Application, Direct Testimony, Appendices, and Schedules of Virginia Electric and Power Company

Before the State Corporation Commission of Virginia

For approval and certification of the Coastal Virginia Offshore Wind Commercial Project and Rider Offshore Wind, pursuant to § 56-585.1:11, § 56-46.1, § 56-265.1 *et seq.*, and § 56-585.1 A 6 of the Code of Virginia

Volume 9 of 11
PUBLIC ONLY VERSION

Case No. PUR-2021-00142

Filed: November 5, 2021

Application of Virginia Electric and Power Company
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Environmental Routing Study (continued)

APPENDIX C CORRESPONDENCE

Route Selection Letter dated April 13, 2021, from Timothy P. Williams (VA DMA) to Gaylene Watson (Dominion)

Route Selection Letter dated June 24, 2021, from Charlton T. Dunn (VA DMA) to Scott Lawton (Dominion)

Environmental Review Letter dated July 13, 2021, from T. Meader (VDCR) to S. Throndson (ERM).

Route Selection Letter dated August 17, 2021, from R.L. Holmes (NAS Oceana) to Gaylene Watson (Dominion)

Letter of Support dated October 22, 2021 from R.M. Dyer (City of Virginia Beach) to B. Billingsley Harris (Dominion)

Potential CVOW-C Crossing of TNC Land along Intracoastal Waterway, City of Chesapeake, VA. Letter dated October 29, 2021, from B. van Eerden (TNC) to R. Bisha (Dominion)

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COMMONWEALTH of VIRGINIA

MG TIMOTHY P. WILLIAMS
THE ADJUTANT GENERAL

DEPARTMENT OF MILITARY AFFAIRS
OFFICE OF THE ADJUTANT GENERAL
VIRGINIA NATIONAL GUARD

JOINT FORCE HEADQUARTERS
8000 JEFFERSON DAVIS HWY
BUILDING 430
RICHMOND, VA 23297

April 13, 2021

Dominion Energy
Attn: Gaylene Watson
Director, Customer Service and Strategic Partnerships
2700 Cromwell Rd.
Norfolk, VA 23509

Dear Ms. Watson:

The Department of Military Affairs (DMA) agrees in principle with the proposed route of the Coastal Virginia Offshore Wind (CVOW) power landing shown on Enclosure 1 with the understanding that adjustments may be necessary due to the design process, construction planning, or survey work as well as the interaction of existing and proposed easements, licenses, and leases.

To further the negotiations on the terms of an agreement, I attach as Enclosure 2 a list of items to assist in reaching an agreement with the Commonwealth concerning the potential transaction. I also hope the list will assist Dominion in its efforts to obtain the approval of the State Corporation Commission of this project.

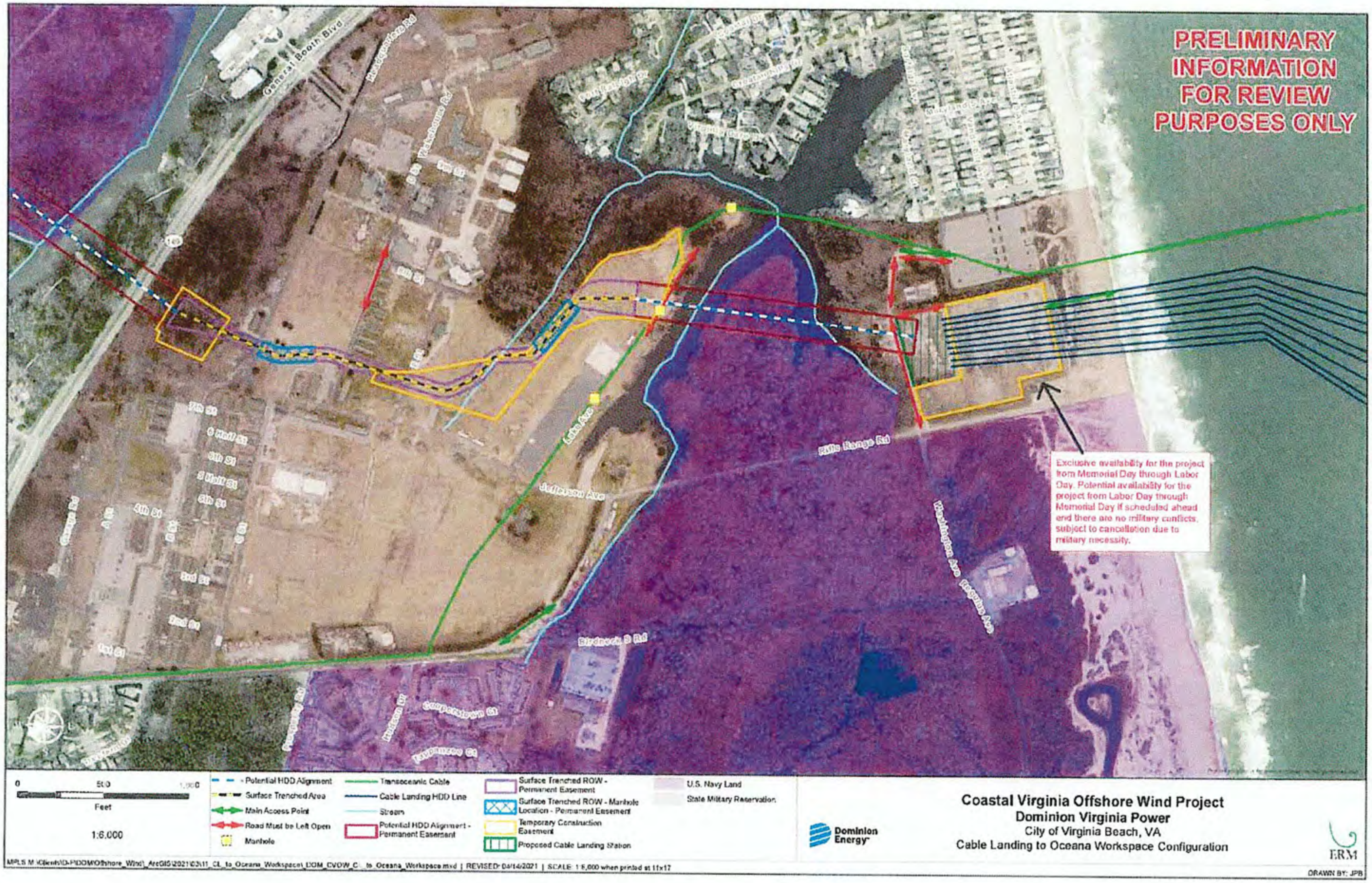
Your point of contact is Mr. Charlton Dunn, charlton.t.dunn.civ@mail.mil 540-290-0183, the Construction and Facility Management Officer for the Virginia Army National Guard/DMA.

Sincerely,

TIMOTHY P. WILLIAMS
Major General, VaARNG
The Adjutant General

Enclosures (2)

ENCLOSURE 1



ENCLOSURE 1

ENCLOSURE 2

The following have been identified to date to facilitate agreement on the proposed route and the terms of an agreement with the Commonwealth:

- Offshore conduit routing to avoid infringement upon Dam Neck Naval Annex.
- CVOW pilot power landing and substation shall remain active for the duration of the overall CVOW lifecycle.
- The Navy grants an easement across Navy land encompassed by Lake Christine along a route all parties are calling "the southern route."
- Acceptance of the engineering and construction plans for the CVOW crossing of the Trans-Oceanic Cable easement by the City of Virginia Beach and the individual cable owners.
- Acceptance of the CVOW design's Emanation Memo by the SCC and DMA.
- Demolitions receive approvals and permits from the Department of Engineering and Buildings (DEB) and Department of General Services Art and Architectural Review Board (AARB) and any State Historic Preservation Office (SHPO) mitigation requirements are met.
- Department of Environmental Quality requirements for wetlands impact mitigation are met.
- Construction impact on existing sewer lines in the western Horizontal Directional Drilling (HDD) site are mitigated/avoided.
- The route across SMR is approved by the SCC and routes off SMR necessary to connect to SMR as currently identified in this document are approved by the SCC.
- Any issues identified by the Hampton Roads Legislative Notice under § 2.2-1150.B are resolved.
- All construction West of Lake Christine and East of 8th street as well as the current range area will be left free and clear of any impediments or risks to helicopter operations and all construction operations will cease for two 3-4 week periods annually to support critical DoD exercises.

This list does not address terms related to:

(i) the consideration for the use of SMR or
(ii) construction related mitigation and remediation requirements

This letter and its attachment are not intended to be a binding agreement between parties and does not contain all of the essential terms of any agreement. Any agreement with respect to the conveyance of any interest in the SMR is subject to approvals and requirements of the Commonwealth and the Code of Virginia.

COMMONWEALTH of VIRGINIA

TIMOTHY P. WILLIAMS
MAJOR GENERAL
THE ADJUTANT GENERAL

DEPARTMENT OF MILITARY AFFAIRS
Adjutant General's Office
Building 316, Fort Pickett

BLACKSTONE, VIRGINIA
23824-6316

June 24, 2021

Mr. Scott Lawton
Dominion Energy, Inc.
707 East Main Street
Richmond, VA 23219

Re: Coastal Virginia Offshore Wind (CVOW) Project -Route selection
Camp Pendleton, State Military Reservation (SMR), Virginia Beach

Dear Mr. Lawton,

The SMR is a state owned military installation, in the possession of the Virginia Department of Military Affairs (VDMA) and is used by the Virginia National Guard (VaARNG) as a training facility, as well all branches of the military and other federal, state, and community agencies and organizations. VDMA-VaARNG recognizes that the CVOW project, which is supported by the administration, is an important initiative with an aggressive schedule. To facilitate planning and approval of the CVOW project, VDMA-VaARNG, Dominion, and DGS have coordinated on the selection of a preferred route, from the oceanfront landing point of the cable system infrastructure leased by Virginia Beach, and through SMR, to route alternatives located west of the SMR property (see enclosed map).

Process

The selection process for the CVOW project cables route, and the identification of locations for structural support components, were guided by several factors.

- Mission-driven programs of VDMA-VaARNG, and those of the installation's tenants and other users;
- Existing infrastructure serving SMR and the previously installed transatlantic (or subsea) cable and the CVOW test pilot cable;
- Consideration of the residential Croatan neighborhood to the north and the U.S. Navy's Dam Neck facility to the south;
- Environmental factors, including compliance with
    - National Environmental Policy Act (NEPA) which involved identifying wetlands; and

- National Historic Preservation Act (NHPA) protected properties within the installation, which is listed in the National Register of Historic Places and the Virginia Landmarks Register as the Camp Pendleton State Military Reservation Historic District.

The overall objective, realized in the route that was selected, minimizes impacts, while reducing effects to ongoing activities at SMR and plans for future improvements at the installation.

Specific Locations within the Route

The "**Transition Vault**" location was selected to avoid interference with the existing transatlantic cable landing at the Croatan Beach parking lot, at the northernmost portion of SMR, and the CVOW test pilot landing at the southern reach of the SMR beachfront. A centrally-placed landing closer to the oceanfront is not an option, due to training needs, supported by a restrictive use easement in favor to the U. S. Navy, and the hazard of running cables close to the beachfront Rifle Range surface, where live munitions are used.

The selected route for conveying the CVOW cables **west from the Transition Vault, extending under Lake Christine**, minimizes risks to the existing transatlantic and CVOW test pilot cables. This route relies on one location for the HDD equipment to install conduits for both the offshore landing and Lake Christine crossing. The alternative of two HDD sites, one to the north and one to the south, would result in avoidable impacts. Engineering obstacles that could threaten the transatlantic cable and utilities infrastructure make the northern option undesirable; and this location would also place disruptive construction activities close to the Croatan neighborhood at SMR's northern edge. The southern location would involve complex engineering challenges, passing through unstable soils, while interfering with use of the only east-west roadway at SMR that accesses the Rifle Range and the beachfront. This location would also come close to several significant properties that are considered historically significant, as "contributing" cultural resources in the Camp Pendleton Historic District.

The selected cable route extending from **Lake Christine to the western HDD site**, located at the western portion of SMR, follows a path that avoids significant impacts to historic buildings and to wetlands, while also minimizing disruption to military training programs. With this route, one building, which is a minor "contributing" resource in the Camp Pendleton Historic District and is in failing condition, will be removed. The proposed western HDD location will involve tree clearing, and a minor degree of incursion into a wetlands area nearby, which is lessened with the selection of the chosen location, instead of a more northerly HDD site which was also considered. The northern site option would also have necessitated removal of additional trees in this wooded zone along SMR's western extent, which buffers SMR from General Booth Boulevard edging the installation's western boundary. The selected western HDD location will involve the removal of another building considered "contributing" in the

Camp Pendleton Historic District, but avoids more extensive impacts to other historic properties that would result from construction at the northern location. As a consulting party in the NEPA and NHPA processes, VDMA-VaARNG intends to continue to work closely with Dominion, and with other state and federal agencies involved in review and approval of the CVOW project, to address the mitigation of impacts to natural and cultural resources as needed.

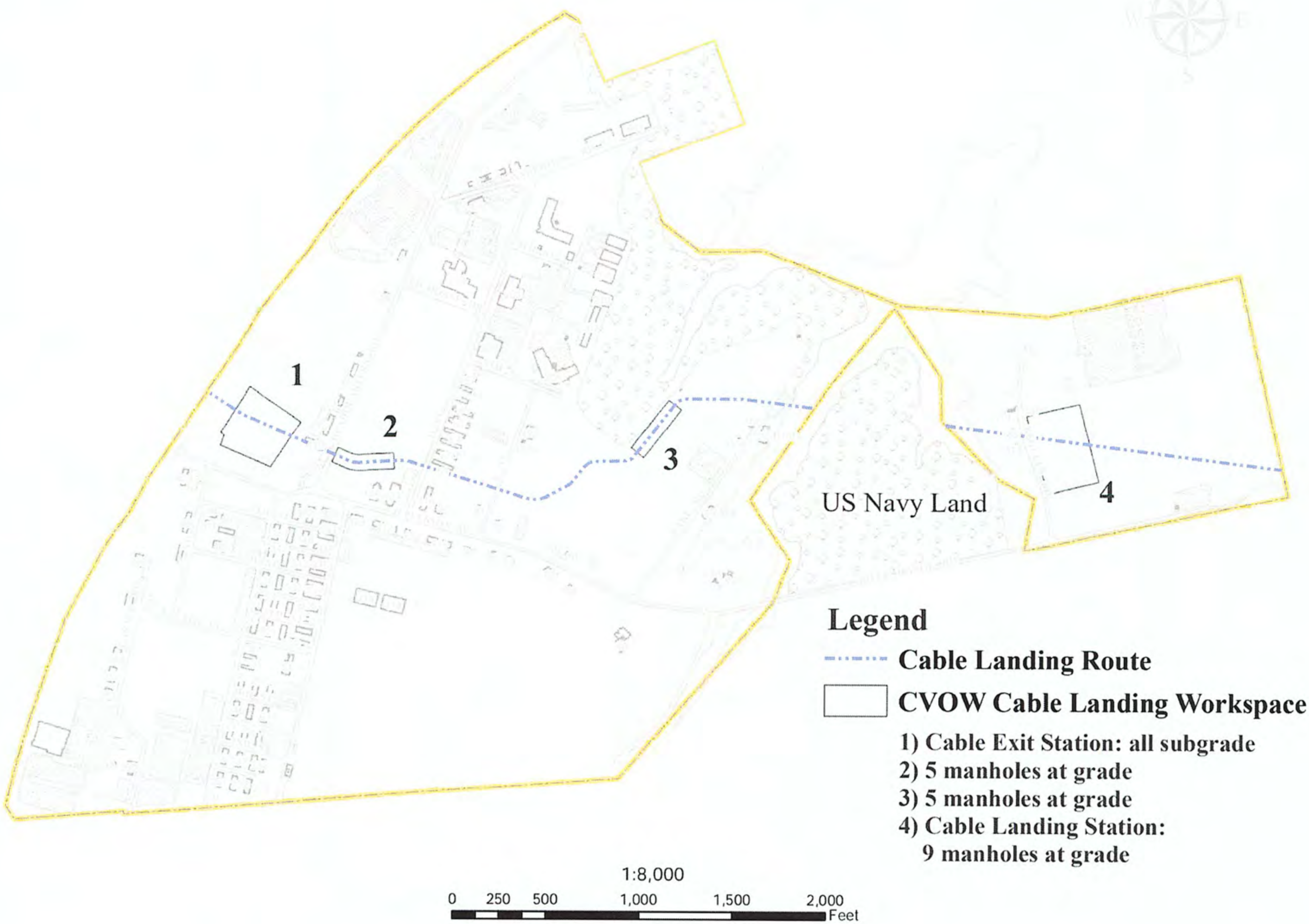
VDMA-VaARNG looks forward to continued coordination with Dominion for the CVOW project. Please contact me by email at charlton.t.dunn.civ@mail.mil or by phone at (540) 290-0183 with questions or require further information.

CHARLTON T. DUNN
COL, EN, VaARNG
ACofS, Facilities
Engineering and Management

Enclosure

CC: Holly Law Eve, Director, DGS Division of Real Estate & Facilities Management
Katheryn Surface Burks, Senior Assistant Attorney General/Real Estate Section Chief, OAG

SMR CVOW Project



Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH *of* VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of Administration and Finance

Russell W. Baxter
Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

Nathan Burrell
Deputy Director of Government and Community Relations

Thomas L. Smith
Deputy Director of Operations

July 13, 2021

Sara Throndson
Environmental Resources Management, Inc.
222 South 9th Street, Suite 2900
Minneapolis, MN 55402

Re: Dominion CVOW Transmission Routing PN0522898

Dear Ms. Throndson:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Cable Landing to Harpers Road Route 1, Cable Landing to Harpers Road Route 2
According to the information currently in our files, the Oceana Ponds and Forest Conservation Site is located within the project site. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Oceana Ponds and Forest Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance and is considered as an irreplaceable conservation site. The natural heritage resources of concern for this route at this site are:

Ludwigia brevipes	Long beach seedbox	G2G3/S2/NL/NL
Perimyotis subflavus	Tri-colored bat	G2G3/S1S3/SOC/LE

Long beach seedbox is a state rare herb in the evening-primrose family that inhabits interdunal swales, low wet places, pond shores, gravel pits and wetlands underlain by sand. It has fleshy leaves and four-part yellow flowers (Ludwig, 1996) that bloom from June to September (Radford et. al, 1968). Long beach seedbox is found in the coastal plain of Virginia, particularly in the southern coastal plain. Surveys for this species should be conducted during the flowering /fruiting period from June to September.

The Tri-colored bat is a very small bat distinguished from other Myotis species by tricolored individual back hairs and inhabits open woods near water, rock cliffs, buildings and caves in the summer. Since 2008 there has been a significant decline in population numbers (greater than 90%) for this bat species due to white nose syndrome. The Tri-colored bat were state listed as "endangered" on April 1, 2016 by the Virginia Department of Wildlife Resources (VDWR).

DCR recommends an inventory for the Long beach seedbox within the Oceana Ponds and Forest Conservation Site to confirm the presence and extent of the documented occurrence. With the survey results we can more accurately evaluate potential impacts to the natural heritage resource and offer specific protection recommendations for minimizing impacts to the documented resources, including adjusting the proposed route to avoid rare plant populations on the western side of the conservation site. DCR-Division of Natural Heritage biologists are qualified to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss availability and rates for field work.

Due to the legal status of the Tri-colored bat, DCR also recommends coordination with the VDWR, Virginia's regulatory authority for the management and protection of this species to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

In addition, the proposed project will fragment Ecological Cores **(C4, C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain.

Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments and designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

Harpers Road to Fentress Route 1, Harpers Road to Fentress Hybrid Route
According to the information currently in our files, the West Neck Conservation Site and the North Landing River Conservation Site are located within the proposed route. West Neck Conservation Site has been given a biodiversity significance ranking of B4, which represents a site of moderate significance. The natural heritage resource of concern for this route at this site is:

Trillium pusillum var. *virginianum* Virginia least trillium G3T2/S2/SOC/NL

Virginia least trillium is a state rare perennial herb that primarily inhabits somewhat acidic, moist to saturated soils, although it does not grow in standing water. The plant is most often found on the margins of swamps, on high spots within swamps or in ground-water seepage areas. Direct destruction of individuals, loss of habitat, and alterations of water quality are the primary threats to this species (Clark and Potter, 1995). This herb species blooms from late March to May (Radford et. al., 1968). Surveys should be conducted during the earlier stages of the flowering period from late March to late April. Please note that this species is currently tracked as a species of concern by the United States Fish and Wildlife Service (USFWS), however this designation has no official legal status.

DCR recommends an inventory for Virginia least trillium within the West Neck Creek Conservation Site to confirm the presence and extent of the documented occurrence. With the survey results we can more accurately evaluate potential impacts to the natural heritage resource and offer specific protection recommendations for minimizing impacts to the documented resources.

Please note, the above comments for West Neck Conservation Site and the survey recommendation for Virginia least trillium also apply to the other proposed routes that cross West Neck Conservation Site in the same alignment: **Harpers Road to Fentress Route 2, Harpers Road to Fentress Route 4, Harpers Road to Fentress Route 5**.

North Landing River Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern for this route at this site are:

Euphyes dukesi	Duke's skipper	G3/S2/NL/NL
Trillium pusillum var. *virginianum*	Virginia least trillium	G3T2/S2/SOC/NL
Non-riverine Swamp Forest (Tupelo – Bald Cypress Type)		G2G3/S1S2/NL/NL
Bald Cypress – Mixed Tupelo Swamp		G3G4/S3S4/NL/NL

In addition, the proposed project will fragment Ecological Cores **(C5)** and dependent on the width of the right-of-way or crossing method within Gum Swamp, may fragment Ecological Cores **(C2, C3)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Harpers Road to Fentress Route 2

According to the information currently in our files, the North Landing River Conservation Site is located within the project area. North Landing River Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern for this route at this site are:

Euphyes dukesi	Duke's skipper	G3/S2/NL/NL
	Bald Cypress – Mixed Tupelo Swamp	G3G4/S3S4/NL/NL

In addition, the proposed project will fragment Ecological Cores **(C2, C4, C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

The proposed route will cause significant fragmentation of one or more highly significant cores with very high to outstanding ecological integrity. Further investigation of these fragmentation impacts is warranted and DCR-DNH can conduct a formal fragmentation analysis upon request. This analysis would estimate direct impacts to cores and habitat fragments and indirect impacts to cores. The final products of this analysis would include an estimate of the total impact of the project in terms of acres. For more information, please contact Joe Weber, DCR Information Manager at Joseph.Weber@dcr.virginia.gov.

Harpers Road to Fentress Route 3
According to the information currently in our files, the West Neck Conservation Site and the North Landing River Conservation Site are located within the proposed route.

West Neck Conservation Site has been given a biodiversity significance ranking of B4, which represents a site of moderate significance. The natural heritage resource of concern for this route at this site is:

Southern Coastal Plain Mesic Mixed Hardwood Forest	G3/S2S3/NL/NL

The Southern Coastal Plain Mesic Mixed Hardwood Forest is dominated by American beech (*Fagus grandifolia*) and various oaks, most commonly white oak (Quercus alba), water oak (Quercus nigra), and swamp chestnut oak (Quercus michauxii). This community type occupies mesic uplands, ravines, lower slopes, swamp "islands," and well-drained "flatwoods" on deep acidic, relatively nutrient-poor soils of the Coastal Plain from southeastern Virginia to South Carolina. It grades into drier forests in which Southern red oak (*Quercus falcata),* Shortleaf pine *(Pinus echinata)*, and Loblolly pine (*Pinus taeda)* are common. In the southeastern Virginia Coastal Plain, American hornbeam (*Carpinus caroliniana*), American holly (*Ilex opaca*), flowering dogwood (*Cornus florida*), sourwood (*Oxydendrum arboreum*), silky camellia (*Stewartia malacodendron*), and big-leaf snowbell (*Styrax grandifolius*) are characteristic small trees. The herb layer is usually open or sparse, but contains scattered individuals and patches of Christmas fern (Polystichum acrostichoides), New York fern (*Thelypteris noveboracensis*), slender spikegrass (*Chasmanthium laxum*), partridge-berry (Mitchella repents), and other species. The Southern Coastal Plain Mesic Mixed Hardwood Forest has been greatly reduced in Virginia by agriculture and development, and many of the remaining stands have been degraded by repeated logging. (Fleming, 2012, NatureServe, 2011)

North Landing River Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern for this route at this site are:

Euphyes dukesi	Duke's skipper	G3/S2/NL/NL
Bald Cypress – Mixed Tupelo Swamp		G3G4/S3S4/NL/NL

In addition, the proposed project will fragment Ecological Cores **(C2, C4, C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Harpers Road to Fentress Route 4
According to the information currently in our files, the North Landing River Conservation Site is located within the proposed route. North Landing River Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern for this route at this site are:

Euphyes dukesi	Duke's skipper	G3/S2/NL/NL
Bald Cypress – Mixed Tupelo Swamp		G3G4/S3S4/NL/NL

In addition, the proposed project will fragment Ecological Cores **(C1, C2, C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Harpers Road to Fentress Route 5
According to the information currently in our files, the North Landing River Conservation Site is located within the proposed route. North Landing River Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern for this route at this site are:

Euphyes dukesi	Duke's skipper	G3/S2/NL/NL
Crotalus horridus	Canebrake rattlesnake	G4/S1/NL/LE

In addition, the proposed project will fragment Ecological Cores **(C1, C2, C3, C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Due to the legal status of the Canebrake rattlesnake, DCR recommends coordination with the VDWR, Virginia's regulatory authority for the management and protection of this species to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

All Routes
Due to the potential for these project areas to support populations of rare bats, DCR recommends a habitat assessment if proposed tree clearing includes the removal or disturbance of large Bald cypress, Water tupelo, or Swamp tupelo trees to identify any potential roost sites. With the habitat assessment results, we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

In addition, according to a DCR zoologist, there is a potential for Little Metalmark (*Calephelis virginiensis,* G4/SH/NL/NL) and additional populations of Duke's skipper (*Euphyes dukesi*, G3/S2/NL/NL) to occur within the proposed routes if suitable habitat exists on site. The Little Metalmark is a butterfly of the southeastern United States, from Virginia to Florida and west to Texas (Cech and Tudor, 2005)). In Virginia, it is documented only in three southeastern counties (VDCR-DNH and VDGIF, 2013). It is a very small butterfly, which almost resembles a moth by resting with its wings open pressed against the underside of leaves thus revealing its orange, black, and metallic markings. The Little Metalmark prefers open areas with its host plants, usually pine flatwoods, savannas and roadsides. Yellow Thistle (*Cirsium horridulum*) was considered the sole host plant, but others have more recently been cited (VDCR-DNH and VDGIF, 2013). Where found, the Little Metalmark can be quite common although it may be much less common at the periphery of its range. The loss of habitat through succession or development is likely the main threat to this species (VDCR-DNH and VDGIF, 2013).

The Duke's skipper is a small, orange-brown and yellow butterfly species which ranges along coastal areas from southeastern Virginia to central Florida, and up the Mississippi River valley from Louisiana to Illinois, and with a pocket in northwestern Ohio and northeastern Indiana (Glassberg, 1999). Dukes' Skippers prefer wet, marshy areas. They are found in swamps, open marshes, and wet roadside ditches, while expansive estuarine or coastal marshes are preferred. Dukes' skippers prefer broad-leaved sedges such as Shoreline sedge (*Carex hyalinolepis*) (VDCR, 2015). In Virginia, it is only recorded from the southeastern outer coastal plain. Females lay their eggs on the undersides of leaves of specific sedge (*Carex*) species; the larvae are dependent on these host sedges. The Duke's skipper is primarily threatened by habitat destruction and fragmentation, especially the elimination of the host sedge species (Clark and Potter, 1995; NatureServe, 2009). Mosquito spraying may be a threat if Dibrome is used (NatureServe, 2009).

Due to the potential for all routes to support populations of Little metalmark and additional populations of Duke's skipper, DCR recommends an inventory for the resources in the study area. DCR recommends surveying for Duke's skipper in wetlands associated with West Neck Creek, North Landing River, Pocaty River and the Intracoastal Waterway where the larval food plant Shoreline sedge (*Carex hyalinolepis*) is found. DCR recommends surveying for Little metalmark in upland areas containing Yellow thistle (*Cirsium horridulum).* With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss availability and rates for field work.

Furthermore, if **Harpers Road to Fentress Route 1, Harpers Road to Fentress Route Hybrid Route,** or **Harpers Road to Fentress Route 3** are selected, DCR recommends an inventory of the documented significant natural communities (e.g., Bald Cypress-Mixed Tupelo swamp) within those proposed routes to determine the condition and extent of the significant natural communities.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of $780.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The VDWR maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from https://vafwis.dgif.virginia.gov/fwis/ or contact Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dwr.virginia.gov. According to the information currently in our files, there is potential for the northern long-eared bat (*Myotis septentrionalis*) to occur within the project area. Due to the legal status of the northern long-eared bat and the associated final 4(d) rule effective February 16, 2016, if tree removal is proposed for the project DCR recommends coordination with the USFWS and the VDWR to ensure compliance with protected species legislation.

Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyler Meader
Natural Heritage Locality Liaison

CC: Troy Andersen, USFWS
Amy Ewing, VDWR

Literature Cited

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DEPARTMENT OF THE NAVY
NAVAL AIR STATION OCEANA
1750 TOMCAT BOULEVARD
VIRGINIA BEACH, VIRGINIA 23460-2191

17 Aug 2021

Gaylene Watson
Director Strategic Partnerships
Dominion Energy Virginia
2700 Cromwell Drive
Norfolk, VA 23509

Dear Ms. Watson,

SUBJECT: COASTAL VIRGINIA OFFSHORE WIND (CVOW) COMMERCIAL PROJECT – PREFERRED ROUTE THROUGH NAVAL AIR STATION (NAS) OCEANA, VIRGINIA BEACH

NAS Oceana recognizes that the CVOW project, which is supported by the Administration and Commonwealth of Virginia, is an important initiative that will serve as a catalyst for a new, renewable domestic energy supply to the region. To facilitate planning and approval of the approximately 2,600 MW CVOW project, NAS Oceana and Dominion Energy have coordinated on the preferred route from the oceanfront landing point of the cable system infrastructure on the State Military Reservation and through NAS Oceana. NAS Oceana is aware of Dominion Energy's coordination with the State Military Reservation, who is also in support of the CVOW project and the preferred route. The objective is to minimize impacts to the surrounding community, while reducing effects to ongoing activities at NAS Oceana and plans for future improvements at the installation. Additionally, selection of the underground route resolved land use conflicts associated with the Air Installations Compatible Use Zones (AICUZ) at NAS Oceana, within which overhead transmission lines are prohibited in areas designated as Accident Potential Zone (APZ) 1. Please see enclosed map that details the preferred utility route and proposed Switching Station through, and on, NAS Oceana property.

NAS Oceana looks forward to further coordination with Dominion Energy on the proposed CVOW project and the requested easement over Navy property to support the utility cable routing and switching station which will cover areas within Lake Christine and parcels of land to support the transmission cabling route and switching station. It is noted that while NAS Oceana supports the CVOW project concept, and the preferred route discussed herein, granting a real estate instrument is subject to, among other items, obtaining higher level Navy approval and satisfying all regulatory requirements.

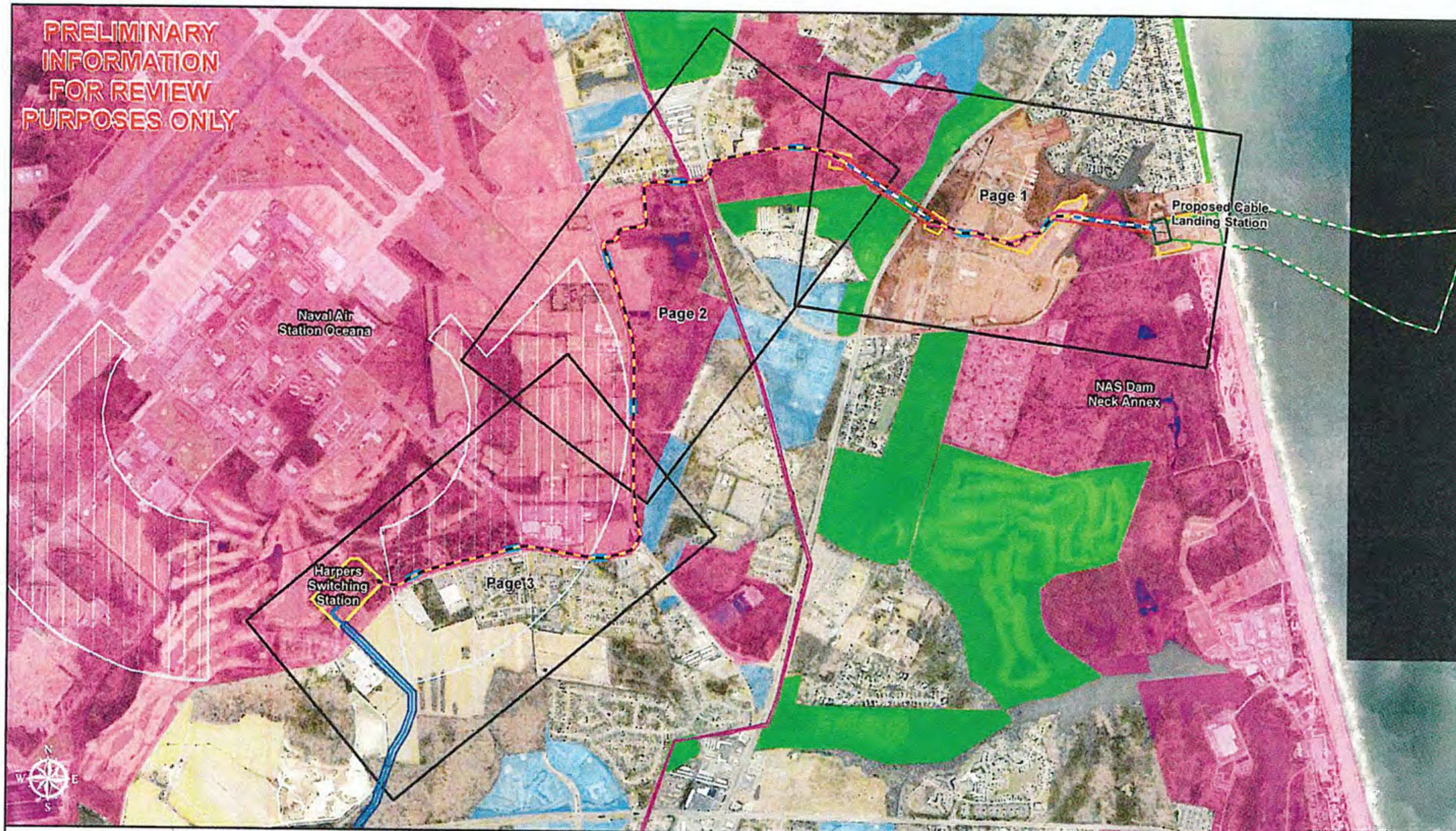
SUBJECT: COASTAL VIRGINIA OFFSHORE WIND (CVOW) COMMERCIAL PROJECT – PREFERRED ROUTE THROUGH NAVAL AIR STATION (NAS) OCEANA, VIRGINIA BEACH

NAS Oceana looks forward to continued coordination with Dominion Energy for the CVOW project. Please contact Rich Riker by email at richard.r.riker4.civ@us.navy.mil or by phone at 757-433-3050 with questions if you require further information.

Sincerely,

R. L. HOLMES

Enclosure: 1. DOM CVOW Navy Oceana Aerial Route Maps Combined



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- Surface Trenched Area
- Overhead Route
- Proposed Overhead ROW
- Proposed Cable Landing Station
- Potential HDD Alignment
- Surface Trenched ROW
- Surface Trenched ROW - Manhole Location
- Temporary Construction Easement
- Offshore Export Cables ROW - Onland
- Offshore Export Cables ROW - Offshore
- Proposed Switching Station
- Existing DOM Transmission Line
- U.S. Navy Land
- State Military Reservation
- City Park
- City Property
- AICUZ Accident Potential Zone 1
- Index Sheet

Overview

Dominion Energy

Figure 1
Coastal Virginia Offshore Wind Project
Dominion Virginia Power
City of Virginia Beach, VA
Transmission Line Routes and Facilities Located on Navy Land/Easements in the Vicinity of NAS Oceana

ERM

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Enclosure (1)

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- Potential HDD Alignment
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Dominion Energy

Figure 1
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City of Virginia Beach, VA
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ERM

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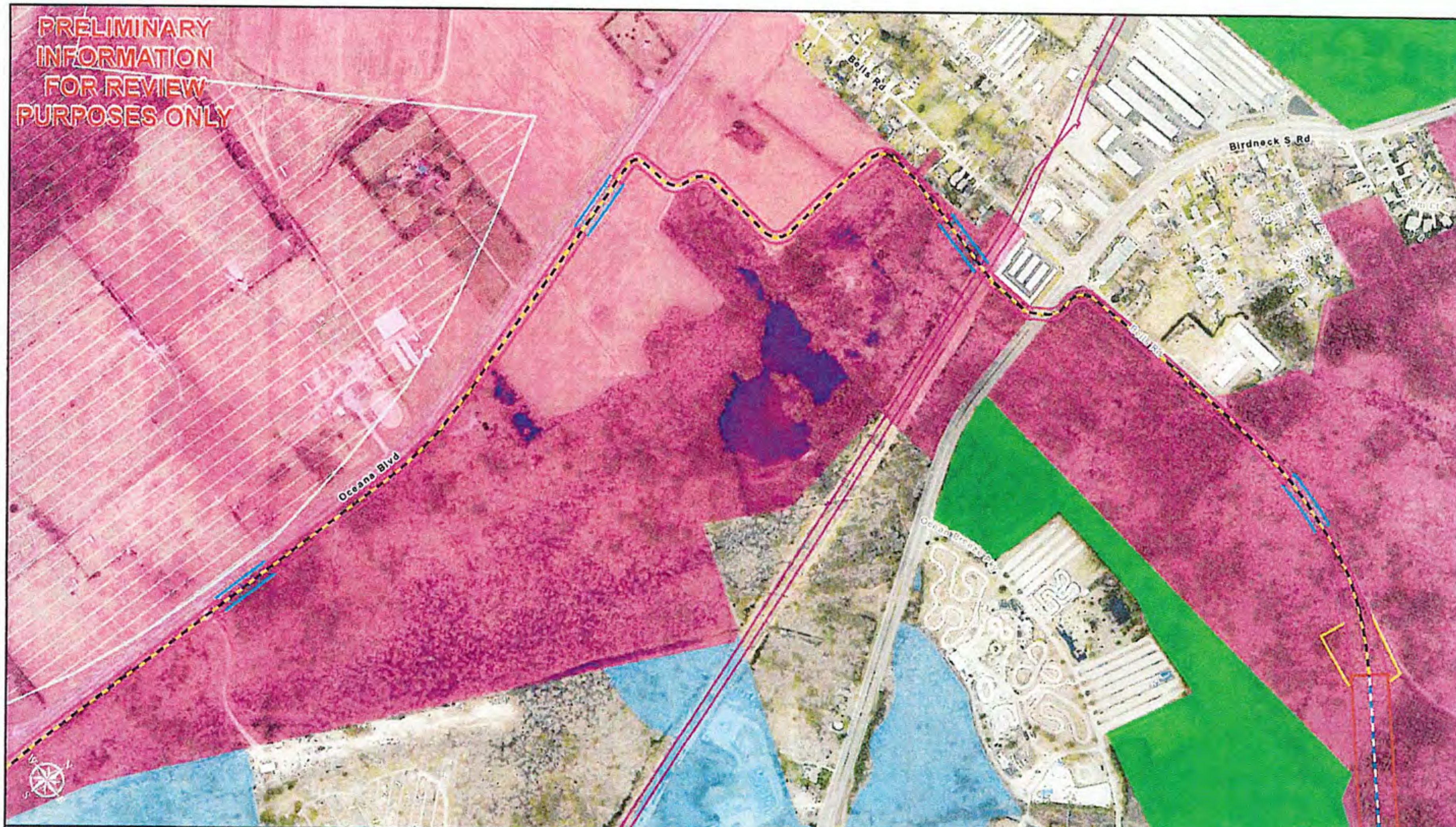

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- City Park
- City Property
- AICUZ Accident Potential Zone 1

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Dominion Energy

Figure 1
Coastal Virginia Offshore Wind Project
Dominion Virginia Power
City of Virginia Beach, VA
Transmission Line Routes and Facilities Located on Navy Land/Easements in the Vicinity of NAS Oceana

ERM

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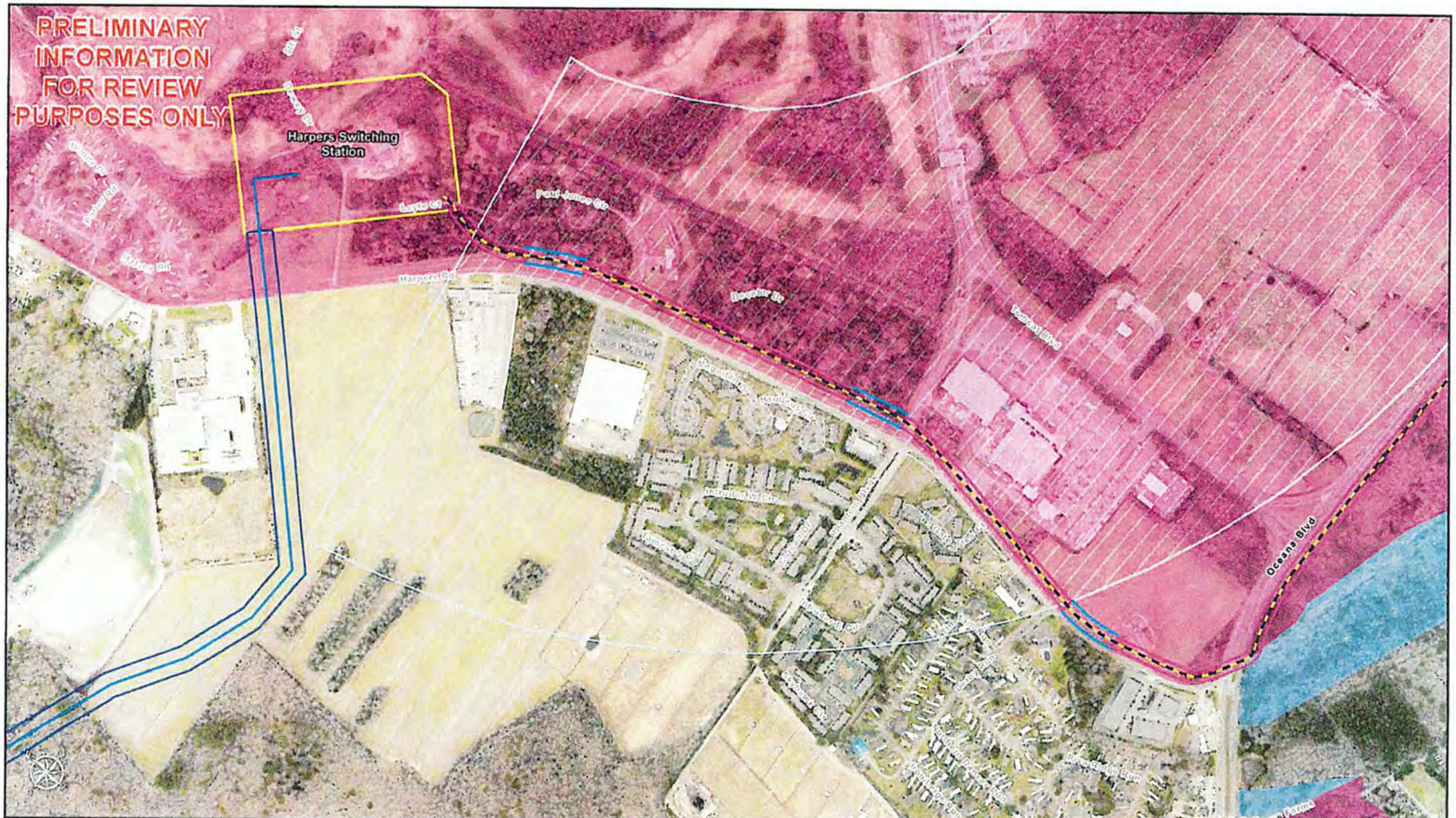

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AICUZ Accident Potential Zone 1

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Dominion Energy

Figure 1
Coastal Virginia Offshore Wind Project
Dominion Virginia Power
City of Virginia Beach, VA
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ERM

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Enclosure (1)

City of Virginia Beach

VBgov.com

Robert "Bobby" D. Dyer
Mayor

Municipal Center
Building 1
2401 Courthouse Drive, Room 234
Virginia Beach, VA 23456-9001
(757)-385-4581
FAX (757) 385-5626

October 22, 2021

Bonita Billingsley Harris
Reginal Director, Easter Region
Dominion Energy Virginia
2700 Cromwell Drive
Norfolk, VA 23509

Dear Mrs. Harris:

On behalf of the City of Virginia Beach, I am writing to express the City Council's strong support for offshore wind.

Since the development of the Virginia Offshore Wind Technology Advancement Project (VOWTAP), City Council has been quite optimistic about the opportunities created by a larger offshore wind project. For Virginia Beach, offshore wind represents an engine for economic growth and job creation, bringing well-paying, quality jobs to Hampton Roads. Furthermore, offshore wind will play a key role in the decarburization of our economy, which is an especially urgent need for coastal communities that are vulnerable to sea levels rising and recurrent flooding.

City Council has been please by Dominion Energy's efforts to develop the Coastal Virginia Offshore wind ("CVOW") Commercial Project. Over the last several years, Dominion Energy has actively engaged the community, businesses, and other interested groups in Hampton Roads to listen, learn and gather feedback on CVOW. When the Company published potential routes for the transmission lines needed to connect the offshore wind energy to Virginia electrical grid, Dominion Energy conducted public events, workshops, roundtables, and small-group and individual meetings. While the City Council recognizes the need for this necessary infrastructure, we are especially pleased with the Company's commitment to solicit and collect feedback from the community and implement changes based on that input.

As this project moves forward, the City Council of Virginia encourages Dominion Energy to minimize the crossing of private properties and use open space and/or overlap with existing infrastructure where possible. We trust that Dominion Energy will continue to be an engaged and receptive partner, as they have demonstrated to be throughout the entirety of this process.

To ensure the success of offshore wind in Hampton Roads, we are committed to working with Dominion Energy throughout this project, including collaborating and cooperating on electric transmission right-of-way needs that cross city-owned land and easement rights. We look forward to continued collaboration as we work together to make offshore wind a reality for Virginia.

Sincerely,

Bobby Dyer

Robert M. "Bobby" Dyer
Mayor, City of Virginia Beach

The Nature Conservancy
Protecting nature. Preserving life.

The Nature Conservancy in Virginia
530 E. Main St. Suite 800
Richmond VA 23219

tel (804) 644-5800
fax (804) 644-1685
nature.org

October 29, 2021

Mr. Robert Bisha
Environmental Technical Advisor
Dominion Energy Services, Inc.
120 Tredegar St.
Richmond, VA 23219

Re: Potential CVOW-C crossing of TNC land along Intracoastal Waterway, City of Chesapeake, VA

Dear Mr. Bisha:

The Nature Conservancy (TNC) understands that one of Dominion's alternative routes for the on-shore transmission portion of the Commonwealth of Virginia Offshore Wind Commercial Project (CVOW-C) would cross properties owned by TNC in the City of Chesapeake, VA. The properties are identified as City of Chesapeake Tax Parcel 0510000000560 located on the north side of the intracoastal waterway (ICW) and Tax Parcel 0500000000630 located south of the ICW. We understand the proposed crossing would involve expansion of an existing Dominion transmission line easement. Dominion provided TNC the attached map depicting a total of +/- 1.60 acres of existing forested wetland cover on TNC land that would need to be cleared for the proposed transmission line expansion.

TNC supports the deployment of renewable energy. While TNC would prefer to see no loss of existing forest resulting from construction of the proposed transmission line, we are willing to allow an expansion of the transmission line corridor that will result in +/- 1.60 acres of forest loss on TNC land.

TNC understands Dominion would like to acquire an easement over the proposed +/- 1.60-acre area encompassing the proposed transmission line expansion. TNC is willing to convey such an easement over the +/- 1.60-acre area to Dominion. TNC will expect to receive full fair market value for the area impacted by the easement. TNC will also expect to be compensated for any diminution of value to the residual parcels resulting from construction of the transmission line. The easement's fair market value and the diminution of value to the residual will be determined by a qualified appraiser. Expenses for the appraisal will be covered by Dominion. TNC may decide to have the appraisal report reviewed by another appraisal firm. Payment for the easement and compensation for diminution in value to the residual will be made by Dominion to TNC.

TNC tracts to be impacted by the proposed transmission line construction are recognized as "match" property for a United State Fish & Wildlife Service (USFWS) North American Wetlands Conservation Act (NAWCA) grant awarded to TNC (NAWCA Grant Agreement 14-0009-92-1218, dated 2/27/1992). TNC has consulted with USFWS regarding Dominion's proposed transmission line expansion. USFWS has determined that sale of a transmission easement over the proposed +/- 1.60 acres by TNC to Dominion is an allowable disposal of NAWCA match property. TNC understands disposal of the property will extinguish all encumbrances on the easement acreage as they relate to the NAWCA grant agreement.

TNC will consult with USFWS on how funds from sale of the easement and compensation for diminution to the residual will be used to offset loss of habitat value resulting from the right of way expansion.

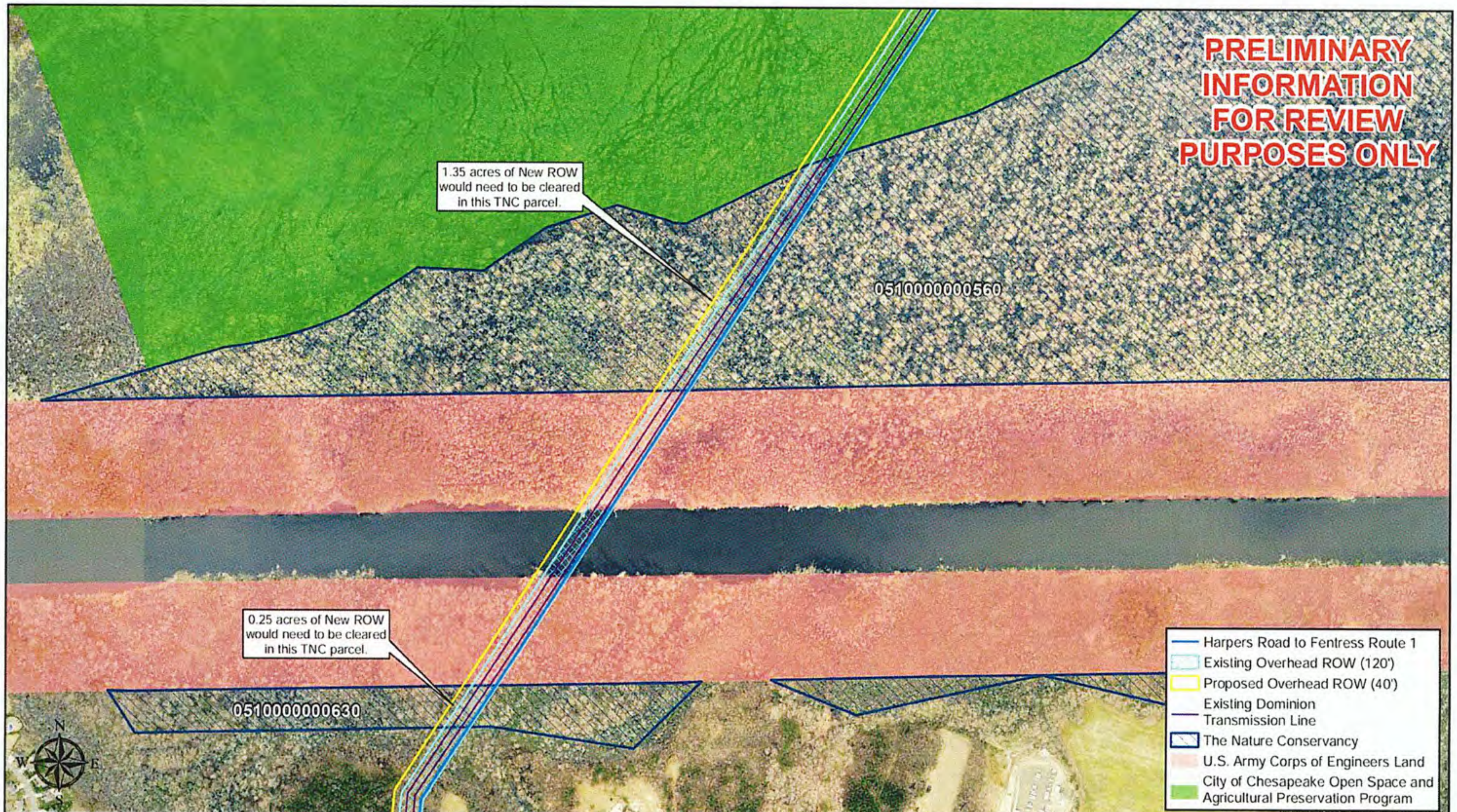
Sincerely,

Brian van Eerden

Brian van Eerden
Director, VA Pinelands Program

attachment: TNC Parcel Crossings map (6/2/21)

cc: Judy Dunscomb, TNC



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Dominion Energy

Coastal Virginia Offshore Wind Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA
The Nature Conservancy Parcel Crossings

ERM

DRAWN BY: JPB

APPENDIX D ASSESSMENT OF ALL-UNDERGROUND ROUTE

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TABLE OF CONTENTS

Acronyms and Abbreviations

Name	Description
A	amp
CVOW	Coastal Virginia Offshore Wind
DEQ	Virginia Department of Environmental Quality
Dominion	Dominion Transmission
GIS	Geographic Information System
H&A	Haley & Aldridge
HDD	horizontal directional drill
HF Route 1	Harpers to Fentress Route 1
kAIC	kilo-ampere interrupting capacity
kcmil	thousands of circular mils
kV	kilovolt
MVAR	megavolt-amps (reactive)
Project	Coastal Virginia Offshore Wind Commercial Project
ROW	right-of-way
TL	transmission line
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
yd^3	cubic yards

1. HARPERS SWITCHING STATION TO FENTRESS SUBSTATION

Dominion Transmission (Dominion) compared an all-underground transmission configuration, referred to here as the All-Underground Route, with Harpers to Fentress (HF) Route 1, which is the preferred overhead transmission configuration for the Coastal Virginia Offshore Wind (CVOW) Commercial Project (Project). Along most of its alignment, the All-Underground Route would use the same alignment as HF Route 1, which measures approximately 14.2 miles in length, from the proposed Harpers Switching Station in Virginia Beach to Dominion's existing Fentress Substation in Chesapeake. An exception is an approximately 2.0-mile long segment of the all underground route generally between Landstown Road and Indian River Farms Park in Virginia Beach. In this area, HF Route 1 follows Dominion's existing transmission right-of-way (ROW) for Lines #271/I-74 through and/or between the Highland Acres, Highland Meadows, Dewberry Farm, Indian River Woods, and Indian River Farms subdivisions, whereas the All-Underground Route follows a greenfield alignment to the northwest. As discussed in more detail below, the All-Underground Route would require several horizontal directional drills (HDDs) in this area; there is not enough room along the existing transmission right-of-way through the subdivisions for the workspace that would be needed to complete the HDDs, which is why the two routes in this area would be different.

Another difference between the two routes would be the width of the ROW corridor for the three proposed CVOW transmission circuits: HF Route 1 would use a typical 140-foot-wide ROW for an overhead transmission configuration and the All-Underground Route would use a 65-foot-wide ROW for an underground transmission configuration.[1] The All-Underground Route additionally would include four HDDs and two microtunnel crossings, while HF Route 1 would have none.

From this review, and as discussed in more detail below, Dominion concluded that the additional materials and equipment, construction risks associated with HDD and microtunnel installations, impacts to sensitive lands, environmental impacts (including the placement of permanent, non-native fill in wetlands), costs, and time to construct associated with the All-Underground Route make this alternative infeasible relative to HF Route 1.

Table 1 in Attachment 1 summarizes the salient characteristics of both routes. A map depicting the All-Underground Route is also included in Attachment 1.

2. STATION EXPANSION AND DEVELOPMENT TO ACCOMMODATE AN ALL-UNDERGROUND ROUTE

2.1 Station Expansion Requirements

2.1.1 Harpers Switching Station

HF Route 1 and the All-Underground Route would both require a switching station at a site near Harpers Road in Virginia Beach. An expansion of the proposed design for the Harpers Switching Station would be required for the All-Underground Route relative to the current planned design for HF Route 1. Additional equipment to be installed at the switching station to support an all-underground transmission line would include:

- Four 230 kV, 3,000 A, 63 kAIC, SF-6 circuit breakers
- Four 230 kV, 3,000 A, 3-phase center break disconnect switches

[1] The width of the right-of-way for the All-Underground Route would increase to approximately 86 feet at manholes/splicing vault locations and 200 feet or more at HDD and micro-tunnel crossings.

- Twelve 230 kV, relaying accuracy, capacitor-coupled voltage transformers
- Four 230 kV, 50-100 MVAR, 3-phase, variable shunt reactors
- Four transmission reactor bank relaying panels

2.1.2 *Fentress Substation*

HF Route 1 and the All-Underground Route would both require an expansion of Dominion's existing Fentress Substation, but a larger expansion would be required to accommodate a 100 percent underground transmission system. Approximately 8 additional acres of expanded area would be needed to accommodate the underground transmission facilities at Fentress Substation.[2] Because of the limitations of the existing substation site (e.g., city-owned parklands to the west, a railroad to the east, residential subdivisions to the north and south, and forested wetlands throughout the area), the 8 acres of additional expanded area would mostly consist of forested wetlands.[3] Regulatory approval by the U.S. Army Corps of Engineers (USACE) and the Virginia Department of Environmental Quality (DEQ) for the clearing and permanent filling of these wetlands would be challenging and potentially infeasible.

Additional Level 1 high-security fencing would be required at the expanded substation, including:

- Approximately 1,000 linear feet of 20-foot-tall Design Level 1 high-security fence
- Four 25-foot-tall super posts
- Anti-dig barrier footing between the perimeter fence foundations
- Foundations for the fence posts, super posts, etc.
- Ground tails, and miscellaneous grounding materials for fence posts, panel-to-panel connections, and security and communication boxes per the current engineering standards
- Security integrations for the fence

Additional equipment to be installed at the Fentress Substation to support an all-underground transmission line would include:

- Six 230 kV 155 MVAR, 3-phase shunt reactors
- Six 230 kV, 3,000 A, 3-phase, center break disconnect switches
- Three 230 kV air-to-underground structures
- Approximately 1,000 feet of air-insulated bus
- Approximately 2,190 feet of gas-insulated bus
- Approximately 390 feet of cable trough, with a 20-foot road-crossing section
- One 10-foot control enclosure expansion
- Four transmission reactor bank relaying panels

2.2 Costs

The additional station-related costs associated with expansions of both the proposed Harpers Switching Station and the existing Fentress Substation discussed above would be approximately $15 million and $35 million, respectively.

[2] The 8 additional acres would be on Dominion-owned property at the site.

[3] This analysis assumes that the additional 8 acres would be on the west side of the current facility in area delineated as (mostly) forested wetland.

2.3 Schedule

Although additional equipment would be required for the expansion of the Harpers Switching Station and the Fentress Substation, this would not likely necessitate significant sequential construction timelines, assuming additional crews could be added to work on the expanded scope at the same time as work for the proposed scope.

3. UNDERGROUND CABLE, HORIZONTAL DIRECTIONAL DRILL, AND MICROTUNNEL REQUIREMENTS

3.1 Underground Infrastructure Requirements

Additional underground infrastructure requirements include the following:

- Open trenching to install 193,248 feet of cable
- HDDs: 24 individual drills and conduit pulls at four HDD locations (six drills per HDD location)
- Microtunnels: two microtunnel locations with six tunnels per location
- Manholes/splicing vaults: 164 (at 27 vault locations)
- Cable: Approximately 2,021,216 feet of a combination of 5,000 kcmil aluminum and 4,000 kcmil copper cross-linked polyethylene cable
- Cable splices: 781

3.2 Horizontal Directional Drill and Microtunnel Feasibility

For HDD and microtunnel design, see the Haley & Aldridge (H&A) HDD and Microtunnel Feasibility Reports in Attachment 2.

The four sites requiring cable installation via HDD are:

- A wetland complex near Holland Pines Park at Chestwood Drive in Virginia Beach (approximately 2,200 feet long)
- A tributary to North Landing River in Virginia Beach (approximately 1,480 feet long)
- Indian River Farms in Virginia Beach and Chesapeake (approximately 1,850 to 2,000 feet long)
- Intracoastal Waterway in Chesapeake (approximately 2,500 feet long)

The two sites requiring cable installation by microtunnel are:

- Dam Neck Road in Virginia Beach (approximately 650 feet long)
- London Bridge Road in Virginia Beach (approximately 300 feet long)

The H&A feasibility assessments evaluated local and regional geology and geotechnical subsurface conditions at each drill/microtunnel site to identify and assess potential subsurface risks for completing successful drills/tunnels. On a scale of 1 to 10, with 10 considered "Not Feasible," two HDD drill sites (the tributary to North Landing River and Indian River Farms) were assessed a risk factor of 6; one microtunnel site was assessed a risk factor of 8 (Dam Neck Road); and one HDD drill site (the wetland complex near Holland Pines Park) and one microtunnel site (London Bridge Road) were each assessed a risk factor of 9. Note in the attached feasibility reports that Risk Factors 7 through 9 are all categorized as "Anticipate Numerous Issues with Respect to Crossing Feasibility," with the higher number representing higher risk.

3.2.1 Risk Factors

The primary components contributing to the potential subsurface risk in the H&A assessments are:

- Subsurface geotechnical conditions:
  - The relative density of sands at the drill/microtunnel sites range from very loose to medium dense.
  - The relative density of clays and organic-rich clays at the drill/microtunnel sites typically range from very soft to soft.
- Borehole instability and/or borehole collapse is a potential risk if subsurface lithology is predominately composed of very loose to loose sands, especially for the large diameter (66-inch) HDD boreholes.
- Inadvertent returns of drilling fluids are high risk, especially near entry and exit locations, if surface and subsurface lithology is predominately composed of very loose to loose sands.
- Decreased borehole stability due to coarse pebbly layers is a potential risk. Locally, the basal units of each geological formation/member can contain varying amounts of gravel and pebbles resulting in higher risk.
- Encountering highly localized paleo-channels that have the potential to be filled with very soft to soft organic-rich clays and peat is a potential risk. The organic-rich clays can also contain in situ tree trunks as well as tree branches.

3.2.2 Installation

See the attached H&A HDD and Microtunnel Feasibility Reports.

3.2.3 Electrical

Because of the subsurface geotechnical conditions, it can be assumed that existing soil conditions at the HDD locations have both poor thermal and physical characteristics. The unstable nature of the soils at the HDD locations can be combated by increasing the depth of the drills. A deeper installation, while lessening the inherent risks associated with HDDs, however, would inversely affect the current carrying capacity of the transmission lines. Additional cables could be added to resolve the capacity issue, but that in turn would require additional drills. As many as three additional HDDs (for a total of nine per site) could be required at each drill location to accommodate the additional cables. The overall space requirements for such an undertaking would likely eliminate the All-Underground Route as a feasible alternative.

3.3 Other Requirements

Right-of-Way

ROW requirements for an underground transmission line include the following:

- For open trench installation, a 65-foot-wide corridor would be required.
- For HDD and microtunnel installations, the corridor width would vary depending on the final design. At this point, however, the design assumes that at least a 245-foot-wide corridor would be required at each HDD/microtunnel location.

Work Hours

Most HDD construction activities would be completed in 10-hour days, but grouting and casing pullback would be a 24-hour, 7-days-per-week operation. Grouting would take 1 to 2 days per casing. Each casing would take about 2 days to pull in.

Noise

Sound walls for noise attenuation would need to be erected for at least two of the four HDD drill pad locations, which would be in close proximity to residential developments associated with the Dewberry Farm, Indian River Farms, and Indian River Meadows subdivisions. Public opposition to drilling activities would be expected to be high for the 1.5 to 2.5 years of HDD activities during the workhours described above.

Cost

The cost estimate is based on an arbitrary 15-mile route. It is extremely high-level and subject to change. The current estimate is approximately an additional $1.4 billion in transmission-related costs to construct an All-Underground Route from the Harpers Switching Station to the Fentress Substation.

Schedule

- HDDs would require 1.5 to 2.5 years to complete.
- The entire All-Underground Route from the Harpers Switching Station to the Fentress Substation would require from 3.5 to 5 years to construct, whereas HF Route 1 would require about 3.5 years to construct.

4. ENVIRONMENTAL CONSIDERATIONS

4.1 Excavation-Related Issues

Installation of the underground cables for the All-Underground Route would require approximately 12.9 miles of open trenching to excavate three parallel trenches, each measuring approximately 7.75 feet deep and 5.25 feet wide. The three excavated trenches would be continuous from Harpers Switching Station to Fentress Substation, with the exception of the four HDDs (measuring a combined 1.5 miles in length) and two microtunnels (measuring a combined 0.2 mile in length). Some other areas may also require specialized construction techniques or deeper trench excavation (e.g., utility or other major road crossings). Most backfill in the trenches would consist of non-native materials, including crushed rock in the trench bottom, 3,000 pounds per square inch concrete around the cable duct bank, and fluidized thermal backfill in the top half of the trench up to about 1 foot below the surface.

For the All-Underground Route, trenching for the underground cables and excavation for concrete splicing vaults between Harpers Switching Station and Fentress Substation would require the excavation of approximately 342,206 cubic yards (yd^3) of material, of which approximately 187,482 yd^3 would be from wetland areas. This is significantly greater than the excavation requirements for installing overhead transmission structures on HF Route 1 (a total of 4,628 yd^3, including 2,379 yd^3 in wetlands).

As noted above, most of the backfill used in the excavated trenches/splicing vaults for the All-Underground Route would consist of non-native materials (i.e., rock, concrete, and fluidized thermal backfill). This would result in the onshore Virginia Facilities depositing approximately 187,482 yd^3 of permanent fill in a mix of forested and emergent wetlands. It would also result in three parallel, subsurface, relatively impermeable barriers (i.e., the backfilled trenches) each measuring about 7.75 feet deep by 5.25 feet wide feet wide across approximately 37,394 feet (7.1 miles) of wetlands in the cities of Virginia Beach and Chesapeake. The regulatory issues associated with this amount of excavation and non-native fill in wetlands is uncertain, particularly concerning the hydrologic effects on subsurface water flows within the wetlands. The magnitude of impact could be problematic relative to the USACE Section 404 and Virginia DEQ regulatory processes for wetland permitting. Consultation with these agencies would be required to determine the viability of permitting success.

In addition to the above, if 342,206 yd^3 of material is excavated and replaced with non-native materials, Dominion would need to determine where and how to dispose of this excess excavated material, which would result in additional surface transportation impacts.

4.2 Total New Right-of-Way and New Right-of-Way Clearing Required on Sensitive Lands

Three sensitive (both environmentally and politically) land tracts crossed by the All-Underground Route and HF Route 1 are respectively owned or under the jurisdiction of the USACE, The Nature Conservancy (TNC), and the City of Chesapeake (Sawyer Tract). Because of the wider ROW and extra workspace needed for an HDD of the Intracoastal Waterway (which could not be collocated with the existing Line #271/I-74 due to drill alignment), an additional approximately 11.8 acres of ROW would be required on USACE lands (of which 1.6 acres would require clearing) and an additional approximately 5.5 acres of ROW would be required on TNC lands (of which 3.4 acres would require clearing). Conversely, only about 1.8 acres of new ROW on USACE lands (of which 1.4 acres would require clearing) and approximately 1.5 acres of new ROW on TNC lands (all of which would require clearing) would be needed for HF Route 1. Only 2.5 acres of new ROW would be required on the city-owned Sawyer Tract for construction of the All-Underground Route (of which 0.6 acre would require clearing), while HF Route 1 would require an additional 5.8 acres (all of which would require clearing).

4.3 Forested Land Clearing

The major difference between the All-Underground Route and HF Route 1 relative to forested land clearing and disturbance is the width of the ROW and use of HDD and microtunnel installation methods for select crossings. As indicated above, the underground portion of the All Underground Route would use a typical 65-foot-wide ROW for both construction and operation of the transmission line, while HF Route 1 would use a typical 140-foot-wide ROW. In addition to the ROW, clearing of forested land would be needed for extra temporary workspace to install the HDD and microtunnels along the All-Underground Route and for the planned expansion of Fentress Substation. As noted above, 8 additional acres would be required to expand the substation for the All-Underground Route relative to HF Route 1. Most of this additional area is forested.

Using recent (2020) digital aerial photography obtained from the cities of Virginia Beach and Chesapeake, the forested areas to be cleared within each ROW and at the Fentress Substation were measured and totaled using GIS. Collocation and overlap onto existing cleared corridors were taken into account as was the trenchless installation for the HDD and microtunnels. Based on this analysis, forested land clearing for the overhead route (101.2 acres) would be approximately 22.4 acres greater than for the All-Underground Route (78.8 acres).

4.4 Wetlands

HF Route 1 would cross about 8.1 miles and the All-Underground Route would cross about 7.1 miles of forested, scrub/shrub, emergent, pond, and riverine wetlands. Because of the narrower ROW and use of HDD for several crossings, the amount of wetlands affected (both clearing and excavation) by the

All-Underground Route (100.2 acres) would be about 49.0 acres less than HF Route 1 (149.2 acres). As noted above, however, the backfilling of wetlands along the All-Underground Route with non-native materials would be significantly greater than HF Route 1; filling of wetlands for the latter would be limited to transmission structure foundations. Additionally, the larger expansion of the Fentress Substation required for the All-Underground Route would permanently fill an additional 8 acres of forested wetland relative to the expansion required to accommodate HF Route 1.

4.5 Visual Impacts

The All-Underground Route would reduce the overall ROW width from 140 feet to 65 feet, which would reduce forest clearing impacts. The most obvious effect of the underground transmission configuration relative to an overhead configuration, in addition to the narrower ROW, would be the lack of visible transmission line structures. This would be most notable in greenfield sections of the route which cross or pass near residential subdivisions (including the Mayberry, Prince George Estates, Pine Ridge, Castleton, Holland Pines, Woods of Piney Grove, Highland Acres, Highland Parish, Dewberry Farm, and Indian River Farms subdivisions in Virginia Beach). Approximately 7.8 miles or 55 percent of HF Route 1 is adjacent to existing transmission lines, however, so the new transmission structures would not represent a new utility land use in these areas.

