreation area and popular destination for residents and tourists.

Landscape Character Description: Open Ocean, Open Beach, Dunes	**Scenic Integrity:** No permanent visual intrusions
Visual Absorption Capability: Low – the view from the remote beach to a distant ocean horizon does not facilitate visual absorption.	**Dominant Landscape Attributes:** Broad expanse of unobstructed Ocean with sharp angle of light reflecting off the ocean surface. The sun angle highlights the color of the sand, increasing color contrast between the ocean edge, and the sky

Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** In summer this beach is inundated with people coming to experience the sunset views.	**Viewer Position:** Level
Visual Connection to Project: Unobstructed view to project. The project direction is south east of the viewpoint.	**Viewing distance: Statute Miles and Kilometers (km)** 24.20 mi 38.94km	

VISIBILITY ANALYSIS FORMS

B. Landscape/Seascape Character Description [KOP 22-N (Clear Skies/Sunset)]					
Landscape/Seascape Character Attributes	**Landform**	**Ocean**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat to gently sloped beach	Strongly horizontal, flat to mildly choppy ripple	NA	NA	NA
Line	Strong line where beach meets the ocean	Horizon line, intermittent line, clouds, Irregular wave lines	NA	NA	NA
Color	Tan sand	Dark horizon line- reflective white and blue, gray to white clouds, slight haze above ocean, blue sky above haze band	NA	NA	NA
Texture	Fine grainy	Smooth to choppy	NA	NA	NA

Existing Landscape/Seascape Character Description:

The dominant visual impression is the broad, flat expanse of dark blue water contrasting the smooth light blue of the sky. The horizon line is very strong due to the time of day and light conditions. Scenic integrity is high, with few or no existing visual intrusions other than beach activity. Madaket Beach has a long linear horizontal line form, tan color and strong variable edge where the ocean tide meets the beach.

C. **Contrast Rating [KOP 22-N (Clear Skies/Sunset)]** ☐Short Term ☒Long Term

		Features																			
		Landform				Ocean				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Line	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Color	X				X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Horizontal Scale (% field of view)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Vertical (Height of Object against the horizon)	NA	NA	NA	NA		X			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Motion	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	X				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Moderate to Strong
Visibility Level Rating: [4] - [5]
[4] Plainly visible, but not dominant
[5] Strongly attracts visual attention. Prominent.

The Contrast Rat8ng is Moderate to Strong. The Project is in direct view to the ocean setting from the viewer position on the beach. Although the distance and atmospheric haze will partly reduce visibility, the Project will be [5] visually dominant in clear conditions. The blade movement will also draw the attention of the viewer.

Contrasting Elements:

- Dark gray platforms are visually evident against the white/blue background.
- Vertical elements introduced into a flat horizontal seascape scene;
- The density of structures arrayed across the horizon interrupts the view of the sky;
- The perceived lack of visual order of the Project from the viewer position;
- Blade motion is visible along the horizontal line, spinning motion of the blades does not correspond with the natural back and forth motion of the waves.

Mitigating Factors:

- Distance to nearest turbines is more than 20 miles
- Wide panorama reduces apparent horizontal scale of project
- Nighttime visibility will depend on selection of an FAA approved lighting system. The Project will use Radar Activated ADLS, if approved by FAA.

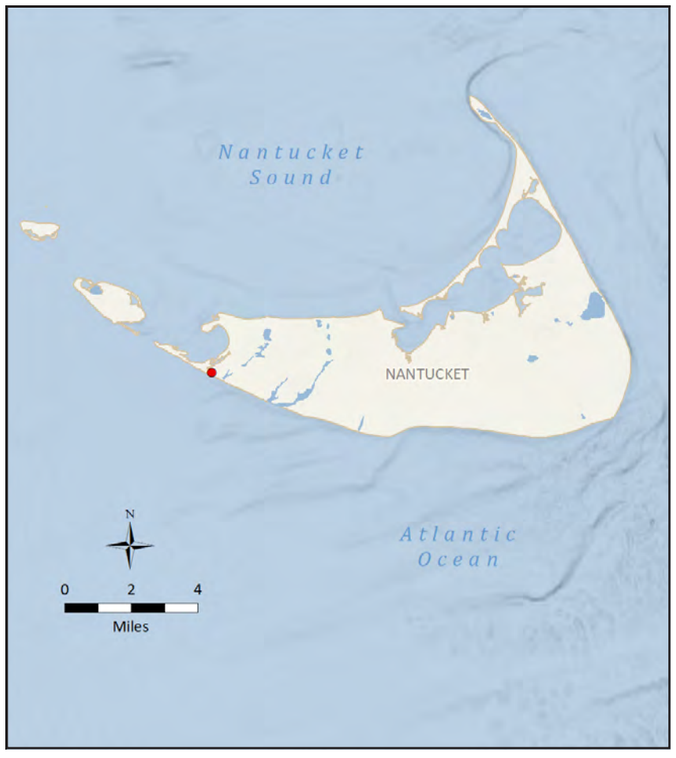
KOP 22-N Madaket Beach at Sunset

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 6:11 PM	Viewing direction: South (187°)
Date of photograph: 7-29-20	Latitude: 41.270282°N
L/SCA: Ocean beach	Longitude: 70.201719°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 74° F
Humidity: 79%
Wind Dir & Speed: WNW 3 mph
Weather Condition: Clear

CAMERA

Camera Elevation: 13.5 ft / 4.1 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes, scrub shrub landscape

Adjacent Amentities: Small parking lot, Millie's Restaurant, Madaket Town Center

Adjacent Areas: Residential homes, Smiths Point, White Goose Cove, Madaket Harbor

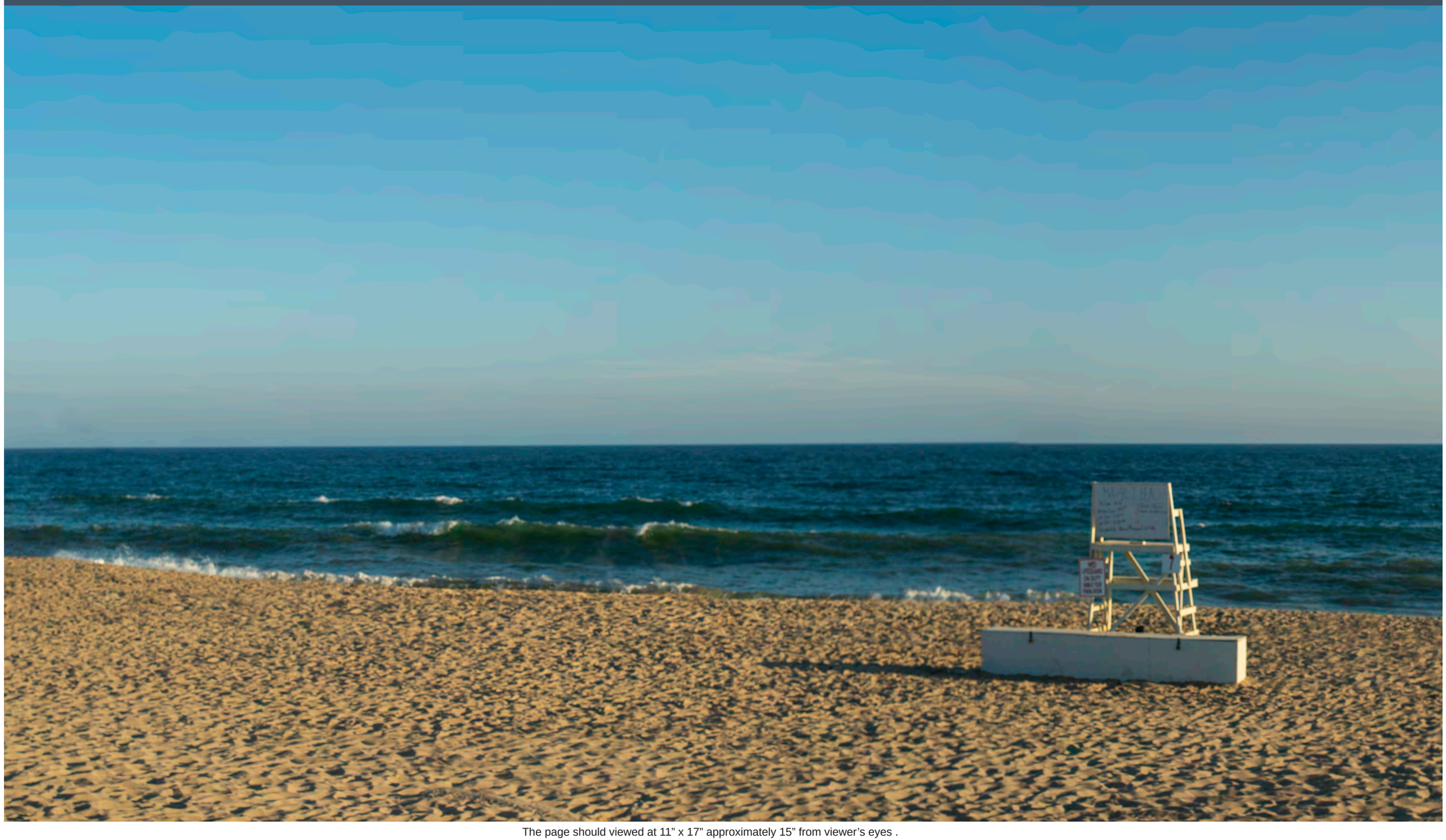
Adjacent L/SCAs: Ocean beach, coastal dunes, coastal scrub bush, medium density residential structures

