

APPALACHIAN POWER COMPANY
BEFORE THE
VIRGINIA STATE CORPORATION COMMISSION
CASE NO. PUR-2021 -00001

APPLICATION FOR APPROVAL AND CERTIFICATION OF
ELECTRICAL TRANSMISSION LINE

Central Virginia Transmission
Reliability Project

VOLUME 2 OF 4

Siting Studies

January 2021

JOSHUA FALLS – RIVERVILLE – GLADSTONE 138 KV SITING STUDY

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**JOSHUA FALLS – RIVERVILLE – GLADSTONE 138 kV SITING
STUDY**

Siting Study

Central Virginia Transmission Reliability Project: Joshua Falls – Riverville – Gladstone 138-kV Transmission Lines SCC Case No. PUR-2021-00001

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Key Terminology

Alternative Routes	Assemblage of Study Segments that form routes for analysis and comparison.
Conceptual Routes	Initial routes for the project that adhere to a series of general siting and technical guidelines.
Constraints	Specific areas that should be avoided to the extent reasonably practical during the route development and site selection process.
Distribution Line	An electric line that delivers power from a substation to households and businesses.
Opportunity Feature	Areas where the transmission line may have less disruption to area land uses and the natural and cultural environment.
Project Endpoint	The project starting and ending point(s), which may include substations, switch stations, tap points, or other locations defined by the Company’s planners and engineers.
Proposed Route	The alignment on which the applicant/Siting Team proposes to construct a transmission line. The Proposed Route (1) reasonably minimizes adverse impacts on area land uses and the natural and cultural environment; (2) minimizes special design requirements and unreasonable costs; and (3) can be constructed and operated in a timely, safe and reliable manner.
Segment Endpoint	The intersection of two or more Study Segments.
Siting Team	A multidisciplinary team of experts in transmission line routing, impact assessment for a wide variety of natural resources and the human environment, impact mitigation, engineering, and construction management.
Routing Concepts	Initial routes for the project that adhere to a series of general siting and technical guidelines.
Study Area	The territory in which line route alternatives can be sited to feasibly meet the Project’s functional requirements and, at the same time, minimize environmental impacts and Project costs.
Study Segments	Study Segments are partial alignments that when combined form a complete route.
Substation	Substations are facilities that transform electric power from high to low, or the reverse an enclosed assemblage of

equipment, e.g., switches, circuit breakers, buses, and transformers, through which electric energy is passed for the purpose of switching or modifying its characteristics.

Tap Point

The location where power is tapped from an existing transmission line to source a substation or customer.

Transmission Line

An electric line that moves bulk electric power from a generating plant to a substation or between substations.

ACRONYMS

AEP	American Electric Power
Appalachian Power	Appalachian Power Company
BMP	Best Management Practice
Company	Appalachian Power Company
CPCN	Certificate of Public Convenience and Necessity
CR	County Road
CVEC	Central Virginia Electric Cooperative
CVTRP	Central Virginia Transmission Reliability Project
DOF	Virginia Department of Forestry
GIS	Geographic information system
GPS	Global positioning system
HOA	Homeowner’s Association
IPaC	Information for Planning and Consultation
kV	kilovolt
LiDAR	Light Detection and Ranging
NERC	North American Electric Reliability Corporation
NCED	National Conservation Easement Database
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PEM	Palustrine emergent wetlands
PFO	Palustrine forested wetlands
Project	Joshua Falls – Riverville – Gladstone 138-kV Transmission Lines Component
PSS	Palustrine shrub wetlands
PUB	Palustrine unconsolidated bottom wetlands

ROW(s)	Right(s)-of-way
SCC	State Corporation Commission
SR	State Route
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
U.S.	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCRIS	Virginia Cultural Resources Information System
VDACS	Virginia Department of Agriculture and Consumer Services
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historical Resources
VDOT	Virginia Department of Transportation
VDWR	Virginia Department of Wildlife Resources
VMRC	Virginia Marine Resources Commission
VOF	Virginia Outdoors Foundation
WOTUS	Waters of the United States

1.0 INTRODUCTION

1.1 Project Description

With the Central Virginia Transmission Reliability Project (“CVTRP”), Appalachian Power Company (Appalachian Power or the Company) is planning to upgrade the local electric transmission grid in five central Virginia counties: Amherst, Appomattox, Albemarle, Campbell, and Nelson. The CVTRP provides a new electrical source for the region, increases reliability to customers and supports the retirement of aging equipment. The Company’s application to the Virginia State Corporation Commission (SCC) (Case No. PUR-2021-00001), describes the overall need and necessity for the CVTRP.

