

Appendix II-P1

Phase IA Terrestrial Archaeology Resources Assessment (TARA) Onshore Interconnection Facilities - Public Summary

May 2024

Note: At the time of the initial development of this report, development of a substation and/or converter station at the Brook Road Site in Howell Township, New Jersey was considered. The Brook Road site is now expected to be prepared and developed as part of the State of New Jersey Board of Public Utility (BPU) State Agreement Approach 1.0 (SAA)¹ to support the delivery of offshore wind energy onshore. In collaboration with the regional grid operator PJM Interconnection (PJM), NJBPU conducted a study that examined whether an integrated suite of open access transmission facilities designated to support the delivery of offshore wind energy onshore could best facilitate meeting New Jersey's expanded offshore wind goals. Under the SAA 1.0 Award all permitting for site preparation activities, including construction activities to provide a "fit for purpose" site, for an associated substation and/or converter station will be the responsibility of the BPU's SAA-awardee at the Brook Road Site. Therefore, impacts associated with site preparation have not been considered as part of the Project Design Envelope (PDE) of the Project. Discussion of the site has been retained as part of the study area in this report to demonstrate the completeness of Atlantic Shores' multi-year development efforts.

¹[New Jersey Board of Public Utilities Selects Offshore Wind Transmission Project Proposed by Mid-Atlantic Offshore Development and Jersey Central Power & Light Company in First in Nation State Agreement Approach Solicitation](#)

Terrestrial Archaeological Resources Assessment – Public Summary

Atlantic Shores South Offshore Wind Project – Onshore Interconnection Facilities

Monmouth and Atlantic County, New Jersey

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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 Terrestrial Archaeological Resources Assessment (TARA) for the proposed onshore interconnection facilities located in the Boroughs of Manasquan and Borough of Sea Girt, Township of Howell and Township of Wall, Monmouth County, New Jersey and the City of Atlantic City and City of Pleasantville, Egg Harbor Township, Atlantic County, New Jersey (Figure 1). The information and results included in the TARA are intended to assist the New Jersey Department of Environmental Protection (NJDEP), New Jersey State Historic Preservation Office (NJHPO), the Bureau of Ocean and Energy Management (BOEM), and other relevant New Jersey State and/or Federal agencies and consulting partners in their review of the proposed onshore interconnection facilities 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 (NHPA), as applicable. This TARA was completed in support of the Atlantic Shores Construction and Operations Plan (COP; EDR, 2021a) for Atlantic Shores' proposal to develop two offshore wind energy generation projects (the Projects) within BOEM Lease Area OCS-A 0499 (the Lease Area).

The purpose of this TARA is to inventory and characterize previously identified archaeological resources within the Preliminary Area of Potential Effects for Physical Effects to Above Ground Historic Properties and Terrestrial Archaeological Resources (PAPE) and evaluate the potential for unidentified terrestrial archaeological resources to be present within the PAPE. Additional phased Phase IB archaeological field survey has been recommended within targeted portions of the PAPE.

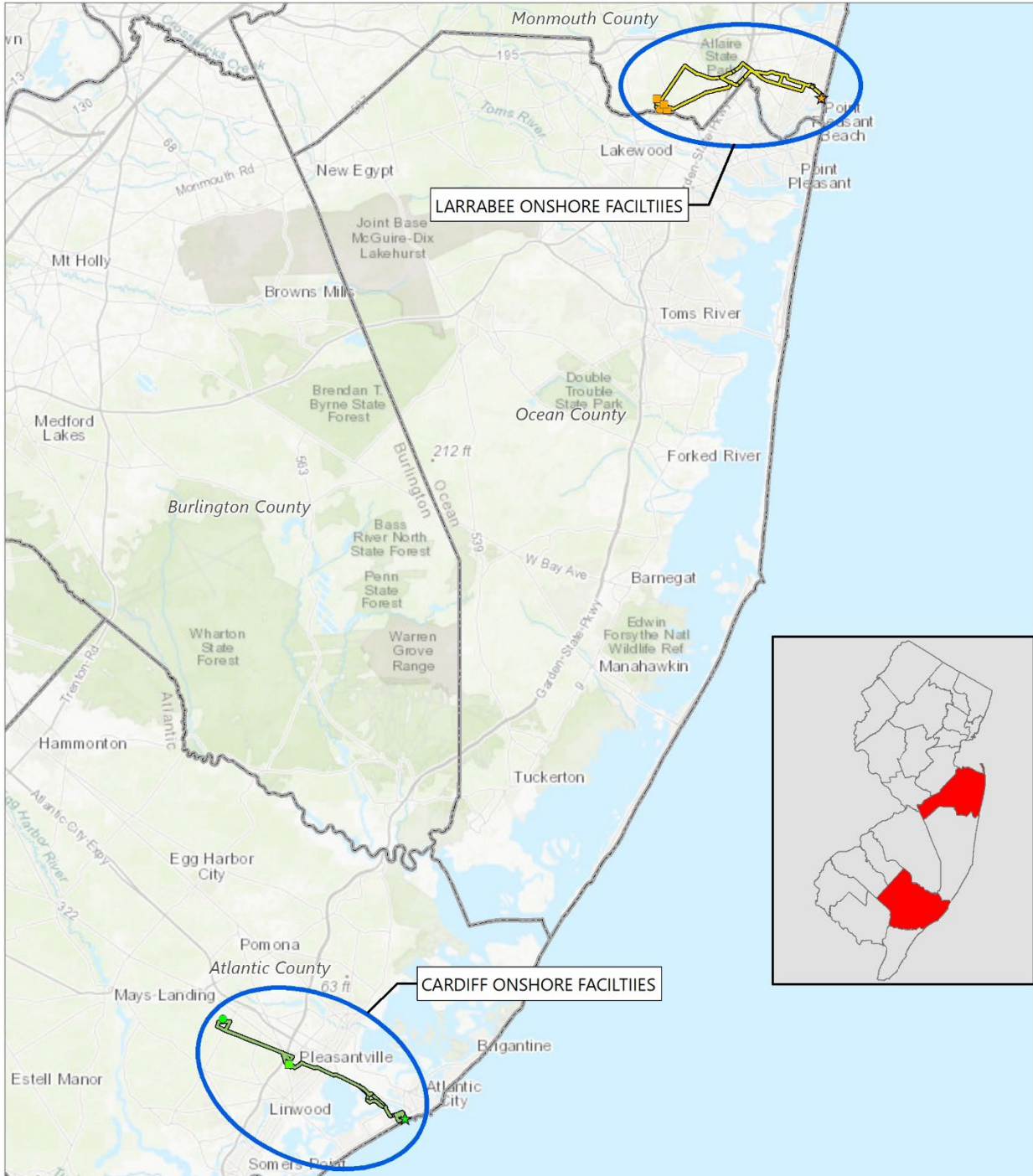
In August 2023, targeted Phase IB survey was completed for 19.98 acres of the Cardiff Onshore Facilities PAPE and approximately 4.77 acres of the Larrabee Onshore Facilities PAPE. The Phase IB archaeological field survey efforts for the remaining targeted portions of the PAPE are ongoing. BOEM has determined, in accordance with Section 106 regulations (36 CFR § 800.4 (b)(2), that a Phased Identification approach is appropriate for the survey, reporting, and consultation related to this

archaeological investigation while property access permissions are acquired to conduct the remaining Phase IB archaeological investigations. The anticipated Phased Identification schedule is included in the Projects' Phased Identification Plan: Terrestrial Archaeological Resources which can be found in Attachment 21 of the Memorandum of Agreement (MOA) executed among BOEM, NJSHPO, consulting Native American Tribes, and other consulting parties (BOEM, 2023).

The TARA 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 TARA was 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 and 2008). The results of the completed Phase IB field survey efforts are detailed in the full TARA report. The results of any Phase IB testing conducted hereafter will be presented in a subsequent revision or addendum to the TARA. Atlantic Shores anticipates that some Phase IB archaeological survey will be conducted following the Project's Record of Decision (ROD) and the execution of the MOA, but all survey results and additional relevant data will be submitted to BOEM and the consulting parties for review prior to the start of construction activities in unsurveyed areas.