Adjacent KOPs: KOP 3-N Madaket Beach, KOP 24-N Washington Ave and Madaket Road, KOP 30-N Massachusetts Ave, KOP 16-N Head of Plains

KOP 22-N Madaket Beach at Sunset

Nantucket

EXISTING CONDITIONS



The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 22-N Madaket Beach at Sunset

Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

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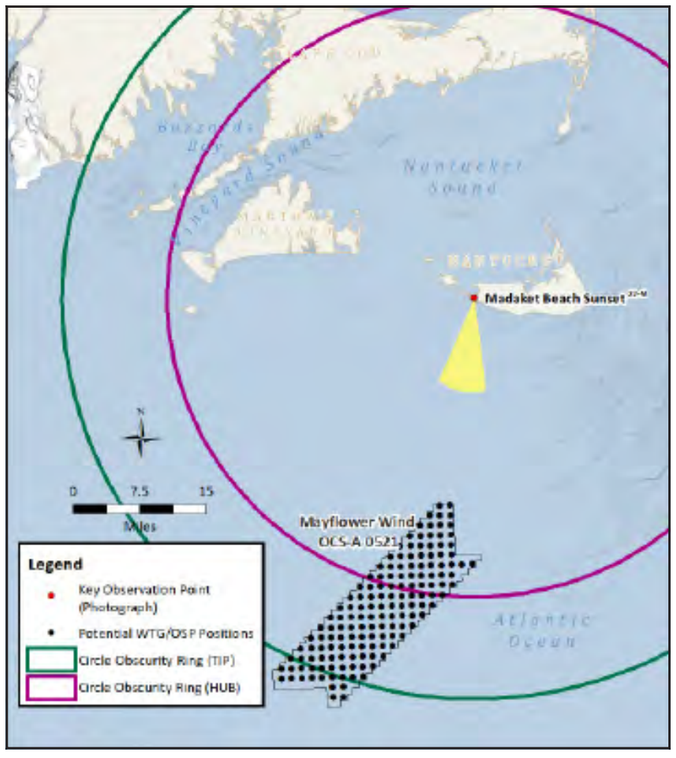
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 6:11 PM	Viewing direction: South (187°)
Date of photograph: 7-29-20	Latitude: 41.270282°N
L/SCA: Ocean beach	Longitude: 70.201719°W
	Lighting Direction: Backlit diffused

ENVIRONMENT

Temperature: 74° F
Humidity: 79%
Wind Dir & Speed: WNW 3 mph
Weather Condition: Clear

CAMERA

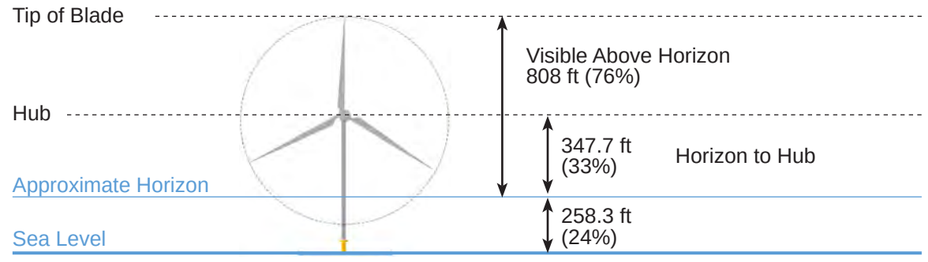
Camera Elevation: 13.5 ft / 4.1 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 207.2 mi / 333.5 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 134
Nearest WTG: 24.4 mi / 39.2 km	Potential Number of WTGs Not Visible: 15

