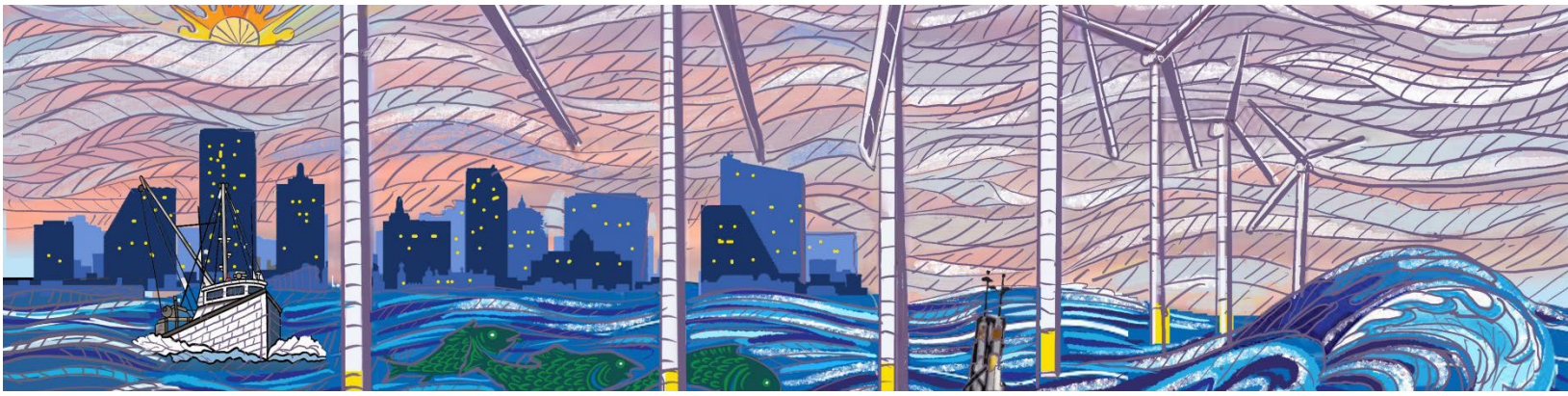

# Appendix II-P1

## Phase IA Terrestrial Archaeology Survey - Cardiff

**Portions of this report have been redacted to exclude sensitive information including locations of archaeological resources.**

Note:

On March 26, 2021, Atlantic Shores Offshore Wind, LLC (Atlantic Shores) submitted a Construction and Operations Plan (COP) to BOEM for the southern portion of Lease OCS-A 0499. On June 30, 2021, the New Jersey Board of Public Utilities (NJ BPU) awarded Atlantic Shores an Offshore Renewable Energy Credit (OREC) allowance to deliver 1,509.6 megawatts (MW) of offshore renewable wind energy into the State of New Jersey. In response to this award, Atlantic Shores updated Volume 1 of the COP to divide the southern portion of Lease OCS-A 0499 into two separate and electrically distinct Projects. Project 1 will deliver renewable energy under this OREC allowance and Project 2 will be developed to support future New Jersey solicitations and power purchase agreements.

As a result of the June 30, 2021 NJ BPU OREC award, Atlantic Shores updated Volume I (Project Information) of the COP in August 2021 to reflect the two Projects. COP Volume II (Affected Environment) and applicable Appendices do not currently include this update and will be updated to reflect Projects 1 and 2 as part Atlantic Shores' December 2021 COP revision.

# Phase IA Archaeological Survey

## Atlantic Shores Offshore Wind – Cardiff Onshore Interconnection Cable Route and Facilities

Atlantic County, New Jersey

Prepared for:

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February 2021

## MANAGEMENT SUMMARY

| | |
|---|---|
| Involved State/Federal Agencies: | Bureau of Ocean Energy Management<br>New Jersey Historic Preservation Office<br>New Jersey Department of Environmental Protection |
| Phase of Survey: | Phase IA Archaeological Survey |
| Location Information: | City of Atlantic City and City of Pleasantville, Egg Harbor Township<br>Atlantic County, New Jersey |
| Area of Potential Effect: | |
| Description: | Approximately 12-mile (19.3-kilometer) buried, onshore transmission cable in a 20-foot (6-meter) corridor, as well as an approximately 13.3-acre (5.4-hectare) onshore substation to be sited in one of two possible locations. |
| USGS 7.5-Minute Quadrangles: | *Atlantic City, NJ, Oceanville, NJ, Pleasantville, NJ* |
| Phase IA Archaeological Survey | |
| Overview: | There are no previously reported archaeological sites located within the area of potential effect for the proposed Cardiff Onshore Interconnection Cable Route and associated facilities.<br><br>There are seven previously identified archaeological sites within 0.5-mile (0.8-kilometer) of the area of potential effect, four Native American sites and three Euro-American sites. |
| Report Authors: | T. Arron Kotlensky, RPA, Michael Kenneally, Douglas Pippin, PhD, RPA, Patrick Heaton, RPA |
| Date of Report: | February 2021 |

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GLOSSARY OF ACRONYMS, SYMBOLS, AND TERMS

| | |
|---|---|
| ac | acre |
| APE | Area of Potential Effect |
| At | Atlantic County (for archaeological trinomial site numbers) |
| BOEM | Bureau of Energy Management |
| BP | Before Present |
| cm | centimeter |
| CFR | Code of Federal Regulations |
| D.P.C. | Design Professional Corporation |
| ECC | Export Cable Corridor |
| EDR | Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. |
| ESRI | Environmental Systems Research Institute |
| ft | feet |
| GNSS | Global Navigation Satellite System |
| ha | hectare |
| HDD | horizontal directional drilling |
| in | inch |
| km | kilometer |
| kV | kilovolt |
| LOC | Library of Congress |
| LUCY | Look Up Cultural-resources Yourself – The New Jersey Historic Preservation Office database |
| MDS | map documented structure |
| m | meter |
| mi | mile |
| NPS | National Park Service |
| NEPA | National Environmental Policy Act |
| NHL | National Historic Landmark |
| NJ | New Jersey |
| N.J.A.C. | New Jersey Administrative Code |
| NJHPO | New Jersey Historic Preservation Office (State Historic Preservation Office) |
| NJSM | New Jersey State Museum |
| NRHP | National Register of Historic Places |
| NRCS | Natural Resources Conservation Service |
| POI | Point of Interconnection |
| ROW/ROWs | Right-of-way/rights-of-way |
| RPA | Register of Professional Archaeologists |
| § | Section |
| SCS | Soil Conservation Service |
| SRHP | State Register of Historic Places |
| SOI | Secretary of the Interior |
| USGS | United States Geological Survey |

# 1.0 INTRODUCTION

## 1.1 Purpose of the Investigation

On behalf of Atlantic Shores Offshore Wind, LLC (Atlantic Shores), a 50/50 joint venture between EDF-RE Offshore Development, LLC, a wholly owned subsidiary of EDF Renewables, Inc. (EDF Renewables) and Shell New Energies US LLC (Shell), Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) has prepared this Phase IA archaeological survey for the proposed Atlantic Shores, Cardiff Onshore Interconnection Cable Route and associated facilities. The Onshore Cable Route is located within the cities of Atlantic City and Pleasantville and Egg Harbor Township, Atlantic County, New Jersey (Figures 1 and 2).

The Phase IA archaeological survey was prepared to assist the New Jersey Historic Preservation Office (NJHPO; acting as the State Historic Preservation Office), the Bureau of Ocean and Energy Management (BOEM), and other New Jersey state and/or federal agencies in their review of the Facility under Section 7:4 of the New Jersey Administrative Code (NJAC), the State of New Jersey Executive Order 215, and/or Section 106 of the National Historic Preservation Act, as applicable.

The purpose of this Phase IA archaeological survey is to inventory and characterize previously identified archaeological resources within the Onshore Cable Route's Area of Potential Effect (APE; as described in Section 1.2) and evaluate the potential for unidentified terrestrial archaeological resources to be present within the Preliminary APE. The Phase IA archaeological survey was prepared by professional archaeologists who satisfy the qualifications criteria provided in the Secretary of the Interior's Standards for archaeology and historic preservation (Title 36 Code of Federal Regulations Part 61, Appendix A), as appropriate. The Phase IA survey and report were prepared in accordance with applicable requirements and guidance provided in NJAC 7:4-8.4 and 7:4-8.5, *Requirements for Phase I Archaeological Survey* and *Requirements for Archaeological Survey Reports* (NJAC. 2015), further expanded and clarified by the New Jersey Historic Preservation Office (NJHPO 2000; 2008).

## 1.2 Project Description

Atlantic Shores is developing an offshore wind energy generation project within the southern portion of Lease Area OCS-A 0499, located on the Outer Continental Shelf within the New Jersey Wind Energy Area. Atlantic Shores proposes to construct, operate, and decommission offshore wind energy generation facilities, offshore export cables, onshore interconnection cables, and an onshore substation. The Project will include up to 200 wind turbine generators, up to 10 offshore substations, and up to four cables installed within a single offshore, Export Cable Corridor. Those cables will deliver power from the generation facilities to landfall sites located in either Monmouth County (the Monmouth Landfall Site) or Atlantic County (the Atlantic Landfall Site), New Jersey. From the Atlantic Landfall Site,

onshore cables will travel through existing roadway, bike trail, and/or railroad rights-of-way to the Cardiff Point of Interconnection (POI) for connection to the electrical grid.

The Cardiff Onshore Interconnection Cable Route is an approximately 12-mile (mi) (19-kilometer [km]) underground electrical transmission cable and supporting infrastructure sited within existing linear infrastructure corridors to connect the Atlantic Landfall Site with the existing Cardiff POI. The APE for the Onshore Cable Route is an approximately 12-mi (19.3-km) underground, onshore transmission cable in a 20-foot (ft) (6-meter [m]) corridor which will interconnect to one of two possible onshore substation locations.

Atlantic Shores has proposed that the Cardiff Onshore Interconnection Cable be buried within existing paved roadways, a bike path, and railroad ROWs. The selection of a buried cable (as opposed to an overhead transmission line) avoids potential visual impacts (including visual impacts to historic properties). In addition, siting the Cardiff Onshore Interconnection Cable within paved roadways avoids potential impacts to adjacent undisturbed soils and avoids or minimizes the risk of potentially encountering undisturbed archaeological deposits. The historical development and extent of prior disturbance within the Cardiff Onshore Interconnection Cable Route is described in this report.