The CVTRP includes numerous components; however, the Joshua Falls – Riverville – Gladstone 138-kilovolt (kV) Transmission Lines Component (the “Project”) is the subject of this report and depicted on **Figure 1**. The Project involves building approximately 17 miles of new single-circuit 138-kV transmission lines to connect the existing Joshua Falls and Riverville substations, owned by the Company, and the Gladstone Substation, owned by the Central Virginia Electric Cooperative (CVEC). The Project includes the following improvements in Amherst, Appomattox, Campbell, and Nelson counties:

1. Building a new single-circuit 138-kV transmission line between the existing Joshua Falls and Riverville substations (approximately 11 miles, Joshua Falls – Riverville 138-kV Transmission Line).
2. Building a new single-circuit 138-kV transmission line between the existing Riverville and Gladstone (CVEC) substations (approximately six miles, Gladstone – Riverville 138-kV Transmission Line).
3. Expanding the Company’s existing Riverville Substation.

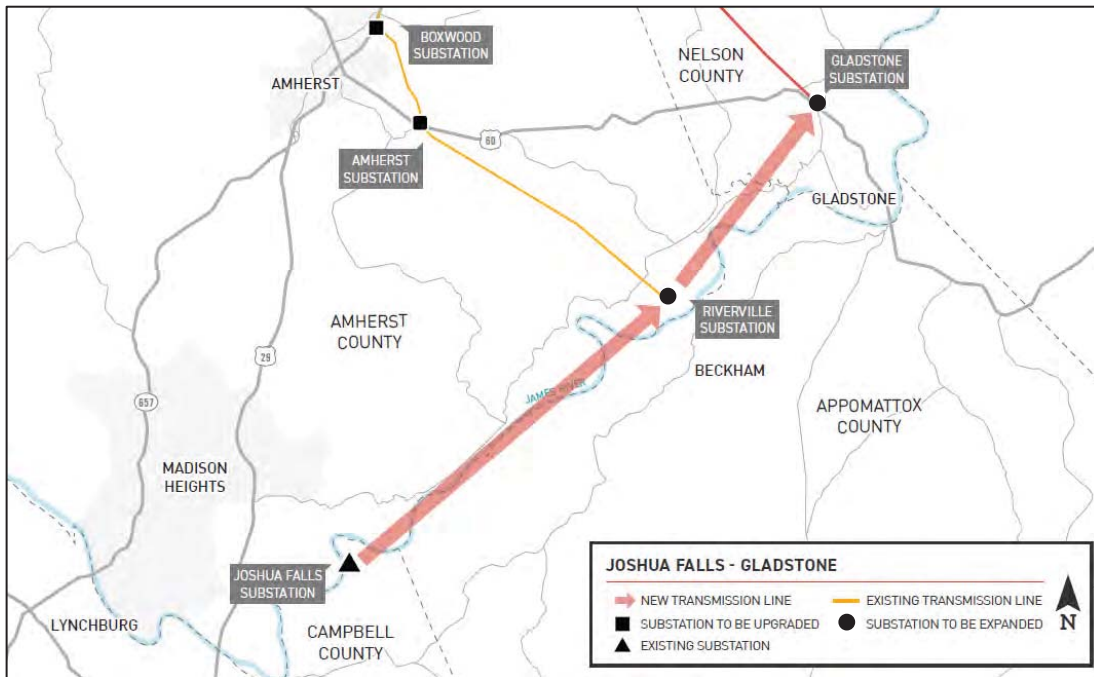


Figure 1. Component 1 Location Map

1.2 Proposed Transmission Facilities Description

Transmission line structure type may vary along the line route depending on topography and the needs of the Project. The primary structure type for the Joshua Falls – Riverville – Gladstone 138 kV Transmission Lines will be a steel H-frame structure. The anticipated structure heights of the proposed 138-kV transmission line range from 55 feet to 100 feet tall with an average height of approximately 70 feet (**Figure 2**). To span over the James River into Riverville Substation, 138 kV lattice towers will be necessary, and the average height is approximately 100 feet tall, with structure heights possibly ranging between 80 feet to 120 feet. The new transmission lines between the Joshua Falls, Riverville, and Gladstone (CVEC) substations will be built within a new 100-foot-wide right-of-way (ROW). The improvements at the Riverville Substation includes a new substation yard. The gravel fenced portion of the proposed Riverville substation yard at the will be approximately 250 feet by 180 feet.

The Company will seek approval from the SCC to construct the new transmission line and associated ROW within a 500-foot-wide filing corridor (250 feet on either side of the route centerline). The filing corridor allows for design flexibility in determining the final centerline within a 100-foot-wide ROW, which will be based on ground surveys, environmental studies, additional landowner input, and final engineering. If the SCC approves the Project, the Company will complete the preliminary engineering and work with property owners to determine the final

centerline alignment for the proposed 138-kV transmission lines. Easements will be acquired across private lands for the new transmission line ROWs. After receiving the above input, the Company will finalize the proposed structure locations and 100-foot-wide ROW within the SCC-approved 500-foot-wide filing corridor. The Company will also work with the necessary local, federal and state agencies during permitting and construction phases.