The full TARA is included as Appendix II-P1 of the Projects' COP. A Historic Resources Effects Assessment (HREA) to identify and document aboveground historic properties with potential visibility of the proposed onshore interconnection facilities has been provided under separate cover and is included as Appendix II-N1 of the Projects' COP. A TARA to inventory and characterize previously identified archaeological resources within the PAPE for a proposed Operations and Management Facility (O&M Facility) has been provided under separate cover and included as Appendix II-P2 of the COP.

Figure 1. Regional Project Location



1.2 Description of Preliminary Area of Potential Effects (PAPE)

Atlantic Shores is developing two offshore wind energy generation projects within the Lease Area, located on the Outer Continental Shelf (OCS) within the New Jersey Wind Energy Area. Atlantic Shores proposes to construct, operate, and decommission the offshore wind energy generation facilities, offshore export cables, onshore interconnection cables, and onshore substations and/or converter stations. The Projects will include up to 200 wind turbine generators, up to 10 offshore substations, and up to eight cables installed within two offshore, export cable corridors (ECCs). Those cables will deliver energy from the offshore generation facilities to proposed landfall sites located in either Monmouth County (the Monmouth Landfall Site) and/or Atlantic County (the Atlantic Landfall Site), New Jersey. From the landfall sites, onshore cables will follow onshore interconnection cable routes (onshore routes) proposed within existing roadway, utility rights-of-way (ROWs), and/or along bike paths to existing Points of Interconnection (POIs) for connection to the electrical grid. Along the onshore routes, onshore substations and/or converter stations are also proposed.

To facilitate BOEM's Section 106 review, Atlantic Shores has defined the PAPE for the Projects. The PAPE included all locations under consideration where construction or operation of the proposed Projects has the potential to affect historic properties within the Project Design Envelope (PDE). According to BOEM, "A PDE approach is a permitting approach that allows a project proponent the option to submit a reasonable range of design parameters within its permit application, allows a permitting agency to then analyze the maximum impacts that could occur from the range of design parameters, and may result in the approval of a project that is constructed within that range" (BOEM, 2020). The PDE approach allows Atlantic Shores design flexibility and an ability to respond to advancements in industry technologies and techniques.

To support the assessment of potential physical effects to historic properties and terrestrial archaeological resources within the PDE, Atlantic Shores established a PAPE for physical effects to historic properties and terrestrial archaeological resources which incorporates the maximum breadth and depth of all areas of onshore ground disturbing activity, or other construction activities that could result in demolition or alteration of existing buildings or other built features.

The Project's overall PAPE for physical effects consists of three distinct PAPEs; two PAPEs for the Project's proposed Onshore Interconnection Cable Routes and associated Onshore Facilities and one

PAPE for the O&M Facility¹. The Cardiff and Larrabee Physical Effects PAPEs include the export cable landfall sites, the onshore transmission cable routes, the proposed onshore substation and/or converter station sites, and the POIs².

The PAPEs are based on the current PDE and are anticipated to be refined as the design of the Projects progresses. The breadth and depth of physical effects for the Onshore Interconnection Facilities are tabulated in Table 1.

Table 1. Summary of PAPEs for Physical Effects

Project Component	Maximum Horizontal Effect	Maximum Vertical Effect
Larrabee Facilities	237.17 ac. (96.24 ha)	
Landfall Site(s)		
Monmouth Landfall Site	8.32 ac. (3.37 ha)	16.8 ft. (5.12m)
Onshore Stations and/or Converter Station(s)		
Lanes Pond Road Site	16.27 ac. (6.84 ha)	60 ft. (18.3 m)
Brook Road Site ^a	99.37 ac. (40.21 ha)	60 ft. (18.3 m)
Randolph Road Site	24.64 ac. (9.97 ha)	60 ft. (18.3 m)
Larrabee Onshore Interconnection Cable Route Options^b		
Larrabee Onshore Interconnection Cable Route	187.94 ac. (76.06 ha) 20 ft. (6 m) width of Open Trenching	Open Trenching 11.5 ft. (3.5 m) Specialty Installation 30 ft. (9 m)
Cardiff Facilities	342.15 ac. (138.46 ha)	
Landfall Site(s)		
Atlantic Landfall Site	2.90 ac. (1.17 ha)	16.8 ft. (5.12m)
Onshore Substation and/or Converter Station(s)		
Fire Road Site	19.71 ac. (7.98 ha)	60 ft. (18.3 m)
Cardiff Onshore Interconnection Cable Route Options^b		
Cardiff Onshore Interconnection Cable Route	319.56 ac. (129.31 ha) 20 ft. (6 m) width of Open Trenching	Open Trenching 11.5 ft. (3.5 m) Specialty Installation 30 ft. (9 m)

- a. Note that since the Brook Road Site is proposed to be developed separately under the New Jersey Board of Public Utilities (NJBP) State Agreement Approach (SAA), it has been removed from the Larrabee Physical Effects PAPE and its listed acreage is not included in the maximum horizontal effects total. Although no specific actions or effects are proposed by Atlantic Shores at this location, discussion of the Brook Road Site has been retained as part of the study area in the TARA since the project may utilize future facilities on the site.
- b. Trenchless portions of the PAPE, including planned HDD and/or jack and bore locations, are included as part of the Onshore Routes. The maximum vertical effect of these installations is described as "Specialty Installation" in this table.

¹ A TARA for the O&M Facility was prepared under separate cover as Appendix II-P2 of the Project's COP.

² The existing substation POIs are by definition included in the PAPEs; however, they are owned by Jersey Central Power and Light (JCP&L) and Atlantic City Electric (ACE), who will be responsible for the design and construction of the required upgrades at these locations. This TARA does not include an assessment of either POI as no specific actions or effects are proposed by Atlantic Shores at these existing facilities at this time.

The final Area of Potential Effects (APE) will be formally determined by BOEM in consultation with NJHPO as part of the Section 106 consultation process. The process for identifying and evaluating effects on historic properties resulting from the construction and operation of the Project will involve consultation with BOEM and the NJHPO, Native American Tribes/Nations, and other consulting parties with a demonstrated interest in the historic properties (e.g., historic preservation organizations).

1.3 Description of Onshore Facility Sites

Atlantic Shores is considering multiple options for onshore transmission, including multiple sites and locations for the Projects' Onshore Facilities. A description of each potential Facility Site is included below.

- The **Monmouth Landfall Site** is made up of two landfall options on the grounds of the New Jersey Army National Guard Training Center, immediately west of the Atlantic Ocean shoreline:
 - The first landfall option is a previously disturbed area in the southeast corner of the National Guard Training Center.
 - The second landfall option is a partially disturbed area on the eastern side of the National Guard Training Center, north of the first landfall option.

Collectively, both landfall options are hereafter included when referencing the proposed Monmouth Landfall Site (Figure 2).

- The **Larrabee Onshore Interconnection Cable Route (Larrabee Onshore Route)** is an approximately 12 mile (mi.) (19.5 kilometer [km]) underground transmission route that largely uses existing linear corridors to connect the Monmouth Landfall Site to a planned onshore substation and/or converter station and the existing Larrabee Substation POI (Figure 2). In order to pursue a conservative estimate of potential effects while Project plans are in development, all routing options for the proposed Larrabee Onshore Route are included in the PDE.
- Atlantic Shores has identified three potential locations for the proposed **Larrabee Onshore Substation and/or Converter Station** in the vicinity of the Larrabee Onshore Route:

- The **Lanes Pond Road Site** is an approximately 16.3-acre (6.6-hectare [ha]) parcel consisting of agricultural fields and wooded areas south of the intersection of Miller Road and Lanes Pond Road in Howell Township.
- The **Brook Road Site**³ is an approximately 99.4-acre (40.2 ha) combination of two parcels consisting primarily of forested uplands and some wetlands between Randolph Road and the Metedeconk River in Howell Township.
- The **Randolph Road Site** is an approximately 24.6-acre (9.97 ha) combination of three parcels consisting of a steel fabrication facility with associated laydown yard, offices, and parking, as well as forested wetlands surrounding Dicks Brook. The location is north of Randolph Road to the northeast of the existing Larrabee POI in Howell Township.
- The **Atlantic Landfall Site** is collectively 2.90 acres (1.17 ha) and is located on paved public parking lot at the southeastern terminus of S. California Avenue adjacent to the Atlantic City Boardwalk, and along the block of S Iowa Avenue between Pacific Avenue and the Atlantic City Boardwalk (Figure 3).
- The **Cardiff Onshore Interconnection Cable Route (Cardiff Onshore Route)** is an approximately 12-14 mi. (19-23 km) underground transmission route that largely uses existing linear infrastructure corridors to connect the Atlantic Landfall Site to the proposed onshore substation and/or converter station at the Fire Road Site and existing Cardiff Substation POI (Figure 3). All of the proposed routing options detailed in the full TARA report are included in the PDE.
- The **Fire Road Site** at approximately 3038 Fire Road, is situated on approximately 19.71 acres (7.98 ha) of currently wooded and overgrown lots in Egg Harbor Township (Figure 3).