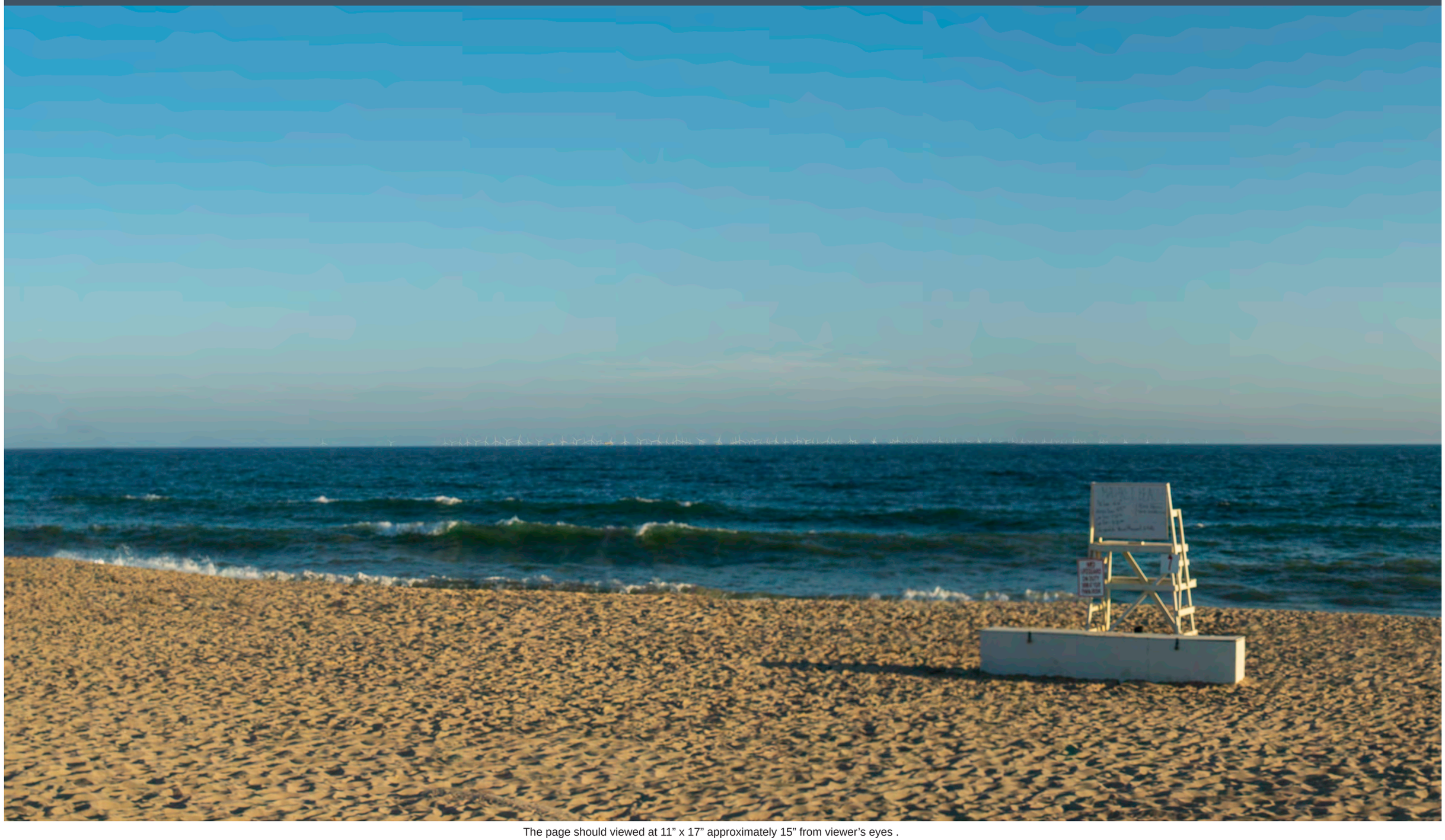
VISIBILITY OF CLOSEST TURBINE



KOP 22-N Madaket Beach at Sunset

Nantucket

SIMULATED CONDITIONS



The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

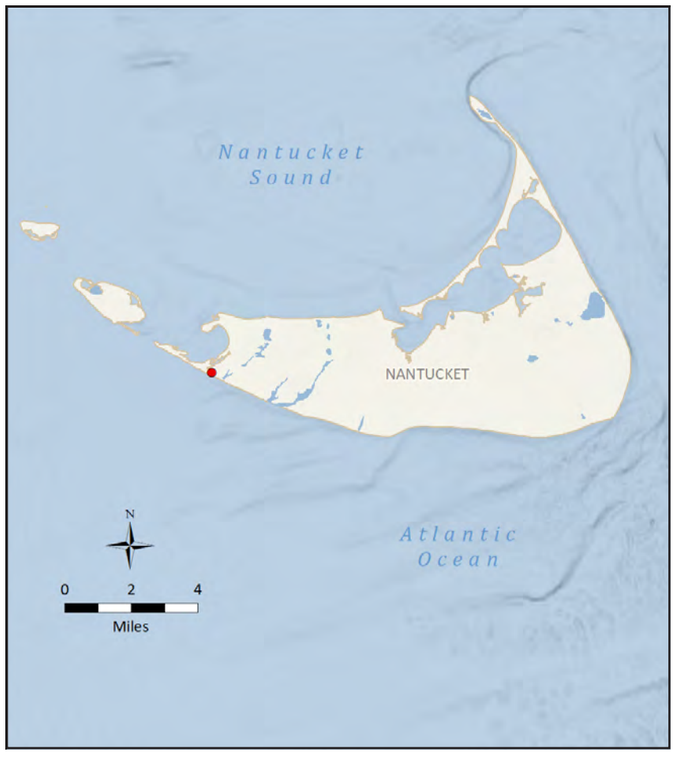
KOP 22-N Madaket Beach

Nantucket

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

ISLAND MAP



PHOTOGRAPH AND SITE

Time of photograph: 11:28 AM	Viewing direction: South (187°)
Date of photograph: 6-28-20	Latitude: 41.269820°N
L/SCA: Ocean beach	Longitude: 70.201260°W
	Lighting Direction: Backlit

ENVIRONMENT

Temperature: 71° F
Humidity: 84%
Wind Dir & Speed: S 7 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 13.5 ft / 4.1 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP

ADJACENT FEATURES

Access: Public beach recreation

Scenic Resources: Ocean beach, open ocean, coastal dunes, scrub shrub landscape

Adjacent Amentities: Small parking lot, Millie's Restaurant, Madaket Town Center

Adjacent Areas: Residential homes, Smith Point, White Goose Cove, Madaket Harbor

Adjacent L/SCAs: Ocean beach, coastal dunes, coastal scrub bush, medium density residential structures

Adjacent KOPs: KOP 3-N Madaket Beach, KOP 24-N Washington Ave and Madaket Road, KOP 30-N Massachusetts Ave, KOP 16-N Head of Plains

KOP 22-N Madaket Beach

Nantucket

EXISTING CONDITIONS

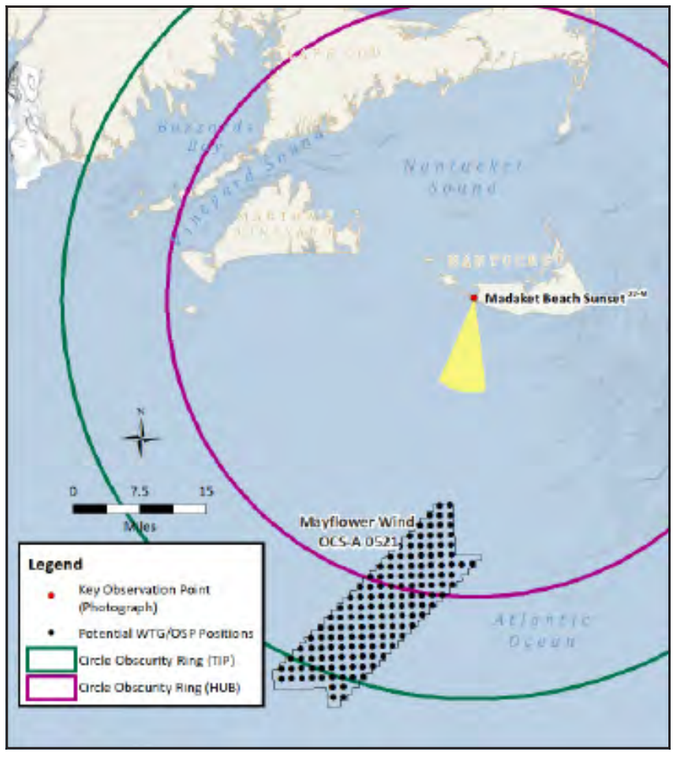
The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 22-N Madaket Beach
Nantucket

PANORAMIC PHOTOGRAPH - SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 11:28 AM	Viewing direction: South (187°)
Date of photograph: 6-28-20	Latitude: 41.269820°N
L/SCA: Ocean beach	Longitude: 70.201260°W
	Lighting Direction: Backlit

ENVIRONMENT

Temperature: 71° F
Humidity: 84%
Wind Dir & Speed: S 7 mph
Weather Condition:Partly Cloudy

CAMERA

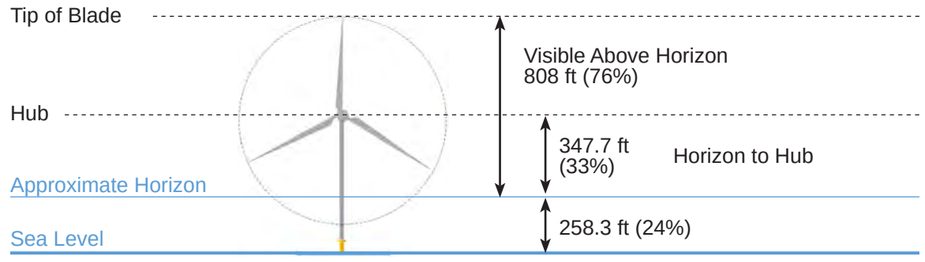
Camera Elevation: 13.5 ft / 4.1 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP

PROJECT VIEW

Horizontal Field of View: 127°	Furthest WTG: 49.2 mi / 79.2 km
Vertical Field of View: 39.6°	Potential Number of WTGs Visible: 134
Nearest WTG: 24.4 mi / 39.2 km	Potential Number of WTGs Not Visible: 15

VISIBILITY OF CLOSEST TURBINE



KOP 22-N Madaket Beach

Nantucket

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Attachment 4 – Onshore Visibility Analysis Forms and Photo Simulations for Falmouth, Massachusetts

Attachment 4 Onshore Visibility Analysis Forms

Tables

Scale		Level	Definition
Weak contrast		1	Visible only after extended, close viewing.
		2	Visible when scanning in the general direction of the project facilities.
Moderate contrast		3	Visible after only a brief glance in the direction of the project facilities.
		4	Plainly visible, but not dominant.
Strong contrast		5	Strongly attracts visual attention. Prominent.
		6	Dominates the view. Occupies most of the visual field.
No contrast		NA	Not Visible

VISIBILITY ANALYSIS FORMS

Table 1. KOP Number 44-C

A. KOP Information				
KOP Number: **44-C**	**Name KOP:** Oak Grove Cemetery	**Date:** November 3, 2020	**Time:** 9:29 AM	**Weather**: Sun, partly cloudy
Location Description: The key observation point is located in the north central part of the historic Oak Grove Cemetery in Falmouth, Massachusetts.				
Landscape Character Description: Village/Town	**Scenic Integrity:** Scenic integrity is moderately high due to the manicured, park-like landscape with mature trees, and the dense woodland buffer that screens the Project site and adjacent neighborhoods.			
Visual Absorption Capability: Moderate– –The scene is semi-natural in character. Screening is dense, but mostly deciduous. Views of structures along the ridge and evidence of powerline pole. Therefore, its effectiveness is limited.	**Dominant Landscape Attributes:** Park-like village setting within residential neighborhood. Mature trees growing in maintained lawn. Dense, low shrubs provide screening at edges.			
Relevant Viewer Groups: Residents, Tourists	**Viewer Context:** From within the north central part of the cemetery	**Viewer Position:** Viewer level		
Visual Connection to Project: View is partly open to the proposed Project	**Viewing distance: Statute Miles (mi) and Kilometers (km)** 0.14 mi 0.22 km			

VISIBILITY ANALYSIS FORMS

B. Landscape Character Description [KOP 44-C]				
Landscape	**Landform**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat terrain. Slight rise in distance.	Not in view	Open mature tree canopy Maintained lawn. Massing of broadleaf shrubs and small trees at edges. Semi-natural.	Wooden H type utility poles in central part of view. Partial view of residences.
Line	Flat plain creates strong horizontal	Not in view	Strong line of dense shrubs at property boundary. Diffused lines of open canopy within cemetery.	Utility poles create a weak vertical in distance.
Color	NA	Not in view	Mostly shades of green, seasonal yellow, lime, reds,	Light gray, white, green fencing
Texture	NA	Not in view	Smooth lawn and tree boles. Irregular, rough shrub edge.	NA

Summary
Existing Landscape Character Description:
The Oak Grove Cemetery is a historic site with a park-like character within Falmouth. It is semi-natural with mature deciduous trees well-spaced within a managed lawn. Dense, moderately low deciduous shrubs sit on top of a berm at the property line of the site.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 44-C] ☐Short Term ☒Long Term

		Features															
		Landform				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X		NA	NA	NA	NA	X				X			
	Line	X				NA	NA	NA	NA		X			X			
	Color		X			NA	NA	NA	NA	X				X			
	Horizontal Scale (% field of view)		X			NA	NA	NA	NA		X			X			
	Vertical (Height of Object against the horizon)		X			NA	NA	NA	NA		X				X		
	Motion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: High
Visibility Rating: 4-5
[4] Plainly visible, but not dominant
[5] Strongly attracts visual attention. .