Figure 2. Typical Transmission Line Structures
H-frame (left) and Three-Pole Dead End (right)

1.3 Proposed Construction Activities Description

To prepare for the transmission line construction activities, ground surveying and environmental field surveys are necessary. The typical transmission line construction activities include: ROW clearing, erosion and sediment controls installation, temporary access road construction, crane pad grading, foundation installation, structure assembly and erection, conductor and shield wire installation, and restoration upon completion. See below **Figure 3**. These activities can create temporary inconveniences such traffic delays and detours, potentially brief electrical outages to customers, increased heavy equipment traffic, dust, and sounds.



Figure 3. Typical Access Road Construction Activities

The Company will make every effort during the construction process to be respectful of the environment. Activities will be conducted in accordance with applicable federal, state, and/or local requirements. After construction, general maintenance activities include periodic right-of-way vegetative management and inspections to ensure the safe and reliable operation of the transmission line.

1.4 Project Timeline and Overview of Regulatory Approvals

The CVTRP was initiated in the spring of 2018 with a kick-off meeting held among the Siting Team members of various disciplines, described in Section 2.1. Team members divided the Project into four main components given their geographical location in central Virginia: 1) Joshua Falls – Gladstone – Riverville 138-kV Transmission Lines (the focus of this report); 2) James River 138-kV Substation, building a new 138-kV substation in Nelson County; 3) Soapstone 138-kV Substation, building a new 138-kV substation in Nelson County; and 4) Amherst – Reusens 69-kV Transmission Line Rebuild, rebuilding an existing 69-kV transmission line in Amherst County and the City of Lynchburg. The last part of the CVTRP involves rebuilding an existing 46-kV transmission line and expanding one substation in Albemarle County (the Esmont – Scottsville component), but is not associated with the anticipated Certificate of Public Convenience and Necessity (CPCN) Application for the CVTRP. The CVTRP components subject to SCC approval are depicted on **Map 1, Attachment A**.

Early in the route development process, the Siting Team coordinated with key stakeholders and introduced the Project to Amherst, Appomattox, Nelson, and Campbell counties in June and July 2019. Throughout the route development process, the siting team collected resource data, developed routing criteria, conducted an opportunities and constraints analysis, and conducted field visits to verify the data and aid in the development of a Study Segment Network as discussed in Sections 3.5 and 3.6. After developing a Study Segment Network, the siting team conducted two sets of public open houses in November 2019 and February 2020 to solicit feedback from the public and affected landowners on the Study Segment Networks. Open houses were held in both Amherst and Appomattox counties and over two consecutive days. After the open houses, siting team members conducted field reviews and met with landowners to discuss concerns and feedback on Study Segments (further discussed in Section 3.0). The Siting Team completed the detailed route development process for the Project with the selection of a Proposed Route in December 2020.

The Joshua Falls – Riverville – Gladstone 138-kV Transmission Lines are part of a CPCN application that will be submitted to the SCC.

1.5 Goal of the Siting Study

The goal of the Joshua Falls – Riverville – Gladstone Siting Study (Siting Study) is to gain an understanding of the constraints and opportunity features in the study area to facilitate the development of Study Segments, evaluate potential impacts associated with the Study Segments, and identify a proposed route and one or more alternative routes. The proposed route is the route that (1) is most consistent with the siting guidelines (see Section 2.4); (2) reasonably minimizes adverse impacts on the natural and human environments; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner. Section 2.0 describes the route development process to meet the goal of the Siting Study. The document also provides the basis for the Company to identify a Proposed Route that addresses the Virginia SCC Staff’s Guidelines for Transmission Line Applications filed under Title 56 of the Code of Virginia.

2.0 ROUTE DEVELOPMENT PROCESS

2.1 Siting Team

The route development process begins by assembling a multi-disciplinary team with a wide range of experiences. Team member expertise includes (but not always limited to): transmission line siting, impact assessment for a wide variety of natural resources and the human environment,

impact mitigation, engineering, construction management, project management, and public relations (the **Siting Team**). The Siting Team includes AEP employees and outside consultants. Additional expertise is added depending on the project needs.

The Siting Team works together to develop siting criteria, identify siting constraints and opportunities, collect and analyze environmental and design data, solicit public input and concerns, consult with natural resource and permitting agencies, develop and revise the siting alternatives, and analyze and report on the selection of a proposed route.