³ At the time of the initial development of the TARA, development of a substation and/or converter station at the Brook Road Site in Howell Township, New Jersey was considered. The Brook Road Site is now expected to be prepared and developed separately under the NJBPU SAA to support multiple offshore wind generation projects that the State will procure as part of NJBU's Third Offshore Wind Solicitation. All siting, permitting, and other site preparation activities associated with the substation and/or converter station will be the responsibility of the BPU's SAA-awardee at the Brook Road Site and therefore, is no longer considered as part of the PDE. Discussion of the site has been retained as part of the study area in the TARA to demonstrate the completeness of Atlantic Shores' multi-year development efforts.

Figure 2. Proposed Larrabee Onshore Interconnection Cable Route and Associated Facility Sites

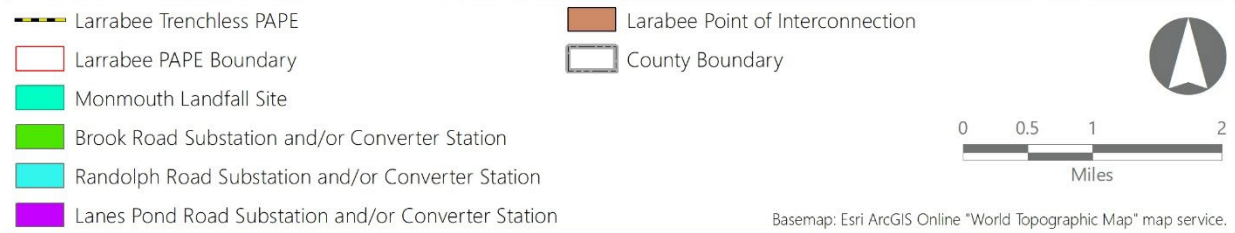
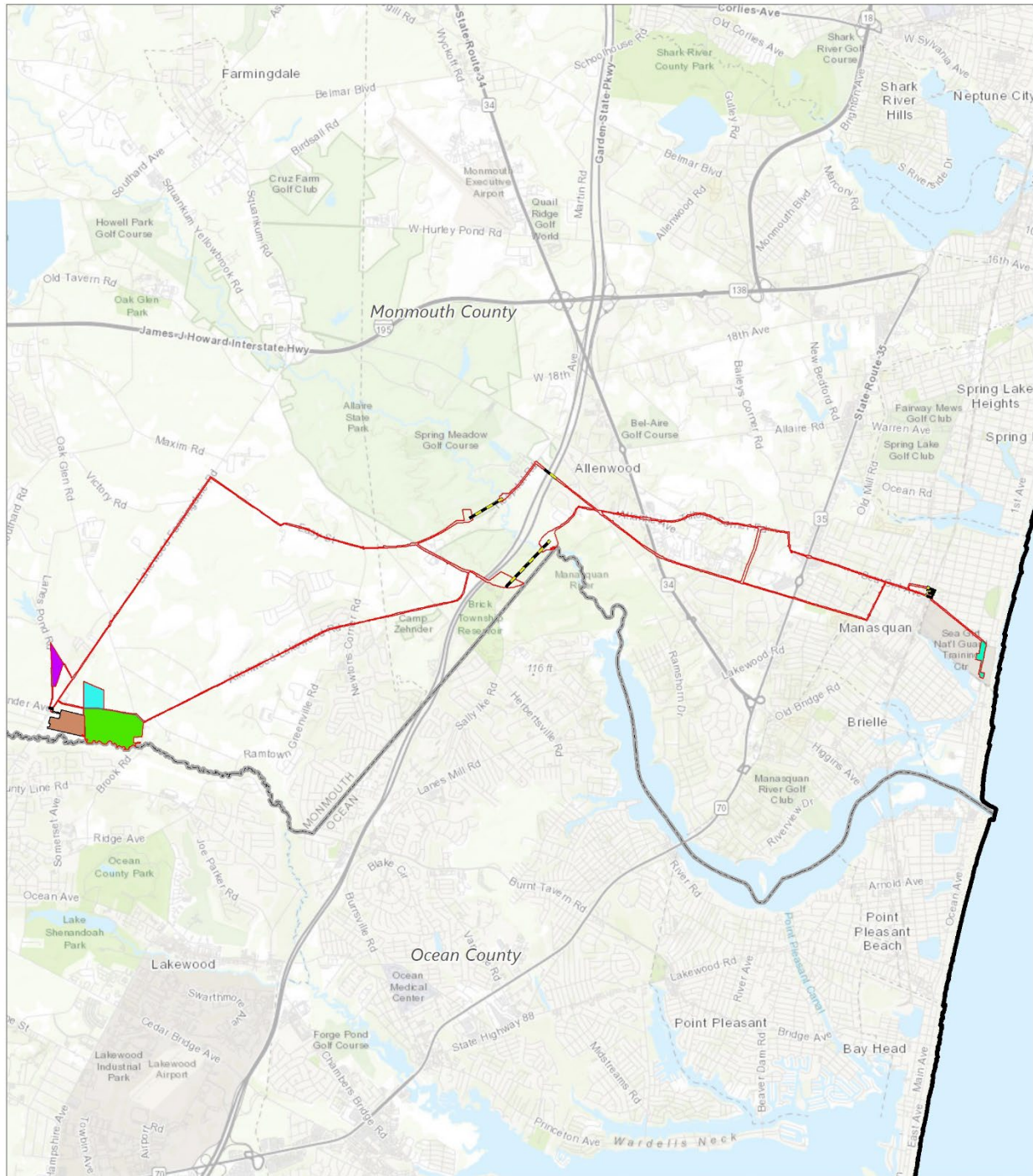
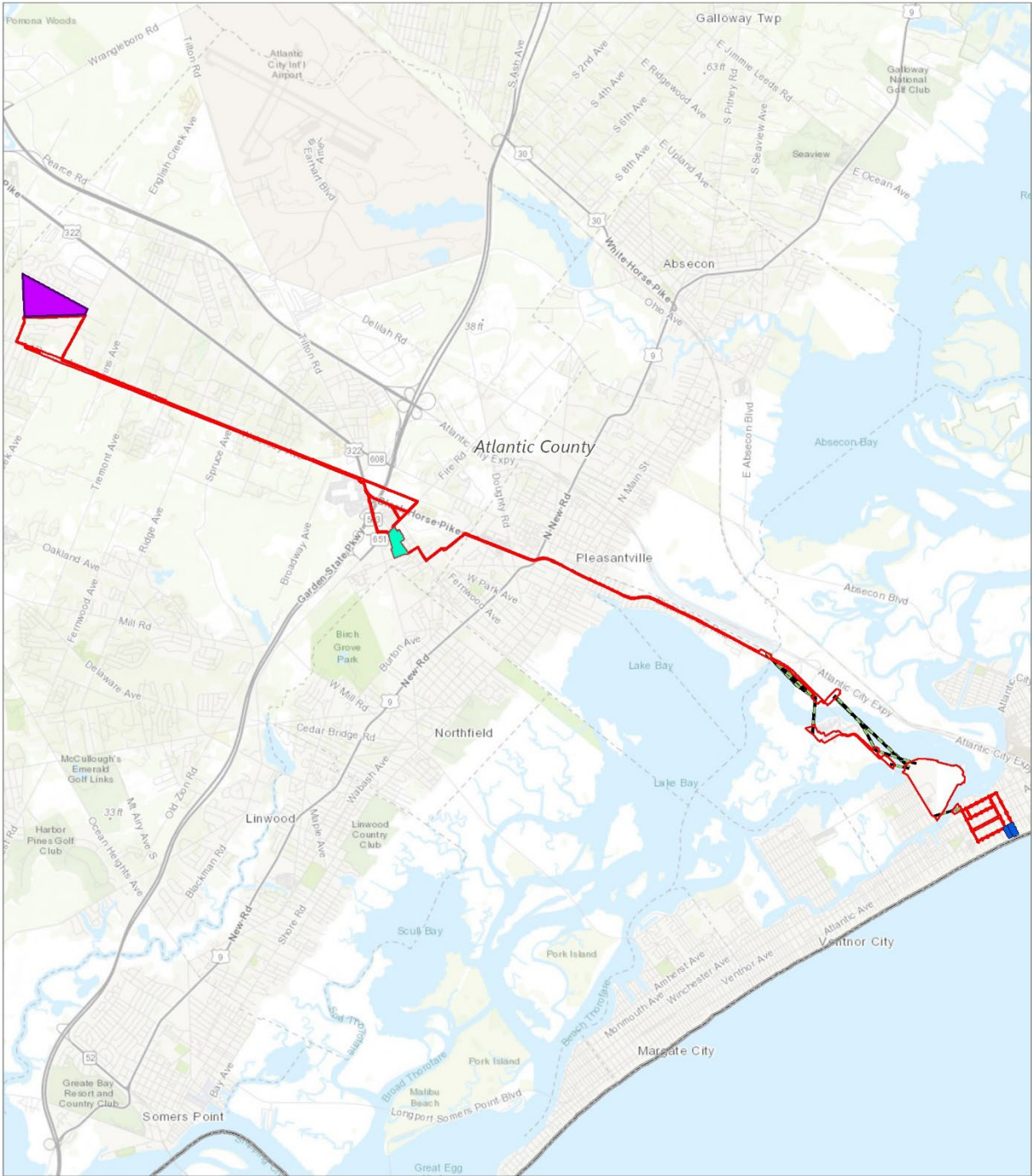