The Atlantic Landfall Site is located in the southern portion of Atlantic City, along Sovereign Avenue. The onshore section of the underground submarine cable transition vault as proposed will terminate at the eastern end of Sovereign Avenue under a parking area adjacent to the Atlantic City Boardwalk. The proposed onshore cable route continues northwest under Sovereign Avenue through urban residential and commercial areas to the western end of the roadway at the Intracoastal Waterway where the cable will be emplaced with horizontal directional drilling (HDD) to the opposite shore within Bader Airfield.

From Bader Airfield, the cable will be further emplaced with HDD under Turtle Gut and Great Thoroughfares tidal waterways and will run parallel to U.S. Route 40 for approximately 1.5-mi (2.4-km) to the northwest, at which the cable route merges into an inactive railroad ROW that also accommodates an existing overhead 69 kilovolt (kV) electrical transmission line operated by Atlantic City Electric. The cable route continues northwest along this corridor for approximately 4.5-mi (7.2-km) through the Town of Pleasantville and will cross beneath the Garden State Parkway near the existing Shore Mall commercial property.

At this point, from the shopping mall, the inactive railroad ROW transitions into the asphalt-paved Atlantic County Bikeway East. The proposed cable route continues within this ROW to English Creek Road for approximately 3.0-mi (4.8-km). At English Creek Road, the route turns north following English Creek Road for approximately 0.5-mi (0.8-km) to the existing Atlantic City Electric-operated 230 kV transmission line ROW. The Cardiff POI is approximately 0.3-mi

(0.5-km) west of English Creek Road. The estimated design width of the Onshore Cable Route corridor is approximately 20-ft (6-m), with the designed depth of emplacement no greater than 6.0-ft (1.8-m) below ground surface.

For the purposes of clarity and brevity, the following terms are used throughout this report:

| | |
|---|---|
| Atlantic Shores Offshore Wind Project | Atlantic Shores' proposal to develop the Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 0499 for the generation of renewable energy from offshore wind comprised of up to 200 total wind turbine generators (WTG) and up to ten offshore substation (OSS) positions. |
| Atlantic Shores Onshore Project Area | The onshore locations where Atlantic Shores Offshore Wind components will be physically located. |
| Cardiff Onshore Interconnection Cable Route (Onshore Cable Route) | The Onshore Cable Route described in this survey with is associated infrastructure, within which the onshore interconnection cables will be installed, from Atlantic City to the Cardiff Point of Interconnection. |
| Cardiff Onshore Substation, Preferred | An approximately 13.3-acre (ac) (5.4-hectare [ha]) landside gas-insulated substation sited on a parcel of land approximately 21.6-ac (8.7-ha), on an existing paved lot in Egg Harbor Township, Atlantic County, New Jersey. |
| Cardiff Onshore Substation, Alternate | An approximately 13.3-ac (5.4-ha) landside gas-insulated substation sited on a parcel of land approximately 23.9-ac (9.7-ha), on an existing paved lot in Egg Harbor Township, Atlantic County, New Jersey. |
| Cardiff POI | The existing Cardiff Point of Interconnection substation at the western terminus of the Onshore Cable Route. |
| APE for Direct Effects: | The APE for Direct Effects (APE) for the Onshore Cable Route are those areas containing all proposed soil disturbance associated with the construction of the Cardiff Onshore Interconnection Cable Route. As currently designed, the Onshore Cable Route will utilize existing roadways for access and no new roadways are proposed. |
| Historic Properties: | Historic properties include: sites and properties (whether archaeological resources, existing above-ground resources, or both) that are listed in, or have been determined by NJHPO to be eligible for listing in, the State and/or National Registers of Historic Places (S/NRHP); National Historic Landmarks (NHL); and properties without formal S/NRHP eligibility determinations provided by NJHPO, characterized as "not determined" or "undetermined" in site files. |

The Onshore Cable Route also includes the parcels for the preferred and alternate Cardiff Onshore Substation locations which may include either an air-insulated switchgear design or a gas-insulated switchgear design pending the substations' final detailed design. The onshore substation will require permanent improvements consisting of an above-ground substation situated within former or active shopping area and adjoining parking area (see Figures 2 and 3). The preferred location is at the interchange between U.S. Routes 40/322 and the Garden State Parkway, and the inactive railroad ROW that the Onshore Cable Route follows. The preferred location is situated within a 21.6-ac (8.7-ha) parcel encompassing a former shopping mall area and adjoining parking, located approximately 2,000-ft (609-m) west of the interchange between U.S. Routes 40/322 and the Garden State Parkway. The alternate location is situated within a 23.9-ac (9.7-ha) parcel encompassing an active shopping center with parking, located approximately 1,250-ft (381-m) north of the interchange between U.S. Routes 40/322. A companion report provides a preliminary Phase IA assessment of the potential indirect, or visual, effects of the substation to above-ground historic resources (EDR 2020).

## 1.3 Organization of the Report

The Phase IA survey and report were prepared in accordance with applicable requirements and guidance provided in NJAC 7:4-8.4 and 7:4-8.5, *Requirements for Phase I Archaeological Survey* and *Requirements for Archaeological Survey Reports* (NJAC 2015), further expanded and clarified by the New Jersey Historic Preservation Office (NJHPO 2000; 2008). This report includes an *Introduction* (Section 1.0) followed by *Background Research* for the Cardiff Onshore Cable Route (Section 2.0), *Archaeological Sensitivity Assessment* (Section 3.0), *Summary and Conclusions* (Section 4.0), *References* (Section 5.0), *Appendix A: Photographs*, and *Figures*.

# 2.0 BACKGROUND RESEARCH

## 2.1 Environmental Setting and Soils

The Onshore Project Area is located along the Atlantic Ocean shoreline of New Jersey within the broad, low relief Outer Coastal Plain physiographic province, which formed from rising and falling sea levels over the Cenozoic Era (66 million years to the present). Subsequently, bedrock and older sediments in this physiographic province are derived from marine and littoral sediments as well as riverine and alluvial deposits originating from the eroding Appalachian Mountains to the west. More recent deposits consist of outwash plains formed during the Pleistocene Epoch and accelerating with the retreat of the Laurentide Ice sheet approximately 12,000 years ago (National Park Service [NPS] 2018; Newell et al. 1998).

The deeper underlying unit below the Outer Coastal Plain is made up of unconsolidated sediments that mainly consist of gravels, sands, and clays that gradually decrease in depth with increasing distance from the coastline, before merging into the Inner Coastal Plain province that precedes the Piedmont further inland. The farthest southern advance of glacial ice during the Pleistocene Epoch terminated north of the Outer Coastal Plain in northern New Jersey and did not significantly alter the composition or relief of the Outer Coastal Plain. However, Pleistocene glaciation created significantly lower sea levels than at present due to the massive amount of seawater absorbed into ice sheets in the northern hemisphere. Sea levels were as much as 394-ft. (120-m) lower than the present day in various settings in North America during the Pleistocene (Gornitz 2007). As ice sheets melted during the terminal Pleistocene and early to middle Holocene (between approximately 20,000 and 4,000 years before present [BP]), global sea levels rose and submerged large areas of once habitable land, including land east of the present New Jersey shoreline. Global sea levels stabilized at current levels approximately 4,000 years BP but seaward coastal conditions and estuaries continued to evolve as they do at the present time.

Like other coastal areas along the North American eastern seaboard, there are relatively few perennial streams in the vicinity of the Onshore Cable Route. The closest named stream to the interconnection facility, Patcong Creek, drains areas south of the Onshore Cable Route and numerous bays, islands, and inlets separate the upland area of Egg Harbor Township from Abescon Island. This is a barrier island that stretches for approximately 8.0-mi. (12.9-km) northeast to southwest, from Abescon Inlet in the north to Great Egg Harbor Inlet in the south. The island is 1.8-mi. (2.9-km) is maximum width. Much of the island is developed for entertainment, hotels, resorts, and vacation homes within Atlantic City, with Ventnor City, Margate City, and Longport to the south of Atlantic City.

Four distinct soil units are present within the Onshore Cable Route, representing the primarily sandy composition of soils in the vicinity. These units include Downer and Galloway loamy sands to Psammaquents, as well as sand/gravel

pits, ranging from well drained to somewhat poorly drained (Environmental Systems Research Institute [ESRI] and Natural Resources Conservation Service [NRCS] 2020; NRCS 2020). As noted previously, Atlantic Shores has elected to site the Onshore Interconnection Cable buried within existing paved roadways and railroad ROWs. This avoids potential impacts to adjacent undisturbed soils and avoids or minimizes the risk of potentially encountering undisturbed archaeological deposits.

## 2.2 Research Sources

EDR reviewed primary and secondary sources to assess the potential for previously unidentified cultural resources within the APE. Digital collections, online databases, archives, and repositories consulted during EDR's research for the Onshore Cable Route included the following:

- NJHPO LUCY online database[1];
- New Jersey State Museum archaeological site files;
- Library of Congress (LOC) digital collections;
- LOC Historic American Building Survey /Historic American Engineering Record digital collections;
- New Jersey Historical Society digital collections;
- Atlantic County Historical Society website;
- David Rumsey Map Collection database;
- NRHP nominations as provided by the NPS;
- New Jersey State Library Genealogy and Local History collection;
- New Jersey State Archives online catalog; and
- Online academic journal databases.

In addition, local and regional histories were consulted, including:

- *Early History of Atlantic County, New Jersey* by Laura Willis (1915); and
- *Greater Egg Harbor Township Historical Society* website (2020)

Historical mapping and community management documents consulted included:

- 1828 *A Map of the State of New Jersey: With Part of the Adjoining States* by Gordon, T.;
- 1860 *Topographical Map of the State of New Jersey* by Hopkins, G.M.;

[1] Due to the Covid-19 pandemic, the NJHPO suspended in-person research visits in 2020.

- 1872 *State Atlas of New Jersey* by F.W. Beers;
- 1872 "Topographical Map of Atlantic County, New Jersey: From Recent and Actual Surveys." In *State Atlas of New Jersey: Based on State Geological Surveys and From Additional Surveys* by F.W. Beers (Figure 5);
- 1878 "The State of New Jersey," in *Historical and Biographical Atlas of the New Jersey Coast* by Howell, G.W.;
- 1888 *A Topographical Map of Egg Harbor and Vicinity including the Atlantic Shore from Barnegat to Great Egg Harbor* by Cook, G.H., Smock, J.C., and Vermeule, C.C. (Figure 6);
- 1893 USGS 1:62,500-scale Topographical Map, *Great Egg Harbor, N.J.* Quadrangle (Figure 7);
- 1894 and 1941 USGS 1:62,500-scale Topographical Maps, *Atlantic City, N.J.* Quadrangle (Figures 7 and 8);
- 1943 USGS 1:62,500-scale Topographical Map, *Pleasantville, N.J.* Quadrangle (Figure 8);
- 1906,1921, and 1943 Sanborn Fire Insurance Maps for Atlantic City, NJ;
- 1886,1891, and 1903 Sanborn Fire Insurance Maps for Egg Harbor City, NJ
- 1906,1911, and 1924 Sanborn Fire Insurance Maps for Pleasantville, NJ;
- Historical cartography provided online by Rutgers University;
- 2000 *Atlantic County Master Plan* by Atlantic County Department of Regional Planning and Economic Development;
- 2002 *Egg Harbor Township Master Plan* by Mott, Polistina & Associates, LLC (Polistina 2002); and
- 2008 *City of Pleasantville Master Plan* by Remington, Vernick & Walberg Engineers (Wiser and Walberg 2008).