2.2 Route Development Process Overview

The route development process is inherently iterative with frequent modifications made throughout the study as a result of identifying new constraints, obtaining input from agencies, landowners, residents and other stakeholders, periodic re-assessment of routes with respect to the siting criteria, and adjustments to the overall route network. As a result of the evolving nature of the route development process, the Siting Team uses specific vocabulary to describe the routes at different stages of development. The following provides an overview of the route development process and related vocabulary.

Initial route development efforts start with the identification of **Project Endpoints**. Project starting and ending points may include substations, switch stations, tap points, or other locations defined by the Company's planners and engineers. Next, the large area constraints and opportunity features are identified within the **Study Area**, which encompasses the Project Endpoints and areas in between (**Figure 4, Step 1**). These areas are typically identified using a combination of readily available public data sources.

The **Siting Team** uses this information to first develop an array of **Conceptual Routes** for the Project adhering to a series of general siting and technical guidelines (**Step 2**).

Where two or more of these routing concepts intersect, **Study Segments** are formed between two common points of intersection. Together, the assemblage of Study Segments is referred to as the **Study Segment Network (Step 3)**.

As the route development process progresses, the Siting Team continues to evaluate new data, such as public and stakeholder input and field inspections, and modifies, if necessary, the Study Segments included in the network to develop a **Refined Study Segment Network (Step 4)**. Eventually, formal **Alternative Routes** are developed by assembling the Study Segments that practicably meet the Siting Guidelines (see Section 2.4) into individual routes for analysis (**Step 5**). Alternative Routes are assessed and compared on land uses, natural and cultural resources,

and engineering and construction concerns. Ultimately, through a quantitative and qualitative analysis and comparison of the Alternative Routes, the Siting Team identified a **Proposed Route (Step 6)**, which is the most suitable route that meets the goal of the Siting Study (see Section 1.5).