Figure 3. Proposed Cardiff Onshore Route and Associated Facility Sites



-  Cardiff Trenchless PAPE
-  Cardiff PAPE Boundary
-  Atlantic Landfall Site
-  Cardiff Point of Interconnection
-  Fire Road Substation and/or Converter Station
-  County Boundary



Basemap: Esri ArcGIS Online "World Topographic Map" map service.

1.4 Methods of Investigation

To inventory and characterize previously identified archaeological resources and evaluate the potential for unidentified terrestrial archaeological resources to be present within the PAPE, EDR conducted the following research:

- Archaeological reconnaissance of the Facility Sites to assess and document existing conditions;
- Local and regional histories review;
- Review of the NJHPO's Look Up Cultural Resources Yourself (LUCY) website;
- Review of archaeological site forms within a 0.5-mi. (0.8-km) buffer of the PAPE;
- Review of digitally available previous cultural resources surveys encompassing or intersecting portions of the PAPE⁴;
- Historical map review;
- Topographic survey;
- Lidar and hillshade analysis;
- Mapping of buried utilities;
- Review of as-built road drawings;
- Present and past aerial photography review, and;
- Soils assessment, including soil boring data.

Informed by a synthesis of the research listed above, the PAPE was categorized into "Disturbed" and "Potentially Undisturbed" areas. Following discussions with NJHPO and BOEM staff, the "Disturbed", "Potentially Undisturbed", and "Paved" areas within the PAPE were further subdivided to correspond to the archaeological sensitivity categories described in NJHPO's *Guidelines for Phase I Archaeological Investigations: Identification of Archaeological Resources* (hereafter, NJHPO's *Guidelines*; NJHPO, 2019). The criteria applied by EDR to determine these categories are outlined below:

- Excluded from field survey consideration – Disturbed areas. Slopes greater than 15%. Areas of previous subsurface archaeological testing/survey.

⁴ Due to the Covid-19 pandemic, NJHPO suspended in-person research visits, and review of previous cultural resource survey reports was limited to those that were available digitally or through correspondence with report authors.

- Low sensitivity – Mapped wetlands and poorly drained soils. Potentially undisturbed areas adjacent to paved roadways (within which the onshore cables are actually sited) where depth to culturally sterile subsoil is less than approximately 2.0 feet (ft.). These areas will be pedestrian surveyed (and may be subject to limited judgmental subsurface archaeological testing [i.e., shovel testing] if deemed appropriate based on observed field conditions).
- Medium sensitivity, included in “Potential Phase IB Survey Areas” for shovel testing – Potentially undisturbed areas outside of road and railroad/bike path ROWs, mapped wetlands, and poorly drained soils. Potentially undisturbed areas adjacent to paved roadways and bike paths (within which the onshore cables are actually sited) where depth to culturally sterile subsoil is greater than approximately 2.0 ft. These areas will be subject to systematic shovel testing.
- Medium-High sensitivity, included in “Potential Phase IB Survey Areas” for shovel testing – Potentially undisturbed areas within approximately 500 ft. of surface freshwater and/or 1,000 ft. of previously identified archaeological sites. These areas will be subject to systematic shovel testing. Potentially undisturbed areas which are completely paved within 1,000 ft. of previously identified archaeological sites are recommended for archaeological monitoring.

In those portions of the proposed onshore routes with Medium to Medium-High sensitivity that overlap with paved roadways or bike paths not suitable for shovel testing, then shovel test pits (STPs) would be excavated within the public ROW on the road shoulder or bike path margins adjacent to the paved areas, as a proxy for what may be beneath the paved areas. This testing strategy is based on methodologies utilized when evaluating the onshore facilities for similar offshore wind projects reviewed by BOEM (EDR, 2020 and 2022).

1.4.1 Phase IB Survey Methodology

Atlantic Shores followed the general survey methodology described herein for all Phase IB archaeological survey presented in the TARA. This methodology will also be utilized for the remaining Phase IB survey efforts.

Prior to initiating the archaeological fieldwork, New Jersey One Call (811) is contacted to request a utility mark-out. The utility mark-out enables the archaeologists to avoid excavation in the area of

existing utilities and helped identify additional previously disturbed areas where no archaeological work is necessary.

The archaeological survey consists of hand excavation of STPs in a 50-by-50-ft. (15-by-15-meter [m]) grid or transects in areas identified as “Potentially Undisturbed.” In Medium to Medium-High sensitivity areas of proposed ground disturbance that overlap with paved roadways or bike paths not suitable for subsurface archaeological testing (i.e., shovel testing), STPs would be excavated within the public ROW on the road shoulder or bike path margins adjacent to the paved areas, as a proxy for what may be beneath the paved areas. This testing strategy is based on methodologies utilized when evaluating the onshore facilities for similar offshore wind projects evaluated by BOEM (EDR, 2020 and 2022). Note that excavation does not occur in areas consisting of wetlands, inundated terrain, or slopes in excess of 15 to 20%, as these areas are not required to be tested under NJHPO’s *Guidelines* (NJHPO, 2019).

STPs measure approximately 18 to 20 inches (in.) (45 to 50 centimeters [cm]) in diameter and are excavated to a depth of at least 4.0 in. (10 cm) into a sterile subsoil stratum or to the practical limits of hand excavation (typically 3.0 to 4.0 ft. [0.9 to 1.2 m] below the ground surface). No machinery or heavy equipment was used during excavation. The locations of all STPs are recorded with sub-meter accurate global navigation satellite system (GNSS) equipment and noted on field maps. Stratigraphic profiles, including depth, soil color, and texture, for all shovel tests will be recorded digitally on standardized field record forms.

All soils excavated from STPs are screened through 0.25-in. (0.6 cm) mesh hardware cloth over tarps (to avoid leaving soil piles) to allow for the identification of artifacts. The presence of clearly modern materials, such as plastic fragments, modern bottle glass fragments, or twentieth-century architectural materials in shovel tests are noted on field forms, but these materials are not collected for subsequent analysis. All STPs are backfilled immediately upon completion and restored to match pre-existing conditions.