## 2.3 Previously Identified Cultural Resources

No previously identified cultural resources are located within the APE for the Onshore Cable Route. EDR conducted a literature review and background research for the APE and a 0.5-mile (0.8-km) buffer, using information available through LUCY, the NJHPO's cultural resources online database. The LUCY database includes State and National Registers of Historic Places (S/NRHP)-eligible and -listed properties and sites, historic districts, properties, and sites not listed in or unassessed for listing in S/NRHP, and archaeologically sensitive areas organized by a grid. EDR conducted archaeological site file research through correspondence with the New Jersey State Museum (NJSM) in Trenton, NJ. For its background and site file research, EDR employed a 0.5-mi (0.8-km) study radius encompassing the APE. In addition to a review of the information available through LUCY, EDR also examined cultural resources reports held in EDR's reference library and available online. Archaeological sites located within 0.5-mi. (0.8-km) of the Onshore Cable Route are summarized in Table 1and shown on Figure 4.

**Table 1. Previously Recorded Archaeological Sites Within 0.5-Mile (0.8-Kilometer) of the Onshore Cable Route**

| Site Number | Alternate Number | Site Name | Approx. Distance and Direction from Onshore Cable Route | NRHP-Eligibility | Time Period | Site Type |
|---|---|---|---|---|---|---|
| 28At003 | 36-13-5-1-9 | Pleasantville | [redacted] | Undetermined | Unspecified, | Native American Village site |
| 28At004 | 36-13-5-4-6 | Smith's Landing (location 1) | [redacted] | Undetermined | Unspecified, | Native American Shell midden |
| 28At006 | 36-13-5-5-4 | Smith's Landing (location 3) | [redacted] | Undetermined | Unspecified, | Native American Shell midden |
| 28At007 | 36-13-5-2-2 | Mt. Pleasant | [redacted] | Undetermined | Unspecified, | Native American Camp site |
| 28At137 | Pinelands Site #: Interim 9 | None provided | [redacted] | Undetermined | Mid-20th century | Agricultural buildings |
| 28At160 | Pinelands Site #: Interim 35 | Pine View Grove | [redacted] | Undetermined | Mid- to late 20th century | Religious meeting camp |
| 28At226 | Pinelands Site #: 90-B | Broadway | [redacted] | Undetermined | Mid-20th century | Refuse dump |

## 2.4 Historic Context

The following cultural context summarizes the Native American and Euro-American settlement of coastal New Jersey as they relate to cultural resources which may be present in the vicinity of the APE. Table 3 provides a summary of Native American cultural periods that are typically recognized by archaeologists.

**Table 2. Native American Cultural Periods for Coastal New Jersey**

| Time Period | Environment | Settlement Pattern & Subsistence Strategy | Artifact Assemblage | Comments |
|---|---|---|---|---|
| Paleo-Indian Period (Prior to 10,000 BP) | Non-forested plains, Pleistocene megafauna present along the coast, low sea level causes coastline to be miles out to sea from its current location. | Mobile hunting and gathering. | Fluted points. | Sites along coastlines now inundated under the Atlantic Ocean surface. Low population density. Sites are extremely rare. Very few sites dating to the Paleoindian Period are known from New Jersey. |
| Early Archaic Period (10,000-8,000 BP) | Warmer and wetter conditions relative to previous period, sea level begins to rise. | Mobile hunting and gathering (but somewhat decreased mobility) | Bifurcate Points. | Sites along coastlines now inundated under the Atlantic Ocean surface. Low population density. Sites are extremely rare. Very few sites dating to the Early Archaic Period are known from New Jersey. |
| Middle Archaic Period (8,000-6,000 BP) | Continuation of warm and wet conditions, sea level rises and coast stabilizes near current extent. Pine and oak dominated forests give way to mixed deciduous forests. | Mobile hunting and gathering. Seasonal exploitation of resources. Initial exploitation of marine resources at the end of this period. | Poplar Island complex; Stanly Stemmed and Neville projectile points, notched atlatl weights, biface knives, drills, side scrapers, hammerstones, and choppers. | Small seasonal sites utilizing a majority of terrestrial fauna for subsistence. Marine shellfish were utilized but not deposit in great number due to high mobility. |
| Late Archaic Period (6,000-3,500 BP) | Continuation of warm and wet conditions | Somewhat high residential mobility, likely on a seasonal basis. Exploitation of marine resources (not widely represented). | Susquehanna point types, cremation burials in shallow pits, diversifying stone toolkit. | Larger population sizes than the previous period, small seasonal settlements seasonally located on upland landforms and sandy plateaus. |
| Transitional Period (4,000-3,000 BP) | Cooling trend. Mixed deciduous forests persist. | Somewhat high residential mobility, likely on a seasonal basis. Small scale exploitation of marine resources. | Orient Culture influences. Small shell middens. Cemeteries. Orient fishtail projectile points. Steatite vessels. | Shellfish exploitation in seasonal camps leaving middens. Cemeteries for burials. |
| Early Woodland Period (3,000-2,300 BP) | Cooler temperatures persist. Mixed deciduous forests persist. | Terrestrial foraging coupled with intensive exploitation of marine resources. | Cadwalader Complex. Large shell middens/rings. Introduction of ceramics. | Increased sedentism leads to larger communities developing leaving more material trace. |

| Time Period | Environment | Settlement Pattern & Subsistence Strategy | Artifact Assemblage | Comments |
|---|---|---|---|---|
| Middle Woodland Period (2,300-1,000 BP) | Warming and drying trend (Medieval Climatic Anomaly). Mixed deciduous forests persist. | Terrestrial foraging coupled with intensive exploitation of marine resources, introduction of agriculture. | Meadowood Culture. Lithic toolkits including quartz and quartzite projectile points. Shell tempered and stamped undecorated ceramics. | Large communities exploiting all resources available. Introduction of agriculture. |
| Late Woodland Period (1,000-400 BP) | Warm and dry conditions persist. Mixed deciduous forests persist. | Sedentary villages supported by agriculture, seasonal camps targeting large and small game, plants, riverine, and marine resource. | Wide variety of projectile point types, high frequency of triangular projectile points including quartz and quartzite. Increasing use of decorated ceramics. | Large communities exploiting all resources available including agriculture, relationships with surrounding populations cause consistent trade. |
| Contact Period (400 BP) | Cooler and wetter conditions (Little Ice Age). Mixed deciduous forests persist. | Sedentary villages supported by agriculture, seasonal camps targeting large and small game, plants, riverine, and marine resource. | Similar technology to Late Woodland Period, with increasing presence of European trade goods. | Relationships with the English and Dutch reveal a mixture of pre-contact and post-contact material culture, large manufacture of wampum to facilitate political interests. |

Sea levels along the east coast of North America reached their late Pleistocene nadir during the Last Glacial Maximum, between approximately 26,500 and 20,000 years ago. Deglaciation began in the Northern hemisphere at approximately 20,000 years ago and in Antarctica at approximately 14,500 years ago. Although physically distant, the timing of deglaciation in Antarctica is relevant to the current along coastal New Jersey because it introduced a large volume of water into the oceans which drastically increased the rate of global sea level rise between approximately 14,500 years ago and 10,000 years ago (Clark et al. 2009). The significantly lower sea levels during glaciation meant that large expanses of the eastern North American continental shelf were exposed, providing habitat for plants and animals, as well humans. In the words of Stanford and Bradley (2012:91): "during the last ice age the western Atlantic shelf was a vast and environmentally rich plain stretching from the Grand Banks off Newfoundland to Florida and around the Gulf of Mexico." Lower sea levels during the late Pleistocene epoch and extending into the early Holocene, the outer coastal plain of New Jersey extended the coastal plain to the east by 60 to 80-miles (97 to 129-km) (Stanzeski 2005:58).

In eastern North American, rising sea levels gradually inundated the coastal plain between approximately 20,000 and 10,000 years ago (with the rate of sea level rise increasing between approximately 14,500 and 10,000 years ago), temporarily creating a biotically rich estuarine environment which was also eventually inundated (Stanford and Bradley,

2012:111). Sea levels along the east coast of North America have continued to rise throughout the last 10,000 years, although at much reduced rates compared to the period between approximately 20,000 and 10,000 years ago.

The earliest people to occupy the coastal plain of New Jersey likely focused their subsistence along the plains and estuaries now submerged under the Atlantic Ocean (Stanzeski 2005). Therefore, due to rising sea levels, many of the earliest archaeological sites in the region are now underwater. Similar to other coastal regions of eastern North America, few archaeological sites representing the Pre-Clovis, Paleoindian, and Early Archaic Periods (i.e., spanning between approximately 13,000 and 8,500 years ago) have been identified along coastal New Jersey (Shrabisch 1915; 1917; Skinner and Shrabisch 1913; Stanzeski 1996; 1998). However, undisturbed Pre-Clovis (i.e., pre-13,000-year-old) archaeological sites in the region would likely be located on the now-submerged continental shelf east of the present New Jersey shoreline (Stanford and Bradley, 2012). It is also possible early sites dating to the Paleoindian and Early Archaic periods, if they exist on modern-day terrestrial coast of New Jersey, have been overlooked in previous investigations because they often consist of relatively small, low density lithic scatters lacking diagnostic bifaces and dateable carbon-bearing features. This is reflective of the fact that the earliest human groups who occupied the landscape were highly mobile, existed in relatively low population densities, and did not use ceramic technologies (Ritchie and Funk 1973).