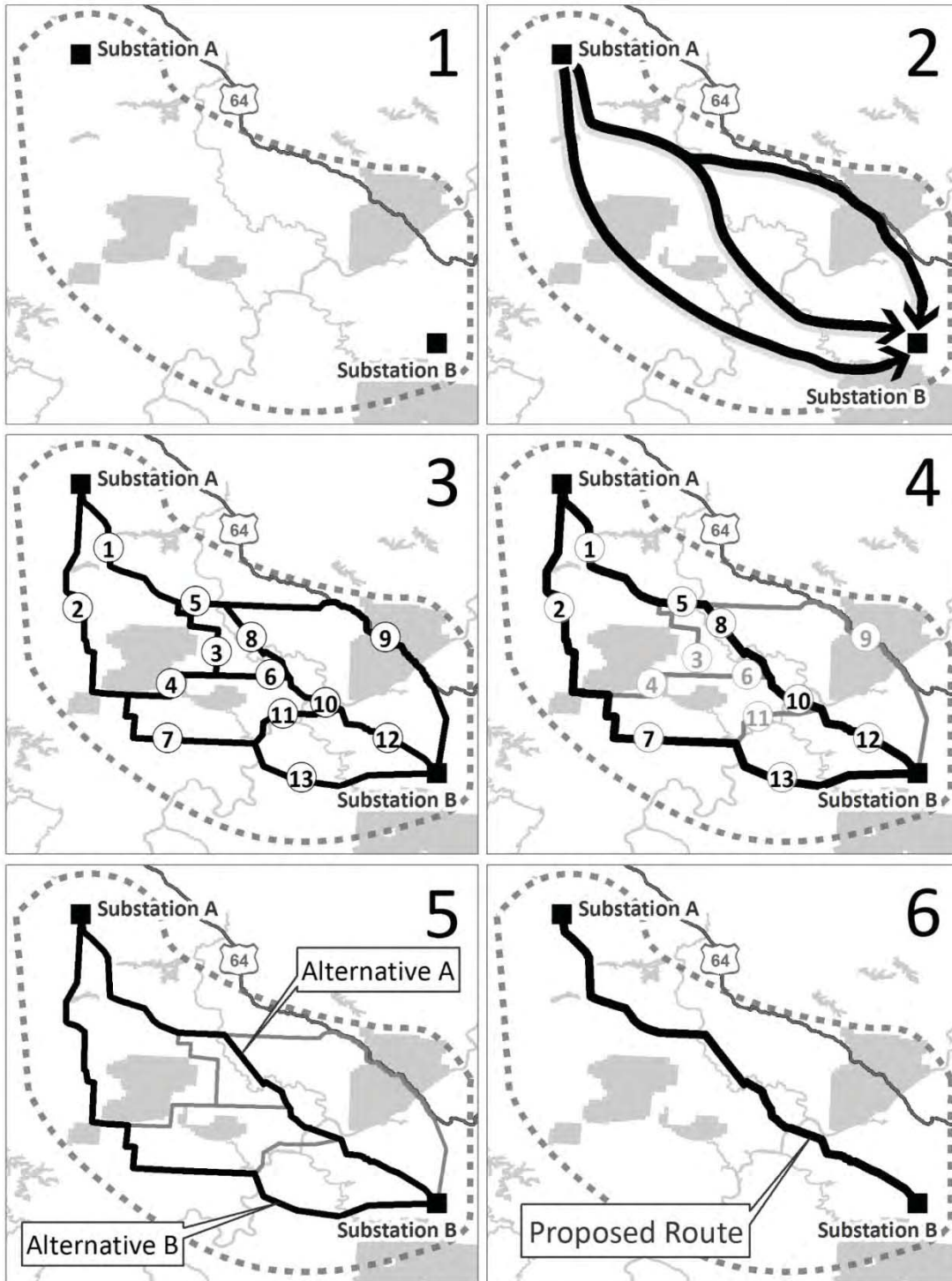


Figure 4. Route Development Process Steps

This figure shows the route development process and does not depict routes or segments related to this Project.

2.3 Data Collection

The following sources of information were used to develop data for the Siting Study. Data was reviewed and collected for existing land uses, natural resources, cultural resources, transportation facilities, and existing utility and linear features. A detailed table of data sources is provided in **Attachment B – GIS Data Sources**. The Siting Team collected and reviewed the data in the following sections, to support the Siting Study.

2.3.1 Geographic Information System (GIS) Data Collection

Aerial photography is an important tool for route selection. The primary sources of aerial imagery used in the route identification, analysis, and selection effort for the Project include:

- Esri (2020)
- Google (Imagery dates vary by location)
- Light Detection and Ranging (LiDAR) (flown in September 2020 for alternative routes as described in Section 3.8)

Updated information, such as the location of new residences and other constraints, was annotated to the photography by either paper maps (at the public open houses) and transferred into the GIS or digitized directly into the GIS as identified during field inspections from points of public access or aerial photography.

The study made extensive use of information in existing GIS data sets, obtained from many sources, including federal, state, and local governments. Much of this information was obtained through official agency GIS data access websites, some was provided directly by government agencies, and the Siting Team created some by digitizing information from paper-based maps, aerial photo interpretation, interviews with stakeholders, and field inspections.

GIS data sources vary with respect to their accuracy and precision. For this reason, GIS-based calculations and maps presented throughout this study should be considered reasonable approximations of the resource or geographic feature they represent and not absolute measures or counts. The data and calculations presented in this study allow for relative comparisons among project alternatives, with the assumption that any inherent errors or inaccuracies would be generally equal across all alternatives. Field reviews are conducted to verify certain features (e.g., locations of residential, commercial, and industrial buildings). **Attachment B** presents a list of the GIS data sources used for the Siting Study.

2.3.2 Federal, State, and Local Government Coordination

The Siting Team obtained information from or contacted various federal, state, and local agencies and/or officials to inform them of the Project and request data for the route planning process. The agencies contacted are listed below. Copies of letters and agency correspondence specific to the Project are included in **Attachment C – Agency Correspondence**.

Federal Agencies

- United States Army Corps of Engineers (USACE)
- United States Environmental Protection Agency (USEPA)
- United States Fish and Wildlife Services (USFWS)
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)
- United States Department of Transportation Federal Highway Administration
- United States Department of Transportation Federal Aviation Administration

State Agencies

- Virginia Department of Wildlife Resources (VDWR), previously the Department of Game and Inland Fisheries
- Virginia Department of Conservation and Recreation (VDCR)
- Virginia Department of Environmental Quality (VDEQ)
- Virginia Marine Resources Commission (VMRC)
- Virginia Department of Agriculture and Consumer Services (VDACS)
- Virginia Department of Historical Resources (VDHR)
- Virginia Outdoors Foundation (VOF)
- Virginia Department of Forestry (DOF)
- Virginia Department of Aviation
- Virginia Department of Mines, Minerals, and Energy
- Virginia Department of Health
- Virginia Department of Transportation (VDOT)

Local Agencies and/or Officials

The Siting Team coordinated with local government agencies/officials to aid the route development process. The Siting Team reviewed future land uses and county-specific goals to evaluate areas of constraints and opportunities in each of the county’s comprehensive planning documents (further detailed in Section 4.2). These entities included:

- Amherst County Administrator, Director of Planning and Zoning, and members of the Board of Supervisors
- Appomattox County Administrator and members of the Board of Supervisors
- Campbell County Administrator and members of the Board of Supervisors
- Nelson County Administrator and members of the Board of Supervisors

Other stakeholders and individual landowners were identified and contacted as part of the siting process. The input received from landowner meetings and the public open houses was used in the development and modification of line routes and is further discussed in Section 3.0.