If artifacts or other archaeological materials (e.g., lithic artifacts/stone tools, projectile points, pottery sherds, indications of a former building) are recovered from STPs, then additional STPs at closer intervals may be excavated to determine if an archaeological site is present. If artifacts are recovered from an isolated shovel test, then up to eight additional radial STPs will be excavated at 16- and 33-ft.

(5- and 10-m) intervals around the original STP to determine whether the artifacts represent an isolated find or may indicate the presence of a more substantial archaeological site. If any archaeological finds are observed, these will be collected and returned to the archaeologists' laboratory facility where they will be washed, rebagged in labeled, clean, 4-mil archival quality plastic bags and inventoried in accordance with the *Requirements for Phase I Archaeological Survey* and *Requirements for Archaeological Survey Reports* (NJHPO, 2008).

Results of any subsequent Phase IB archaeological survey, as well as tabulated field record forms and a complete inventory of all potential archaeological finds, will be included in a subsequent revision or in an addendum to this TARA report. The revision or addendum will be provided to appropriate federal, state, and/or local agencies and interested parties and marked "Confidential – Not for Public Disclosure – Contains Archaeological Site Information" if it contains locational information for archaeological resources that may be placed at risk by disclosure. The report will be prepared in accordance with applicable portions of the NJHPO's *Requirements for Archaeological Survey Reports* (NJHPO, 2008). Atlantic Shores anticipates that some Phase IB archaeological survey may be conducted following the Project's Record of Decision (ROD) and the execution of the Memorandum of Agreement (MOA), but all survey results and relevant data will be submitted to BOEM and relevant consulting parties for review prior to the start of construction activities in unsurveyed areas.

2.0 LARRABEE PHYSICAL EFFECTS PAPE

2.1 Environmental Setting

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 Larrabee PAPE 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 mi. (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 Larrabee PAPE is located on the Atlantic Ocean shoreline and near inland areas of New Jersey within the broad, low relief Outer Coastal Plain physiographic province. The Outer Coastal Plain formed from rising and falling sea levels over the Cenozoic Era (66 million years to the present) and has remained relatively stable in recent geological history. The bedrock and older sediments of the Outer Coastal Plain 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, 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 ago), 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 ago, but seaward coastal conditions and estuaries continued to evolve as they do at the present time.

The Larrabee Onshore Route ranges from 6.6 ft. (2 m) in elevation above mean sea level at the Monmouth Landfall Site in the Borough of Sea Girt to a high of approximately 100 ft. (30 m) in Wall Township. The Manasquan River is the principal drainage intersected by the Onshore Route, draining its central portions, with Judas Creek draining the eastern portion of the Onshore Route and the Metedeconk River draining the western terminus. Several named streams also intersected by the Onshore Route drain into the two rivers and include from east to west: Tarklin Brook, Haystack Brook, and Dicks Brook.

2.2 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 PAPE.

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, 1982). Diagnostic artifacts and features that indicate a Middle Archaic period occupation include Stanly Stemmed and Neville projectile point types with shallow basal notching, while Late Archaic bifaces and tool kits are marked by non-local sources of lithic materials, such as rhyolite and porphyry (Chesler, 1982; Custer, 2001). 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 mediums 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, 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 later portion of the Late Archaic period is referred to as the Transitional Archaic/Terminal Archaic period (Stewart et al., 2015). Trends observed during this Transitional Period include further development of extensive trade networks (Grossman-Bailey, 2001; Stewart et al., 2015). The Transitional Period 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; Stewart et al., 2015).

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 more 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 Meadowood 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, 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, 1982). Late Woodland Period settlement and subsistence patterns are discussed in additional detail below in the context of observations by European traders and settlers following the period of contact beginning in the sixteenth century and accelerated in seventeenth century. Resource use changed from Paleo-Indian to Late Woodland times, and though the inhabitants of the Outer Coastal Plain remained hunter-gatherers, their use of local food and lithic resources increased (Grossman-Bailey, 2001).

In the period of contact between Native Americans and Europeans in the sixteenth and seventeenth centuries, the Leni Lenape inhabited present day coastal areas and the interior of New Jersey. The Unalachtigo Lenape, or the “people who live near the ocean,” lived across central and southern New Jersey (Ellis, 1885). However, sixteenth and seventeenth century-dated Native American archaeological sites for the coastal and near upland regions are difficult to clearly discern in the archaeological record and are further poorly characterized due to loss of sites from later periods of development and regular erosion of shorelines and stream and riverbanks.

Dutch, Finnish, and Swedish colonists were the first Europeans to establish trading and settlements in what is now New Jersey, 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 population and financial resources. In 1655, Peter Stuyvesant sent a fleet of Dutch ships to raid the Finnish and Swedish settlements, resulting in the Dutch absorbing the region into the New Netherlands colony (Salter, 1890). However, the New Netherlands colonies soon came under English control in 1664 following the Dutch defeat in the Second Anglo-Dutch War (Snyder, 1969). For the following century, settlers from the Netherlands, French Huguenot refugees, and increasingly, settlers from England and Scotland, colonized coastal areas between the Hudson and Delaware Rivers under English crown charter and protection. Colonial settlements at this time also included a significant number of enslaved Africans involved in agricultural labor. Until 1702, colonial New Jersey was organized into two separate provinces, East Jersey and West Jersey, when the provinces were combined into a single province that largely assumed the present-

day boundaries of the state of New Jersey. During the American War for Independence, several engagements between British and Continental forces took place in New Jersey and the city of Princeton served as the seat of the United States government for a brief period in 1783 (Salter, 1890).

English colonial officials formed Monmouth County in 1683 in the East Jersey province. English Quakers formed a significant share of early Euro-American settlers in the county, while bands of Lenni Lenape continued to dwell in the region and maintained trading relationships with Europeans (Ellis, 1885; Salter, 1890). Colonizing Euro-Americans largely concentrated economic development of the region on clearing pitch pine timber for lumber and producing tar and turpentine for the maritime industry and subsequently developed cleared areas for agricultural and livestock grazing land in favorable soil conditions (Parsons, 1928). The Euro-American population of Monmouth County remained relatively low compared to more intensively developed areas in the Hudson and Delaware River valleys but steadily grew into the nineteenth century with a focus on agriculture and light industry, such as grist and saw milling on suitable streams and rivers.

In what is now Howell and Wall Townships, iron production was an important aspect of the early nineteenth century economy. In 1822, James P. Allaire organized the Howell Works to produce pig iron for his prosperous Allaire Iron Works in New York City (Boyer, 1931; Wilson, 1974). Purchasing the existing Monmouth Furnace from Benjamin B. Howell, Allaire developed a largely self-supported industrial community around the furnace that remained prosperous through the 1830s. The furnace consumed bog ore raised from surrounding swamps and charcoal rendered from stands of nearby pitch pine. However, the long-term economic downturn following the Panic of 1837 and competition from larger and cheaper ironmakers in northern New Jersey led to abandonment of the furnace and surrounding community by the late 1840s (Boyer, 1931; Wilson, 1974). Remaining as a largely vacant village until the mid-twentieth century, New Jersey purchased and developed the property into Allaire State Park beginning in 1957. The area encompassing 27 previously recorded archaeological sites associated with the Howell Works is located to the north of the Larrabee Onshore Route beyond the 0.5-mi. buffer.

Apart from the growth of public roadways that connected farms and communities, two early railroads were important to the continued prosperity of southern Monmouth County into the twentieth century. The Raritan and Delaware Bay Railroad Company (later the New Jersey Southern Railroad) completed

its north-south line from Port Monmouth on Raritan Bay to Lakewood by 1860, passing through Howell Township (Cunningham, 1997). Today the single-track line remains in use but for infrequent freight service and has been determined as eligible for listing in the National Register of Historic Places (NRHP) as the "New Jersey Southern Railroad Historic District". Other major railroads in the region of the Larrabee Physical Effects PAPE include the Farmingdale and Squan Village Railroad and the active NJ Transit Railroad.