The Middle and Late Archaic Periods (8,500 to 3,000 years ago) on the coastal plain of New Jersey is characterized by higher mobility, which was likely patterned by seasonal subsistence strategies. Population density increased at a greater rate during these periods than during previous periods and settlement was characterized by small seasonally occupied settlements located in riverine, lacustrine, and coastal environments. This settlement pattern took advantage of the wide variety of natural resources, including marine resources that were available across coastal settings after sea levels stabilized to near present levels (Chesler ed. 1982). Diagnostic artifacts and features that indicate a Middle Archaic period occupation include Stanly Stemmed and Neville projectile point types, while Late Archaic bifaces and tool kits are marked by non-local sources of lithic materials, such as rhyolite and porphyry (Chesler ed. 1982). Late Archaic projectile points have been further characterized by Small Stemmed and the later Susquehanna point traditions in southern New Jersey. The stabilizing oak-chestnut-hickory forests of the eastern Atlantic seaboard began to support larger populations of medium sized game like deer and turkey that in turn led to higher human populations. Sites dating from the Late Archaic further suggest that higher population density led to greater exploitation of niche ecosystems, smaller game, and more attention paid to nuts and wild cereal grains for food (Chesler ed. 1982). Decreasing mobility coupled with the funerary practice of cremation points to increasing attention to semi-permanent settlements and territoriality (Spier 1915; Veit and Bello 2001).

The Transitional Period spanning between the Late Archaic and Early Woodland Periods is defined by somewhat high residential mobility, likely on a seasonal basis to pursue small scale exploitation of marine resources, especially shellfish, during optimum harvest seasons and while shifting to terrestrial, upland resources during other seasons. Coastal camp sites dating to the Transitional Period often contain shell middens, such as the Tuckerton Shell Mound in Burlington County, New Jersey. The period is characterized by material culture that includes small shell middens, formal cemeteries, and distinctive Orient fishtail stemmed projectile points which were often made of locally procured quartzite and occasionally quartz. An important technological change from the Late Archaic Period was the appearance of soapstone vessels that preceded ceramic cultures (Braun 1974; Ritchie and Funk 1973).

The Early Woodland Period (3,000 to 2,000 years ago) is characterized by a foraging tradition combined with an intensive exploitation of marine resources and the introduction of ceramic technology. Increased sedentism during this period caused large communities to converge on more permanent settlements. These large, semi-permanent settlements left a more distinct material culture trace, and as a result are more archaeologically expressed than the smaller campsites dating to earlier periods. Material culture dating to this period in the Outer Coastal plain is most often included in the Cadwalader Complex which includes the first appearance early ceramic technology with flat-bottomed vessels, large shell middens/shell rings, and broad side-notched projectile points. Early woodland ceramics tend to be coarser and unrefined in construction, tempered with steatite and quartz, and are rarely extensively decorated (Tuck 1978).

The Middle Woodland Period (2,000 to 1,000 years ago) is distinguished from earlier periods by increased evidence of foraging and intensive exploitation of marine resources, but also the first appearance of horticulture throughout the Middle Atlantic region and the Atlantic coast. Horticultural economies allowed larger communities to remain sedentary for much of the year, utilizing more resources available around these settlements but with groups rarely exceeding 50 persons. Material culture traditions that are well expressed during the Middle Woodland Period in New Jersey include the Meadowwood Culture, which consists of lithic toolkits including various styles of quartz lobate, stemmed, and side-notched projectile points, as well as shell tempered undecorated ceramics, followed by the Fox Creek Culture that placed heavier preference on fishing than upland game (ASNJ 2013).

During the Late Woodland Period (1,000 to 400 years ago), groups along the coast of New Jersey occupied large villages and engaged in intensive marine and riverine resource exploitation, and terrestrial hunting. Archaeological evidence, including exotic trade goods, indicates complex relationships with both surrounding and more distant cultures which facilitated trade as well as the spread of technologies and cultural practices including ceremonial use of tobacco (Chesler ed. 1982; Veit and Bello 2004). Usage of decorated ceramics increased dramatically, which has been useful to archaeologists in defining distinct cultural traditions, or *phases*, tied to different areas of the Middle Atlantic region.

These phases include a wide variety of projectile point types and a high frequency of triangular projectile points made of local quartz and quartzite, plus exotic traded materials such as rhyolite and chalcedony. Large shell rings, middens, and decorated ceramics (e.g., Overpeck Incised, Bowmans Brook Incised, and Riggins Fabric-Impressed) are also all prevalent during this period (Chesler ed. 1982).

At the time of contact between Native Americans and Europeans, in the sixteenth and seventeenth centuries, the Lenni Lenape people inhabited present day coastal areas and the interior of New Jersey. The local branch was the Unalachtigo Lenape, or the "people who live near the ocean" (Snyder 1969). However, contact-period Native American archaeological sites for the coastal region are rare and poorly characterized due to loss of sites from later periods of development and increasing erosion of shorelines and stream and riverbanks.

The first European voyagers included the Dutch, Finns, and Swedes, who founded competing trade settlements along the coast from present-day Cape May to Trenton and into the Delaware River valley. The Finnish and Swedish colonies, however, did not receive enough support from their respective home countries, and suffered from a lack of financial and human resources. In 1655, Peter Struyvesant sent a fleet of Dutch ships to raid the Finnish and Swedish settlements, resulting in the Dutch taking over control of the area for New Netherland (Meredith and Hood 1921; Snyder 1969).

The New Jersey colonies came under English control when the Dutch surrendered New Amsterdam in 1664. For the next century, emigres from Holland, Huguenots from France, and Scots, among others, made New Jersey their home. During this early colonial period, the colony was split into two halves, East and West Jersey. In 1693, Great Egg Harbor Township, or simply Egg Harbor, was formed. During the American Revolution, southern New Jersey was the site of many battles and for four months in 1783, the city of Princeton served as the capitol of the United States (Meredith and Hood 1921; Snyder 1969).

Atlantic County was formed in 1837 from the Townships of Egg Harbor, Galloway, Hamilton, and Weymouth (Snyder 1969). The first deed sold in Atlantic County was in the Township of Egg Harbor in the same year. An economy around the production of iron arose in the early nineteenth century in the vicinity of Egg Harbor City, but the ore supplies were exhausted by the turn of the century (Hall, 1900). In addition, Cape May and Atlantic City emerged as major resort attractions on the Atlantic Ocean during the nineteenth century. In 1854, a rail line connecting the seashore to areas inland was constructed through Egg Harbor Township, which precipitated growth. By the turn of the twentieth century, most of the residents in Atlantic County lived in Atlantic City (Morrison 1950; Atlantic County Planning 2000). During the early-twentieth century, Egg Harbor Township was also center for the manufacturing of cut glass and textiles (Meredith and Hood 1921).

During the first half of the twentieth century, Atlantic County, specifically Atlantic City, continued to grow and remain popular. However, during the second half of the twentieth century, the population shifted from Atlantic City to the suburban county areas, following the nation-wide trends. In 1976, New Jersey passed an act which legalized gambling in Atlantic City. Consequently, fears of an economic boom in the suburban areas prompted various environmental conservation laws to protect the natural resources from improper development and suburban sprawl. At the beginning of the twenty-first century, Atlantic County was undergoing gentrification in some populated areas where the transition from multi-family apartment housing to new single-family dwellings occurred. In the suburban areas, senior housing developments were built in response to the region's aging population (Atlantic County Planning 2000).

## 2.5 Existing Conditions

Existing conditions within and adjacent to the APE were observed and photographed during an archaeological reconnaissance completed by EDR personnel on September 22, 2020. The reconnaissance included walking or driving adjacent to or across the proposed locations of the transmission cable, both preferred and alternate onshore substation locations, Atlantic Landfall Site along the shore, and POI. These conditions are explained in further detail here, progressing from the landfall location, along the proposed Onshore Cable Route to the POI. Recent aerial imagery and photographic documentation of the APE is provided in Figure 9 and in Appendix A.

From the Atlantic Landfall Site along the shoreline in Atlantic City, the Cardiff Onshore Cable Route follows a northwest course through developed urban neighborhoods along South and North Sovereign Avenues in the City of Atlantic City for approximately 2,700-ft (824-m) (Appendix A: Photographs 1 and 2). At the end of North Sovereign Avenue, the Onshore Cable Route crosses beneath the Intracoastal Waterway, and passes through the inactive Bader Airfield on the north shore of the Intracoastal Waterway before continuing to the northwest, crossing beneath Great Thorofare waterway and assuming a course that parallels to the north of U.S. Route 40/322 (Appendix A: Photograph 3). Northwest of Bader Airfield, the Onshore Cable Route parallels U.S. Route 40/322 for 3,940-ft (1,200-m) as it passes over the upland portion of Great Island, then once again crosses Great Thorofare and continues to parallel U.S. Route 40/322 for approximately 3,120-ft (950-m) before merging into an inactive railroad ROW that parallels the Atlantic City Expressway to its north. Historic map research suggests that the areas adjacent to U.S. Route 40/322 near Great Thorofare are built up land and have been modestly developed for light commercial and public buildings since the mid-twentieth century.

The Onshore Cable Route continues within the inactive railroad ROW on a course to the northwest, passing into and through the City of Pleasantville for approximately 3.2-mi (5.1-km). Situated within the inactive railroad ROW, the Onshore Cable Route passes by lightly developed mixed-use commercial and industrial areas, residential

neighborhoods, and cemeteries (Appendix A: Photographs 4 and 5). West of Devins Lane and passing into Egg Harbor Township, the Onshore Cable Route follows for 1.1-mi (1.7-km) an active single-track railroad spur that serves adjacent mixed industries (Appendix A: Photograph 6). The Onshore Cable Route continues to follow along an inactive railroad ROW for approximately 1,385-ft (422-m), passing beneath the Garden State Parkway and intersects U.S. Route 40/322 in the vicinity of several shopping centers before merging into the ROW of the Atlantic County Bikeway corridor, an asphalt-paved rail-trail that utilizes the former railroad ROW (Appendix A: Photograph 7). The Onshore Cable Route, situated within the Atlantic County Bikeway ROW, parallels West Jersey Avenue and continues on a relatively straight northwest course that passes through light density residential neighborhoods for a distance of approximately 2.9-mi (4.7-km) (Appendix A: Photographs 8-11). At the intersection of English Creek Avenue, the Onshore Cable Route turns to the north-northeast, following English Creek Avenue within the shoulder of the northbound lane for approximately 0.5-mi (0.8-km), passing through light density mixed commercial areas and residential neighborhoods (Appendix A: Photographs 12 and 13). At the intersection of the existing Atlantic City Electric high-tension transmission ROW, the Onshore Cable Route turns to the west and follows the transmission ROW for approximately 0.4-mi (0.6-km) before interconnecting with an existing open-air substation (Appendix A: Photograph 14).