The proposed facilities are plainly visible to dominant in this view due to the partially open canopy on the perimeter of the cemetery. The building is visually evident and only partly screened through the open forest.

Contrasting Elements:

- Introduction of large structures very close to cemetery boundary
- Corrugated texture of building contrasts strongly with existing landscape textures. Substation has very “busy” and complex lines.

Mitigating Factors:

- Partially screened by existing vegetation

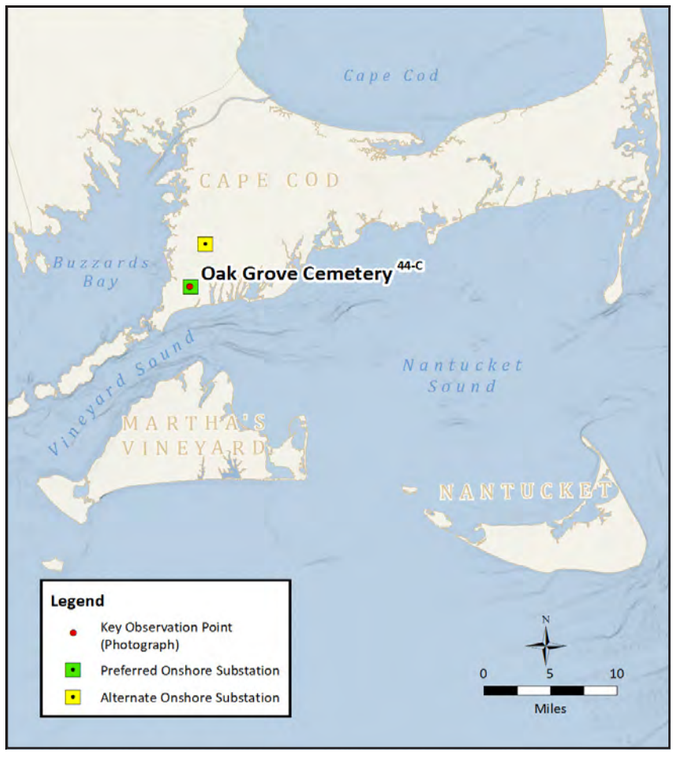
KOP 44-C - Oak Grove Cemetery

Cape Cod

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 9:29 AM	Viewing direction: East (105°)
Date of photograph: 11-3-20	Latitude: 41.565870°N
L/SCA: Cemeteries, Village/Town	Longitude: 70.614637°W
	Lighting Direction: Sidelit diffused

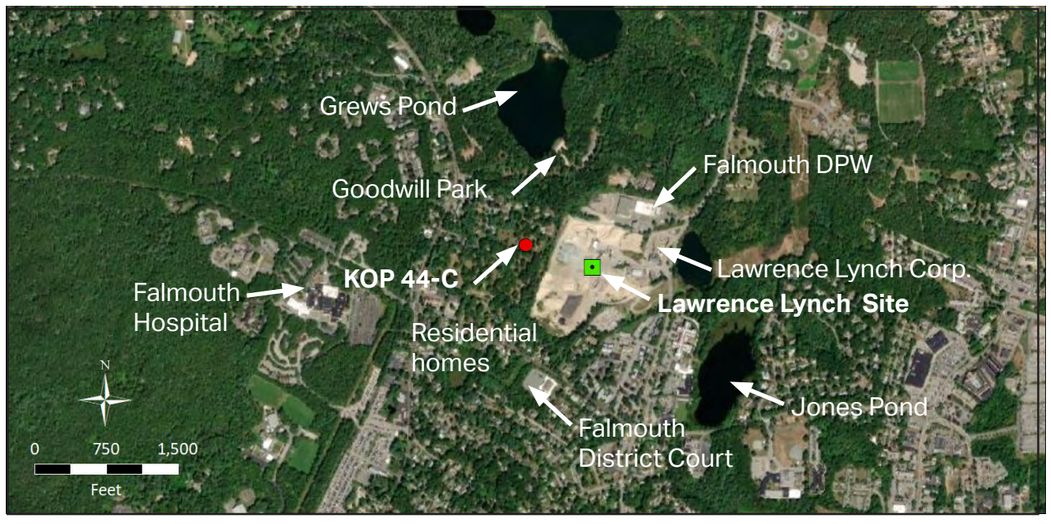
ENVIRONMENT

Temperature: 55° F
Humidity: 80%
Wind Dir & Speed: WNW 16 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 16.5 ft / 5.0 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public residential road

Scenic Resources: Cemeteries, Village/Town

Adjacent Amentities: Falmouth Hospital, Falmouth Pumping Station, Falmouth DPW, restaurants, shops

Adjacent Areas: Goodwill Park, Lawrence Lynch Corporation, residential homes, Falmouth DPW, Grews Pond, Jones Pond, Falmouth District Court, Falmouth Hospital, shopping, restaurants

Adjacent L/SCAs: Commercial, Light Industrial, Parks/Developed Recreation, Forests/Woodlands, Village/Town

Adjacent KOPs: KOP 33-C Carlson Lane at Park near Bike Path, KOP 32-C Ter Heun Drive at Bike Path, KOP 46-C Goodwill Park, KOP 4-C Gifford Road, KOP 47-C Lawrence Lynch Site - Gifford Road Substation, KOP 48-C Gifford Road

KOP 44-C - Oak Grove Cemetery

Cape Cod

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 44-C - Oak Grove Cemetery

Cape Cod

PANORAMIC PHOTOGRAPH-SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

STATE MAP

PHOTOGRAPH AND SITE

Time of photograph: 9:29 AM	Viewing direction: East (105°)
Date of photograph: 11-3-20	Latitude: 41.565870°N
L/SCA: Cemeteries, Village/Town	Longitude: 70.614637°W
	Lighting Direction: Sidelit diffused

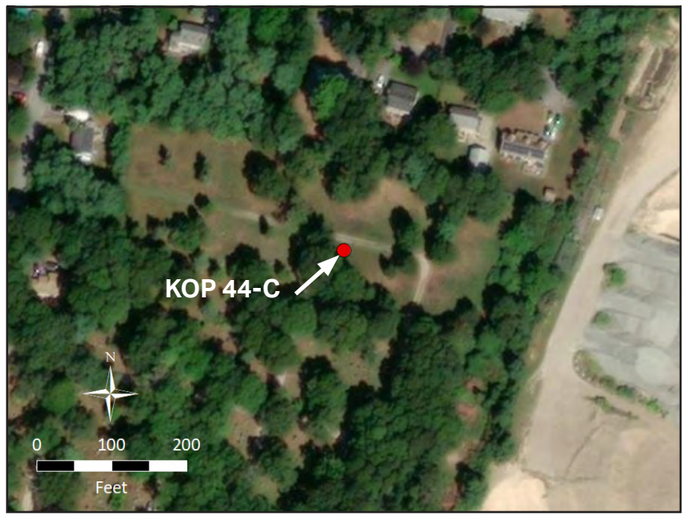
ENVIRONMENT

Temperature: 55° F
Humidity: 80%
Wind Dir & Speed: WNW 16 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 43.5 ft / 13.3 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°
Vertical Field of View: 42°
Distance to Preferred Substation: 0.14 mi / 0.22 km

KOP 44-C - Oak Grove Cemetery

Cape Cod

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

VISIBILITY ANALYSIS FORMS

Table 2. KOP Number 46-C

A. KOP Information				
KOP Number: **46-C**	**Name KOP:** Goodwill Park	**Date:** November 2, 2020	**Time:** 10:10 AM	**Weather**: Sun, partly cloudy
Location Description: The key observation point is located across from the access road and parking area at Goodwill Park, southeast of Grews Pond. The park is comprised of 70 acres of forested woodland, freshwater ponds, and hiking trails.				
Landscape Character Description: Village/Town, Parks/Developed Recreation, Forests/Woodlands	**Scenic Integrity:** Scenic integrity high due to a combination of mature trees, woodland, and park setting. There are few visual intrusions.			
Visual Absorption Capability: Moderate– Woodland vegetation helps buffer surrounding land uses.		**Dominant Landscape Attributes:** Native forest and woodland, manicured landscaping, paved park road.		
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** From along main park road south of pond.		**Viewer Position:** Viewer level	
Visual Connection to Project: View is partly screened to the proposed Project		**Viewing distance: Statute Miles (mi) and Kilometers (km)** 0.19 mi 0.30 km		