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ATTACHMENT 1 TABLE 1 AND ALL-UNDERGROUND ROUTE MAP

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Table 1: Assessment of All-Underground Route, Harpers Switching Station to Fentress Substation

Features	Harpers to Fentress Route 1 (Overhead)	All-Underground Route
Length of Transmission Line Route		
Length of overhead installation (miles)	14.2	0.0
Length of underground installation (miles)	0.0	14.6
Surface trench (miles)	0.0	12.9
HDD/microtunnel (miles)	0.0	1.7
Overhead Transmission Structures		
Total number of overhead structures	356	0
Number in wetlands	183	0
Number in uplands	173	0
Total required excavation/fill (yd^3) [a]	4,628	0
Excavation/fill in wetlands (yd^3) [a]	2,379	0
Excavation/fill in uplands (yd^3) [a]	2,249	0
Underground Cables and Manholes/Splicing Vaults		
Total number of manhole/splicing vaults [b]	0	164
Number in wetlands [b]	0	90
Number in uplands [b]	0	74
Total required excavation/fill (yd^3) [c]	0	342,206
Excavation/fill in wetlands (yd^3) [c]	0	187,482
Excavation/fill in uplands (yd^3) [c]	0	154,724
New ROW Required on Sensitive Lands (both cleared and uncleared [HDD])		
USACE (acres)	1.8	11.8 [d]
TNC (acres)	1.5	5.5 [e]
Sawyer Tract (acres)	5.8	2.5 [f]
Clearing of New ROW on Sensitive Lands (cleared lands only)		
USACE (acres)	1.4	1.6
TNC (acres)	1.5	3.4
Sawyer Tract (acres)	5.8	0.6
Forested Land Clearing		
Total forested land clearing (acres) [g]	101.2	78.8
ROW (acres)	92.3	43.8
Temporary workspace (HDD) (acres)	0.0	18.1
Fentress Substation (acres)	8.9	16.9 [h]
Wetland Impacts (Clearing and Excavation)		
Total wetland impacts (acres) [g, i]	149.2	100.2

Features	Harpers to Fentress Route 1 (Overhead)	All-Underground Route
Forested wetland impacts	68.8	51.0 [j]
Scrub/shrub wetland impacts	45.4	31.6
Emergent wetland impacts	25.5	14.3
Riverine wetland impacts	8.0	2.9
Pond	1.4	0.4

HDD = Horizontal Directional Drill; ROW = right-of-way; TNC = The Nature Conservancy; USACE = U.S. Army Corps of Engineers; yd^3 = cubic yards

[a] *Calculation of the volume of excavated soil and concrete fill required for overhead structures based on an estimate of 13 yd^3 per structure.*

[b] *Estimate based on an assumption of six manholes/splicing vaults for all three CVOW circuits approximately every 2,500 feet along the All-Underground Route, excluding areas crossed by HDD.*

[c] *Calculation of the volume of excavated soil and fluidized thermal and concrete backfill for the underground cables and manholes/splicing vaults based on an estimate of 12,534.2 yd^3 per 2,500-foot-long segment of route, excluding areas crossed by HDD or microtunnel.*

[d] *Of this, 11.6 acres consist of new permanent ROW and 0.2 acre consists of temporary construction ROW; 10.2 acres consists of an HDD crossing (no surface disturbance).*

[e] *Of this, 4.4 acres consist of new permanent ROW and 1.1 acres consists of temporary construction ROW; 2.1 acres consists of an HDD crossing (no surface disturbance).*

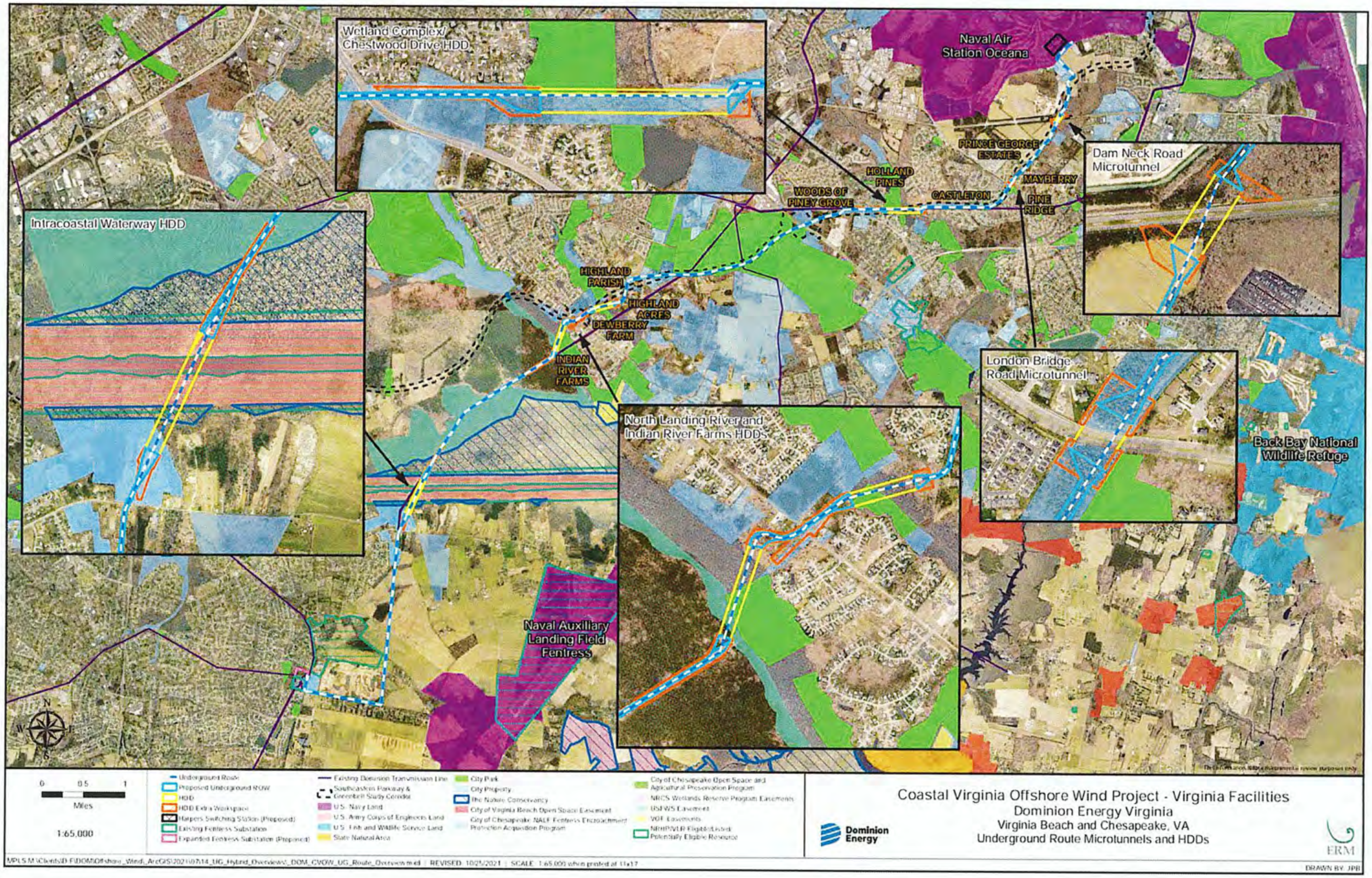
[f] *Of this, 1.9 acres consist of new permanent ROW and 0.6 acre consists of temporary construction ROW; 1.9 acres consist of an HDD crossing (no surface disturbance).*

[g] *Excludes areas crossed by HDD or microtunnel.*

[h] *Includes an additional 8 acres of forested impacts for the larger expansion required at Fentress Substation; the additional area is assumed to be west of the existing facility in mostly forested areas.*

[i] *Includes the pipeline ROW, Harpers Switching Station, temporary workspace, and Fentress Substation.*

[j] *Includes an additional 8 acres of forested wetland impacts for the larger expansion required at Fentress Substation; the additional area is assumed to be west of the existing facility in mostly forested areas.*


Wetland Complex/
Chestwood Drive HDD
Naval Air
Station Oceana
Dam Neck Road
Microtunnel
PRINCE GEORGE
ESTATES
HOLLAND
PINES
WOODS OF
PINEY GROVE
CASTLETON
MAYBERRY
PINE
RIDGE
Intracoastal Waterway HDD
HIGHLAND
PARISH
HIGHLAND
ACRES
DEWBERRY
FARM
INDIAN
RIVER
FARMS
London Bridge
Road Microtunnel
North Landing River and
Indian River Farms HDDs
Back Bay National
Wildlife Refuge
Naval Auxiliary
Landing Field
Fentress
0 0.5 1
Miles
1:65,000
Underground Route
Proposed Underground ROW
HDD
HDD Extra Workspace
Harpers Switching Station (Proposed)
Existing Fentress Substation
Expanded Fentress Substation (Proposed)
Existing Dominion Transmission Line
Southeastern Parkway & Greenbelt Study Corridor
U.S. Navy Land
U.S. Army Corps of Engineers Land
U.S. Fish and Wildlife Service Land
State Natural Area
City Park
City Property
The Nature Conservancy
City of Virginia Beach Open Space Easement
City of Chesapeake NALF Fentress Encroachment Protection Acquisition Program
City of Chesapeake Open Space and Agricultural Preservation Program
NRCS Wetlands Reserve Program Easements
USFWS Easement
VOF Easements
NRHP/VLR Eligible/Listed Potentially Eligible Resource
Coastal Virginia Offshore Wind Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA
Underground Route Microtunnels and HDDs
Dominion Energy
ERM
REVISED: 10/25/2021 | SCALE: 1:65,000 when printed at 11x17
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ATTACHMENT 2 HALEY & ALDRIDGE HDD AND MICROTUNNEL FEASIBILITY REPORTS

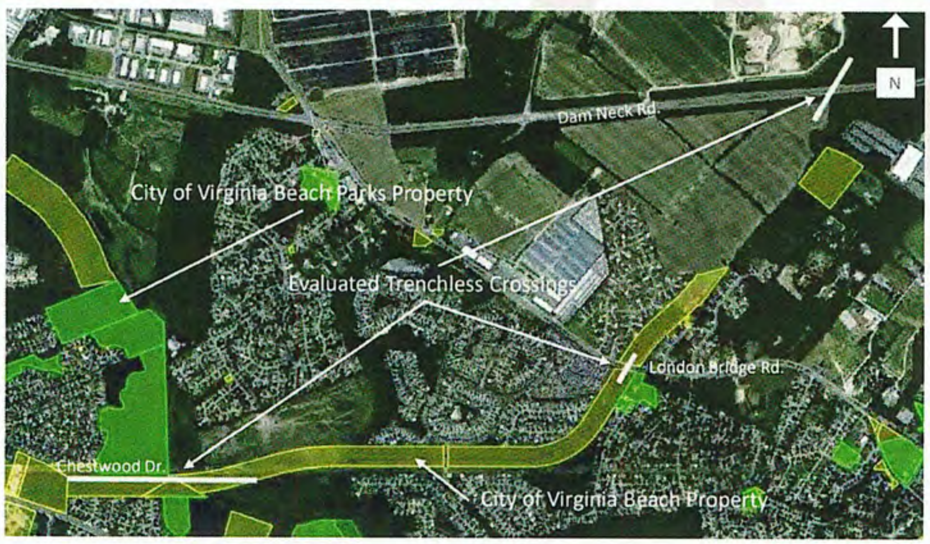
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation Hybrid Route – Geological Overview & Summary

Date: 14 June 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Harpers Road Substation to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of three potential trenchless crossings along a hybrid route, to tie the CVOW project into the onshore grid.
   a. Number of HDDs or Jack and Bores per crossing: 6
   b. Proposed casing Pipe: 48-inch HDPE/FPVC or 66-inch RCP
   c. Preferred trenchless technique: Horizontal Directional Drilling (HDD) or Jack and Bore
4. The following documents were provided:
   a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
   a. Dam Neck Rd. Crossing
   b. London Bridge Rd. Crossing
   c. Crossing near Chestwood Dr.
6. Trenchless technologies for consideration in this feasibility study may be Microtunnel, horizontal directional drills (HDDs) or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
	NOT FEASIBLE

Evaluations, Opinions and Recommendations

SUMMARY

1. Evaluated local and regional geology and geotechnical subsurface conditions based on geological maps, regional geological studies, well logs, and geotechnical logs.
   a) Main subsurface lithology: Very loose to medium dense fine to coarse siliceous to siliceous-carbonate silty sand. Potential for localized pebbly units at the base of each geological formation/member.
   b) Secondary subsurface lithology: Very soft to soft clay and organic-rich clay in highly localized paleochannels (widths of up to 30 ft and depths of up to 60 ft) and as sporadic thin interbeds.
2. Subsurface Geotechnical conditions.
   a) Relative density of sands ranges from very loose to medium dense.
   b) Relative density of clays and organic-rich clays typically range from very soft to soft.

POTENTIAL SUBSURFACE RISKS

1. Potential risk for borehole instability and/or borehole collapse, if subsurface lithology is predominately composed of very loose to loose sands, especially for a large diameter HDD boreholes.
2. High risk for inadvertent returns especially near entry and exit locations, if surface and subsurface lithology is predominately composed of very loose to loose sands.
3. Locally the basal units of each geological formation/member can contain varying amounts of gravel and pebbles. These coarse pebbly layers can potentially decrease borehole stability.
4. Potential for encountering highly localized paleochannels that have the potential to be filled with very soft to soft organic-rich clays and peat. The organic-rich clays can also contain in situ tree trunks as well as tree branches.

Crossing	Differentiators	Feasibility Ranking
Dam Neck Road – Microtunnel	Do not recommend Jack and Bore due to anticipated subsurface conditions (sands under groundwater table). Six parallel microtunnels for approx. 650 ft each will require similar width of ROW as HDD and jacking/receiving shafts. RCP may be required due to its strength properties.	8
London Bridge Road – Microtunnel	Do not recommend Jack and Bore due to anticipated subsurface conditions (sands under groundwater table). Possible drainage channel running in the north-south direction along the eastern side of the ROW and microtunnel work areas. Gas lines along the ROW. Elevation difference between entry and exit location may require deep jacking and receiving shafts for microtunneling operation.	9
Chestwood Drive – HDD	Lack of space to laydown full string of pipe for pullback which could lead to complications during installation. Presence of overhead lines to the north and residences to the south and surrounding waterbodies make this challenging.	9

Next Steps

1. Obtain detailed surface and subsurface information: Topographic surveys, bathymetric surveys, overhead and underground utilities.
2. Perform a detailed subsurface exploration program to minimize geotechnical risk factors.

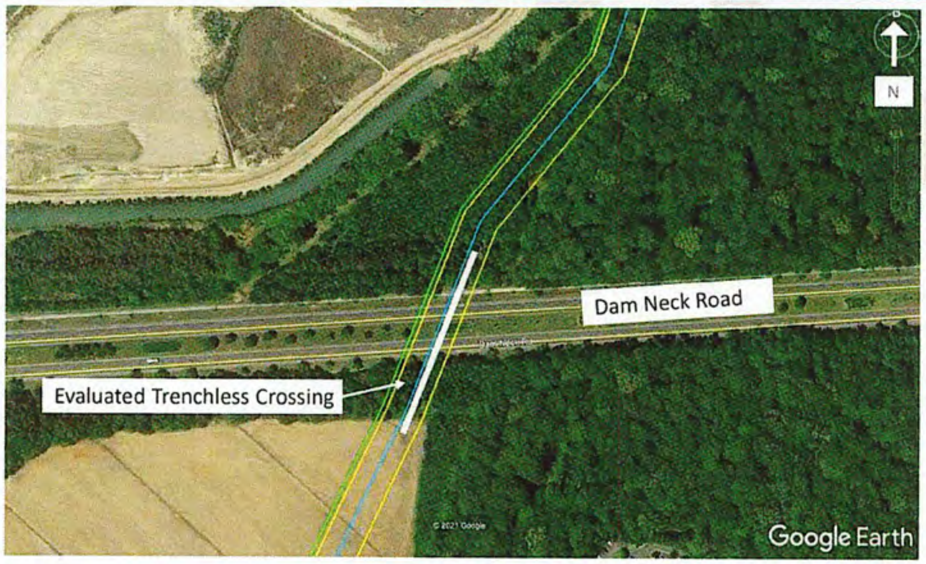
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation Hybrid Route – Dam Neck Road – Microtunnel

Date: 14 June 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Harpers Road Substation to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of three potential trenchless crossings along a hybrid route, to tie the CVOW project into the onshore grid.
   a. Number of HDDs or Jack and Bores per crossing: 6
   b. Proposed casing Pipe: 48-inch HDPE/FPVC or 66-inch RCP
   c. Preferred trenchless technique: Horizontal Directional Drilling (HDD) or Jack and Bore
4. The following documents were provided:
   a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
   a. Dam Neck Rd. Crossing
   b. London Bridge Rd. Crossing
   c. Crossing near Chestwood Dr.
6. Trenchless technologies for consideration in this feasibility study may be Microtunnel, horizontal directional drills (HDDs) or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

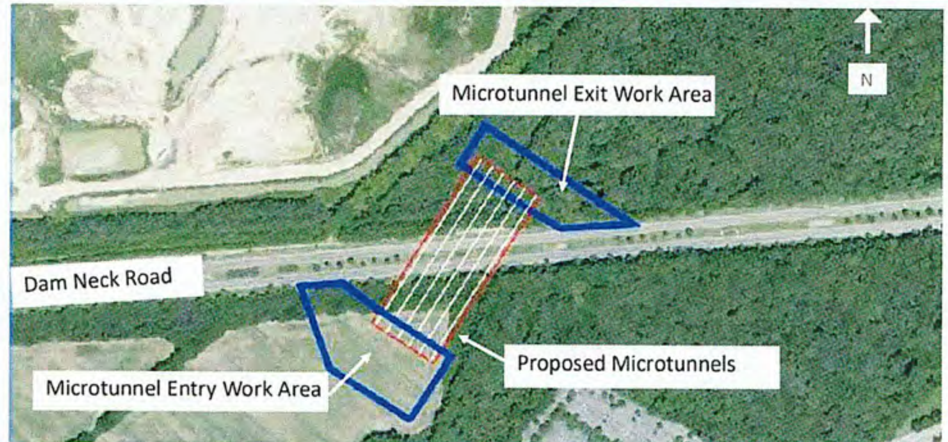
Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)



Evaluations, Opinions and Recommendations

Feasibility Ranking
8

SUMMARY

1. Approximate length of each microtunnel drive: 650 ft. Total length for six drives: 3,900 ft
2. Spacing : 43 ft
3. Trenchless ROW width: 245 ft
4. Casing pipe material: 66-in. diameter RCP. Alternatively, HOBAS may be considered for final design
5. Conduit material: HDPE
6. Work areas for six microtunnels including ingress and egress: Entry side – Approx. 112,000 sqft; Exit side – Approx. 72,000 sqft
7. Estimated depth from the ground surface to the crown: +/- 25 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions
8. Depth of Jacking and receiving shafts: +/- 35 ft

RISKS

1. Partial closure of Dam Neck Rd. may be necessary to access both entry and exit side work area during construction
2. Tree clearance will be required in both entry and exit side work areas
3. Requires timber mats/construction road for vehicle access.
4. Increased width of ROW will be required compared to open cut ROW
5. Based on the final depth of the jacking and receiving shaft, the cable transition from a deeper microtunnel alignment to a shallower open cut may be challenging based on the DOT requirements and subsurface conditions
6. Desktop study conducted for this overall area indicated subsurface conditions to be generally consisting of very loose to medium dense silty sands which may result in:
   a. Potential difficulty in drilling/steering
   b. Potential for inadvertent release of drilling fluid
   c. Potential surface subsidence or heave
7. Technical and logistical challenges:
   a. The clearance under critical features including underground utilities, wetlands, and tree root systems.
   b. All applicable permit requirements and stakeholder issues impacting the work areas

Next Steps

1. Obtain detailed surface and subsurface information including topographic survey, overhead and underground utilities.
2. Perform a detailed subsurface exploration program.
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment.

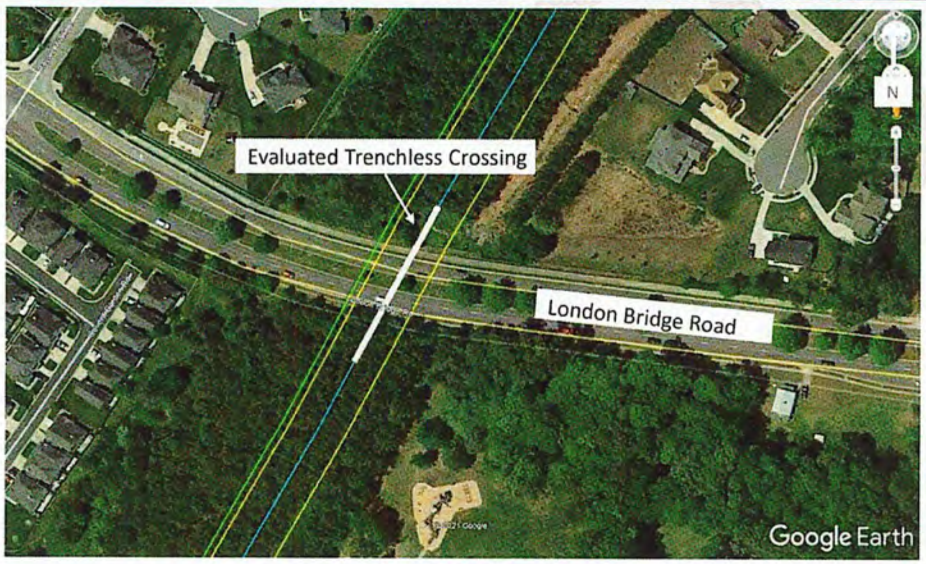
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation Hybrid Route – London Bridge Rd Crossing – Microtunnel

Date: 14 June 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Harpers Road Substation to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of three potential trenchless crossings along a hybrid route, to tie the CVOW project into the onshore grid.
   a. Number of HDDs or Jack and Bores per crossing: 6
   b. Proposed casing Pipe: 48-inch HDPE/FPVC or 66-inch RCP
   c. Preferred trenchless technique: Horizontal Directional Drilling (HDD) or Jack and Bore
4. The following documents were provided:
   a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
   a. Dam Neck Rd. Crossing
   b. **London Bridge Rd. Crossing**
   c. Crossing near Chestwood Dr.
6. Trenchless technologies for consideration in this feasibility study may be Microtunnel, horizontal directional drills (HDDs) or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)

Evaluations, Opinions and Recommendations

Feasibility Ranking
9

SUMMARY

1. Approximate length of each microtunnel drive: 300 ft. Total length for six drives: 1,800 ft
2. Spacing : 43 ft
3. Trenchless ROW width: 245 ft. It appears to be within the City property.
4. Casing pipe material: 66-in. diameter RCP. Conduit material: HDPE. Alternatively, HOBAS may be considered for final design.
5. Work areas for six microtunnels including ingress and egress: Entry side – Approx. 90,000 sqft; Exit side – Approx. 62,000 sqft
6. Estimated depth from the ground surface to the crown: +/- 30 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions.
7. Depth of Jacking and receiving shafts: +/- 40 ft

RISKS

1. Possible drainage channel running in the north-south direction along the eastern side of the ROW encroaches on the trenchless ROW and microtunnel work areas.
2. Presence of possible gas lines on both sides of the ROW within the microtunnel work areas.
3. The topography on the south side of London Bridge Rd. appears to be undulating and low-lying. If so, it would complicate the microtunnel process due to deeper shafts and additional logistical issues that would have to be addressed by the contractor in including ingress and egress.
4. HDD is not feasible due to the minimum length requirements and proximity to nearby residences and risk of inadvertent returns.
5. Partial closure of London Bridge Rd. may be necessary to access both entry and exit side work area during construction
6. Tree clearance and grading may be required in both entry and exit side work areas
7. Requires timber mats/construction road for vehicle access.
8. Increased width of ROW will be required compared to open cut ROW.
9. Deeper shaft will also make the cable transition from a deeper microtunnel alignment to a shallower open cut more challenging.
10. Desktop study conducted for this overall area indicated subsurface conditions to be generally consisting of very loose to medium dense silty sands which may result in:
    a. Potential difficulty in drilling/steering, potential for inadvertent release of drilling fluid and potential surface subsidence or heave
    b. Challenges with drill mud management, containment and clean up due to difficulty in accessing certain areas along the alignment
11. Noise and traffic impact to residences near the work area during construction.

Next Steps

1. Obtain detailed surface and subsurface information: Topographic survey, overhead and underground utilities.
2. Perform a detailed subsurface exploration program.
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment

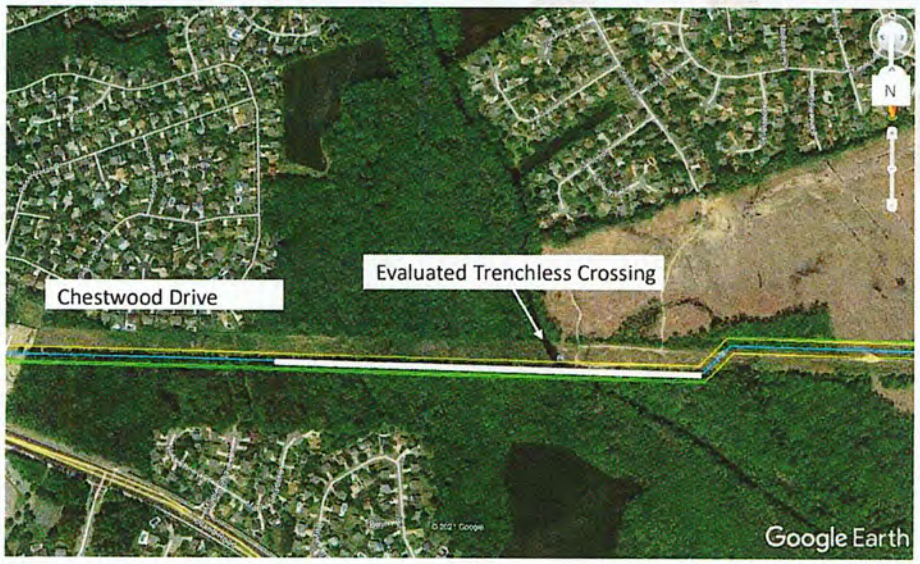
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation Hybrid Route – Chestwood Dr. – HDD

Date: 14 June2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Harpers Road Substation to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of three potential trenchless crossings along a hybrid route, to tie the CVOW project into the onshore grid.
    a. Number of HDDs or Jack and Bores per crossing: 6
    b. Proposed casing Pipe: 48-inch HDPE/FPVC or 66-inch RCP
    c. Preferred trenchless technique: Horizontal Directional Drilling (HDD) or Jack and Bore
4. The following documents were provided:
    a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
    a. Dam Neck Rd. Crossing
    b. London Bridge Rd. Crossing
    c. Crossing near Chestwood Dr.
6. Trenchless technologies for consideration in this feasibility study may be Microtunnel, horizontal directional drills (HDDs) or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

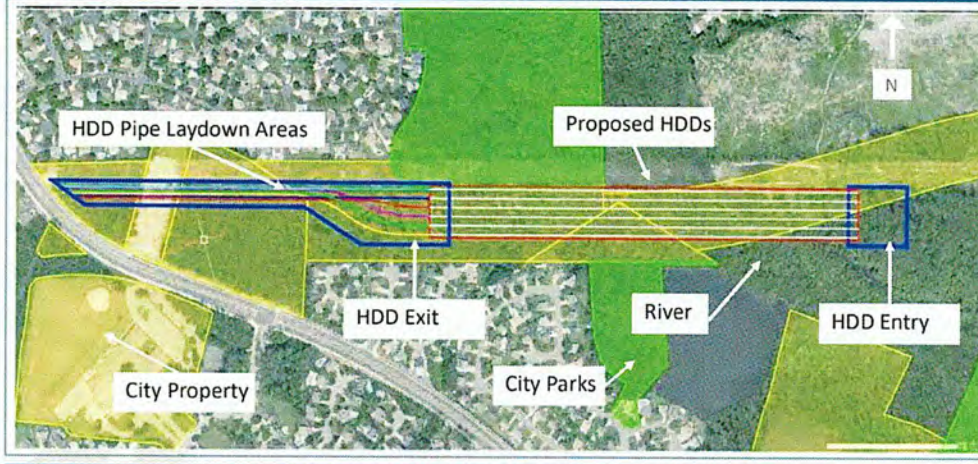
Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)



Evaluations, Opinions and Recommendations

Feasibility Ranking
9

SUMMARY

1. Approximate length of each HDD: 2,200 ft. Total length for six drives: 13,200 ft
2. Width of trenchless ROW: 245 ft
3. The ROW is within the City property
4. Approximate HDD entry angle – 12 degrees, HDD exit angle – 12 degrees
5. Entry side work area –85,000 sqft; Exit side work area – approx. 332,000 sqft including pipe assembly and fusion areas
6. Approx. depth: 80 to 90 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions.

RISKS

1. Desktop study conducted for this overall area indicated subsurface conditions to be generally consisting of very loose to medium dense silty sands which may result in:
    a. Potential for localized borehole instability due to difficulty in drilling/steering.
    b. Increased risk of inadvertent release of drilling fluid near the entry and exit locations.
    c. Challenges with drill mud management, containment and clean up due to difficulty in accessing certain areas along the alignment
2. Technical and logistical challenges:
    a. High risk due to the proximity of residences to the south and overhead utilities to then north as shown in the figure above.
    b. The clearance under critical features including underground utilities, wetlands, the river and tree root systems and overhead infrastructure.
    c. All applicable permit requirements and stakeholder issues impacting the work areas
    d. There is insufficient work area to assemble the entire length of pipe in a single string. Given the diameter of the casing pipe, it is critical to have the entire string of pipe assembled to increase the changes of success.
    e. Exit and entry locations require tree clearing and grading.
    f. Entry location might need additional ground improvement measures due to the proximity to wetlands.
    g. Requires timber mats/construction road for vehicle access.
    h. May require relocation of overhead utilities, underground utilities.
    i. Stakeholder issues due to noise during construction.

Next Steps

1. Obtain detailed surface and subsurface information: Topographic survey, bathymetric survey, overhead and underground utilities.
2. Perform a detailed subsurface exploration program.
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment.

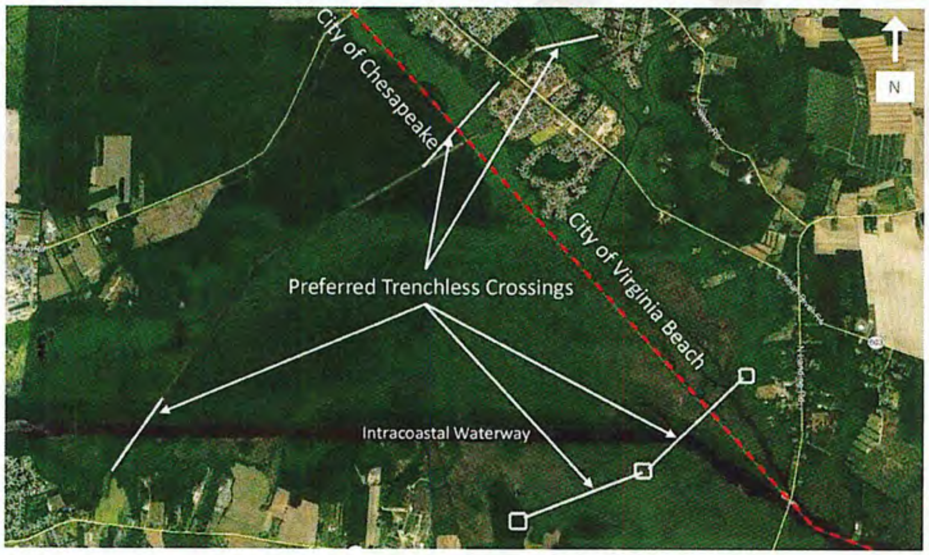
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation – Geological Overview & Summary

Date: 27 April 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Oceana Switching Station to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of five potential trenchless crossings, to tie the CVOW project into the onshore grid.
   a. Number of HDDs per crossing HDDs: 6 (Approx. diameter 60-inch)
   b. Proposed casing Pipe: 48-inch HDPE/FPVC
   c. Preferred trenchless technique: Horizontal Directional Drilling (HDD)
4. The following documents were provided:
   a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
   a. Northern Landing River Crossing
   b. Indian River Farms Park Crossing
   c. Intracoastal Waterway Crossing 1
   d. Intracoastal Waterway Crossing 2
   e. South Chesapeake Wetland Crossing
6. Trenchless technologies for consideration in this feasibility study may be horizontal directional drills (HDDs). Direct Pipe® or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
10	NOT FEASIBLE

Evaluations, Opinions and Recommendations

SUMMARY

1. Evaluated local and regional geology and geotechnical subsurface conditions based on geological maps, regional geological studies, well logs, and geotechnical logs.
   a) Main subsurface lithology: Very loose to medium dense fine to coarse siliceous to siliceous-carbonate silty sand. Potential for localized pebbly units at the base of each geological formation/member.
   b) Secondary subsurface lithology: Very soft to soft clay and organic-rich clay in highly localized paleochannels (widths of up to 30 ft and depths of up to 60 ft) and as sporadic thin interbeds.
2. Subsurface Geotechnical conditions.
   a) Relative density of sands ranges from very loose to medium dense.
   b) Relative density of clays and organic-rich clays typically range from very soft to soft.

POTENTIAL SUBSURFACE RISKS

1. Potential risk for borehole instability and/or borehole collapse, if subsurface lithology is predominately composed of very loose to loose sands. Especially for a large diameter HDD boreholes
2. High risk for inadvertent returns especially near entry and exit locations, if surface and subsurface lithology is predominately composed of very loose to loose sands.
3. Locally the basal units of each geological formation/member can contain varying amounts of gravel and pebbles. These coarse pebbly layers can potentially decrease borehole stability.
4. Potential for encountering highly localized paleochannels that have the potential to be filled with very soft to soft organic-rich clays and peat. The organic-rich clays can also contain in situ tree trunks as well as tree branches.

Crossing	Differentiators	Feasibility Ranking
Northern Landing River Crossing – HDD	Additional Pipe laydown area required, to allow final pullback to be conducted in one continues operation. Additional laydown area/crossing Indian River Road only needed for final pullback operations. Could be done using a Jack and bore to avoid road closure.	6
Indian River Farms Park Crossing – HDD	Most of the pipe laydown area follows the existing overhead utility ROW. Due to buildings near the entry location, the entry work area had to be moved towards the northwest. There is not enough space to move entry location closer to the overhead ROW.	6
Intracoastal Waterway Crossing 1 – HDD	Large portion of the pipe laydown area follows the existing overhead utility ROW.	7
Intracoastal Waterway Crossing 2 – HDD	Very Challenging: Due to the length of around 3,800 ft and wetland conditions at entry and exit locations.	9
South Chesapeake Wetland Crossing – HDD	Very Challenging: Due to the length of around 3,700 ft and wetland conditions at entry and exit locations.	9

Next Steps

1. Obtain detailed surface and shallow-subsurface information: Topographic surveys, bathymetric surveys, overhead and underground utilities.
2. Perform a detailed subsurface exploration program to minimize geotechnical risk factors.

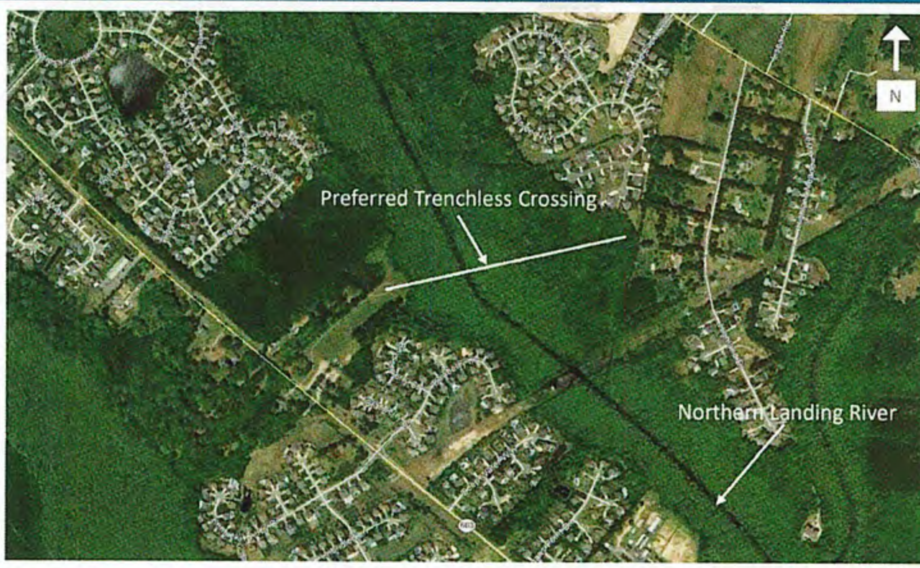
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation – Northern Landing River Crossing – HDD

Date: 27 April 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Oceana Switching Station to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of five potential trenchless crossings, to tie the CVOW project into the onshore grid.
    a. Number of HDDs per crossing HDDs: 6 (Approx. diameter 60-inch)
    b. Proposed casing Pipe: 48-inch HDPE/FPVC
    c. Preferred trenchless technique: Horizontal Directional Drilling (HDD)
4. The following documents were provided:
    a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
    a. Northern Landing River Crossing
    b. Indian River Farms Park Crossing
    c. Intracoastal Waterway Crossing 1
    d. Intracoastal Waterway Crossing 2
    e. South Chesapeake Wetland Crossing
6. Trenchless technologies for consideration in this feasibility study may be horizontal directional drills (HDDs), Direct Pipe® or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

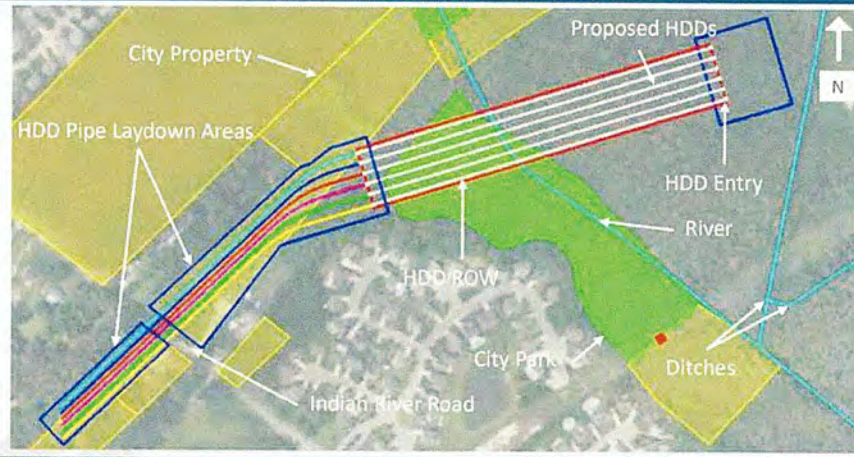
Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)



Evaluations, Opinions and Recommendations

Feasibility Ranking
6

SUMMARY

1. Approximate HDD length: 1480 ft
2. HDD spacing : 43 ft
3. HDD ROW width: 245 ft
4. HDD exit area located approx. 75 ft from the edge of the city park area
5. Approximate HDD entry angle – 12 degrees, HDD exit angle – 12 degrees
6. Entry side work area – 360 ft X 300 ft (108,000 sqf); Exit side work area – approx. 320,000 sqf
7. Estimated maximum depth of drill from the entry location: +/- 74 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions.

RISKS

1. The subsurface in this area consists manly of very loose to medium dense silty sands which may result in:
    a. Potential for localized borehole instability due to difficulty in drilling/steering
    b. Increased risk of inadvertent release of drilling fluid near the entry and exit locations.
    c. Challenges with drill mud management, containment and clean up due to difficulty in accessing certain areas along the alignment
2. Technical and logistical challenges:
    a. The clearance under critical features including underground utilities, wetlands, the river and tree root systems
    b. All applicable permit requirements and stakeholder issues impacting the work areas
3. HDD work areas:
    a. **Additional Pipe laydown area required, to allow final pullback to be conducted in one continues operation. Additional laydown area/crossing Indian River Road only needed for final pullback operations. Jack and bore below road to avoid road closure.**
    b. Exit and entry locations require tree clearing and grading.
    c. **Entry location might need additional ground improvement measures due to the proximity to wetlands.**
    d. Requires timber mats/construction road for vehicle access.
    e. May require relocation of overhead utilities, underground utilities.
    f. Stakeholder issues due to noise during construction.

Next Steps

1. Obtain detailed surface and shallow-subsurface information: Topographic survey, bathymetric survey of Northern Landing River, overhead and underground utilities.
2. Perform a detailed subsurface exploration program to minimize geotechnical risk factors.
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment.

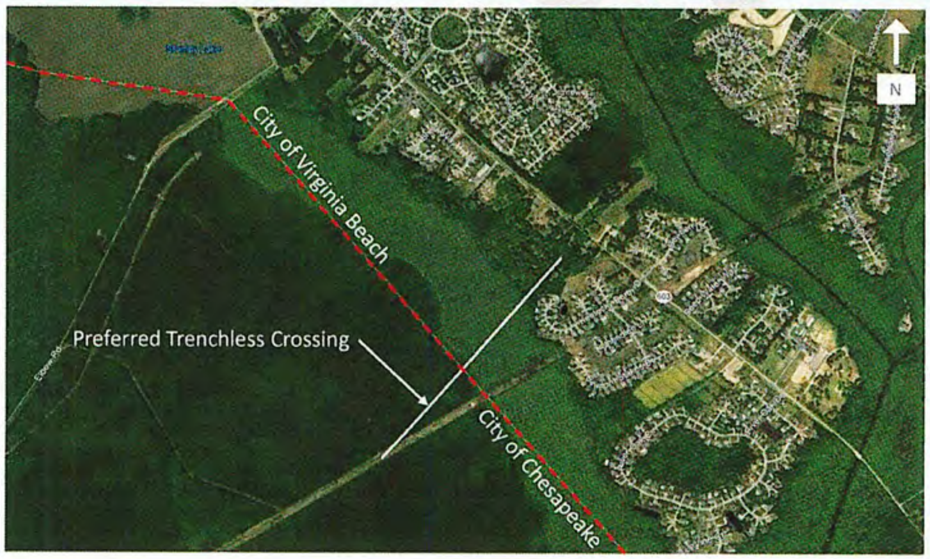
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation – Indian River Farms Park Crossing – HDD

Date: 27 April 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Oceana Switching Station to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of five potential trenchless crossings, to tie the CVOW project into the onshore grid.
   a. Number of HDDs per crossing HDDs: 6 (Approx. diameter 60-inch)
   b. Proposed casing Pipe: 48-inch HDPE/FPVC
   c. Preferred trenchless technique: Horizontal Directional Drilling (HDD)
4. The following documents were provided:
   a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
   a. Northern Landing River Crossing
   b. Indian River Farms Park Crossing
   c. Intracoastal Waterway Crossing 1
   d. Intracoastal Waterway Crossing 2
   e. South Chesapeake Wetland Crossing
6. Trenchless technologies for consideration in this feasibility study may be horizontal directional drills (HDDs), Direct Pipe® or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

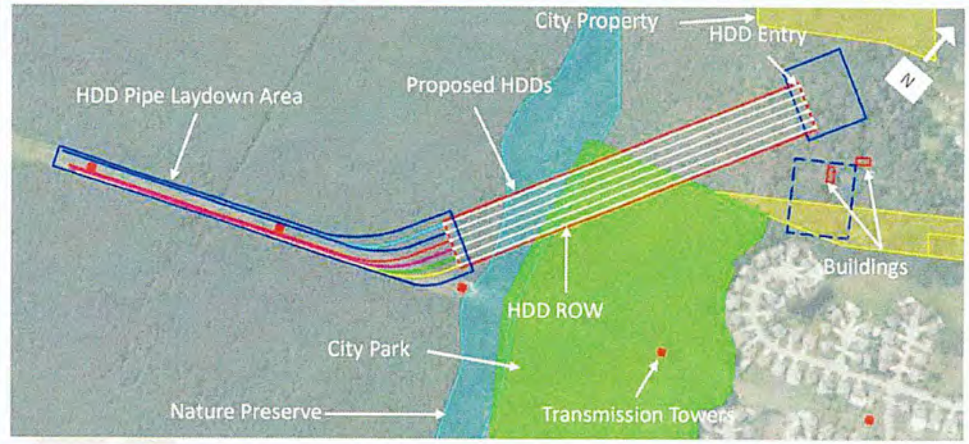
Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)



Evaluations, Opinions and Recommendations

Feasibility Ranking
6

SUMMARY

1. Approximate HDD length: 1,850 to 2,000 ft
2. HDD spacing : 43 ft
3. HDD ROW width: 245 ft
4. Approximate HDD entry angle – 12 degrees, HDD exit angle – 12 degrees
5. Entry side work area – 360 ft X 300 ft (108,000 sqf); Exit side work area – approx. 287,000 sqf
6. Estimated maximum depth of drill from the entry location: +/- 89 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions.

RISKS

1. The subsurface in this area consists manly of very loose to medium dense silty sands which may result in:
   a. Potential for localized borehole instability due to difficulty in drilling/steering
   b. Increased risk of inadvertent release of drilling fluid near the entry and exit locations
   c. Challenges with drill mud management, containment and clean up due to difficulty in accessing certain areas along the alignment
2. Technical and logistical challenges:
   a. The clearance under critical features including underground utilities, wetlands, and tree root systems.
   b. All applicable permit requirements and stakeholder issues impacting the work areas
3. HDD work areas:
   a. Exit and entry locations require tree clearing and grading.
   b. Entry location might need additional ground improvement measures due to the proximity to wetlands.
   c. Not enough space for an alternative entry location to the south (dashed blue line).
   d. Most of the pipe laydown area follows the existing overhead utility ROW.
   e. Requires timber mats/construction road for vehicle access.
   f. May require relocation of overhead utilities and underground utilities.
   g. Stakeholder issues due to noise during construction.

Next Steps

1. Obtain detailed surface and shallow-subsurface information: Topographic survey, overhead and underground utilities.
2. Perform a detailed subsurface exploration program to minimize geotechnical risk factors .
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment.

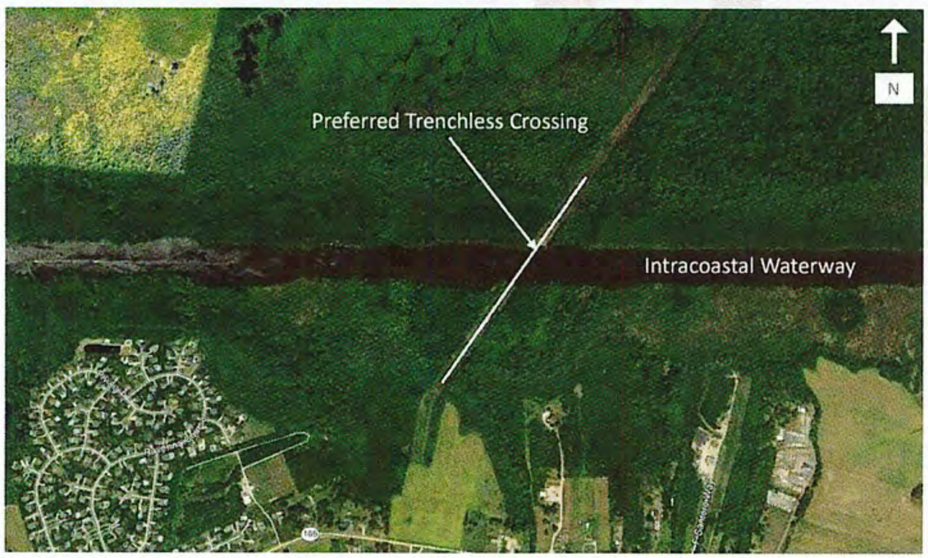
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation – Intracoastal Waterway Crossing 1 – HDD

Date: 27 April 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Oceana Switching Station to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of five potential trenchless crossings, to tie the CVOW project into the onshore grid.
    a. Number of HDDs per crossing HDDs: 6 (Approx. diameter 60-inch)
    b. Proposed casing Pipe: 48-inch HDPE/FPVC
    c. Preferred trenchless technique: Horizontal Directional Drilling (HDD)
4. The following documents were provided:
    a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
    a. Northern Landing River Crossing
    b. Indian River Farms Park Crossing
    c. Intracoastal Waterway Crossing 1
    d. Intracoastal Waterway Crossing 2
    e. South Chesapeake Wetland Crossing
6. Trenchless technologies for consideration in this feasibility study may be horizontal directional drills (HDDs), Direct Pipe® or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

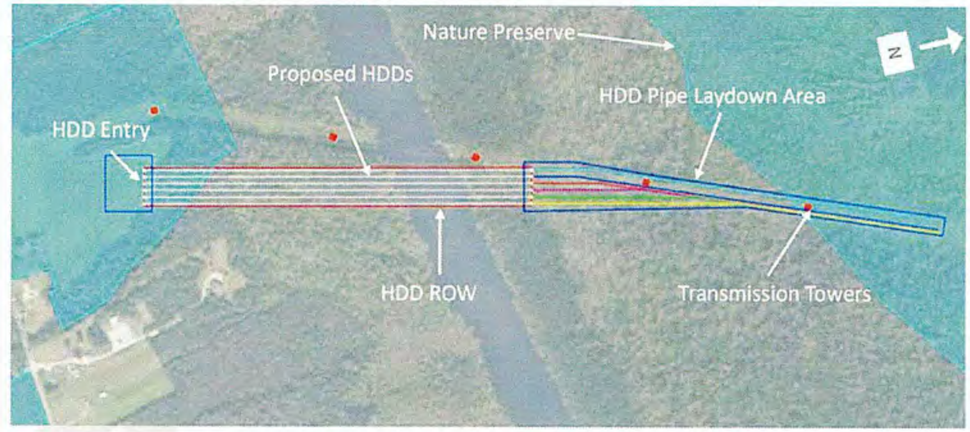
Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
10	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)



Evaluations, Opinions and Recommendations

Feasibility Ranking
7

SUMMARY

1. Approximate HDD length: 2,500 ft
2. HDD spacing : 43 ft
3. HDD ROW width: 245 ft
4. HDD exit area located minimum 350 ft from the edge of the Intracoastal Waterway
5. HDD minimum of 50 ft from the transmission tower.
6. Approximate HDD entry angle – 12 degrees, HDD exit angle – 14 degrees
7. Entry side work area – 360 ft X 300 ft (108,000 sqf); Exit side work area – approx. 487,000 sqf
8. Estimated maximum depth of drill from the entry location: +/- 93 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions.

RISKS

1. The subsurface in this area consists manly of very loose to medium dense silty sands which may result in:
    a. Potential for localized borehole instability due to difficulty in drilling/steering
    b. Increased risk of inadvertent release of drilling fluid near the entry and exit locations
    c. Challenges with drill mud management, containment and clean up due to difficulty in accessing certain areas along the alignment
2. Technical and logistical challenges:
    a. The clearance under critical features including wetlands, the Intracoastal Waterway and tree root systems.
    b. All applicable permit requirements and stakeholder issues impacting the work areas
3. HDD work areas:
    a. Exit location requires tree clearing and grading.
    b. **Large portion of the pipe laydown area follows the existing overhead utility ROW.**
    c. Requires timber mats/construction road for vehicle access.
    d. May require relocation of overhead utilities and underground utilities.
    e. Stakeholder issues due to proximity to nature preserve areas.

Next Steps

1. Obtain detailed surface and shallow-subsurface information: Topographic survey, bathymetric survey of Intracoastal Waterway, overhead and underground utilities.
2. Perform a detailed subsurface exploration program to minimize geotechnical risk factors .
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment.

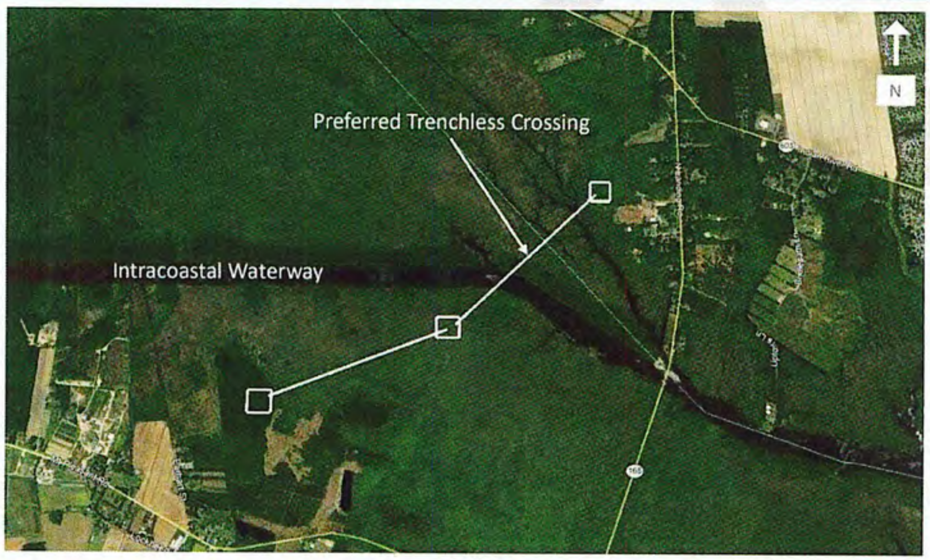
DOMINION ENERGY – COASTAL VIRGINIA OFFSHORE WIND – HARPERS ROAD TO FENTRESS SUBSTATION – INTRACOASTAL WATERWAY CROSSING 2 – HDD

Date: 27 April 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Oceana Switching Station to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of five potential trenchless crossings, to tie the CVOW project into the onshore grid.
   a. Number of HDDs per crossing HDDs: 6 (Approx. diameter 60-inch)
   b. Proposed casing Pipe: 48-inch HDPE/FPVC
   c. Preferred trenchless technique: Horizontal Directional Drilling (HDD)
4. The following documents were provided:
   a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
   a. Northern Landing River Crossing
   b. Indian River Farms Park Crossing
   c. Intracoastal Waterway Crossing 1
   d. **Intracoastal Waterway Crossing 2**
   e. South Chesapeake Wetland Crossing
6. Trenchless technologies for consideration in this feasibility study may be horizontal directional drills (HDDs), Direct Pipe® or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.

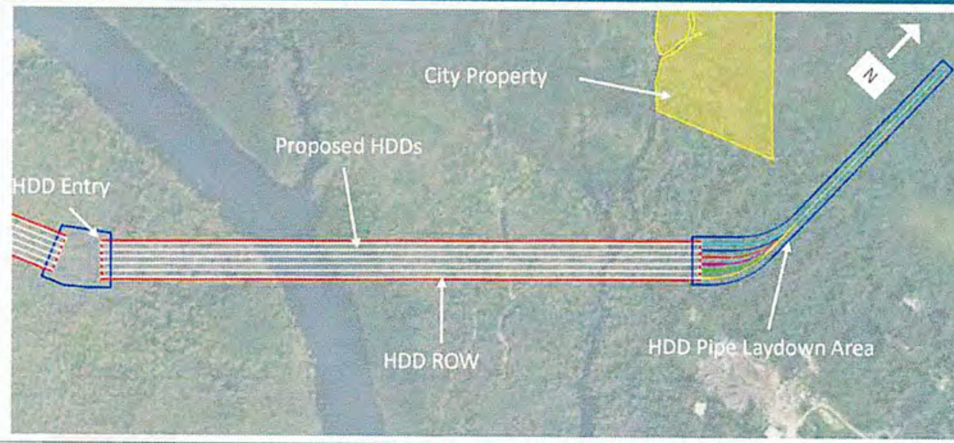
Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
10	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)



Evaluations, Opinions and Recommendations

Feasibility Ranking
9

SUMMARY
1. Approximate HDD length: 3,800 ft.
2. HDD spacing : 43 ft
3. HDD ROW width: 245 ft
4. Approximate HDD entry angle – 12 degrees, HDD exit angle – 12 degrees
5. Entry side work area – approx. 137,000 sqf; Exit side work area – approx. 283,000 sqf
6. Estimated maximum depth of drill from the entry location: +/- 78 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions.

RISKS
1. The subsurface in this area consists manly of very loose to medium dense silty sands which may result in:
   a. Potential for localized borehole instability due to difficulty in drilling/steering
   b. Increased risk of inadvertent release of drilling fluid near the entry and exit locations
   c. Challenges with drill mud management, containment and clean up due to difficulty in accessing certain areas along the alignment
2. Technical and logistical challenges:
   a. **The clearance under critical features including, the Intracoastal Waterway, wetlands, and tree root systems.**
   b. **A length above 2500 feet would make a traditional HDD bore for a 48-inch casing pipe in potentially challenging ground conditions (unstable muddy toil soils and very loose to medium dense silty sands in the subsurface) very challenging.**
   c. All applicable permit requirements and stakeholder issues impacting the work areas
3. HDD work areas:
   a. **Exit and entry locations require extensive tree clearing.**
   b. **Entry/Exit location might need not be feasible due to the proximity to wetlands.**
   c. Requires timber mats/construction road for vehicle access.
   d. Stakeholder issues due to proximity to nature preserve areas.

Next Steps

1. Obtain detailed surface and shallow-subsurface information: Topographic survey, bathymetric survey of Intracoastal Waterway.
2. Perform a detailed subsurface exploration program to minimize geotechnical risk factors .
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment.

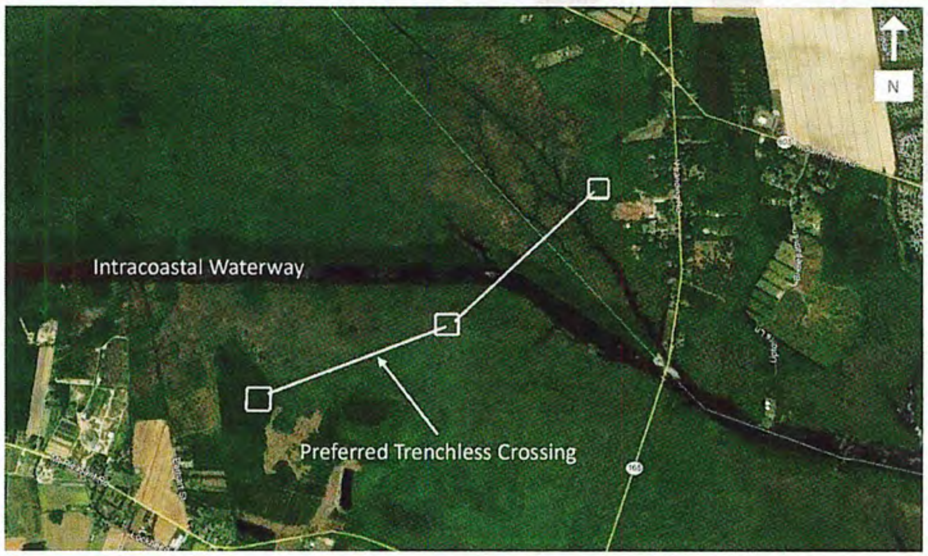
Dominion Energy – Coastal Virginia Offshore Wind – Harpers Road to Fentress Substation – South Chesapeake Wetland Crossing – HDD

Date: 27 April 2021

Project Information and Assumptions

1. Dominion Energy Virginia (DEV) plans to install a 230kV XLPE underground transmission line, associated with the Coastal Virginia Offshore Wind (CVOW) project. The project will connect the Oceana Switching Station to the Fentress Substation.
2. The work is in Virginia Beach and Chesapeake, Virginia.
3. Haley & Aldrich, Inc was contracted to evaluate the feasibility of five potential trenchless crossings, to tie the CVOW project into the onshore grid.
   a. Number of HDDs per crossing HDDs: 6 (Approx. diameter 60-inch)
   b. Proposed casing Pipe: 48-inch HDPE/FPVC
   c. Preferred trenchless technique: Horizontal Directional Drilling (HDD)
4. The following documents were provided:
   a) A KMZ file with the preferred crossing locations was provided.
5. The crossings being evaluated are:
   a. Northern Landing River Crossing
   b. Indian River Farms Park Crossing
   c. Intracoastal Waterway Crossing 1
   d. Intracoastal Waterway Crossing 2
   e. South Chesapeake Wetland Crossing
6. Trenchless technologies for consideration in this feasibility study may be horizontal directional drills (HDDs), Direct Pipe® or other appropriate trenchless method depending on length, geology and configuration of connecting pipe to be installed by conventional open trench excavation.
7.

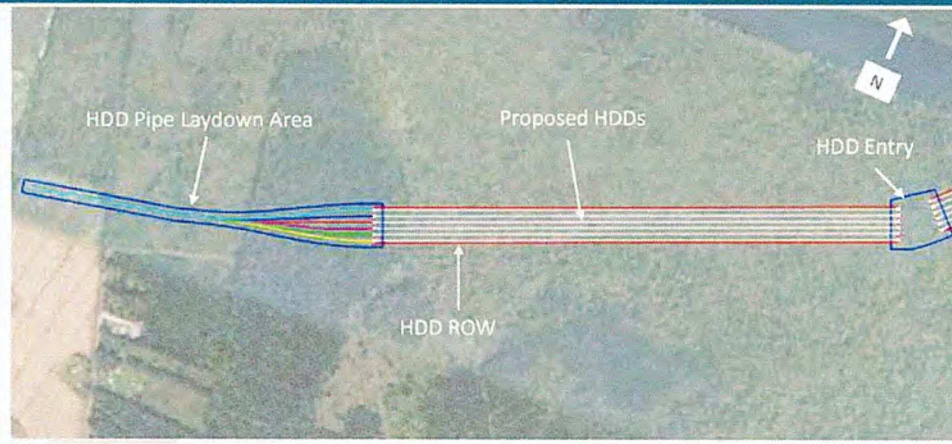
Crossing Location Provided by Dominion Energy



Feasibility Ranking Codes

1 to 3	ANTICIPATE FEWER ISSUES WITH RESPECT TO CROSSING FEASIBILITY
4 to 6	ANTICIPATE MODERATE ISSUES WITH RESPECT TO CROSSING FEASIBILITY
7 to 9	ANTICIPATE NUMEROUS ISSUES WITH RESPECT TO CROSSING FEASIBILITY
	NOT FEASIBLE

Plan View of the Proposed Crossing (Not to Scale)



Evaluations, Opinions and Recommendations

Feasibility Ranking
9

SUMMARY

1. Approximate HDD length: 3,670 ft.
2. HDD spacing : 43 ft
3. HDD ROW width: 245 ft
4. Approximate HDD entry angle – 12 degrees, HDD exit angle – 12 degrees
5. Entry side work area – approx. 137,000 sqf; Exit side work area – approx. 373,000 sqf
6. Estimated maximum depth of drill from the entry location: +/- 75 ft. Actual depth of installation and other design parameters may vary based on the subsurface conditions.

RISKS

1. The subsurface in this area consists manly of very loose to medium dense silty sands which may result in:
   a. Potential for localized borehole instability due to difficulty in drilling/steering
   b. Increased risk of inadvertent release of drilling fluid near the entry and exit locations
   c. Challenges with drill mud management, containment and clean up due to difficulty in accessing certain areas along the alignment
2. Technical and logistical challenges:
   a. **The clearance under critical features including, wetlands, and tree root systems.**
   b. **A length above 2500 feet would make a traditional HDD bore for a 48-inch casing pipe in potentially challenging ground conditions (unstable muddy toil soils and very loose to medium dense silty sands in the subsurface) very challenging.**
   c. All applicable permit requirements and stakeholder issues impacting the work areas
3. HDD work areas:
   a. **Exit and entry locations require extensive tree clearing.**
   b. **Entry/Exit location might need not be feasible due to the proximity to wetlands.**
   c. Requires timber mats/construction road for vehicle access.
   d. Stakeholder issues due to proximity to nature preserve areas.

Next Steps

1. Obtain detailed surface and shallow-subsurface information: Topographic survey.
2. Perform a detailed subsurface exploration program to minimize geotechnical risk factors .
3. Lengths and depths are subject to change. Additional evaluations would be necessary to determine the final trenchless alignment.

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APPENDIX E STRUCTURE TYPES

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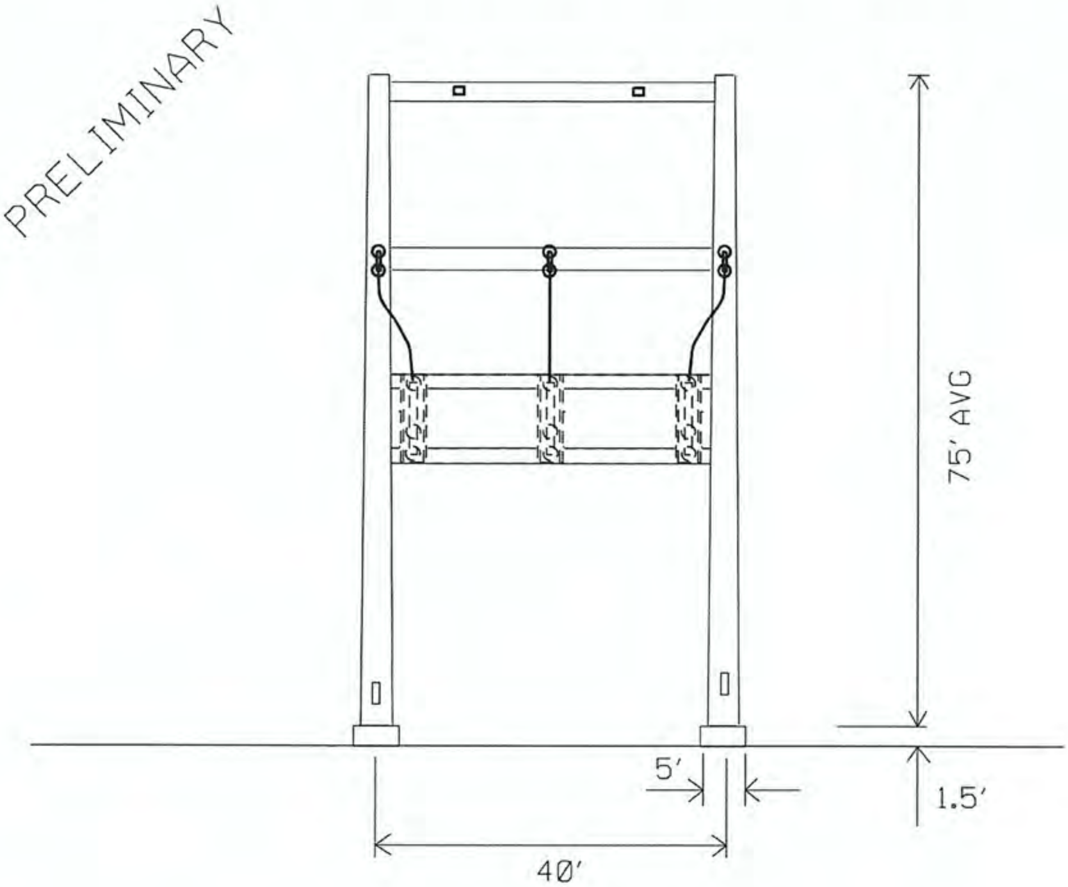
STRUCTURE 2252/1, 2253/1, 2254/1 & HARPERS 2252/117, 2253/117, 2254/117



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: STANDARD SUBSTATION STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 6 STRUCTURES AND 0.22 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: GALVANIZED STEEL WAS SELECTED TO MATCH TYPICAL SUBSTATION STRUCTURES AND EQUIPMENT

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 40 FEET

g. AVERAGE WIDTH AT BASE: 5 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 75 FEET AT ALL LOCATIONS MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE

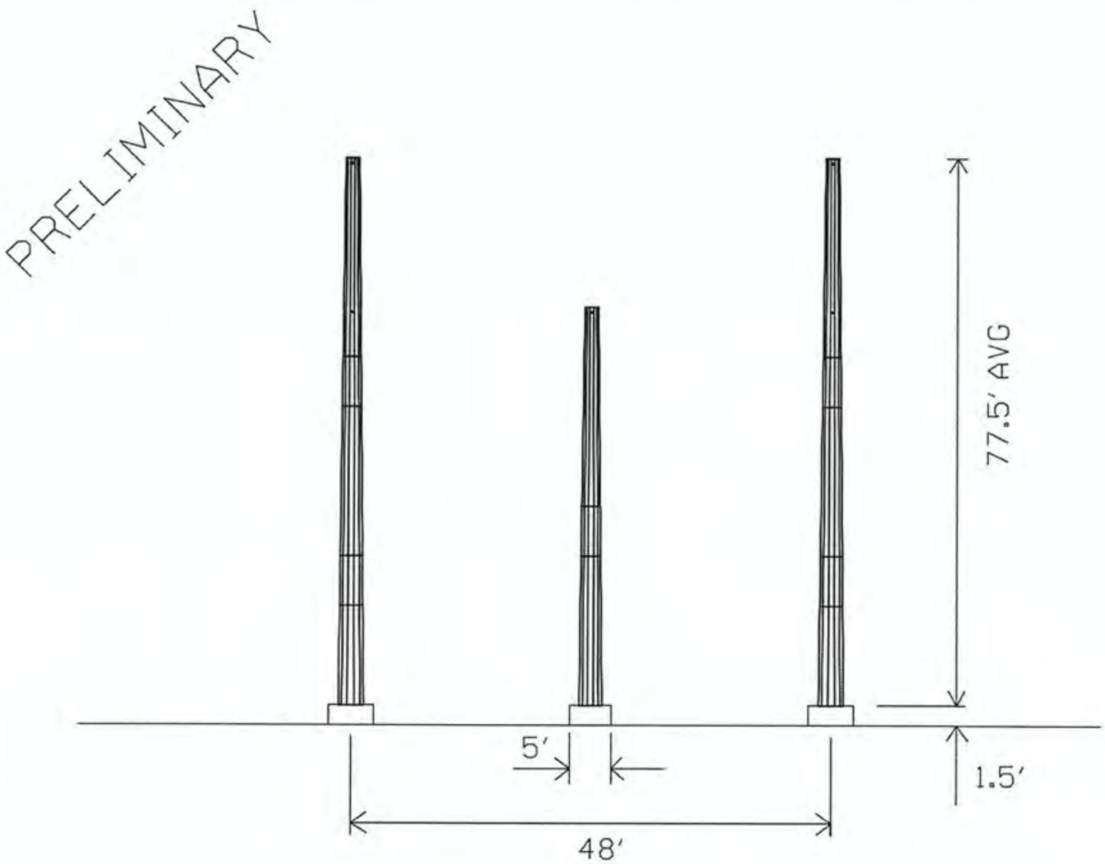
i. AVERAGE SPAN LENGTH: 200 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 25.5 FEET

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

STRUCTURE 271/1, 271/2, 2128/1A, 2128/1B



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: HORIZONTAL CONFIGURATION ALLOWS CIRCUIT TO CROSS UNDER EXISTING CIRCUITS.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 4 STRUCTURES & 0.30 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH CO-LOCATED TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

f. AVERAGE WIDTH AT CROSSARM: N/A (NO CROSSARM)

g. AVERAGE WIDTH AT BASE: 5 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 80 FEET, 75 FEET, AND 77.5 FEET RESPECTIVELY

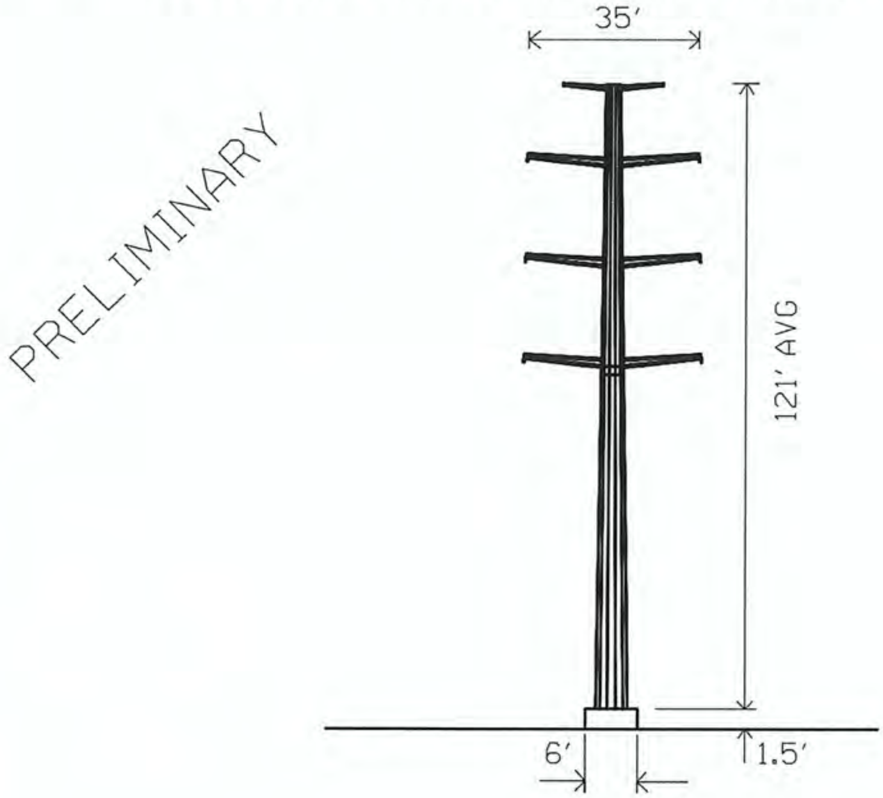
i. AVERAGE SPAN LENGTH: 400 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 25.5 FEET

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

STRUCTURE 2252/3-2252/13, 2252/15-2252/65,
2253/24(2254/24)-2253/25(2254/25), 2253/49(2254/49)-2253/53(2254/53),
2253/57(2254/57)-2253/61(2254/61), 2128/1, 2128/2



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
SHARED STRUCTURES FOR NEW 230KV CIRCUIT AND EXISTING 230KV CIRCUIT (LINE 271). MONOPOLES HAVE SMALLER FOOTPRINT COMPARED TO LATTICE TOWERS AND USE LESS ROW WIDTH COMPARED TO H-FRAMES.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
76 STRUCTURES & 10.1 MILES.