2.3.3 Field Reconnaissance

Siting Team members conducted field inspections within the Study Area throughout the duration of the route development process. The team members examined Study Segments by automobile from public roads and other points of public access and correlated observed features to information shown on aerial photography, United States Geological Survey (USGS) 7.5-minute topographic maps, road maps, and the range of GIS sources compiled. Prior to field work, some key features such as residences, outbuildings, places of worship, cemeteries, and commercial and industrial areas were identified and mapped in GIS. Certain features were field-verified on site-visits and added to the GIS database using tablets with GPS (global positioning system) capabilities and annotating paper maps.

A total of six field visits were conducted for the Project. One field visit with the Siting Team was conducted in 2018 (July 25 – 26). Three field visits with the Siting Team were conducted in 2019 (February 12, August 12, and August 21). One-day field visits were conducted on May 12 and July 29, 2020. The field visits provided the Siting Team a high-level understanding of the Project area and the opportunity to review Study Segments in the field from public points of access. Field visits were also conducted during stakeholder and landowner meetings in December 2019 and June 2020. Additionally, the Siting Team used LiDAR imagery for the Project (flown for alternative

routes as discussed in Section 4.0) to verify building and structure locations and was considered the best available data prior to filing with the Virginia SCC.

2.3.4 Public and Stakeholder Input

The consideration of public and stakeholder input is critical to the route development process. Landowners and stakeholders provide information and recommendations to aid the Siting Team in the development and refinement of Study Segments and alternative routes. Typically, a project-specific outreach plan is developed and can include open houses, websites, mailings, advertising, etc. More information on how public and stakeholder input was used for the Project can be found in Section 3.0.

2.4 Siting Guidelines

2.4.1 General Guidelines

To the extent reasonable and practical, the Siting Team used the following general siting guidelines to help develop Study Segments and routes:

- Avoid crossing or minimize conflict with designated public conservation and protected lands such as national and state forests and parks and local conservation easements.
- Avoid or minimize new crossings of rivers and large wetland complexes, critical and protected habitats, and other unique or distinct natural resources.
- Minimize transmission line span length and the number of crossings over the James River.
- Avoid or minimize habitat fragmentation in unfragmented areas and impacts on designated areas of biodiversity concern.
- Maximize the separation distance from and/or minimize impact on dwellings and community facilities, cemeteries, schools, daycare facilities, hospitals, historic resources, and designated landmarks.
- Avoid or minimize visibility from designated scenic resources.
- Avoid or minimize conflict with existing land uses and future development with a proposed plan, schedule, and permitting process underway.
- Minimize interference with existing and future economic activities, natural gas activities, mining operations, and industrial facilities.

- Consider using or paralleling existing ROWs or other linear features and infrastructure when feasible. When paralleling existing facilities, however, reliability issues and mitigation requirements must be evaluated.
- Consider paralleling property lines, land use breaks, and land cover edges.
- Consider stakeholder input.
- Avoid conflicts with designated public and military aviation facilities.
- Minimize environmental impact and construction/maintenance costs by selecting shorter, direct routes.
- Consider safety with respect to construction, maintenance, and operation of the facilities.
- Consider construction concerns such as access, road traffic control, outages, pipeline mitigations, railroad interactions, existing telecommunication line and distribution line conflicts, etc.
- Consider routes through terrain and land use where economical construction and environmental best management practices can be employed.
- Minimize environmental impact by considering routes that minimize the overall length of access roads, length on steep slopes, and waterbody crossings.
- Consider state-specific regulatory siting guidelines if available.
- Consider Environmental Justice. The station site selection and line routes will fairly consider the environmental impacts on the surrounding community and area “regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (www.epa.gov/environmentaljustice).

2.4.2 Technical Guidelines

Technical guidelines are driven by the physical characteristics and engineering limitations of the structures and lines themselves, and the design criteria necessary to meet Company design standards, North American Electric Reliability Corporation (NERC) reliability standards, National Electric Safety Code, and industry best practices for construction. The technical guidelines were informed by: (1) the technical expertise of engineers and other industry professionals responsible for the reliable, safe and economical construction, operation, and maintenance of electric system facilities, (2) NERC reliability standards as implemented by PJM; and (3) industry best practices.

The Siting Team considered the following technical guidelines during Study Segment and route development to the extent practical:

- Minimize crossing lines of higher voltage.
- Minimize the length of paralleling extra-high voltage transmission lines due to operational and reliability issues.
- Maintain a minimum of 100 feet of centerline-to-centerline separation when paralleling 138-kV or lower voltage transmission lines.
- When paralleling existing transmission lines, verify there are no reliability issues by locating two lines adjacent to each other.
- When paralleling existing pipelines, evaluate mitigation requirements.
- Minimize structure angles greater than 65 degrees.
- Minimize structures on steep slopes (generally, this is more than 20% slopes for angle structures and more than 30% for tangent structures), particularly if guy wires are required for construction.
- Avoid triple-circuit lines.
- Locate proposed lines near future load growth areas.
- Minimize distribution underbuild or co-location on transmission structures if possible.