While Wall and Howell Townships remained largely agricultural into the twentieth century, rail connections with larger urban areas and later improved roadways for automobiles in the twentieth century led to the growth of seaside communities in Monmouth County that were increasingly not connected with local farming or industry (Parsons, 1928). The New Jersey state legislature formed Manasquan as a separate borough from Wall Township in 1887 and later formed Sea Girt as its own borough in 1917 as an influx of part-time and full-time residents came to live in the area due its seaside and beach amenities (Snyder, 1969). The current 165 acres (67 ha) New Jersey National Guard training facility in Sea Girt began as an annual encampment ground when the New Jersey state legislature leased the initial property (locally known as the "Stockton Farm") in 1885, later purchasing it for state militia training at the time of the Spanish-American War in 1898 (Parson, 1928).

2.3 SUMMARY OF LARRABEE RESULTS

The results of the TARA can be summarized as follows with respect to the archaeological potential of the Larrabee Physical Effects PAPE (Larrabee PAPE):

- Prior ground disturbance was identified within the proposed Monmouth Landfall Site and Larrabee Onshore Route. Depth to subsoil is approximately 1.0 to 2.0 ft. (0.3 to 0.6 m) for most of the Larrabee Onshore Route. Atlantic Shores has elected to site the buried onshore cables within existing, previously disturbed road, bike path, and railroad ROWs, where disturbance during construction and installation of the existing infrastructure likely exceeded the depth of potential archaeological deposits. This siting strategy avoids or significantly reduces potential impacts to adjacent undisturbed soils and avoids or minimizes the risk of potentially encountering undisturbed archaeological deposits throughout most of the Larrabee Onshore Route.

- One previously recorded archaeological resource (28-Mo-283) is mapped within the Larrabee PAPE. Information on the archaeological site is scarce and the exact location has been inconsistently recorded. The New Jersey State Museum (NJSM) site form lists the site as prehistoric and a place where "implements have been found in the borough of Point Pleasant." A Phase IB archaeological survey conducted in 2004 and 2005 attempted to reconfirm the boundaries of 28-Mo-283 (Siegel and Baldwin, 2005). The site was not relocated in this survey, and most of the terrain in and around the purported location of the site was determined by the archaeologists to be previously disturbed. The surveying archaeologists recommended no additional survey on the portion of the Larrabee PAPE on which the site is purportedly located, a sentiment that was concurred by NJHPO. As such, no additional archaeological investigation is anticipated to be necessary for portion of the PAPE containing 28-Mo-283.
- There are ten previously identified archaeological sites within 0.5 mi. (0.8 km) of the Larrabee PAPE. These sites consist of six Native American sites, three historic-period sites, and one multicomponent site. The Native American sites are generally clustered along tributaries to the Manasquan River north of the Larrabee Onshore Route. One historic-period site is associated with a now demolished structure within a golf course. The second historic period site and is comprised of eighteenth and nineteenth century artifact concentrations and features associated with the Thomas Shearman family, Joseph Mount, and/or Commodore Robert Stockton.
- Historical map and photography review demonstrates that Map Documented Structures (MDS) are mapped in the immediate vicinity of the proposed Larrabee Onshore Route, with most MDS mapped along existing roadways and at intersections that were largely established by the mid-nineteenth century.
- A portion of the proposed Larrabee Onshore Route is collocated with the Edgar Felix Memorial Bikeway, within the former railroad corridor of the Farmingdale and Squan Railroad. A previous intensive-level architectural survey identified a segment of the Edgar Felix Memorial Bikeway as part of the former Farmingdale and Squan Railroad (RBA, 2012). The research and fieldwork for that survey concluded that the Farmingdale and Squan Railroad was ineligible for listing on the S/NRHP. A NJHPO opinion letter dated to August 2021 concurred with the results of the

survey, stating “No Historic Properties Affected” within the APE for the bridge replacement (NJHPO, 2012).

- Pedestrian survey (with judgmental shovel testing if deemed appropriate based on observed field conditions) is recommended in any Low sensitivity, “Potentially Undisturbed” areas adjacent to paved roadways (within which the onshore cables are actually sited) where depth to culturally sterile subsoil is less than approximately 2.0 ft. as well as in any wetlands or areas of steep slope.
- Targeted archaeological shovel testing is recommended within those portions of the Larrabee Onshore Route, and potential Larrabee Onshore Substation and/or Converter Station options categorized as Medium and Medium-High sensitivity “Potential Phase IB Survey Areas.”
- Phase IB STP survey has been completed for several areas along the proposed Larrabee Onshore Route. A total of 202 STPs were excavated across 16 designated survey areas along the Larrabee Onshore Route. No archaeological sites were identified, and no archaeological artifacts were encountered during the Phase IB survey. As such, no mitigation or avoidance measures are proposed, and no further archaeological work is recommended for the areas that were surveyed. The Phase IB survey results for the remaining areas will be presented in an addendum to the TARA report at a future date. The areas Larrabee Physical Effects PAPE that have not yet been surveyed include: the Lanes Pond Road Site, the Randolph Road Site, and approximately 21.58 acres of the Larrabee Onshore Route (Table 2). The Phase IB survey results for these remaining areas will be presented in an addendum to this TARA report at a future date.
- In addition, the Project’s Monitoring Plan and Post Review Discovery Plan (MPRDP) (Section 4.1.1.) for terrestrial archaeological resources will be in effect for all construction and installation activities, providing guidance and instructions to all contractors on how to proceed in the event (however unlikely) of encountering unanticipated cultural resources during work in the Larrabee PAPE.

3.0 CARDIFF PHYSICAL EFFECTS PAPE

3.1 Environmental Setting

A general summary of the environmental setting of the Atlantic Ocean shoreline and near inland areas of New Jersey within the broad, low relief Outer Coastal Plain physiographic province was presented in Section 2.1. The following is additional context information specific to the Cardiff Physical Effects PAPE (Cardiff PAPE).

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

3.2 Historic Context

A general summary of 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 PAPE was presented in Section 2.2. The following is additional context information specific to the Cardiff PAPE.

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). Within the Cardiff PAPE, Absecon Island (occupied today by Atlantic City) was visited by the Lenni Lenape in the summer months via a trail through the marshland which was located approximately where Florida Avenue is today (City of Atlantic City, 2021). 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.

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 a 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).

3.3 SUMMARY OF CARDIFF RESULTS

The results of the TARA can be summarized as follows with respect to the archaeological potential of the Cardiff PAPE:

- Prior ground disturbance was identified within the proposed Atlantic Landfall Site, Cardiff Onshore Route, and portions of the Fire Road Site. Depth to subsoil is approximately 1.0 to 2.0 ft. (0.30 to 0.6 m) for most of the Cardiff Onshore Route. As noted previously, Atlantic Shores has elected to site the buried onshore cables within existing, previously disturbed road, bike path, and railroad ROWs, where disturbance during construction and installation of the existing infrastructure likely exceeded the depth of potential archaeological deposits. This siting

strategy avoids or significantly reduces potential impacts to adjacent undisturbed soils and avoids or minimizes the risk of potentially encountering undisturbed archaeological deposits throughout most of the Cardiff Onshore Route.

- Substantial areas of artificial/historic fill were identified along the eastern half of the Cardiff Onshore Route according to NJDEP online mapping (NJDEP, 2018). This historic fill is mapped as extending from Atlantic City all the way to the mainland in Pleasantville, encompassing all portions of the Cardiff Onshore Route on Bader Airfield, Great Island and the Atlantic City High School, U.S. Route 40, and the existing 69 kilovolt (kV) Atlantic City Electric (ACE) transmission line and railroad ROW.
- No previously recorded archaeological sites are located within the Cardiff PAPE. The proposed Atlantic Landfall Site does encompass previously identified historic properties, all of which were previously determined ineligible for the State/NRHP and subsequently demolished. Lacking spatial specificity, the mapped locations of the earliest recorded Native American sites were considered areas of elevated archaeological sensitivity and not be considered equivalent to formally tested and delineated archaeological sites.
- All previously recorded archaeological sites with Native American components located within 0.5 mi. (0.8 km) of the Cardiff Onshore Route are mapped near the Pleasantville area. The earliest recorded sites lack spatial specificity as they were not formally delineated. As such, their mapped locations should be considered areas of elevated archaeological sensitivity and not be considered equivalent to formally tested and delineated archaeological sites. No "Potential Phase IB Survey Areas" were identified in the Pleasantville area due to extensive documented previous ground disturbance. However, archaeological monitoring of the construction and installation of the Cardiff Onshore Route in Pleasantville is recommended.
- Historic-period sites in the vicinity of the Cardiff Onshore Route include the Greenhouse site in urban Atlantic City and three mid-twentieth century Pinelands Commission sites which did not meet the criteria for the S/NRHP.
- Historical map review demonstrates that the proposed Atlantic Landfall Site was undeveloped before the construction of Atlantic City and its associated block and street grid, which has remained largely unchanged from their original establishment to today.