Three cemeteries are adjacent to portions of the Onshore Cable Route in the Town of Pleasantville (Figure 9, Sheets 5 and 6). There are two of these cemeteries adjacent to the APE between the intersections with Doughty Road and New Road. These are Atlantic City Cemetery on the north side of the Onshore Cable Route, and Greenwood Cemetery on the south side. Approximately 0.75-mi (1.2-km) to the west is Mount Calvary Cemetery on the south side of the Onshore Cable Route. The sensitivity assessment for the three cemeteries with respect to the Onshore Cable Route is discussed in greater detail in Section 3.2.

# 3.0 ARCHAEOLOGICAL SENSITIVITY ASSESSMENT

## 3.1 Native American Archaeological Sensitivity Assessment

As noted in Section 2.3, no previously recorded archaeological resources are located within the APE for the Onshore Cable Route. All the sites with Native American components within 0.5-mi (0.8-km) of the APE are near the Intracoastal Waterway (Figure 4). This indicates a higher likelihood for sites to be situated near permanent sources of water, both fresh and salt, specifically Lakes Bay located within the Intracoastal Waterway, and the Great Thorofare waterway which flows within the APE. Locating sites proximal to the coast, freshwater streams, and wetlands would have provided a diverse set of resources to Native Americans. As also described in Section 2.2, there are four previously identified archaeological sites with Native American components located within 0.5-mi (0.8-km) of the APE (see Table 2; see Figure 4). These sites consist of a village (28At003), two shell middens (28At004 and 28At006), and a camp site (28At007), indicating occupation of the landscape at both a transient and intensive scale.

Due to the presence of several previously identified Native American archaeological sites within 0.5-mi (0.8-km) of the APE, the proximity of the APE to the Atlantic Coast and Intracoastal Waterway, the APE should be considered to have a moderate sensitivity for the presence of Native American archaeological resources (in the absence of historic-period and modern ground disturbance). This sensitivity is particularly noted across the eastern portion of the APE near Lakes Bay and the Great Thorofare. In general terms, portions of the APE that are not located close to the coast, freshwater streams, and wetlands (and associated ecological habitats) are less likely to contain potentially significant Native American archaeological sites. However, due to the extent of prior ground disturbance (see Section 3.3) there is very low likelihood for intact Native American archaeological resources to be located within the APE.

## 3.2 Euro-American Archaeological Sensitivity Assessment

As described in Section 2.4 and illustrated on historic maps (see Figures 5 to 8), the surrounding area has an historic-period occupational history since at least the mid-seventeenth century. No previously recorded historic-period archaeological sites are located within the APE. There are three previously recorded archaeological sites with historic-period components located within 0.5-mi (0.8-km) of the APE (see Table 2; see Figure 4). These sites, associated with agricultural buildings (28At137), a religious meeting camp (28At160), and a refuse dump (28At226) all date from the mid- to late-twentieth century. Two of the sites are associated with former structures (i.e., agricultural outbuildings, and church cabins and dining hall), and all consist of domestic and/or architectural artifact scatters/remains.

Historic maps illustrate the patterns of settlement and development within and adjacent to the APE during the nineteenth and twentieth centuries. The APE is sited within well-established roadway and railroad corridors, the evolution and longevity of which are depicted on historic maps and aerial photographs. The following summary provides

a brief overview of historic maps for the Onshore Cable Route, which underwent gradual development throughout the nineteenth century before undergoing rapid suburbanization in the twentieth century.

During the early- to mid-nineteenth century local road networks were already established throughout the region, as seen in the 1828 Gordon *Map of the State of New Jersey*, but major settlements were not present in the immediate vicinity of the Onshore Cable Route. The larger settlements of Bargaintown and Absecon are visible to the south and north of the Onshore Cable Route respectively, and a series of road networks traversed the area joining these larger population areas (Gordon 1828).

The late-nineteenth century witnessed further development within the Onshore Cable Route. The 1872 Beers *Topographical Map of Atlantic Co.* depicts more development in the vicinity, including the development of Smith's Landing, Pleasantville, and Risleyville near the center of the Onshore Cable Route, and development associated with Atlantic City in the eastern portion of the Onshore Cable Route (Beers 1872). The Atlantic City Turnpike, which portions of the Onshore Cable Route parallels, is depicted traversing west from Atlantic City to the more populated areas around Smith's Landing, Pleasantville, and Risleyville. However, the western terminus of the Onshore Cable Route remained largely undeveloped, as did the area between the Atlantic Coast and the mainland (Figure 5). The 1888 Cook, Smock, and Vermeule *Topographical Map of Egg Harbor and Vicinity* shows a similar road network as depicted in the 1872 Beers map, but also depicts an influx of rail lines through the Onshore Cable Route including the West Jersey & Atlantic Railroad, the Philadelphia and Atlantic City Railroad, the Pleasantville and Ocean City Railroad, the Camden and Atlantic Railroad, and the South Atlantic Railroad (Figure 6). These transportation networks were still intact and depicted on the 1893 and 1894 *Great Egg Harbor, NJ* and *Atlantic City, NJ* USGS topographical maps (Figure 7). The West Jersey Railroad began construction for the new rail line in 1856 and use of the railroad began by 1863, with certain portions in use earlier as the West Jersey Railroad utilized portions of a discarded section of the Camden and Woodbury Railroad.

The Onshore Cable Route was extensively developed by the mid-twentieth century, as visible on the 1941 and 1943 *Pleasantville, NJ* and *Atlantic City, NJ* USGS topographical maps (Figure 8). These maps show increased development both on the Atlantic Coast, south of Atlantic City (present-day Ventnor) and along the mainland abutting the Intracoastal Waterway, as well as the development of West Atlantic City on the north shore of Lake Bay. In addition, development had by then extended west from Pleasantville into the western portion of the Onshore Cable Route. These mid-twentieth-century maps indicate increased population density, and the development of a more complex road system and extensive development pattern over the past half century, and development further increased through the end of the twentieth century. These maps illustrate most of the Onshore Cable Route's transition from rural agricultural

communities to burgeoning suburbs in the twentieth century, as evidenced by the previously recorded archaeological sites within 0.5-mile (0.8-kilometer) of the APE.

In the latter half of the twentieth century, the construction of the Garden State Parkway in 1955 precipitated extensive commercial development at the interchanges in the vicinity of the Onshore Cable Route, which are still mostly intact today. The Harbor Square Mall, originally known as the Shore Mall, then Searstown Mall, was first constructed in 1968. Other plazas and shopping centers followed in the 1970s, including Cardiff Center. Some small-scale residential development also took place, including mobile homes parks, and intermittent groups of one-story prefabricated homes around the periphery of the commercial centers.

### *3.2.1 Cemeteries*

As noted in Section 2.5, the Onshore Cable Route runs adjacent to three cemeteries in Pleasantville (Figure 9, sheets 5 and 6). The Atlantic City Cemetery on the north side of the Onshore Cable Route, and Greenwood Cemetery and Mount Calvary Cemetery on the south side. All three cemeteries are absent from the 1872 Beers *State Atlas of New Jersey* and *Topographical Map of Atlantic County, New Jersey*. The Atlantic City cemetery appears fist on the 1918 USGS topographic quadrangles for Great Egg Harbor, New Jersey (USGS, 1918). As noted, the West Jersey Railroad (now the route of the Onshore Cable) began construction in 1856 and use of the railroad began by 1863. All three cemeteries were established after the construction of the railroad. According to cemetery records, the earliest dates for internment in each of the cemeteries are as follows:

- The Atlantic City Cemetery (Figure 9: Sheet 5) was formally established in 1865 (Internment.net, 2021), however, cemetery records indicate the earliest burial in the cemetery belonged to Matilda Pickett dating back to 10 March 1827, predating any construction for the West Jersey and Camden/Woodbury Railroads (Atlantic County Historical Society, 2021; Find a Grave, 2021; The Jersey City News, 1893, 1900, 1920). The APE (a 20-ft [6 m] wide corridor) is located within the former railroad ROW (approximately 66-ft [20m] wide), approximately 22-ft (6.7-m) south of the property line with the cemetery.
- Greenwood Cemetery (Figure 9: Sheet 5) has its earliest burial in the cemetery recorded as 13 March 1893 and belonging to Nellie Ware (Atlantic County Historical Society, 2021; Find a Grave, 2021; The Jersey City News, 1893, 1900, 1920). The APE is approximately 24-ft (7.3-m) north of the property line with the cemetery.
- The Mount Calvary Cemetery (Figure 9: Sheet 6) has its earliest burial in the cemetery belonging to Neta Souder and dating to 19 May 1892 (Atlantic County Historical Society, 2021; Find a Grave, 2021; The Jersey City News, 1893, 1900, 1920). The APE is located within the former railroad ROW (approximately 98-ft [30 m] wide in this area), approximately 47-ft (14.3-m) north of the property line with the cemetery.

Because the cemeteries were established after the construction of the railroad, it is not anticipated that there is any potential for burials to be located (or to have once been located) within the former railroad ROW and APE.

## 3.3 Prior Ground Disturbance

The NJHPO archaeological survey guidelines indicate that Phase I archaeological survey is not necessary in delineated wetlands, inundated terrain, previously disturbed areas, and areas where slopes exceed 12 to 15 percent (NJHPO 2008). Slope is not a significant factor in the archaeological sensitivity of the APE as the proposed Onshore Cable Route is predominately located across flat to gently sloping terrain. Atlantic Shores has proposed that the Onshore Cable be located within existing paved roadways, a bike path, and a railroad corridor. Siting the Onshore Cable within paved roadways and railroads ROWs avoids potential impacts to adjacent undisturbed soils and avoids or minimizes the risk of potentially encountering undisturbed archaeological deposits.

Previous ground disturbance throughout the Onshore Cable Route vicinity has been intense over the past century, during which time the area endured significant development and transformed into a densely populated and commercially developed sprawling suburban landscape. This transformation occurred relatively quickly as large tracts of land were developed during the twentieth century and uniformly subdivided neighborhoods were constructed for a rapidly growing population of Americans. Development throughout the Onshore Cable Route vicinity continues to the modern day as new residences, businesses, and recreational facilities are constructed within interstitial pockets of undeveloped land. This development would have significantly disturbed, if not destroyed, any archaeological sites that may have been present within now-developed areas. Limited to the APE specifically, this disturbance is predominately the result of commercial, recreational, and road construction and maintenance.