VISIBILITY ANALYSIS FORMS

B. Landscape Character Description [KOP 46-C]				
Landscape	**Landform**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Level to gently rolling terrain.	180 degrees from this view	Mature mixed broadleaf and pine woodland, grass in foreground at viewpoint, natural undergrowth at edge.	None noticeable.
Line	Horizontal plain	180 degrees from this view	Trees provide vertical elements. Lawn/road edge is strongly horizontal.	None noticeable
Color	NA	NA	Dark green, light green seasonal yellow, lime, reds,	NA
Texture	NA	NA	Smooth lawn, rough, Irregular, understory shrubs.	NA

Summary
Existing Landscape Character Description:
Goodwill Park is a semi-natural woodland that surrounds a small pond in Falmouth. The interior of the park is well screened from adjacent land uses due to the woodland vegetation. Some areas are more open and park-like, with open, maintained lawn undergrowth. The scenic integrity of the setting is high and the cultural relationship to the area is strong.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 46-C] ☐Short Term ☒Long Term

		Features															
		Landform				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X			NA	NA	NA	NA		X					X	
	Line		X			NA	NA	NA	NA		X					X	
	Color		X			NA	NA	NA	NA	X		X				X	
	Horizontal Scale (% field of view)			X		NA	NA	NA	NA							X	
	Vertical (Height of Object against the horizon)			X		NA	NA	NA	NA		X				X		
	Motion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak to Medium
Visibility Rating: 2-3
[2] Visible when scanning in the general direction of the project facilities
[3] Visible after only a brief glance in the direction of the project facilities

The substation buildings and utility infrastructure are visible through the vegetated buffer at the edge of the property.

Contrasting Elements:
- Introduction of new structures near property edge that rise above screening vegetation.

Mitigating Factors:
- Vegetation screening provides a good visual buffer

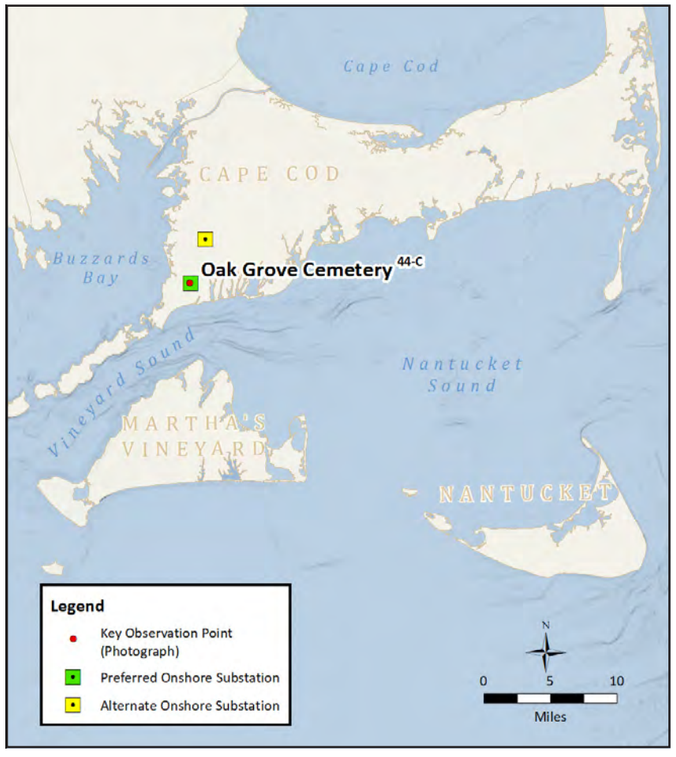
KOP 46-C - Goodwill Park

Cape Cod

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 10:10 AM	Viewing direction: Southeast (167°)
Date of photograph: 11-3-20	Latitude: 41.567893°N
L/SCA: Village/Town, Parks/Developed Recreation, Forests/Woodlands	Longitude: 70.612580°W
	Lighting Direction: Backlit diffused

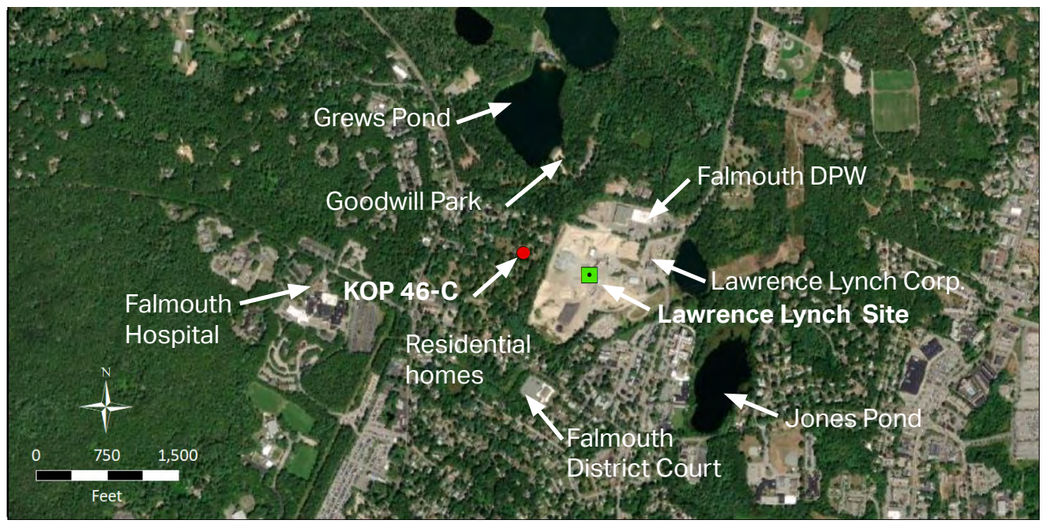
ENVIRONMENT

Temperature: 43° F
Humidity: 61%
Wind Dir & Speed: WNW 16 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 42.5 ft / 13.0 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public road

Scenic Resources: Village/Town, Parks/Developed Recreation, Forests/Woodlands

Adjacent Amentities: Goodwill Park, Lawrence Lynch Corporation, residential homes, Falmouth DPW, Grews Pond, Jones Pond, Falmouth District Court, Falmouth Hospital, restaurants, shops

Adjacent Areas: Lawrence Lynch Corporation, residential homes

Adjacent L/SCAs: Commercial, Light Industrial, Salt Pond/ Tidal Marsh, Village/Town, Parks/Developed Recreation, Forests/ Woodlands

Adjacent KOPs: Kop 33-C Carlson Lane at Park near Bike Path, KOP 44-C Oak Grove Cemetery, KOP 4-C Gifford Road, KOP 50-C St. Joseph Cemetery

KOP 46-C - Goodwill Park

Cape Cod

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 46-C - Goodwill Park

Cape Cod

PANORAMIC PHOTOGRAPH-SIMULATED CONDITIONS

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STATE MAP

PHOTOGRAPH AND SITE

Time of photograph: 10:10 AM	Viewing direction: Southeast (167°)
Date of photograph: 11-3-20	Latitude: 41.567893°N
L/SCA: Village/Town, Parks/Developed Recreation, Forests/Woodlands	Longitude: 70.612580°W
	Lighting Direction: Backlit diffused

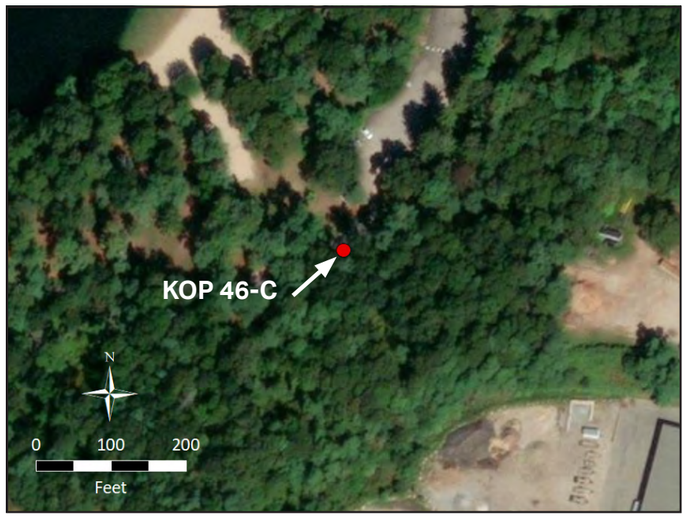
ENVIRONMENT

Temperature: 43° F
Humidity: 61%
Wind Dir & Speed: WNW 16 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 42.5 ft / 13.0 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°	Distance to Preferred Substation: 0.19 mi / 0.30 km
Verticle Field of View: 42°	