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH CO-LOCATED TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 35 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTRE HEIGHTS: 170 FEET, 105 FEET, AND 121 FEET RESPECTIVELY

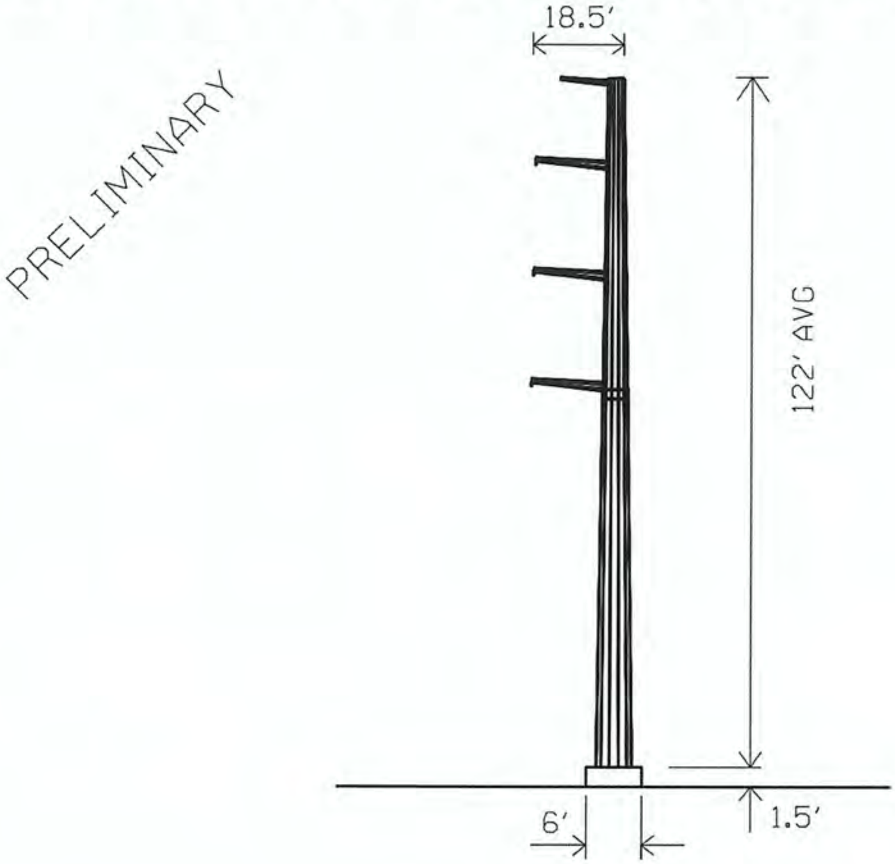
i. AVERAGE SPAN LENGTH: 700 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
25.5 FEET

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

STRUCTURE 2252/1A, 2252/1B, 2252/1-2252/2, 2252/14, 2252/65-2252/116, 2253/1A, 2253/1-2253/23, 2253/26-2253/48, 2253/54-2253/56, 2253/62-2253/116, 2254/1-2254/23, 2254/26-2254/48, 2254/54-2254/56, 2254/62-2254/116



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: SINGLE CIRCUIT STRUCTURES REQUIRED FOR COMPLIANCE PER TRANSMISSION PLANNING. MONOPOLES HAVE SMALLER FOOTPRINT COMPARED TO LATTICE TOWERS AND USE LESS ROW WIDTH COMPARED TO H-FRAMES.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 266 STRUCTURES AND 35.3 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH CO-LOCATED TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 18.5 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 170 FEET, 100 FEET, AND 122 FEET RESPECTIVELY

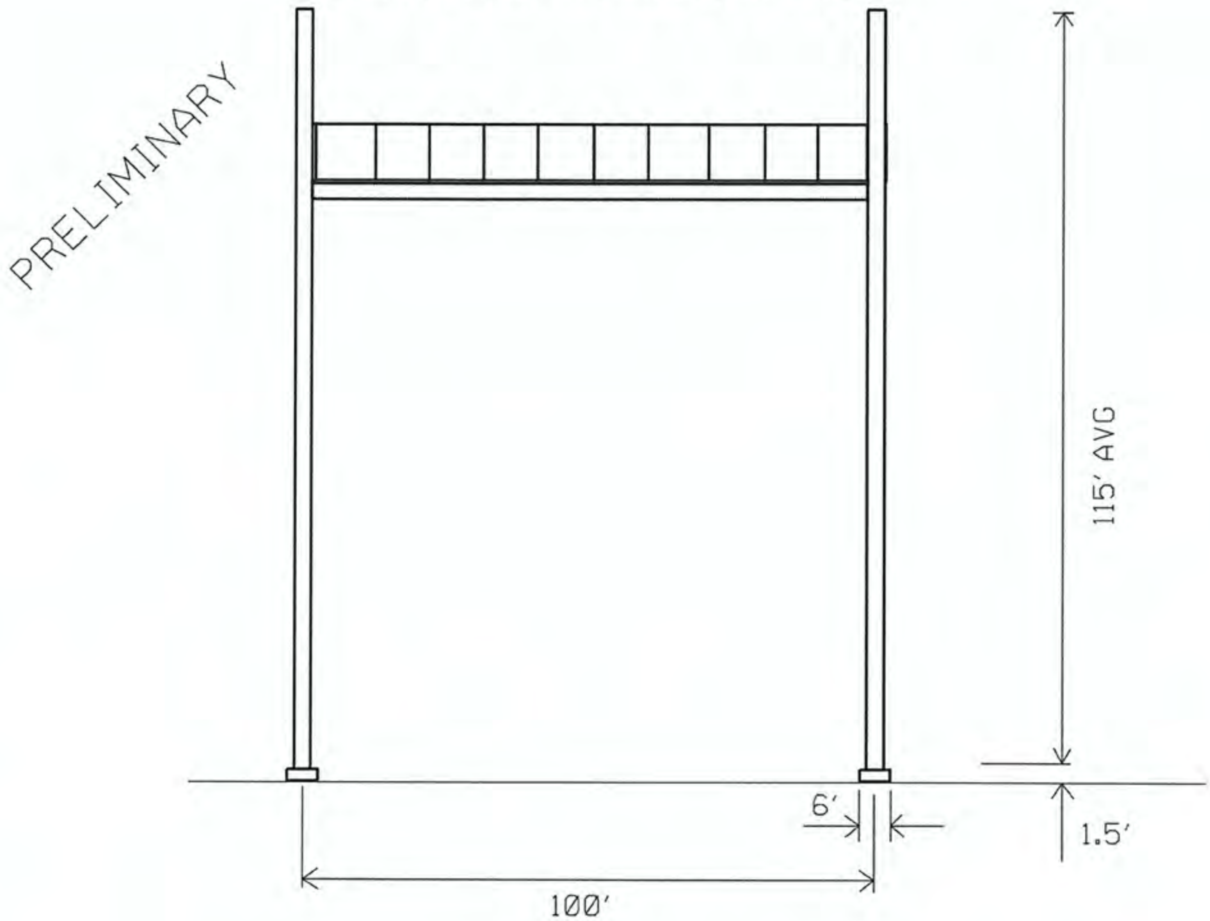
i. AVERAGE SPAN LENGTH: 700 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 25.5 FEET

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

STRUCTURE FENTRESS 588



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
STANDARD SUBSTATION STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
1 STRUCTURE AND 0.07 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
GALVANIZED STEEL WAS SELECTED TO MATCH TYPICAL SUBSTATION STRUCTURES AND EQUIPMENT

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 100 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 115 FEET AT ALL LOCATIONS

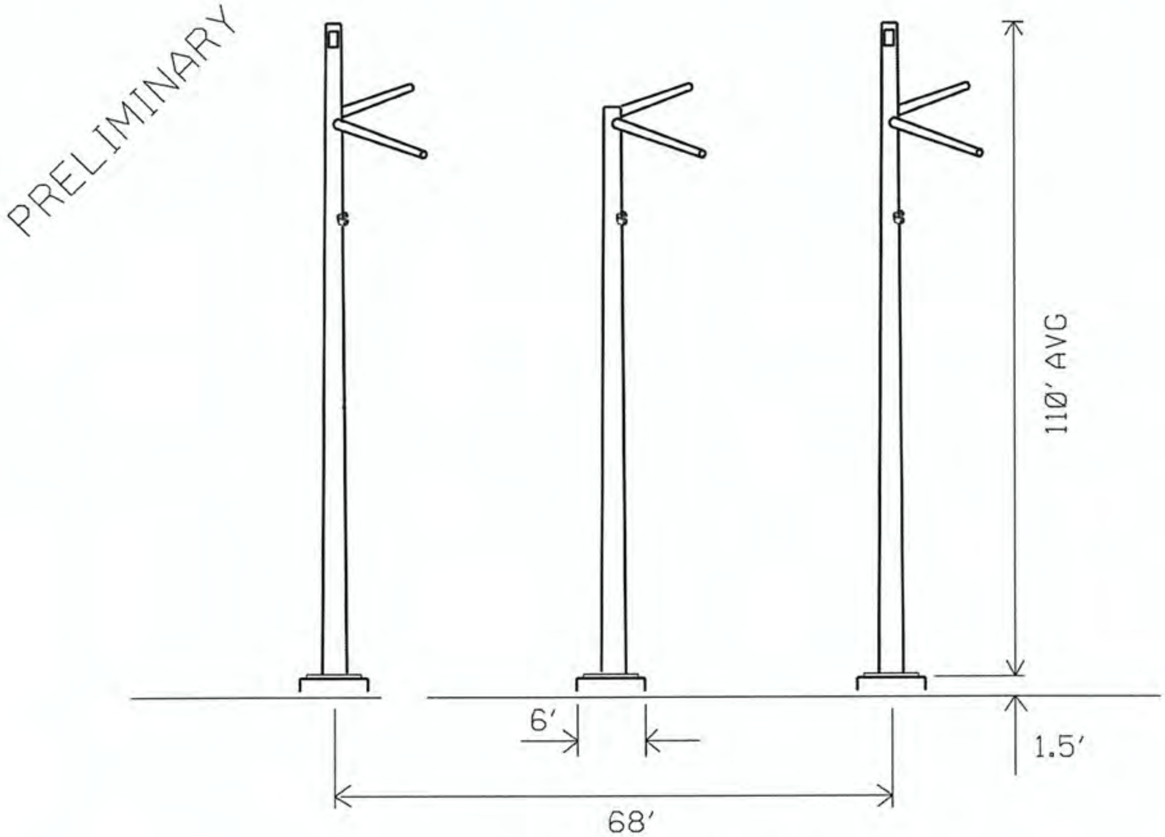
i. AVERAGE SPAN LENGTH: 350 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
30.9 FEET

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

STRUCTURE 588/254



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
MAINTAINS HORIZONTAL CONFIGURATION INTO SUBSTATION BACKBONE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
1 STRUCTURE & 0.10 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH ADJACENT TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

f. AVERAGE WIDTH AT CROSSARM: N/A (NO CROSSARM)

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 110 FEET AT ALL LOCATIONS

i. AVERAGE SPAN LENGTH: 540 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
30.9 FEET

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

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APPENDIX F WETLAND AND WATERBODY REPORT

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Dominion Energy

Coastal Virginia Offshore Wind Commercial Project – Onshore Virginia Facilities

Appendix F: Wetland and Waterbody Report

November 2021

Project No.: 0522898

The business of sustainability

ERM

Signature Page

November 2021

Coastal Virginia Offshore Wind Commercial Project – Onshore Virginia Facilities

Appendix F: Wetland and Waterbody Report

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CONTENTS

List of Tables

Acronyms and Abbreviations

Name	Description
CLH	Cable Landing to Harpers
CVOW	Coastal Virginia Offshore Wind Commercial Project
CWA	Clean Water Act
Dominion	Virginia Electric and Power Company
E1UB	Estuarine Subtidal
E2EM	Estuarine Intertidal
ERM	Environmental Resources Management, Inc.
GIS	Geographic Information System
HDD	horizontal directional drill
HF	Harpers to Fentress
ITA	Interfacility Traffic Area
kV	kilovolt
MP	milepost
NA	not applicable
NAIP	National Agricultural Imagery Program
NALF	Naval Auxiliary Landing Field
NAS	Naval Air Station
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NWI	National Wetland Inventory
NRCS	Natural Resources Conservation Service
OCS	Outer Continental Shelf
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub/Shrub
PUB	Palustrine Unconsolidated Bottom
ROW	right-of-way
RVR	Riverine
SCC	State Corporation Commission
SEPG	Southeastern Parkway and Greenbelt
SMR	State Military Reservation
SSURGO	Soil Survey Geographic
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USN	U.S. Navy
VDEQ	Virginia Department of Environmental Quality

1. INTRODUCTION

Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion) is proposing to construct and operate the Coastal Virginia Offshore Wind (CVOW) Commercial Project (Project), a commercial offshore wind generating facility and associated infrastructure connecting the facility to the electric transmission grid in Tidewater, Virginia. The wind generating facility would be built within the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS) Offshore Virginia (Lease No. OCS-A-0483), approximately 27 miles east of the City of Virginia Beach, Virginia. An offshore subsea transmission line would be built from the wind generating facility to the shoreline of Virginia Beach, coming ashore east of Lake Christine in the Virginia State Military Reservation (SMR) at the Cable Landing Location, near the U.S. Navy's (USN) Dam Neck Annex. From this location, an onshore underground transmission line would be built to a point near Harpers Road in the City of Virginia Beach. An overhead or a hybrid (i.e., part underground/part overhead) transmission line would then be built from this point to Dominion's existing Fentress Substation in the City of Chesapeake.

Dominion considered multiple alternatives for the onshore portion of the Project (referred to as the onshore Virginia Facilities) that would integrate the energy output of the Project into Dominion's existing transmission system while maintaining the structural integrity and reliability of the system in compliance with mandatory North American Electric Reliability Corporation (NERC) Reliability Standards.

The onshore Virginia Facilities would include:

- Cable Landing Location for Offshore Export Circuits: Nine new 230 kilovolt (kV) submarine export circuits coming ashore at the Cable Landing Location in the SMR in the City of Virginia Beach;
- Onshore Export Circuits: Nine new 230 kV circuits extending underground from the Cable Landing Location to a new switching station in the City of Virginia Beach;
- Switching Station: A new 25-breaker, 230 kV switching station at a site near Harpers Road or an alternate site near Princess Anne Road in the City of Virginia Beach;
- Overhead Transmission Circuits: Three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 megavolt-amperes, along the same corridor and using a combination of new and expanded rights-of-way (ROWs) from the new switching station in the City of Virginia Beach to the Company's existing Fentress Substation in the City of Chesapeake; and
- Fentress Substation Expansion: Expansion of the Company's existing 500 kV Fentress Substation to accommodate the new transmission circuits.

In developing potential alternatives, Dominion considered the onshore facilities required to construct and operate the Project, the length and width of new and expanded ROWs that would be required, the amount of existing development in the area, the potential for environmental impacts, and the relative cost of each alternative.

The purpose of this desktop analysis is to identify and evaluate potential impacts of the onshore Virginia Facilities on aquatic resources. In accordance with the Virginia Department of Environmental Quality's (VDEQ's) and the State Corporation Commission's (SCC's) Memorandum of Agreement, the evaluation was conducted using various datasets that may indicate wetland and waterbody location and type. In areas where field wetland delineations had previously been approved by the U.S. Army Corps of Engineers (USACE), in accordance with the USACE *Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* (USACE 2010), the results of those investigations were also used to inform desktop analysis of wetland and waterbody evaluations. The desktop analysis provides a probability of wetland and waterbody occurrence within each alternative transmission line route and their associated onshore facilities. Field delineations were not performed and would be required to verify the accuracy and extent of aquatic resource boundaries. The information summarized in this report will be submitted to the VDEQ as part of the VDEQ wetland impacts consultation.

2. STUDY AREA AND POTENTIAL ROUTES

As a first step in identifying potential transmission line routes, Environmental Resources Management, Inc. (ERM) defined a study area for the onshore Virginia Facilities based on Dominion's electric transmission and service needs. The study area was identified to encompass areas around and between the Naval Air Station (NAS) Oceana and Dominion's existing Fentress Substation, which would be expanded. The study area encompasses an approximately 170-square-mile area (Figure 1 in Attachment A) generally defined by Dominion's Atlantic and Lynnhaven substations to the north; the Atlantic Ocean coastline to the east; the Green Run, Stumpy Lake, and Thrasher substations to the west; and the Hickory Substation to the south. This study area has an extensive network of existing Dominion transmission line infrastructure and a well-developed road infrastructure, both of which offer potential routing opportunities.

The study area for the onshore Virginia Facilities includes heavily developed portions of Virginia Beach and Chesapeake to the north and west, as well as the extensive Gum Swamp and associated North Landing River wetlands complex and more rural areas to the south. It encompasses very dense residential and commercial developments, large and numerous publicly owned lands, forested wetlands, major watercourses and associated floodplains, the Intracoastal Waterway canal, agricultural fields, military airport facilities, sports complexes, and golf courses.

ERM used a range of data resources to identify and map existing land uses, planned developments, and environmental, visual, and cultural features within the study area. Environmental or other features potentially affecting the constructability of the onshore Virginia Facilities within the study area were defined as routing constraints. ERM also identified existing electric transmission lines, pipelines, roads, and other ROWs within the study area. These existing linear corridor features were defined as potential opportunities for routing/siting transmission infrastructure. ERM layered the routing opportunities over the constraints in the Geographic Information System (GIS) to identify potential routes/sites for the onshore Virginia Facilities.

A single underground route alternative was identified for the proposed transmission lines between the Cable Landing Location and a point near Harpers Road in Virginia Beach, which is one of two potential sites for a proposed new switching station. This segment is referred to as the Cable Landing to Harpers (CLH) Route. ERM identified three overhead route alternatives and one hybrid route alternative for the transmission line between this point in Virginia Beach and Dominion's existing Fentress Substation in Chesapeake; these are referred to as Harpers to Fentress (HF) Routes 1, 2, and 5, and the HF Hybrid Route. HF Routes 1, 2, and 5 would each require a switching station at the point near Harpers Road (Harpers Switching Station), whereas the HF Hybrid Route would require a switching station at an alternate site near Princess Anne Road (Chicory Switching Station). Both potential switching station sites are located in Virginia Beach. The Harpers Switching Station would be located on USN lands at NAS Oceana and the Chicory Switching Station would be located on private lands. ERM additionally identified and evaluated two route variations, the Dam Neck Route Variation and the Line #2085 Route Variation. A description of the proposed onshore Virginia Facilities, including alternative transmission line routes, route variations, and associated facilities is provided below.

2.1 Cable Landing to Harpers Road

2.1.1 Cable Landing Location

The intersection of the proposed Offshore and Onshore Export Circuits would occur at the Cable Landing Location at the SMR. The site would measure approximately 293 feet by 430 feet in size, encompassing approximately 2.8 acres, plus additional temporary workspace that would be used during construction. For the landing design, Dominion proposes to use the horizontal directional drill (HDD) or direct pipeline installation method to excavate nine subsurface holes or tunnels through which the transmission circuits would installed under the beach and associated dunes to a location approximately 1,800 feet offshore. HDD is a trenchless installation method that uses a steerable drilling machine to drill a hole through the ground along pre-determine path and then pull steel casing pipelines through the hole. Direct pipe is a trenchless installation method that uses a steerable boring machine to excavate a tunnel through the ground along a pre-determined path, while simultaneously pushing steel casing pipes through the tunnel.

2.1.2 Cable Landing to Harpers Route

The CLH Route for the Onshore Export Circuits would include both HDD and surface trench installation of the proposed underground circuits between the Cable Landing Location and the potential switching station site near Harpers Road. After exiting the tunnels, the nine concrete-encased, underground duct banks would transition to five HDDs for crossing Lake Christine. The HDDs would extend east for approximately 0.3 mile (1,540 feet) passing beneath two branches of the lake separated by a peninsula of USN land at Dam Neck Annex. The HDDs would terminate on the west side of the lake just north of a helicopter landing pad at the north end of Lake Road on the SMR. From here, the underground circuits would be installed by surface trenching in a typical, three-wide, nine-circuit, duct bank configuration. The route would head generally west for about 0.6 mile, mostly crossing parade and training grounds within the SMR.

At a point just east of General Booth Boulevard, the typical, three-wide, duct bank configuration would diverge into five HDDs for crossing Owl Creek and associated wetlands. The HDDs would extend approximately 0.4 mile (2,200 feet) to the northwest, leaving the SMR, crossing a parcel along the creek owned by the City of Virginia Beach, and exiting onto USN land at NAS Oceana near Bells Road. The underground circuits would then converge into the typical, three-wide, duct bank configuration and continue west and south on USN land for about 1.0 mile, paralleling Bells Road for 0.6 mile and crossing Birdneck Road and Dominion's existing ROW for Lines #2118/78. The CLH Route would then turn south to parallel the east side of Oceana Boulevard for about 1.1 miles, all on USN land. At the intersection of Oceana Boulevard and Harpers Road, the route for the underground circuits would head west to parallel the north side of Harpers Road for about 1.0 mile and terminate at the Harpers Switching Station site on the north side of Harpers Road.

The total length of the CLH Route is 4.4 miles; 3.7 miles would be constructed with surface trenching and 0.7 mile would be constructed with HDD.

2.2 Harpers Road to Fentress Alternatives

For each alternative, a switching station would be required to consolidate the nine onshore export circuits down to three transmission circuits and to electrically adjust the facilities to transition from an underground to an overhead transmission configuration. As noted previously, HF Routes 1, 2, and 5 would each require a switching station near Harpers Road (Harpers Switching Station), while the HF Hybrid Route would require a switching station near Princess Anne Road (Chicory Switching Station).

Except as noted in the subsections below, HF Routes 1, 2, and 5 and the overhead segment of the HF Hybrid Route would each require sets of three single-circuit monopole structures to carry the three proposed 230 kV circuits. For the underground segment of the HF Hybrid Route, the typical three-wide, duct bank configuration described above for the CLH Route would continue from the common point north of Harpers Road to the Chicory Switching Station.

2.2.1 Harpers to Fentress Route 1

Harpers to Fentress (HF) Route 1 would be entirely overhead from the Harpers Switching Station to the Fentress Substation. After exiting the Harpers Switching Station, HF Route 1 would proceed generally southwest for about 2.3 miles across both private lands and lands owned by the City of Virginia Beach adjacent to or within the Southeastern Parkway and Greenbelt (SEPG) study corridor. This segment of the route would cross Dam Neck and London Bridge roads and pass between the Prince George Estates, Mayberry, Pine Ridge, and Castleton residential subdivisions. The route would then intersect and parallel Dominion's existing Lines #2118/147 corridor for a distance of approximately 1.8 miles, mostly crossing City-owned lands within or adjacent to the SEPG corridor. This segment would pass south of the Castleton residential subdivision and between the Buyrn Farm North, Holland Pines, and Woods of Piney Grove residential subdivisions near Holland Road.

After leaving Dominion's existing transmission line corridor, HF Route 1 would continue in a southwesterly direction for about 2.1 miles, mostly crossing City-owned lands within the SEPG corridor, including an undeveloped portion of the Princess Anne Athletic Complex. This segment would cross Dominion's existing ROW for Line #2085 just east of Landstown Road and intersect with the existing ROW for Line #271 north of the intersection of Salem and Landstown roads. The existing lattice structures for Line #271 also support the idle Line #I-74, with both lines configured for 230 kV.

At the intersection with Line #271, the three proposed circuits would join and follow the Line #271 corridor for 6.1 miles to the south/southwest to Dominion's existing Pocaty Substation in Chesapeake. This section of the route would require a wreck-and-rebuild of the existing double-circuit lattice structures for Lines #271/I-74 with new double-circuit monopole structures (to carry Line #271 and one CVOW Project circuit), plus the construction of either an additional double-circuit, monopole structure or two additional single-circuit structures (to carry two CVOW Project circuits). The double circuit monopole structures would be installed in the route segment crossing the Highland Meadows/Highland Acres subdivisions from approximate mileposts (MPs) 6.6 to 7.0 and the Indian River Woods/Indian River Farms subdivisions from approximate MPs 7.3 to 7.7 in Virginia Beach where there is limited space to expand the existing ROW. Two new single-circuit monopole structures would be installed elsewhere along this segment (i.e., from approximate MPs 6.2 to 6.7, MPs 7.0 to 7.3, and MPs 7.7 to 12.3).

The route segment along Line #271 would enter the City of Chesapeake southwest of Indian River Farms Park. The Chesapeake portion of the route initially would cross mostly forested lands, including private land, parcels owned by the City of Chesapeake, and two tracts owned by The Nature Conservancy. This segment would also cross USACE-owned lands along the Intracoastal Waterway canal. South of the waterway, the route would mostly cross privately owned agricultural lands in addition to crossing Mt. Pleasant and Blue Ridge roads.

From the Pocaty Substation, HF Route 1 would follow Dominion's existing corridor for Lines #2240/I-74 for 0.7 mile south, crossing Whittamore Road and passing along the east side of the Battlefield Golf Club. The route would then head west for 1.1 miles along the south side of the golf club before entering Fentress Substation. The route segment from the Pocaty to Fentress substations would require a wreck-and-rebuild of Dominion's existing Line #2240 double-circuit lattice structures and their replacement with new double-circuit, monopole structures, plus construction of two additional single-circuit structures. The new double-circuit structures would carry Line #2240 and one CVOW Project circuit, and the new single-circuit, monopole structures would each carry one CVOW Project circuit. The total length of HF Route 1 is 14.2 miles.

2.2.2 Harpers to Fentress Route 2

HF Route 2 would follow the same alignment as HF Route 1 for approximately 5.5 miles from the Harpers Switching Station to a point just east of Landstown Road in the Princess Anne Athletic Complex. The route would then head south/southwest for about 1.8 miles across sparsely developed forested and agricultural lands primarily owned by the City of Virginia Beach and managed as part of the City's Interfacility Traffic Area (ITA). After crossing Indian River Road, the route would continue about 1.0 mile to the south across mostly forested private lands to the boundary between Virginia Beach and Chesapeake.

Once in Chesapeake, HF Route 2 would head southwest for approximately 0.9 mile, crossing the Intracoastal Waterway canal and adjacent federal lands managed by the USACE at a point about 0.6 mile northwest of the North Landing River Bridge. It would then proceed west for 2.6 miles across privately owned forested and agricultural parcels along the south side of the Intracoastal Waterway canal to an intersection with Dominion's existing ROW for Lines #271/I-74. From here, the route would follow the same alignment as HF Route 1 for about 3.5 miles to the Fentress Substation. The total length of HF Route 2 is 15.2 miles.

2.2.3 Harpers to Fentress Route 5

HF Route 5 would follow the same alignment as HF Routes 1 and 2 for approximately 5.5 miles from the Harpers Switching Station site to Dominion's existing ROW for Line #2085 near Landstown Road at the Princess Anne Athletic Complex. It would then follow the west side of Line #2085 for approximately 2.8 miles to the south. About 2.5 miles of this route segment would cross primarily undeveloped (agricultural) lands owned by the City of Virginia Beach adjacent to (but on the opposite side of the existing transmission line from) the Courthouse Woods and Courthouse Estates residential subdivisions. The remainder of this segment, about 0.3 mile on the south side of Indian River Road, would continue along Line #2085 across mostly forested, privately owned parcels. The route would then head southwest away from Line #2085 for about 1.0 mile, where it would cross the Intracoastal Waterway canal about 0.1 mile downstream of the North Landing River Bridge and enter the City of Chesapeake.

South of the river, HF Route 5 would cross Mt. Pleasant Road and a short segment (about 320 feet) of USACE land before heading generally south for about 3.9 miles, crossing 1.9 miles of undeveloped USN land along the edge of Naval Auxiliary Landing Field (NALF) Fentress and agricultural and forested private lands further south. This segment of the route would cross Mt. Pleasant, Blackwater, and Fentress Airfield roads, pass to the west of North Landing Farms, and parallel Blackwater Road for about 0.8 mile. HF Route 5 would then cross the state-designated scenic Pocaty River, turn southwest, and generally parallel the river through forested private lands for about 2.2 miles. It would then head west/northwest for about 4.6 miles across sparsely populated, privately owned, agricultural lands. HF Route 5 would then follow Dominion's existing ROW for Line #2240 for about 0.1 mile east to Fentress Substation. The total length of HF Route 5 is 20.2 miles.

2.2.4 Harpers to Fentress Hybrid Route

The HF Hybrid Route would not have a switching station at Harpers Road. Instead, the HF Hybrid Route would continue underground in a typical, three-wide, nine-circuit, duct bank configuration following, with one minor exception, the same alignment as HF Routes 1, 2, and 5 to the Chicory Switching Station site near Princess Anne Road in Virginia Beach, a distance of about 4.5 miles. The exception would be an approximately 0.25-mile deviation, starting at a point about 0.3 mile southeast of Harpers Road, where the underground alignment would follow the edge of an agricultural field.

While the majority of the underground segment of the HF Hybrid Route would be installed by surface trenching, this alternative would also require two microtunnels to install the transmission line beneath Dam Neck and London Bridge roads and an HDD to install the transmission line beneath a large wetland complex east of Chestwood Drive. For each of the trenchless installations, the three-wide, nine-circuit, duct bank configuration would diverge into six HDDs/microtunnels to complete the crossing, then converge back to the standard underground configuration.

At the Chicory Switching Station, the HF Hybrid Route would transition to a typical, three-circuit, overhead configuration and follow the same path as HF Route 1 to Fentress Substation in Chesapeake.

The total length of the HF Hybrid Route is 14.2 miles; 9.7 miles would be constructed as overhead transmission, 3.9 miles would be constructed underground using surface trenching, and 0.6 miles would be constructed underground using HDD or microtunnel installation.

2.2.5 Dam Neck Route Variation

The Dam Neck Route Variation provides an alternative to the alignment of HF Routes 1, 2, and 5 where they pass between the residential developments of Prince George Estates, Mayberry, Castleton, and Pine Ridge (within the SEPG study corridor and/or adjacent to Dominion's existing ROW for Lines #2118/147) in Virginia Beach. This route variation was considered because it would collocate part of the route with Dam Neck Road and avoid passing between the residential developments. Rather than continuing to the southwest after crossing Dam Neck Road, the route variation would instead turn west to parallel the south side of Dam Neck Road for approximately 1.8 miles, primarily crossing privately owned agricultural and forested lands. At a point about 0.4 mile west of the crossing of London Bridge Road, the route would turn south and continue for approximately 1.0 mile across private and forested lands owned by the City of Virginia Beach, including an approximately 0.5-mile-long crossing of City-owned undeveloped parkland at Holland Pines Park and a crossing of West Neck Creek. The route variation would end at its intersection with Dominion's existing ROW for Lines #2118/147, where it would rejoin the alignment of HF Routes 1, 2, and 5. The total length of the Dam Neck Route Variation is 2.8 miles.

2.2.6 Line #2085 Route Variation

The Line #2085 Route Variation provides an alternative to HF Route 2 in the area between the Princess Anne Athletic Complex and the crossing of the Intracoastal Waterway canal. This route variation was considered because it would utilize the Line #2085 corridor as a routing opportunity. The route variation would deviate from HF Route 2 near Landstown Road on the south side of the Princess Anne Athletic Complex and the U.S. Field Hockey Complex. It would then follow the west side of Line #2085 for approximately 2.8 miles to the south following the same alignment as HF Route 5 across agricultural and forested lands on the west side of the Courthouse Woods and Courthouse Estates subdivisions. At a point about 0.3 mile south of Indian River Road, the route variation would turn away from the Line #2085 corridor and continue west for approximately 1.6 miles, crossing North Landing Road, North Landing River, and the Intracoastal Waterway canal before rejoining HF Route 2 on the west side of the waterway. The total length of the Line #2085 Route Variation is 4.4 miles.

2.3 Switching Stations

The switching station required for the onshore Virginia Facilities would be an electric transmission system asset comprising circuit breakers, gas-insulated switchgear, shunt reactors, and static synchronous compensators. The primary purpose of the switching station would be to consolidate the nine Onshore Export Circuits down to three transmission circuits that would then connect to the existing transmission grid. The transition from an underground to an overhead transmission configuration would also occur at the switching station. The facility would generally have the appearance of a typical Dominion substation.

For HF Routes 1, 2 and 5, the Harpers Switching Station would be built on USN lands at NAS Oceana north of Harpers Road. The northeast corner of the site includes portions of two fairways within the Aeropines Golf Course and the central portion of the site includes maintenance structures associated with the golf course, which would be removed from the site during construction of the switching station. The site would encompass approximately 21.0 acres, all of which would be fenced and maintained for operations. Locations of stormwater management facilities have not yet been determined.

For the HF Hybrid Route, the Chicory Switching Station would be built at an alternate site on mostly private lands on the north side of Princess Anne Road adjacent to Dominion's existing ROW for Lines #2118/I-47, just south of the existing Princess Anne Substation. The alternate site encompasses a mix of city and privately owned lands, all currently forested. The site would encompass approximately 31.5 acres, of which approximately 17.1 acres would be fenced and maintained for operations. The remainder of the site would be used for stormwater management and temporary construction workspace.

2.4 Fentress Substation

Dominion's existing 500 kV Fentress Substation is situated on a parcel it owns in Chesapeake east of the Fentress Loop Road, south of the Fentress Lakes subdivision, north of the Carriage House Commons subdivision, and west of the Chesapeake & Albemarle Railroad. The facility measures approximately 705 feet by 755 feet, encompassing about 11.7 acres. Surrounding lands are predominantly forested (and mostly wetland) with the exception of existing transmission ROWs entering and exiting the facility.

For the CVOW Project, Dominion proposes to expand the existing facility footprint on Company-owned land, convert the 500 kV portion of the substation into a 10-breaker, gas insulated station, and install three 500-230 kV transformer banks and associated equipment to interconnect each of the proposed 230 kV circuits. The expansion would extend the boundary of the existing station about 490 feet to the north, encompassing an additional approximately 8.9 acres for a total (post-Project) station footprint of about 20.6 acres.

3. DESKTOP EVALUATION METHODOLOGY

The area of effect considered for this study consists of the alternative transmission line routes and associated facilities identified above. Data sources used for this review include the following, each of which is described briefly below:

- National Agricultural Imagery Program (NAIP) Digital Ortho-Rectified Images:
  - NAIP Digital Ortho-Rectified Natural Color Images, Virginia, 1-meter pixel resolution, photo date January 2021 (NAIP 2019)
  - NAIP Digital Ortho-Rectified Infrared Images, Virginia, 1-meter pixel resolution, photo date November 2020 (NAIP 2019)
- U.S. Geological Survey (USGS) Topographic Mapping (USGS 2021a)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping (USFWS 2021)
- U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) database (USDA 2021)
- USGS National Hydrography Dataset (NHD; USGS 2021b)
- City of Chesapeake Geospatial Data (City of Chesapeake 2018)
- City of Virginia Beach Mapping and Spatial Analysis (City of Virginia Beach 2019)

3.1 Data Sources

Natural Color and Infrared Aerial Photography

Recent (2010 to 2019) natural color aerial photography was used to provide a visual overview of the study area and to assist in evaluating current conditions. Recent (2010 to 2019) infrared aerial photography was used to identify the potential presence of wetlands based on signatures associated with the levels of reflectance. For example, areas inundated with water appear very dark (almost black) due to the low level of reflectance in the infrared spectrum. The presence of these dark colors can be used as a potential indicator of hydric or inundated soils likely associated with wetlands (NAIP 2019).

USGS Topographic Mapping

The recent (2014 to 2017) USGS topographic maps show the topography of the area. The USGS topographic maps also depict other important landscape features such as forest cover, development, buildings, agricultural areas, streams, lakes, and wetlands. Historic topographic mapping (1988 to 2012) was used to identify potential changes in stream locations and topography due to the high level of urban disturbance in a portion of the study area (USGS 2021a).

USFWS National Wetland Inventory Mapping

The NWI maps provide the boundaries and classifications of potential wetland areas as mapped by the USFWS (USFWS 2021). NWI data are based primarily on aerial photo interpretations with limited ground-truthing and may represent incorrect boundaries or wetland cover types. NWI data can be unreliable in some areas, especially in forested landscapes, when aerial photography is used as the major data source. The classifications of the majority of the NWI polygons in the study area appear to be accurate based on a review of the cover types observed in the aerial photography. However, in areas where there was an obvious discrepancy between the NWI classification and the aerial photography, ERM modified the classification to more accurately reflect current conditions. For example, an area mapped by NWI data as riverine may be adjusted to an emergent wetland type. In order to acknowledge ERM's adjustment of NWI classifications where appropriate, the wetland types referenced in this assessment are referred to as "assigned wetland cover types" regardless of whether the cover type was actually modified from the NWI classification.

USDA-NRCS Soils Data

The soils in the study area were identified and assessed using the SSURGO database, which is a digital version of the original county soil surveys (USDA 2021). The attribute data within the SSURGO database provides the proportionate extent of the component soils and their properties (e.g., hydric rating) for each soil map unit. The soils in the study area were grouped into three categories based on the hydric rating of the component soils within each map unit: hydric, partially hydric, and non-hydric. Hydric soils were defined as those where the major component soils, and minor components in some cases, are designated as hydric. Hydric components in these map units account for more than 80 percent of the map unit, and for the purposes of this analysis, the soil survey map unit for water was also considered as hydric. Partially hydric soils include map units that only contain minor component soils that are designated as hydric. The partially hydric map units in the study area contain 10 percent or less hydric soils. The remaining map units do not contain any component soils designated as hydric. Areas mapped as hydric or partially hydric have a higher probability of containing wetlands than areas with no hydric soils.

USGS National Hydrography Dataset

The NHD contains waterbody features such as lakes, ponds, streams, rivers, canals, dams and stream gages (USGS 2021b). The waterbodies mapped by the NHD appeared consistent with those visible on the USGS maps, aerial photography, and topography of the area.

3.2 Mapping Procedure

ERM used a stepwise process to identify probable wetland and waterbody areas along the alternative transmission line routes and associated onshore facilities, as follows:

1. Infrared and natural color aerial photography was used in conjunction with USGS topographic maps, soils maps, and other data sources to identify potential wetland areas. Boundaries were assigned to the areas that appeared to exhibit wetland signatures based on this review and a cover type was determined based on aerial photo interpretation. For the purpose of the study, these areas are referred to as Interpreted Wetlands.
2. To further determine the probability of a wetland occurring within a given location, the Interpreted Wetland polygon shape files were digitally layered with the NWI and NHD mapping and hydric soils information from the SSURGO database.
3. The probability of a wetland occurring was assigned based on the number of overlapping data layers (i.e., indicators of potential wetland presence) that occurred in a particular area.

The criteria assigned to each probability class are outlined in Table 1.

Table 1: Criteria Used to Rank the Probability of Occurrence

Probability Class	Criteria
High	Areas where layers of hydric soils, Interpreted Wetlands, and NWI data overlap
Medium/High	NWI data overlaps hydric soils; or NWI data overlaps Interpreted Wetlands with or without partially hydric soils; or hydric soils overlap Interpreted Wetlands
Medium	Interpreted Wetlands with or without overlap by partially hydric soils
Medium/Low	Hydric soils only; or NWI data with or without overlap by partially hydric soils
Low	Partially hydric soils only
Very Low	Non-hydric soils only

Using the above criteria, a range of wetland and waterbody occurrence probabilities were identified from very low to high for each alternative route, with acreages of each probable type of wetland according to probability class. The probability of wetland and waterbody occurrence increases as multiple indicators begin to overlap toward the "high" end of the spectrum. The medium-high and high probability category are the most reliable representation of in-situ conditions, due to overlapping data sets, and these categories are carried through in the summary below as a percentage of the total acreage of each alternative route. Figure 2 in Attachment A depicts the interpreted wetlands displayed on color base map images.

4. RESULTS

Multiple wetlands and waterbodies with a high to medium probability of occurrence were identified within the study area for each of the alternative transmission line routes and their associated onshore facilities. Based on the presence of multiple indicators, high and medium/high categories are considered the most reliable probability classes for determining wetland and waterbody location and size. A summary of the probability of occurrence for wetland and waterbody types by acreage within the route ROW and associated facility footprint for each route is presented in Table 2. Figure 2 in Attachment A depicts wetland and waterbody locations along each route according to probability of occurrence

The majority of the wetlands in the study area are adjacent to, or contiguous with, rivers, streams, and associated tributaries regulated by the USACE and VDEQ under Sections 404 and 401 of the Clean Water Act (CWA), respectively. Based on the wetland classification system defined by Cowardin et al. (1979), wetlands in the study area primarily are palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) wetlands. PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes (i.e., aquatic plants), excluding mosses and lichens. PSS wetlands are characterized by woody vegetation less than 20 feet tall. PFO wetlands are characterized by woody vegetation that is at least 20 feet tall.

The CLH Route would cross wetlands surrounding Lake Christine between Regulus Avenue and Lake Road. The CLH Route would also cross several PFO wetland complexes within the SMR and NAS Oceana in the Owl Creek watershed between General Booth Boulevard and Birdneck Road.

HF Routes 1, 2, and 5, the HF Hybrid Route, and the Dam Neck Route Variation would all cross PFO wetland complexes associated with West Neck Creek, with smaller areas of PEM wetlands found in existing ROWs and in agricultural lands. The PFO wetland complexes are located between London Bridge Road and Holland Road.

HF Routes 1, 2, and 5, the HF Hybrid Route, and the Line #2085 Route Variation would cross extensive PFO wetlands in floodplains adjacent to the North Landing River, Intracoastal Waterway canal, and/or Pocaty River, many of which are collectively known as Gum Swamp. In much of this area, HF Route 1 and the HF Hybrid Route would be located along Dominion's existing Lines #271/I-74 corridor. The wetlands within Gum Swamp and the area surrounding the Intracoastal Waterway canal and North Landing River are located south of the boundary between Chesapeake and Virginia Beach, southwest of Indian River Road and north of Mt Pleasant Road.

ERM identified and mapped waterbodies in the study area using similar publicly available GIS databases as those used to identify and map wetlands. Waterbodies in the study area are primarily palustrine unconsolidated bottom (PUB) open waters and riverine (RVR) features such as intermittent and perennial streams. All of the alternative transmission line routes would cross perennial and intermittent waterbodies (rivers, streams, tributaries), including the Intracoastal Waterway canal and/or North Landing River, which are both considered navigable waterbodies by the USACE, regulated under Section 10 of the Rivers and Harbors Act.

The CLH Route would cross Owl Creek, an estuary connected to Rudee Inlet, between General Booth Boulevard and Bells Road, and Lake Christine, located between Owl Creek and the Atlantic Ocean. Small PUB waterbodies would be crossed by or adjacent to each alternative route in various locations.
HF Routes 1, 2, and 5, the HF Hybrid Route, and the Line #2085 Route Variation would each cross North Landing River and/or the Intracoastal Waterway canal. HF Routes 1, 2, and 5, the HF Hybrid Route, and the Dam Neck Route Variation would each cross West Neck Creek, a tributary of the North Landing River. The West Neck Creek crossings would be east of the Holland Pines subdivision along Holland Road in Virginia Beach. The routes would cross the North Landing River and/or Intracoastal Waterway canal at various locations, all south of Indian River Road and along or near the boundary between Chesapeake

and Virginia Beach. HF Route 1 and the HF Hybrid Route would cross the Intracoastal Waterway canal along Dominion's existing Lines #271/I-74 corridor, while HF Routes 2 and 5 would cross North Landing River farther east near the North Landing River Bridge (State Road 165). HF Route 5 also would cross Pocaty River, another tributary to the North Landing River, east of NALF Fentress.

Table 2: Probability of Occurrence for Wetland and Waterbody Types per Route

		Wetland and Waterbody Type (Acres)								
Probability	Total Acres[a]	Palustrine Emergent (PEM)	Scrub/Shrub (PSS)	Forested (PFO)	Unconsolidated Bottom (PUB)	Riverine (RVR)	Lacustrine (Lake)	Estuarine Subtidal (E1UB)	Estuarine Intertidal (E2EM)	Marine Intertidal (M2US)
CLH Route [b]										
High	2.53	0.19	NA	1.10	NA	NA	NA	0.09	1.15	NA
Medium/High	16.67	2.97	NA	10.22	NA	0.15	2.52	0.32	0.50	NA
Medium	6.75	NA	NA	6.15	NA	0.04	0.23	NA	0.33	NA
Medium/Low	17.16	NA	NA	0.15	NA	0.03	NA	NA	0.32	NA
Low	3.21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Very low	22.53	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF Route 1 [c]										
High	65.44	6.64	29.87	26.43	0.28	2.22	NA	NA	NA	NA
Medium/High	83.75	18.85	15.55	42.37	1.17	5.81	NA	NA	NA	NA
Medium	17.96	0.17	3.71	14.17	NA	NA	NA	NA	NA	NA
Medium/Low	113.13	NA	NA	NA	NA	NA	NA	NA	NA	NA
Low	14.18	NA	NA	NA	NA	NA	NA	NA	NA	NA
Very low	0.98	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF Route 2 [c]										
High	70.89	3.32	0.20	65.34	0.28	1.76	NA	NA	NA	NA
Medium/High	88.91	14.86	9.62	56.93	1.17	6.33	NA	NA	NA	NA
Medium	18.39	0.14	2.19	15.83	NA	0.24	NA	NA	NA	NA
Medium/Low	112.25	NA	NA	2.99	NA	0.07	NA	NA	NA	NA
Low	14.18	NA	NA	NA	NA	NA	NA	NA	NA	NA
Very low	2.33	NA	NA	NA	NA	NA	NA	NA	NA	NA

Probability	Total Acres[a]	Wetland and Waterbody Type (Acres)								
		Palustrine Emergent (PEM)	Scrub/Shrub (PSS)	Forested (PFO)	Unconsolidated Bottom (PUB)	Riverine (RVR)	Lacustrine (Lake)	Estuarine Subtidal (E1UB)	Estuarine Intertidal (E2EM)	Marine Intertidal (M2US)
HF Route 5 [c]										
High	112.20	3.91	0.26	105.59	NA	2.45	NA	NA	NA	NA
Medium/High	73.56	13.61	4.66	46.38	0.68	8.23	NA	NA	NA	NA
Medium	19.10	1.22	NA	17.50	0.02	0.37	NA	NA	NA	NA
Medium/Low	151.91	NA	NA	0.07	NA	0.24	NA	NA	NA	NA
Low	13.16	NA	NA	NA	NA	NA	NA	NA	NA	NA
Very low	14.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF Hybrid Route [d]										
High	68.78	6.86	29.87	29.41	0.28	2.35	NA	NA	NA	NA
Medium/High	105.15	20.00	15.47	62.94	1.17	5.58	NA	NA	NA	NA
Medium	5.78	0.17	3.71	1.90	NA	NA	NA	NA	NA	NA
Medium/Low	105.57	NA	NA	NA	NA	0.07	NA	NA	NA	NA
Low	7.34	NA	NA	NA	NA	NA	NA	NA	NA	NA
Very low	0.98	NA	NA	NA	NA	NA	NA	NA	NA	NA
Damn Neck Route Variation										
High	17.71	0.28	NA	16.88	NA	0.55	NA	NA	NA	NA
Medium/High	9.72	0.70	NA	8.63	0.03	0.36	NA	NA	NA	NA
Medium	1.79	NA	NA	1.66	NA	0.12	NA	NA	NA	NA
Medium/Low	18.23	NA	NA	NA	NA	NA	NA	NA	NA	NA
Low	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Very low	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Line #2085 Route Variation										
High	22.57	0.19	0.26	20.99	NA	1.14	NA	NA	NA	NA
Medium/High	21.81	1.91	4.54	8.09	0.27	6.99	NA	NA	NA	NA

Probability	Total Acres[a]	Wetland and Waterbody Type (Acres)								
		Palustrine Emergent (PEM)	Scrub/Shrub (PSS)	Forested (PFO)	Unconsolidated Bottom (PUB)	Riverine (RVR)	Lacustrine (Lake)	Estuarine Subtidal (E1UB)	Estuarine Intertidal (E2EM)	Marine Intertidal (M2US)
Medium	4.02	0.77	NA	3.09	0.02	0.14	NA	NA	NA	NA
Medium/Low	32.85	NA	NA	NA	NA	NA	NA	NA	NA	NA
Low	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Very low	1.09	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not applicable due to absence of wetland or waterbody type within the alternative route.

[a] The numbers in this table have been rounded for presentation purposes. Sums do not always equal the total of addends due to rounding error or spatial discrepancies in data sets used to identify constraints.

[b] The acreage presented for the CLH Route includes the Cable Landing Location.

[c] The acreage presented for HF Routes 1, 2, and 5 includes the Harpers Switching Station and the Fentress Substation expansion.

[d] The acreage presented for the HF Hybrid Route includes the Chicory Switching Station and the Fentress Substation expansion.

4.1 Cable Landing to Harpers Route

The CLH Route is approximately 4.4 miles long; the ROW width varies along this route. The route in total encompasses approximately 68.9 acres. Based on the methodology discussed above, the ROW would encompass approximately 28 percent (19.20 acres) of land with a medium/high and high probability of containing wetlands and waterbodies.

4.2 Harpers to Fentress Route 1

HF Route 1 is approximately 14.2 miles long; the general ROW width is 140 feet wide except where collocated with Dominion's existing infrastructure where the amount of new ROW required for the onshore Virginia Facilities varies. A total of approximately 295.5 acres are encompassed by this route. Based on the methodology discussed above, the ROW would encompass approximately 50 percent (149.2 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

4.3 Harpers to Fentress Route 2

HF Route 2 is approximately 15.2 miles long; the ROW is generally 140 feet wide along this route, which encompasses a total of approximately 306.9 acres. Based on the methodology discussed above, the ROW would encompass approximately 52 percent (159.8 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

4.4 Harpers to Fentress Route 5

HF Route 5 is approximately 20.2 miles long; the ROW is generally 140 feet wide along this route, which encompasses a total of approximately 384.3 acres. Based on the methodology discussed above, the ROW would encompass approximately 48 percent (185.8 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

4.5 Harpers to Fentress Hybrid Route

The HF Hybrid Route is approximately 14.2 miles long; the ROW width varies along this route, which encompasses a total of approximately 293.6 acres. Based on the methodology discussed above, the ROW would encompass approximately 59 percent (173.9 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

4.6 Dam Neck Route Variation

The Dam Neck Route Variation is approximately 2.8 miles long; the 140-foot-wide ROW along this route encompasses a total of approximately 47.5 acres. Based on the methodology discussed above, the ROW would encompass approximately 58 percent (27.4 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

4.7 Line #2085 Route Variation

The Line #2085 Route Variation is approximately 4.4 miles long; the ROW width varies along this route, which encompasses approximately 82.3 acres. Based on the methodology discussed above, the ROW would encompass approximately 54 percent (44.4 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

5. CONCLUSION

5.1 Project Impacts

Avoiding or minimizing impacts on wetlands and waterbodies was among the criteria Dominion used in developing the alternative transmission line routes.

To minimize impacts on aquatic resource areas, the transmission line would be designed to span or avoid these resources where possible. Where the removal of woody or shrubby vegetation occurs within wetlands, Dominion would use the least intrusive method reasonably possible to clear the corridor. Hand-cutting of vegetation would be conducted, where needed, to avoid and minimize impacts on waterbodies and/or wetlands. Excess soil in wetlands resulting from foundation installation for overhead transmission structures or surface trenching for underground installations would be spread across the ROW and/or removed for disposal at an appropriate site. Mats would be used for construction equipment to travel over wetlands, as needed. Access to the ROW for each alternative route generally would be from existing public roads or access roads where available; however, in some areas new temporary access roads would likely need to be constructed. Where warranted, Dominion would install a culvert, ford, or temporary bridge along the ROW or approved access roads to cross small streams. In such cases, some temporary fill material could be placed in wetlands adjacent to these crossings. Where needed, this fill would be placed on erosion-control fabric and removed when work is completed, returning ground elevations to original contours. Potential direct impacts on wetlands would be temporary in nature, but a reduction in wetland functions and values would occur where tree clearing within wetlands is necessary.

5.2 Summary

This Wetland and Waterbody Report was prepared in accordance with the Memorandum of Agreement between the VDEQ and the SCC for purposes of initiating a Wetlands Impact Consultation. A formal on-site wetland delineation was not conducted as part of this review. Upon SCC approval of a route and final line engineering, Dominion will obtain the appropriate permits from the USACE for work within wetlands to ensure full compliance with Section 404 of the CWA and to minimize potential impacts on wetlands within the transmission line corridor.

6. REFERENCES

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ATTACHMENT A FIGURES

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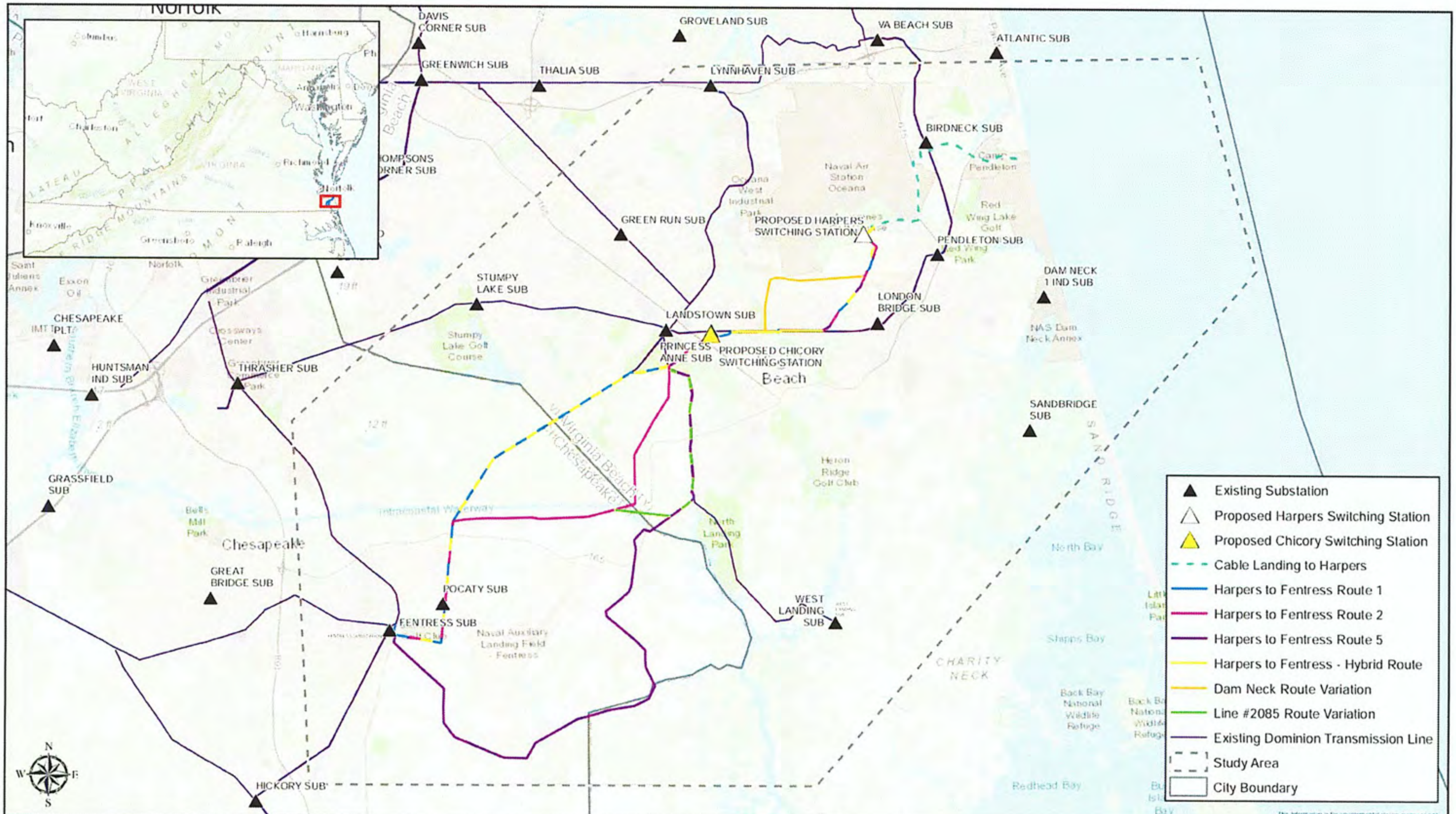
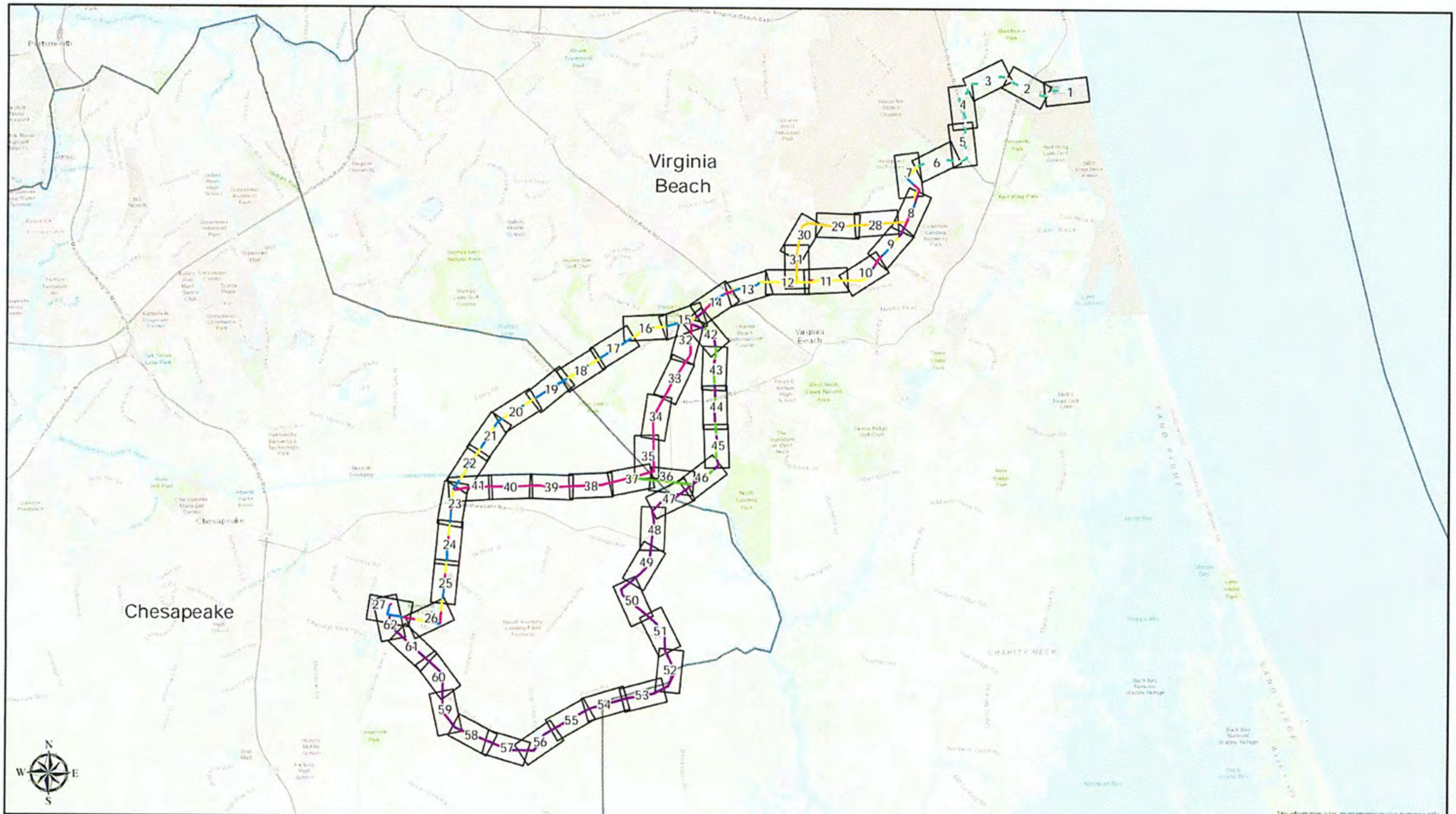


Figure 1
Project Overview Map
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia



Cable Landing to Harpers	Harpers to Fentress - Hybrid Route
Harpers to Fentress Route 1	Dam Neck Route Variation
Harpers to Fentress Route 2	Line #2085 Route Variation
Harpers to Fentress Route 5	Page Index

0 2 4
Miles

Dominion Energy

Figure 2
Wetland and Waterbody Index Map
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia

ERM

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DRAWN BY: JPB

The wetlands and waterbodies depicted on this map are an estimate of possible wetland and waterbody extent based on desktop data review only, and are subject to change in extent and location based on actual field delineation of wetlands and waterbodies.

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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DRAWN BY: JPB

The wetlands and waterbodies depicted on this map are an estimate of possible wetland and waterbody extent based on desktop data review only, and are subject to change in extent and location based on actual field delineation of wetlands and waterbodies.

0 200 400 Feet	Cable Landing to Harpers	Medium/High
	Project Limits	High
	Wetland Probability	NHD Waterbody
	Medium	NWI Wetland
	Not Hydric Soil	Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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The wetlands and waterbodies depicted on this map are an estimate of possible wetland and waterbody extent based on desktop data review only, and are subject to change in extent and location based on actual field delineation of wetlands and waterbodies.