Prior ground disturbance within the APE was recorded by EDR archaeologists on September 22, 2020, which included walking or driving adjacent to or across the proposed locations of the transmission cable, both preferred and alternate onshore substations, Atlantic Landfill Site along the shore, and the Cardiff POI to record existing conditions, which were documented by photographs, field notes, and GNSS-collected data. The primary goal of the reconnaissance was to identify those areas where visible prior ground disturbance (e.g., engineered/artificial landforms, grading, cut and fill, and/or buried utility markers) was evident. Observations of existing conditions within the APE are described in Section 2.5 of this report, depicted on Figure 9, and in photographs included in Appendix A.

## 3.4 Archaeological Sensitivity Summary

The results of background research and the archaeological reconnaissance described herein indicate that the Onshore Cable Route, Cardiff POI, and preferred and alternate onshore substation locations have been significantly disturbed due to transportation infrastructure development (principally roadways and railroads) and adjoining business and

residential neighborhoods. Siting the Onshore Cable within paved roadways and railroads ROWs avoids potential impacts to adjacent undisturbed soils and avoids or minimizes the risk of potentially encountering undisturbed archaeological deposits. Therefore, in the opinion of EDR, there is very little likelihood for intact or potentially significant archaeological resources to be located within the APE.

# 4.0 SUMMARY AND CONCLUSIONS

## 4.1 Summary of Phase IA Archaeological Survey

The results of the Phase IA archaeological survey are summarized as follows:

- No previously recorded cultural resources are located within the APE for the Onshore Cable Route.
- Atlantic Shores has sited the Cardiff Onshore Interconnection Cable to be buried within existing paved roadways, a bike path, and railroad ROW to the maximum extent practicable. Siting within paved roadways avoids potential impacts to adjacent undisturbed soils and previously unrecorded cultural resources.
- Four previously recorded archaeological sites associated with Native Americans are located within 0.5-mi (0.8-km) of the APE. These sites consist of a village, a camp site, and two shell middens.
- Three previously recorded archaeological sites with historic-period components are located within 0.5-mi (0.8-km) of the onshore facilities but are not intersected by the APE. These three sites consist of domestic and/or architectural artifact scatters/features associated with a religious camp dating from the mid- to late twentieth century and domestic refuse.
- Three cemeteries are adjacent to the portion of the Onshore Cable Route that is located within the ROW for the former route of the West Jersey Railroad, which was constructed 1856-1863. Because the cemeteries were established after the construction of the railroad, it is not anticipated that there is any potential for burials to be located (or to have once been located) within the former railroad ROW and APE.
- An archaeological reconnaissance and desktop assessment of the onshore facilities was conducted to determine the extent of previous disturbance within the APE. This reconnaissance and desktop assessment found that the APE has been previously disturbed by road construction and maintenance, railroad construction and maintenance, commercial buildings and parking lots, modified/made land associated with road build-up and berms, grading, paving, drainage ditches, buried utilities, sidewalks, and excavations for buried utilities.

## 4.2 Conclusions

Atlantic Shores has proposed that the Onshore Cable be located within existing paved roadways, a bike path, and a railroad corridor which avoids potential impacts to adjacent undisturbed soils and avoids or minimizes the risk of potentially encountering undisturbed archaeological deposits. The results of background research and the archaeological reconnaissance described herein indicate that the Onshore Cable Route, Cardiff POI, and preferred and alternate onshore substation locations have been significantly disturbed due to transportation infrastructure development (principally roadways and railroads) and adjoining business and residential neighborhoods. Therefore, in the opinion of EDR, there is very little likelihood for intact or potentially significant archaeological resources to be located within the APE.

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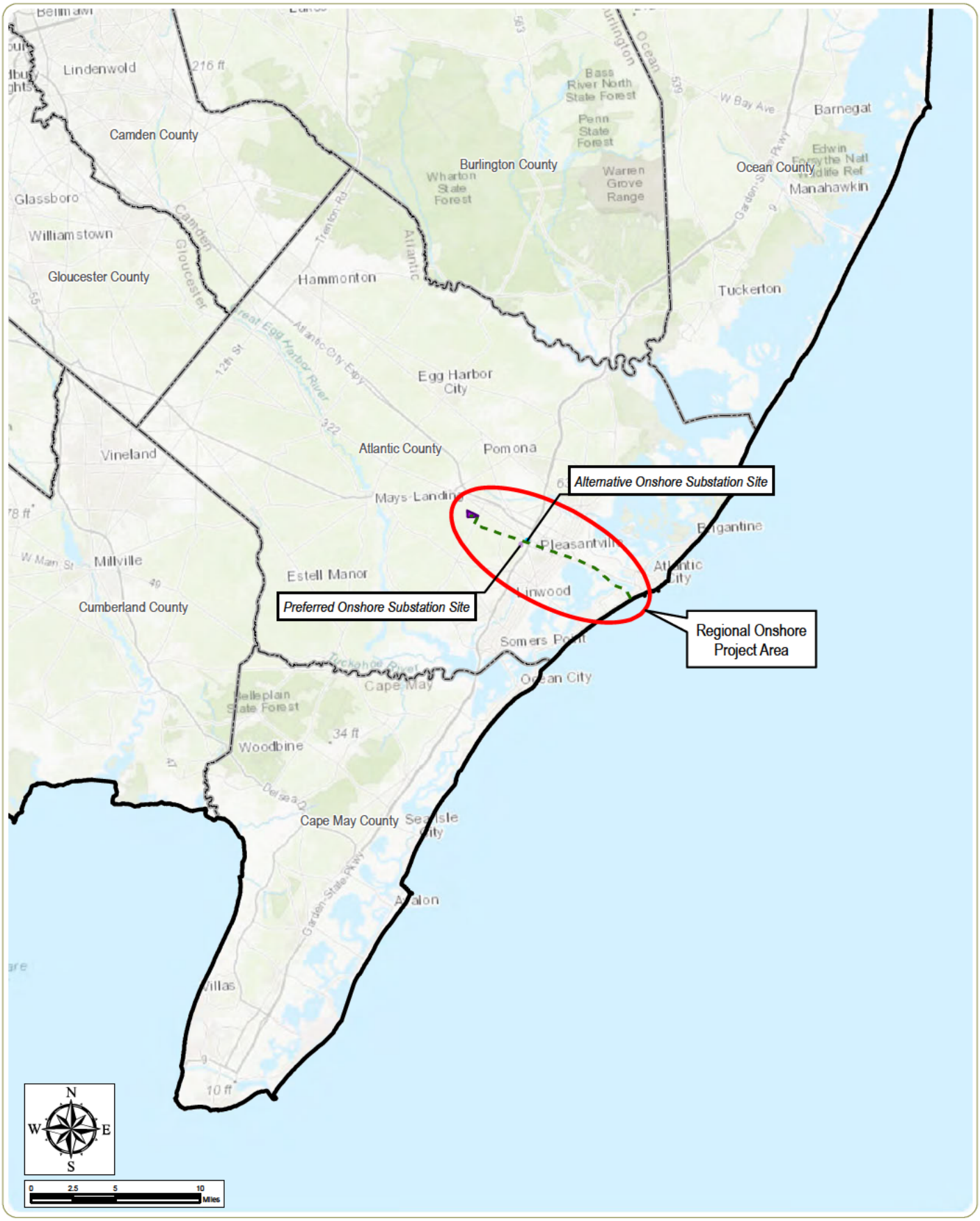
Figures



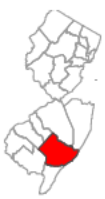

## Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 1: Regional Onshore Project Area**

**Notes: 1.** Basemap: ESRI ArcGIS Online "World Topographic Map" map service. **2.** This map was generated in ArcMap on January 25, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Cardiff Onshore Cable Route
- Cardiff Point of Interconnection
- County Boundary
- State Boundary



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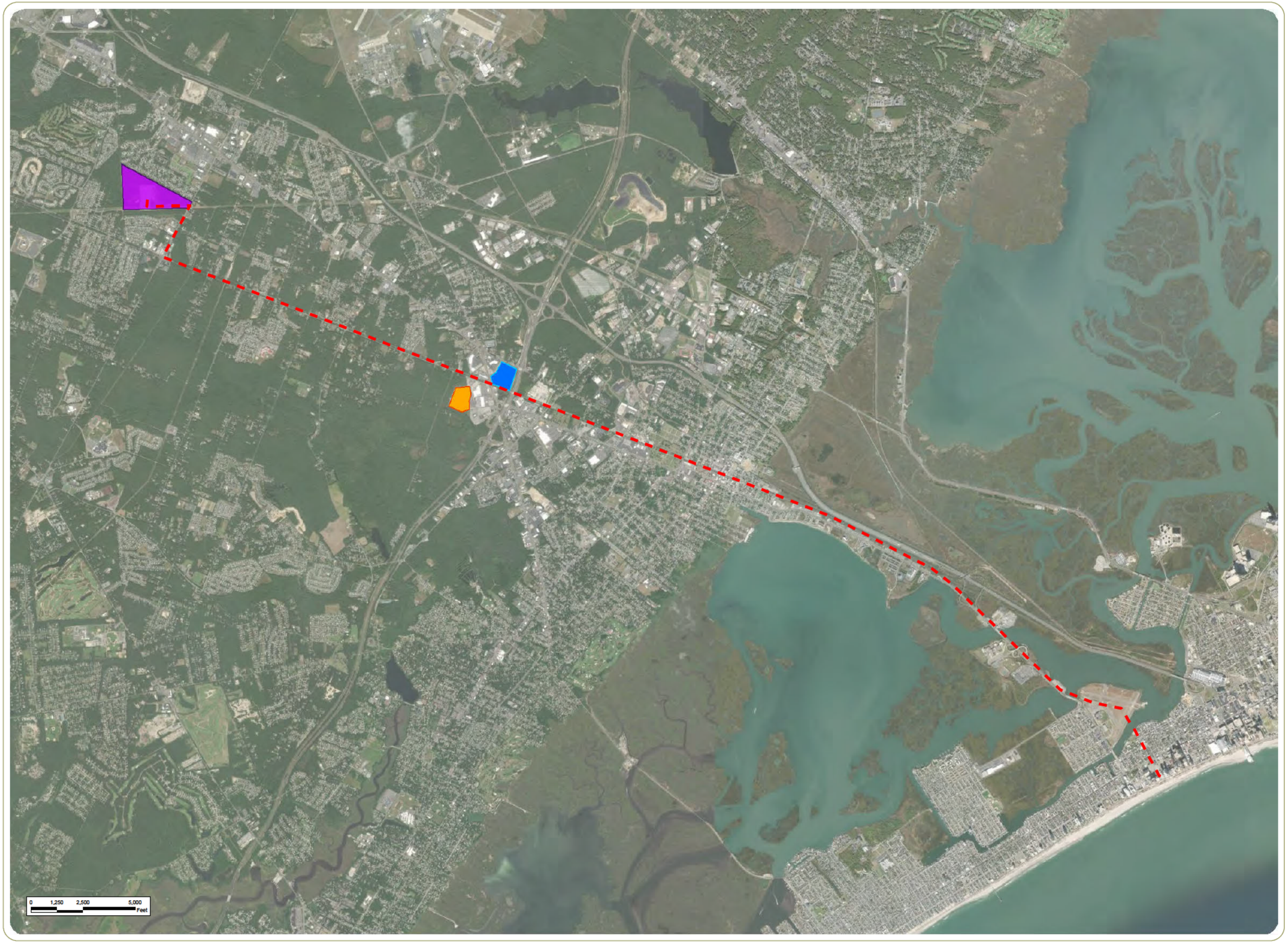
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 2. Proposed Onshore Cable Route**