KOP 46-C - Goodwill Park

Cape Cod

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

VISIBILITY ANALYSIS FORMS

Table 3. KOP Number 47-C

A. KOP Information				
KOP Number: **47-C**	**Name KOP:** Lawrence Lynch Site - Gifford Road Substation	**Date:** November 3, 2020	**Time:** 10:33 AM	**Weather**: Sun, partly cloudy
Location Description: The key observation point is located on the sidewalk of Gifford Road at the corridor clearing, west of Sols Pond.				
Landscape Character Description: Roadway, Village/Town, Woodland	**Scenic Integrity:** Scenic integrity is low due to numerous utility poles, containers, and disturbed vegetation. Wooded context outside of the Project area has higher integrity. No foreground screening.			
Visual Absorption Capability: Moderate – The view is of an engineered facility, with numerous utility poles and wires but few buildings. Green vegetation is the dominant color but bleached out wooden poles and light metal buildings are co-dominant. The scene is developed/disturbed.	**Dominant Landscape Attributes:** Disturbed ground plane, utility poles, wires, metal containers, and buildings. Woodland at outer edges.			
Relevant Viewer Groups: Residents, Tourists	**Viewer Context:** From Gifford Road	**Viewer Position:** Viewer Even		
Visual Connection to Project: View is open to the proposed Project.	**Viewing distance: Statute Miles (mi) and Kilometers (km)** 0.17 mi 0.28 km			

VISIBILITY ANALYSIS FORMS

B. Landscape Character Description [KOP 47-C]				
Landscape	**Landform**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Flat to slightly rolling. Low	Not in view	Low scrub. Broadleaf and pine woodland outside immediate project area.	Wooden utility poles. Metal buildings and containers.
Line	Horizontal ground plain and road.	No water in view	Vertical and horizontal lines in the vegetation, low scrub under utility lines, some vertical in surrounding woodlands.	Horizontal lines of metal containers and trailer. Vertical lines of utility poles.
Color	NA	No water in view	Light green, brown	Gray, white, green
Texture	NA	No water in view	Irregular, rough	Smooth surfaces. Ribbed metal siding
Summary **Existing Landscape Character Description:** A village edge and sparse woodland context around the Project site, which is a disturbed area with a dense array of wooden utility poles and scattered metal buildings and shipping containers.				

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 47-C] ☐Short Term ☒Long Term

		Features															
		Landform				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X	NA	NA	NA	NA			X					X
	Line			X		NA	NA	NA	NA				X				X
	Color		X			NA	NA	NA	NA		X			X			X
	Horizontal Scale (% field of view)				X	NA	NA	NA	NA		X						NA
	Vertical (Height of Object against the horizon)		X			NA	NA	NA	NA		X				X		
	Motion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Medium
Visibility Rating: 3-4
[3] Visible after only a brief glance in the direction of the project facilities
[4] Plainly visible, but not dominant

This simulation shows the proposed new building and substation within an open, manicured landscape clean of existing visual clutter. While the project is fully visible, the removal of the existing clutter offsets this and the result is a neutral or even slightly positive visual change to the site as seen from this viewpoint.

Contrasting Elements:
- Landscape improvements will reflect local codes and relate to existing native vegetation within the area.

Mitigating Factors:
- Removal of substantial visual clutter and landscape improvements make the Project neutral or slightly beneficial visually.

KOP 47-C - Lawrence Lynch Site – Gifford Road Substation

Cape Cod

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

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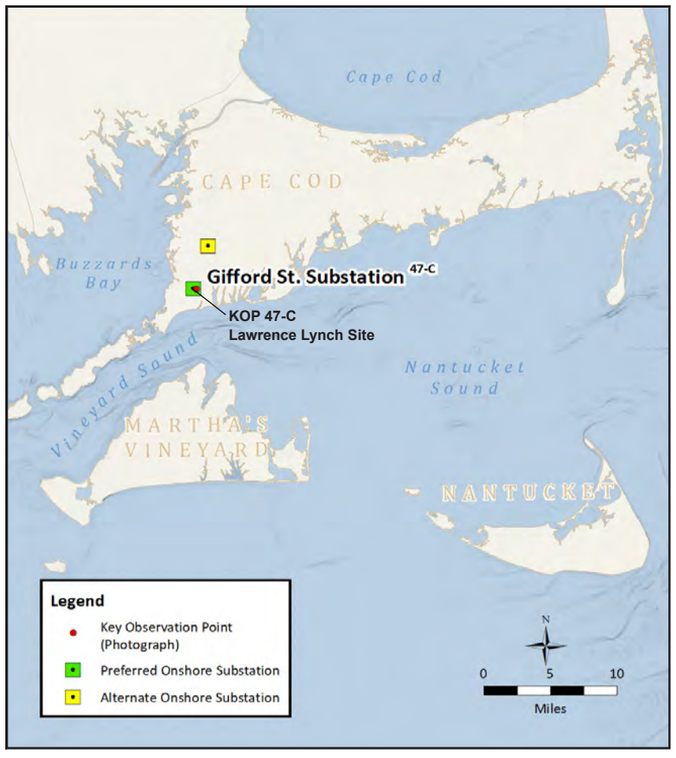
REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 10:33 AM	Viewing direction: North (297°)
Date of photograph: 11-3-20	Latitude: 41.564221°N
L/SCA:Roadways, Village/Town, Forests/Woodlands, Light Industrial	Longitude: 70.609044°W
	Lighting Direction: Sidelit

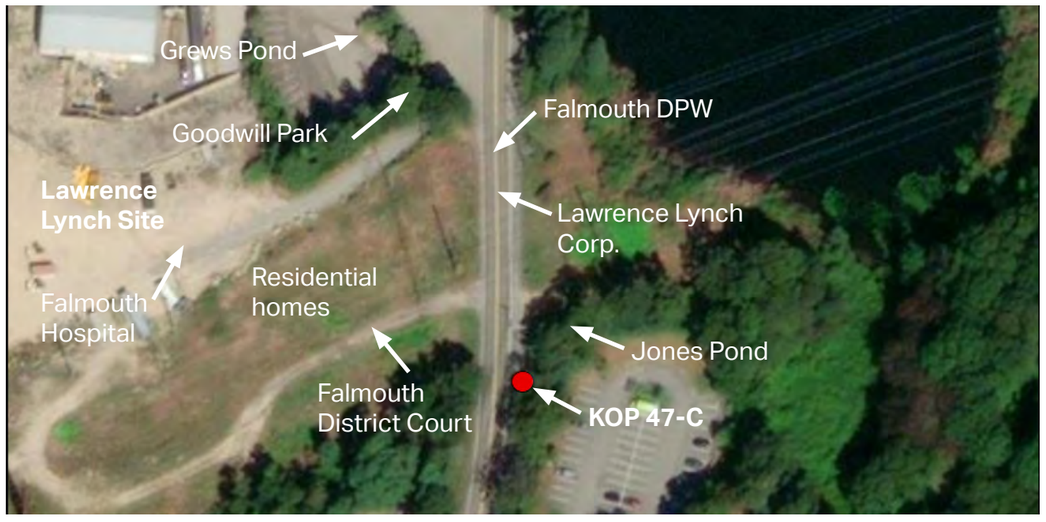
ENVIRONMENT

Temperature: 43° F
Humidity: 49%
Wind Dir & Speed: WNW 21 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 35.5 ft / 10.2 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

CONTEXT MAP



ADJACENT FEATURES

Access: Public road

Scenic Resources: Roadways, Village/Town, Forests/Woodlands, Light Industrial

Adjacent Amentities: Goodwill Park, Lawrence Lynch Corporation, residential homes, Falmouth DPW, Grews Pond, Jones Pond, Falmouth District Court, Falmouth Hospital, restaurants, shops

Adjacent Areas: Falmouth Center, residential homes

Adjacent L/SCAs: Commercial, Light Industrial, Coastal Scrub, Salt Pond/Tidal Marsh, Village/Town, Parks/Developed Recreation, Forests/Woodlands

Adjacent KOPs: KOP 4-C Gifford Road, KOP 48-C Gifford Road, KOP 49-C Two Ponds

KOP 47-C - Lawrence Lynch Site – Gifford Road Substation

Cape Cod

EXISTING CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 47-C - Lawrence Lynch Site – Gifford Road Substation