0 200 400
Feet

Cable Landing to Harpers
Project Limits
Wetland Probability
Medium
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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ERM

DRAWN BY: JPB

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0 200 400
Feet

Cable Landing to Harpers
Project Limits
Wetland Probability
Medium
Medium/High
NHD Waterbody
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Cable Landing to Harpers
Project Limits
Wetland Probability
Medium
Medium/High
High
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

- Cable Landing to Harpers
- Harpers to Fentress Route 1
- Harpers to Fentress Route 2
- Harpers to Fentress Route 5
- Harpers to Fentress - Hybrid Route
- Project Limits
- Wetland Probability
  - Medium
  - Medium/High
  - High
- NHD Waterbody
- NWI Wetland
- Partially Hydric Soil
- Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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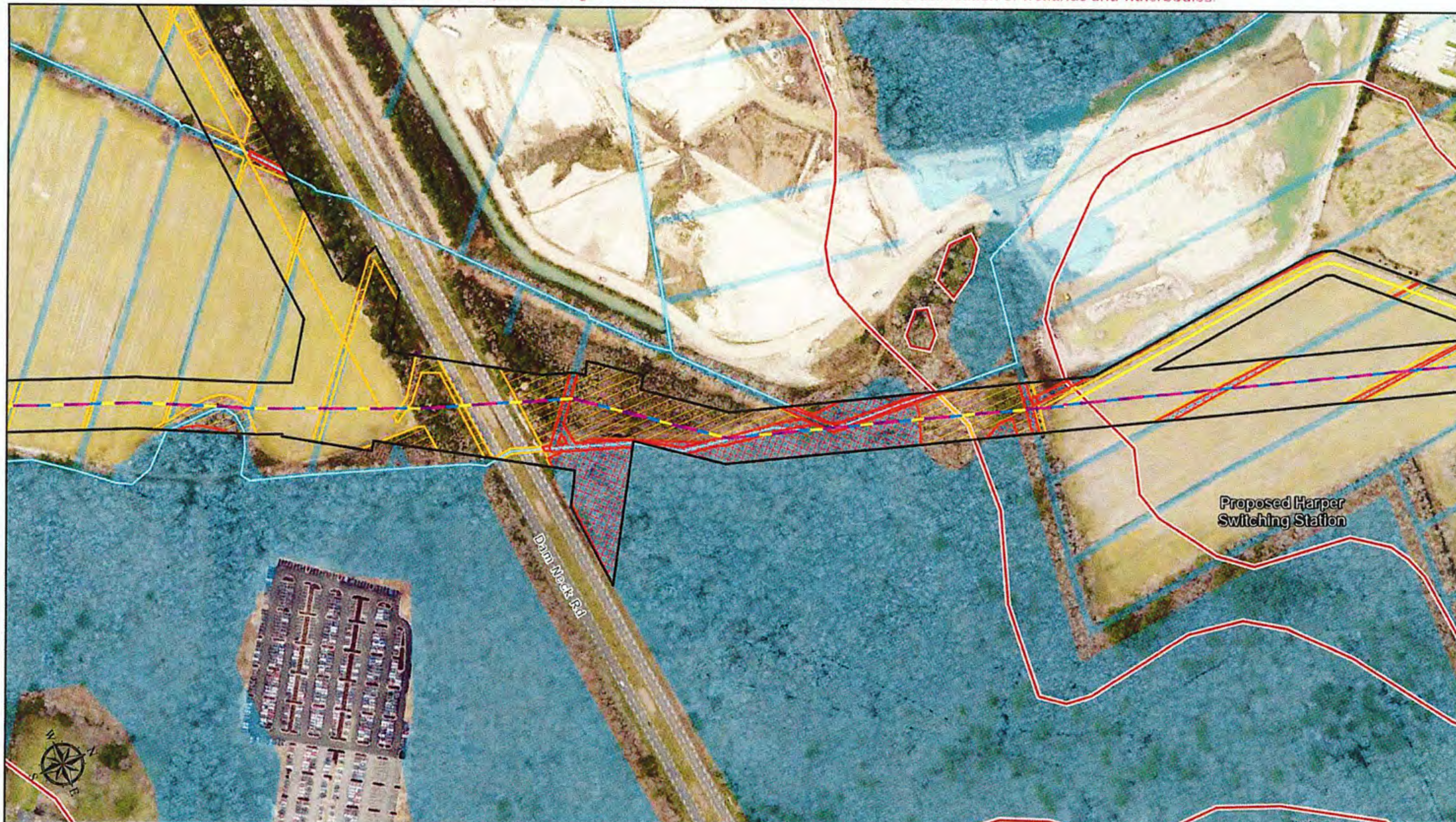

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Dominion Energy

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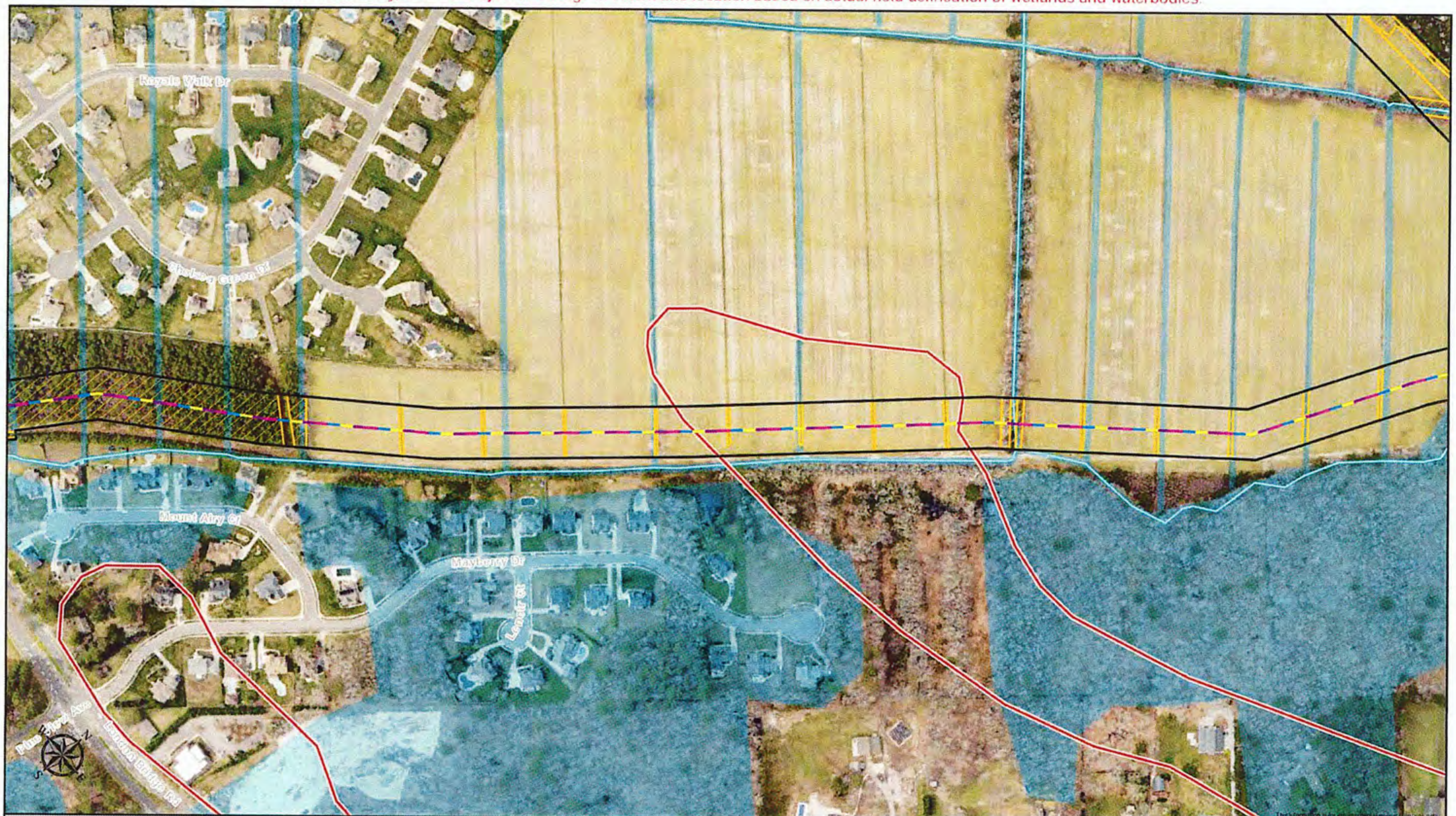

0 200 400
Feet

Harpers to Fentress Route 1	Dam Neck Route Variation
Harpers to Fentress Route 2	Project Limits
Harpers to Fentress Route 5	Wetland Probability
Harpers to Fentress - Hybrid Route	Medium/High
NHD Waterbody	
NWI Wetland	
Hydric Soil	

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

- Harpers to Fentress Route 1
- Harpers to Fentress Route 2
- Harpers to Fentress Route 5
- Harpers to Fentress - Hybrid Route

Project Limits

Wetland Probability
- Medium/High
- High

NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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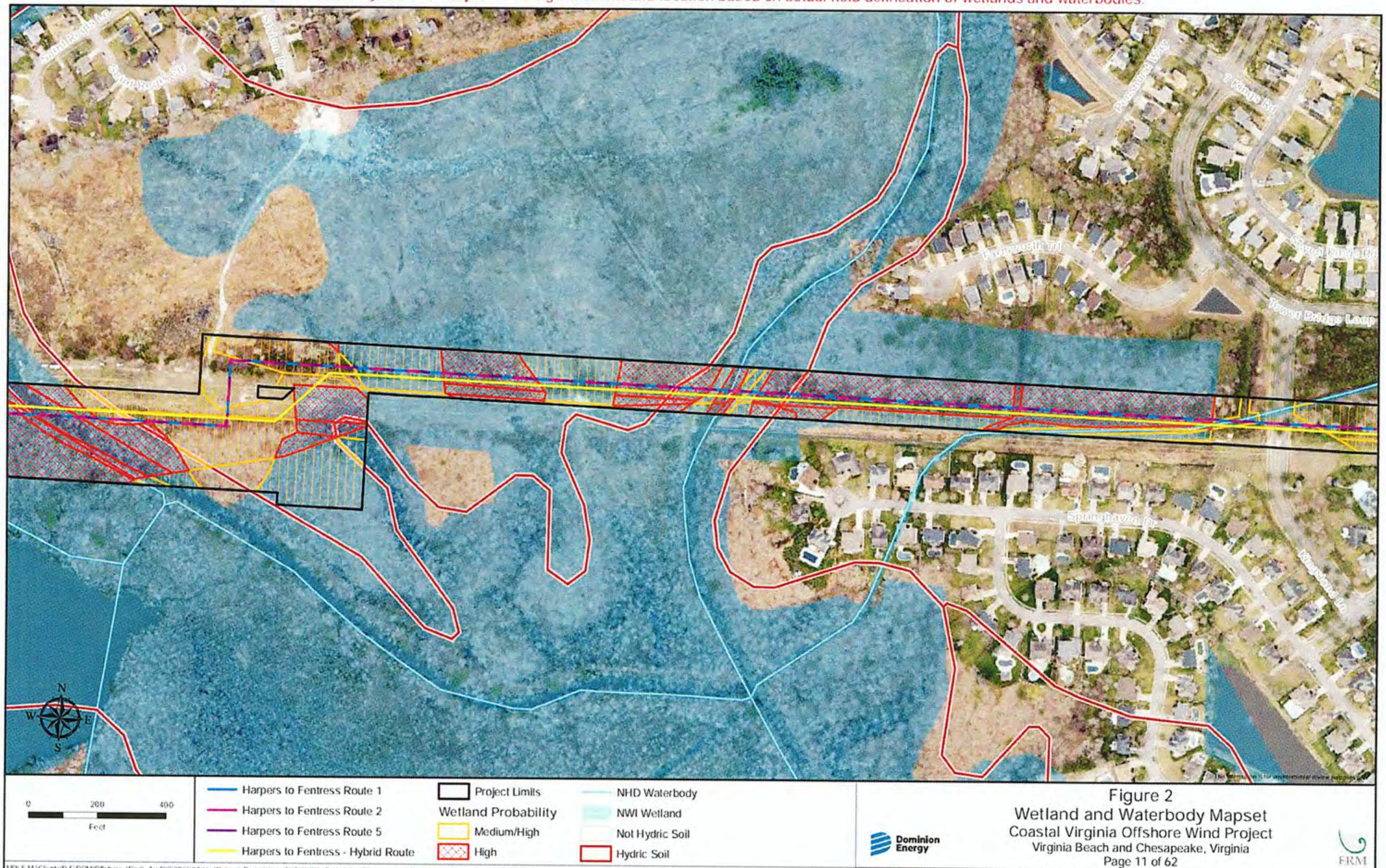

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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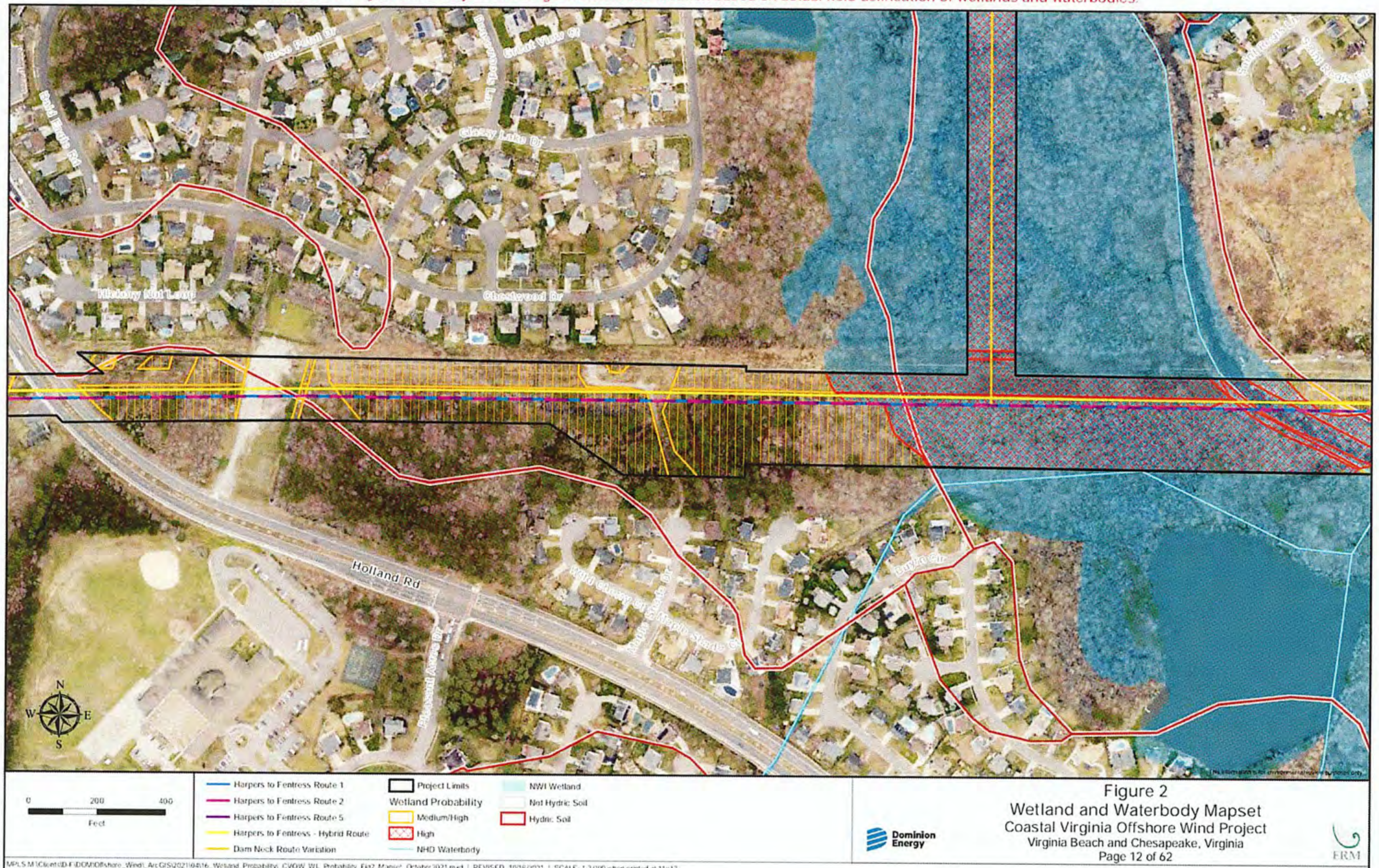

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0 200 400 Feet

- Harpers to Fentress Route 1
- Harpers to Fentress Route 2
- Harpers to Fentress Route 5
- Harpers to Fentress - Hybrid Route
- Project Limits
- Wetland Probability
  - Medium/High
  - High
- NHD Waterbody
- NWI Wetland
- Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

- Harpers to Fentress Route 1
- Harpers to Fentress Route 2
- Harpers to Fentress Route 5
- Harpers to Fentress - Hybrid Route

Project Limits

Wetland Probability
- Medium/High
- High

- NHD Waterbody
- NWI Wetland
- Not Hydric Soil
- Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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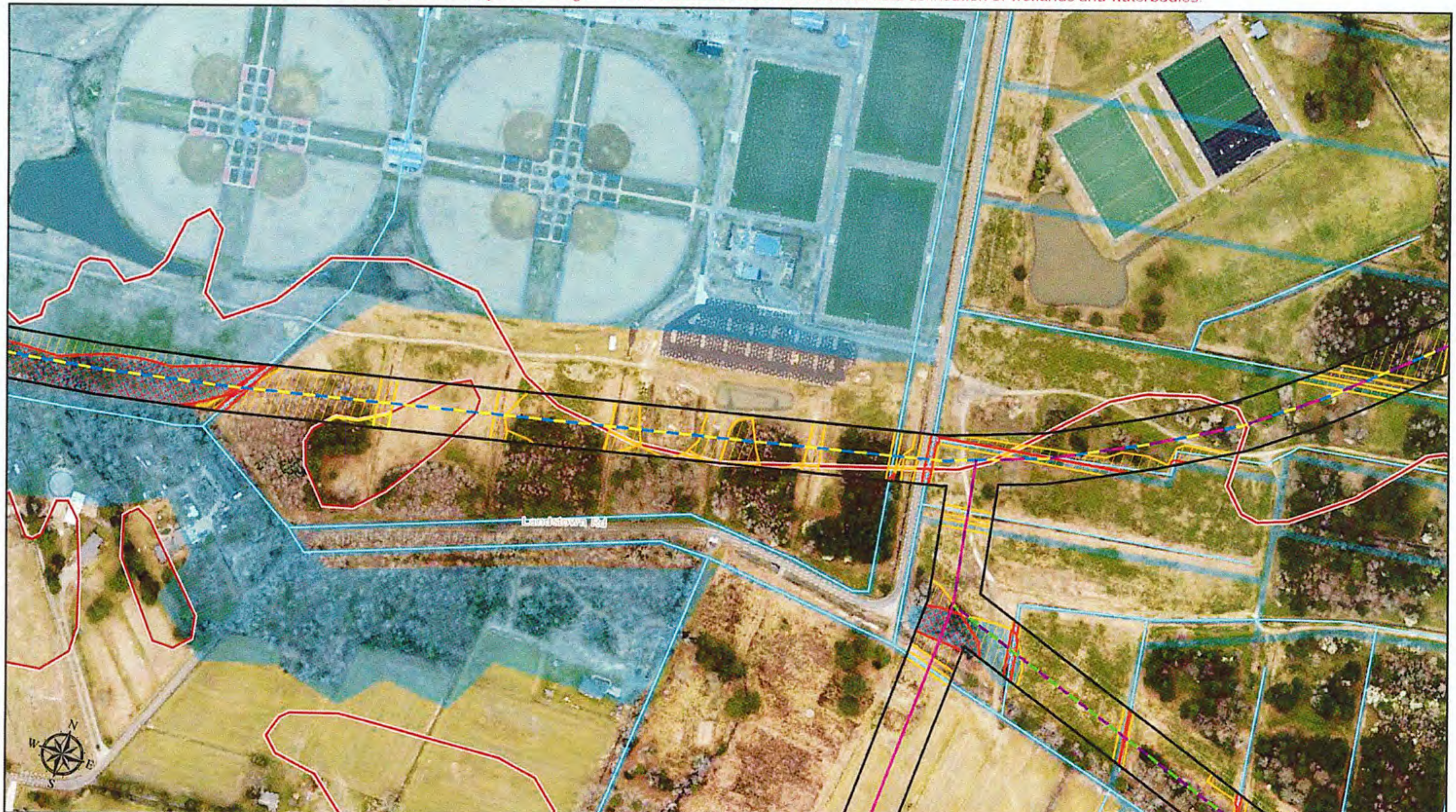

0 200 400
Feet

- Harpers to Fentress Route 1
- Harpers to Fentress Route 2
- Harpers to Fentress Route 5
- Harpers to Fentress - Hybrid Route
- Line #2085 Route Variation
- Project Limits
- Wetland Probability
  - Medium
  - Medium/High
  - High
- NHD Waterbody
- NWI Wetland
- Not Hydric Soil
- Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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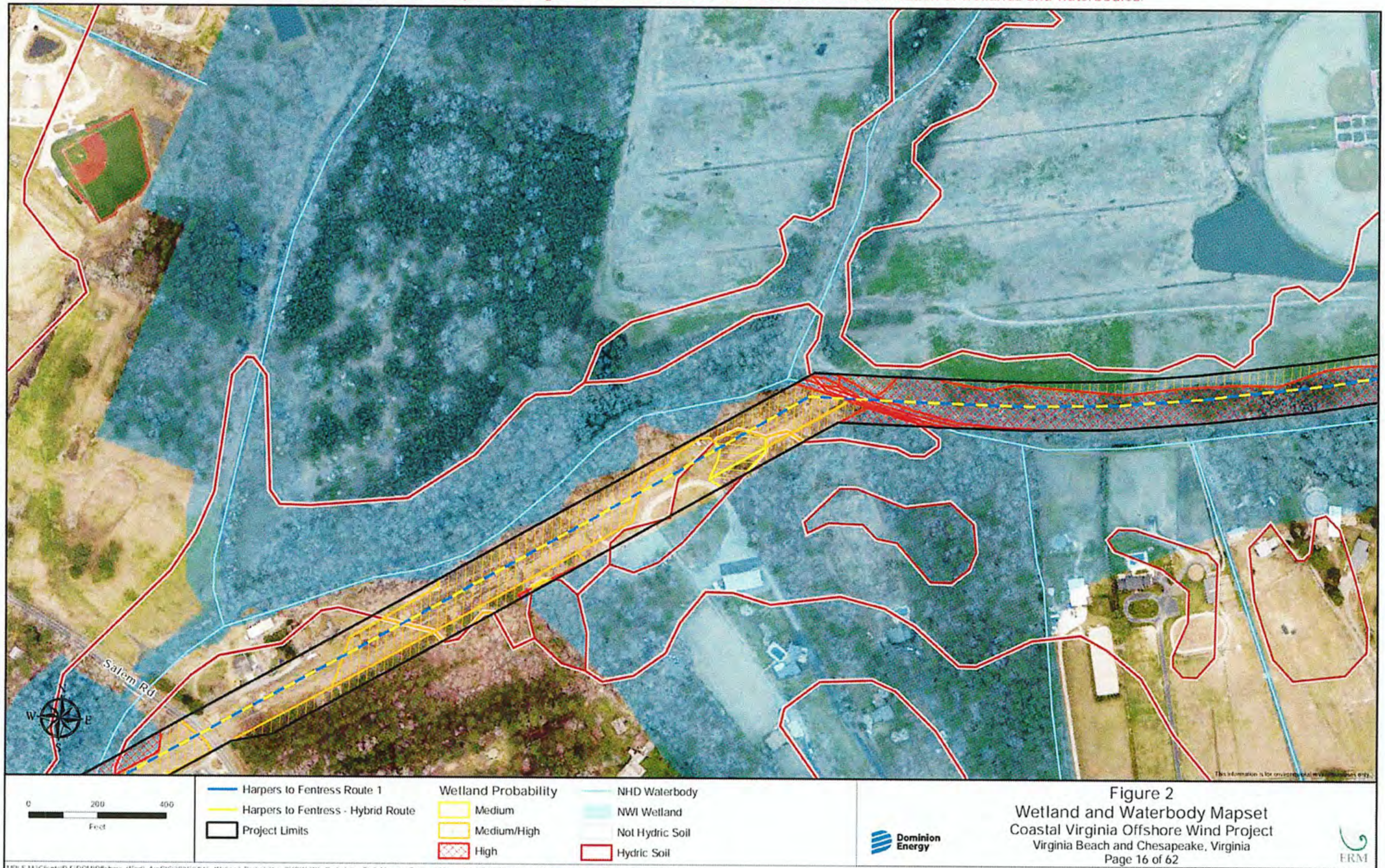

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 1
Harpers to Fentress - Hybrid Route
Project Limits

Wetland Probability
Medium/High
High
NHD Waterbody

NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 1
Harpers to Fentress - Hybrid Route
Project Limits

Wetland Probability
Medium/High
High
NHD Waterbody

NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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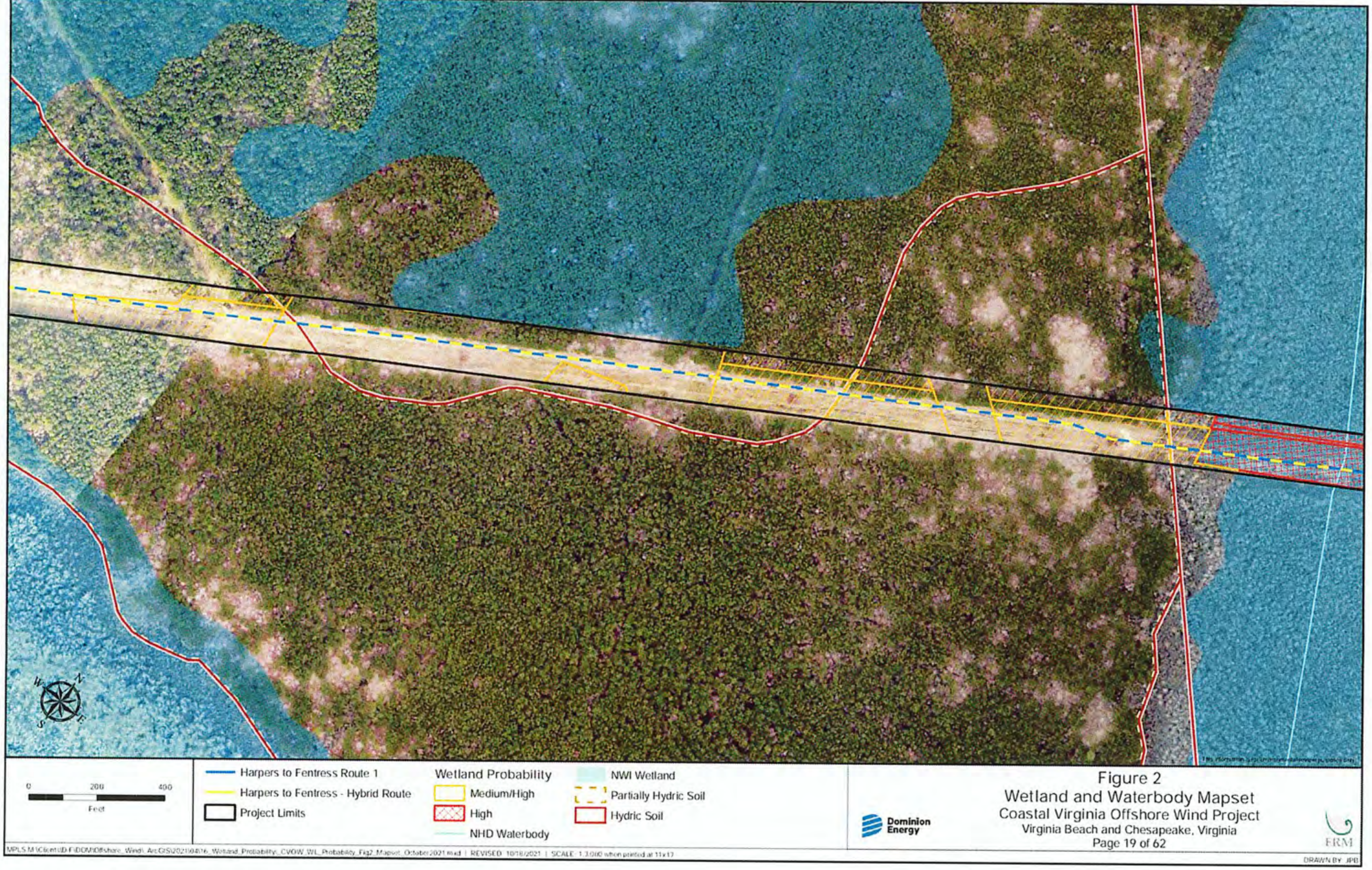

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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DRAWN BY: JPB

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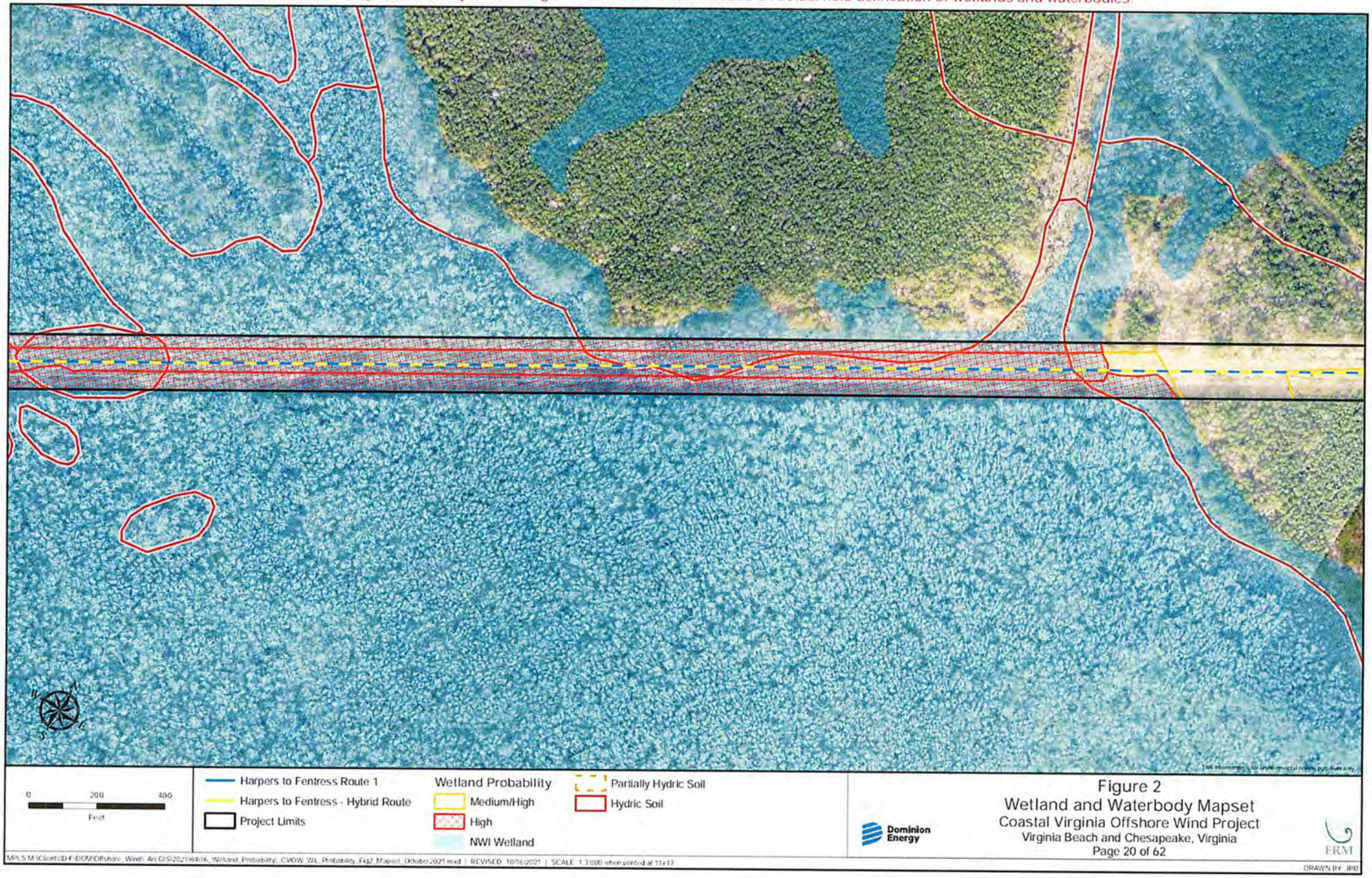

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
Page 20 of 62

The wetlands and waterbodies depicted on this map are an estimate of possible wetland and waterbody extent based on desktop data review only, and are subject to change in extent and location based on actual field delineation of wetlands and waterbodies.

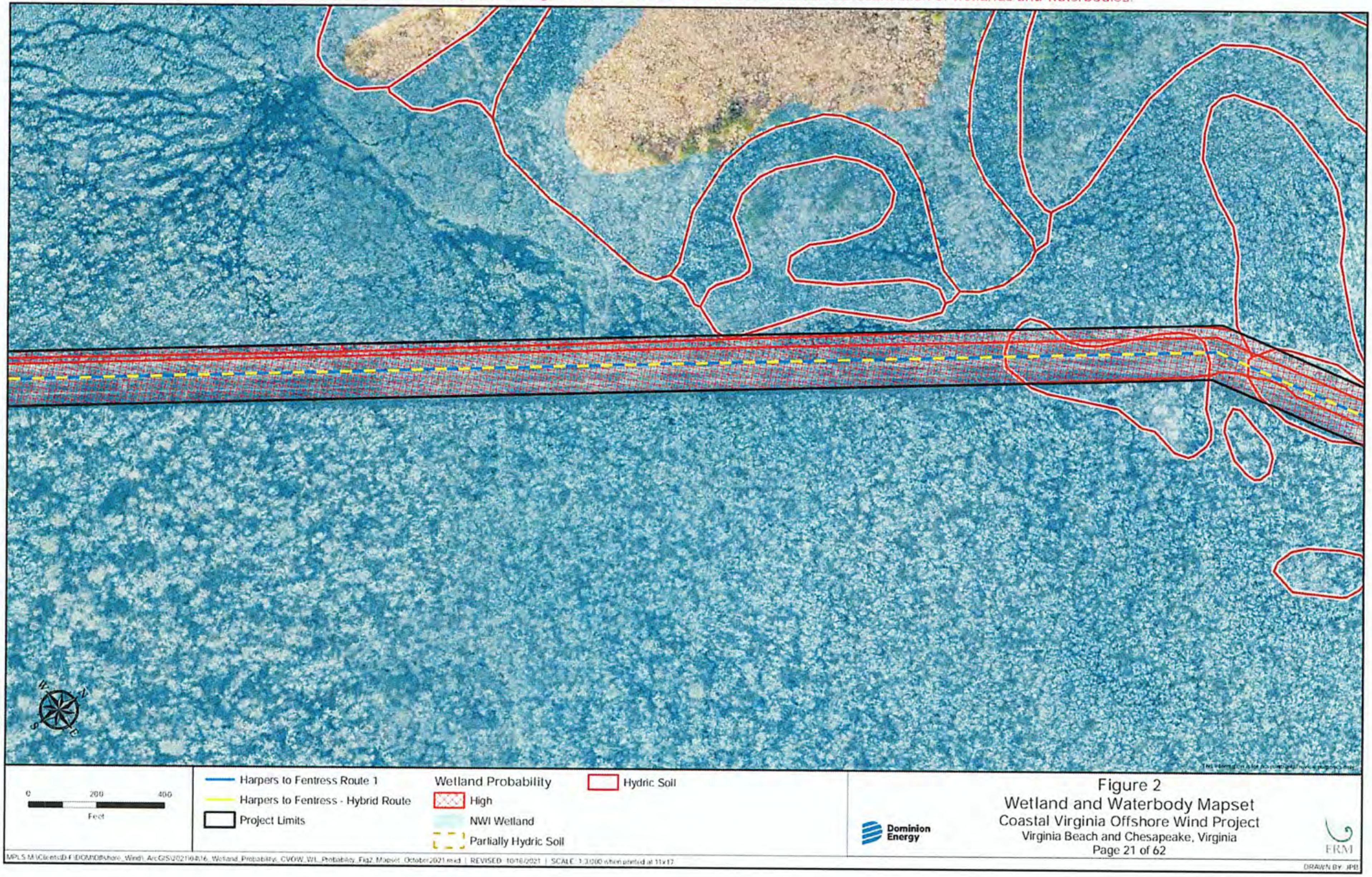

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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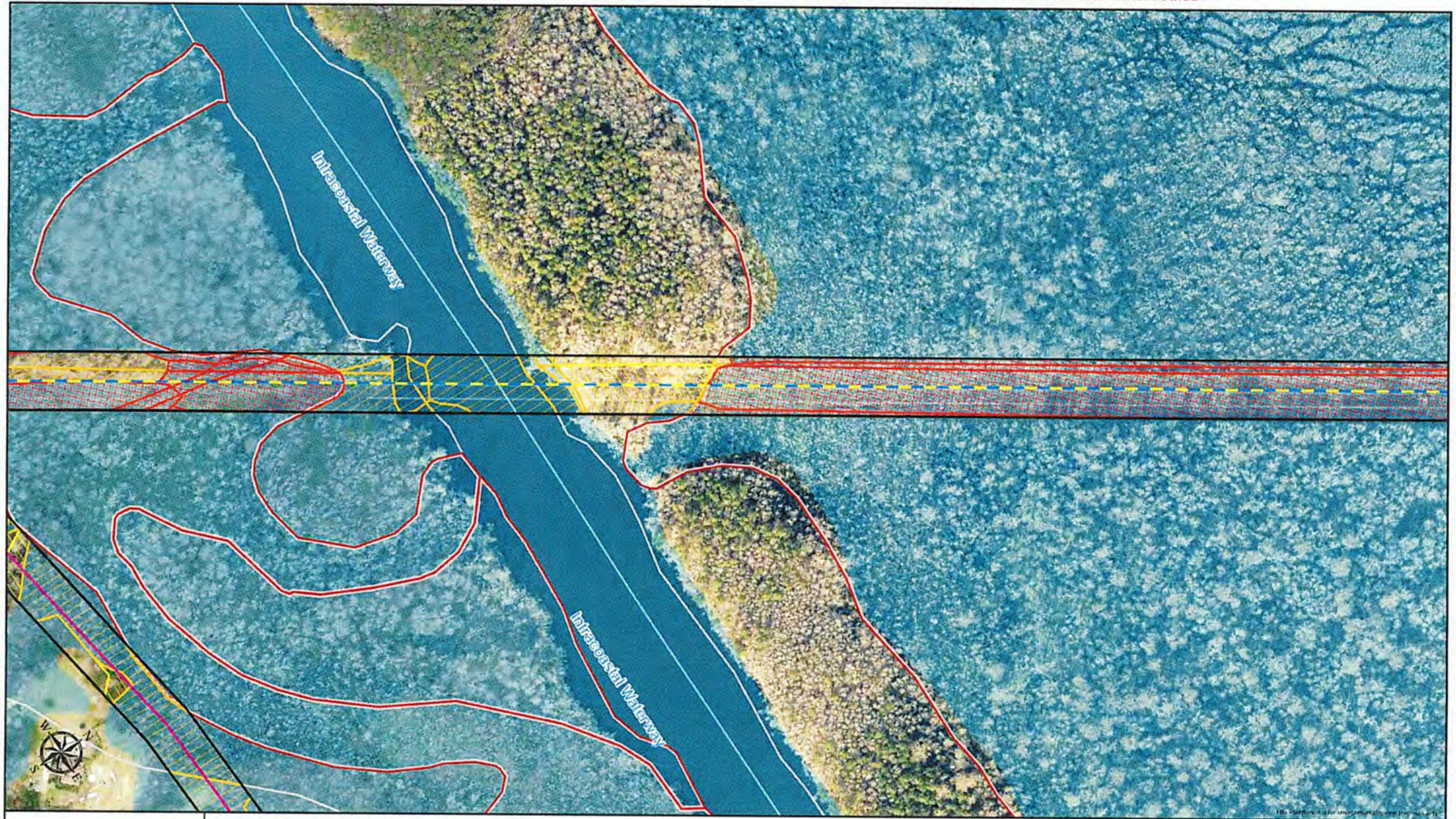

0 200 400
Feet

Harpers to Fentress Route 1
Harpers to Fentress Route 2
Harpers to Fentress - Hybrid Route
Project Limits

Wetland Probability
Medium
Medium/High
High

NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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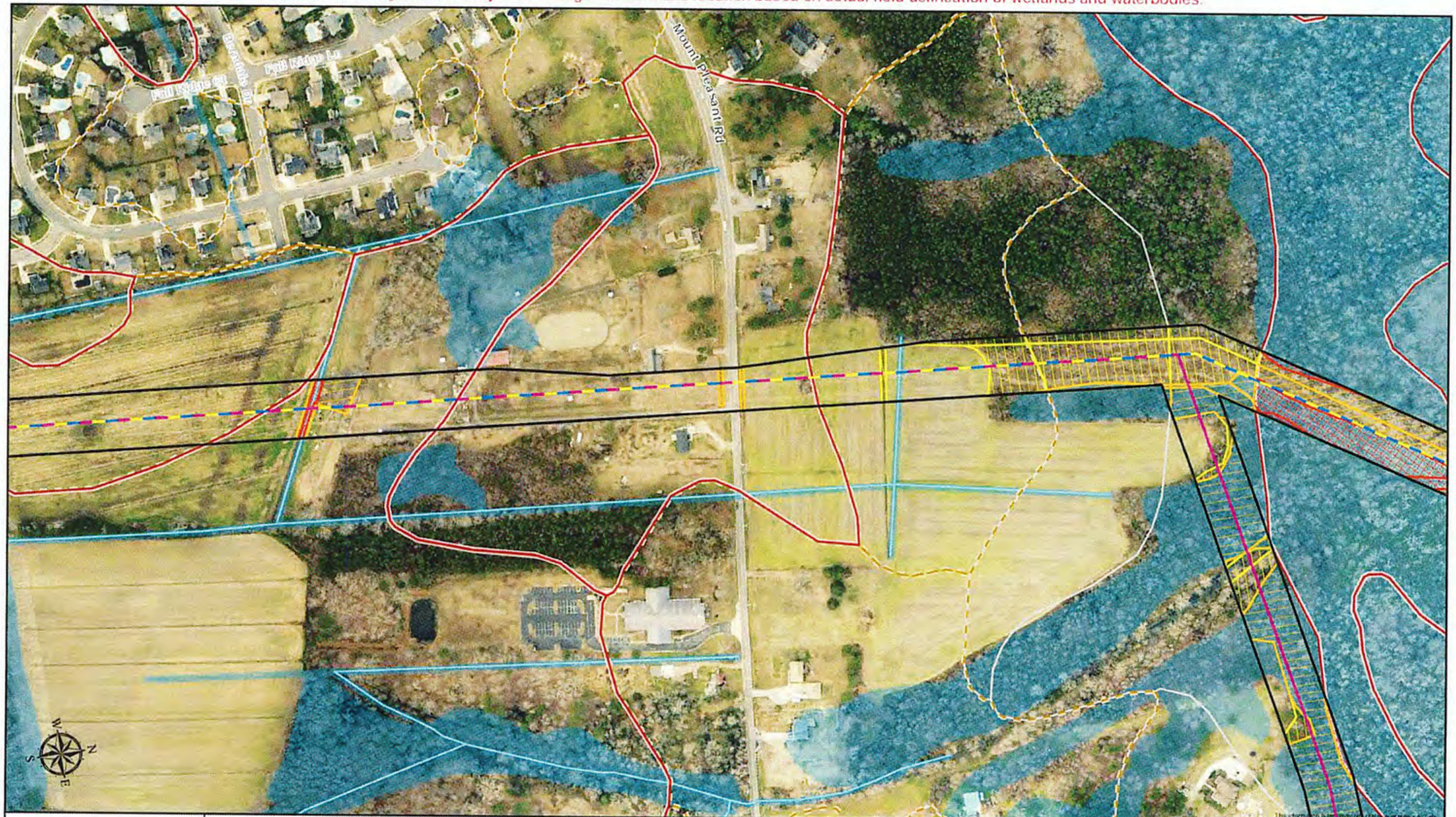

Harpers to Fentress Route 1	Wetland Probability	NHD Waterbody	Hydric Soil
Harpers to Fentress Route 2	Medium	NWI Wetland	
Harpers to Fentress - Hybrid Route	Medium/High	Not Hydric Soil	
Project Limits	High	Partially Hydric Soil	

0 200 400
Feet

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Harpers to Fentress Route 1	Wetland Probability	NHD Waterbody	Hydric Soil
Harpers to Fentress Route 2	Medium	NWI Wetland	
Harpers to Fentress - Hybrid Route	Medium/High	Not Hydric Soil	
Project Limits	High	Partially Hydric Soil	

0 200 400
Feet

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 1
Harpers to Fentress Route 2
Harpers to Fentress - Hybrid Route
Project Limits

Wetland Probability
Medium/High
High
NHD Waterbody

NWI Wetland
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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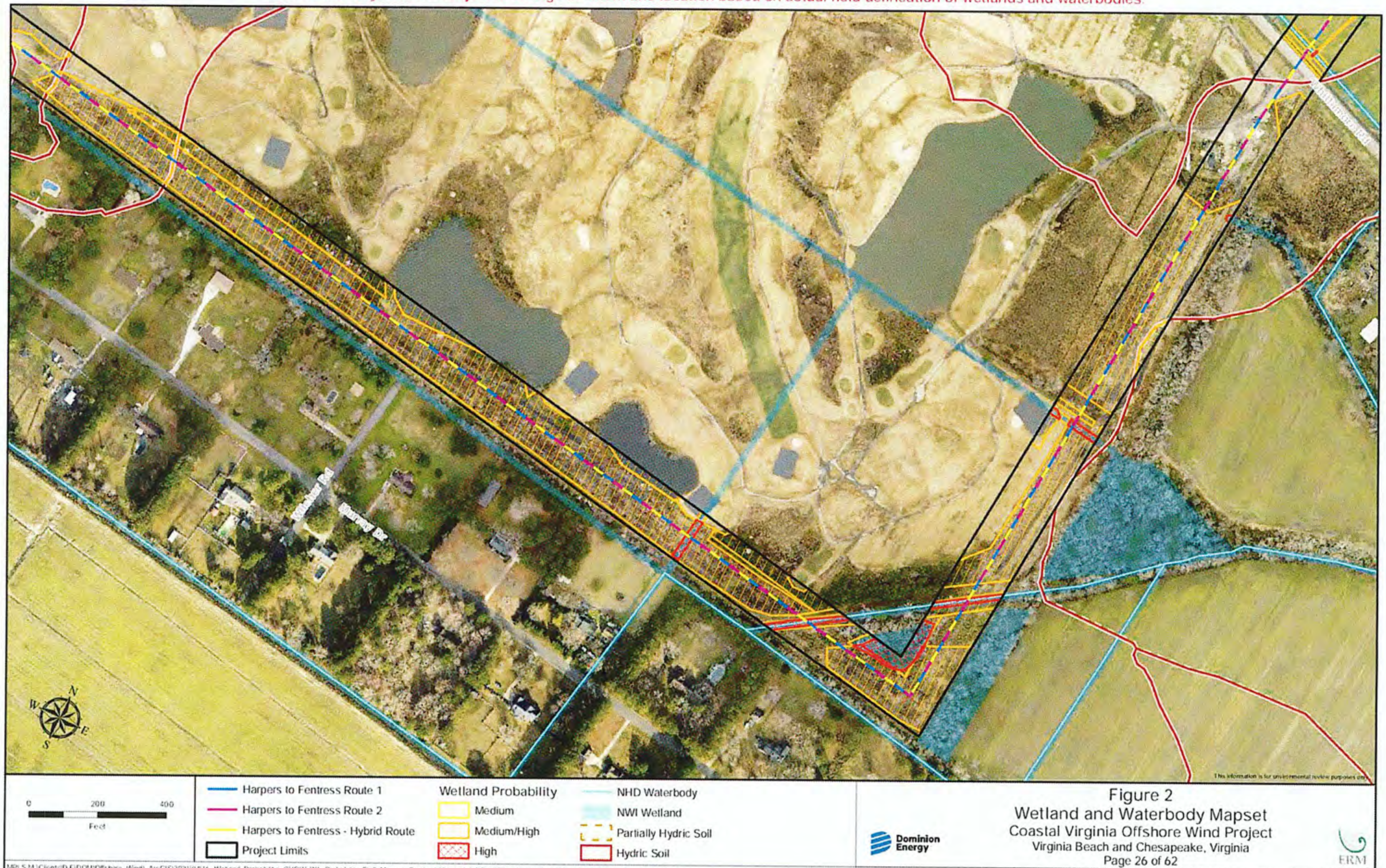

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Dam Neck Route Variation
Project Limits
Wetland Probability
Medium
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Dam Neck Route Variation
Project Limits
Wetland Probability
Medium
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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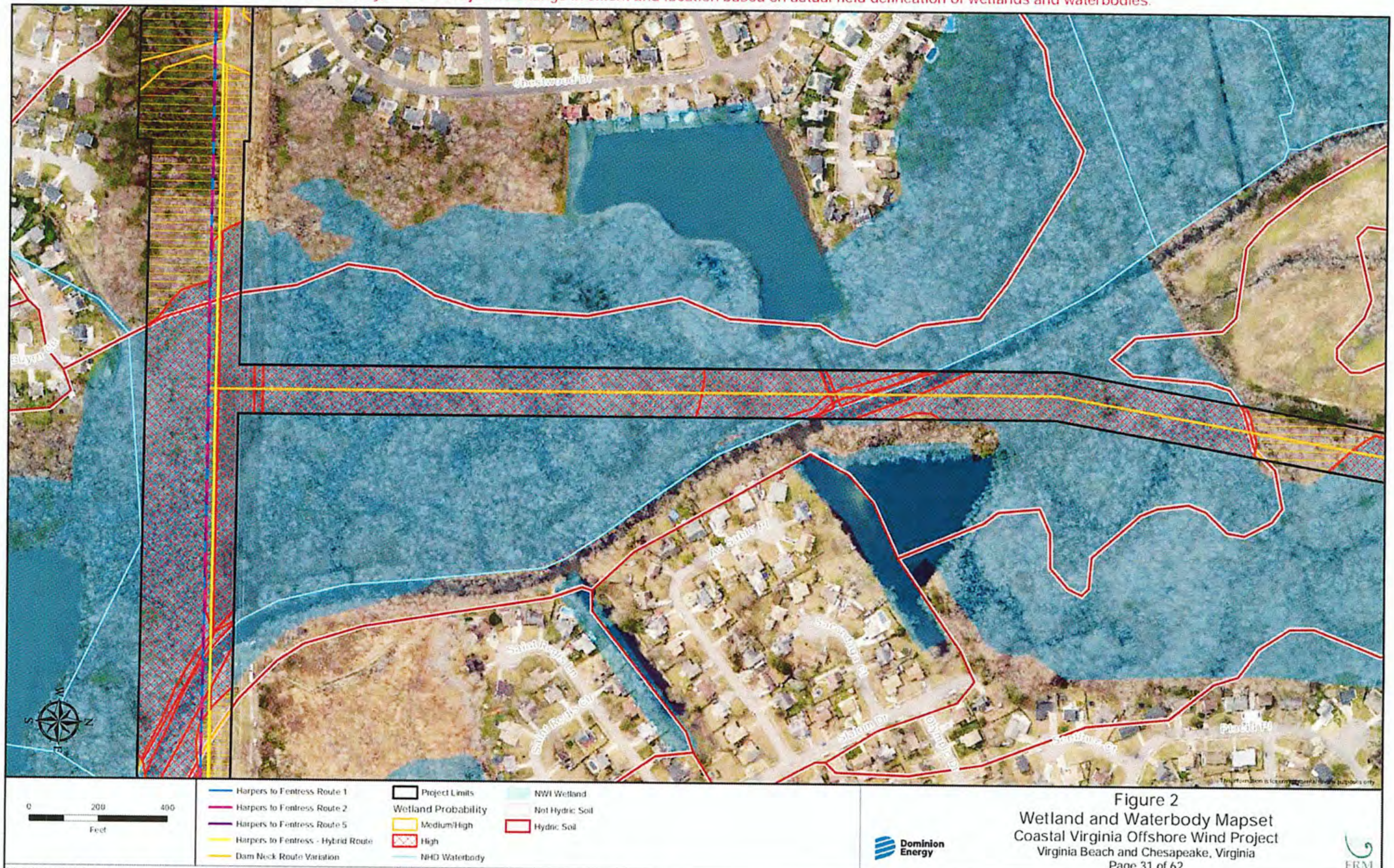

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 2
Project Limits
Wetland Probability
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 2
Project Limits
Wetland Probability
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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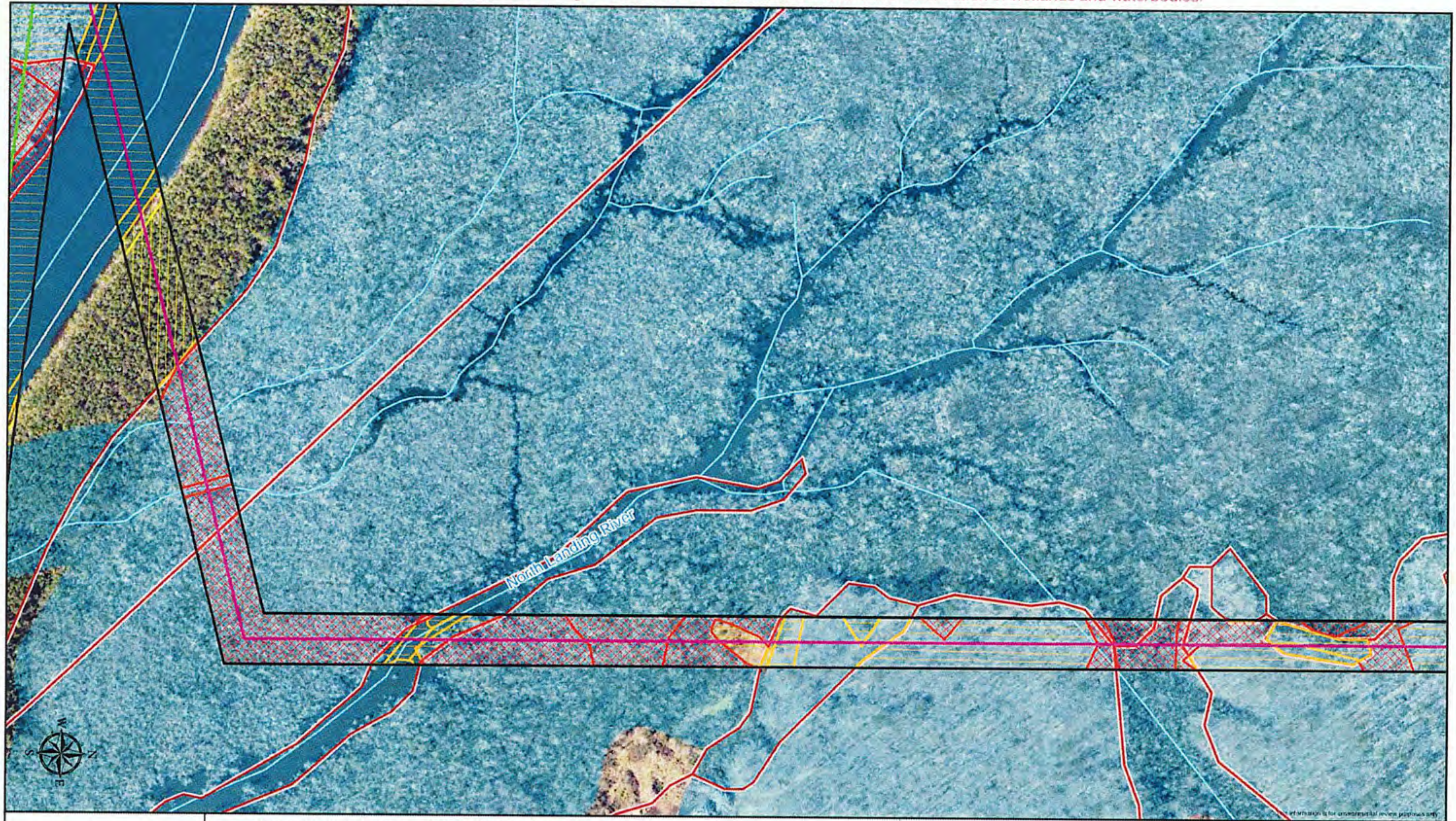

0 200 400
Feet

- Harpers to Fentress Route 2
- Line #2085 Route Variation
- Project Limits

Wetland Probability
- Medium
- Medium/High
- High

- NHD Waterbody
- NWI Wetland
- Not Hydric Soil
- Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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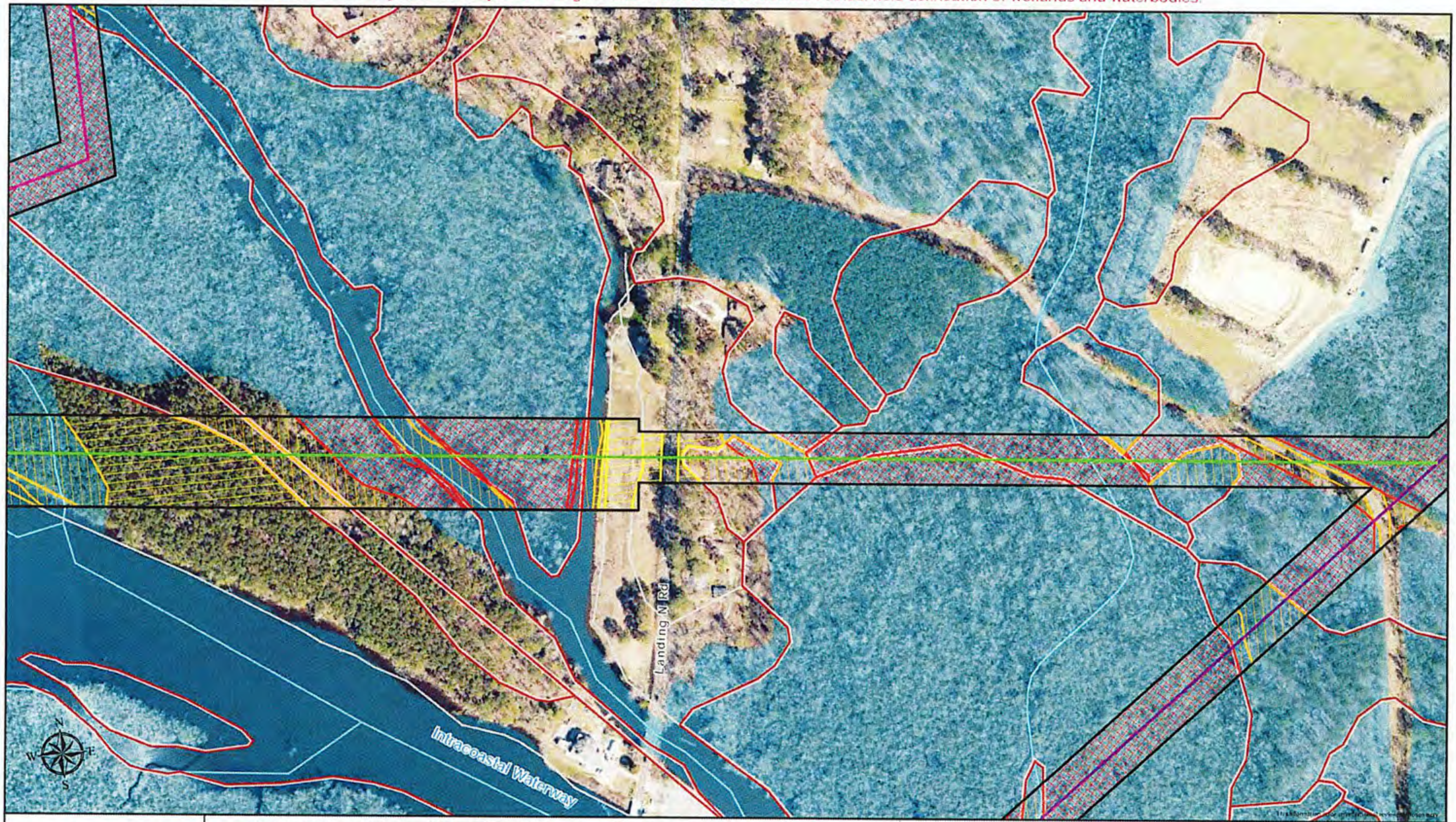

0 200 400 Feet	Harpers to Fentress Route 2	Wetland Probability	NHD Waterbody
	Harpers to Fentress Route 5	Medium	NWI Wetland
	Line #2085 Route Variation	Medium/High	Not Hydric Soil
	Project Limits	High	Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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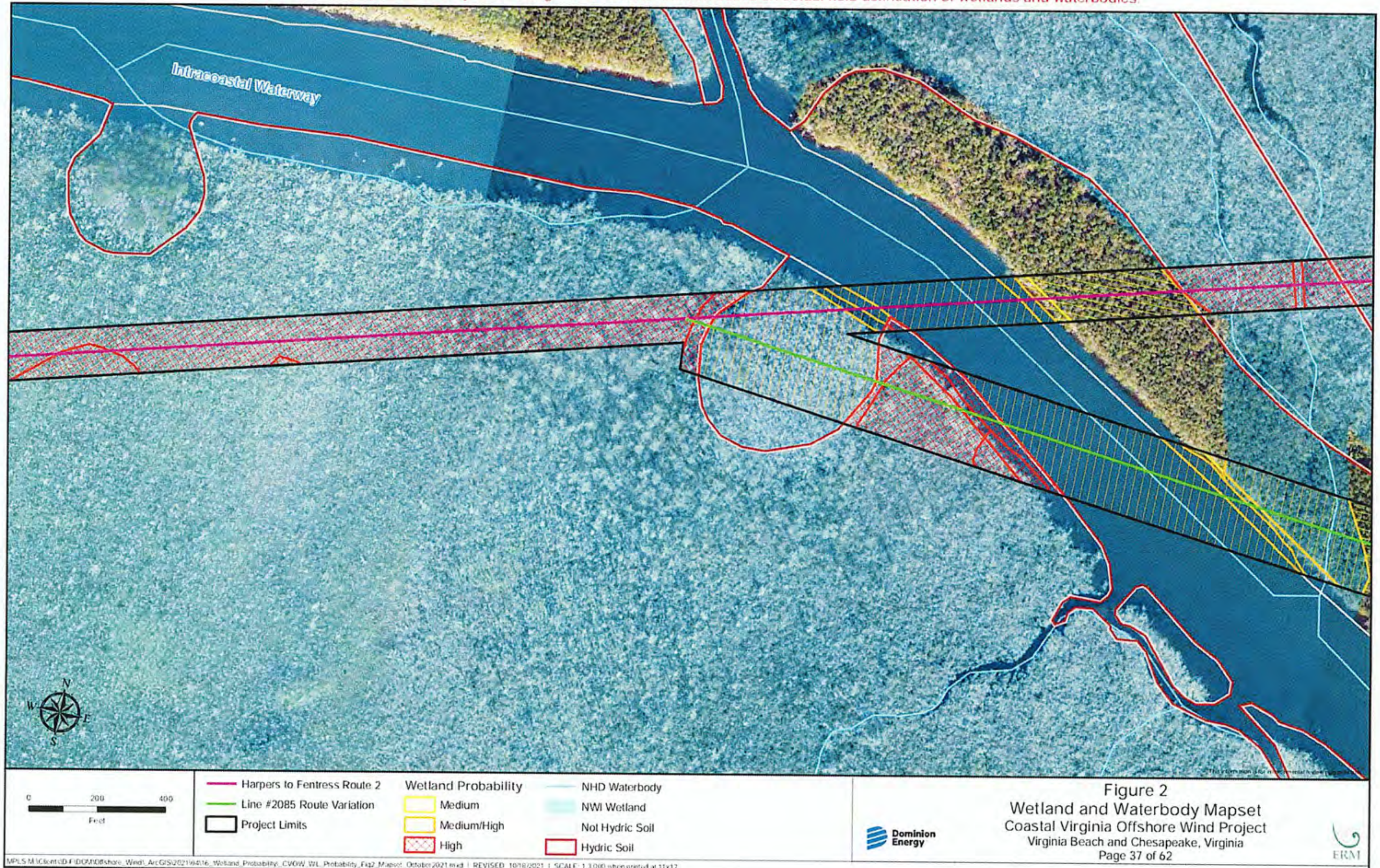

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
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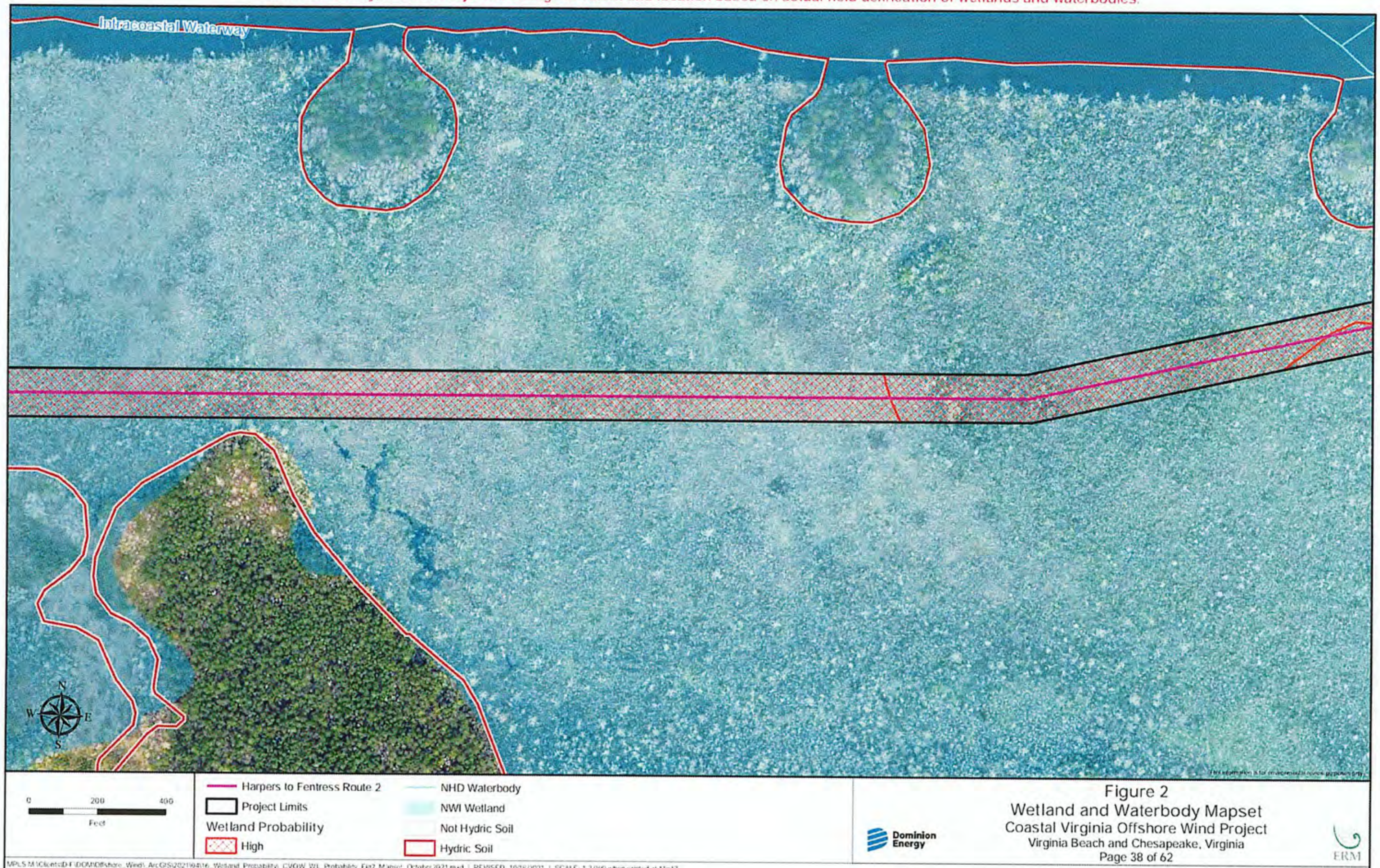

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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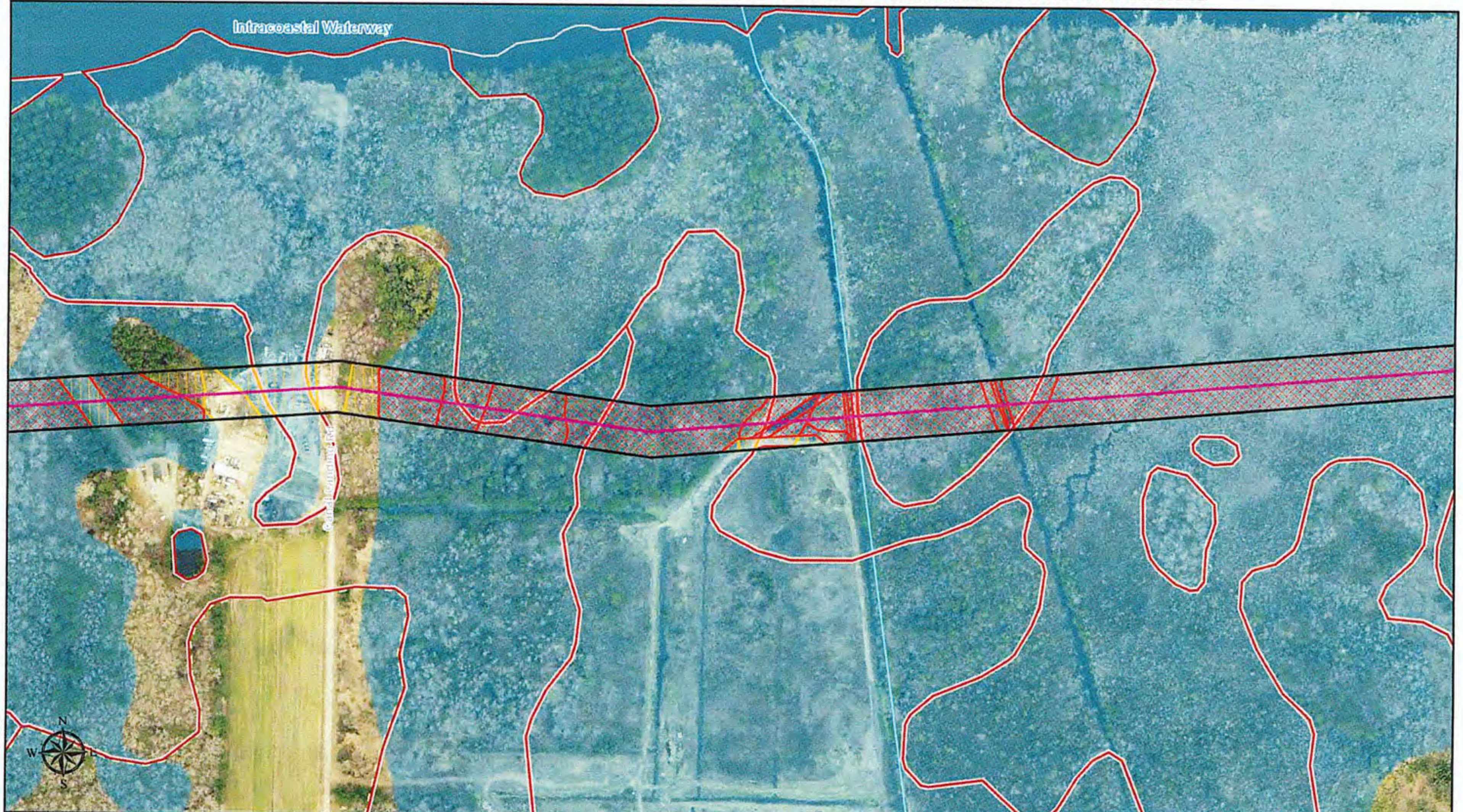

0 200 400
Feet

Harpers to Fentress Route 2
Project Limits
Wetland Probability
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
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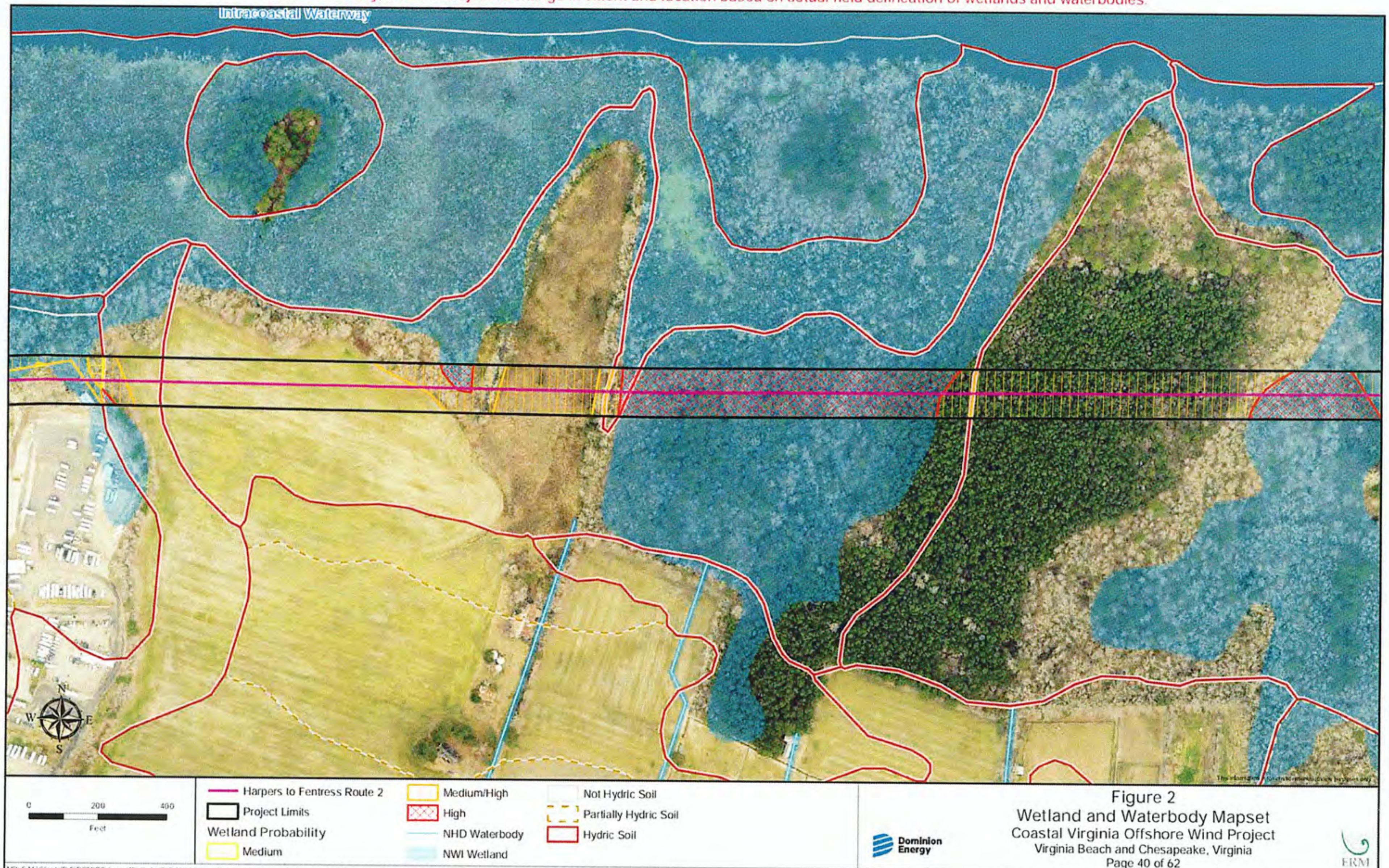

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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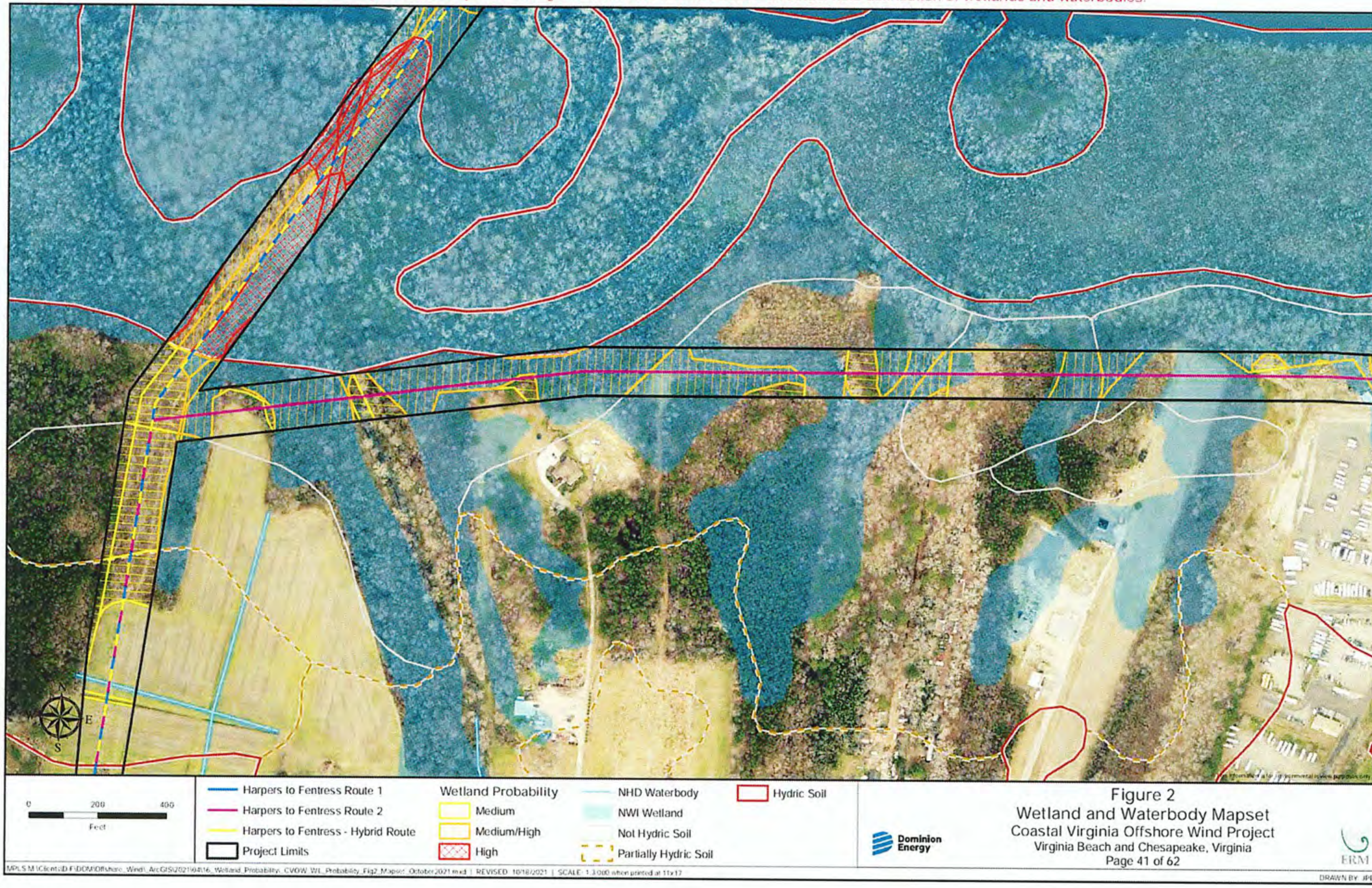