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# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 3. Proposed Onshore Cable Route - Topographic Conditions**

- Cardiff Onshore Cable Route
- Cardiff Point of Interconnection
- Preferred Onshore Substation Site
- Alternative Onshore Substation Site

0 2,500 5,000 10,000 Feet

**Notes: 1.** Basemap: ESRI ArcGIS Online "USA Topo Maps" map service. **2.** This map was generated in ArcMap on January 25, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

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# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

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Figure 4. Previously Identified Cultural Resources

- Previously Identified Archaeological Sites
- Cardiff Onshore Cable Route
- Cardiff Point of Interconnection
- Preferred Onshore Substation Site
- Alternative Onshore Substation Site

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" map service.2. This map was generated in ArcMap on January 21, 2021. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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## Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 5. 1872 F. W. Beers, *Topographical Map of Atlantic County, New Jersey*: From Recent and Actual Surveys**

- Cardiff Onshore Cable Route
- Cardiff Point of Interconnection
- Preferred Onshore Substation Site
- Alternative Onshore Substation Site

**Notes: 1.** Basemap: 1872 F.W. Beers *Topographical Map of Atlantic County New Jersey* **2.** This map was generated in ArcMap on January 22, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

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# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 6. 1888 Cook, Smock, and Vermeule, *A Topographical Map of Egg Harbor and Vicinity* including the Atlantic Shore from Barnegat to Great Egg Harbor**

- Cardiff Onshore Cable Route
- Cardiff Point of Interconnection
- Preferred Onshore Substation Site
- Alternative Onshore Substation Site

**Notes: 1.** Basemap: 1888 Cook, Smock and Vermeule *A Topographical Map of Egg Harbor and Vicinity* **2.** This map was generated in ArcMap on January 22, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

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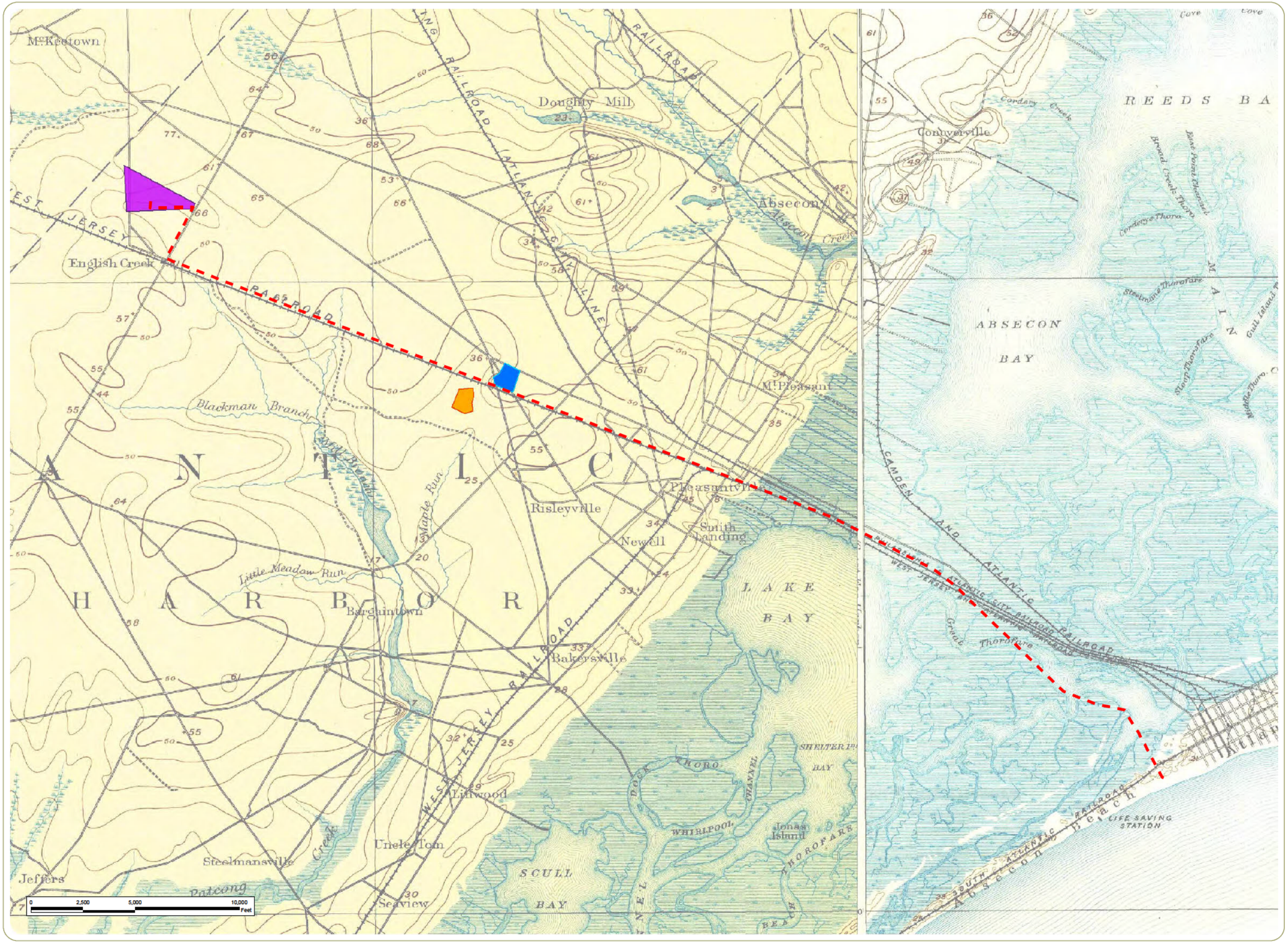
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 7. 1893 and 1894 USGS 1:62,500-scale topographical maps, *Great Egg Harbor, NJ and Atlantic City, NJ***




- Cardiff Interconnection Route
- Cardiff Point of Interconnection
- Preferred Onshore Substation Site
- Alternative Onshore Substation Site

**Notes: 1.** Basemap: 1893 USGS *Great Egg Harbor, NJ* and 1894 USGS*Atlantic City, NJ* 1:62,500 Topographic Quadrangles **2.** This map was generated in ArcMap on January 22, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

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## Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 8. 1941 and 1943 USGS 1:62,500-scale topographical maps, *Atlantic City, NJ and Pleasantville, NJ***

- Cardiff Onshore Cable Route
- Cardiff Point of Interconnection
- Preferred Onshore Substation Site
- Alternative Onshore Substation Site

**Notes: 1.** Basemap: 1941 USGS *Atlantic City, NJ* and 1943 USGS *Pleasantville, NJ* 1:62,500 Topographic Quadrangles **2.** This map was generated in ArcMap on January 22, 2021. **3.** This is a color graphic. Reproduction in grayscale may

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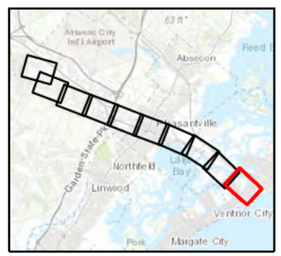
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**


Photograph Location

Cardiff Onshore Cable Route

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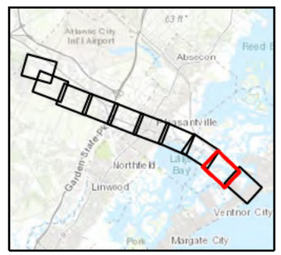
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**

Cardiff Onshore Cable Route

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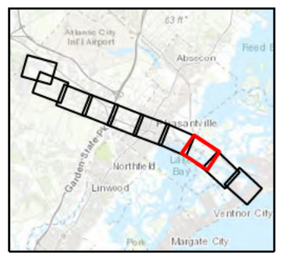
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**

Cardiff Onshore Cable Route

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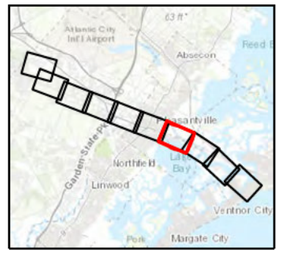
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**