Cape Cod

PANORAMIC PHOTOGRAPH-SIMULATED CONDITIONS

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STATE MAP

PHOTOGRAPH AND SITE

Time of photograph: 10:33 AM	Viewing direction: North (297°)
Date of photograph: 11-3-20	Latitude: 41.564221°N
L/SCA:Roadways, Village/Town, Forests/Woodlands, Light Industrial	Longitude: 70.609044°W
	Lighting Direction: Sidelit

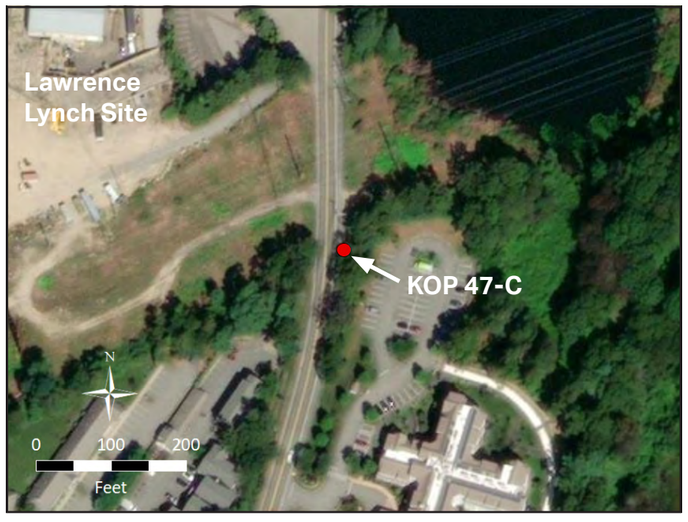
ENVIRONMENT

Temperature: 43° F
Humidity: 49%
Wind Dir & Speed: WNW 21 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 35.5 ft / 10.2 m	Fstop: f/7.1
Nikon D4	Shutter: 1/1250 sec
Nikon 50mm	Aperture priority
ISO: 100	Exposure bias: -0.7 step

SITE MAP



PROJECT VIEW

Horizontal Field of View: 115°
Verticle Field of View: 42°
Distance to Preferred Substation: 0.17 mi / 0.28 km

KOP 47-C - Lawrence Lynch Site – Gifford Road Substation

Cape Cod

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

VISIBILITY ANALYSIS FORMS

Table 4. KOP Number 49-C

A. KOP Information				
KOP Number: **49-C**	**Name KOP:** Two Ponds	**Date:** November 3, 2020	**Time:** 10:54 AM	**Weather**: Sun, partly cloudy
Location Description: The key observation point is located along the Two Ponds walking trail across Sols Pond, northwest of Jones Pond, and east of Gifford Street behind a retirement community.				
Landscape Character Description: Forest/Woodland, Freshwater Pond	**Scenic Integrity:** Scenic integrity is moderately high due to the woodland/pond setting. Buildings, utility poles, and storage tanks impinge on the view, but are mostly screened by forest vegetation.			
Visual Absorption Capability: Moderate – The extent and density of the woodland vegetation helps screen development.	**Dominant Landscape Attributes:** Native forest and woodland, pond, and trail			
Relevant Viewer Groups: Residents, Tourists, Recreational Users	**Viewer Context:** From the Two Pond trail southeast of Sols Pond.	**Viewer Position:** Viewer Even		
Visual Connection to Project: View to the proposed Project is mostly screened by forest vegetation.	**Viewing distance: Statute Miles (mi) and Kilometers (km)** 0.26 mi 0.41 km			

VISIBILITY ANALYSIS FORMS

B. Landscape Character Description [KOP 49-C]				
Landscape	**Landform**	**Enclosed Water Bodies**	**Vegetation**	**Structures**
Form	Low, level to rolling terrain	Sols Pond has rounded form partly noticeable	Massing of broadleaf woodland forest, grass, understory shrubs in foreground at viewpoint	One visible utility pole, tanks, houses partly screened
Line	Distinct linear edge along margins upper edge of pond.	Sols pond upper edge has strong horizontal line	Bent vertical lines of trees. Horizontal line of vegetation along pond.	Vertical line of visible utility poles.
Color	NA	Blue water of pond	Green, seasonally yellow to brown leaves.	Light grays,
Texture	NA	Smooth pond surface	Irregular, rough	Smooth flat surface of storage tanks.

Summary
Existing Landscape Character Description:
The Two Ponds Trail provides access to a local 14.75 acre conservation area that was once part of a golf course. The trail goes through broadleaf woodland vegetation, and along Sols and Jones Ponds. Overhead powerlines bisect the property at the south end of Sols Pond. Commercial and residential development surround the area on three sides. Woodland continues to the north. The terrain is level to gently rolling. There are wetlands along Jones Pond. The scenic integrity of the setting is moderately high.

VISIBILITY ANALYSIS FORMS

C. Contrast Rating [KOP 49-C] ☐Short Term ☒Long Term

		Features															
		Landform				Enclosed Water Bodies				Vegetation				Structures			
Degree of Contrast		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form			X	X		X						X				X
	Line			X	X		X						X				X
	Color				X		X						X				
	Horizontal Scale (% field of view)				X								X				X
	Vertical (Height of Object against the horizon)			X	X	NA	NA						X				X
	Motion	NA	NA	NA	NXA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lighting	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Overall Visual Contrast Rating: Weak
Visibility Rating: [1]
[1] Project is not visually evident

This simulation shows the new gray building that can barely be seen through the vegetation and across the pond. The proposed facility does not detract from existing visual setting.

Contrasting Elements:

- Gray building and color blend with the color of the pond and sky

Mitigating factors:

- Existing screening is sufficient to mostly hide the proposed building
- New building compatible with existing development

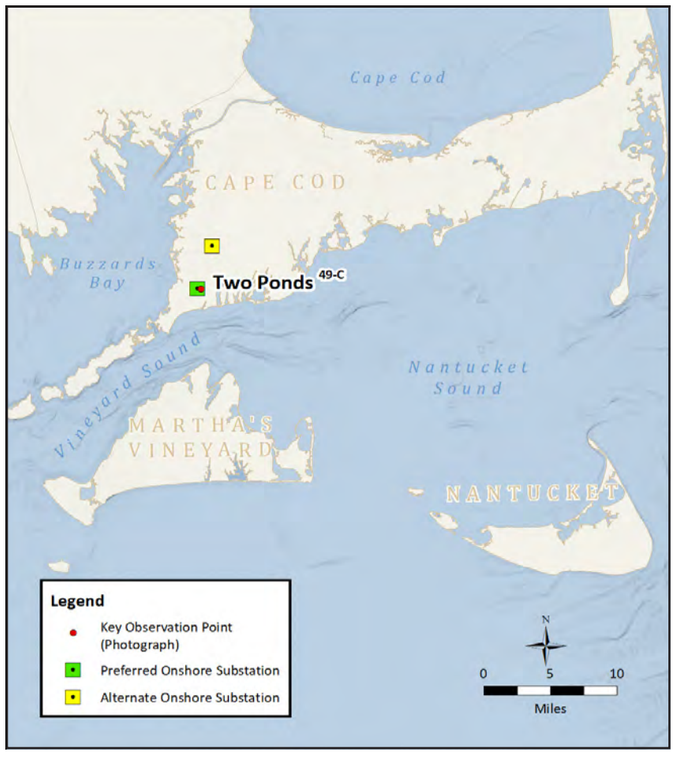
KOP 49-C - Two Ponds

Cape Cod

PANORAMIC PHOTOGRAPH - EXISTING CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

REGIONAL MAP



PHOTOGRAPH AND SITE

Time of photograph: 10:54 AM
Date of photograph: 11-3-20
L/SCA: Freshwater Pond, Forest/ Woodland
Viewing direction: Northwest (284°)
Latitude: 41.564407°N
Longitude: 70.607283°W
Lighting Direction: Front lit