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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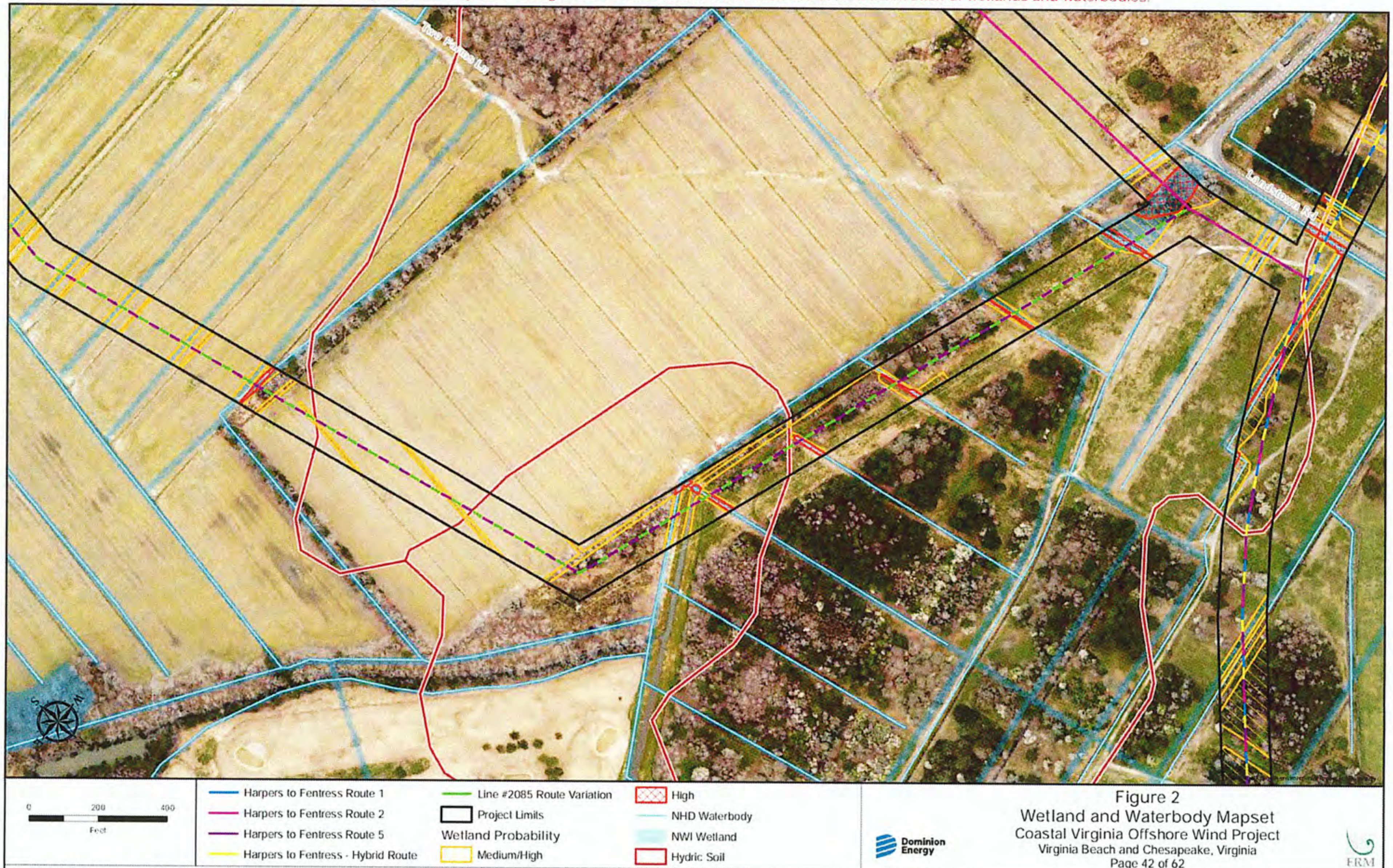

Figure 2
Wetland and Waterbody Mapset
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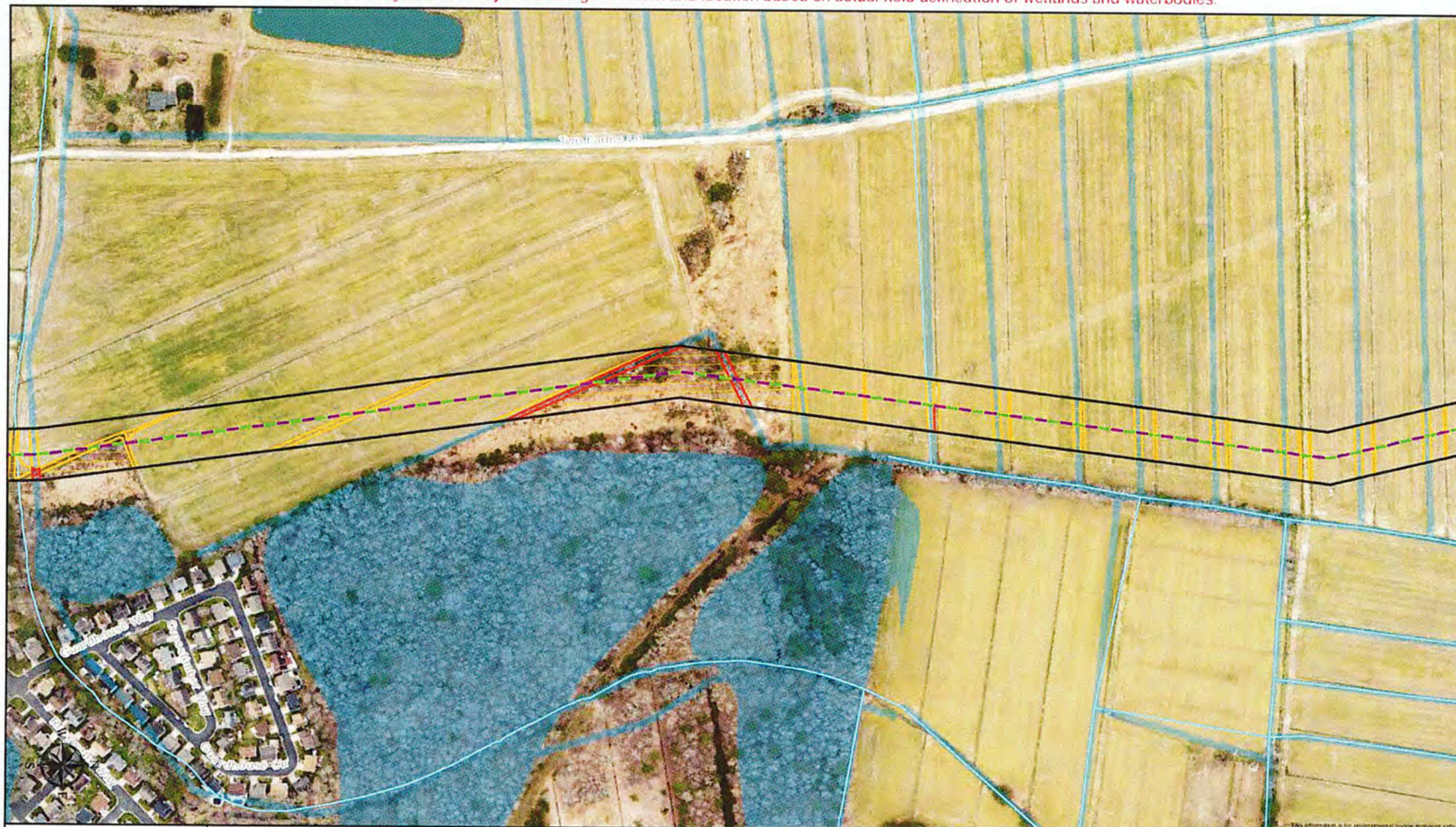

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
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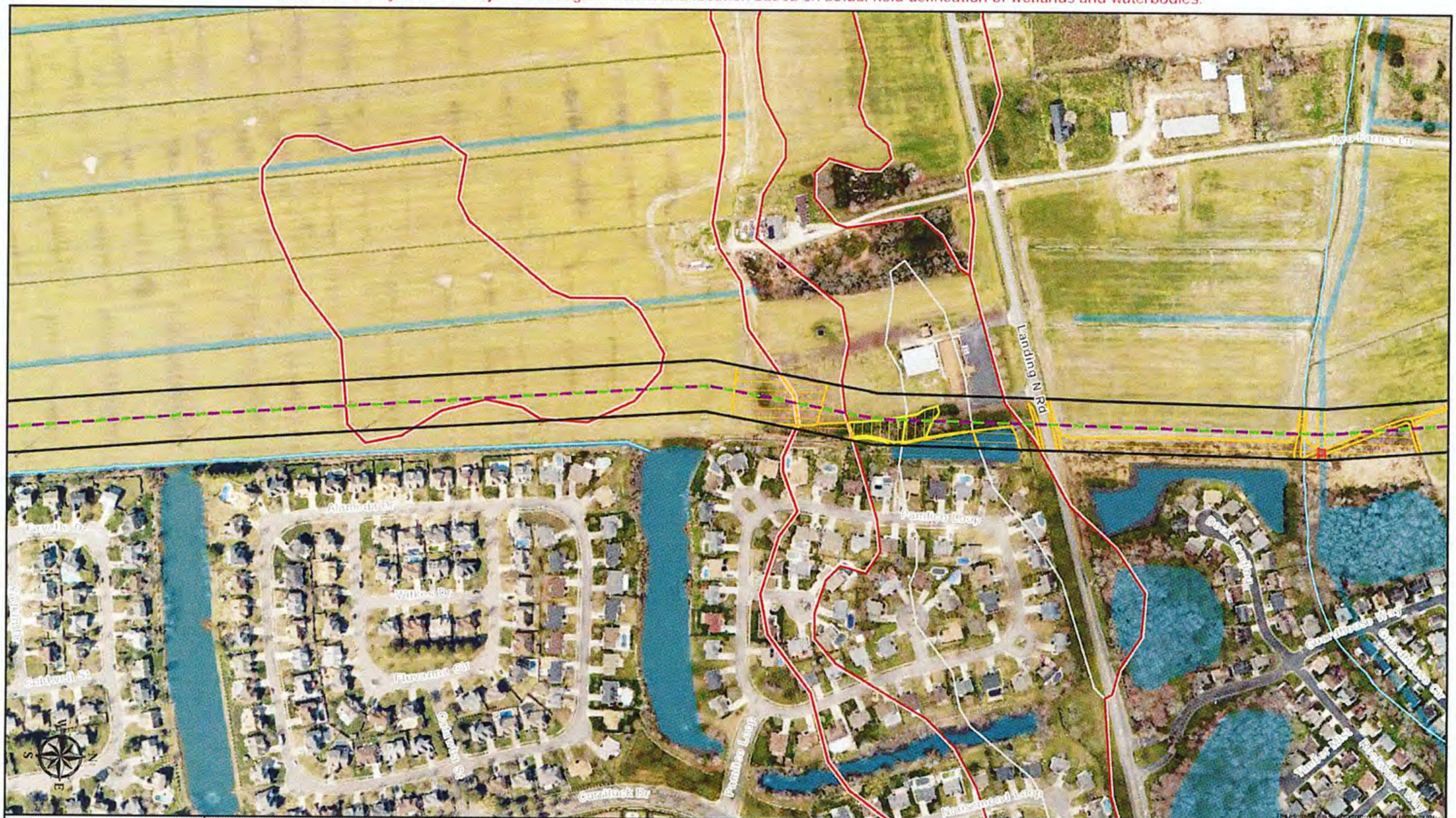

0 200 400
Feet

Harpers to Fentress Route 5
Line #2085 Route Variation
Project Limits

Wetland Probability
Medium
Medium/High
High

NHD Waterbody
NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 5
Line #2085 Route Variation
Project Limits

Wetland Probability
Medium/High
High
NHD Waterbody

NWI Wetland
Not Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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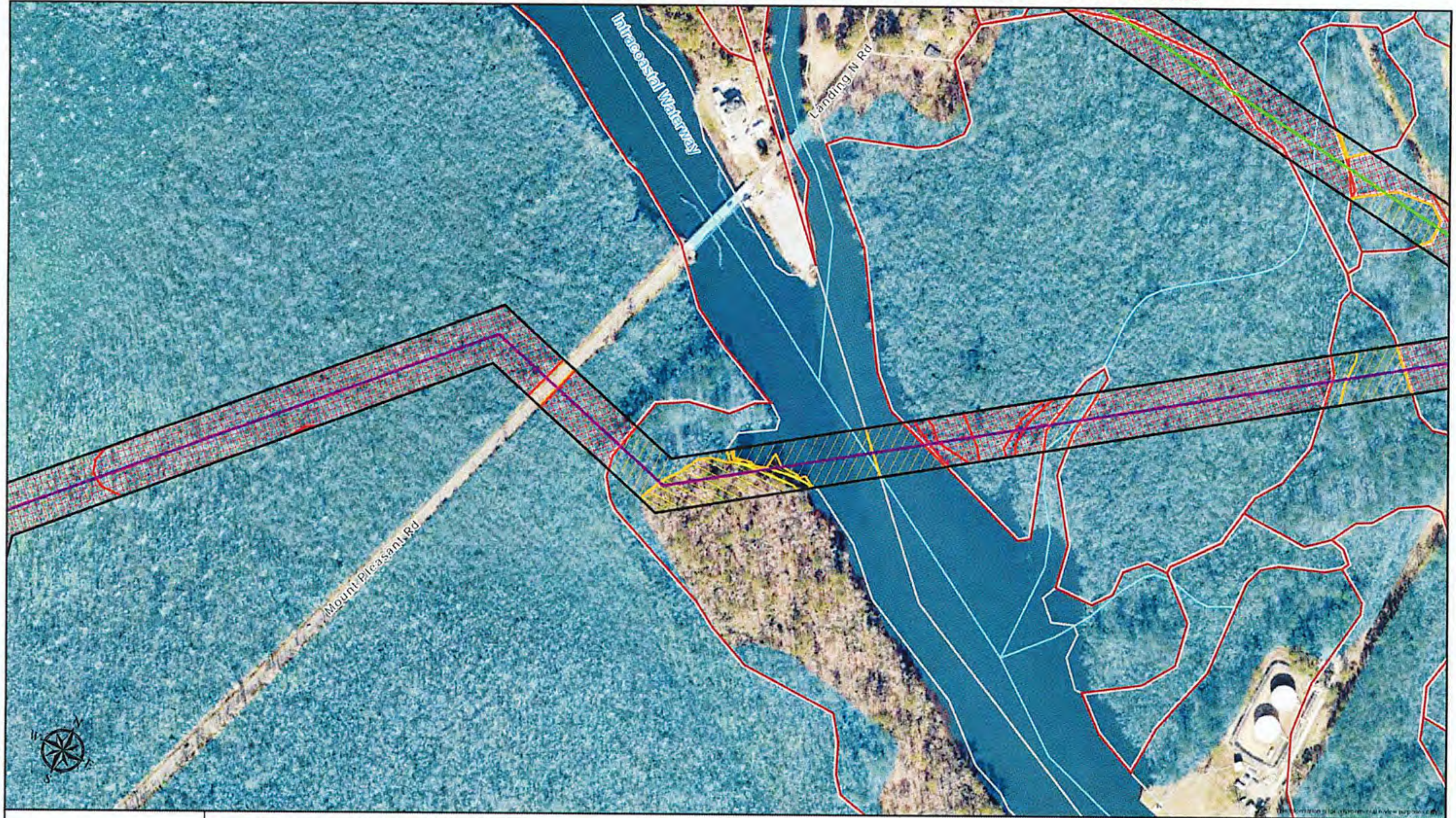

0 200 400
Feet

- Harpers to Fentress Route 5
- Line #2085 Route Variation
- Project Limits

Wetland Probability
- Medium
- Medium/High
- High

- NHD Waterbody
- NWI Wetland
- Not Hydric Soil
- Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 5
Project Limits
Wetland Probability
Medium
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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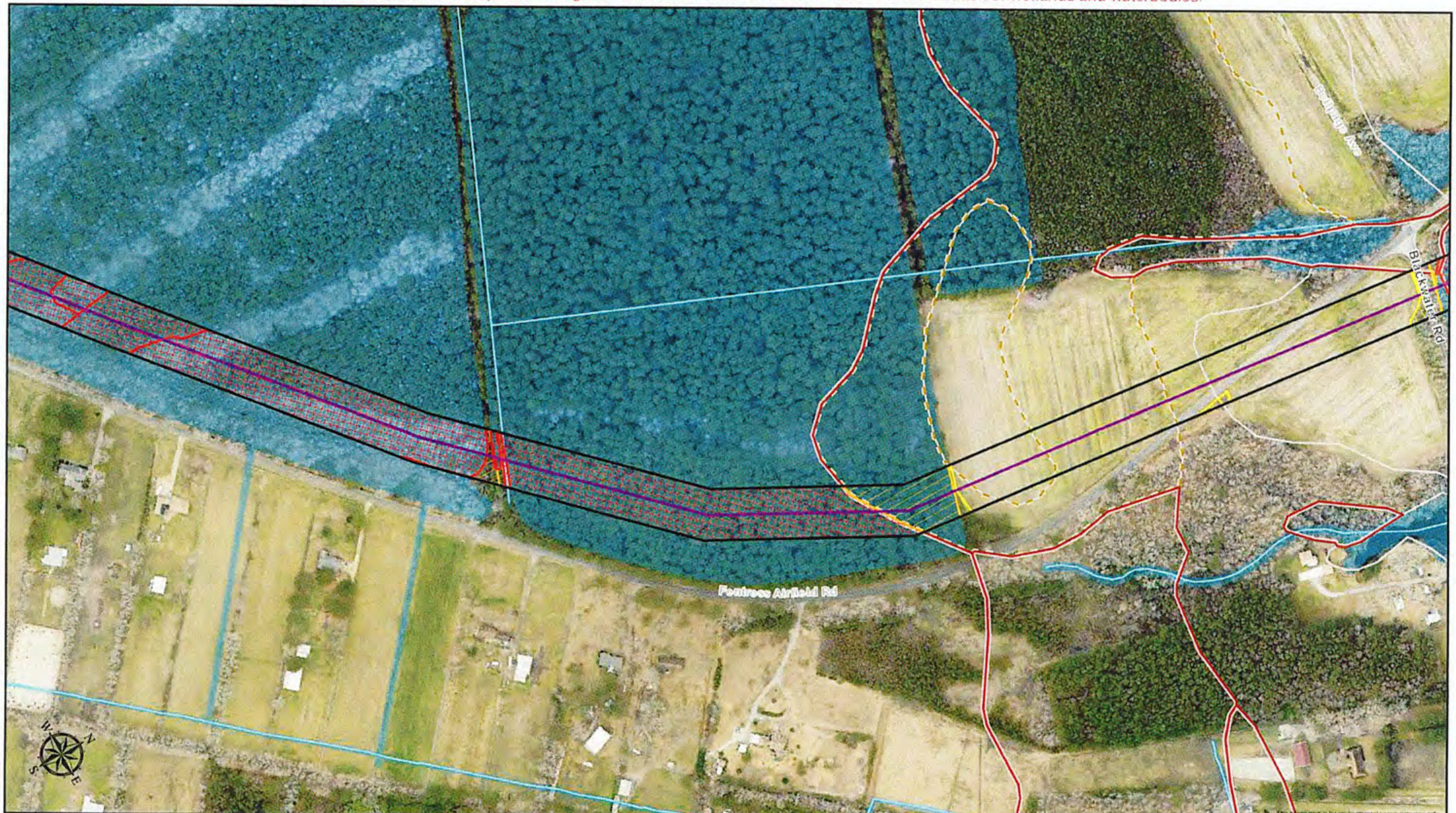

0 200 400
Feet

Harpers to Fentress Route 5
Project Limits
Wetland Probability
Medium
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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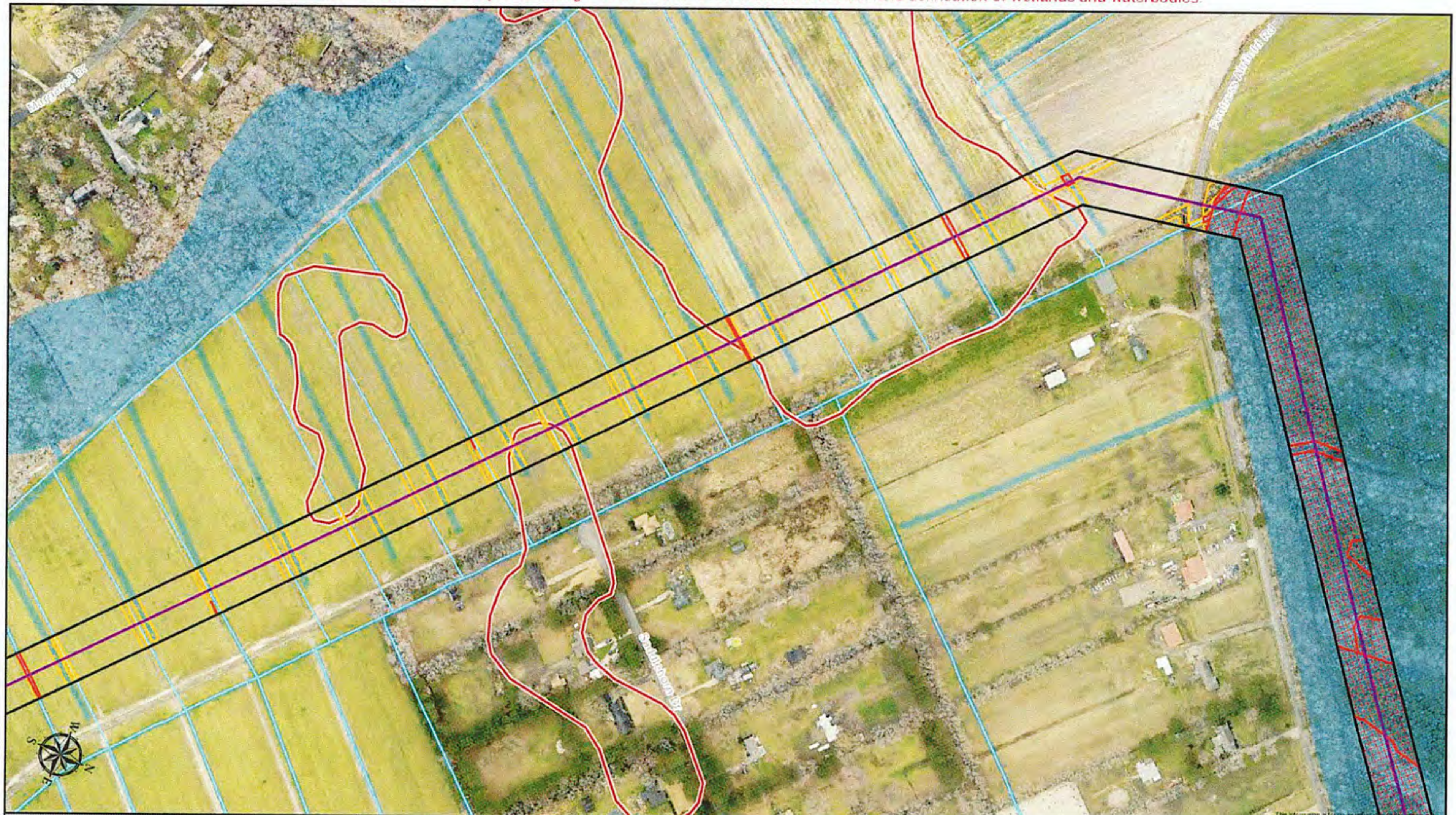

0 200 400
Feet

Harpers to Fentress Route 5
Project Limits
Wetland Probability
Medium/High
High
NHD Waterbody
NWI Wetland
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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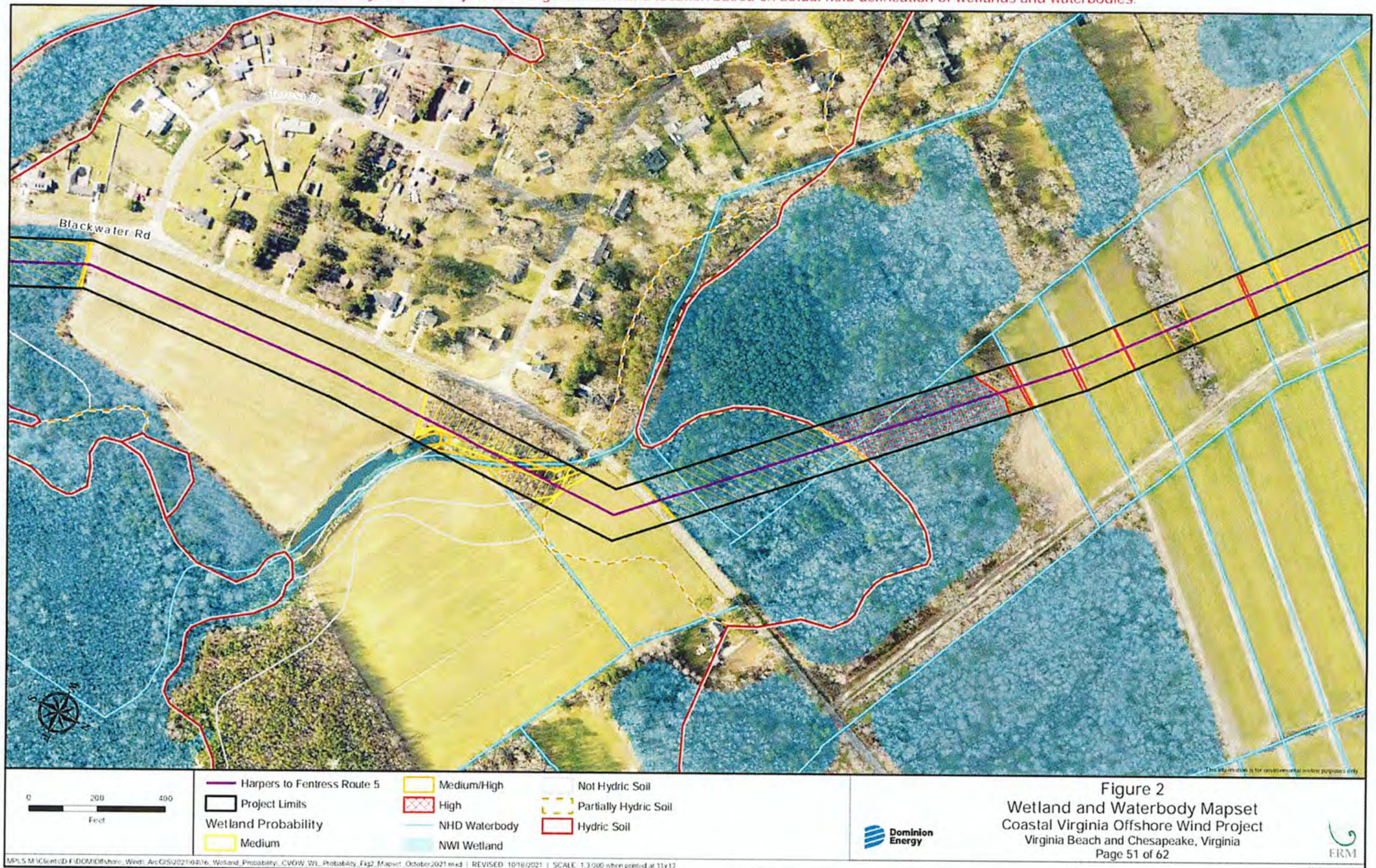

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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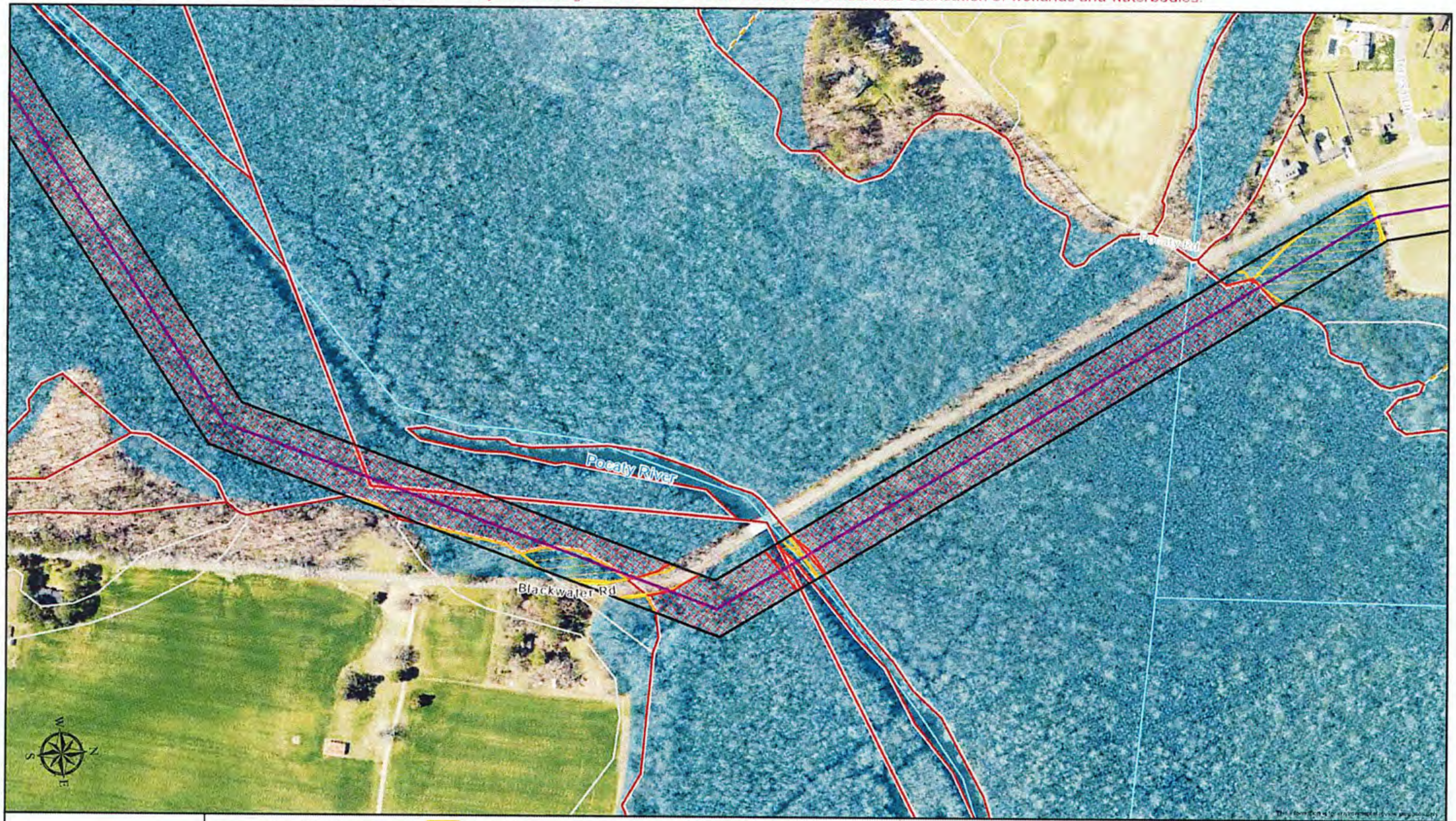

Harpers to Fentress Route 5
Project Limits
Wetland Probability
Medium
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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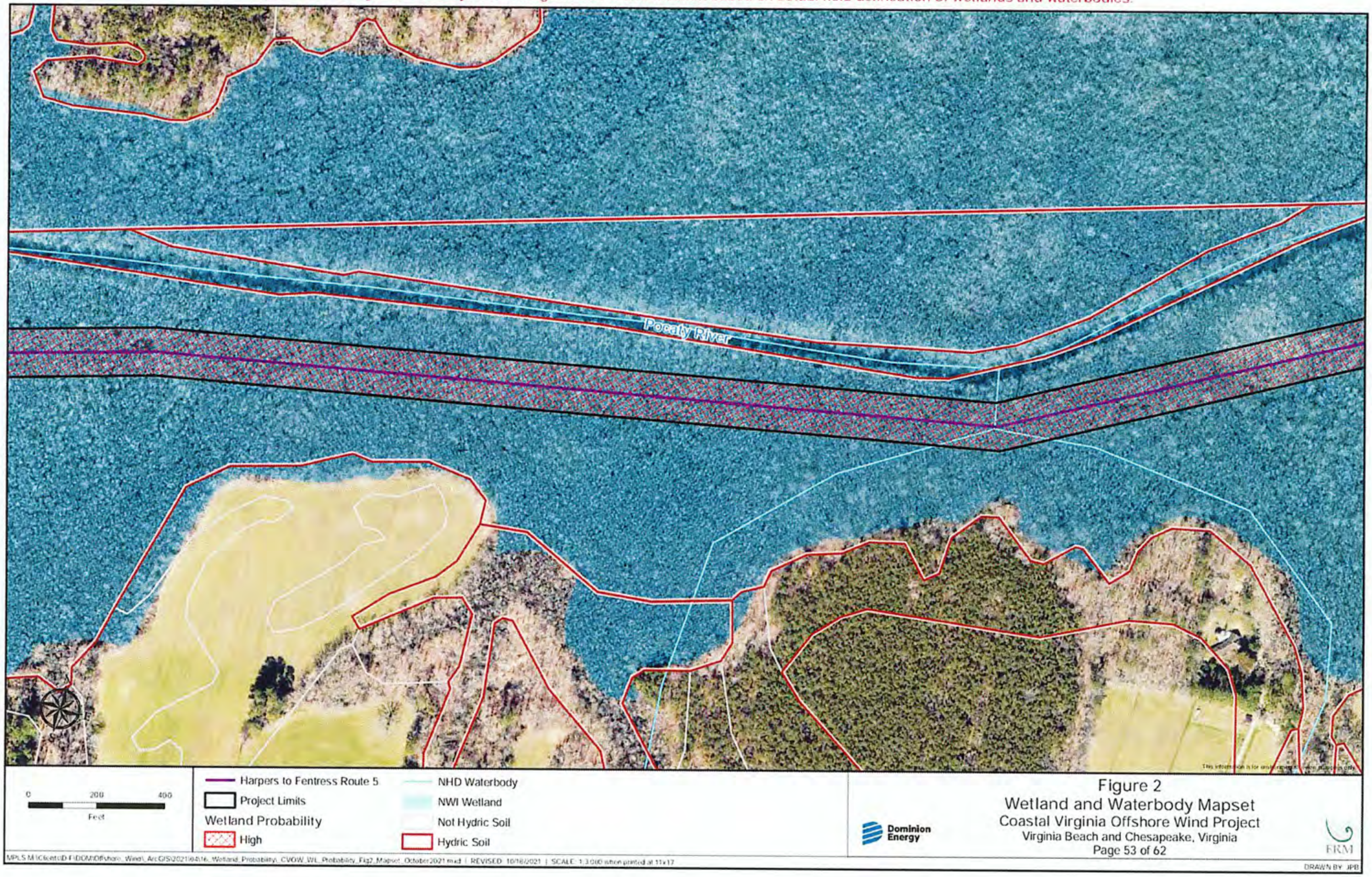

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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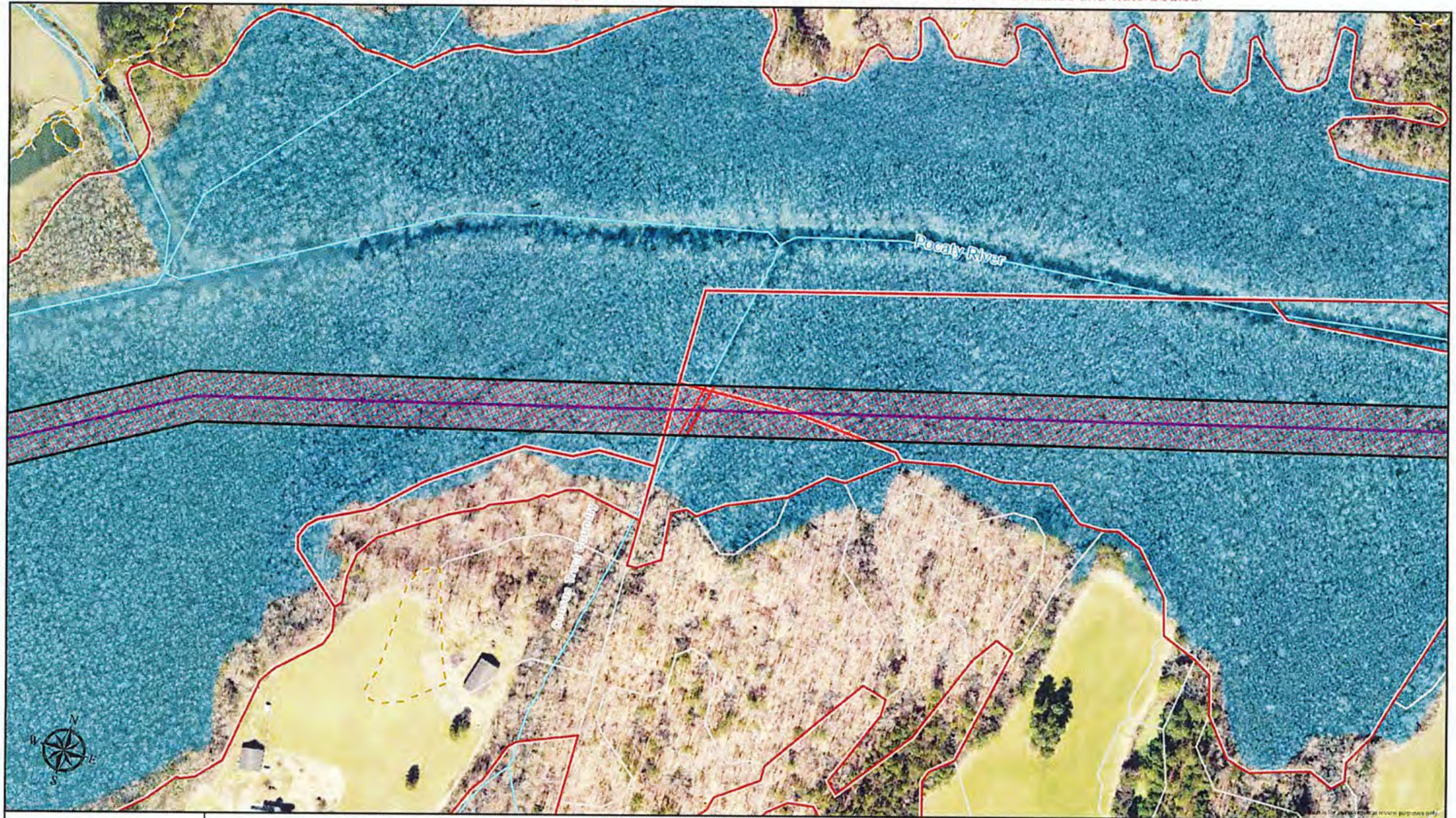

0 200 400
Feet

Harpers to Fentress Route 5
Project Limits
Wetland Probability
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
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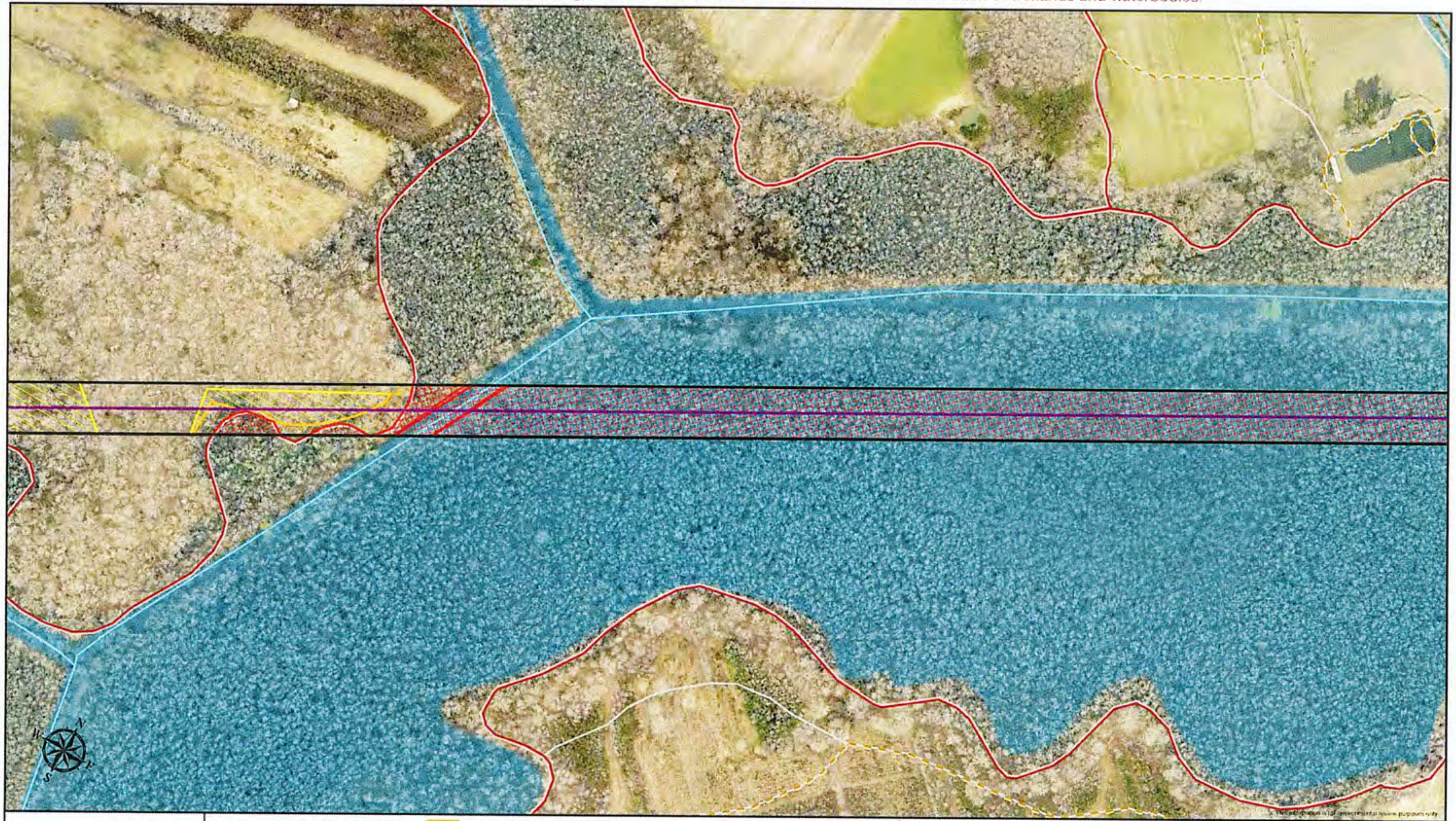

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
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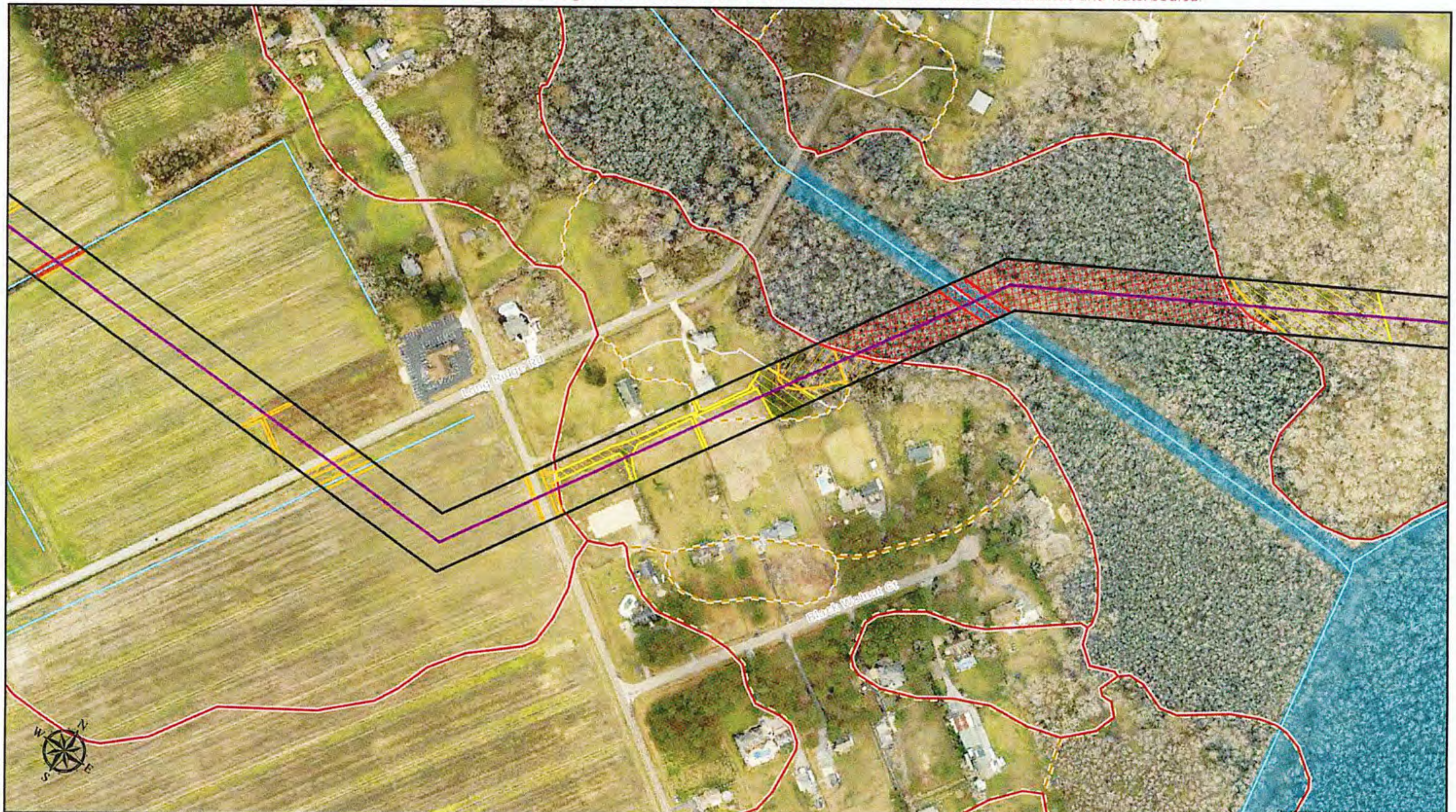

0 200 400
Feet

Harpers to Fentress Route 5
Project Limits
Wetland Probability
Medium
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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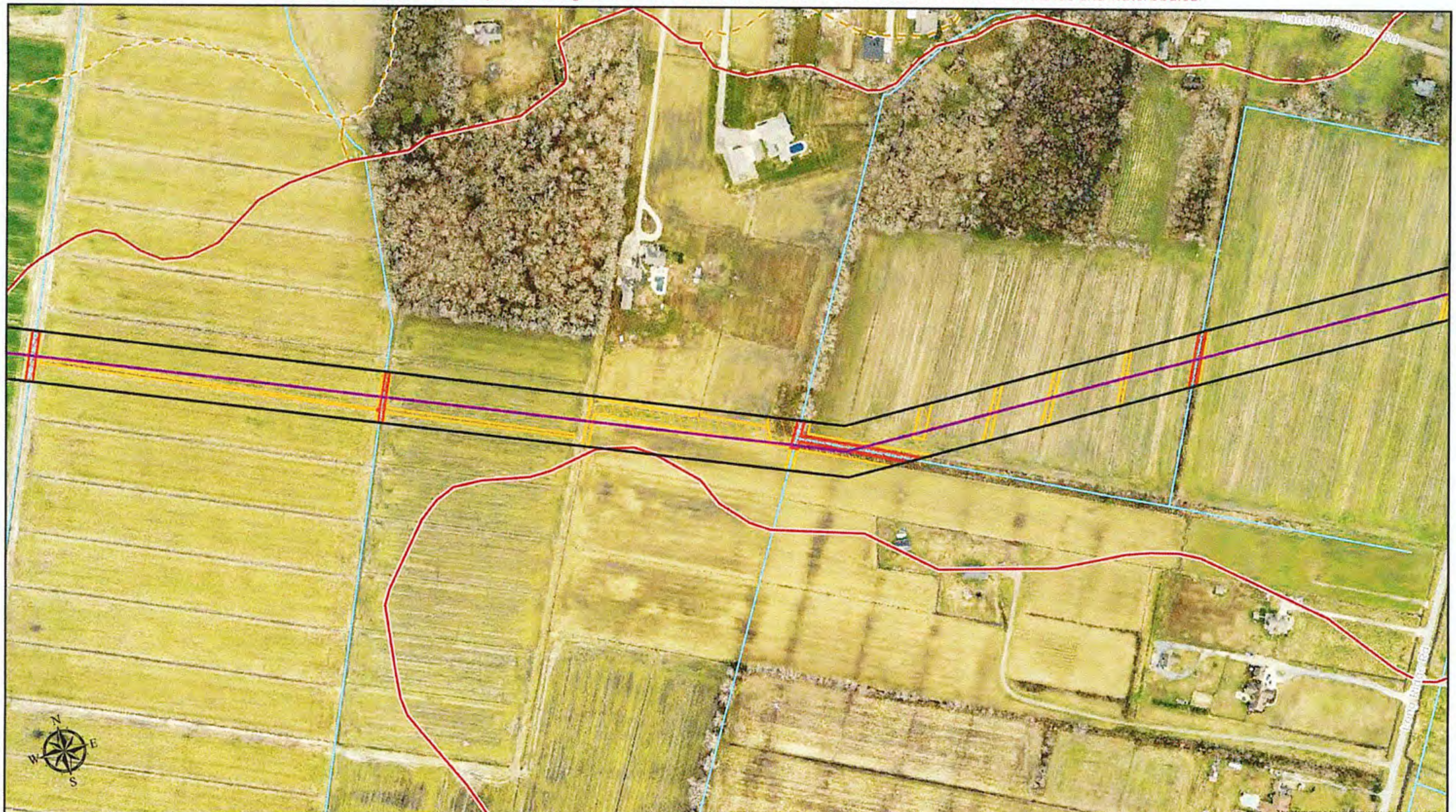

0 200 400
Feet

Harpers to Fentress Route 5
Project Limits
Wetland Probability
Medium/High
High
NHD Waterbody
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

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Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
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Harpers to Fentress Route 5	Medium/High	Not Hydric Soil	
Project Limits	High	Partially Hydric Soil	
Wetland Probability	NHD Waterbody	Hydric Soil	
Medium	NWI Wetland		

0 200 400 Feet

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
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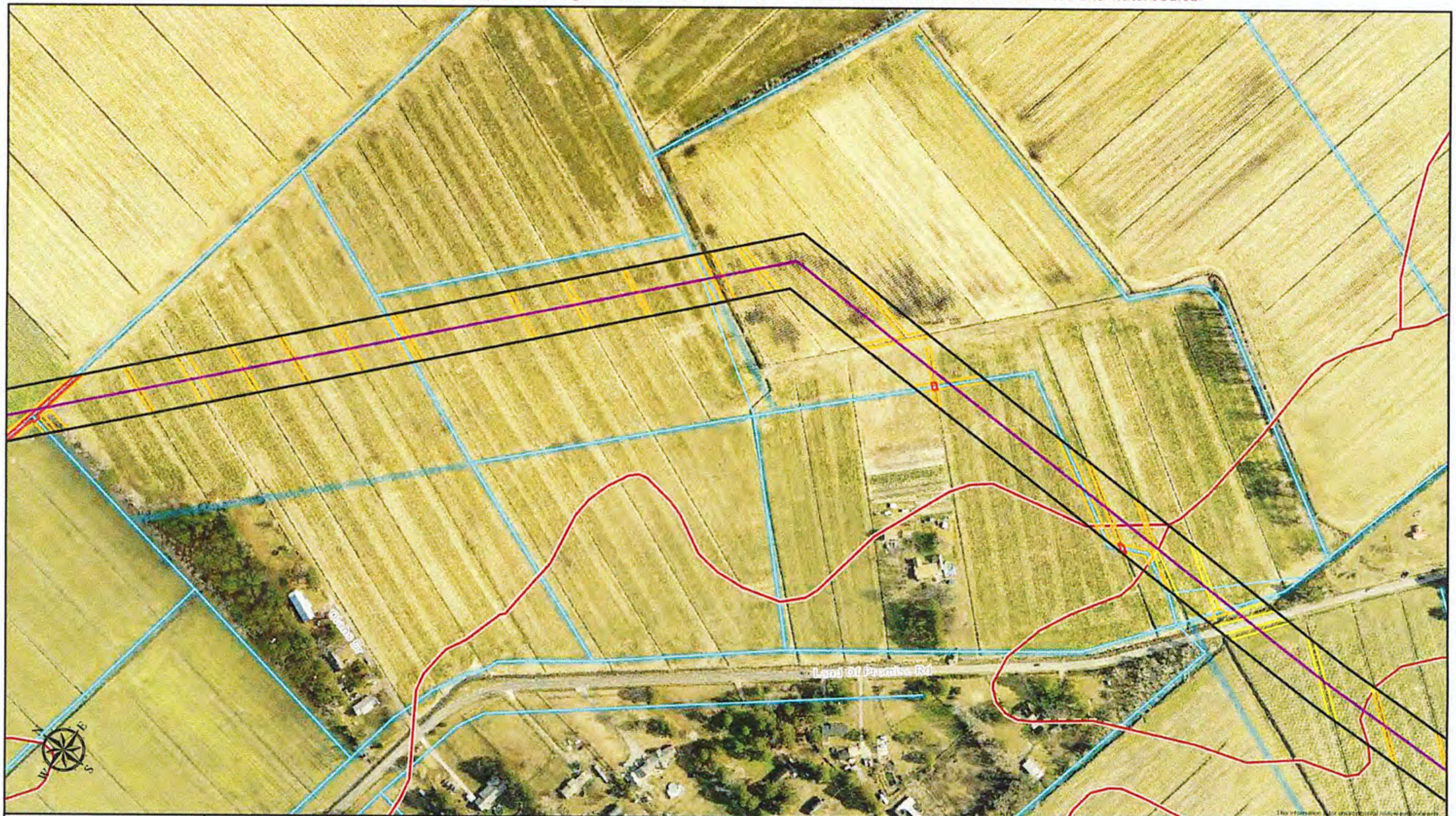

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Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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0 200 400
Feet

Harpers to Fentress Route 5
Project Limits
Wetland Probability
Medium/High
High
NHD Waterbody
NWI Wetland
Not Hydric Soil
Partially Hydric Soil
Hydric Soil

Dominion Energy

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
Virginia Beach and Chesapeake, Virginia
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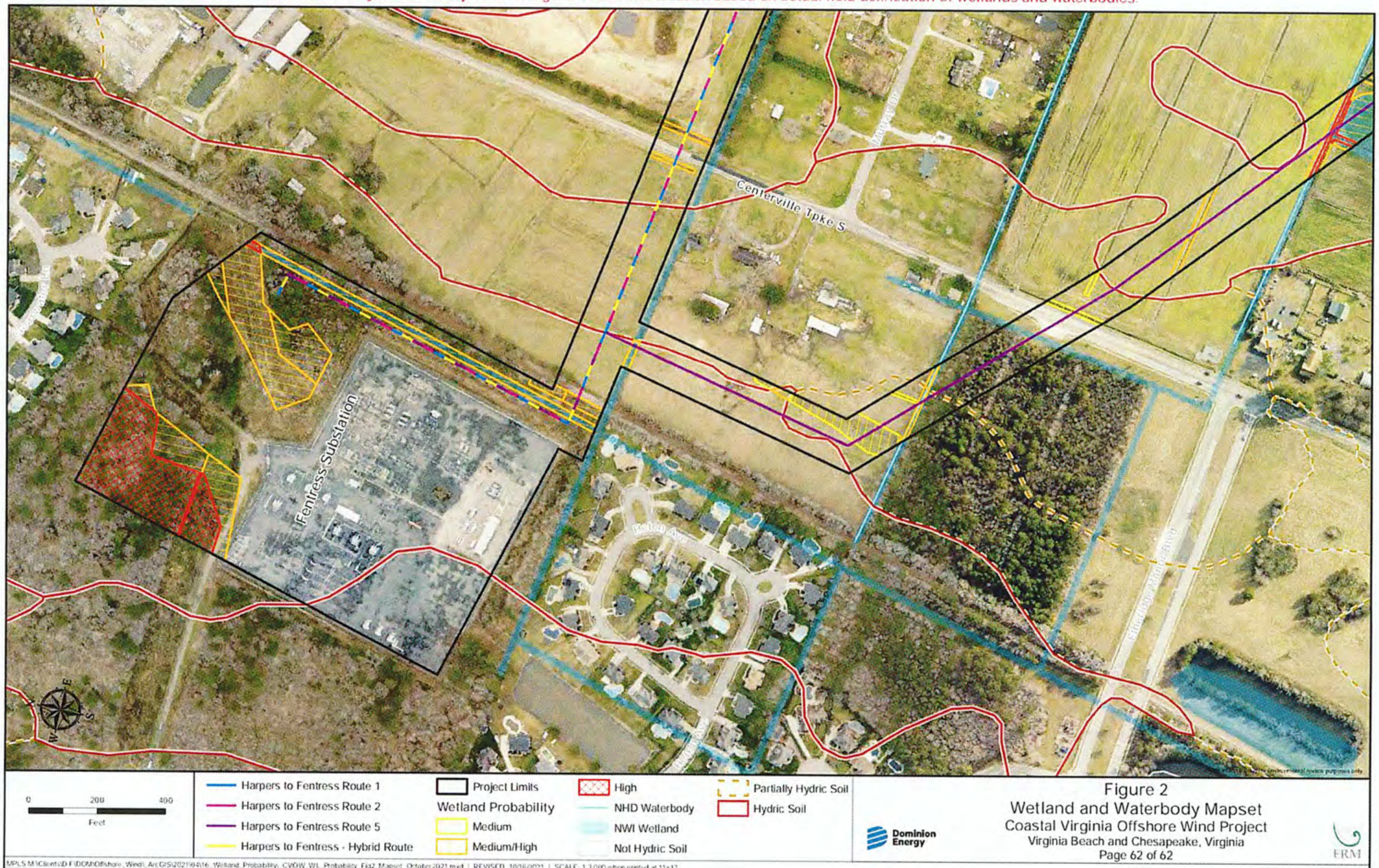

Figure 2
Wetland and Waterbody Mapset
Coastal Virginia Offshore Wind Project
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Malaysia
Mexico
Mozambique
Myanmar
The Netherlands
New Zealand
Norway
Panama
Peru
Poland
Portugal
Puerto Rico
Romania
Russia
Senegal
Singapore
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
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222 South 9th Street, Suite 2900
Minneapolis Minnesota 55402

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APPENDIX G PROTECTED SPECIES

List of Tables

Attachments

IPac Resource Lists

G.1. BIRDS OF CONSERVATION CONCERN AND HIGH PRIORITY

Table G-1 Birds of Conservation Concern and High Priority Species within the Project Vicinity

Common Name	Scientific Name
American Avocet	*Recurvirostra americana*
American Bittern	*Botaurus stellaris*
American Black Duck (B)	*Anas rubripes*
American Coot (B)	*Fulica americana*
American Golden Plover	*Pluvialis dominica*
American Kestrel (B)	*Falco sparverius*
American Oystercatcher (B)	*Haematopus palliatus*
American White Pelican	*Pelecanus erythrorhynchos*
American Wigeon	*Anas americana*
American Woodcock (B)	*Scolopax minor*
Audubon's Shearwater	*Puffinus lherminieri*
Bachman's Warbler (B)	*Vermivora bachmanii*
Bachman's Sparrow (B)	*Peucaea aestivalis*
Bald Eagle (B)	*Haliaeetus leucocephalus*
Band-rumped Storm-Petrel	*Oceanodroma castro*
Bermuda Petrel	*Pterodroma cahow*
Bewick's Wren	*Thryomanes bewickii*
Bicknell's Thrush	*Catharus bicknelli*
Black Rail (B)	*Laterallus jamaicensis*
Black Scoter	*Melanitta americana*
Black Skimmer (B)	*Rynchops niger*
Black Tern	*Chlidonias niger*
Black-capped Petrel	*Pterodroma hasitata*
Black-crowned Night-Heron (B)	*Nycticorax nycticorax*
Black-throated Green Warbler (B)	*Setophaga caerulescens*
Blue-winged Teal	*Anas discors*
Blue-winged Warbler	*Vermivora cyanoptera*
Brant	*Branta bernicla*
Bridled Tern	*Onychoprion anaethetus*
Brown Pelican (B)	*Pelecanus occidentalis*
Brown Thrasher (B)	*Toxostoma rufum*
Brown-headed Nuthatch (B)	*Sitta pusilla*
Buff-breasted Sandpiper	*Calidris subruficollis*
Canada Goose	*Branta canadensis*
Canvasback	*Aytha valisineria*
Cerulean Warbler (B)	*Setophaga cerulea*
Chimney Swift (B)	*Chaetura pelagica*
Chuck-will's-widow (B)	*Antrostomus carolinensis*
Clapper Rail (B)	*Rallus crepitans*
Common Goldeneye	*Bucephala clangula*
Painted Bunting (B)	*Passerina ciris*
Peregrine Falcon	*Falco peregrinus*
Pied-billed Grebe (B)	*Podilymbus podiceps*
Piping Plover (B)	*Charadrius melodus*
Prairie Warbler (B)	*Setophaga discolor*
Prothonotary Warbler (B)	*Protonotaria citrea*
Purple Gallinule (B)	*Porphyrio porphyrio*
Purple Sandpiper (B)	*Calidris maritima*
Razorbill	*Alca torda*
Red Knot	*Calidris canutus*
Red Phalarope	*Phalaropus fulicarius*
Red-cockaded Woodpecker (B)	*Dryobates borealis*
Redhead	*Aythya americana*
Red-headed Woodpecker (B)	*Melanerpes erythrocephalus*

Common Name	Scientific Name
Red-throated Loon (B)	*Gavia stellata*
Roseate Spoonbill	*Platalea ajaja*
Roseate Tern	*Sterna dougallii*
Ruddy Turnstone (B)	*Arenaria interpres*
Rusty Blackbird (B)	*Euphagus carolinus*
Saltmarsh Sharp-tailed Sparrow	*Ammospiza caudacuta*
Sanderling	*Calidris alba*
Sandhill Crane (B)	*Antigone canadensis*
Sandwich Tern (B)	*Thalasseus sandvicensis*
Seaside Sparrow (B)	*Ammospiza maritima*
Sedge Wren	*Cistothorus stellaris*
Semipalmated Sandpiper (B)	*Calidris pusilla*
Short-billed Dowitcher (B)	*Limnodromus griseus*
Short-eared Owl	*Asio flammeus*
Snow Goose	*Anser caerulescens*
Common Ground-Dove (B)	*Columbina passerina*
Common Loon	*Gavia immer*
Common Moorhen (B)	*Gallinula chloropus*
Common Tern (B)	*Sterna hirundo*
Cory's Shearwater	*Calonectris borealis*
Dunlin (B)	*Calidris alpina*
Eastern Kingbird (B)	*Tyrannus tyrannus*
Eastern Meadowlark (B)	*Sturnella magna*
Eastern Towhee (B)	*Pipilo erythrophthalmus*
Eastern Wood-Pewee (B)	*Contopus virens*
Field Sparrow	*Spizella pusilla*
Glossy Ibis (B)	*Plegadis falcinellus*
Golden-winged Warbler	*Vermivora chrysoptera*
Grasshopper Sparrow	*Ammodramus savannarum*
Greater Shearwater	*Ardenna gravis*
Gull-billed Tern (B)	*Gelochelidon nilotica*

Common Name	Scientific Name
Henslow's Sparrow (B)	*Centronyx henslowii*
Horned Grebe	*Podiceps auritus*
Hudsonian Godwit	*Limosa haemastica*
Ivory-billed Woodpecker (B)	*Campephilus principalis*
Kentucky Warbler (B)	*Geothlypis formosa*
King Rail (B)	*Rallus elegans*
Kirtland's Warbler	*Setophaga kirtlandii*
Le Conte's Sparrow	*Ammospiza leconteii*
Least Bittern (B)	*Ixobrychus exilis*
Least Sandpiper	*Calidris minutilla*
Least Tern (B)	*Sternula antillarum*
Lesser Scaup	*Aythya affinis*
Lesser Yellowlegs (B)	*Tringa flavipes*
Limpkin (B)	*Aramus guarauna*
Little Blue Heron (B)	*Egretta caerulea*
Loggerhead Shrike (B)	*Lanius ludovicianus*
Long-billed Curlew	*Numenius americanus*
Manx Shearwater	*Puffinus puffinus*
Marbled Godwit	*Limosa fedoa*
Nelson's Sharp-tailed Sparrow	*Ammospiza nelsoni*
Northern Bobwhite (B)	*Colinus virginianus*
Northern Flicker (B)	*Colaptes auratus*
Northern Harrier	*Circus hudsonius*
Northern Pintail	*Anas acuta*
Snowy Egret (B)	*Egretta thula*
Snowy Plover (B)	*Charadrius nivosus*
Solitary Sandpiper	*Tringa solitaria*
Stilt Sandpiper	*Calidris himantopus*
Swainson's Warbler (B)	*Limnothlypis swainsonii*
Swallow-tailed Kite (B)	*Elanoides forficatus*
Tricolored Heron (B)	*Egretta tricolor*

Common Name	Scientific Name
Upland Sandpiper	*Bartramia longicauda*
Vesper Sparrow	*Pooecetes gramineus*
Western Sandpiper	*Calidris mauri*
Whimbrel (B)	*Numenius hudsonicus*
Whip-poor-will	*Antrostomus vociferus*
White Ibis (B)	*Eudocimus albus*
White-tailed Tropicbird	*Phaethon lepturus*
White-throated Sparrow	*Zonotrichia albicollis*
White-winged Scoter	*Melanitta deglandi*
Whooping Crane	*Grus americana*
Wilson's Snipe	*Gallinago delicata*
Willet	*Tringa semipalmata*
Wilson's Phalarope	*Phalaropus tricolor*
Wilson's Plover (B)	*Charadrius wilsonia*
Wilson's Snipe	*Gallinago delicata*
Wood Stork (B)	*Mycteria americana*
Wood Thrush (B)	*Hylocichla mustelina*
Worm-eating Warbler (B)	*Helmitheros vermivorum*
Yellow Rail	*Coturnicops noveboracensis*
Yellow-billed Cuckoo (B)	*Coccyzus americanus*
Yellow-crowned Night-heron (B)	*Nyctanassa violacea*

Sources: FWS 2008; FWS 2021; Atlantic Coast Joint Venture 2021; South Atlantic Bird Initiative 2020

(B) = Breeding

G.2. LISTED SPECIES

Table G-2: Federally and Commonwealth-Listed Species Occurrence in the Project Vicinity

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Counties/City Documented	Source
FEDERALLY LISTED SPECIES							
Mammals							
Northern long-eared bat	*Myotis septentrionalis*	LT	LT	G1	Old growth or late successional interior forests. Partially dead or decaying trees are used for breeding, summer day roosting, and foraging. Hibernation occurs primarily in caves, mines, and tunnels.	Chesapeake	IPaC VaFWIS
West Indian manatee	*Trichechus manatus*	LT	LE	G2	Marine, brackish, and freshwater systems in coastal and riverine areas throughout their range.	Chesapeake Virginia Beach	VaFWIS
Birds							
Roseate Tern	*Sterna dougallii dougallii*	LE	LE	G4	Salt marsh islands and beaches with sparse vegetation. Nests are set among rocks, shells, or vegetation in concealed spots such as clumps of beach grass or goldenrod.	Virginia Beach	IPaC VaFWIS
Red Knot	*Calidris canutus rufa*	LT	LT	G4	Sandy beaches, saltmarshes, lagoons, mudflats of estuaries and bays, and mangrove swamps.	Chesapeake Virginia Beach	VaFWIS
Eastern Black Rail	*Laterallus jamaicensis jamaicensis*	LT	LE	G3	Salt and brackish marshes with dense cover. May use impounded and unimpounded wetland habitats with sufficient vegetative cover.	Chesapeake Virginia Beach	VaFWIS
Piping Plover	*Charadrius melodus*	LT	LT	G3	Wide, flat, open sandy beaches with little vegetation. Nests occur on open ground some distance away from water, often with large rock or clump of grass nearby, but no direct shelter or shade.	Virginia Beach	VaFWIS
Red-cockaded Woodpecker	*Dryobates borealis*	LE	LE	G3	Mature pine forests, especially longleaf pine and other southern pine forests. Roosts and nests are located in live pines,	Chesapeake	NHDE

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Counties/City Documented	Source
					specifically those infected with red heart fungus.		
Fish							
Shortnose sturgeon	*Acipenser brevirostrum*	LE	LE	G3	Rivers and coastal waters from Canada to Florida. Hatch in freshwater and spend most of their lives in estuaries.	Virginia Beach	VaFWIS
Atlantic sturgeon	*Acipenser oxyrinchus*	LE	LE	G3	Rivers and coastal waters from Maine to Florida. Hatch in the freshwater of rivers, travel out to sea as juveniles, and return to their birthplace for spawning.	Chesapeake Virginia Beach	VaFWIS
Reptiles							
Kemp's ridley sea turtle	*Lepidochelys kempii*	LE	LE	G1	Nearshore and inshore waters of the northern Gulf of Mexico. Nests on beaches.	Virginia Beach	VaFWIS
Leather back sea turtle	*Dermochelys coriacea*	LE	LE	G2	Open ocean, especially deep and rough seas. Nests on sandy beaches backed with vegetation.	Virginia Beach	VaFWIS
Hawksbill sea turtle	*Eretmochelys imbricate*	LE	LE	G3	Tropical waters, including coral reefs. Nests on beaches, especially vegetated dunes.	Virginia Beach	VaFWIS
Loggerhead sea turtle	*Caretta caretta*	LT	LT	G3	Subtropical and temperate oceans, including the Atlantic. Nesting occurs on beaches.	Virginia Beach	VaFWIS NHDE
Green sea turtle	*Chelonia mydas*	LT	LT	G3	Tropical and subtropical waters, including reefs, bays, and inlets. Nests on beaches.	Virginia Beach	VaFWIS
COMMONWEALTH-LISTED SPECIES							
Mammals							
Rafinesque's big-eared bat	*Corynorhinus rafinesquii macrotis*	None	LE	G3	Caves year-round, especially those in karst regions dominated by oak-hickory or beech-maple-hemlock forest.	Chesapeake Virginia Beach	VaFWIS NHDE
Tri-colored bat	*Perimyotis subflavus*	SOC	LE	G3	Roost in trees near forest edges during summer. Hibernate deep in caves or mines in areas with warm, stable temperatures during winter.	Chesapeake Virginia Beach	VaFWIS NHDE

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Counties/City Documented	Source
Birds							
Wilson's Plover	*Charadrius wilsonia*	None	LE	G5	Coastal sandy and shell beaches, barrier and spoil banks, borders of salt ponds, tidal mudflats, inlets, bays, estuaries, and sometimes sandbars and mudbanks of rivers near the coast. Nests principally on sand or bare soil near salt or brackish water.	Virginia Beach	VaFWIS
Henslow's Sparrow	*Ammodramus henslowii*	None	LT	G4	Open grasslands with few or no woody plants and tall dense grasses and litter layer.	Virginia Beach	VaFWIS
Loggerhead Shrike	*Lanius ludovicianus*	None	LT	G4	Open country with scattered shrubs and trees or other tall structures for perching.	Chesapeake Virginia Beach	VaFWIS
Migrant Loggerhead Shrike	*Lanius ludovicianus migrans*	None	LT	G4	Breed in open country with scattered trees and shrubs, savanna, and desert scrub in southwestern U.S. Nests in shrubs or small deciduous or coniferous trees in eastern North America.	Chesapeake Virginia Beach	VaFWIS
Peregrine Falcon	*Falco peregrinus*	None	LT	G4	Tall structures, such as powerline poles, buildings, and rock ledges, in generally open landscapes.	Chesapeake Virginia Beach	VaFWIS
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	None	LT	G4	River mouths, tidal flats and shorelines, lagoons, herbaceous wetlands, bays and sounds.	Virginia Beach	VaFWIS
Gull-billed Tern	*Gelochelidon nilotica*	None	LT	G5	Found along coastlines, salt marshes, estuaries, lagoons, and plowed fields in all seasons. Nest along sandy barrier islands along the coast of New Jersey.	Virginia Beach	VaFWIS
Amphibians							
Barking treefrog	*Hyla gratiosa*	None	LT	G5	Generally found in sandy areas in pinelands or swampy woods, most often near standing water.	Virginia Beach	VaFWIS NHDE
Reptiles							
Eastern chicken turtle	*Deirochelys reticularia reticularia*	None	LE	G5	Heavily-vegetated aquatic habitats, especially quiet bodies of water such as ponds, lakes, ditches, marshes, and cypress swamps.	Virginia Beach	VaFWIS NHDE

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Counties/City Documented	Source
Canebrake rattlesnake	*Crotalus horridus*	None	LE	G4	Lowland cane thickets, high areas around swamps and river floodplains, hardwood and pine forests, mountainous areas, and rural habitats near agriculture.	Chesapeake Virginia Beach	VaFWIS NHDE
Eastern glass lizard	*Ophisaurus ventralis*	None	LT	G5	Pine flatwoods, mesic hammocks, wet meadows, maritime forests, and damp grassy areas in sandy environments.	Virginia Beach	VaFWIS NHDE
Plants							
Raven's seedbox	*Ludwigia ravenii*	SOC	LE	G1	Boggy clearings and ditches in wet flatwoods, probably former savannas.	Chesapeake	NHDE

Sources:
IPaC U.S. Fish and Wildlife Service Information for Planning and Consultation (FWS 2021)
NHDE Virginia Department of Conservation and Recreation Natural Heritage Data Explorer (VDCR 2021)
VaFWIS Virginia Department of Game and Inland Fisheries Virginia Fish and Wildlife Information System (VDWR 2021)

Federal/State Status:
LE Listed as endangered
LT Listed as threatened
PE Proposed as endangered
PT Proposed as threatened
SOC Species of concern

Global Rank (NatureServe 2021):
G1 Critically Imperiled: At very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factor
G2 Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors
G3 Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors
G4 Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors
G5 Secure: Common, widespread, and abundant

G.3. REFERENCES

Atlantic Coast Joint Venture. 2020. Flagship Species Initiatives. Accessed: May 2021. Retrieved from: https://acjv.org/.