2.5 Public Involvement Process

2.5.1 Public Communications and Open Houses

Given the geographical size of the Project, team members conducted two sets of public open houses to gather landowner and community feedback. The first set of open houses was held November 6 and 7, 2019 from 5:30 – 7:30 p.m. at Appomattox County High School (198 Evergreen Avenue) and Amherst County High School (139 Lancer Lane), respectively. The first set of open houses were used to introduce the Project and present the initial Study Segment network (further detailed in Section 3.5). After completing route modifications from additional desktop and field reviews, as well as landowner and stakeholder meetings, the Siting Team held a second set of open houses. These were held on February 26 and 27, 2020 at the same high schools. The second set of open houses presented a revised Study Segment network based on landowner feedback and additional analysis from the first set of open houses, as further discussed in Section

3.6. Various stations were set up at all open houses that provided information related to engineering and design of structures, overall Project need, ROW, and construction.

Printed aerial and topographical maps at a scale of 1-inch equals 200 feet were provided at each open house for the public to review and were used to record written comments concerning sensitive resources in their local environment. Members of the Siting Team greeted meeting attendees, answered questions about the Project, and aided attendees in locating their property or other features of concern on aerial maps showing the array of existing infrastructure and Study Segments under consideration. Participants were encouraged to document the location of their houses, places of business, property of concern, or other sensitive resources on the printed maps. After each public open house, handwritten comments were digitized and entered into a GIS database.

Comment sheets were distributed to all meeting attendees. Attendees were asked to fill out the sheet completely, including contact information. The Siting Team read all comment sheets and scanned and stored them in the project database as a record of meeting attendance and public comments. A total of 47 people attended the first set of open houses held in November 2019 and a total of 64 people attended the second set of open houses in February 2020. A total of 46 comment cards were received from both sets of public open houses. No elected or appointed officials attended an open house; however, three media representatives attended the February 2020 open houses.

2.5.2 Public Notifications

A public notification for the Joshua Falls – Riverville – Gladstone 138-kV Transmission Lines component was initially made on October 29, 2019. Landowners within a 1,000- foot corridor (500 feet on either side of a route centerline) of the presented study segment networks were notified about the two sets of public open house through the following means:

1. Two automated telephone notifications from the Company were made, on October 30 and November 5, 2019. Twenty-two (22) landowners were reached through the message.
2. A total of 349 letters and project fact sheets were mailed to landowner addresses on October 25, 2019 and 397 letters were mailed on February 13, 2020. Post card invitations indicating the locations of the open houses were mailed to the same addresses on October 25, 2019 and February 19, 2020.
3. Prior to the open houses, advertisements circulated in the Amherst, Appomattox and Lynchburg areas to introduce the Project and invite the public to the meetings. The

advertisements were published in the Amherst New Era Progress, Nelson County Times, News & Advance and Times Virginian. Two advertisements were published on October 30 and November 4, 2019, and again on February 19 and 24, 2020.

4. A news release was distributed by the Company on October 25, 2019 and February 13, 2020 on the Project website (see Section 2.5.3).

2.5.3 CVTRP Website

A website was created by the Company for all CVTRP components. The CVTRP website is intended to encourage attendance at the public open houses and provide information regarding the CVTRP. The website (www.AppalachianPower.com/CVTRP) was initially launched on October 24, 2019 to announce the CVTRP, and is continually updated as the CVTRP progresses. The website includes information, updates and news releases, an interactive map, fact sheet information, and timelines. Questions and comments were also welcomed on the CVTRP website through the contact page.

3.0 ALTERNATIVE ROUTE IDENTIFICATION

3.1 Project Endpoints

The Project Endpoints include the Company's existing Joshua Falls and Riverville substations, and CVEC's Gladstone Substation, which will connect the two new 138-kV transmission lines. A substation site selection process was not needed for the Siting Study as the substations are existing and will expand or upgrade at their current locations.

3.2 Study Area Description

The study area is the territory in which line route alternatives can be sited to feasibly meet a project's functional requirements and reasonably minimize environmental impacts and project costs. The boundaries of the Study Area were determined by the geographic area encompassing the Joshua Falls, Riverville, and Gladstone substations. The James River bisects the Study Area southwest to northeast, with the Joshua Falls Substation located on the south side of the river and the Riverville and Gladstone substations located on the north side of the river. The Study Area includes some of CVEC's service territory in Appomattox County, south of the James River, and in Amherst and Nelson counties, east of the Riverville Substation and north of the James River. The Study Area was intended to encompass all reasonable Routing Concepts between these connection points. Given these considerations, the Siting Team identified a Study Area encompassing approximately 73,000 acres (approximately 43 square miles) in Amherst, Appomattox, Campbell, and Nelson counties.