Cardiff Onshore Cable Route

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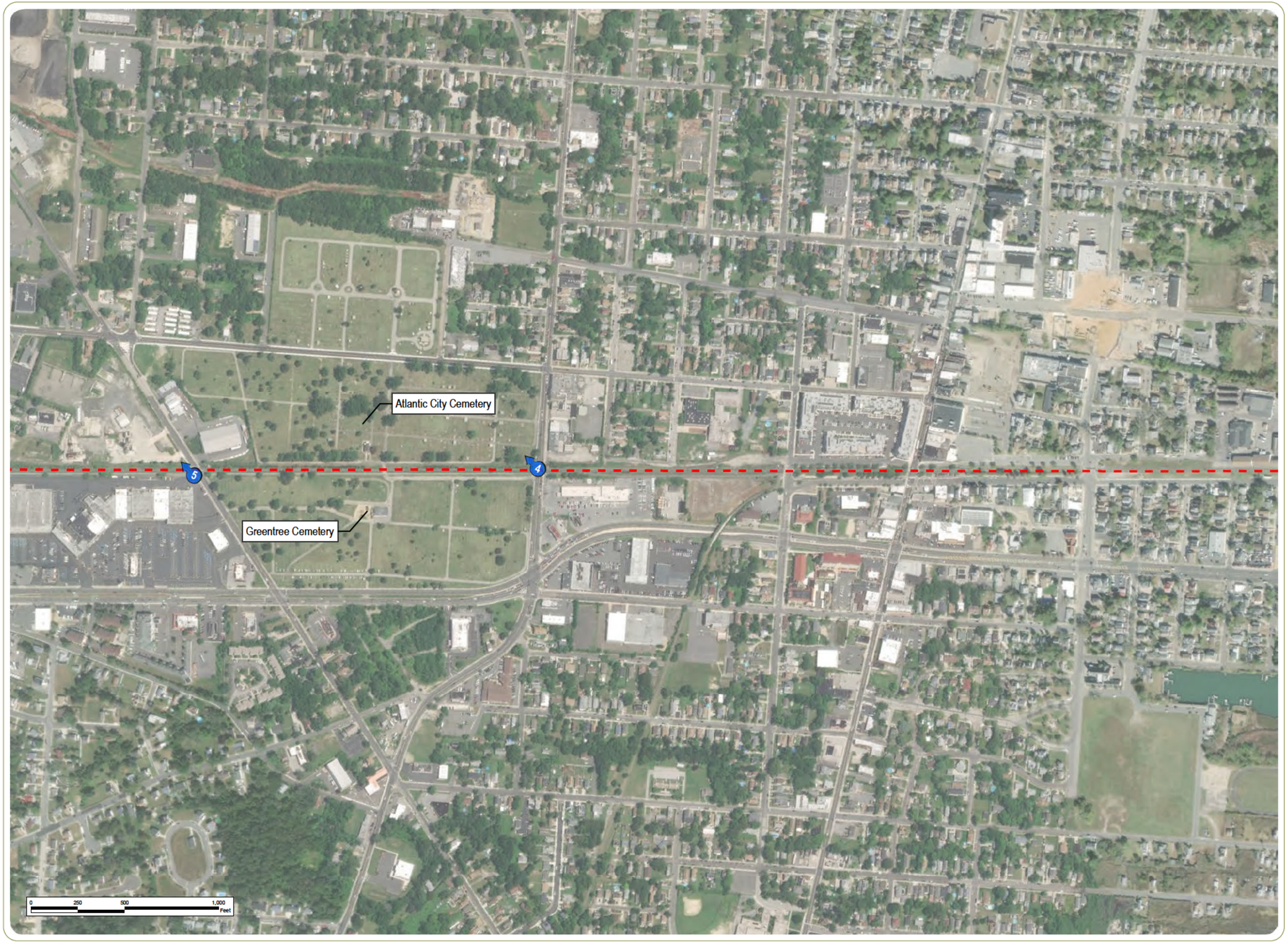


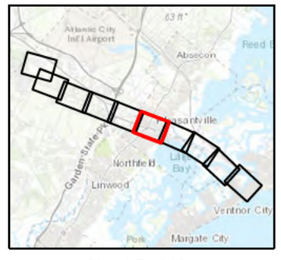

# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**

Photograph Location

Cardiff Onshore Cable Route

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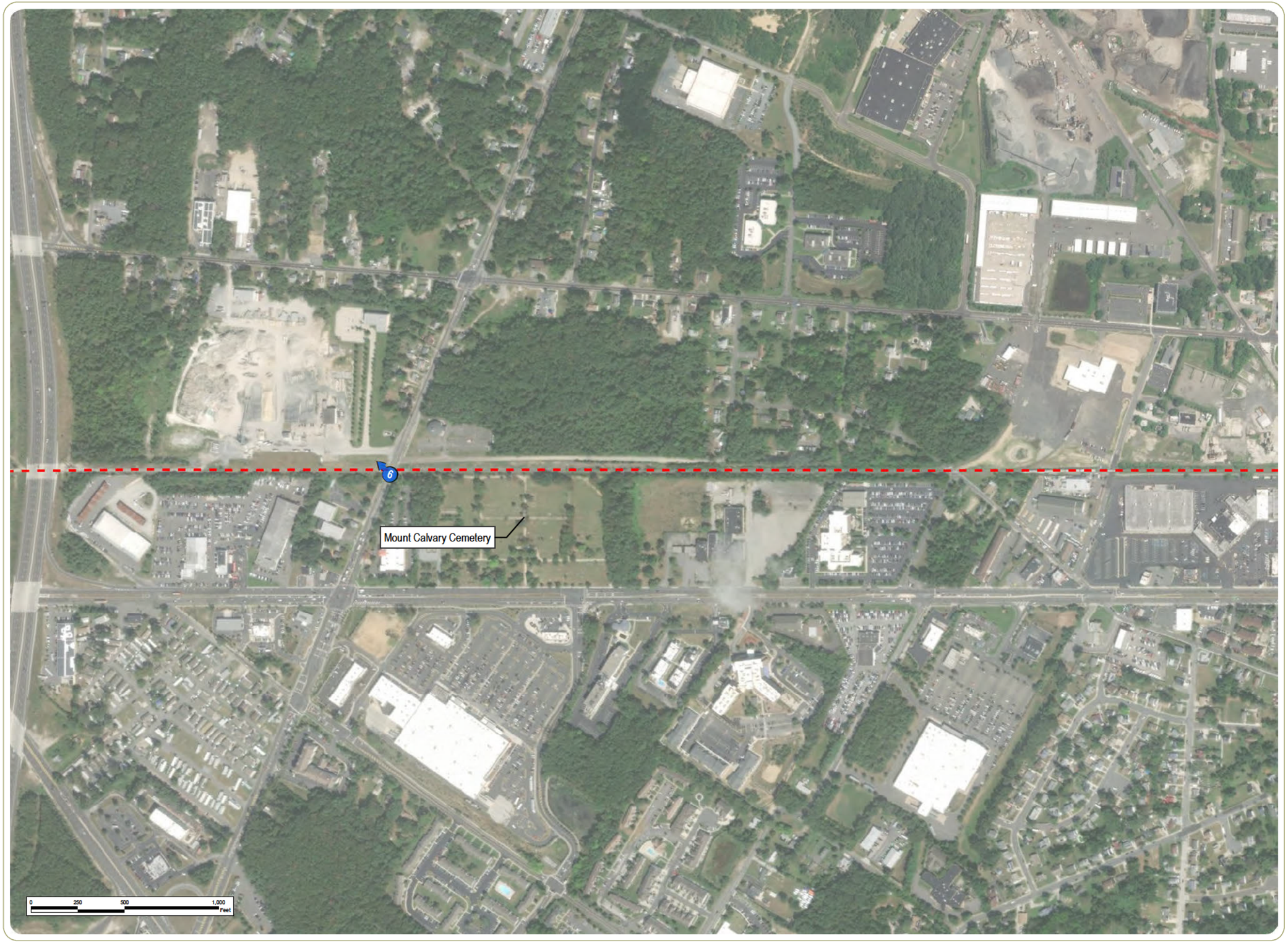
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

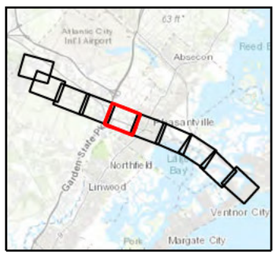
Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**




Photograph Location

Cardiff Onshore Cable Route

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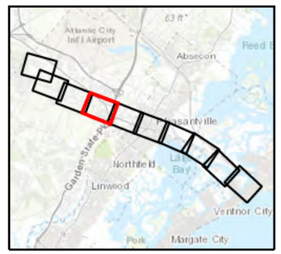
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**


- Photograph Location
- Cardiff Onshore Cable Route
- Preferred Onshore Substation Site
- Alternative Onshore Substation Site

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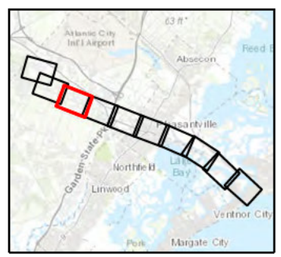
# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**

Photograph Location

Cardiff Onshore Cable Route

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# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

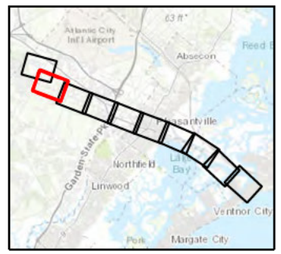
Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**

Photograph Location

Cardiff Onshore Cable Route

Cardiff Point of Interconnection

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# Atlantic Shores Offshore Wind Cardiff Onshore Interconnection Cable Route

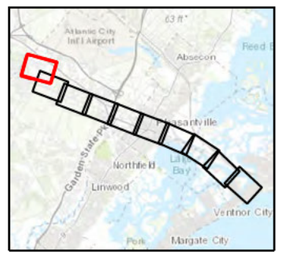
Borough of Egg Harbor Township, Pleasantville City, and the City of Atlantic City
Atlantic County, New Jersey

**Figure 9. Existing Conditions and Photo Key**


Photograph Location

Cardiff Onshore Cable Route

Cardiff Point of Interconnection

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# Appendix A:
# Photographs

## Photograph 1

Parking lot in area of cable landing point near South Sovreign Avenue. View to the southeast.

## Photograph 2

Area of cable route at north end of North Sovreign Avenue. View to the northwest.


## Photograph 3

Area of cable route within parking lot of vacant baseball park and adjacent to the inactive Bader Air Field. View to the northwest.

## Photograph 4

Area of cable route adjacent to Atlantic County Bikeway at northwest corner of South New Road (U.S. Route 9) and inactive West Jersey Railroad rail line. View to the northwest.

## Photograph 5

Area of cable route adjacent to Atlantic County Bikeway at the northwest corner of Doughty Road and inactive West Jersey Railroad rail line. View to the northwest.

## Photograph 6

Area of cable route adjacent at the northwest corner of Fire Road and inactive West Jersey Railroad rail line. View to the northwest.

## Photograph 7

Area of cable route adjacent to intersection of U.S. Route 40 and inactive West Jersey Railroad rail line. View to the northwest.

## Photograph 8

Existing conditions at Site 28-AT-226 at West Jersey Avenue. View to the south.


## Photograph 9

Area of cable route at the intersection of Winter Green Avenue and Atlantic County Bikeway along former West Jersey Railroad rail line. View to the northwest.

## Photograph 10

Area of cable route at the intersection of Winter Green Avenue and Atlantic County Bikeway along former West Jersey Railroad rail line. View to the southeast.

## Photograph 11

Existing conditions at Site 28-AT-137 at West Jersey Avenue. View to the southwest.

## Photograph 12

Area of cable route at the northeast intersection of English Creek Avenue and West Jersey Avenue, adjacent to Atlantic County Bikeway. View to the southeast.

## Photograph 13

Area of cable route along east side of English Creek Avenue. View to the north.

## Photograph 14

Area of cable route interconnection with existing high-tension transmission corridor. View to the west.

## Photograph 15

Overview of Preferred GIS location for the Cardiff Interconnect. View to the southwest.

## Photograph 16

Overview of Alternate GIS location for the Cardiff Interconnect. View to the southeast.