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ATTACHMENTS

IPac Resource Lists

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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Virginia Beach County, Virginia

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis | Threatened

Wherever found

No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Birds

NAME	STATUS
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds
  http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA http://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
http://ecos.fws.gov/ecp/species/1626

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/5234

Blue-winged Warbler Vermivora pinus — Breeds May 1 to Jun 30

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/9679

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/9480

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

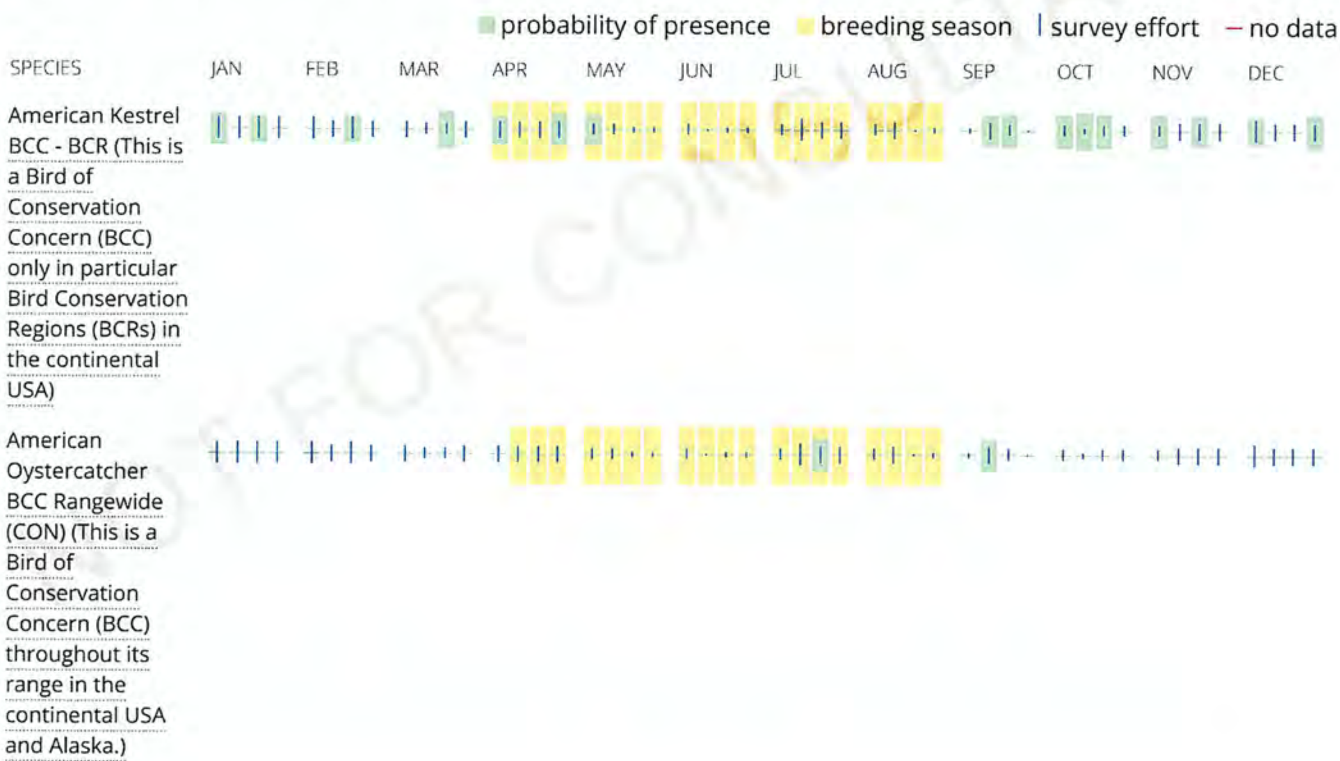
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

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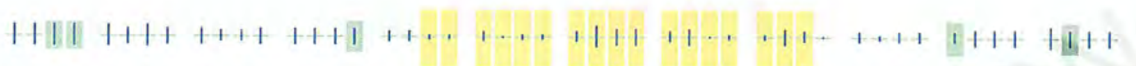
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Blue-winged Warbler
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Gull-billed Tern
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prairie Warbler
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Prothonotary Warbler
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Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Ruddy Turnstone
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Rusty Blackbird
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

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What does IPaC use to generate the migratory birds potentially occurring in my specified location?

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The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Chesapeake and Virginia Beach counties, Virginia

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the

FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA http://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. http://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
King Rail Rallus elegans This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5

Prairie Warbler Dendroica discolor
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 1 to Jul 31

Prothonotary Warbler Protonotaria citrea
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds Apr 1 to Jul 31

Red-headed Woodpecker Melanerpes erythrocephalus
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 10 to Sep 10

Rusty Blackbird Euphagus carolinus
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
Breeds elsewhere

Willet Tringa semipalmata
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds Apr 20 to Aug 5

Wood Thrush Hylocichla mustelina
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of

presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

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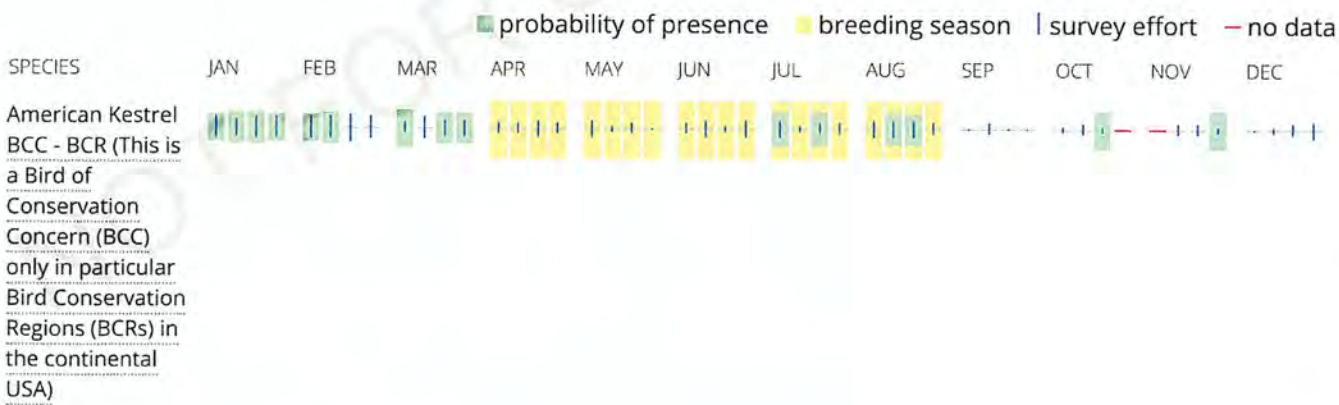

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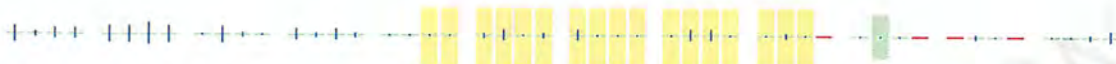

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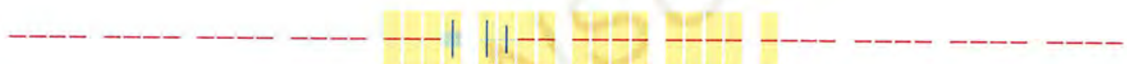

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The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Chesapeake and Virginia Beach counties, Virginia

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis — Threatened

Wherever found

No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the

FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA http://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. http://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
King Rail Rallus elegans This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5

Prairie Warbler *Dendroica discolor* — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler *Protonotaria citrea* — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker *Melanerpes erythrocephalus* — Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird *Euphagus carolinus* — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Willet *Tringa semipalmata* — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush *Hylocichla mustelina* — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of

presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

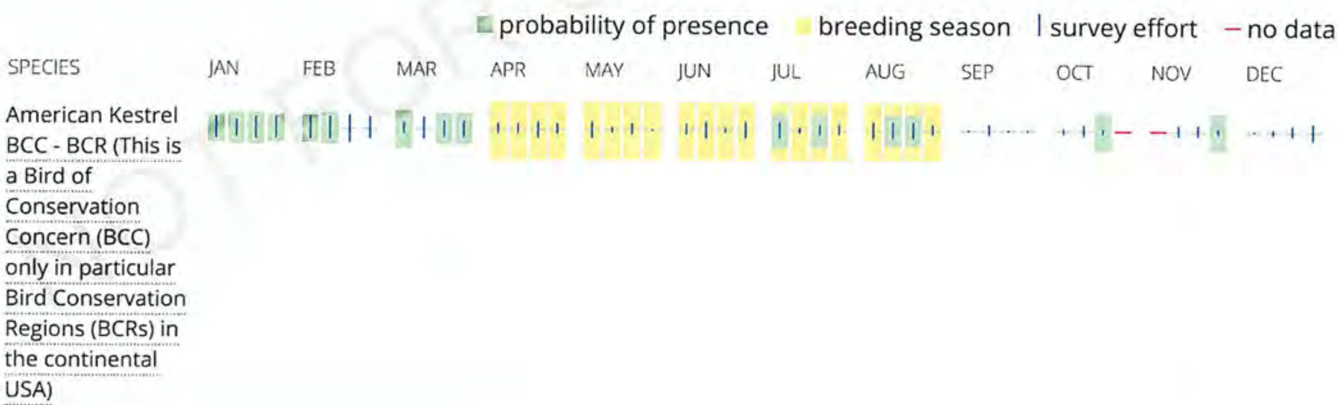
Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

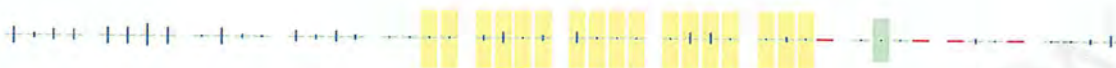
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

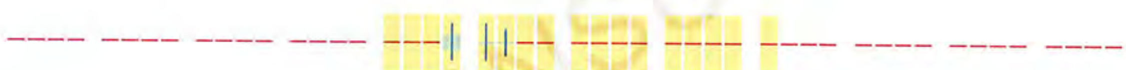


Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

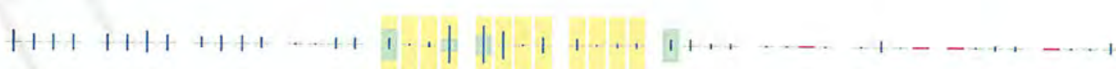
Black Skimmer
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



King Rail
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

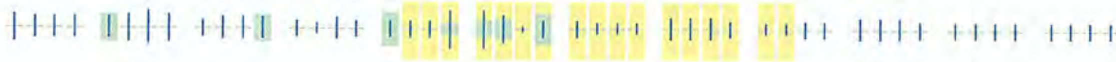


Prairie Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Prothonotary Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Rusty Blackbird
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

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The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

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Data precautions

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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Chesapeake and Virginia Beach counties, Virginia

Local office

Virginia Ecological Services Field Office

📞 (804) 693-6694
📠 (804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
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4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the

FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA http://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. http://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
King Rail Rallus elegans This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Purple Sandpiper Calidris maritima — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that

week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

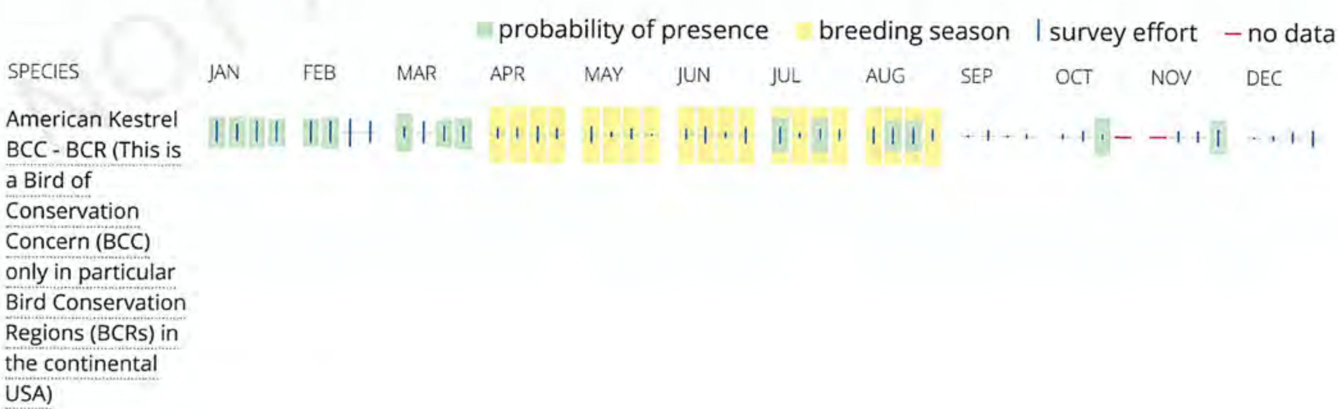
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

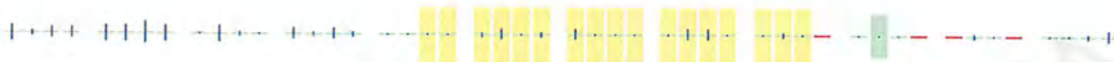
Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Black Skimmer
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



King Rail
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Prairie Warbler
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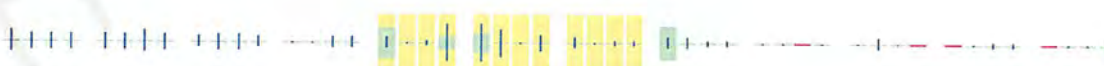

Prothonotary Warbler
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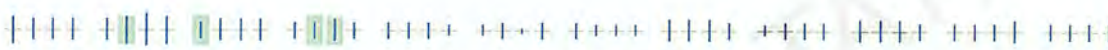
Rusty Blackbird
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Willet
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Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Chesapeake and Virginia Beach counties, Virginia

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

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Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
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Additional information can be found using the following links:

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- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
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FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

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Breeds Apr 20 to Aug 5

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Probability of Presence Summary

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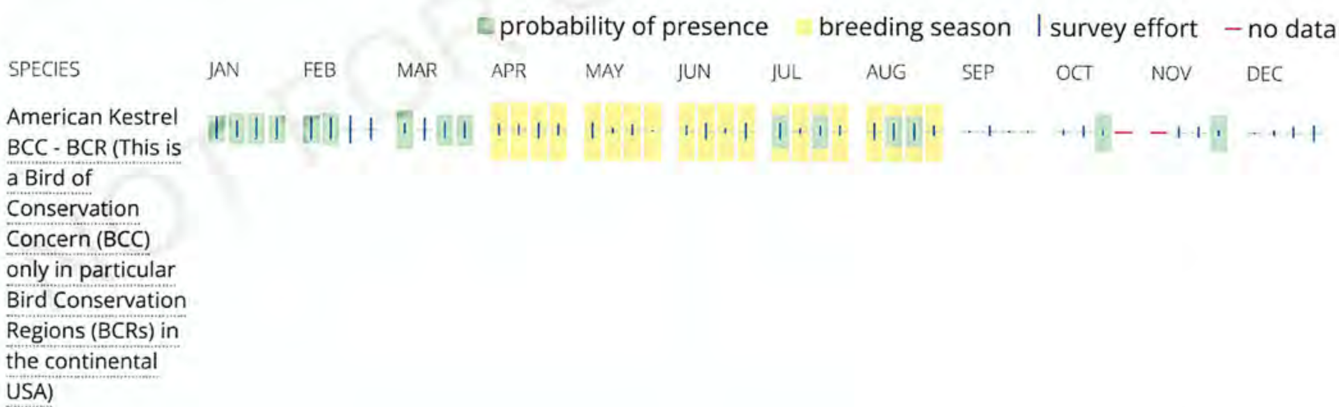

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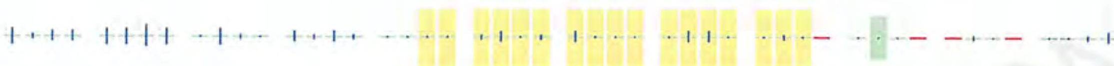

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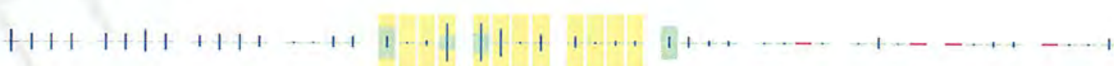

Prothonotary Warbler
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Wood Thrush
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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

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Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
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Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

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This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

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Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

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Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Virginia Beach County, Virginia

Local office

Virginia Ecological Services Field Office

📞 (804) 693-6694
📠 (804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis — Threatened

Wherever found

No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the

FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA http://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. http://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
King Rail Rallus elegans This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31

Prothonotary Warbler *Protonotaria citrea* — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker *Melanerpes erythrocephalus* — Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird *Euphagus carolinus* — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Willet *Tringa semipalmata* — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush *Hylocichla mustelina* — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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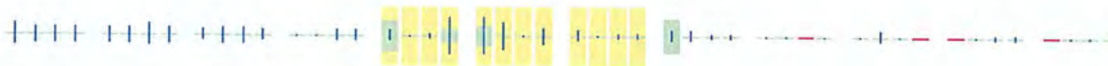

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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Chesapeake and Virginia Beach counties, Virginia

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis — Threatened

Wherever found

No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the

FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA http://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. http://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
King Rail Rallus elegans This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31

Prothonotary Warbler Protonotaria citrea
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds Apr 1 to Jul 31

Red-headed Woodpecker Melanerpes erythrocephalus
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 10 to Sep 10

Rusty Blackbird Euphagus carolinus
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
Breeds elsewhere

Wood Thrush Hylocichla mustelina
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

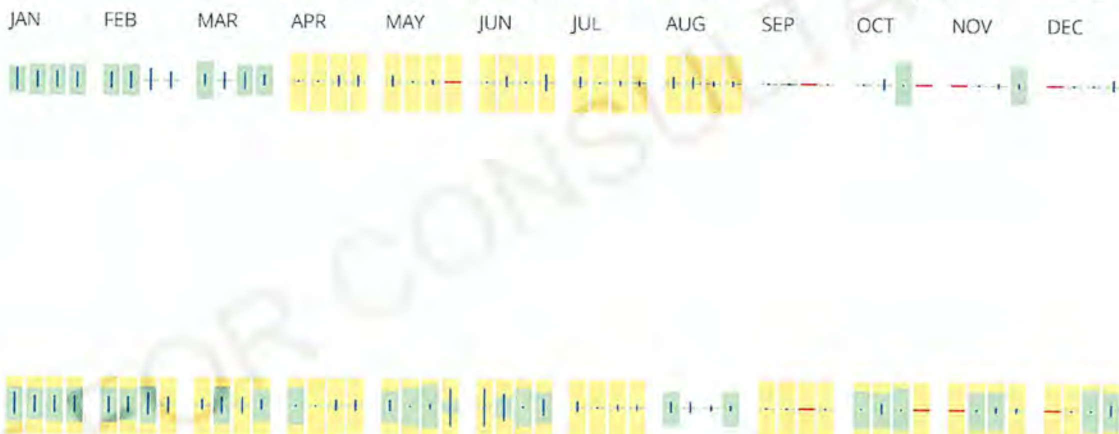
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES

American Kestrel BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Bald Eagle Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

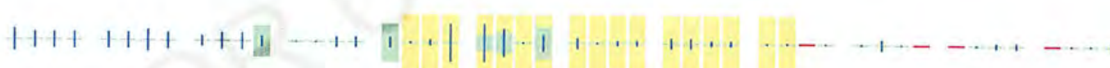


King Rail
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prairie Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prothonotary Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Rusty Blackbird
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX H PRE-APPLICATION ANALYSIS OF CULTURAL RESOURCES

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Coastal Virginia Offshore Wind Commercial Project

Pre-Application Analysis

1 November 2021

Signature page

1 November 2021

Coastal Virginia Offshore Wind Commercial Project

Pre-Application Analysis

Mary Beth Derrick
Architectural Historian

Jeffrey L. Holland
Senior Historian

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ERM
3300 Breckinridge Boulevard
Suite 300
Duluth, GA 30096

EXECUTIVE SUMMARY

This report presents the findings of the pre-application analysis conducted for Dominion Energy Virginia's proposed Coastal Virginia Offshore Wind (CVOW) Commercial Project (Project). For this Project, Dominion Energy Virginia (Virginia Electric and Power Company or Company) is proposing to construct and operate a commercial offshore wind generating facility and associated infrastructure connecting this facility to the electric transmission grid in Tidewater Virginia. This report addresses the associated onshore infrastructure required for the Project, including an electric transmission line extending from the proposed Cable Landing Location in Virginia Beach to the Company's existing Fentress Substation in the City of Chesapeake. This pre-application analysis is a required study for onshore transmission line projects regulated by the Virginia State Corporation Commission (SCC).

Note to Readers: This report (and other documents Dominion submitted to the Bureau of Ocean Energy Management (BOEM)) discusses seven alternative transmission line routes (CLH Route, HF Route 1, HF Route 2, HF Route 3, HF Route 4, HF Route 5, and the HF Hybrid Route), whereas Dominion's application to the State Corporation Commission (SCC) discusses five alternative routes and two route variations (CLH Route, HF Route 1, HF Route 2, HF Route 5, HF Hybrid Route, Dam Neck Route Variation, and Line #2085 Route Variation). HF Routes 3 and 4 were eliminated as routes for consideration in the SCC application; however, portions of those routes, to the extent they differ from other routes, were retained as the Dam Neck and Line #2085 Route Variations. These route variations respectively represent a small portion of HF Route 2 and HF Route 3. While the route numbering/naming conventions before each agency is slightly different, the physical location of the routing options before each agency is the same. They differ due to the fact that the route numbering before BOEM was public before the Company's application before SCC was filed, and thus, that routing numbering needs to remain the same so as not to confuse the public already engaged in the BOEM process.

A number of route options are currently under consideration for the proposed onshore transmission line. All of the route options begin with a proposed underground transmission line segment extending from the Cable Landing Location at the Virginia State Military Reservation to a point north of Harpers Road in the City of Virginia Beach. This segment is referred to as the Cable Landing to Harpers (CLH) Route. From the Company's existing Fentress Substation, there are five potential overhead transmission line routes and one underground/overhead hybrid transmission line route under consideration. These segments are referred to as Harpers to Fentress (HF) Routes 1 through 5 and the Hybrid Route.

The HF overhead routes would require a switching station, referred to as the Harpers Switching Station, north of Harpers Road. The HF Hybrid Route would continue in an underground configuration to an alternate site for the switching station on the north side of Princess Anne Road in the City of Virginia Beach. The switching station at this site is referred to as the Chicory Switching Station. From here, the HF Hybrid Route would continue in an overhead configuration to the Fentress Substation in the City of Chesapeake. All of the routing solutions would require an expansion of the Fentress Substation.

This pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources in relation to each Project alternative route. Environmental Resources Management (ERM) conducted the pre-application analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts to historic resources.

Sixteen known archaeological sites are located in the ROW of the proposed onshore transmission line alternatives. Ten architectural resources fall within the study tiers defined by the Virginia Department of Historic Resources (VDHR) for aboveground historic sites for the various route options under consideration. Since each of the routes overlap to some extent, impacts on several aboveground historic resources discussed in this report would be the same regardless of the route option selected for the

Project. The likely impacts on individual historic resources associated with each route are presented in the tables below.

As the CLH Route is the only option under consideration for an underground route between the Cable Landing Location north of Harpers Road, it is the expected route for this segment of the Project. For the route options south of this point, it appears that HF Route 1 and the HF Hybrid Route would result in minimal and no impacts, respectively, to the considered resources discussed in this report. In contrast, HF Routes 2, 3, and 5 would result in moderate impacts and HF Route 4 would result in severe impacts to the considered resources.

This pre-application analysis on its own does not provide the level of identification and evaluation of historic properties needed to comply with the Bureau of Ocean Energy Management's (BOEM's) review and consultation processes under Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA). A Phase I Historic Architectural Survey of Alternative Routes was prepared to satisfy BOEM guidelines with respect to historic resource impacts associated with onshore Project components and is included as part of this report.

Executive Summary of Project Impacts to Considered Aboveground Historic Resources in the Study Area of the Proposed Routes

Considered Resource		Proposed Alternative Routes					
	CLH Route	HF Route 1	HF Route 2	HF Route 3	HF Route 4	HF Route 5	HF Hybrid Route
131-0044/ 131-5333-0002	-	Minimal	Moderate	Moderate	Severe	Moderate	Minimal
131-5071	-	Minimal	Minimal	Minimal	Minimal	Moderate	Minimal
131-5333	-	Minimal	Moderate	Moderate	Severe	Moderate	Minimal
134-0003/ 134-5027-0004	Minimal	-	-	-	-	-	-
134-0038	-	None	None	None	None	None	None
134-0072	-	None	None	None	None	None	None
134-0413	Severe	-	-	-	-	-	-
134-0413-0110	None	-	-	-	-	-	-
134-0702	-	None	None	None	None	None	None
134-0917	None	-	-	-	-	-	-

Note: CLH Route is the only option currently under consideration extending from the Cable Landing location at the Virginia State Military Reservation to a point north of Harpers Road in the City of Virginia Beach. This segment would be used in conjunction with one of the overhead or hybrid HF options under review to provide a continuous route between the Cable Landing Location and Fentress Substation.

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Acronyms and Abbreviations

Name	Description
BOEM	Bureau of Ocean Energy Management
CLH	Cable Landing to Harpers
COP	Construction and Operations Plan
CVOW	Coastal Virginia Offshore Wind Commercial Project
ABPP	American Battlefield Protection Program
ERM	Environmental Resources Management
ESRI	Environmental Systems Research Institute
CLH	Cable Landing to Harpers Road
GNSS	Global Navigation Satellite System
HF	Harpers to Fentress
ICW	Intracoastal Waterway
ITA	Interfacility Traffic Area
MOA	Memorandum of Agreement
NAS	Naval Air Station
NERC	North American Electric Reliability Corporation
NHL	National Historic Landmark
NPS	National Park Service
NRHP	National Register of Historic Places
ROW	Right-of-Way
SEPG	Southeastern Parkway and Greenway
SMR	State Military Reservation
SP	Simulation Point
TNC	The Nature Conservancy
TL	Transmission Line
USACE	U.S. Army Corps of Engineers
UTM	Universal Transverse Mercator
V-CRIS	Virginia Cultural Resource Information System
VDHR	Virginia Department of Historic Resources
VLR	Virginia Landmarks Register

1 INTRODUCTION

This report presents the findings of the pre-application analysis prepared by Environmental Resources Management, Inc. (ERM) on behalf of Dominion Energy Virginia (Virginia Electric and Power Company or Company) for an onshore electric transmission line associated with the proposed Coastal Virginia Offshore Wind (CVOW) Commercial Project (Project). The onshore electric transmission line would extend from the Cable Landing Location in the City of Virginia Beach to the Company's existing Fentress Substation in the City of Chesapeake. As discussed in more detail below, several alternative routes for the onshore transmission line are currently under consideration. This pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources relative to each proposed alternative. ERM conducted the pre-application analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts to historic resources.

The proposed onshore transmission line and associated facilities, including a switching station, are needed to reliably interconnect the proposed Project, as requested by the Company's Generation Construction Group, to maintain the structural integrity and reliability of its transmission system consistent with the Company's Facility Interconnection Requirements and in compliance with mandatory North American Electric Reliability Corporation (NERC) Reliability Standards, and to solve identified congestion issues to allow the energy output of the Project onto the Company's transmission system. The proposed Project facilities will support Dominion Energy Virginia's continued reliable electric service to retail and wholesale customers and will support the future overall growth and system generation capability in the area.

1.1 Overview

The Project will encompass an offshore wind generating facility as well as onshore electrical transmission infrastructure, the latter of which is the focus of the current report. A number of route options are currently under consideration for the proposed onshore transmission line (Figure 1-1). All of the options begin with an underground transmission line segment extending from the Cable Landing Location at the Virginia State Military Reservation (SMR) to a point north of Harpers Road in the City of Virginia Beach. This segment is referred to as the Cable Landing to Harpers (CLH) Route. From the Company's existing Fentress Substation, there are five potential overhead transmission line routes and one underground/overhead hybrid transmission line route under consideration. These segments are referred to as Harpers to Fentress (HF) Routes 1 through 5 and the Hybrid Route.

Note to Readers: This report (and other documents Dominion submitted to the Bureau of Ocean Energy Management (BOEM)) discusses seven alternative transmission line routes (CLH Route, HF Route 1, HF Route 2, HF Route 3, HF Route 4, HF Route 5, and the HF Hybrid Route), whereas Dominion's application to the State Corporation Commission (SCC) discusses five alternative routes and two route variations (CLH Route, HF Route 1, HF Route 2, HF Route 5, HF Hybrid Route, Dam Neck Route Variation, and Line #2085 Route Variation). HF Routes 3 and 4 were eliminated as routes for consideration in the SCC application; however, portions of those routes, to the extent they differ from other routes, were retained as the Dam Neck and Line #2085 Route Variations. These route variations respectively represent a small portion of HF Route 2 and HF Route 3. While the route numbering/naming conventions before each agency is slightly different, the physical location of the routing options before each agency is the same. They differ due to the fact that the route numbering before BOEM was public before the Company's application before SCC was filed, and thus, that routing numbering needs to remain the same so as not to confuse the public already engaged in the BOEM process.

The HF overhead routes would require a switching station, referred to as the Harpers Switching Station, at the north of Harpers Road. The HF Hybrid Route would continue in an underground configuration from the alternate site for the switching station on the north side of Princess Anne Road in the City of Virginia Beach. The switching station at this site is referred to as the Chickory Switching Station. From here, the HF Hybrid Route would continue in an overhead configuration to the Fentress Substation in the City of Chesapeake. The Project also would require an expansion of the Fentress Substation. Furthermore, Dominion Energy intends to lease existing and/or build to suit facilities in the Hampton Roads region of Virginia for an Operations and Maintenance (O&M) facility and construction port. In the event that upgrades or a new, build to suit facility is needed, construction would be undertaken by the lessor and would be separately reviewed and authorized as needed. As such, the construction and O&M ports are not a part of this undertaking and will not be addressed in this analysis.

The underground and overhead route segments would require three circuits, with the exception of the CLH Route, which would require nine circuits. For underground segments, each circuit would be installed in separate duct banks. For overhead segments, each circuit typically would be installed on separate monopole structures (except as indicated below).

1.1.1 Cable Landing to Harpers Route

The CLH Route for the Onshore Export Circuits would include both Horizontal Directional Drill (HDD) and surface trench installation of the proposed underground circuits between the Cable Landing Location and the switching station site north of Harpers Road. After exiting the transition joint bays the nine concrete-encased, underground duct banks would transition to five HDDs for crossing Lake Christine. The HDDs would extend west for approximately 0.3 mile (1,540 feet) passing beneath two branches of the lake separated by a peninsula of USN land at Dam Neck Annex. The HDDs would terminate on the west side of the lake just north of a helicopter landing pad at the north end of Lake Road on the SMR. From here, the underground circuits would be installed by surface trenching in a typical, three-wide, nine-circuit, duct bank configuration. The route would head generally west for about 0.6 mile, mostly crossing parade and training grounds within the SMR.

At a point just east of General Booth Boulevard, the typical, three-wide, duct bank configuration would diverge into five HDDs for crossing General Booth Boulevard, Owl Creek, and associated wetlands. The HDDs would extend approximately 0.4 mile (2,200 feet) to the northwest, leaving the SMR, crossing a City-owned parcel along the creek, and exiting onto U.S. Navy Land at NAS Oceana near Bells Road. The underground circuits would then converge into the typical, three-wide, duct bank configuration and continue west and south on USN land for about 1.0 mile, paralleling Bells Road for 0.6 mile and crossing Birdneck Road and Dominion's existing Lines TL-2118/78 corridor. The CLH Route would then turn south to parallel the east side of Oceana Boulevard for about 1.1 miles, all on USN land. At the intersection of Oceana Boulevard and Harpers Road, the route for the underground circuits would head west to parallel the north side of Harpers Road for about 1.0 mile and terminate at the Harpers Switching Station site on the north side of Harpers Road.

The ROW for underground segments installed by surface trenching would measure 65 feet wide with duct banks for each circuit installed within three parallel trenches excavated within the corridor. Where manholes/splicing vaults are installed, the width of the ROW would expand to 86 feet. The CLH underground route is approximately 4.4 miles in length.

1.1.2 Harpers to Fentress Route 1

After exiting the Harpers Switching Station, HF Route 1 would proceed generally southwest for about 2.3 miles across both private lands and lands owned by the City of Virginia Beach adjacent to or within the SEPG study corridor. This segment of the route would cross Dam Neck and London Bridge roads and pass between the Prince George Estates, Mayberry, Pine Ridge, and Castleton residential subdivisions. The route would then intersect and parallel Dominion's existing Lines TL-2118/147 corridor for a distance of approximately 1.8 miles, mostly crossing City-owned lands within or adjacent to the SEPG corridor. This segment would pass south of the Castleton residential subdivision and between the Buyrn Farm North, Holland Pines, and Woods of Piney Grove residential subdivisions near Holland Drive.

After leaving Dominion's existing transmission line corridor, HF Route 1 would continue in a southwesterly direction for about 2.1 miles, mostly crossing City-owned lands within the Southeastern Parkway and Greenbelt (SEPG)[1] corridor, including an undeveloped portion of the Princess Anne Athletic Complex. This segment would cross Dominion's existing Line TL-2085 ROW just east of Landstown Road and intersect with the Line TL-271 ROW just north of Landstown Road. At the intersection with Line TL-271[2], HF Route 1 would follow existing transmission right-of-way for 7.9 miles to the Fentress Substation.

The route would enter the City of Chesapeake southwest of Indian River Farms Park. The Chesapeake portion of the route initially would cross mostly forested lands, including private land, parcels owned by the City of Chesapeake, and a tract owned by TNC. This segment would also cross USACE-owned lands along the Intracoastal Waterway. South of the waterway, the route would mostly cross privately-owned agricultural lands in addition to crossing Mt. Pleasant, Blue Ridge, and Whittamore Roads. The HR Route 1 would pass along the east side of the Battlefield Golf Club. The route would then head west for 1.1 miles along the south side of the golf club before entering Fentress Substation.

The total length of HF Route 1 is approximately 14.37 miles. In areas where this route is greenfield, the ROW for the route would be 140 feet wide. Where the route is collocated with TL-2118/147, the existing ROW would be expanded from 120 feet to 225 feet, and where the route is collocated with TL-271 and TL-2240, the existing ROW generally would be expanded from 120 feet to 160 feet. In those locations along TL-271 where there is existing residential development adjacent to the ROW, the transmission line would be constructed within the existing ROW of TL-271.

1.1.3 Harpers to Fentress Route 2

HF Route 2 would follow the same alignment as HF Route 1 for approximately 5.5 miles from the Harpers Switching Station site to a point just east of Landstown Road in the Princess Anne Athletic Complex. The route would then head south/southwest for about 1.8 miles across sparsely developed forested and agricultural lands primarily owned by the City of Virginia Beach and managed as part of the City's ITA. After crossing Indian River Road, the route would continue about 1.0 mile to the south across mostly forested private lands to the boundary between Virginia Beach and Chesapeake.

Once in Chesapeake, HF Route 2 would head southwest for approximately 0.9 mile, crossing the Intracoastal Waterway and adjacent federal lands managed by the USACE at a point about 0.6 mile northwest of the North Landing River Bridge. It would then proceed west for 2.6 miles across privately owned forested and agricultural parcels along the south side of the Intracoastal Waterway to an intersection with Dominion's existing Lines TL-271 right-of-way. From here, the route would follow the same alignment as HF Route 1 to the Fentress Substation for a distance of about 1.9 miles.

The total length of HF Route 2 is approximately 15.23 miles. In greenfield areas, the new ROW would be 140 feet wide. Where the route is adjacent to TL-2118/147, the existing ROW would be expanded from

1 In the 1990s and early 2000s, the Cities of Virginia Beach and Chesapeake and the Virginia Department of Transportation evaluated a potential highway project, referred to as the SEPG, to address traffic congestion in the area. While the project was abandoned, much of the study corridor remains undeveloped, with a large portion of the land in the Virginia Beach portion of the corridor owned by the city.

2 Line 271 also supports idle Line I-74.

120 feet to 225 feet wide; and where adjacent to TL-271 and TL-2240, the existing ROW would be expanded from 120 feet to 160 feet wide.

1.1.4 Harpers to Fentress Route 3

HF Route 3 is identical to HF Route 2 with the exception of a segment in Virginia Beach south of NAS Oceana. Unlike HF Route 2, HF Route 3 would turn west after crossing Dam Neck Road, rather than continuing southeast with the SEPG study corridor. The route would then parallel the south side of Dam Neck Road for approximately 1.8 miles, primarily crossing privately owned agricultural and forested lands. At a point about 0.4 mile west of London Bridge Road, the route would turn south and continue for about 1.0 mile across private and city-owned forested lands to Dominion's existing TL-2118/147 corridor. This segment of HF Route 3 includes an approximately 0.5-mile-long crossing of city-owned, open space, undeveloped parkland at Holland Pines Park. The route would then follow the same alignment as HF Route 2 to Fentress Substation.

The total length of HF Route 3 is approximately 15.59 miles. In areas where this route is greenfield, the new ROW would be 140 feet wide. Where the route is adjacent to TL-2118/147, the existing ROW would be expanded from 120 feet to 225 feet wide, and where adjacent to TL-271 and TL-2240, the existing ROW would be expanded from 120 feet to 160 feet wide. Where HF Route 3 parallels TL-2085, the existing ROW would be expanded from 145 feet to 200 feet wide.

1.1.5 Harpers to Fentress Route 4

HF Route 4 would follow the same alignment as HF Route 1 from the Harpers Switching Station to Dominion's existing TL-2085 ROW near Landstown Road at the Princess Anne Athletic Complex. It would then follow the west side of TL-2085 for approximately 2.8 miles to the south. About 2.5 miles of this route segment would cross primarily undeveloped (agricultural) Virginia Beach city-owned lands adjacent to (on the opposite side of the existing transmission line from) the Courthouse Woods and Courthouse Estates residential subdivisions. The remainder of the segment, about 0.3 mile on the south side of Indian River Road, would cross mostly forested privately owned parcels. The route would then then head east/southeast for approximately 1.2 miles across privately-owned forested tracts to the boundary between the Cities of Virginia Beach and Chesapeake. Once in Chesapeake, the route would continue for 0.5 mile to the east, crossing the Intracoastal Waterway and adjacent USACE lands at a point approximately 0.5 mile northwest of the North Landing Ridge Bridge. It would then follow the same alignment as HF Route 2 to Fentress Substation.

The total length of HF Route 4 is approximately 16.47 miles. In greenfield areas, the new ROW would be 140 feet wide. Where the route is adjacent to TL-2118/147, the existing ROW would be expanded from 120 feet to 225 feet wide, and where the route is adjacent to TL-271 and TL-2240, the existing ROW would be expanded from 120 feet to 160 feet wide. Where HF Route 4 parallels TL-2085, the existing ROW would be expanded from 145 feet to 200 feet wide.

1.1.6 Harpers to Fentress Route 5

HF Route 5 would follow the same alignment as HF Routes 1 and 2 for approximately 5.5 miles from the Harpers Switching Station site to Dominion's existing Line TL-2085 ROW near Landstown Road at the Princess Anne Athletic Complex. It would then follow the west side of Line TL-2085 for approximately 2.8 miles to the south. About 2.5 miles of this route segment would cross primarily undeveloped (agricultural) lands owned by the City of Virginia Beach adjacent to (but on the opposite side of the existing transmission line from) the Courthouse Woods and Courthouse Estates residential subdivisions. The remainder of this segment, about 0.3 mile on the south side of Indian River Road, would continue along Line TL-2085 across mostly forested, privately owned parcels. The route would then head southwest away from Line TL-2085 for about 1.0 mile, where it would cross the Intracoastal Waterway about 0.1 mile downstream of the North Landing River Bridge and enter the City of Chesapeake.

South of the river, HF Route 5 would cross Mt. Pleasant Road and a short segment (about 320 feet) of USACE land before heading generally south for about 3.9 miles, crossing 1.9 miles of undeveloped USN land along the edge of NALF Fentress and agricultural and forested private lands further south. This segment of the route would cross Mt. Pleasant, Blackwater, and Fentress Airfield roads, pass to the west of North Landing Farms, and parallel Blackwater Road for about 0.8 mile. HF Route 5 would then cross the state-designated scenic Pocaty River, turn southwest, and generally parallel the river through forested private lands for about 2.2 miles. It would then head west/northwest for about 4.6 miles across sparsely populated, privately owned, agricultural lands. HF Route 5 would then follow Dominion's existing right-of-way for about 0.1 mile west to Fentress Substation.

The total length of HF Route 5 is approximately 20.19 miles. In areas where the route is greenfield, the new ROW would be 140 feet wide. Where the route is adjacent to TL-2118/147, the existing ROW would be expanded from 35 feet to 140 feet wide, and where adjacent to TL-2240, the existing ROW would be expanded from 120 feet to 160 feet wide. Where HF Route 5 parallels TL-2085, the existing ROW would be expanded from 120 feet to 210 feet wide.

1.1.7 Harpers to Fentress Hybrid Route

The HF Hybrid Route would not have a switching station at Harpers Road. Instead, the HF Hybrid Route would continue underground from the CLH Route to the Chicory Switching Station site near Princess Anne Road in Virginia Beach, a distance of about 4.5 miles. At the Chicory Switching Station, the HF Hybrid Route would transition to a typical, three-circuit, overhead configuration and follow the same alignment as HF Route 1 to Fentress Substation in Chesapeake.

The total length of HF Hybrid Route is approximately 14.4 miles. For the underground segment, the width of the new ROW would be 65 feet, or 86 feet at manhole locations. For the overhead segment in greenfield areas, the new ROW would be 140 feet wide. Where the overhead segment of the route is parallel to TL-271 and TL-224, the existing ROW generally would be expanded from 120 feet to 160 feet wide. In those locations along TL-271 where there is existing residential development adjacent to the ROW, the transmission line would be constructed within the existing ROW of TL-271.

1.2 Management Recommendations

Sixteen known archaeological sites are located in the ROW of the proposed transmission line alternatives. Ten previously recorded resources fall within the study tiers established by the Virginia Department of Historic Resources (VDHR) for aboveground historic resources along the transmission line options under consideration (Attachment 1). CLH Route is the only option extending from the Cable Landing site to the Harpers Switching Station. Among the HF route alternatives, both HF Route 1 and the HF Hybrid Route have the least impacts in terms of total number of resources impacted and the severity of impacts. More information about the resources subject to potential impacts and the nature of impacts for the proposed alternatives can be found in the sections that follow.

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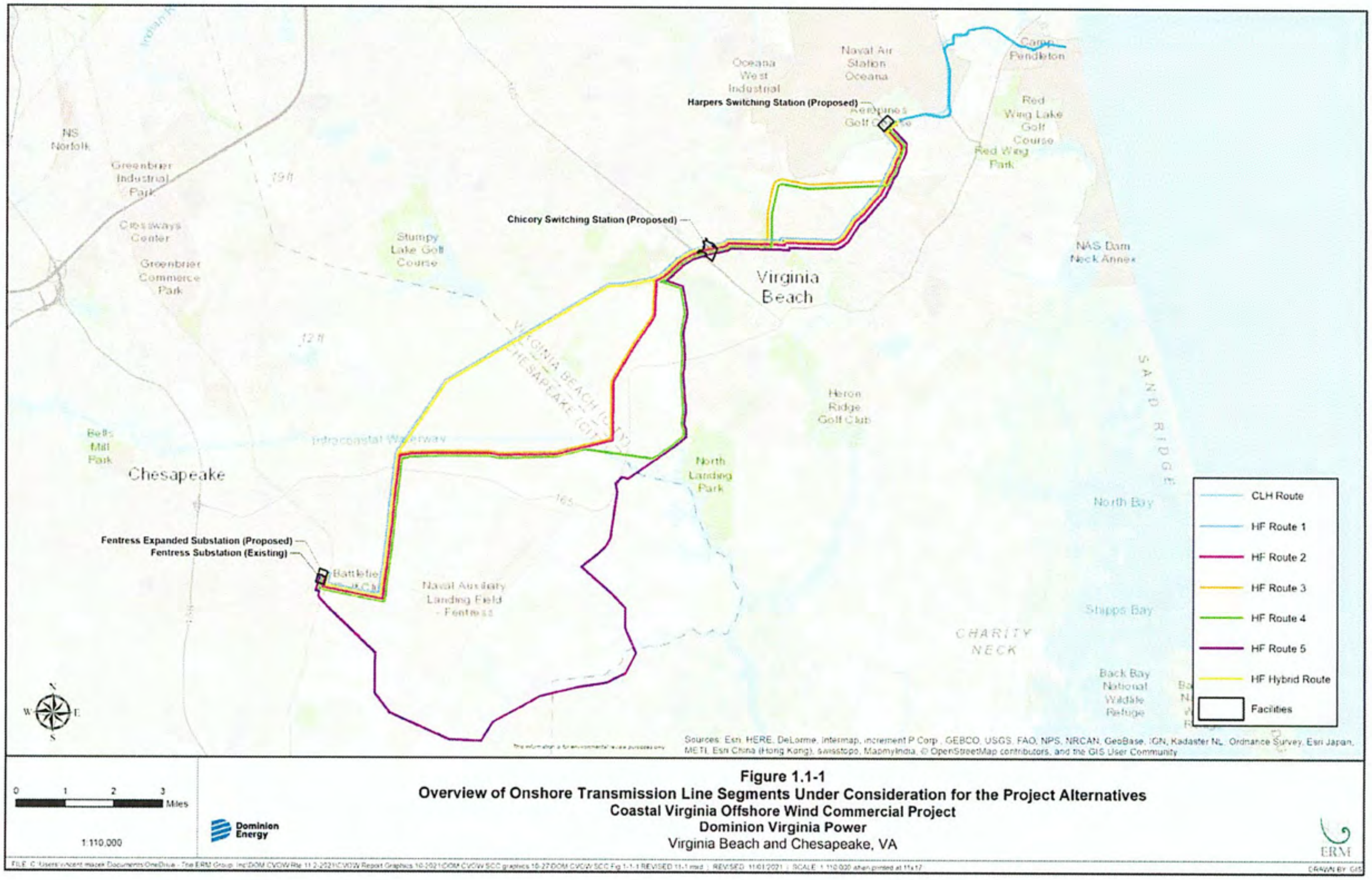

Figure 1.1-1: Overview of Onshore Transmission Line Segments under Consideration for the Project

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2 RECORDS REVIEW

2.1 Data Collection Approach

ERM conducted an analysis of potential cultural resource impacts for the alternative routes under consideration in accordance with the VDHR's 2008 ***Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*** (VDHR 2008). ERM additionally prepared a methodology document for the analysis, titled ***Coastal Virginia Offshore Wind Commercial Project Onshore Aboveground Historic Properties Survey Plan*** that was reviewed and approved by BOEM and the VDHR.

ERM's analysis in the current study also will serve to partially fulfill the cultural resource review requirements stipulated in BOEM's ***Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585*** (2020), which apply to the overall Project's offshore and onshore components. While the pre-application analysis on its own does not provide the level of identification and evaluation of historic properties necessary as part of BOEM's Section 106 and NEPA review and consultation process, a Phase I Historic Architectural Survey of Alternative Routes was prepared to satisfy BOEM guidelines with respect to historic resource impacts associated with onshore Project components and is included as part of this Appendix.

For the pre-application analysis of cultural resources, ERM conducted an analysis of potential cultural resource impacts for the alternative transmission line routes and other facilities discussed in this report in accordance with the VDHR's ***Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*** (Guidelines) (VDHR 2008). For each route, this analysis identified and considered the following previously recorded resources:

- National Historic Landmarks (NHL) within a 1.5-mile radius of the centerline;
- NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of the centerline;
- NRHP-eligible and NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of the centerline; and
- All of the above qualifying resources as well as archaeological sites within the ROW for each alternative route.

Information on the considered resources in each study tier was collected from the Virginia Cultural Resource Information System (V-CRIS). ERM also collected information from the City of Virginia Beach City Council's Historic and Cultural Overlay Districts (City of Virginia Beach 2017a), the Virginia Beach Historical Register (City of Virginia Beach 2018), and the City of Chesapeake's Historic Preservation Commission (City of Chesapeake 2018) to find locally significant resources within a 1.0-mile radius of each centerline. In addition, ERM collected information on battlefields surveyed and assessed by the National Park Service's American Battlefield Protection Program (ABPP).

Along with the records review carried out for the four tiers as defined by VDHR, ERM also conducted field assessments of the considered aboveground resources for each Project alternative route in accordance with the VDHR guidelines. Digital photographs of each architectural resource and views to the proposed transmission line were taken. Photosimulations were prepared to assess visual impacts on the considered resources within the VDHR defined tiered study areas for considered resources. For previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and the spatial relationship between the sites and any existing or planned transmission lines.

2.2 Archaeological Resources

Crossings of archaeological sites were considered a constraint in this study due to the potential for an electric transmission line to impact archaeological deposits in these areas (for example, due to transmission structure placement, tree clearing or heavy equipment usage within a site). The known archaeological sites in the ROW for each Project alternative are summarized in Table 2.2-1. The sites are presented in the order they occur from the Cable Landing Location to the Fentress Substation. Because portions of the route alternatives are conterminous, the same resources may occur in the same tier for more than one route. Out of 16 resources, four are potentially eligible for the NRHP, three are unevaluated, 8 are ineligible, and one is no longer extant. However, a confident and complete assessment of the integrity of each site would require archaeological field investigations, which are ongoing at the time of this report.

Table 2.2-1: Archaeological Resources in ROW of Proposed Routes

Route Alternative	Greenfield/ Existing ROW?	Site Number	Description	NRHP Status
CLH Route	Greenfield	44VB0204	Trash scatter (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
		44VB0361	Historic farmstead (Reconstruction and Growth, The New Dominion, World War I to World War II)	Not eligible
		44VB0389	Prehistoric lithic scatter (Pre-Contact)	Not eligible
			Historic architectural remains (The New Dominion, World War I to World War II)	
		44VB0395	Prehistoric lithic scatter (Pre-Contact)/ Historic artifact scatter (Antebellum Period, Civil War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Not eligible
		44VB0396	Historic artifact scatter (The New Dominion, World War I to World War II)	Not eligible
HF Route 1	Existing ROW	44CS0250	Multicomponent prehistoric camp (Middle Archaic, Late Archaic)	Not evaluated
	Greenfield	44VB0162	Prehistoric camp (Early Archaic, Middle Archaic, Late Archaic, Early Woodland, Middle Woodland, Late Woodland)/ Historic cemetery (Antebellum Period, Civil War, Early National Period, Post-Cold War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Potentially eligible
	Existing ROW	44VB0274	Prehistoric artifact scatter (Pre-contact)/ Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible

Route Alternative	Greenfield/ Existing ROW?	Site Number	Description	NRHP Status
	Greenfield	44VB0306	Salem Canal (Channelized Segment of North Landing River) (Antebellum Period, Civil War, Early National Period, Post-Cold War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Non-extant
		44VB0314	Historic dwelling (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
HF Route 2	Existing ROW	44VB0274	Prehistoric artifact scatter (Pre-contact)/ Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
		44VB0275	Trash scatter (Antebellum Period, Civil War, Reconstruction and Growth)	Potentially eligible
	Greenfield	44VB0314	Historic dwelling (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
HF Route 3	Existing ROW	44VB0274	Prehistoric artifact scatter (Pre-contact)/ Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
		44VB0275	Trash scatter (Antebellum Period, Civil War, Reconstruction and Growth)	Potentially eligible
	Greenfield	44VB0314	Historic dwelling (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
HF Route 4	Existing ROW	44VB0263	Historic artifact scatter (Antebellum Period, Civil War, Early National Period, Reconstruction and Growth)	Potentially eligible
		44VB0267	Multicomponent historic trash scatter (Antebellum Period, Civil War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Potentially eligible
		44VB0274	Prehistoric artifact scatter (Pre-contact)/ Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
		44VB0275	Historic trash scatter (Antebellum Period, Civil War, Reconstruction and Growth)	Potentially eligible
		44VB0280	Cemetery (Reconstruction and Growth)	Not eligible
	Greenfield	44VB0314	Historic dwelling (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
HF Route 5	Greenfield	44CS0016	Prehistoric site (Early Archaic, Middle Archaic, Late Archaic)	Not evaluated

Route Alternative	Greenfield/ Existing ROW?	Site Number	Description	NRHP Status
		44CS0156	Multicomponent historic artifact scatter (Colony to Nation, Contact Period, Early National Period, Post-Cold War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Not evaluated
	Existing ROW	44VB0263	Historic artifact scatter (Antebellum Period, Civil War, Early National Period, Reconstruction and Growth)	Potentially eligible
		44VB0267	Multicomponent historic trash scatter (Antebellum Period, Civil War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Potentially eligible
		44VB0274	Prehistoric artifact scatter (Pre-contact)/ Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
		44VB0275	Historic trash scatter (Antebellum Period, Civil War, Reconstruction and Growth)	Potentially eligible
		44VB0280	Cemetery (Reconstruction and Growth)	Not eligible
	Greenfield	44VB0314	Historic dwelling (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
HF Hybrid Route	Existing ROW	44CS0250	Multicomponent prehistoric camp (Middle Archaic, Late Archaic)	Not evaluated
	Greenfield	44VB0162	Prehistoric camp (Early Archaic, Middle Archaic, Late Archaic, Early Woodland, Middle Woodland, Late Woodland)/ Historic cemetery (Antebellum Period, Civil War, Early National Period, Post-Cold War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Potentially eligible
	Existing ROW	44VB0274	Prehistoric artifact scatter (Pre-contact)/ Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible
	Greenfield	44VB0306	Salem Canal (Channelized Segment of North Landing River) (Antebellum Period, Civil War, Early National Period, Post-Cold War, Reconstruction and Growth, The New Dominion, World War I to World War II)	Non-extant
		44VB0314	Historic dwelling (Antebellum Period, Civil War, Reconstruction and Growth)	Not eligible

2.3 Historic Resources

Each alternative under consideration has the potential to impact a number of historic and architectural resources. The following discussion summarizes known resources in the vicinity of each Project alternative according to VDHR's tiered study area model, including those resources that are significant on a local level. The locations of the considered architectural resources and the proposed route alternatives are shown in Figure 2.3-1. Individual maps for each proposed alternative are located in Attachment 2.

The resources located within the ROW of a proposed route may be subject to both direct impacts from placement of the line across the property, as well as visual impacts from changes to the viewshed introduced by the new transmission line structures. Resources in the 0-0.5 mile tier would not be directly impacted, but are likely to be visually impacted, unless topography or vegetation obscures the view to the transmission line. At a distance over 0.5 mile, it becomes less likely that a resource would be within line-of-sight of the proposed transmission line. However, the full architectural survey mandated in the second stage of VDHR's transmission line review process would determine which resources actually would be visually impacted. Many of the same resources in the 0.50-mile tier also extend into the 1.0-mile tier. Beyond 1.0 mile, it becomes even less likely that a given resource would be within line-of-sight of the proposed Project.

Because of the overlap among several of the routes, many of the same cultural resources would be impacted, regardless of the alternative selected. The nature of those impacts, while estimated in this study with the assistance of photosimulations, would depend on the final Project design in which the exact placement and height of transmission line structures will be determined. As part of the forthcoming full architectural survey, actual Project impacts will be assessed, and additional (as of yet, unrecorded) historic properties will be identified in the study area. The study area will be defined based on the height of the proposed transmission line structures (including overhead versus underground), topography, tree cover, and other factors impacting the line-of-sight to the proposed Project.

2.3.1 Cable Landing to Harpers Route

CLH Route is a new, greenfield underground route that does not follow any existing ROW. It is the only alternative under consideration for the route segment between the Cable Landing Location the Harpers Switching Station north of Harpers Road in the City of Virginia Beach. From the nine transition joint bays within the Cable Landing Location, the route would head generally west for about 0.6 mile, mostly crossing parade and training grounds within the SMR. At a point just east of General Booth Boulevard, an HDD would extend to the northwest, leaving the SMR, crossing a City-owned parcel along the creek, and exiting onto U.S. Navy Land at NAS Oceana near Bells Road. The underground circuits would then continue west and south on USN land paralleling Bells Road and crossing Birdneck Road and Dominion's existing Lines TL-2118/78 corridor. The CLH Route would then turn south to parallel the east side of Oceana Boulevard, all on USN land. At the intersection of Oceana Boulevard and Harpers Road, the route for the underground circuits would head west to parallel the north side of Harpers Road for about 1.0 mile and terminate at the Harpers Switching Station site on the north side of Harpers Road.

The considered resources that lie within the VDHR tiers for the CLH Route are presented in Table 2.3.1-1 and depicted in Attachment 2, Sheet 1. For the resources intersected by the transmission line ROW, the distance along the line is provided. Resources that extend from one tier into the next are only presented once in the tier nearest the proposed transmission line. There are four aboveground historic properties identified within the VDHR tiers for the CLH Route. The proposed route would intersect approximately 0.92 mile of the Camp Pendleton Historic District (134-0413). The four considered

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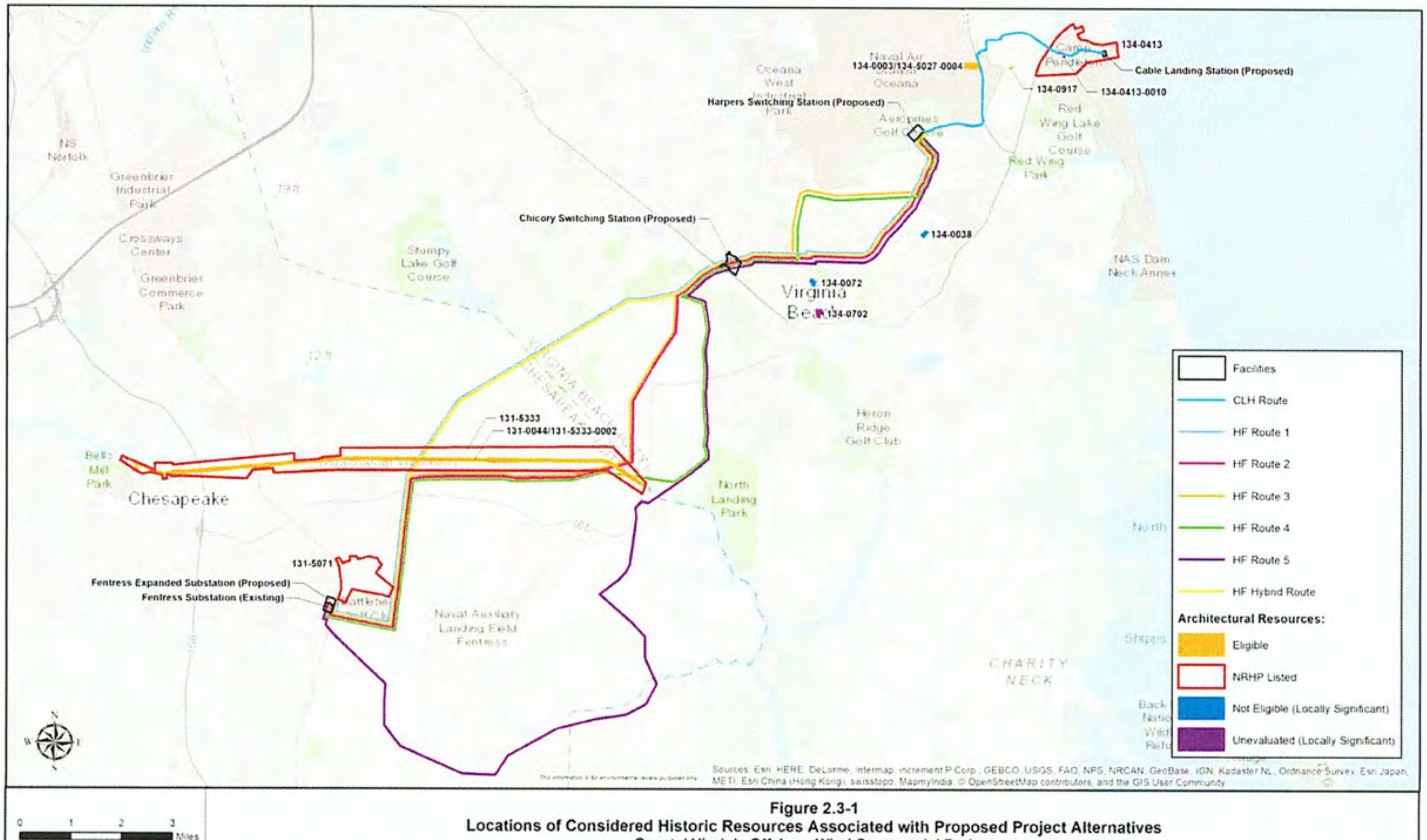

Figure 2.3-1
Locations of Considered Historic Resources Associated with Proposed Project Alternatives
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

ERM

Figure 2.3-1: Locations of Considered Historic Resources Associated with Proposed Project Alternatives

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resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3.1-1: Historic Resources in VDHR Tiers for CLH Route

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	-
0.5 to 1.0	National Register Properties (Listed)	-	-
0.0 to 0.5	National Register Properties (Listed)	134-0413-0110	Building 1
	National Register - eligible	134-0917	Winford White House
0.0 (within ROW)	National Register - eligible	134-0003	Bell House (ROW does not intersect resource, but is nearly adjacent)
	National Register Properties (Listed)	134-0413	Camp Pendleton/State Military Reservation Historic District (0.092-mile segment of ROW intersects resource)

2.3.2 Harpers to Fentress Route 1

After exiting the Harpers Switching Station, HF Route 1 would proceed generally southwest. The route would then intersect and parallel Dominion's existing Lines TL-2118/147 corridor. After leaving Dominion's existing transmission line corridor, HF Route 1 would continue in a southwesterly direction mostly crossing City-owned lands within the SEPG corridor. At the intersection with Line TL-271, HF Route 1 would follow existing transmission right-of-way to the Fentress Substation. The route would enter the City of Chesapeake southwest of Indian River Farms Park. The Chesapeake portion of the route initially would cross mostly forested lands, including private land, parcels owned by the City of Chesapeake, and a tract owned by TNC. This segment would also cross USACE-owned lands along the Intracoastal Waterway. South of the waterway, the route would mostly cross privately-owned agricultural lands. The route would then head west along the south side of the golf club before entering Fentress Substation.

HF Route 1 is an overhead route that would include the expansion of the ROW for the Landstown to Virginia Beach transmission line ROW (TL-2118/147) and the wreck-and-rebuild and expansion of portions of the rights of way for the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty Line TL-2240. HF Route 1 would utilize both greenfield and existing rights-of-way.

The considered resources that lie within the VDHR tiers for HF Route 1 are presented in Table 2.3.2-1 and depicted in Attachment 2, Sheet 2. For the resources intersected by the transmission line ROW, the distance along the line is provided. Resources that extend from one tier into the next are only presented once in the tier nearest the proposed transmission line. There are six aboveground historic properties identified within the VDHR tiers for HF Route 1. Based on the findings from the records review, HF Route 1 intersects approximately 390 feet of the Albemarle & Chesapeake Canal (131-0044/131-5333-0022) and approximately 0.43 mile of the Albemarle & Chesapeake Canal Historic District (131-5333). The six considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3.2-1: Historic Resources in VDHR Tiers for HF Route 1

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	-
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/William Woodhouse House
		134-0072	Thomas Lovett House/Rollingswood Academy
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District (0.43-mile segment of ROW intersects resource)
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal (390-foot segment of ROW intersects resource)

2.3.3 Harpers to Fentress Route 2

HF Route 2 follows the same alignment as HF Route 1 until Landstown Road. At this point, HF Route 2 turns south until it reaches the Albemarle & Chesapeake Canal. HF Route 2 then turns west and rejoins HF Route 1 near its intersection with Mt. Pleasant Road and then continues south to the Fentress Substation. This route includes an expansion of the existing rights-of-way for the Landstown to Virginia Beach transmission line ROW (TL-2118/147) and the wreck-and-rebuild and expansion of portions of the rights of way for the existing Landstown-Pocaty transmission line (TL-271), and the Fentress-Pocaty Line TL-2240. HF Route 2 would utilize both greenfield and existing rights-of-way.

The considered resources that lie within the VDHR tiers for HF Route 2 are presented in Table 2.3.3-1 and depicted in Attachment 1, Sheet 3. For the resources intersected by the transmission line ROW, the distance along the line is provided. Resources that extend from one tier into the next are only presented once in the tier nearest the proposed transmission line. There are six aboveground historic properties identified within the VDHR tiers for HF Route 2. The route runs parallel to the Albemarle & Chesapeake Canal (131-0044) on its south side and the Albemarle & Chesapeake Canal Historic District (131-5333), and intersects the eastern boundaries of both. The route traverses an approximately 0.61-mile portion of the district, as well as an approximately 420-foot segment of the canal itself. The six considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3.3-1: Historic Resources in VDHR Tiers for HF Route 2

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	–
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/William Woodhouse House
		134-0072	Thomas Lovett House/Rollingswood Academy
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District (0.61-mile segment of ROW intersects resource)
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal (420-foot segment of ROW intersects resource)

2.3.4 *Harpers to Fentress Route 3*

HF Route 3 leaves the Harpers Switching Station and turns west at Dam Neck Road. The route next turns south near the intersection of Dam Neck Road and London Bridge Road. The route then joins the SEPG corridor along the same alignment as HF Routes 1 and 2 up to Landstown Road. From this point HF Route 3 follows the same alignment as HF Route 2 to the Fentress Substation. This route includes an expansion of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) and a wreck-and-rebuild and expansion of portions of the rights of way for the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty Line TL-2240. HF Route 3 utilizes a combination of both greenfield and existing ROW.

The considered resources that lie within the VDHR tiers for HF Route 3 are presented in Table 2.3.4-1 and depicted in Attachment 2, Sheet 4. For the resources intersected by the transmission line ROW, the distance along the line is provided. Resources that extend from one tier into the next are only presented once in the tier nearest the proposed transmission line. There are six aboveground historic properties identified within the VDHR tiers for HF Route 3. The route runs parallel to the Albemarle & Chesapeake Canal (131-0044) on its south side and the Albemarle & Chesapeake Canal Historic District (131-5333), and intersects the eastern boundaries of both. The route traverses an approximately 0.61-mile portion of the district, as well as an approximately 420-foot segment of the canal itself. The six considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3.4-1: Historic Resources in VDHR Tiers for HF Route 3

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	–
0.5 to 1.0	Locally Significant Resources	134-0038	Jonathan Woodhouse House/William Woodhouse House
		134-0702	St. John's Baptist Church
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District
	Locally Significant Resources	134-0072	Thomas Lovett House/Rollingswood Academy
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District (0.61-mile segment of ROW intersects resource)
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal (420-foot segment of ROW intersects resource)

2.3.5 Harpers to Fentress Route 4

HF Route 4 follows the same alignment of HF Routes 1 and 2 until a point east of Landstown Road. HF Route 4 then continues south along the TL-2085 corridor. The route next turns west, crossing North Landing Road and the Albemarle & Chesapeake Canal then joins HF Routes 2 and 3. HF Route 4 then follows the same alignment as HF Routes 2 and 3 to the Fentress Substation. This route includes an expansion of the existing Landstown to Virginia Beach transmission line (TL-2118/147) and Landstown to West Landing transmission line (TL-2085) rights of way as well as a wreck-and-rebuild of portions of the rights of way for the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty Line TL-2240. HF Route 4 utlizes a combination of both greenfield and existing ROW.