- MDS are mapped in the immediate vicinity of the PAPE, mostly along existing roadways and at intersections that were largely established by the mid-nineteenth century. Most of the MDS are concentrated in the central and eastern portion of the Cardiff Onshore Route in Smith's Landing, Pleasantville, and Risleyville, as well as in the developed urban environment of Atlantic City.
- A portion of the proposed Cardiff Onshore Route is collocated within a segment of the West Jersey and Atlantic Railroad Historic District. West of the Garden State Parkway and U.S. Route 40 the railroad corridor has been converted into the asphalt paved Atlantic County Bikeway. Only a series of at-grade street crossings were identified between English Creek Avenue and Franklin Boulevard, an area encompassing the entire portion of the PAPE within the former railroad ROW/Bikeway (Gannett Fleming, 2002: Appendix C). In this area, contributing resources to the linear historic property have been removed, and only the rail prism and associated cuts and embankments remain. The actual fills of the rail prism are not contributing features to the eligibility of the resource. Avoidance of the prism may not be feasible but impacts to the fills of the prism are not anticipated to constitute an adverse effect, especially if restored to present condition (as proposed by Atlantic Shores) following installation of the onshore cable.
- The previously demolished McKee City Station, a contributing resource of the West Jersey and Atlantic Railroad Historic District, is mapped within the Cardiff Onshore Route (NJHPO, 2021). This documented resource is a demolished historic structure which may exist in the archaeological record. The "Potentially Undisturbed" areas in the vicinity have been characterized as Medium sensitivity "Potential Phase IB Survey Areas". During the August 2023 Phase IB survey mobilization, 54 STPs were excavated in the "Potential Phase IB Areas" purportedly located in the vicinity of the station. Remnant features of the West Jersey and Atlantic Railroad were noted in these survey areas but were located on or near ground surface mixed with modern material and therefore cannot be considered intact historic cultural deposits. No artifacts or features associated with the demolished McKee City Station were uncovered during the Phase IB survey. As such no mitigation or avoidance measures are proposed, and no further archaeological work is recommended for these areas.

- Construction and installation activities associated with the Projects will avoid all cemeteries and burials regardless of S/NRHP status or previous disturbance. Since the boundaries of the Greenwood Cemetery were well established prior to construction of U.S. Route 40, and use of the area adjacent to the U.S. Route 40 does not appear to happen until after the construction of the highway corridor, it is not anticipated that there is any potential for burials associated with the Greenwood Cemetery to be located within the PAPE along the U.S. Route 40 ROW. As such, construction and installation of the Cardiff Onshore Route will avoid all burials, and no remote sensing survey is anticipated to be necessary. However, out of an abundance of caution, archaeological monitoring of construction and installation in the area is recommended. In addition, the Project's MPRDP will be in effect for all construction and installation activities, providing guidance and instructions to all contractors on how to proceed in the event (however unlikely) of encountering unanticipated cultural resources during work in this area. The MPRDP will include appropriate "Stop Work" procedures if potential grave shafts or burials are observed.
- Pedestrian survey (with judgmental shovel testing if deemed appropriate based on observed field conditions) is recommended in any Low sensitivity, "Potentially Undisturbed" areas adjacent to paved roadways (within which the onshore cables are actually sited) where depth to culturally sterile subsoil is less than approximately 2.0 feet as well as in any wetlands or areas of steep slope.
- No additional archaeological investigation is anticipated to be necessary for the proposed Atlantic Landfall Site within the Cardiff Physical Effects PAPE.
- Targeted archaeological shovel testing is recommended within portions of the Cardiff Onshore Route and Fire Road Site identified as Medium and Medium-High sensitivity "Potential Phase IB Survey Areas."
- Phase IB STP survey has been completed for the majority of the proposed Cardiff Onshore Route. A total of 146 STPs were excavated across seven designated survey areas along West Jersey Avenue and English Creek Avenue in August 2023. No archaeological sites were identified, and no archaeological artifacts were encountered during the Phase IB survey. As such, no mitigation or avoidance measures are proposed, and no further archaeological work is recommended for the areas that were surveyed. Approximately 0.12 acres of the Cardiff

Onshore Route have yet to be surveyed. The Phase IB survey results for these remaining areas will be presented in an addendum to this TARA report at a future date.

- Phase IB shovel testing has been completed for the proposed Fire Road Site Onshore Substation and/or Converter Station. A total of 188 STPs were excavated in the Fire Road Site in January 2023. No archaeological sites were identified, and no archaeological artifacts were encountered during the Phase IB survey. As such, no mitigation or avoidance measures are proposed, and no further archaeological work is recommended.
- In addition, the Project's MPRDP (Section 4.1.1) will be in effect for all construction and installation activities, providing guidance and instructions to all contractors on how to proceed in the event (however unlikely) of encountering unanticipated cultural resources during work in the Cardiff PAPE.

4.0 SUMMARY AND CONCLUSIONS

4.1 Summary of TARA Results and Status of Phase IB Survey

Pedestrian survey (with judgmental shovel testing if deemed appropriate based on observed field conditions) is recommended in any Low sensitivity, "Potentially Undisturbed" areas adjacent to paved roadways (within which the onshore cables are actually sited) where depth to culturally sterile subsoil is less than approximately 2.0 ft. as well as in any wetlands or areas of steep slope. Targeted archaeological shovel testing is recommended within those portions of the proposed Onshore Facilities that are sited within areas of the PAPE categorized as Medium and Medium-High sensitivity and "Potentially Undisturbed."

Since Phase IB survey has been completed for the majority of the Cardiff PAPE and for part of the Larrabee Onshore Route, remaining targeted areas consist of the remainders of both Onshore Routes and portions of the proposed Larrabee Onshore Substation and/or Converter station locations. A summary of the sensitivity and the status of Phase IB survey completion for each proposed Onshore Facility Site is included in Table 2

Any alternate routing options or substation and/or converter locations removed from Project consideration prior to conducting any potential Phase IB archaeological field survey for the Projects will result in the omission of any corresponding "Potential Phase IB Survey Areas" from the field effort. Additional "Potential Phase IB Survey Areas" may be added within portions of the PAPE categorized as "Potentially Undisturbed" if Project updates or alterations call for the use of roadside ROW or additional areas outside of the current siting within paved lanes and bikes paths.

Table 2. Summary of and Status of Identified “Potential Phase IB Survey Areas” for Proposed Onshore Facility Sites

Onshore Facility Site	Archaeological Sensitivity	Recommended Additional Measures to Identify Archaeological Resources	Status of Completion for Recommended Additional Measures
Larrabee Physical Effects PAPE 237.17 ac		Combined Phase IB STP Survey 49.14 ac. (20.17%)	Completed Phase IB STP Survey 4.77 of 49.14 ac. (9.7%)
Landfall Site(s)			
Monmouth Landfall Site 8.32 ac.	Disturbed, Medium-High	No Further Investigation	-
Onshore Substation and/or Converter Station Site(s)			
Lanes Pond Road Site 16.27 ac.	Low to Medium	Targeted Phase IB STP Survey 10.87 ac. (66.81%)	Survey Pending
Randolph Road Site 24.64 ac.	Disturbed, Medium-High	Targeted Phase IB STP Survey 11.90 ac. (48.30%)	Survey Pending
Larrabee Onshore Interconnection Cable Route Options			
Larrabee Onshore Route 187.94 ac.	Disturbed, Low to Medium-High	Targeted Phase IB STP Survey 26.35 ac. (14%)	4.77 ac. of Targeted Phase IB STP Survey Completed in August 2023.
Cardiff Physical Effects PAPE 342.15 ac.		Combined Phase IB STP Survey 20.07 ac. (5.86%)	Completed Phase IB STP Survey 19.98 of 20.07 ac. (99.5%)
Landfall Site(s)			
Atlantic Landfall Site 2.90 ac.	Disturbed	No further investigation	-
Onshore Substation and/or Converter Station Site(s)			
Fire Road Site 19.71 ac.	Disturbed, Medium	Partial Phase IB STP Survey 17.0 ac. (86.2%)	Targeted Phase IB STP Survey Completed in January 2023. No Further Investigation Needed
Cardiff Onshore Interconnection Cable Route Options			
Cardiff Onshore Route 319.56 ac.	Disturbed, Low to Medium-High	Targeted Phase IB STP Survey 3.07 ac. (0.96%)	2.98 ac. of Targeted Phase IB STP Survey Completed in August 2023.