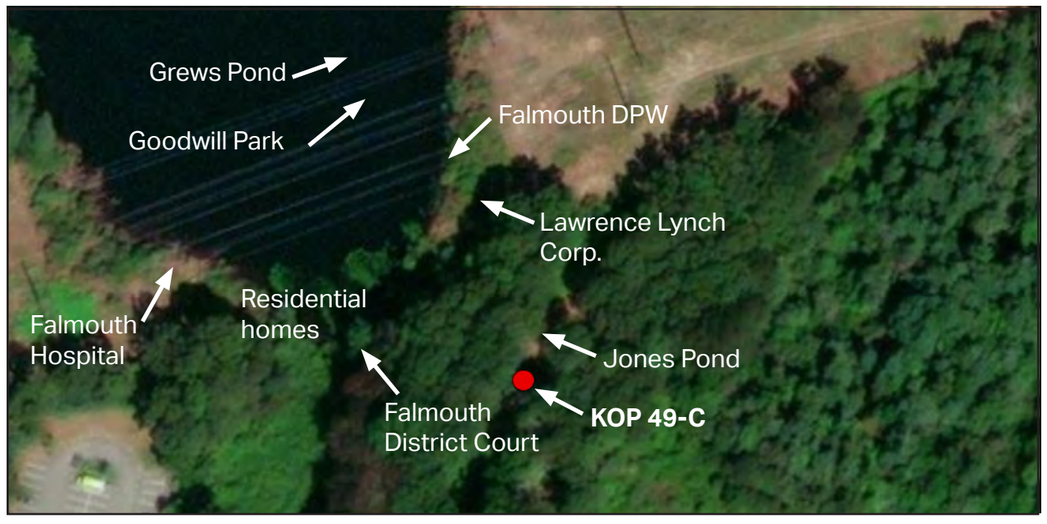
ENVIRONMENT

Temperature: 43° F
Humidity: 49%
Wind Dir & Speed: WNW 21 mph
Weather Condition: Partly Cloudy

CAMERA

Camera Elevation: 27.5 ft / 8.4 m
Nikon D4
Nikon 50mm
ISO: 100
Fstop: f/7.1
Shutter: 1/1250 sec
Aperture priority
Exposure bias: -0.7 step

CONTEXT MAP



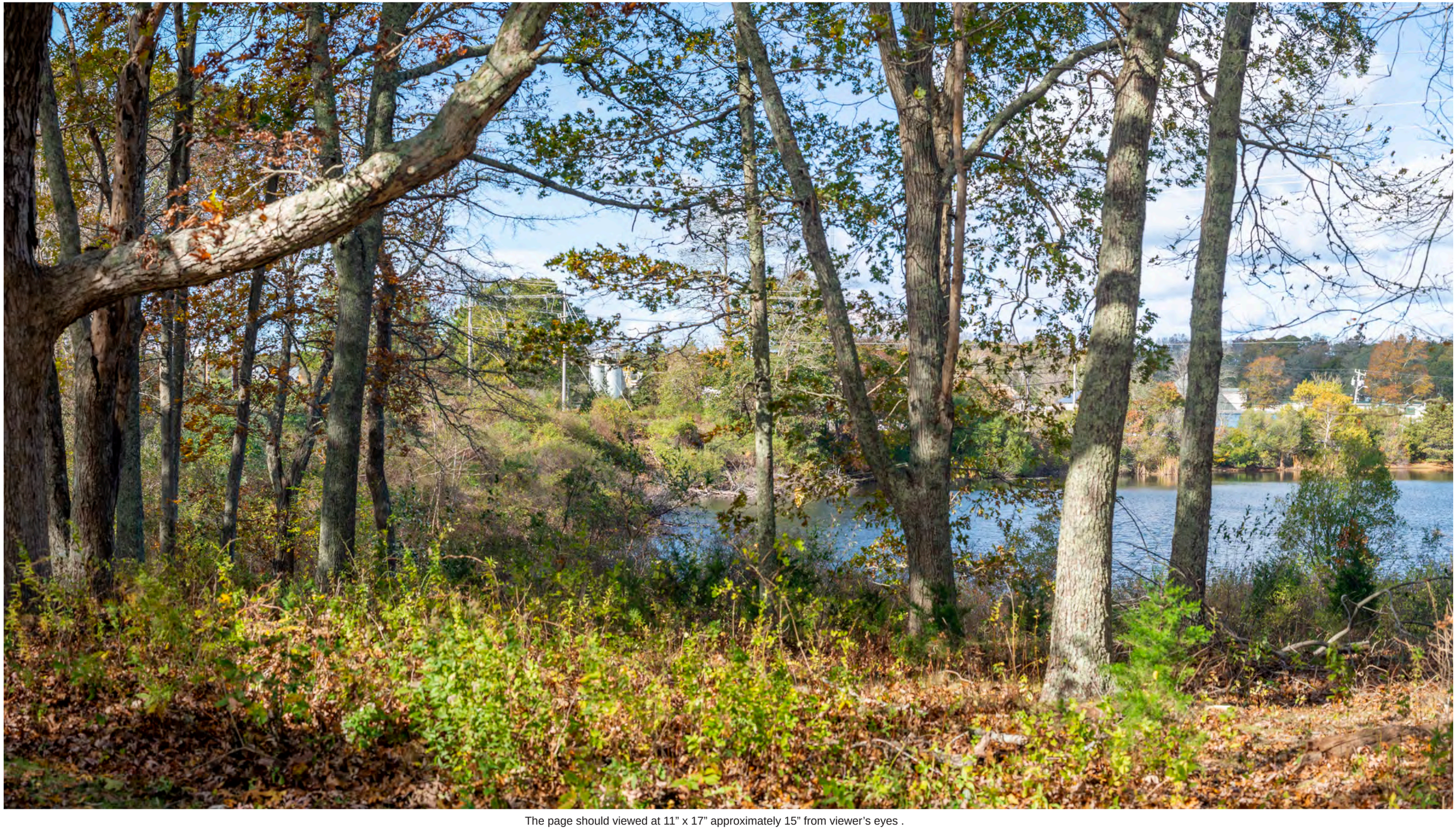
ADJACENT FEATURES

Access: Public parking lot
Scenic Resources: Freshawater Ponds, Forests/Woodlands
Adjacent Amentities: Goodwill Park, Lawrence Lynch Corporation, residential homes, Falmouth DPW, Grews Pond, Jones Pond, Falmouth District Court, Falmouth Hospital, restaurants, shops
Adjacent Areas: Falmouth Center, residential homes
Adjacent L/SCAs: Commercial, Light Industrial, Coastal Scrub, Salt Pond/Tidal Marsh, Village/Town, Parks/Developed Recreation, Forests/Woodlands
Adjacent KOPs: KOP 4-C Gifford Road, KOP 47-C Lawrence Lynch Site - Gifford Road Substation, KOP 48-C Gifford Road

KOP 49-C - Two Ponds

Cape Cod

EXISTING CONDITIONS



The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

KOP 49-C - Two Ponds
Cape Cod

PANORAMIC PHOTOGRAPH-SIMULATED CONDITIONS

This image should be viewed on a 24 inch monitor scaling the yellow square to 11" x 17" and pan the surrounding panoramic image maintaining the 11" x 17" size. The yellow area depicts the area on the following page.

STATE MAP

PHOTOGRAPH AND SITE

Time of photograph: 10:54 AM
Date of photograph: 11-3-20
L/SCA: Freshwater Pond, Forest/ Woodland
Viewing direction: Northwest (284°)
Latitude: 41.564407°N
Longitude: 70.607283°W
Lighting Direction: Frontlit

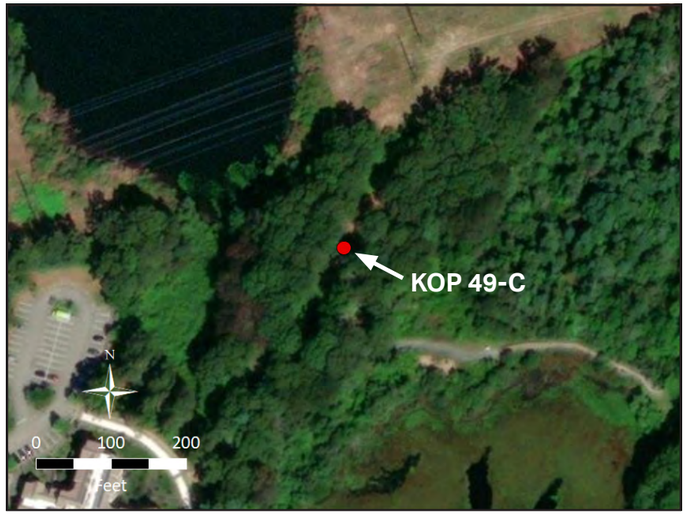
ENVIRONMENT

Temperature: 43° F
Humidity: 49%
Wind Dir & Speed: WNW 21 mph
Weather Condition:Partly Cloudy

CAMERA

Camera Elevation: 27.5 ft / 8.4 m
Nikon D4
Nikon 50mm
ISO: 100
Fstop: f/7.1
Shutter: 1/1250 sec
Aperture priority
Exposure bias: -0.7 step

SITE MAP



PROJECT VIEW

Horizontal Field of View: 127°
Verticle Field of View: 42°
Distance to Preferred Substation: 0.26 mi / 0.41 km

KOP 49-C - Two Ponds

Cape Cod

SIMULATED CONDITIONS

The page should viewed at 11” x 17” approximately 15” from viewer’s eyes .

Attachment 5 – Photographs Supporting the Visual Impact Assessment (Business Confidential)