The considered resources that lie within the VDHR tiers for HF Route 4 are presented in Table 2.3.5-1 and depicted in Attachment 2, Sheet 5. For the resources intersected by the transmission line ROW, the distance along the line is provided. Resources that extend from one tier into the next are only presented once in the tier nearest the proposed transmission line. There are six aboveground historic properties identified within the VDHR tiers for HF Route 4. The route runs parallel to the Albemarle & Chesapeake Canal (131-0044) on its south side and the Albemarle & Chesapeake Canal Historic District (131-5333), and continues east, past the boundaries of these resources. The route traverses an approximately 0.75-mile portion of the district, as well as an approximately 715-foot segment of the canal itself. The six considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3.5-1: Historic Resources in VDHR Tiers for HF Route 4

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	–
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/William Woodhouse House
		134-0072	Thomas Lovett House/Rollingswood Academy
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District (0.75-mile segment of ROW intersects resource)
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal (715-foot segment of ROW intersects resource)

2.3.6 Harpers to Fentress Route 5

HF Route 5 follows the same alignment as HF Route 4 to a point just east of the Albemarle & Chesapeake Canal. HF Route 5 deviates from HF Route. Instead of turning west at the canal like HF Route 4, HF Route 5 turns southwest, crosses the Albemarle & Chesapeake Canal and then follows an alignment south of Fentress Naval Air Station. The route then turns to the northwest to Fentress Substation. This route includes an expansion of the rights of way of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) and Landstown to West Landing transmission line (TL-2085) and a wreck-and-rebuild of a small (0.16-mile) section of the existing ROW for the Fentress-Pocaty Line TL-2240. HF Route 5 utilizes a combination of greenfield and existing rights-of-way.

The considered resources that lie within the VDHR tiers for HF Route 5 are presented in Table 2.3.6-1 and depicted in Attachment 2, Sheet 6. For the one resource intersected by the transmission line ROW, the distance along the line is provided. Resources that extend from one tier into the next are only presented once in the tier nearest the proposed transmission line. There are six aboveground historic properties identified within the VDHR tiers for HF Route 5. The route intersects approximately 60 feet of the southeast corner of the Albemarle & Chesapeake Canal Historic District (131-5333). The six considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3.6-1: Historic Resources in VDHR Tiers for HF Route 5

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	–
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/William Woodhouse House
		134-0072	Thomas Lovett House/Rollingswood Academy
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District (60-foot segment of ROW intersects resource)

2.3.7 Harpers to Fentress Hybrid Route

HF Hybrid Route follows the same alignment as HF Route 1, but consists of a partially underground and partially aboveground alternative solution. The HF Hybrid Route does not include the Harpers Switching Station (as used for HF Routes 1–5) and instead includes the Chicory Switching Station to the north of Princess Anne Road. A portion of the underground segment of the route would be constructed adjacent to the Landstown to Virginia Beach transmission line (TL-2118/147). A portion of the overhead segment of the route would include a wreck-and-rebuild of portions of the rights of way for the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty Line TL-2240. The HF Hybrid Route utilizes a combination of both greenfield and existing rights of way.

The considered resources that lie within the VDHR tiers for HF Hybrid Route are presented in Table 2.3.7-1 and depicted in Attachment 2, Sheet 7. For the resources intersected by the transmission line ROW, the distance along the line is provided. Resources that extend from one tier into the next are only presented once in the tier nearest the proposed transmission line. There are six aboveground historic properties identified within the VDHR tiers for HF Hybrid Route. Based on the findings from the records review, HF Hybrid Route intersects approximately 390 feet of the Albemarle & Chesapeake Canal (131-0044/131-5333-0022) and approximately 0.43-mile of the Albemarle & Chesapeake Canal Historic District (131-5333). The six considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3.7-1: Historic Resources in VDHR Tiers for HF Hybrid Route

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	–
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/William Woodhouse House
		134-0072	Thomas Lovett House/Rollingswood Academy
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District (0.43-mile segment of ROW intersects resource)
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal (390-foot segment of ROW intersects resource)

2.4 Previous Surveys

Much of the proposed Project alternatives have been subjected to previous cultural resource survey coverage. Thirty previous cultural resource surveys intersect at least one of the alternative routes under consideration. Among these, three surveys associated with the SEPG have been conducted that overlap all the routes, and together cover substantial portions of the proposed Project alternatives (Traver and Ralph 1989; Higgins et al 1994; Baicy et al. 2005).

Seventeen cultural surveys have been conducted in the vicinity of the CLH Route, with the majority associated with the Camp Pendleton Historic District (Robison and Seckinger 1987a, 1987b; Bussey and Traver 1992; Boyko and Boyko 2008; Markell et al. 2007; Monroe et al. 2017) or Naval Station Oceana (Hornum et al. 1994; Wittkofski 1980; Shmookler 1996; Madsen et al. 1996; Shmookler 1996; Jensen 2003; Clement. 2011). The remainder dealt with road improvements to Oceana Boulevard and Birdneck Road (Egghart and Boyd 1991; Busby and Bashman 1993; Hodges and Stephenson 1997).

An array of previous surveys on road improvements intersect a small portion of all of the HF Routes between Dam Neck Road and Princess Anne Road/North Landing Road (Clark and Bowden. 2000; Brady and Lautzenheiser 2000; Tippett 2002; Tyrer and Muir-Frost 2017a, 2017b). Two of these surveys extend farther, to Indian River Road to follow more of HF Routes 4 and 5 (Stuck et al. 1997; McDonald and Meyers. 2002). These two surveys are associated with and conform to the Landstown to West Landing transmission line's (TL-2085) existing ROW.

A small portion of HF Routes 1 through 4 and the Hybrid Route intersect a proposed solar project that is located in an existing ROW (Smith 2018). One previous survey on the canal intersects HF Route 1 and the HF Hybrid Route (Penner 2003). Another intersects HF Route 4 at Salem Road (Bott 1980). Finally, a small portion of a survey on the North Landing Bridge Replacement intersects HF Route 4 (Goode et al. 2019).

Additional information on these previous surveys is provided in Table 2.4-1. The extent of the previous survey coverage is depicted in the maps provided in Attachment 3.

Table 2.4-1: Cultural Resource Surveys Covering Portions of the Alternative Routes

VDHR Survey #	Title	Author	Date
CS-019	Phase I Cultural Resource Survey of the Proposed Build Alternatives for the Southeastern Expressway in the Cities of Chesapeake and Virginia Beach, Virginia	Traver, Jerome D., and Maryanna Ralph	1989
CS-034	Phase I Archaeological Survey of Approximately 2,000 Acres at Naval Air Station Oceana, Virginia Beach, Virginia and Naval Auxiliary Landing Field Fentress, Chesapeake City, Virginia	Hornum, Michael B, Patrick Giglio, and William T. Dod	1994
CS-044	Additional Phase I Cultural Resource Survey of Revised Alignments for Proposed Southeastern Expressway, Cities of Chesapeake and Virginia Beach, Virginia	Higgins, Thomas F. III, Anne S. Beckett, and Veronica Deitrick	1994
CS-078	Archaeological Survey, Proposed Southeastern Parkway and Greenbelt, Cities of Chesapeake and Virginia Beach, Virginia	Baicy, Daniel, Loretta Lautzenheiser, and Michael Scholl	2005
CS-137	Phase I Cultural Resource Survey of the ±233-Hectare (±576-Acre) Bedford Solar Project Area, City of Chesapeake, Virginia	Smith, Hope	2018
VB-015	An Archaeological Survey of the Virginia National Guard Camp Pendleton Training Camp Site, City of Virginia Beach, Virginia	Robison, Neil, and Ernie Seckinger	1987
VB-017	A Phase I Archaeological Reconnaissance Survey of the Proposed Improvements to the Entrance to Oceana Naval Air Station, Virginia Beach, Virginia	Wittkofski, J. Mark	1980
VB-025	Review and Compliance Phase I Reconnaissance Summary: North Landing River Bridge Replacement	Bott, Keith	1980
VB-035	An Archeological Survey of the Naval Amphibious Base Annex, Camp Pendleton, Virginia Beach, Virginia	Robison, Neil, and Ernie Seckinger	1987
VB-037	Phase I Cultural Resource Survey Along Proposed Improvements to Oceana Boulevard in Virginia Beach, Virginia	Egghart, Christopher, and Luke Boyd	1991
VB-038	Phase I Archaeological Survey of a Proposed U. S. Navy Construction Project at Owl Creek in Virginia Beach, Virginia	Bussey, Stanley B., and Jerome D. Traver	1992
VB-047	Phase I Cultural Resource Survey, Birdneck Road, City of Virginia Beach, Virginia	Busby, Virginia, and Leslie Bashman	1993
VB-064	Phase I Archaeological Identification Survey in Support of 1995 Base Realignment and Closure, Naval Air Station Oceana, Virginia Beach, Virginia	Shmookler, Leonid I.	1996

VDHR Survey #	Title	Author	Date
VB-066	An Addendum to Phase I Cultural Resource Study of Proposed Improvements to Oceana Boulevard and First Colonial Road in Virginia Beach, Virginia	Hodges, Mary Ellen N., and Margaret Long Stephenson	1997
VB-069	Phase I Archaeological Survey of Proposed Landstown-West Landing, 230 KV Transmission Line, Virginia Beach, Virginia	Stuck, Kenneth E., and Thomas F. Higgins III	1997
VB-079	Archaeological Survey along a Portion of Holland Road (Route 410), the City of Virginia Beach, Virginia	Clarke, Robert, and Bradley Bowden	2000
VB-082	Archaeological Identification Survey, Princess Anne Road and Ferrell Parkway, City of Virginia Beach, Virginia	Brady, Ellen M., and Loretta Lautzenheiser	2000
VB-087	Phase I Archeological Survey of Approximately 583 Acres at Naval Air Station Oceana, Virginia Beach, Virginia	Madsen, Andrew D., Michael B. Hornum, Steven A. Mallory, and W. Patrick Giglio	1996
VB-088	Archaeological Survey of Route 165 (Princess Anne Road) Between Dam Neck Road and Judicial Boulevard, Virginia Beach, Virginia: Management Summary	Tippett, Lee	2002
VB-091	Phase I Archaeological Identification Survey in Support of 1995 Base Closure and Realignment, Naval Air Station Oceana, Virginia Beach, Virginia	Shmookler, Leonid I.	1996
VB-095	Archaeological Identification Survey and Archaeological Evaluations of Nine Sites Along the Proposed Landstown-West Landing 230 KV Transmission Line, City of Virginia Beach, Virginia	McDonald, Bradley, and Maureen Meyers	2002
VB-097	Supplemental Archaeological Survey of Two Canals within the Proposed Realignment of Elbow Road, City of Virginia Beach, Virginia	Penner, Bruce R.	2003
VB-099	Phase I Archaeological Identification Survey of the Proposed Security Improvements (P-445/P-509), NAS Oceana, Virginia Beach, Virginia	Jensen, Todd L.	2003
VB-125	Phase I Archaeological Survey of the State Military Reservation, 83.81 ha (207 Acres) at Camp Pendleton, Virginia Beach, Virginia	Boyko, Wayne C. J., and Beverly A. Boyko	2008
VB-143	Phase I Archaeological Investigation of Approximately 170 Acres at Naval Air Station Oceana, Virginia Beach, Virginia	Clement, Christopher	2011
VB-145	Survey of the Architectural and Archaeological Cultural Resources at the Virginia Air National Guard Installations at the Richmond International Airport, Henrico County and the State Military Reservation, Camp Pendleton, City of Virginia Beach, Virginia	Markell, Ann, Katherine Kuranda, Katherine Grandine, and Nathan Workman	2007

VDHR Survey #	Title	Author	Date
VB-173	Phase I Cultural Resources Survey of Landstown Road Improvements, City of Virginia Beach, Virginia	Tyrer, Carol D., and Dawn M. Muir-Frost	2017
VB-174	Completion and Synthesis of Archaeological Survey, State Military Reservation Camp Pendleton, City of Virginia Beach, Virginia	Monroe, Elizabeth J., David W. Lewes, and Ellen L. Chapman	2017
VB-183	Addendum to Phase I Cultural Resources Survey of Landstown Road Improvements, City of Virginia Beach, Virginia	Tyrer, Carol D., and Dawn M. Muir-Frost	2017
VB-193	Phase I Archaeological and Architectural Reconnaissance Surveys for the North Landing Bridge Replacement, Albemarle and Chesapeake Canal/State Route 165; Cities of Chesapeake and Virginia Beach, Virginia	Goode, Charles E., Sarah G. Traum, and Cynthia V. Goode	2019

3 STAGE I PRE-APPLICATION ANALYSIS FINDINGS

3.1 Methods for Analysis

Fieldwork for the pre-application analysis was conducted by Secretary of the Interior Qualified architectural historian Mary Beth Derrick and photographer Vincent Macek between March 30 and April 7, 2021, and again on August 26, 2021. The fieldwork involved photographing 11 resources requiring visual assessment according to VDHR Guidelines and examining the potential line-of-sight views from each resource towards the proposed transmission lines. For resources where property owner approval was granted for historic resource documentation, photographs were taken towards the proposed transmission line(s) on the property at the most prominent view of the landscape. When permission was not available, the photographs were taken from public ROW.

Photographs were taken from each resource, with an effort to capture the direction with the clearest, most unobstructed view toward the Project. The precise location of the photograph was captured with a mobile tablet device connected to a sub-meter accurate Global Navigation Satellite System (GNSS) receiver, the Trimble R1. The locations of where the photographs were taken were noted as Simulation Points (SP). The SPs were prioritized based on their location in relation to the proposed site(s), so that viewpoints east of the site were visited in the morning and viewpoints west of the site were visited in the afternoon to ensure, where possible, that the sun was behind the photographer at the time that viewpoint photography was captured. Additionally, minor adjustments to position were made in order to obtain as clear a view to the site center as possible, avoiding trees, landscaping, or man-made obstructions. Tablets recorded the center bearing, angle of view, altitude, and camera lens height. Upon receipt of the viewpoint location information, the viewpoints were plotted on to Environmental Systems Research Institute (ESRI) Opensource mapping using the Universal Transverse Mercator (UTM) 18N coordinate system.

The process of taking panoramas included setting up the tripod and camera. The camera was placed on the panoramic head in a landscape orientation where its lens height was confirmed and set at 1.5 m (please note: a portrait camera orientation was sometimes used in situations where the viewpoint is very close to a development in order that the top of the development is not cut off by the image boundaries). The tripod head and camera combination was then levelled. With the camera's viewfinder centered on the perceived site center, exposure and focus settings were taken. These were then fixed manually on the camera so that they could not be inadvertently altered. The head was rotated 90 degrees to the left where the first frame of the 360 degree sequence was then taken. Each subsequent frame was taken using a 50 percent overlap of the previous frame until the full 360 degree sequence was captured. The camera was then removed from the tripod and a viewpoint location photograph was captured showing the tripod in its position.

The following camera and tripod configuration was used:

- Camera body: Nikon D800 professional specification digital SLR (full frame CMOS sensor)
- Camera lens: Nikkor AF 50mm f1.8 prime
- Tripod: Manfrotto 055MF4 with Manfrotto 438 ball leveller
- Panoramic head: Manfrotto 303SPH

The following camera settings were used for all photography:

- Camera mode: Manual Priority
- ISO: 100
- Aperture: f13
- Image format: RAW

After the photos were complete, they were uploaded to a server to begin the simulation/visualization process. The single-frame photographs were opened in Adobe Photoshop CC 2021 where they were checked and any camera sensor dust spots were removed before being saved as high resolution JPEG images. If required, discrete color and tonal adjustments were made to each frame before they were saved. The single-frame photographs were stitched together in PTGui Pro version 10.0.12 professional photographic stitching software using cylindrical projection settings. These were saved at 90-degree fields of view as high resolution JPEG images. The camera locations were plotted in Resoft Windfarm version 5 and models of the proposed transmission line structures were then built using the supplied dimensions. The positions of each structure for each proposed route were then plotted in the software for use in the computer model. 2D wireline imagery was produced at the 90-degree fields of view using a cylindrical projection. Wirelines for each route and each tower combination were then exported for use as an overlay.

Detailed, correctly dimensioned 3D computer models of the proposed Project routes were generated using Autodesk 3DS Max 2021. The virtual 3D model of the structures was created using the real-world measurements and elevation drawings provided by the Company. These were textured using photorealistic image maps of the required Corten steel texture. The detailed, textured models were rendered to a digital image using a simulated physical camera and sun and sky simulation lighting model in the computer software consistent with conditions within the original viewpoint photography.

Photomontages were produced by overlaying the rendered image on the photograph, using known control points and the wireline imagery showing the tower columns at the correct height and distance. Final adjustments were then made to brightness and contrast of the rendered images to match them to the photograph. Final photomontages were prepared from each viewpoint for each route. These were then opened in Adobe Photoshop CC 2021 where minor changes were made such as placing relevant tree/building/hedge screening or telegraph wires over the proposed development renders where necessary. Finally, the final images were cropped to the proportions required for the visual simulation figures and the visualization figures were prepared in Adobe Indesign CC2021 and exported out in a PDF format.

3.2 Structure Types and Right-of-Way Widths

The photosimulations prepared according to the methods discussed above utilized specifications for the types of transmission line structures to be used along different portions of the proposed routes, the spacing and locations of those structures, and the width of new ROW that would be required in different locations. This section summarizes the ROW and transmission line structure specifications for the different types of settings along each proposed overhead route. In most settings, Dominion Energy Virginia will use three single-circuit monopole structures for the proposed CVOW Project. The new structures will be constructed of weathering steel (COR-TEN®), with average heights ranging from 115 to 120 feet depending on the particular route.[3] For each overhead route segment, tower heights would be highest at the ICW/North Landing River crossing, where the heights for structures closest to the

3 Tower heights range from 75 feet to 170 feet for HF Routes 1 and 4 and the Hybrid Route; 75 feet to 155 feet for Routes 2 and 3; and 75 feet to 150 feet for Route 5.

waterbody would be 145 feet for HF Routes 2 and 3, 150 feet for Route 5, and 170 feet for Routes 1 and 4 and the Hybrid Route.

3.2.1 Greenfield Areas

The typical construction and operational ROW in greenfield segments of the overhead routes will measure 140 feet wide (Attachment 4, Figure 1).

3.2.2 Collocation with TL-2118/147

Where route segments are collocated with the existing TL-2118/147 transmission line, the existing ROW will be expanded from 120 feet to 225 feet in width (i.e., by an additional 105 feet) to accommodate the three single-circuit structures required for the Project (Attachment 4, Figure 2). The CVOW construction corridor will measure 140 feet wide, including 35 feet of overlap with the existing ROW.

3.2.3 Collocation with TL-2085

Where route segments are collocated with the existing TL-2085 transmission line, the existing ROW will be expanded from 120 feet to 210 feet in width (i.e., by an additional 90 feet) to accommodate the three single-circuit structures required for the Project (Attachment 4, Figure 3). The CVOW construction corridor will measure 140 feet wide, including 50 feet of overlap with the existing ROW.

3.2.4 Wreck and Rebuild TL-271

Route segments adjacent to TL-271 will require a wreck-and-rebuild of the existing TL-271 double-circuit structures and construction of two additional single-circuit structures for a total of three structures. One structure will be double-circuit to carry TL-271 and one of the new CVOW circuits. The other two structures will each carry one CVOW circuit. The existing TL-271 corridor is 120 feet wide. In most places an additional 40 feet of new right-of-way will be needed for a total right-of-way width of 160 feet (Attachment 4, Figure 4). The additional 40 feet will generally be on the west side of the existing right-of-way where two new single circuit monopole structures will be utilized in addition to the rebuilt double circuit monopole structures for Line TL-271. There are exceptions to this configuration:

i. In Virginia Beach where the existing right-of-way crosses: (1) the Highland Acres and Highland Meadows subdivisions, and (2) the Dewberry Farms, Indian River Woods, and Indian River Farms subdivisions. In these two places, the right-of-way will be limited to the existing 120-foot width due to adjacent residential development that precludes expansion of the Line TL-271 right-of-way. The existing double circuit lattice structures will be wrecked and replaced with double circuit monopole structures to carry Line TL-271 and one Overhead Transmission Circuit, and new double circuit monopole structures will be installed to carry two Overhead Transmission Circuits (Attachment 4, Figure 5).

ii. In Chesapeake where the existing right-of-way crosses: (1) Mount Pleasant Road, a non-typical structure configuration will be used along a 0.3-mile-long segment within the existing 120-foot right-of-way to avoid impacts on a home; and (2) Bedford Solar Center, the additional 40 feet of new right-of-way will be on the east side of the existing right-of-way for an approximately 0.4-mile-long segment in the area immediately north of the existing Pocaty Substation (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way).

During construction, CVOW will use the entire width of the existing ROW (120 feet) plus the additional 40 feet of new ROW.

3.2.5 Wreck and Rebuild TL-2240

Route segments adjacent to TL-2240 will require a wreck-and-rebuild of the existing TL-2240 double-circuit structures and construction of two additional single-circuit structures for a total of three structures. One structure will be double-circuit to carry TL-2240 and one of the new CVOW circuits. The other two structures will each carry one CVOW circuit. The existing TL-2240 corridor is 120 feet wide. An additional 40 feet will be needed for the Project, for a total ROW width of 160 feet (see Attachment 4, Figure 4 TL 271 for example). During construction, CVOW will use the entire width of the existing ROW (120 feet) plus the additional 40 feet of new ROW.

3.3 Assessment of Potential Impacts

Assessment of potential Project impacts on individual resources made use of the visual assessment findings and categorized the level of severity of impacts according to the scale devised by VDHR:

None - Project is not visible from the resource.

Minimal - Viewsheds have existing transmission lines, there would be only a minor change in height, and/or other views are partially obscured by topography or vegetation.

Moderate - Viewsheds have more expansive views of the transmission line, more dramatic changes in height are proposed, and/or the overall visibility of the Project would be greater.

Severe - Existing viewshed contains no transmission line, the view to the Project would be relatively unobstructed, the new transmission line would introduce a significant change to the setting of historic properties, and/or a dramatic change in the height of an existing transmission line would take place in close proximity to historic properties. A severe impact corresponds to an adverse effect under the Section 106 review process.

3.4 Historic Resource Descriptions

3.4.1 131-0044/131-5333-0002, Albemarle & Chesapeake Canal

The Albemarle & Chesapeake Canal is a contributing resource to the NRHP-listed Albemarle & Chesapeake Canal Historic District (Attachment 5, Figure 1). In addition, the VDHR determined the canal to be individually eligible for listing in the NRHP in 1990. The portion recorded as 131-0044 is the 9-mile-long Virginia cut, which links the North Landing River on its eastern end with the Southern Branch of the Elizabeth River on its western end. The only lock in the system is located at Great Bridge on the western end of the cut, along with associated maintenance facilities. The water route connects Albemarle Sound with Norfolk, Virginia and the Chesapeake Bay. It was constructed in the 1850s and widened from 80 feet to 90 feet in the 1910s by the U.S. Army Corps of Engineers. It has been dredged several times since then and is still in use. The setting of the canal varies from urban at the western end to rural at the eastern end.

The boundaries of the resource are defined on the east by Bridge #1826 (131-5333-0020) over North Landing River on Mt. Pleasant Road, on the west by Great Bridge Locks (131-5333-0001), and on the north and south by the banks of the existing canal, which does not have a towpath. In addition to the bridge on Mt. Pleasant Road, the canal is crossed by two other historic bridges: Bridge #8003 on Centerville Turnpike (131-5333-0017), and the Norfolk Southern Railroad Bridge (131-5333-0016). The portion of the canal that could be impacted by proposed Project alternatives is the eastern approximate 5.3 miles, which includes the Mt. Pleasant Road and Centerville Turnpike bridges.

The Albemarle & Chesapeake Canal is a well-preserved example of a nineteenth-century coastal canal. It has been determined eligible for the NRHP at the state level in the areas of Technology/Engineering and

Transportation/Communication under Criterion A for its association with events that contribute to the broad patterns of history. It lies within the study area for HF Routes 1 through 5 and the Hybrid Route.

3.4.2 131-5071, Centreville-Fentress Historic District

The Centreville-Fentress Historic District encompasses 257 acres around the village of Centreville, which developed in the 1880s around a stop on the Norfolk and Elizabeth City Railroad (later the Norfolk Southern Railroad). The town also had a connection to the nearby Albemarle & Chesapeake Canal, constructed in the 1850s. The district includes 24 contributing and 33 non-contributing properties (Attachment 5, Figure 2). The village declined as the railroad faded in importance in the second quarter of the twentieth century. The Centreville-Fentress Historic District is a well-preserved example of a rural farming community with a small commercial core that developed in the nineteenth century due to transportation improvements and declined as railroads and agriculture became less prominent elements of the economy of the eastern seaboard.

The district is bounded roughly on the north by Blue Ridge Road, on the east by farmland, on the south by Whittamore Road, and on the west by the Norfolk and Southern Railroad. The contributing residences in the district are primarily late nineteenth century farmhouses that exhibit Colonial Revival, Queen Anne, and Craftsman influences within their vernacular forms. The brick New Burfoot House, built in 1925, is the only brick residence from the period of significance. The Centerville Baptist Church, also constructed in 1925, is a prominent brick structure that is a focal point of the district. A frame store is the only contributing commercial building in the district. The Centreville-Fentress Historic District meets Criterion C for its association with community planning and development and Criterion A for its association with transportation during the period of significance from 1871 to 1940. The district was listed in the NRHP and Virginia Landmarks Register (VLR) in 2003. The Centreville-Fentress Historic District lies within the study area for HF Routes 1 through 5 and the Hybrid Route.

3.4.3 131-5333, Albemarle & Chesapeake Canal Historic District

The Albemarle & Chesapeake Canal Historic District encompasses 1,704 acres along the 9-mile-long, 90-foot-wide canal between Great Bridge on the west and North Landing Bridge on the east (Attachment 5, Figure 3). The district is comprised of three contributing structures, eight contributing buildings, and a previously NRHP-listed contributing site. The contributing structures include the Virginia Cut of the canal, completed in 1859 and widened in the 1910s; the Great Bridge Canal Lock, which replaced the old lock in 1932; and the North Landing Bridge. The eight contributing buildings are all part of the Great Bridge Corps of Engineers Reservation constructed in the 1930s and 1940s as maintenance facilities for the canal. The Battle of Great Bridge site is a previously-listed NRHP property that is also a contributing resource to the Albemarle & Chesapeake Canal Historic District. The setting of the canal varies from the heavily developed Great Bridge community at the western end to large areas of swampland and undeveloped deciduous forests along the eastern half of the canal. The canal has been dredged several times since it was widened to 90 feet and it is still in use.

The boundaries of the district are defined by the Great Bridge Locks on the west, the North Landing River Bridge on the east, and an approximately 100-foot border on either side of the canal on the north and south, which represents the property acquired by the Albemarle and Chesapeake Canal Company in 1855 to construct the canal. The portion of the canal within the study area is the eastern approximately 5.3 miles of the canal, which includes the contributing North Landing River Bridge. The other contributing resources are outside of the study area to the west.

The Albemarle & Chesapeake Canal Historic District is a well-preserved example of a nineteenth-century coastal canal and its associated features. It was listed in the VLR in 2002 and the NRHP in 2004. It is significant at a state level under Criterion A as a property that is associated with events that have contributed to the broad patterns of history in the areas of Transportation, Engineering, and Military for the period of 1775–1953. It lies within the study area for HF Routes 1 through 5 and the Hybrid Route.

3.4.4 134-0003/134-5027-0004, James Bell House

The James Bell House, also known as Cedar Grove, is located at 805 Oceana Boulevard in the City of Virginia Beach (Attachment 5, Figure 4). It is part of the Oceana Naval Air Station Historic District and is accessed via an approximately 950-foot driveway flanked by cedar trees that lead to a manicured lot.

134-0003/134-5027-0004 includes a dwelling and garage. The dwelling is a circa 1810, two-story, Federal style structure clad in common bond brick and featuring a side-gabled metal roof with side parapets. The five-bay dwelling has paired interior-end brick chimneys on the north and south elevations and features six-over-six double-hung wood sash windows. The windows are flanked by wooden shutters. The entrance is located on the east elevation through a six-panel wooden door and a vinyl storm door with four-paned sidelights and a three-paned transom. The entrance is accessed via a flat-roofed portico with a brick foundation, and concrete floor. The portico features a pair of Doric pilasters and Doric columns. The dwelling features three additions, including two on the west elevation, and one on the south elevation.

In addition to the dwelling, the James Bell House also includes a circa 1940 garage with a front-gabled, rolled asphalt roof, vinyl siding, and a concrete foundation. It features six-over-six windows and is accessed via a vinyl personnel door on its east elevation. A two-door garage door is located on its north elevation. Both the dwelling and garage are in good condition. The James Bell House was determined eligible for listing on the NRHP in 2011 and is a contributing property to the Oceana Naval Air Station Historic District, which was determined ineligible for listing on the NRHP in 2017. It lies within the study area for the CLH Route.

3.4.5 134-0038, Jonathan Woodhouse House/William Woodhouse House

The Jonathan Woodhouse House, also known as the William Woodhouse House, is located at 2380 London Bridge Road in the City of Virginia Beach (Attachment 5, Figure 5). The dwelling is located at the end of a private road, approximately 680 feet from the public ROW. The resource is surrounded by modern residential dwellings and a commercial complex. Due to lack of access, ERM architectural historians took photos from the public ROW.

According to aerial views, 134-0038 includes a dwelling and two outbuildings (GoogleEarthPro 2021). According to the V-CRIS form, the Georgian dwelling was built in circa 1760 and was heavily altered in 1981 after a fire destroyed the roof and interior. The dwelling has a rolled asphalt gambrel roof, and Flemish bond brick cladding. The dwelling features two interior-end brick chimneys and shed roof dormers on the upper level with six-over-six windows. According to aerial views, the dwelling also includes a shed-roof addition on its southeast elevation, and a side-gabled addition on its northeast elevation. No other details could be seen from the public ROW.

The two outbuildings seen on aerial views include a gabled structure, and a shed-roofed structure with a lean-to addition. All the structures associated with 134-0038 appear to be in good condition. Although it has been determined not eligible for the NRHP by VDHR staff, Jonathan Woodhouse House is listed in the Virginia Beach Historical Register, and is thus deemed locally significant for purposes of this report. It lies within the study area for HF Routes 1 through 5 and the Hybrid Route.

3.4.6 134-0072, Thomas Lovett House/Rollingswood Academy

The Thomas Lovett House, also known as the Lancaster Lovett House, is located at 1752 Prodan Lane in the City of Virginia Beach and currently operates as the Rollingwood Academy, a daycare facility

(Attachment 5, Figure 6). [Note that Rollingwood Academy is the correct spelling; Rollingswood is retained in the resource name to match what currently appears in V-CRIS.] A modern residential development surrounds the Thomas Lovett House, and a thick group of trees border the northern, eastern, and western edges of the parcel.

The former dwelling is a circa 1772 Georgian structure with a gambrel roof sheathed in square-butt wood shingles, replacement vinyl siding, and a continuous brick foundation. The Thomas Lovett House features five shed-roofed dormers on its southwest elevation with nine-over-six replacement vinyl windows. The remainder of the windows in the former dwelling feature the same configuration as the dormer windows. The northwest and southeast elevations feature exterior-end brick chimneys. The primary entrance is centered on the southwest elevation through a replacement vinyl door with two lower panels and one upper light with a nine-paned applied muntin. The entrance is accessed via a set of semi-circular brick steps that lead to a small brick stoop. The Thomas Lovett House also features a modern gambrel-roofed addition on the northeast elevation built in 1999, and a modern shed-roof addition on the southeast elevation (City of Virginia Beach Real Estate Assessor's Office 2021).

Aerial views also show a circa 1990 shed to the north of the dwelling. Both the dwelling and shed appear to be in good condition. Although it has been determined not eligible for the NRHP by VDHR staff, it is listed on the City of Virginia Beach Historic and Cultural Overlay Districts, and is thus deemed locally significant for purposes of this report. It lies within the study area for HF Routes 1 through 5 and the Hybrid Route.

3.4.7 134-0413, Camp Pendleton/State Military Reservation Historic District

The Camp Pendleton/SMR Historic District occupies 343 acres on the Atlantic Ocean in the City of Virginia Beach (Attachment 5, Figure 7). The facility was established in 1911 as the State Rifle Range, and has served as a training facility for the Virginia National Guard, as well as for the U.S. Navy during World War I, and the U.S. Army during World War II and at other times since then. The historic district includes 130 contributing resources, consisting of 113 buildings, eight structures, eight sites, and one object. The buildings are primarily utilitarian-type military buildings, including barracks, mess halls, classroom buildings, administration buildings, and maintenance and storage facilities, but they also include residential cottages, a firehouse, a chapel, an officers' club, an armory, and a service station. Contributing structures include building foundations, loading docks, an observation deck, a water tower, and the road network. Six of the eight contributing sites are historic landscapes that include the parade ground, camp area, drill field, two rifle ranges, and the beachfront. The district is surrounded by modern development, but within the boundaries of the camp, the setting is mostly open grassy lawns and training areas, with areas of park-like woods, a lake, and ordered, modest buildings arranged by function. The Camp Pendleton SMR Historic District represents a well-preserved example of a twentieth century military training facility that includes a large number of historical buildings, structures, and landscapes.

The boundaries of the district consist of the Croatan residential neighborhood to the north, the Atlantic Ocean to the east, Birdneck Avenue to the south, and General Booth Boulevard to the west. The majority of the buildings in the district date to the period of expansion during World War II. They were constructed in the style of temporary military structures, but have continued to serve the needs of the Virginia National Guard and its tenants. A handful of buildings from the original State Rifle Range remain, along with those from the period between the world wars. The majority of the buildings in the district are of frame construction and reflect function over form.

The Camp Pendleton/SMR Historic District meets Criterion A of the NRHP as a well-preserved twentieth century military training facility that adapted to the needs of state and federal defense needs. It is also meets Criterion C for its representative examples of twentieth century military architectural styles from different periods of the early twentieth century. The district was originally listed in the VLR in 2004 and the

NRHP in 2005. Additional documentation was conducted in 2013. The updated registration form added a number of contributing resources and defined six contributing historical landscapes. The historic district lies within the study area for the CLH Route.

3.4.8 134-0413-0110, Building 1 - Camp Pendleton/State Military Reservation Historic District

Building 1 is located on the Camp Pendleton State Military Reservation at Warehouse Road (Attachment 5, Figure 8). It is a non-contributing resource to the NRHP-listed Camp Pendleton/State Military Historic District. However, the structure itself was individually listed on the NRHP in 2012.

134-0413-0110 is a one-story storage structure with a front-gabled metal roof, ribbed metal siding, and a poured concrete foundation built in 1988. The south elevation features a metal garage door and a metal personnel door. A light is centered above the metal garage door and a chain-link fence is located on the east and west elevations.

The VDHR form presents Building 1 as a NRHP-listed property (Malvasi 2012). However, the building is not of age, and does not appear to be individually listed on the NRHP website's associated update to the district's nomination form (Malvasi 2013). Because it is recorded in V-CRIS as NRHP listed and appeared in the background research, ERM has included the building as a considered resource for the purposes of this report. 134-0413-0110 lies within the study area for the CLH Route.

3.4.9 134-0702, St. John's Baptist Church

St. John's Baptist Church is located at 2300 Holland Road in Virginia Beach (Attachment 5, Figure 9). The church complex is situated between two residential developments to the east and west. A thick tree line borders the northern and eastern edges of the parcel.

134-0702 includes a circa 1880 church and multiple interconnecting structures, including an additional chapel, built to the west of the original chapel. The original chapel is a front-gabled structure with a rolled asphalt roof, clapboard siding, and a continuous brick foundation. Its northern elevation features a central entry tower with a steeple. The windows on the original block's north elevation are four-over-four lancet windows, while the east and west elevations feature four-over-four lancet windows that are arranged in a series of three-unit groupings, separated by mullions. The primary entrance is located on the entry tower's east elevation through a set of wooden double doors with four lower panels and two upper lights. A triangular broken pediment is located above the door. The original church features two pre-1960 wings and a rear addition. According to aerial views, the original church was moved from its original location by the road, to its current location between 2009 and 2011, when the new church was built in its place (NETROnline 2021). Prior to its move, a circa 1970, secondary structure was built, which features a front-gabled roof and brick siding. As of now, a covered walkway connects the original church's west elevation to the secondary structure. Another covered walkway connects the secondary structure's northern elevation to the new church. The church is in good condition.

Although it has not been evaluated for the NRHP by VDHR staff, the site is listed in the Virginia Beach Historical Register (City of Virginia Beach 2017c), and is thus deemed locally significant for purposes of this report. It lies within the study area for HF Routes 1 through 5 and the Hybrid Route.

3.4.10 134-0917, Winford White House

The Winford White House is located at 829 South Birdneck Road in the City of Virginia Beach (Attachment 5, Figure 10). It is situated in a densely forested area with other mid-twentieth century dwellings. Two public elementary schools are located to the east.

134-0917 includes a dwelling and a garage. The dwelling is a circa 1950 vernacular structure with a modern gabled-ell addition. The dwelling's original block has a front-gabled, ribbed metal roof. The foundation has been covered in wood skirting. The northeast elevation has replacement vinyl siding, while the rest of the dwelling features wavy-edge asbestos siding. The dwelling features one-over-one vinyl windows arranged in single and twin configurations, as well as a one-paned picture window. The entrance does not appear to be original, but is currently located on the southeast elevation through a vinyl door with two lower panels and one upper light, as well as a vinyl storm door. It is accessed via a modern wooden deck. According to historic aerial imagery, the side-gabled addition was built between 1970 and 1982 (NETROnline 2021). The addition has a ribbed metal roof, wavy-edge asbestos siding, and a concrete masonry unit foundation. It also features a brick chimney.

134-0917 also includes a circa 1950 garage with a front-gabled roof and replacement channel rustic siding. It is accessed via a pair of hinged, wooden garage doors on the northeast elevation. The dwelling and garage are in good condition. The Winford White House was determined eligible for the NRHP in 2011. It lies within the study area for the CLH Route.

3.5 Historic Resource Findings for Cable Landing to Harpers Route

The impacts to each resource in the CLH Route study area are discussed and illustrated below.

3.5.1 134-0003/134-5027-0004, James Bell House

The underground transmission line associated with CLH Route would run north to south across the street from the James Bell House boundary (Attachment 6, Figure 1). Because it is so close to the ROW, ERM has included it in the ROW tier to account for any potential mapping errors. The proposed route does not intersect the property boundary, but would be located directly east, across a divided highway. CLH Route is underground, therefore the only impact on the resource would be a minor change to its viewshed from a slight tree cut across the street from the property (Attachment 6, Figures 2 through 5). Because the route would create only a minor change to the setting of the resource as a result of the tree cut, there would be a **Minimal Impact** to the property from the proposed route.

3.5.2 134-0413, Camp Pendleton/State Military Reservation Historic District

The underground transmission line associated with CLH Route would run east to west, through the entire district, for 0.92 miles (Attachment 6, Figure 6). 134-0413's eastern portion would not be impacted by the underground route because the circuits in this area would be installed by horizontal directional drill (HDD), a trenchless installation method, and the HDD operation would not require the removal of any existing vegetation. The area around Lake Christine would be bored and no tree cut would occur, as shown through SP 5 and SP10 (Attachment 6, Figures 7 through 10). However, the proposed route would remove trees and vegetation near the western edge of the district, to the north of the main entrance. In addition to the tree cut, this route would also result in the demolition of two contributing structures to the district, Building 410 and Building 59, as shown in SP25 and SP26 (Attachment 6, Figures 11 through 14).[4]

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4 The Company worked closely with staff from SMR through regular meetings and weekly calls to identify a route that minimizes impacts on military training/readiness, natural and cultural resources, and future development plans at the base. SMR staff prefer a route requiring the demolition of Buildings 410 and 59 to preserve other elements of the historic district, including trees considered as contributing elements to the property. Additionally, the route in the vicinity of Buildings 410 and 59 was designed to overlap with portions of two potential future developments at the base which would be compatible with an underground transmission line.

Building 410 is a fire house constructed between 1940 and 1942. Building 59 is a mess hall constructed in 1934, during the period in which the State Rifle Range was expanded between the world wars; it is one of nine nearly identical buildings. Building 410 is a unique structure, constructed for a specific purpose during the World War II expansion of the base. The loss of this building would have a greater impact on the overall integrity of the district, since it represents a specific activity that took place at the facility. While the vegetation is part of the district's historic landscape, it is not as integral to the resource's historic setting and feeling as the built environment. In addition to effects to those buildings, the Project will entail use of workspace near the ruins of the YMCA that once was on the base of Headquarters Road. The ruins, recorded as archaeological site 44VB0388, are of interest to SMR resource managers as a potential historic resource. Project plans call for avoidance of the ruins with a buffer of at least 10 feet, and while tree clearing within the workspace will alter the current viewshed of the YMC ruins, those woodlands are not integral to the site's historical significance. Furthermore the HDD or direct pipe work in the proposed workspace at the Rifle Range will be restored to pre-construction activities. However, because the destruction of the two contributing structures, Buildings 410 and 59, would be permanent, ERM recommends that CLH Route would have a **Severe Impact** on the historic district.

3.5.3 134-0413-0110, Building 1 - Camp Pendleton/State Military Reservation Historic District

As stated previously, the underground transmission line for the CLH Route would run east to west, through the entire Camp Pendleton SMR Historic District. Building 1 within the district is located approximately 0.28 mile to the northwest of the proposed route (Attachment 6, Figure 15). The structure would have no view to CLH Route and would not have a view of any vegetation removal along the ROW because of intervening buildings and vegetation (Attachment 6, Figures 16 and 17). Because the view of the Project from Building 1 is entirely screened, there would be **No Impact** from the CLH Route.

3.5.4 134-0917, Winford White House

The underground transmission line for the CLH Route is located 0.44 mile to the north of 134-0917 (Attachment 6, Figure 18). There would be no view to CLH Route from any vantage point at the Winford White House, nor would any tree or vegetative cut be visible because of intervening buildings and vegetation (Attachment 6, Figures 19 and 20). Because the view would be entirely screened, there would be **No Impact** from CLH Route on 134-0917.

3.6 Historic Resource Findings for Harpers to Fentress Route 1

The impacts to each resource in the HF Route 1 study area are discussed and illustrated below.

3.6.1 131-0044/131-5333-0002, Albemarle & Chesapeake Canal

A 390-foot segment of HF Route 1 intersects the Albemarle & Chesapeake Canal. This overhead route segment is located along a section of the existing Landstown-Pocaty transmission line (TL-271), near where it intersects Mt. Pleasant Road (Attachment 6, Figure 21). The recorded boundary for the resource consists of the 9-mile-long Virginia cut, which links the North Landing River on its eastern end with the Southern Branch of the Elizabeth River on its western end; the Project would affect only a small portion of the overall resource.

HF Route 1 would include a wreck-and-rebuild of the existing double-circuit line structures as well as the construction of two additional single circuit structures, for a total of three new structures. The existing structures adjacent to the canal have heights ranging from 180 to 185 feet; the replacement and new structures immediately adjacent to the canal would have heights of 170 feet. While the Landstown-Pocaty transmission line ROW is currently 120 feet, construction of the new structures required for the HF Route

1 route would expand the ROW in most places by 40 more feet, for a total ROW width of 160 feet. This expansion would include an additional tree cut on either side of the existing line.

Although the proposed structures are shorter than the existing structures, the addition of two more structures would add more modern elements to the historic canal in this area. The photo simulation (SP19) was taken from the closest public ROW on the canal towards HF Route 1 (Attachment 6, Figures 22 and 23). Because the resource is a canal, no other public access points were available at the time of survey. The proposed route is not visible from this viewpoint (SP19), but would be visible from boats within the canal, near the proposed route's intersection with the canal, north of Mt. Pleasant Road. However, views from the canal are not widely accessible, and only visitors traveling the canal near the intersection of the canal and HF Route 1 would be able to see the Project. The proposed structures would be set back from the canal, and would only be seen when in close proximity due to dense tree coverage on either side of the route. The lines that travel between the structures would be visible from farther down the canal, but given the existing lines, the Project would not constitute a change in this aspect of the viewshed.

In summary, the views of the Project in the vicinity of the Albemarle & Chesapeake Canal would be noticeable from the canal due to the vegetation cut and the construction of additional structures, which would make the Project more visible than the existing transmission line that already intersects the resource. But, because of the presence of the existing transmission line and how the majority of views are obscured by vegetation, ERM recommends that there would be a **Minimal Impact** to this resource from HF Route 1.

3.6.2 131-5071, Centreville-Fentress Historic District

The Centreville-Fentress Historic District is located approximately 174 feet to the west of HF Route 1 at its closest point. The overhead route is located along a section of the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty line (TL-2240) (Attachment 6, Figure 24). Here, HF Route 1 would include a wreck-and-rebuild of the existing line structures, as well as the construction of two additional structures, for a total of three new structures. The existing ROW for the Landstown-Pocaty and Fentress to Pocaty transmission lines is currently 120 feet, and HF Route 1 would expand the existing ROW 40 feet in most places, for a total ROW of 160 feet. A one-mile segment of the route to the north of the Battlefield Golf Course would expand the ROW on the east side of the existing route, while the area to the east of the golf course would expand to the west, and the area to the south of the golf course would expand to the north.

The views of the proposed Project from the historic district are relatively minor, and would scarcely change if HF Route 1 were constructed. Specifically, the views from SP15 are minimal because the existing transmission line heights are between 120 and 145 feet and the proposed structures would be between 130 and 135 feet. The difference between the two lines is negligible (Attachment 6, Figures 25 through 28). At SP17 (the viewpoint closest to HF Route 1), the proposed route would minimally change the view because the construction of the two additional structures moves the ROW closer to the historic district (Attachment 6, Figures 29 and 30). SP18, like SP15 shows no significant change in view (Attachment 6, Figures 31 and 32). Also visible from the historic district are the proposed upgrades to the existing Fentress Substation. The View from SP35 was selected because it is the closest public access point from which the district will have a view of the substation (Attachment 6, Figures 33 and 34). The existing infrastructure is already visible from this point, and while the proposed Project is more visible in terms of height, the existing tree-line masks the structures to a degree, and will continue to grow, thereby minimizing the effects over time.

For these reasons although the proposed Project can be seen from multiple points within the historic district, few views would be significantly altered because of the presence of the existing line and substation. Therefore, ERM recommends that there would be a **Minimal Impact** to the Centreville-Fentress Historic District from HF Route 1.

3.6.3 131-5333, Albemarle & Chesapeake Canal Historic District

HF Route 1 intersects a 0.43-mile segment of the Albemarle & Chesapeake Canal Historic District. This overhead route segment is located along a section of the existing Landstown-Pocaty transmission line (TL-271) (Attachment 6, Figure 34). Here, HF Route 1 would include a wreck-and-rebuild of the existing double circuit structures as well as the construction of two additional structures. The existing structures closest to the canal have heights of 180 to 185 feet; the new structures closest to the canal would have heights of 170 feet. While the Landstown-Pocaty transmission line ROW is currently 120 feet, the construction of the replacement and additional structures for HF Route 1 would expand the ROW 40 more feet in most areas, for a total ROW width of 160 feet. This expansion would include an additional tree cut on the west side of the existing line.

Although the proposed structures are shorter than the existing structures, the addition of two more structures would add more modern elements to the historic canal district in this area. In addition, whereas there are only two existing transmission line structures currently in the district, the proposed route would have four groupings of three structures. The photo simulation (SP19) was taken from the closest public ROW on the canal towards HF Route 1 (Attachment 6, Figures 36 and 37). Because the resource is a canal, no other public access points were available at the time of survey. The proposed route is not visible from this viewpoint (SP19), but would be visible from boats within the canal, near the proposed route's intersection of the canal, north of Mt. Pleasant Road. However, views from the canal are not widely accessible, and only visitors traveling the canal near the intersection of the canal and HF Route 1 would be able to see the proposed route. The proposed structures are located on either side of the canal in the district, but would only be seen when in close proximity due to dense tree coverage on either side of the route. The lines that travel between the structures would be visible from farther down the canal, but given the existing lines, the Project would constitute a minor change in the view.

In summary, the views of the Project in the vicinity of the Albemarle & Chesapeake Canal Historic District would be noticeable from the canal due to the vegetation cut and the construction of additional structures, which would make the Project more visible than the existing transmission line that already intersects the resource. But, because of the existing transmission line and how the majority of views are obscured by vegetation, ERM recommends that there would be a **Minimal Impact** to this resource from HF Route 1.

3.6.4 134-0038, Jonathan Woodhouse House/William Woodhouse House

The Jonathan Woodhouse House is located approximately 0.45 mile to the southeast of the proposed HF Route 1, an overhead route (Attachment 6, Figure 38). The segment of the proposed route closest to the resource would be greenfield and require new ROW. However, due to intervening vegetation and residential subdivisions, 134-0038 would have no view to the proposed route (Attachment 6, Figures 39 through 42). Because the view from the Jonathan Woodhouse House is entirely screened, there would be **No Impact** from HF Route 1.

3.6.5 134-0072, Thomas Lovett House/Rollingswood Academy

The Thomas Lovett House/Rollingswood Academy is located 0.34 mile to the south of the proposed HF Route 1, an overhead route that is located along a section of the existing Landstown to VA Beach transmission line (TL-2118/147) ROW (Attachment 6, Figure 43). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract (Attachment 6, Figures 44 and 45). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 1.

3.6.6 134-0702, St. John's Baptist Church

St. John's Baptist Church is located 0.84 mile to the south of the proposed HF Route 1, an overhead route that is located along a section of the existing Landstown to Virginia Beach transmission line (TL-2118/147) ROW (Attachment 6, Figure 46). The existing ROW in this area would be expanded by 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract and has intervening vegetation and modern subdivisions (Attachment 6, Figures 47 and 48). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 1.

3.7 Historic Resource Findings for Harpers to Fentress Route 2

The impacts to each resource in the HF Route 2 study area are discussed and illustrated below.

3.7.1 131-0044/131-5333-0002, Albemarle & Chesapeake Canal

HF Route 2, an overhead route, runs parallel to the Albemarle & Chesapeake Canal, about 0.18 mile to the south of the canal. In addition, the route traverses an approximately 423-foot segment of the canal itself, on the eastern portion of the canal (Attachment 6, Figure 52). At the crossing, the new Project structures closest to the canal would be 145 feet tall and include three structures per group. The proposed structures would be located on either side of the canal, supporting lines that would be seen when traveling the canal. This segment of the proposed route would be greenfield and require new ROW, which would include vegetation removal. The removal of the trees and construction of the new Project structures would introduce modern elements to the portion of the canal that currently contains only the canal itself surrounded by dense vegetation.

As seen with SP19, the view of the proposed route would be scarcely visible from the bridge on Mt. Pleasant Road/North Landing Road (Attachment 6, Figures 53 and 54). But views of the canal are not widely accessible, and the only other view of the Project where it intersects the resource would be from boats traveling the canal itself. The area in which this proposed Project alternative would be visible is small in relation to extent of the resource as a whole. Also, the proposed structures are set back from the canal, and would only be seen when in close proximity due to dense tree coverings on either side of the route. Because HF Route 2 does not follow an existing line, however, the addition of this modern element constitutes more than a minor change to the viewshed.

Although the intersected section of the canal would be small in comparison to the canal as a whole, given the visibility of the Project from the heavily used public bridge, and the fact that this Project alternative would introduce significant new elements into the viewshed, ERM recommends that HF Route 2 would have a **Moderate Impact** on the Albemarle & Chesapeake Canal.

3.7.2 131-5071, Centreville-Fentress Historic District

HF Route 2 follows the same route as HF Route 1 for the section closest to the Centreville-Fentress Historic District. The Centreville-Fentress Historic District is located approximately 202 feet to the west of HF Route 2 at its closest point (Attachment 6, Figure 55). The overhead route is located along a section of the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty transmission line (TL-2240). Here, HF Route 2 would include a wreck-and-rebuild of the existing line structures, as well as the construction of two additional structures, for a total of three new structures per grouping. The existing Landstown-Pocaty and Fentress-Pocaty transmission line ROW is currently 120 feet, and HF Route 2 would expand the existing ROW 40 feet, for a total ROW of 160 feet. A one-mile segment of the route to the north of the Battlefield Golf Course would expand the ROW on the east side of the existing route, while the area to the east of the golf course would expand to the west, and the area to the south of the golf course would expand to the north.

The views from the historic district towards the proposed Project are relatively minor and would scarcely change if HF Route 2 were constructed. Specifically, the views from SP15 are minimal because the existing transmission line heights are between 120 and 145 feet and the proposed structures are between about 130 and 135 feet. The difference between the two lines is negligible (Attachment 6, Figures 56 through 59). At SP17 (the viewpoint closest to HF Route 1), the proposed route would minimally change the view because the construction of the two additional structures would move the ROW closer to the historic district (Attachment 6, Figures 60 and 61). SP18, like SP15 shows no significant change in view (Attachment 6, Figures 62 and 63). Also visible from the historic district are the proposed upgrades to the existing Fentress Substation. The View from SP35 was selected because it is the closest public access point from which the district will have a view of the substation (Attachment 6, Figures 64 and 65). The existing infrastructure is already visible from this point, and while the proposed Project is more visible in terms of height, the existing tree-line masks the structures to a degree, and will continue to grow, thereby minimizing the effects over time.

For these reasons, although the proposed Project can be seen from multiple points of the historic district, few views would be significantly altered because of the presence of the existing line. Therefore, ERM recommends that there would be a **Minimal Impact** to the Centreville-Fentress Historic District from HF Route 2.

3.7.3 131-5333, Albemarle & Chesapeake Canal Historic District

The overhead route, HF Route 2, runs parallel to the Albemarle & Chesapeake Canal Historic District, about 0.18 mile to the south of the canal. In addition, the route intersects an approximately 0.65-mile portion of the eastern side of the district (Attachment 6, Figure 66). The new structures for the Project in this area would be between about 110 and 145 feet tall (with the tallest structures nearest to the canal) and include three structures per group. The proposed structures would be located on either side of the canal and connected by lines that would be seen when traveling by boat within the canal. This section of the proposed route would be greenfield and required new ROW, which would necessitate vegetation removal. The removal of the trees and construction of the new Project structures would introduce modern elements to a portion of the canal that currently contains only the canal itself surrounded by dense vegetation.

As seen with SP19, the view of the proposed route would be scarcely visible from the bridge on Mt. Pleasant Road/North Landing Road (Attachment 6, Figures 67 and 68). As views of the historic district are not widely accessible, the only other view of this Project alternative in relation to the district would be from boats traveling the canal, and this view would encompass a small area in relation to the overall resource. Although the proposed transmission line structures would be located in the historic district on either side of the canal, they would only be seen when in close proximity due to dense tree covering on either side of the route. However, as HF Route 2 does not follow an existing transmission line, the addition of this modern element constitutes more than a minor change to the viewshed.

In summary, although the intersected section of the historic district is small in comparison to the district as a whole, given the visibility of new infrastructure associated with the Project from the heavily used public bridge, ERM recommends that HF Route 2 would have a **Moderate Impact** on the Albemarle & Chesapeake Canal Historic District.

3.7.4 134-0038, Jonathan Woodhouse House/William Woodhouse House

The Jonathan Woodhouse House is located approximately 0.45 mile to the southeast of the proposed HF Route 2, an overhead route (Attachment 6, Figure 69). The area of the proposed route closest to the resource would be greenfield and require new ROW. However, due to intervening vegetation and residential subdivisions, 134-0038 would have no view to the proposed route (Attachment 6, Figures 70 through 73). Because the view from the Jonathan Woodhouse House is entirely screened, there would be **No Impact** from HF Route 2.

3.7.5 134-0072, Thomas Lovett House/Rollingswood Academy

The Thomas Lovett House/Rollingswood Academy is located 0.34 mile to the south of the proposed HF Route 2, an overhead route that is located along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 74). In this section of the route, the existing ROW would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract (Attachment 6, Figures 75 and 76). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 2.

3.7.6 134-0702, St. John's Baptist Church

St. John's Baptist Church is located approximately 0.84 mile to the south of the proposed HF Route 2, an overhead route that is located along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 77). In this section of the route, the existing ROW would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract and has intervening vegetation and modern subdivisions (Attachment 6, Figures 78 and 79). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 2.

3.8 Historic Resource Findings for Harpers to Fentress Route 3

The impacts to each resource in the HF Route 3 study area are discussed and illustrated below.

3.8.1 131-0044/131-5333-0002, Albemarle & Chesapeake Canal

HF Route 3, an overhead route, runs parallel to the Albemarle & Chesapeake Canal, about 0.18 mile to the south of the canal, following the same portion of the canal as HF Route 2. In addition, the route traverses an approximately 423-foot segment of the canal's eastern section (Attachment 6, Figure 80). The new Project structures adjacent to the canal would be 145 feet tall with three structures per group. The proposed structures would be located on either side of the canal, supporting lines that would be seen when traversing the canal. This segment of the proposed route would be greenfield and require new ROW, which would necessitate vegetation removal. The removal of the trees and construction of the new Project structures would introduce modern elements to a portion of the canal that currently contains only the canal itself surrounded by dense vegetation.

As seen with SP19, the view of the proposed route would be scarcely visible from the bridge on Mt. Pleasant Road/North Landing Road (Attachment 6, Figures 81 and 82). Views of the canal are not widely accessible, and the only other view of HF Route 3 in relation to the resource would be from boats traveling the canal. The portion of the resource that would be affected by the proposed alternative is small in relation to the resource as a whole. Also, the proposed structures are set back from the canal, and would only be seen when in close proximity due to dense tree coverings on either side of the route. However, as HF Route 3 does not follow an existing transmission line, the addition of this modern element into the resource's viewshed would constitute more than a minor change to the viewshed.

In summary, although the intersected section of the canal is small in comparison to the district as a whole, given the visibility of new infrastructure associated with the Project from the heavily used public bridge, ERM recommends that HF Route 3 would have a **Moderate Impact** on the Albemarle & Chesapeake Canal.

3.8.2 131-5071, Centreville-Fentress Historic District

HF Route 3 follows the same route as HF Routes 1 and 2 for the section closest to the Centreville-Fentress Historic District. The Centreville-Fentress Historic District is located approximately 202 feet to the west of HF Route 3, at its closest point (Attachment 6, Figure 83). The overhead route is located along a section of the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty transmission line (TL-2240). Here, HF Route 3 would include a wreck-and-rebuild of the existing structures, as well as the construction of two additional structures, for a total of three new structures. The existing Landstown-Pocaty and Fentress-Pocaty transmission line's ROW is currently 120 feet, and HF Route 3 would expand the existing ROW 40 feet, for a total ROW of 160 feet. A one-mile segment of the route to the north of the Battlefield Golf Course would expand the ROW on the east side of the existing route, while the area to the east of the golf course would expand to the west, and the area to the south of the golf course would expand to the north.

The views from the historic district towards the proposed Project are relatively minor, and would scarcely change. Specifically, the views from SP15 are minimal because the existing transmission line heights are between 120 and 145 feet and the proposed structures are between about 130 and 135 feet. The difference between the two lines is negligible (Attachment 6, Figures 84 through 87). At SP17 (the viewpoint closest to HF Route 3), the proposed route would minimally change the view because the construction of the two additional structures moves the ROW closer to the historic district (Attachment 6, Figures 88 and 89). SP18, like SP15 shows no significant change in view (Attachment 6, Figures 90 and 91). Also visible from the historic district are the proposed upgrades to the existing Fentress Substation. The View from SP35 was selected because it is the closest public access point from which the district will have a view of the substation (Attachment 6, Figures 92 and 93). The existing infrastructure is already visible from this point, and while the proposed Project is more visible in terms of height, the existing tree-line masks the structures to a degree, and will continue to grow, thereby minimizing the effects over time.

For these reasons, although the proposed Project can be seen from multiple vantage points within the historic district, few views would be significantly altered because of the existing line. Therefore, ERM recommends that there would be a **Minimal Impact** to the Centreville-Fentress Historic District from HF Route 3.

3.8.3 131-5333, Albemarle & Chesapeake Canal Historic District

HF Route 3 follows the same alignment as HF Route 2 in vicinity of 131-5333. HF Route 3 runs parallel to the Albemarle & Chesapeake Canal Historic District, about 0.18 mile to the south of the canal. In addition, the route intersects an approximately 0.61-mile portion of the eastern side of the district (Attachment 6, Figure 94). The new Project structures in this area would be between about 110 to 145 feet tall (with the tallest structures nearest to the canal) and include three structures per group. The proposed structures would be located on either side of the canal to support lines that would be seen when traveling by boat along the canal. This area of the proposed route would be greenfield and require new ROW, which would necessitate vegetation removal. The removal of the trees and construction of the new Project structures would introduce modern elements to a portion of the canal that currently contains only the canal itself surrounded by dense vegetation.

As seen in SP19, the proposed route would be scarcely visible from the bridge on Mt. Pleasant Road/North Landing Road (Attachment 6, Figures 95 and 96). As views of the historic district are not widely accessible, the only other view of 131-5333 in relation to HF Route 3 would be for visitors traveling the canal. The portion of the district subject to viewshed effects from the proposed alternative is small in relation to the resource as a whole. Although the proposed structures would be located in the historic district on either side of the canal, they would only be seen when in close proximity due to dense tree coverings on either side of the route. However, as HF Route 3 does not follow an existing transmission line, the addition of this modern element constitutes more than a minor change to the viewshed of the resource.

In summary, although the intersected section of the canal is small in comparison to the district as a whole, given the visibility of new infrastructure associated with the Project from the heavily used public bridge, ERM recommends that HF Route 3 would have a **Moderate Impact** on the Albemarle & Chesapeake Canal Historic District.

3.8.4 134-0038, Jonathan Woodhouse House/William Woodhouse House

The Jonathan Woodhouse House is located approximately 0.45 mile to the southeast of the proposed HF Route 3, an overhead route (Attachment 6, Figure 97). The area of the proposed route closest to the resource would be greenfield and require new ROW. However, due to intervening vegetation and residential subdivisions, 134-0038 would have no view to the proposed route (Attachment 6, Figure 98 through 101). Because the view from The Jonathan Woodhouse House is entirely screened, there would be **No Impact** from HF Route 3.

3.8.5 134-0072, Thomas Lovett House/Rollingswood Academy

The Thomas Lovett House/Rollingswood Academy is located 0.45 mile to the south-southeast of the proposed HF Route 3, an overhead route that is located along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 102). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract with intervening vegetation and modern subdivisions (Attachment 6, Figure 103 and 104). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 3.

3.8.6 134-0702, St. John's Baptist Church

St. John's Baptist Church is located approximately 0.94 mile to the south-southeast of the proposed HF Route 3 along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 105). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract and has intervening vegetation and modern subdivisions (Attachment 6, Figures 106 and 107). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 3.

3.9 Historic Resource Findings for Harpers to Fentress Route 4

The impacts to each resource in the HF Route 4 study area are discussed and illustrated below.

3.9.1 131-0044/131-5333-0002, Albemarle & Chesapeake Canal

HF Route 4, an overhead route, runs parallel to the Albemarle & Chesapeake Canal, about 0.18 mile to the south of the canal, as it does with HF Routes 2 and 3. In addition, the route traverses an approximately 714-foot segment of the canal itself, on the eastern portion of the canal (Attachment 6, Figure 108). This area of the proposed route would be greenfield and require new ROW, which would necessitate vegetation removal and the installation of three 170 foot tall structures on either side of the canal. The removal of the trees and construction of the new Project structures would introduce modern elements to a portion of the canal that currently contains only the canal itself surrounded by dense vegetation.

This route would impact the canal more than the other proposed routes due to the route's extension to the north of the canal, which would be seen on either side of the bridge. This extension would result in the removal of more trees and vegetation than the other routes, as illustrated in SP19 (Attachment 6, Figures 109 and 110). The view towards the Project from SP19 shows that those driving north across the bridge would see HF Route 4. Drivers would also see it to the east. The proposed route is also slightly visible in the view from SP31, but not as visible as it is from SP19 (Attachment 6, Figures 111 and 112). As the existing viewshed does not contain a transmission line and the view to the Project would be relatively unobstructed, the new transmission line would introduce a significant change to the setting of the canal.

In summary, views of the Project in the vicinity of the Albemarle & Chesapeake Canal would be expansive with noticeable changes. Therefore, ERM recommends that HF Route 4 would have a **Severe Impact** on the Albemarle & Chesapeake Canal.

3.9.2 131-5071, Centreville-Fentress Historic District

HF Route 4 follows the same route as HF Routes 1, 2, and 3 for the section closest to the Centreville-Fentress Historic District. The Centreville-Fentress Historic District is located approximately 202 feet to the west of HF Route 4 at its closest point (Attachment 6, Figure 113). The overhead route is located along a section of the existing Landstown-Pocaty transmission line (TL-271) and the Fentress-Pocaty transmission line (TL-2240). Here, HF Route 4 would include a wreck-and-rebuild of the existing transmission line structures, as well as the construction of two additional structures, for a total of three new structures. The existing Landstown-Pocaty and Fentress-Pocaty transmission line ROW is currently 120 feet, and HF Route 4 generally would expand the existing ROW 40 feet, for a total ROW of 160 feet. A one-mile segment of the route to the north of the Battlefield Golf Course would expand the ROW on the east side of the existing route, while the area to the east of the golf course would expand to the west, and the area to the south of the golf course would expand to the north.

The views from the historic district towards the proposed Project are relatively minor and would scarcely change. Specifically, the views from SP15 are minimal because the existing transmission line heights are between 120 and 145 feet and the proposed structures are between about 130 and 135 feet. The difference between the two lines is negligible (Attachment 6, Figures 114 through 117). The view at SP17 (the viewpoint closest to HF Route 4) would minimally change because the construction of the two additional structures moves the ROW closer to the historic district (Attachment 6, Figures 118 and 119). SP18, like SP15 shows no significant change in view (Attachment 6, Figures 120 and 121). Also visible from the historic district are the proposed upgrades to the existing Fentress Substation. The View from SP35 was selected because it is the closest public access point from which the district will have a view of the substation (Attachment 6, Figures 122 and 123). The existing infrastructure is already visible from this point, and while the proposed Project is more visible in terms of height, the existing tree-line masks the structures to a degree, and will continue to grow, thereby minimizing the effects over time.

For these reasons, although the proposed Project could be seen from multiple vantage points within the historic district, few views would be significantly altered because of the existing line. Therefore, ERM recommends that there would be a **Minimal Impact** to the Centreville-Fentress Historic District from HF Route 4.

3.9.3 131-5333, Albemarle & Chesapeake Canal Historic District

HF Route 4 runs parallel to the Albemarle & Chesapeake Canal Historic District, about 0.18 mile to the south of the canal, as it does for HF Routes 2 and 3. However, HF Route 4 intersects an approximately 0.75-mile portion of the eastern side of the district (Attachment 6, Figure 124). The new Project structures in this area would be between about 110 and 170 feet tall (with the tallest structures nearest to the canal) and include three structures per group. Although the proposed structures would be set back from the canal, the lines they would support would be seen when traveling along the canal. This area of the proposed route would be greenfield and require new ROW, which would necessitate vegetation removal. The removal of the trees and construction of the new Project structures would introduce modern elements to a portion of the district that currently contains only the canal itself surrounded by dense vegetation.

Like the canal, the historic district would be impacted more from HF Route 4 than the other routes due to the portion of the route that extends to the north of the canal, which can be seen on both sides of the bridge in SP19 and SP31 (Attachment 6, Figures 125 through 128). The view towards the Project from SP19 shows that those driving north across the bridge would see HF Route 4. Drivers would also see it to the east. The proposed route is also slightly visible in the view from SP31, but not as visible as it is from SP19. As the existing viewshed does not contain a transmission line and the view to the Project would be relatively unobstructed, the new transmission line would introduce a significant change to the setting of the historic district.

In summary, views of the Project in the vicinity of the Albemarle & Chesapeake Canal Historic District would be expansive with noticeable changes. Therefore, ERM recommends that HF Route 4 would have a **Severe Impact** on the Albemarle & Chesapeake Canal Historic District.

3.9.4 134-0038, Jonathan Woodhouse House/William Woodhouse House

The Jonathan Woodhouse House is located approximately 0.45 mile to the southeast of the proposed HF Route 4 (Attachment 6, Figure 129). The area of the proposed route closest to the resource would be greenfield and require new ROW. However, due to intervening vegetation and residential subdivisions, 134-0038 would have no view to HF Route 4 (Attachment 6, Figures 130 through 133). Because the view from the Jonathan Woodhouse House is entirely screened, there would be **No Impact** from HF Route 4.

3.9.5 134-0072, Thomas Lovett House/Rollingswood Academy

The Thomas Lovett House/Rollingswood Academy is located 0.34 mile to the south of the proposed HF Route 4, which is located along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 134). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract (Attachment 6, Figures 135 and 136). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 4.

3.9.6 134-0702, St. John's Baptist Church

St. John's Baptist Church is located approximately 0.84 mile to the south of the proposed HF Route 4, whict is located along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 137). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract and has intervening vegetation and modern subdivisions (Attachment 6, Figures 138 and 139). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 4.

3.10 Historic Resource Findings for Harpers to Fentress Route 5

The impacts to each resource in the HF Route 5 study area are discussed and illustrated below.

3.10.1 131-0044/131-5333-0002, Albemarle & Chesapeake Canal

HF Route 5, an overhead route, is located approximately 0.10 mile to the southeast of the Albemarle & Chesapeake Canal (Attachment 6, Figure 140). This area of the proposed route would be greenfield and require new ROW, which would necessitate vegetation removal and the installation of three 150 foot tall structures on either side of the canal. Although only the eastern views from the canal would be impacted and the proposed route does not intersect the canal, the removal of the trees and construction of the new Project structures would introduce modern elements to a portion of the canal that currently contains only the canal itself surrounded by dense vegetation. Views to the proposed route would only be seen when driving over the bridge, looking east (Attachment 6, Figures 141 through 144), or traveling by boat along the canal itself.

From the vantage point of the canal, the proposed structures would be visible, but not obtrusive, given that they would be set back from the canal and partially screened by dense tree coverings on either side of the route, which would obscure the view except in close proximity. The portion of the canal that would be subject to viewshed effects from HF Route 5 is only a tiny portion of the resource as a whole. Although the new structures would be prominently visible from the bridge, the setting of most of the resource would remain unchanged. There also is a view of the proposed route to the south, but only the lines between the proposed structures would be visible.

In summary, although the intersected section of the canal is small in comparison to the resource as a whole, given the visibility of new infrastructure associated with the Project from the heavily used public bridge, ERM recommends that HF Route would have a **Moderate Impact** on the Albemarle & Chesapeake Canal.