4.1.1 Archeological Monitoring

To further mitigate the potential (however unlikely) for encountering archaeological resources during installation of the Onshore Facilities, Atlantic Shores has prepared a Monitoring Plan and Post Review Discoveries Plan (MPRDP) for Terrestrial Archaeological Resources, which includes stop-work and notification procedures to be followed if a cultural resource is encountered during installation. The MPRDP can be found in Attachment 5 of the MOA executed among BOEM, NJHPO, consulting Native Tribes and other consulting parties to memorialize specific measures that Atlantic Shores will take to resolve adverse effects to identified historic resources and to minimize potential effects to other historic properties in the event of a post-review discovery (BOEM, 2023). The MPRDP outlines the steps for dealing with potential unanticipated discoveries of cultural artifacts and/or features, including human remains, during the construction of the proposed Onshore Facilities. In summary the MPRDP:

- Presents to regulatory and review agencies the plan Atlantic Shores and its contractors and consultants will follow to prepare for and potentially respond to unanticipated cultural resources (i.e., terrestrial archaeological) discoveries;
- Includes provisions and procedures allowing for a Cultural Monitor (Archaeologist) and Tribal Monitors to be present during construction and installation activities conducted in targeted areas of concern as identified in the TARA and through consultation with Native American Tribes; and
- Provides guidance and instruction to Atlantic Shores personnel and its contractors and consultants as to the proper procedures to be followed in the event of an unanticipated cultural resource (i.e., terrestrial archaeological) discovery.

Based on the results of the archaeological reconnaissance and desktop assessment, EDR recommends monitoring in portions of the Larrabee and Cardiff PAPes adjacent to cemeteries, and in paved portions with Medium-High Sensitivity located within 1,000 ft. of previously recorded archaeological sites. Note that scope of monitoring is subject to change and additional areas maybe recommended following Section 106 consultation with BOEM, NJHPO, and consulting Native American Tribes, and other consulting parties.

In addition, the Project's MPRDP will be in effect for all construction and installation activities, providing guidance and instructions to all contractors on how to proceed in the event (however unlikely) of encountering unanticipated cultural resources during work in this area. The MPRDP will include appropriate "Stop Work" procedures if potential cultural material and/or features are observed.

4.2 Conclusions

Atlantic Shores has proposed Onshore Facilities be primarily located within previously disturbed lots, paved roadways, railroads ROWs, and bike paths where disturbance during construction and installation of the existing infrastructure likely exceeded the depth of potential archaeological deposits. The results of background research, archaeological reconnaissance, and desktop assessment described herein indicate that the proposed Onshore Facility Sites have been significantly disturbed due to transportation infrastructure development (principally roadways, railroads, and bike paths) and adjoining business and residential neighborhoods. Note that the Brook Road Site is now proposed to be developed separately under the NJBPU SAA and has been removed from the Larrabee PAPE. Although no specific actions or effects are proposed by Atlantic Shores at this location, discussion of the Brook Road Site was retained as part of the study area in the TARA since the project may utilize future facilities at this location.

There is a very low likelihood of intact or potentially significant archaeological resources to be located within those portions of the PAPE categorized as "Disturbed" in the Archaeological Reconnaissance and Desktop Assessment Results, and they have been excluded from field survey consideration.

Pedestrian survey (with judgmental shovel testing if deemed appropriate based on observed field conditions) is recommended in any Low sensitivity, "Potentially Undisturbed" areas adjacent to paved roadways (within which the onshore cables are actually sited) where depth to culturally sterile subsoil is less than approximately 2.0 ft. as well as in any wetlands or areas of steep slope.

Targeted archaeological shovel testing is recommended within those portions of the proposed Onshore Facilities that are sited within areas of the PAPE categorized as Medium and Medium-High sensitivity and "Potentially Undisturbed" (Table 2). This includes portions of the Monmouth Landfall Site, targeted areas of the Larrabee and Cardiff Onshore Routes, and portions of the proposed Onshore Substation and/or Converter station locations.

A total of 536 STPs have been excavated across the Larrabee and Cardiff PAPEs. 146 STPs were excavated across seven designated survey areas along the Cardiff Onshore Route. Two of these designated survey areas along the Cardiff Onshore Route were of note for their purported proximity to the previously demolished McKee City Station. Remnant features of the West Jersey and Atlantic Railroad were noted but could not be considered intact cultural features because they were located on ground surface and/or mixed with modern trash. No artifacts or features associated with the demolished McKee City Station were uncovered during the Phase IB survey. As such no mitigation or avoidance measures are proposed, and no further archaeological work is recommended. Additionally, no mitigation or avoidance measures are proposed, and no further archaeological work is recommended for the remaining surveyed areas along the Cardiff Onshore Route. Phase IB archaeological field survey efforts are still pending for approximately 0.12 acres of the Cardiff Onshore Route. The survey results for these areas will be presented in a future addendum to the TARA that will be submitted to BOEM and all relevant consulting parties prior to construction activities.

A total of 188 STPs were excavated in the Fire Road Site. No archaeological sites were identified, and no archaeological artifacts were encountered during Phase IB survey. As such, no mitigation or avoidance measures are proposed, and no further archaeological work is recommended for that portion of the PAPE.

A total of 202 STPs were excavated across 16 designated survey areas (totaling 4.77 acres) along the Larrabee Onshore Route. No archaeological sites were identified, and no archaeological artifacts were encountered during Phase IB survey. As such, no mitigation or avoidance measures are proposed, and no further archaeological work is recommended for that portion of the PAPE. Phase IB archaeological field survey efforts are still pending for the Lanes Pond Road site. The Randolph Road Site, and approximately 21.58 acres of the Larrabee Onshore Route (Table 2). The survey results for these areas will be presented in a future addendum to the TARA that will be submitted to BOEM and all relevant consulting parties prior to construction activities.

Additionally, BOEM has determined, that a Phased Identification approach is appropriate for the survey, reporting, and consultation related to this archaeological investigation while property access permissions are acquired to conduct survey these remaining survey areas. The Phased Identification schedule is included in the Projects' Phased Identification Plan: Terrestrial Archaeological Resources,

which can be found in Attachment 21 of the MOA executed among BOEM, NJHPO, consulting Native Tribes and other consulting parties (BOEM, 2023).

Atlantic Shores has prepared a Monitoring Plan and Post Review Discoveries Plan (MPRDP) for Terrestrial Archaeological Resources, which includes stop-work and notification procedures to be followed if a cultural resource is encountered during installation. The MPRDP can be found in Attachment 5 of the MOA executed among BOEM, NJHPO, consulting Native Tribes and other consulting parties (BOEM, 2023). Out of an abundance of caution, EDR recommends archaeological monitoring in five areas of the Larrabee and Cardiff Physical Effects PAPE (Section 4.2.1) that are adjacent to cemeteries or located in paved portions with Medium-High Sensitivity located within 1,000 ft. of previously recorded archaeological sites. Note that scope of monitoring is subject to change and additional areas maybe recommended following Section 106 consultation with BOEM, NJHPO, and consulting Native American Tribes, and other consulting parties.

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