3.10.2 131-5071, Centreville-Fentress Historic District

HF Route 5, an overhead route, differs from the other proposed routes in its southern portion, which is relevant in relation to the Centreville-Fentress Historic District. Unlike the other proposed routes, HF Route 5 turns south at its intersection near the Albemarle & Chesapeake Canal until it turns and runs generally west on the south side of the Pocaty River. It then turns to the northwest at Centerville Farms and crosses Land of Promise Road, and again to the north after crossing the Centerville Turnpike South, on the south side of the Centreville-Fentress District. This area by the district is located to the west and southwest of the Battlefield Golf Course, terminating about 0.06 miles south of the district boundary (Attachment 6, Figure 145). This section of HF Route 5 is greenfield and runs southeast to northwest, until it meets up with a very small (0.16-mile-long) portion of the existing Fentress-Pocaty transmission line (TL-2240), which runs east to west.

The small section that meets up with the existing line would include a wreck-and-rebuild of the existing line structure, as well as the construction of two additional structures, for a total of three new structures in a single group. The existing Fentress-Pocaty transmission line ROW is currently 120 feet, and HF Route 5 would expand the existing ROW 40 feet, for a total ROW of 160 feet. The existing structure is 110 feet, and the proposed replacement structures would be about 102 feet.

Since the proposed route goes through greenfield as it approaches Fentress Substation, additional structures, running southeast to northwest, would be required. These structures would be between about 110 and 125 feet tall. This would drastically change the viewshed from the historic district, to the south, because it is not an existing line. There currently is a view of the existing transmission line that runs east to west, to the Fentress Substation, but the proposed route extends farther north towards the historic district.

Although there are not as many views of HF Route 5 from multiple portions of the district as there are from the other proposed routes, the addition of the structures to the south of the district are more noticeable and would create a bigger change in view than that of the other proposed routes, especially for SP15 (Attachment 6, Figures 146 and 147). However, some areas, like SP17, would actually have less of a view of the Project than the existing line due to the greater distance (Attachment 6, Figures 148 and 149). Also visible from the historic district are the proposed upgrades to the existing Fentress Substation.

The View from SP35 was selected because it is the closest public access point from which the district will have a view of the substation (Attachment 6, Figures 150 and 151). The existing infrastructure is already visible from this point, and while the proposed Project is more visible in terms of height, the existing tree-line masks the structures to a degree, and will continue to grow, thereby minimizing the effects over time.

Because only one portion of the historic district would be impacted, ERM recommends that there would be a **Moderate Impact** to the Centreville-Fentress Historic District from HF Route 5. The viewshed, to the south would have more expansive views of the transmission line and the overall visibility of the Project would be greater in this area because of the construction of the additional structures south of the historic district within greenfield and the removal of vegetation, which would alter the view.

3.10.3 131-5333, Albemarle & Chesapeake Canal Historic District

The overhead route, HF Route 5, intersects approximately 61 feet of the southeast corner of the Albemarle & Chesapeake Canal Historic District (Attachment 6, Figure 152). This segment of the route would be greenfield and require new ROW. The construction of the proposed line would necessitate vegetation removal as well as the construction of new Project structures (measuring between about 120 to 150 feet tall in the vicinity of the crossing), which would introduce modern elements to a portion of the canal that currently contains only the canal itself surrounded by dense vegetation. The views to the east of SP31 and SP32 are more prominent, but can only be viewed when crossing the Mt. Pleasant Road/North Landing Road Bridge (Attachment 6, Figures 153 through 156).

As only the eastern views from the canal would be impacted, ERM recommends that HF Route 5 would have a **Moderate Impact** on the Albemarle & Chesapeake Canal Historic District, since it would change the setting of only a small part of the resource as a whole. ERM does not consider the impact to be as severe as that posed by HF Route 4.

3.10.4 134-0038, Jonathan Woodhouse House/William Woodhouse House

The Jonathan Woodhouse House is located approximately 0.45 mile to the southeast of the proposed HF Route 5, an overhead route (Attachment 6, Figure 157). The area of the proposed route closest to the resource would be greenfield and require new ROW. However, due to intervening vegetation and residential development, 134-0038 would have no view to the proposed route (Attachment 6, Figures 158 through 161). Because the view from The Jonathan Woodhouse House is entirely screened, there would be **No Impact** from HF Route 5.

3.10.5 134-0072, Thomas Lovett House/Rollingswood Academy

The Thomas Lovett House/Rollingswood Academy is located 0.34 mile to the south of the proposed HF Route 5, an overhead route that is located along a section of the existing Landstown to VA Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 162). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract (Attachment 6, Figures 163 and 164). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 5.

3.10.6 134-0702, St. John's Baptist Church

St. John's Baptist Church is located approximately 0.84 mile to the south of the proposed HF Route 5, an overhead route that is located along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 165). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract and has intervening vegetation and modern subdivisions

(Attachment 6, Figures 166 and 167). Because the view from the resource is entirely screened, there would be **No Impact** from HF Route 5.

3.11 Historic Resource Findings for Harpers to Fentress Hybrid Route

The impacts to each resource in the HF Hybrid Route study area are discussed and illustrated below.

3.11.1 131-0044/131-5333-0002, Albemarle & Chesapeake Canal

A 390-foot segment of the HF Hybrid Route intersects the Albemarle & Chesapeake Canal. The overhead route segment near the canal is located along section of the existing Landsdow-Pocaty transmission line (TL-271), and follows the same alignment as HF Route 1; thus it has the same impacts (Attachment 6, Figure 168). Here, the HF Hybrid Route would include a wreck-and-rebuild of the existing double-circuit line structures as well as the construction of two additional single circuit structures, for a total of three new structures. The existing structures adjacent to the canal have heights ranging from 180 to 185 feet; the replacement and new structures immediately adjacent to the canal would have heights of 170 feet. While the Landstown-Pocaty transmission line ROW is currently 120 feet, the construction of the new structures required for the HF Hybrid Route would expand the ROW 40 more feet, for a total ROW width of 160 feet. This expansion would include additional tree cut on either side of the existing line.

Although the proposed structures are shorter than the existing structures, the addition of two more structures would add more modern elements to the historic canal in this area. The photo simulation (SP19) was taken from the closest public ROW on the canal towards the HF Hybrid Route (Attachment 6, Figures 169 and 170). Because the resource is a canal, no other public access points were available at the time of survey. The proposed route is not visible from this viewpoint (SP19), but would be visible from boats within the canal itself near the proposed route's intersection of the canal, to north of Mt. Pleasant Road. However, views from the canal are not widely accessible, and only visitors traveling the canal near the intersection of the canal and the HF Hybrid Route would be able to see it. The proposed structures would be set back from the canal, and would only be seen when in close proximity due to dense tree coverage on either side of the route. The lines carried by the structures would be visible from vantage points farther down the canal, but there are already existing lines and the Project would not change this aspect of the viewshed.

In summary, the views of the Project in the vicinity of the Albemarle & Chesapeake Canal would be noticeable from the canal due to the vegetation cut and the construction of additional structures, which would make the Project more visible than the existing transmission line that already intersects the resource. But, because of the presence of the existing transmission line and how the majority of views are obscured by vegetation, ERM recommends that there would be a **Minimal Impact** to this resource from the HF Hybrid Route.

3.11.2 131-5071, Centreville-Fentress Historic District

The Centreville-Fentress Historic District is located approximately 202 feet to the west of the HF Hybrid Route, at its closest point. The route follows HF Route 1 and thus, has the same impacts to this district, where the line would consist of an overhead segment following a section of the existing Landstown-Pocaty transmission line (TL-271) (Attachment 6, Figure 171). Here, the HF Hybrid Route would include a wreck-and-rebuild of the existing line structures, as well as the construction of two additional structures, for a total of three structures. The existing Landstown-Pocaty and Fentress-Pocaty transmission line ROW is currently 120 feet, and the HF Hybrid Route would expand the existing ROW 40 feet, for a total ROW of 160 feet. A one-mile segment of the route to the north of the Battlefield Golf Course would expand the ROW on the east side of the existing route, while the area to the east of the golf course would expand to the west, and the area to the south of the golf course would expand to the north.

The views from the historic district towards the proposed Project are relatively minor, and would scarcely change if HF Hybrid Route was constructed. Specifically, the views from SP15 are minimal because the existing transmission line heights are between 120 and 145 feet and the proposed structures would be between 130 and 135 feet. The difference between the two lines is negligible (Attachment 6, Figures 172 through 175). At SP17 (the viewpoint closest to the HF Hybrid Route) the proposed route would minimally change the view because the construction of the two additional structures would move the ROW closer to the historic district (Attachment 6, Figures 176 and 177). SP18, like SP15 shows no significant view change in view (Attachment 6, Figures 178 and 179). Also visible from the historic district are the proposed upgrades to the existing Fentress Substation. The View from SP35 was selected because it is the closest public access point from which the district will have a view of the substation (Attachment 6, Figures 180 and 181). The existing infrastructure is already visible from this point, and while the proposed Project is more visible in terms of height, the existing tree-line masks the structures to a degree, and will continue to grow, thereby minimizing the effects over time.

For these reasons, athough the proposed Project can be seen from multiple points of the historic district, few of the views would be significantly altered because of the existing line. Therefore, ERM recommends that there would be a **Minimal Impact** to the Centreville-Fentress Historic District from the HF Hybrid Route.

3.11.3 131-5333, Albemarle & Chesapeake Canal Historic District

Like HF Route 1, the HF Hybrid Route intersects a 0.43-mile segment of the Albemarle & Chesapeake Canal Historic District. This overhead route segment is located along a fWillsection of the existing Landstwon-Pocaty transmission line (TL-271) (Attachment 6, Figure 182). Here, the HF Hybrid Route would include a wreck-and-rebuild of the existing line double circuit structures, as well as the construction of two additional structures, for a total of three structures. The existing structures closest to the canal have heights of 180 to 185 feet; all three new structures would have heights of 170 feet. While the Landsdown-Pocaty transmission line ROW is currently 120 feet, the construction of the additional structures for the HF Hybrid Route would expand the ROW 40 more feet, for a total ROW width of 160 feet.

Although the proposed structures are shorter than the existing structures, the addition of two more structures would add more modern elements to the historic canal in this area. In addition, whereas only two existing structures are in the district, the proposed route would have four groupings of three structures. The photo simulation (SP19) was taken from the closest public ROW on the canal towards the HF Hybrid Route (Attachment 6, Figures 183 and 184). The proposed route is not visible from SP19, but would be visible from boats within the canal and near the proposed route's intersection of the canal to north of Mt. Pleasant Road. However, views from the canal are not widely accessible, and only visitors traveling the canal near the intersection of the canal and the HF Hybrid Route would be able to see the proposed route. The proposed structures would be located on either side of the canal in the district, but would only be seen when in close proximity due to dense tree coverage on either side of the route. The lines supported by the structures would be visible from vantage points farther down the canal, but given the existing lines here, the HF Hybrid Route would not constitute a significant change in this aspect of the viewshed.

In summary, the views of the Project in the vicinity of the Albemarle & Chesapeake Canal Historic District would be noticeable from the canal due to the vegetation cut and the construction of additional structures, which would make the Project more visible than the existing transmission line that already intersects the resource. But, because of the existing transmission line and how the majority of views are obscured by vegetation, ERM recommends that there would be a **Minimal Impact** to this resource from HF Hybrid Route.

3.11.4 134-0038, Jonathan Woodhouse House

The Jonathan Woodhouse House is located approximately 0.45 mile to the southeast of the proposed underground section of the HF Hybrid Route (Attachment 6, Figure 185). The area of the proposed route closest to the resource would be greenfield and require new ROW. However, due to intervening vegetation and residential development, 134-0038 would have no view to the proposed route (Attachment 6, Figure 186 through 189). Because the view from the Jonathan Woodhouse House is entirely screened, there would be **No Impact** from HF Hybrid Route.

3.11.5 134-0072, Thomas Lovett House/Rollingswood Academy

The Thomas Lovett House/Rollingswood Academy is located 0.35 mile to the south of the proposed HF Hybrid Route, an underground section of the route that is located along a section of the existing Landstown to VA Beach transmission line ROW (TL-2118/147) (Attachment 6, Figure 190). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract (Attachment 6, Figure 191 and 192). Because the view from the resource is entirely screened, there would be **No Impact** from HF Hybrid Route.

3.11.6 134-0702, St. John's Baptist Church

St. John's Baptist Church is located 0.84 mile to the south of the proposed HF Hybrid Route, an underground section of the route that is located along a section of the existing Landstown to Virginia Beach transmission line ROW (TL-2118/174) (Attachment 6, Figure 196). This section of the route would be expanded 105 feet for the proposed Project. However, the resource currently has no view to the existing transmission line, which lies beyond a large forested tract and has intervening vegetation and modern subdivisions (Attachment 6, Figure 197 and 198). Because the view from the resource is entirely screened, there would be **No Impact** from HF Hybrid Route.

3.12 Archaeology Findings

Sixteen known archaeological sites are located in the ROW of the proposed transmission line alternatives (Table 3.12-1). Ten sites are recorded within greenfield ROW (44CS0016, 44CS0156, 44VB0162, 44VB0204, 44VB0306, 44VB0314, 44VB0361, 44VB0389, 44VB0395, and 44VB0396). Sites 44VB0204, 44VB0361, 44VB0389, 44VB0395, and 44VB0396 lie within CLH Route's ROW. HF Route 1 and the HF Hybrid Route intersect portions of 44VB0306 in those proposed ROWs. HF Routes 1, 2, 3, and the HF Hybrid Route intersect 44VB0162. Sites 44CS0016 and 44CS0156 lie within HF Route 5's ROW. Finally, 44VB0314 lies within the ROW of HF Routes 1, 2, 3, 4, 5, and the HF Hybrid Route. The remaining six sites lie within existing transmission line ROWs that would be rebuilt (44CS0250) or expanded by 90 feet (44VB0263, 44VB0267, 44VB0274, 44VB0275, and 44VB280).

One site, 44VB0274, is located in a section where HF Routes 1, 2, 3, and the HF Hybrid Route intersect the existing Landstown to West Landing ROW. However, the western part of the site extends beyond the existing ROW into greenfield for approximately 130 feet 44VB0274 is also located within a section of ROW shared by HF Routes 4 and 5, which would be expanded by 90 feet.

The sites that would be impacted by each alternative are discussed below, along with current NRHP status and desktop reconnaissance-level information about the resource's condition. A confident determination about the nature of archaeological deposits at each site and impacts from prior land use activities will be provided in the archaeological reports which are ongoing for the project (see ***Terrestrial Archaeological Resource Assessment*** which can be found in Appendix G of the COP.

Table 3.12-1: Archaeological Resources in the Study Area of the Proposed Routes

Considered Resource	Proposed Alternative[a]						
	CLH Route	HF Route 1	HF Route 2	HF Route 3	HF Route 4	HF Route 5	HF Hybrid Route
44CS0016						X	
44CS0156						X	
44CS0250		X					X
44VB0162		X					X
44VB0204	X						
44VB0263					X	X	
44VB0267					X	X	
44VB0274		X	X	X	X	X	X
44VB0275			X	X	X	X	
44VB0280					X	X	
44VB0306		X					X
44VB0314		X	X	X	X	X	X
44VB0361	X						
44VB0389	X						
44VB0395	X						
44VB0396	X						
Total Resources	*5*	*5*	*3*	*3*	*6*	*8*	*5*

[a] *"X" indicates that the resource is within the ROW of the proposed route.*

3.12.1 Cable Landing to Harpers Route

Five archaeological sites lie within greenfield ROW associated with CLH Route: 44VB0204, 44VB0361, 44VB0389, 44VB0395, and 44VB0396. All have been determined not eligible for listing on the NRHP. Sites 44VB0389, 44VB0395, and 44VB0396 are associated with the Camp Pendleton SMR. 44VB0389 includes a prehistoric lithic scatter and historic architectural remains. A small portion of 44VB0389's northern boundary intersects CLH Route. 44VB0395 is located approximately 60 feet to the south of the centerline, and contains both prehistoric lithic and historic artifact scatters. 44VB0396 includes a historic artifact scatter that is located approximately 86 feet to the north of the centerline. Site 44VB0204 is an 18th/early 19th century trash scatter, and it appears as if the southern portion of the site boundary would intersect the Project. Site 44VB0361 is a historic farmstead and it appears as if the southern portion of its site boundary would intersect the Project as well. Because all five archaeological sites have been determined not eligible for the NRHP, they do not require further consideration.

3.12.2 Harpers Road to Fentress Route 1

Five archaeological sites lie within the ROW for HF Route 1. Two of these have been determined not eligible for the NRHP and require no further consideration. The first, 44VB0274, is associated with a prehistoric artifact scatter and a historic farmstead. The remaining NRHP-ineligible site, 44VB0314, is a historic farmstead, and is intersected by the centerline. One archaeological site is no longer extant and, therefore, also requires no further consideration: 44VB0306. 44VB0306 was associated with the Salem Canal and is intersected by the centerline.

Out of the five archaeological sites that lie within HF Route 1's ROW, one is not evaluated for the NRHP (44CS0250) and one is potentially eligible for the NRHP (44VB0162). Site 44CS0250 is a multicomponent prehistoric camp that is intersected by the existing Fentress-Landstown-Lynnhaven transmission line ROW (TL-271). This section of the route would be a wreck-and-rebuild with addition of two additional structures. Although these sites lie within the existing transmission line ROW, impacts from previous transmission line construction may be limited to the immediate area of the transmission line structures. The existing ROW is 120 feet wide, and an additional 40 feet would be needed for the Project, for a total ROW width of 160 feet. However, no proposed transmission line structures are located within the site boundary.

44VB0162, the NRHP-potentially eligible site, consists of a prehistoric camp and a historic cemetery. HF Route 1 intersects the length of 44VB0162 and goes through greenfield in the vicinity of the site. Two sets of proposed transmission line structures are located within the site boundary (three structures in each set). The historic cemetery is located in the southwestern corner of the site in a grove of trees. The cemetery is in close proximity to one of the proposed structure groupings. The remainder of the site (and possibly the area of the historic cemetery as well) consists of materials associated with a prehistoric camp. It appears that the proposed ROW does not intersect the cemetery and that the cemetery is located outside of the area of direct construction impacts.

3.12.3 Harpers Road to Fentress Route 2

Three archaeological sites lie within the proposed ROW for HF Route 2. Two of these have been determined not eligible for the NRHP and are also in HF Route 1's ROW: 44VB0274 and 44VB0314. Site 44VB0274 consists of a prehistoric artifact scatter and a historic farmstead. 44VB0314 is associated with a historic dwelling. Because both have been determined ineligible for listing on the NRHP, no further consideration is required. However, 44VB0275 is also located within HF Route 2's ROW. 44VB0275 is a potentially eligible site comprised of an 18th/early 19th century trash scatter. HF Route 2's centerline intersects the site, however, none of the proposed transmission line structures would be located within the site boundary.

3.12.4 Harpers Road to Fentress Route 3

The same three archaeological sites that lie within the ROW for HF Route 2 are located within the ROW for HF Route 3 as both routes are exactly the same in these areas. The sites include 44VB0274, prehistoric artifact scatter and a historic farmstead; 44VB0275, a potentially eligible site comprised of an 18th/early 19th century trash scatter. and 44VB0314, a historic dwelling. As 44VB0274 and 44VB0314 have been determined ineligible, neither require additional consideration. However, 44VB0162 is a potentially eligible site. Like HF Route 2, HF Route 3's centerline intersects the site, however, none of the proposed transmission line structures would be located within the site boundary.

3.12.5 Harpers Road to Fentress Route 4

Six archaeological sites lie within the ROW for HF Route 4. Three of these have been determined ineligible for the NRHP: 44VB0274, 44VB0280, and 44VB0314. HF Route 4 intersects the southeastern corner of 44VB0274, a prehistoric artifact scatter, and intersects the center of 44VB0314, a historic dwelling. The section of HF Route 4 that intersects 44VB0314 follows the same route as HF Routes 1 through 3. As these archaeological sites have been determined ineligible for listing on the NRHP, no further consideration is required.

A small cemetery was identified on the property of the Kempsville Mennonite Church along North Landing Road in Virginia Beach and recorded as an archaeological site (44VB0280) at this location as part of a survey completed in 1996 (Stuck and Higgins 1997). The site was defined on the basis of surface observation ("some fallen stones") and informant testimony. The cemetery reportedly contained 12 graves dating from the late nineteenth/early twentieth centuries associated with the Bell family. The VCRIS indicates that the site was revisited in 2020, but no evidence of headstones, depressions, or other signs of burials were observed on the surface. While the route intersects the corner of 44VB0280, no structures will be located within the boundary of the site. Field survey would be required to confirm if burials are present at the site.

Three other archaeological sites have been determined potentially eligible for listing on the NRHP: 44VB0263, 44VB0267, and 44VB0275. All three potentially eligible sites are located within portions of HF Route 4's proposed ROW collocated with the existing Landstown to West Landing transmission line ROW (TL-2085). These sections of the proposed route include a 90-foot expansion to the existing 120-foot-wide transmission line's ROW, for a total of a 210-foot-wide ROW. HF Route 4's centerline intersects the western portion of 44VB0263, which consists of a historic artifact scatter. Two proposed transmission line structures are located within the site boundary. HF Route 4 also intersects the western portion of 44VB0267, which consists of a multicomponent historic trash scatter. The proposed route expansion would extend past the western portion of the site boundary and only one proposed transmission line structure is located in the southwestern edge of the site boundary. Finally, HF Route 4 intersects a small portion of 44VB0275's northeastern edge, which consists of a historic trash scatter. Although no proposed transmission line structures are located within the site boundary, the proposed route expansion would extend into the northeastern portion of the site.

3.12.6 Harpers Road to Fentress Route 5

Eight archaeological sites are located within HF Route 5's ROW. Three of these have been determined ineligible for the NRHP: 44VB0274, 44VB0280, and 44VB0314. HF Route 5 follows the same portions of HF Routes 2, 3, and 4 in the vicinity of 44VB0274, a prehistoric artifact scatter, and the portion of HF Route 5 that intersects 44VB0314, a historic dwelling, follows the same route as HF Routes 1 through 4. As these archaeological sites have been determined ineligible for listing on the NRHP, no further consideration is required.

A small cemetery was identified on the property of the Kempsville Mennonite Church along North Landing Road in Virginia Beach and recorded as an archaeological site (44VB0280) at this location as part of a survey completed in 1996 (Stuck and Higgins 1997). The site was defined on the basis of surface observation ("some fallen stones") and informant testimony. The cemetery reportedly contained 12 graves dating from the late nineteenth/early twentieth centuries associated with the Bell family. The VCRIS indicates that the site was revisited in 2020, but no evidence of headstones, depressions, or other signs of burials were observed on the surface. Similarly, the section of HF Route 5 that intersects 44VB0280, a cemetery, follows the same portion of HF Route 5 in the vicinity. Field survey would be required to confirm if burials are present at the site.

Two unevaluated sites (44CS0016 and 44CS0156) and three potentially eligible sites (44VB0263, 44VB0267, and 44VB0275) are located within HF Route 5's proposed ROW. The greenfield portion of HF Route 5 intersects 44CS0016's western portion. 44CS0016 is a prehistoric site that is located in an open field. One of the proposed transmission structures is located on the site's northwestern boundary. The greenfield portion of HF Route 5 intersects the eastern half of 44CS0156, which consists of a multicomponent historic artifact scatter located in an open field. No proposed transmission structures are located within the site boundary. All three potentially eligible sites are located where both HF Routes 4 and 5 have the same proposed route. 44VB0263 consists of historic artifact scatter, 44VB0267 consists of multicomponent historic trash scatter, and 44VB0275 includes a historic trash scatter. The sites are within the existing Landstown to West Landing transmission line's ROW (TL-2085). These sections of the proposed route include a 90-foot expansion to the existing 120-foot-wide transmission line's ROW, for a total of a 210-foot-wide ROW.

3.12.7 Harpers to Fentress Hybrid Route

The HF Hybrid Route follows the same alignment as HF Route 1. Thus, the same five archaeological sites lie within the ROW for HF Hybrid Route. All are associated with the overhead portion of the route. Two of these have been determined not eligible for the NRHP and require no further consideration. The HF Hybrid Route intersects the southern half of 44VB0274, a prehistoric artifact scatter and a historic farmstead. The remaining NRHP-ineligible site, 44VB0314, is a historic farmstead, and is intersected by the centerline. One archaeological site is no longer extant and requires no further consideration: 44VB0306. 44VB0306 was associated with the Salem Canal and intersects the centerline.

Out of the two remaining sites, one is not evaluated for the NRHP (44CS0250) and one is potentially eligible for the NRHP (44VB0162). Site 44CS0250 is a multicomponent prehistoric camp that is intersected by the Fentress-Landstown-Lynnhaven existing transmission line's ROW (TL-271). This section of the route would be a wreck-and-rebuild plus the addition of two more structuers. Although these sites lie within the existing transmission line ROW, impacts from previous transmission line construction may be limited to the immediate area of the transmission line structures. The existing ROW is 120 feet wide, and an additional 40 feet of new ROW would be required, for a total ROW width of 160 feet. However, no proposed transmission line structures are located within the site boundary.

44VB0162, the NRHP-potentially eligible site, consists of a prehistoric camp and a historic cemetery. HF Hybrid Route intersects the length of 44VB0162 and goes through greenfield. Two sets of transmission line structures are located within the boundary (three structures in each set, for a total of six structures). The historic cemetery is located in the southwestern corner of the site in a grove of trees. The cemetery is in close proximity to one of the proposed transmission structure groupings. The remainder of the site (and possibly the area of the historic cemetery as well) consists of the prehistoric camp. It appears that the proposed ROW does not intersect the cemetery and that the cemetery is located outside of the area of direct construction impacts.

4 CONCLUSIONS AND RECOMMENDATIONS

The pre-application analysis gathered information on archaeological historic resources that qualify for consideration according to VDHR guidelines for transmission line projects.

Sixteen known archaeological sites are located in the ROW of the proposed transmission line alternatives. An assessment of the condition and research potential of those sites is contingent upon archaeological field investigations, which will be presented in a separate archaeological report. Potential impacts to those sites in the context of the currently proposed Project alternatives are difficult to discuss until an approved alternative has been selected. Once this has occurred, Project planners would consult with VDHR on potential impacts to archaeological sites that may be eligible for the NRHP.

Ten aboveground resources fall within the VDHR tiers for the seven route segments under consideration. Since many of the routes substantially overlap, several resources would have the same impact regardless of the selected option. A comparison of the number of resources impacted to different degrees in each Project alternative is presented in Table 4-1.

Table 4-1: Comparison of Project Impacts on Historic Resources in the Study Area of the Proposed Routes

Route Alternative	Number of Considered Resources in Each Impact Category				
	None	Minimal	Moderate	Severe[a]	Total
CLH Route[b]	2	1		1	4
HF Route 1	3	3			6
HF Route 2	3	1	2		6
HF Route 3	3	1	2		6
HF Route 4	3	1		2	6
HF Route 5	3		3		6
HF Hybrid Route	3	3			6

[a] *A severe impact corresponds to an adverse effect under the Section 106 review process.*
[b] *The CLH Route is the only option under consideration for the route segment between the Cable Landing Location and south of Harpers Road.*

Based on the above discussion, the Project is likely to result in adverse effects on historic properties regardless of the final route selected. Final assessments of Project effects will be dependent on the completion of identification-phase archaeological and historic structure surveys and review of survey results by BOEM, VDHR, and other consulting parties. For those resources where the agencies concur in a finding of adverse effect, the Company will propose treatments to avoid, minimize, or mitigate those impacts. Treatment options for archaeological sites could include selective tower placement to avoid direct impacts on sites, minor route adjustments to avoid crossing sites, or archaeological data recovery. Treatment options for aboveground historic resources could include detailed site documentation, historic research, and historic preservation studies; preparation of digital media or museum-type exhibits on various sites for public interpretation; installation of historic markers or signs; installation of vegetative screening; or contributions to historical preservation organizations or specific preservation projects. Additional mitigations could be identified through consultation with BOEM, the SCC, VDHR, SMR, and other consulting parties. Site-specific plans would be prepared for agency review and approval. The treatments would be formalized in a Memorandum of Agreement (MOA) between the consulting parties.

4.1 Cable Landing to Harpers Route Summary of Historic Resource Impacts

There are four aboveground historic resources identified within the VDHR tiers for the CLH Route (Table 4.1-1), although the Project would have no impact on two of these resources. Of the remaining resources, the CLH Route would have a minimal impact on one resource, and a severe impact on the other.

Table 4.1-1: Impacts to Historic Resources in VDHR Tiers for CLH Route

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	–	-	-
0.5 to 1.0	National Register Properties (Listed)	-	-	-
0.0 to 0.5	National Register Properties (Listed)	134-0413-0110	Building 1	None
	National Register – eligible	134-0917	Winford White House	None
0.0 (within ROW)	National Register - eligible	134-0003	Bell House	Minimal
	National Register Properties (Listed)	134-0413	Camp Pendleton/State Military Reservation Historic District	Severe

4.2 Harpers to Fentress Route 1 Summary of Historic Resource Impacts

There are six aboveground resources identified within the VDHR tiers for HF Route 1 (Table 4.2-1). The Project would have no impact on three of these resources, and a minimal impact on three resources, the Albemarle & Chesapeake Canal and Historic District and the Centreville-Fentress Historic District.

Table 4.2-1: Impacts to Historic Resources in VDHR Tiers for HF Route 1

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	–	-	-
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church	None
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District	Minimal
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/William Woodhouse House	None
		134-0072	Thomas Lovett House/ Rollingswood Academy	None

Buffer (miles)	Resource Category	Resource Number	Description	Impact
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District	Minimal
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal	Minimal

4.3 Harpers to Fentress Route 2 Summary of Historic Resource Impacts

There are six aboveground historic resources identified within the VDHR tiers for HF Route 2 (Table 4.3-1), although the Project would have no impact on three of these resources. Of the remaining resources, HF Route 2 would have a minimal impact on one resource, and a moderate impact on the two resources associated with the Albemarle & Chesapeake Canal.

Table 4.3-1: Historic Resources in VDHR Tiers for HF Route 2

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	–	–	-
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church	None
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District	Minimal
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/ William Woodhouse House	None
		134-0072	Thomas Lovett House/ Rollingswood Academy	None
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District	Moderate
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal	Moderate

4.4 Harpers to Fentress Route 3 Summary of Historic Resource Impacts

There are six aboveground historic resources identified within the VDHR tiers for HF Route 3 (Table 4.4-1), although the Project would have no impact on three of these resources. Of the remaining resources, HF Route 3 would have a minimal impact on one resource, and a moderate impact on the two resources associated with the Albemarle & Chesapeake Canal.

Table 4.4-1: Historic Resources in VDHR Tiers for HF Route 3

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	–	–	-
0.5 to 1.0	Locally Significant Resources	134-0038	Jonathan Woodhouse House/ William Woodhouse House	None
		134-0702	St. John's Baptist Church	None
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District	Minimal
	Locally Significant Resources	134-0072	Thomas Lovett House/ Rollingswood Academy	None
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District	Moderate
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal	Moderate

4.5 Harpers to Fentress Route 4 Summary of Historic Resource Impacts

There are six aboveground historic resources identified within the VDHR tiers for HF Route 4 (Table 4.5-1), although the Project would have no impact on three of these resources. Of the remaining resources, HF Route 4 would have a minimal impact on one resource, and a severe impact on the two resources associated with the Albemarle & Chesapeake Canal.

Table 4.5-1: Impacts to Historic Resources in VDHR Tiers for HF Route 4

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	–	–	-
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church	None
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District	Minimal
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/ William Woodhouse House	None
		134-0072	Thomas Lovett House/ Rollingswood Academy	None
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District	Severe
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal	Severe

4.6 Harpers to Fentress Route 5 Summary of Historic Resource Impacts

There are six aboveground historic resources identified within the VDHR tiers for HF Route 5 (Table 4.6-1), although the Project would have no impact on three of these resources. Of the remaining resources, HF Route 5 would have a moderate impact on the two resources associated with the Albemarle & Chesapeake Canal and a moderate impact on the Centreville-Fentress Historic District.

Table 4.6-1: Impacts to Historic Resources in VDHR Tiers for HF Route 5

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	–	–	-
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church	None
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District	Moderate
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal	Moderate
	Locally Significant Resources	134-0038	Jonathan Woodhouse House/ William Woodhouse House	None
		134-0072	Thomas Lovett House/ Rollingswood Academy	None
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District	Moderate

4.7 Harpers to Fentress Hybrid Route Summary of Historic Resource Impacts

There are six aboveground resources identified within the VDHR tiers for HF Hybrid Route (Table 4.7-1). The Project would have no impact on three of these resources, a minimal impact on the Centreville-Fentress Historic District, and a minimal impact on the two resources associated with the Albemarle & Chesapeake Canal.

Table 4.7-1: Impacts to Historic Resources in VDHR Tiers for HF Hybrid Route

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	–	–	-
0.5 to 1.0	Locally Significant Resources	134-0702	St. John's Baptist Church	None
0.0 to 0.5	National Register Properties (Listed)	131-5071	Centreville-Fentress Historic District	Minimal

	Locally Significant Resources	134-0038	Jonathan Woodhouse House/ William Woodhouse House	None
		134-0072	Thomas Lovett House/ Rollingswood Academy	None
0.0 (within ROW)	National Register Properties (Listed)	131-5333	Albemarle & Chesapeake Canal Historic District	Minimal
	National Register – eligible	131-0044	Albemarle & Chesapeake Canal	Minimal

The next stage of assessing impacts on historic resources will be to conduct a survey of resources that could be impacted by the Project. Survey will be conducted in accordance with a number of guidelines per below:

- Guidelines for Assessing Impacts of Proposed Electrical Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia (see Attachment 1);
- the approved Coastal Virginia Offshore Wind Commercial Project Onshore Aboveground Historic Properties Survey Plan prepared for the Project;
- OCS Study BOEM 2021-032, Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States (BOEM, 2021);
- National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (National Park Service, 1995);
- NHPA Section 106 from 16 USC 470f to 54USC 306108; and
- NHPA Section 110(f).

The survey teams will be led by individuals meeting the Secretary of the Interior's professional qualifications standards for architectural history. Teams will traverse the length of the Project corridor(s), revisiting previously recorded historic architectural resources and documenting additional as-yet unrecorded historic resources in the survey area. During the course of the survey, all structures determined to be of age will be photographed and marked on the applicable USGS quadrangle map. While the NPS Bulletin 15 (NPS 1995) defines a historic property as a resource that is 50 years or older, for the purposes of this Project, survey will include those 45 years or older to accommodate the length of time needed to complete the permitting phase for the Project. Furthermore, survey will also record those resources that may have reached significance prior to the 50 (45) year age in accordance with the NPS if they are integral parts of districts, or have merit to be considered eligible for the NRHP on their own.

Digital photographs will be taken to record the resources' overall appearance and details. Sketch maps will be drawn depicting the relationship of dwellings to outbuildings and associated landscape features. Additional information on the structures' appearance and integrity will be recorded to assist in making recommendations of NRHP eligibility. Historic maps, aerial photographs, and tax assessor data will be consulted to assist in dating the resources. Resources identified in the field effort will be reported to the VDHR, V-CRIS numbers will be obtained, and shape files and database information will be provided. Sufficient information will be collected to make recommendations for each identified historic resource regarding eligibility for listing on the NRHP and to assess Project impacts.

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ATTACHMENT 1 VDHR GUIDELINES

01/08

Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia

This guidance has been developed by the Department of Historic Resources (DHR) to assist the State Corporation Commission (SCC) and their applicants in developing transmission line projects that minimize impacts to historic resources. The goals of this analysis are to (1) develop project alternatives that are sensitive to historic resources, (2) generate meaningful data on the potential effects of proposed alternatives on known historic resources, (3) determine the impact of selected alternatives on all resources eligible for listing in the Virginia Landmarks Register and National Register of Historic Places (National Register), and (4) develop recommendations on ways to minimize effects to historic resources.

This guidance is intended as technical assistance to the SCC and their applicants. Completion of these studies may not fully satisfy the requirements set forth by any Federal agency with responsibilities under Section 106 of the National Historic Preservation Act (NHPA) or other Federal law or regulation. It is critical that the project proponent consult directly with all relevant Federal agencies as necessary in the completion of these studies.

I. Pre-Application Analysis

Analysis conducted by the project proponent during the preparation of an application to the SCC is intended to guide the design of the project and aid in the selection of a preferred alternative. By determining the potential impact of the project on recorded historic resources during the application process, the applicant and the SCC may make informed decisions regarding the relative impacts of project alternatives. This pre-application analysis is not intended as a substitute for comprehensive historic resources survey. Full archaeological and architectural surveys are recommended for all approved alternatives. See Section II of this document for more information on recommended comprehensive surveys.

A. Establish a study area for each alternative under consideration. Study areas are tiered to ensure consideration of the Commonwealth's most important resources. The table below shows the four tiers of the study area and the resources that should be considered in each tier.

Radial Buffer (in miles)	Considered Resources
1.5	*National Historic Landmarks*
1.0	Above resources, and: *National Register Properties* (listed) *Battlefields* *Historic Landscapes* (e.g. Rural HD)
0.5	Above resources, and: *National Register-eligible* (as determined by DHR)
0.0 (within ROW)	Above resources, and: *Archaeological Sites*

If the proposed new right-of-way (ROW) exceeds 500 feet in width, the radial buffer should be drawn from the edges of the ROW and not the center line. The study area may be refined through the use of GIS-based spatial analysis of topography and vegetation to exclude areas that would not have a line-of-sight to proposed facilities. Any areas excluded from analysis need to be fully documented and justified in the resulting report. Since vegetative cover is dynamic, meta-data to include date of origin should be provided as part of a discussion of methodology. Areas containing National Historic Landmarks cannot be excluded from analysis.

B. Gather information on known resources. Once appropriate study areas have been established, data on recorded historic resources should be obtained from DHR. Data must be current to within six months of analysis. Affected cities, counties, and localities should be consulted during this stage of the process to ensure consideration of those resources significant at a local level. DHR also recommends gathering information and comments from other agencies and organizations, such as the National Park Service and local historical societies.

C. Assess impacts on known resources. A qualified cultural resources consultant in the appropriate discipline should perform an assessment of impact for each historic resource present within the appropriate tier of the study area provided it is not otherwise excluded from analysis. The analysis and report should include the following:

1. Executive Summary of impacts assessment. Narrative should be accompanied by a data table showing the resource number, name, and potential impact.

2. Statement of scope, methodology, fieldwork (dates, staff).

3. Project maps showing all center lines, radial buffers, and recorded resources subject to analysis. Any spatial analysis conducted that results in excluded areas should be shown on separate project maps. All submitted mapping should be at a legible scale.

4. Discussion of any recorded archaeological sites located within the proposed right of way, to include statements on previous investigations, National Register-eligibility determinations, and potential impacts.

5. Ground photography for each property including, at a minimum, photographs of the main elevation of the primary resource and from the resource towards the project. Be sure to consider the views from the entire property, including secondary resources and historic landscape features, not just the primary resource. The National Register nomination and/or other archival material should be consulted to determine if specific viewsheds are noted as significant. All efforts should be made to accurately represent the viewshed. Panoramic photos are most useful in this analysis.

6. Aerial photograph for each property showing the boundaries of the property, location of primary and secondary resources, a key to the ground photography, and depiction of the proposed line and distance from the resource. The date of the aerial photograph should be included.

7. Photosimulation of the proposed transmission line and towers from significant points on the property. If there are existing towers in or adjacent to the proposed ROW and the proposed towers are the same or lesser height than the existing, no photosimulation is necessary. If new towers will be substantially taller than the existing towers (>10% or 20' increase, whichever is greater), photosimulation is warranted. The means of producing accurate photosimulations is left to the discretion of the consultant, but should be thoroughly discussed as part of the methodology. If a property is not excluded from analysis, but after field assessment, is determined not to have a view of the proposed project, the estimated location and height of the proposed towers should be represented on ground photography.

8. Elevation drawing of proposed and existing (if applicable) tower designs and ROW configuration corresponding to the viewshed of each property.

9. Narrative description of the resource, environmental conditions, and any potential effects from the proposed line. This analysis should consider whether the historic setting is a character defining feature of the resource. The qualified professional conducting the analysis of impact should develop a meaningful hierarchy to characterize the effects to each property.

II. Survey of Approved Alternatives

Once an alternative is approved by the SCC, DHR recommends that full archaeological and architectural surveys be performed to determine the effect of the project on all historic resources listed in or eligible for listing in the National Register. This process involves the recordation of all archaeological sites and structures greater than 50 years of age, the evaluation of those resources for listing in the National Register, determining the degree of impact of the project on eligible resources, and developing a plan to avoid, minimize, or mitigate any negative impacts. Comments received from the public or other stakeholder regarding impacts to specific historic resources should be addressed as part of this survey and assessment process.

A. Defining the survey area and scope of the survey. The survey area for any approved alternative should take into consideration the types of resources that may be affected and the nature of expected impacts. Of special concern are effects to the historic setting and viewshed of significant historic resources. A difference can be drawn between the potential impact of a new line built on raw land and a new line constructed within existing ROW. This guidance takes into consideration these differences. For approved projects, the survey area and scope are defined as following:

1. Archaeological survey should be performed on all areas that will be directly impacted by construction, including proposed ROW, tower and associated facility locations, staging areas, and access roads. If the ROW can be cleared without ground disturbance, such as stump grubbing, comprehensive archaeological survey of the entire ROW will not be necessary. A ROW clearing plan must be submitted for review prior to DHR approval of this methodology. Survey of tower locations would still need to be performed.

2. For all portions of the proposed line to be constructed within existing ROW, where no new areas of vegetation will be cleared outside of the existing maintained ROW and

there will be no substantial increase in tower height (<10% or 20' increase, whichever is greater), the architectural survey will consist of all resources that are adjacent to the existing ROW.

3. For all portions of the proposed line to be constructed within existing ROW and where new areas of vegetation will be cleared outside the existing maintained ROW, the architectural survey will consist of all resources that are within 0.5 miles on either side of the existing ROW.

4. For all portions of the proposed line to be constructed within new ROW, the architectural survey will consist of all resources that are within 0.5 miles on either side of the existing ROW.

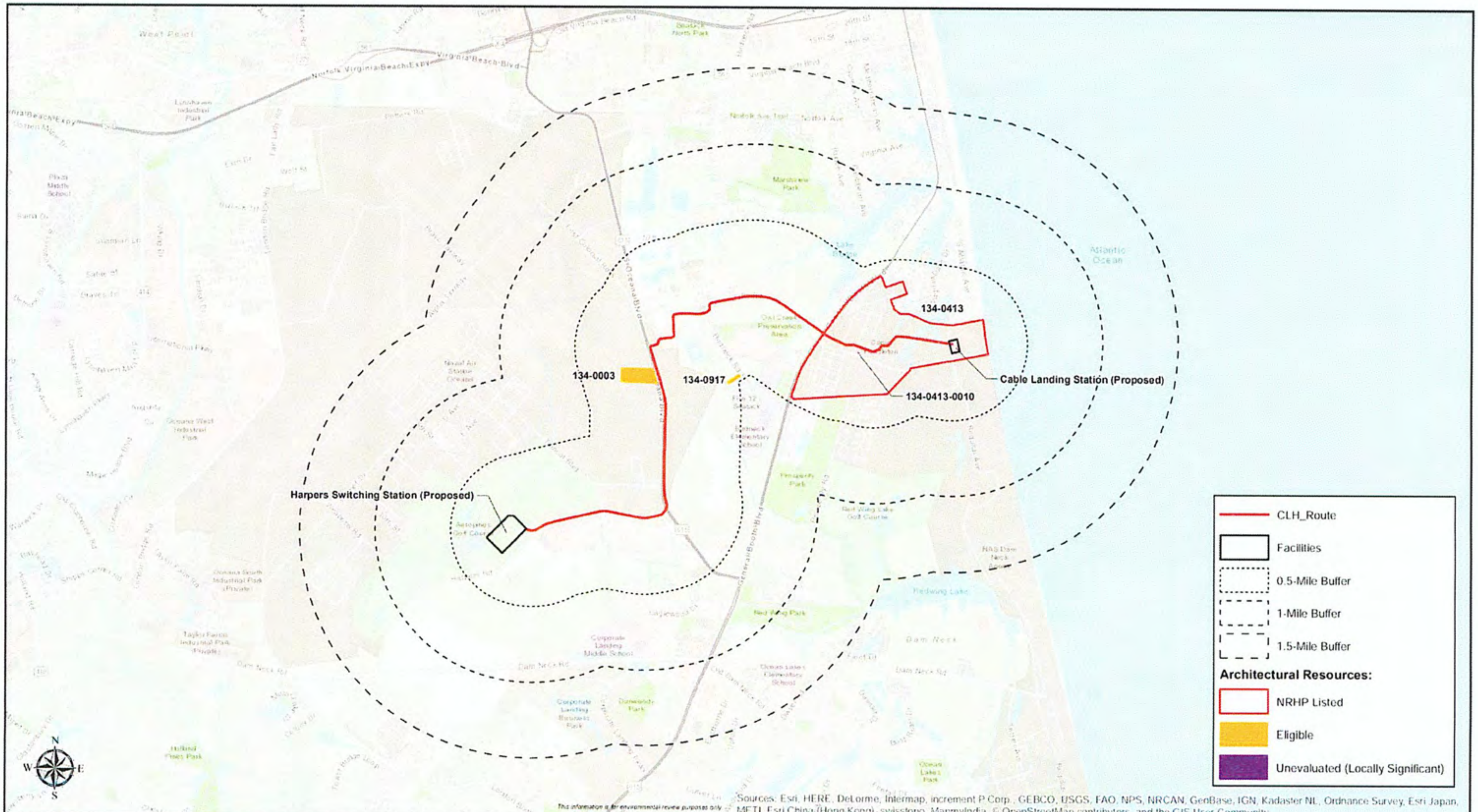
B. Evaluating resources. Following the survey, certain resources may be found to be potentially eligible for listing in the National Register. These resources should be evaluated through Phase II archaeological investigations or intensive level architectural inventory. These evaluations should conform to DHR's *Survey Guidelines* (rev. 2003) and result in a recommendation on eligibility of the resources.

C. Assessing impacts to eligible resources. For those resources identified in the survey that are found to be eligible for listing in the National Register, the impact of the proposed project should be assessed using the procedure presented in Section I.C of this document.

D. Minimizing and mitigating negative impacts. If is it determined by the project proponent in consultation with DHR that the proposed project will significantly and negatively impact a historic resource listed in or eligible for listing in the National Register, the project proponent should propose a means for avoiding or minimizing the effect. If the impact can not be reduced to such a degree as to not cause a significant impact to historic resources, a means to otherwise mitigate the effect must be developed. Minimization and mitigation plans should be developed in consultation with DHR, the affected property owner, and any other interested party. If the project is subject to Section 106 of the NHPA, a Memorandum of Agreement must be executed between the Federal agency, DHR, the project proponent, and any consulting parties to address the adverse effects of the project.

E. Survey personnel and reporting. All survey, evaluation, and assessment must be conducted by or under the direct supervision of a qualified professional in the appropriate field meeting the Secretary of the Interiors *Professional Qualification Standards* (36 CFR 61) in accordance with the Secretary of the Interior's *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (48 FR 44716-42) and DHR's *Survey Guidelines* (rev. 2003). Two copies any report should be submitted to DHR for review and approval prior to any ground disturbance.

ATTACHMENT 2 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ASSOCIATED WITH PROPOSED PROJECT ALTERNATIVES



Attachment 2

Locations of Considered Historic Resources Associated with Proposed Project Alternatives - CLH Route

Coastal Virginia Offshore Wind Commercial Project

Dominion Virginia Power

Virginia Beach and Chesapeake, VA

SHEET 1

Dominion Energy

ERM

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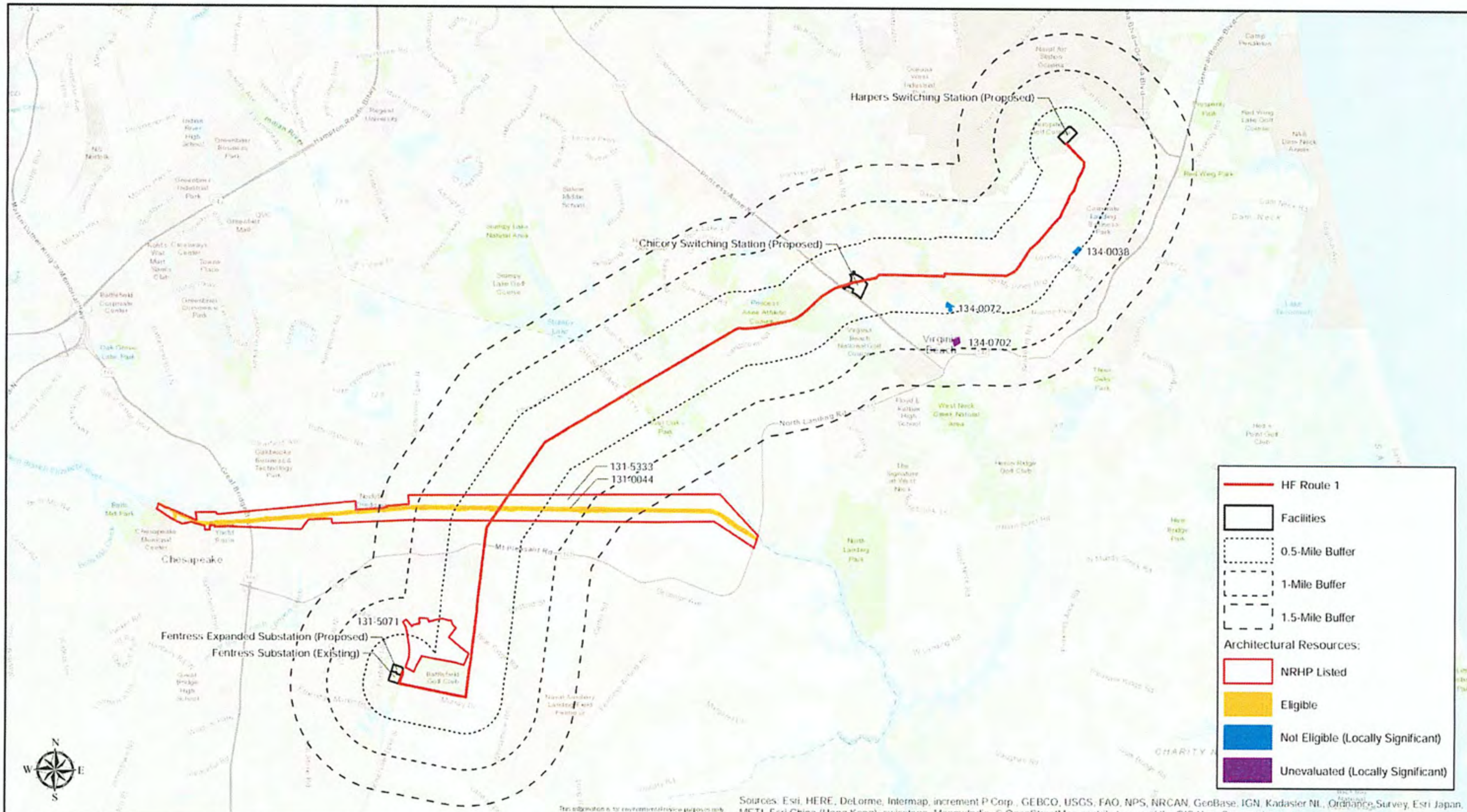

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Dominion Energy

Attachment 2

Locations of Considered Historic Resources Associated with Proposed Project Alternatives - HF Route 1

Coastal Virginia Offshore Wind Commercial Project

Dominion Virginia Power

Virginia Beach and Chesapeake, VA

SHEET 2

ERM

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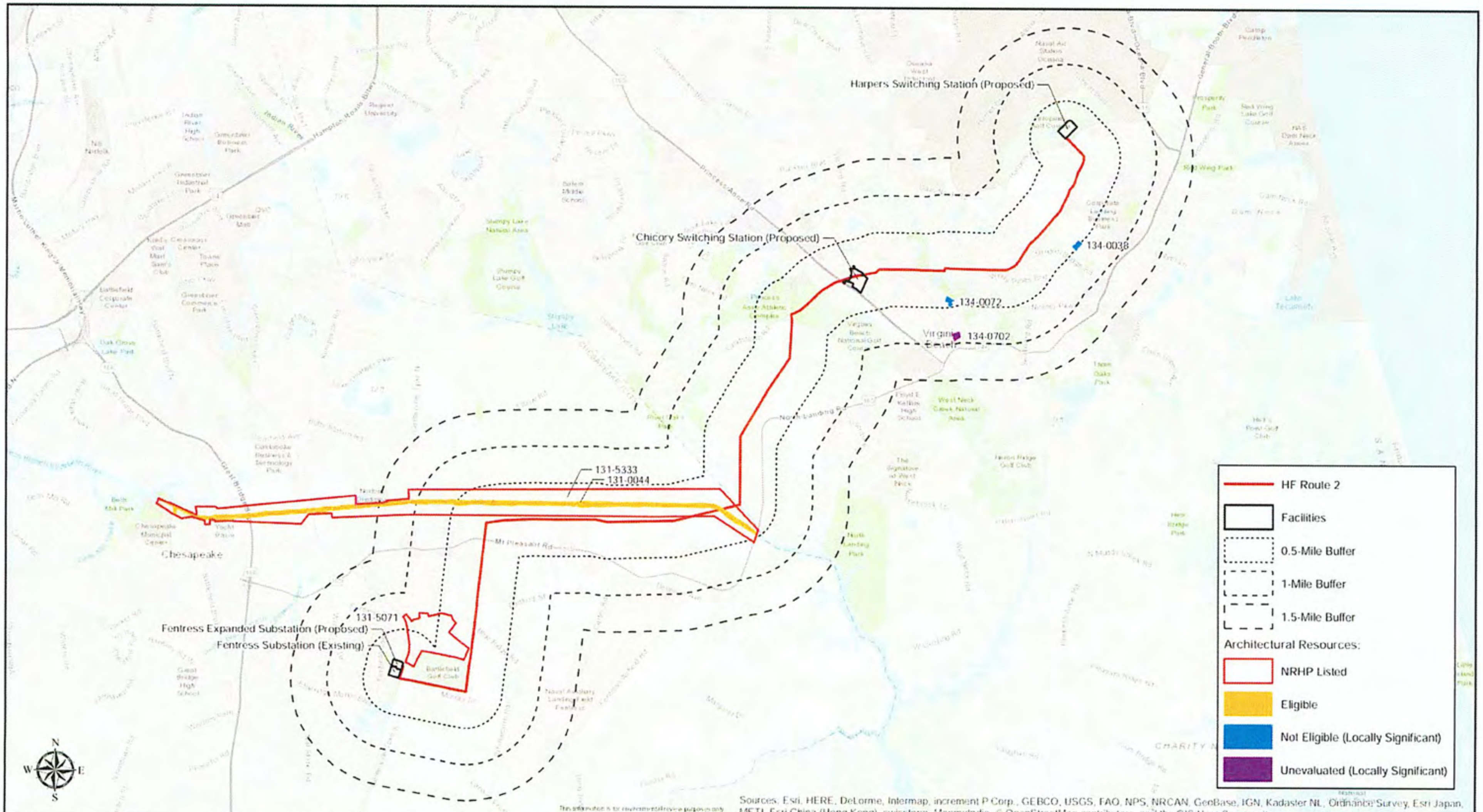

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Dominion Energy

Attachment 2

Locations of Considered Historic Resources Associated with Proposed Project Alternatives - HF Route 2

Coastal Virginia Offshore Wind Commercial Project

Dominion Virginia Power

Virginia Beach and Chesapeake, VA

SHEET 3

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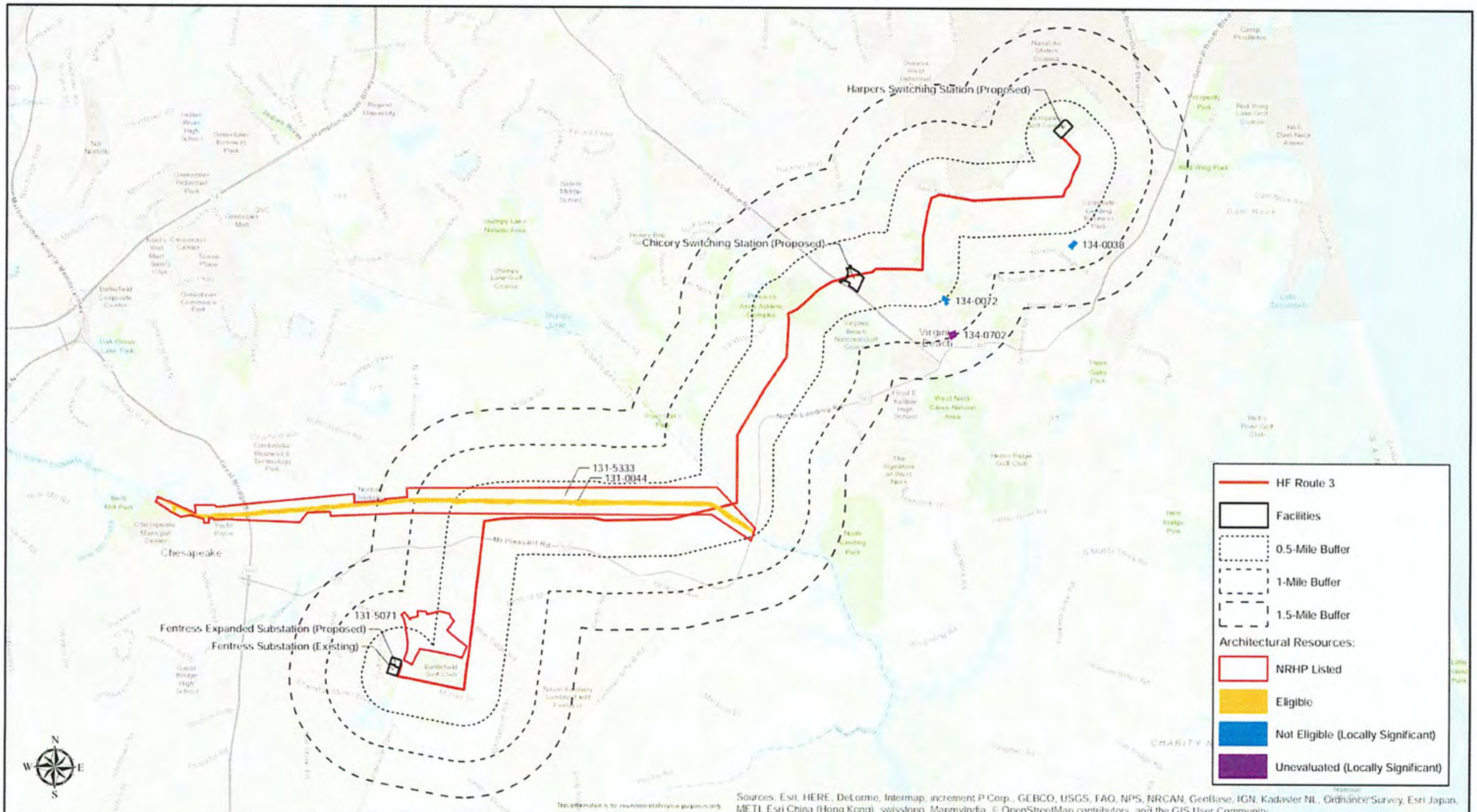

Attachment 2

Locations of Considered Historic Resources Associated with Proposed Project Alternatives - HF Route 3

Coastal Virginia Offshore Wind Commercial Project

Dominion Virginia Power

Virginia Beach and Chesapeake, VA

SHEET 4

Dominion Energy

ERM

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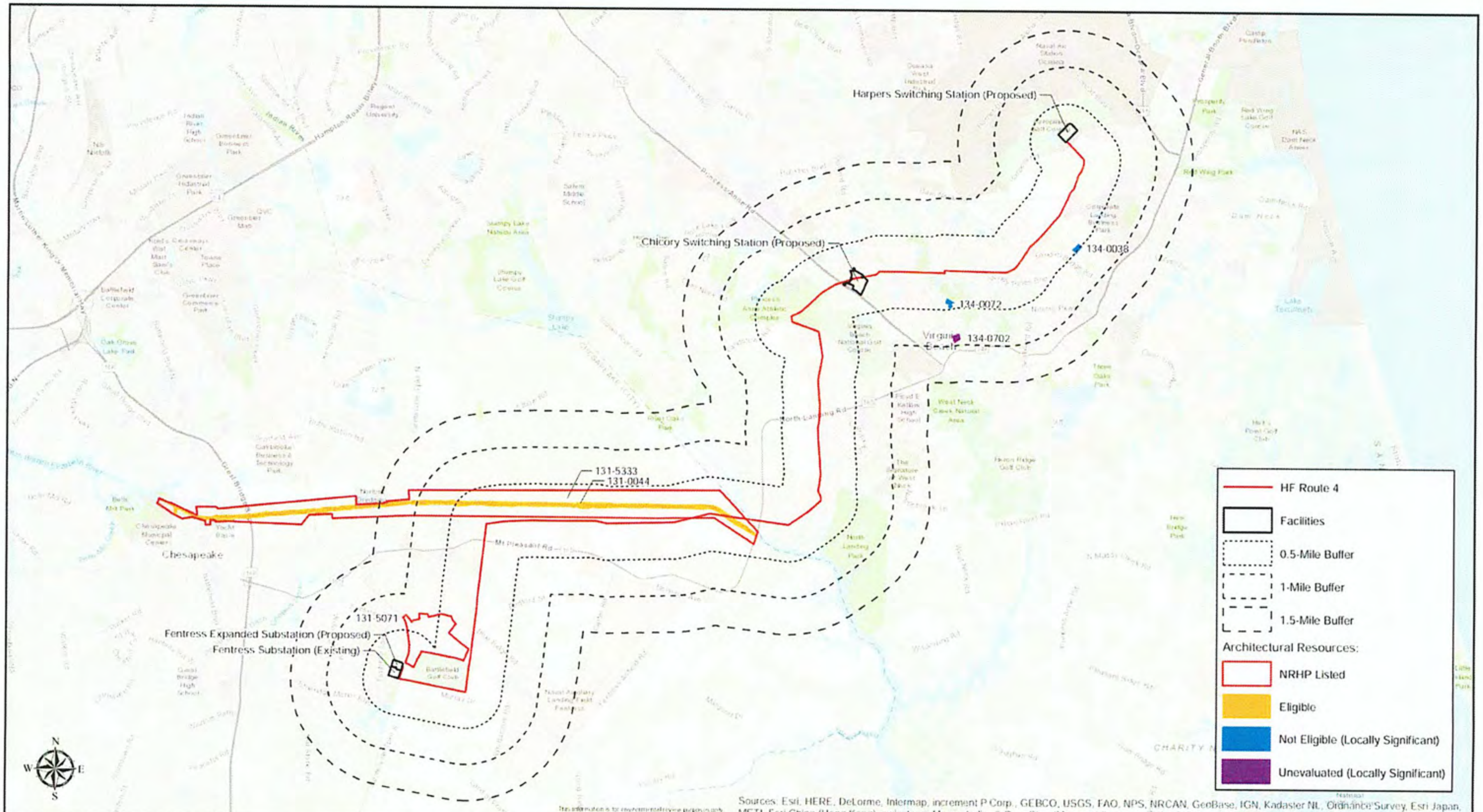

Attachment 2
Locations of Considered Historic Resources Associated with Proposed Project Alternatives - HF Route 4
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

SHEET 5

Dominion Energy

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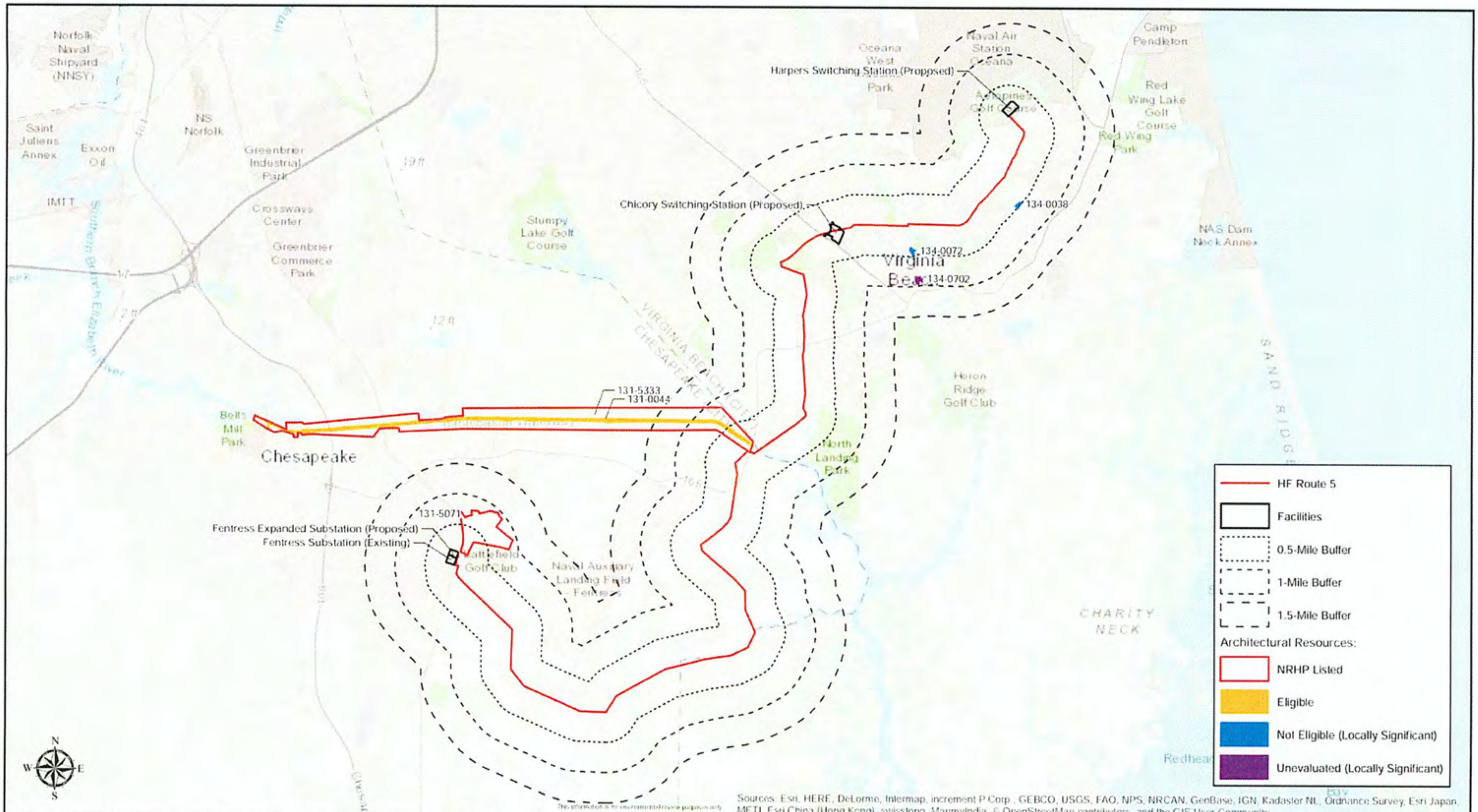

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Dominion Energy

Attachment 2
Locations of Considered Historic Resources Associated with Proposed Project Alternatives - HF Route 5
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

SHEET 6

ERM

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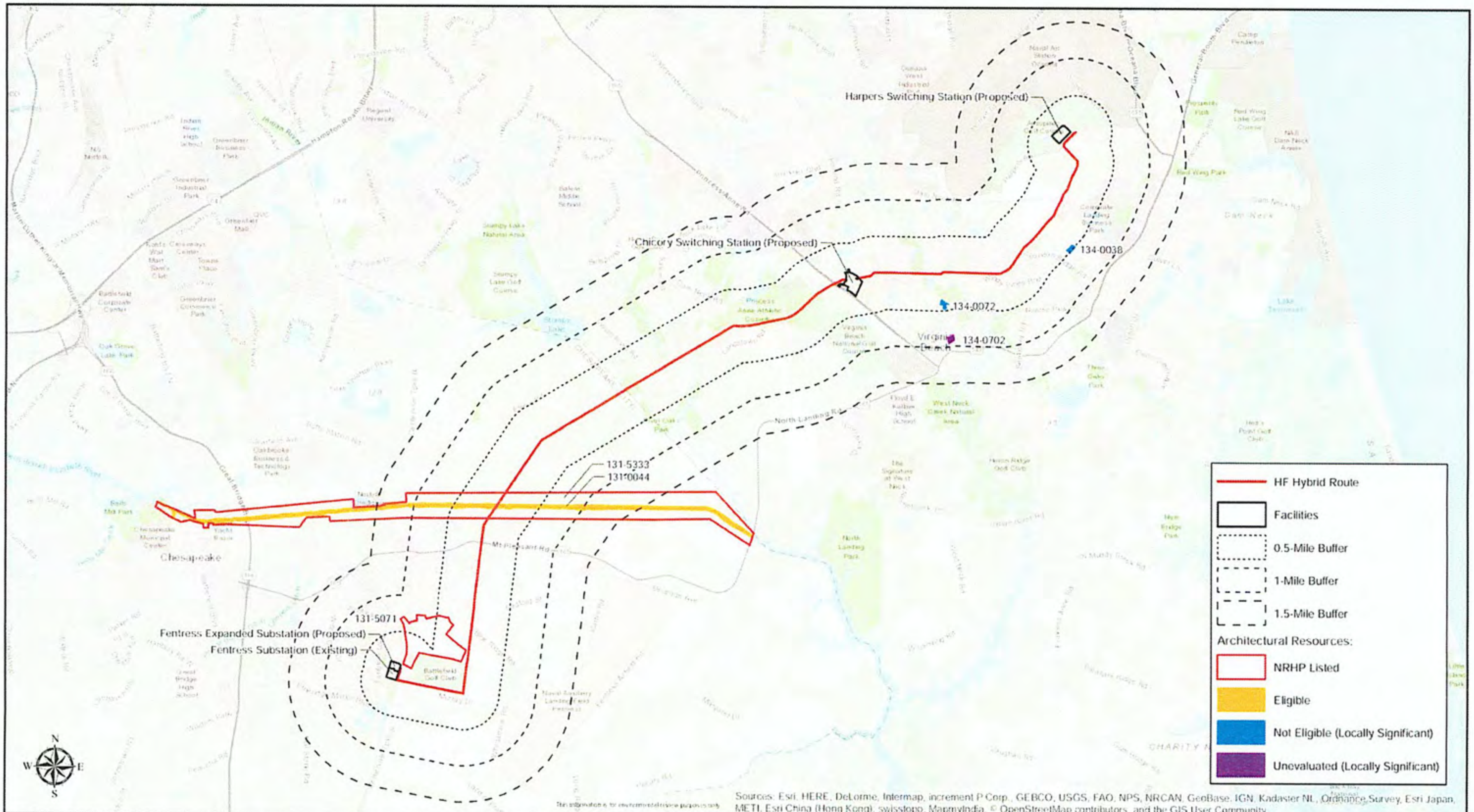

Dominion Energy

Attachment 2

Locations of Considered Historic Resources Associated with Proposed Project Alternatives - HF Hybrid Route

Coastal Virginia Offshore Wind Commercial Project

Dominion Virginia Power

Virginia Beach and Chesapeake, VA

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