The Study Area is bisected by the James River, a Section 10 navigable waterway, and will be unavoidably crossed to connect the three substations. Along the James River are scenic farmlands and some properties with historical significance. Generally, the terrain on the south side of the river can be characterized as rolling hillsides with flatter agricultural areas. There is steeper terrain on the north side of the James River and near the Joshua Falls Substation. Large blocks of timbering areas exist throughout the Study Area. Residential development is concentrated along major county road corridors and on ridgelines. Major roadways in the Study Area include Stapleton Road, Earley Farm Road, and Riverville Road in Amherst County and Appomattox County Roads (CR) 605, 611, and 721. Industrial development exists in Amherst County near the Riverville Substation, including the Greif Paper Mill. The Study Area for the Joshua Falls – Riverville – Gladstone 138-kV Transmission Lines is depicted on **Map 2, Attachment A**.

3.3 Constraints and Opportunities Features

The Siting Team identified and mapped siting constraints and opportunity features within the Study Area as described below and shown on the Study Area map (**Map 2, Attachment A**).

Constraints

Constraints are specific areas that should be avoided to the extent practical during the route development process. Using readily available data sources, the Siting Team initially identifies large constraints during the beginning of the route development process including, but not limited to, the following:

- Populated areas, including towns, small villages, urban areas, and other high concentrations of residential, commercial and industrial development areas.
- National Register of Historic Places (NRHP) districts (listed and eligible).
- VDHR's Virginia Cultural Resources Information System (VCRIS) architectural and archaeological resources.
- Recreational areas such as parks or recreational waterways.
- Large rivers (including the James River), streams, creeks, wetlands, flood zones or unique natural resource features, and critical habitat areas.
- Designated federal or state forests, parks, state game lands, and other natural and conservation areas, including DOF and VOF conservation easements.
- Large industrial areas, such as the Greif Paper Mill.

The Study Area includes the following large constraints: the James River, several DOF and VOF conservation easements and multiple VDHR resources along the James River, including the NRHP-listed Galts Mill Complex. No National Forests or Wildlife Management Areas are located in the Study Area.

As the Siting Team developed specific siting alignments, smaller site-specific constraints are identified (using readily available public data sources, stakeholder input, and field inspections). Through the iterative process of route development (described in Section 2.0), the routes were adjusted to avoid small constraints where feasible, including, but not limited to, the following:

- Individual residences (houses, mobile homes, and multi-family buildings)
- Commercial and industrial buildings

- Outbuildings and barns
- Cemeteries
- Places of worship
- Schools
- Hospitals
- Designated historic resources and landmarks, such as Virginia Department of Agricultural and Consumer Services-designated century farms
- Small National Wetlands Inventory (NWI) wetlands
- Specific recreational sites, facilities, and trails
- Radio and communications towers
- Designated scenic vista points and/or roadways such as Galts Mill Road
- Steep terrain and narrow ridgelines

Opportunity Features

Opportunity features are typically existing corridors where a transmission line would be a compatible land use or its viewshed has been previously impacted by an existing linear feature. Opportunity features typically considered include other linear infrastructure and utility corridors, rail lines, and roads, but may also include land cover edges, unused portions of industrial or commercial areas, or parcel boundaries.

The Study Area is limited in available siting opportunities. There are no existing transmission lines that bisect the Study Area from west to east that provide a paralleling opportunity to connect the Project Endpoints. However, there are two existing north-south transmission lines, the Cloverdale – Joshua Falls 765-kV and the Amherst – Riverville 138-kV transmission lines that provide short paralleling opportunities. After field reviews, roads and railroads within the Study Area were not considered opportunity features given the amount of residential development along those corridors and the location of the railroad along the James River. Where practicable, the Siting Team considered paralleling parcel boundaries as an opportunity to avoid residences and to minimize bisecting parcels that could impact future development or other uses.

3.4 Routing Concepts

The Siting Team began the route development process by identifying routing concepts for the proposed transmission lines, considering the opportunities and constraints, the goal of the Project, and general routing and technical guidelines. Routing concepts were developed on either side of the James River, which must be unavoidably crossed as the Joshua Falls Substation is on the south side of the river and the Riverville Substation is on the north. The Routing Concepts considered to connect the Project Endpoints are presented in **Map 3, Attachment A**.

3.4.1 Joshua Falls – Riverville 138-kV Transmission Line

Routing concepts must cross the James River to connect the Joshua Falls and Riverville substations. The area immediately across the James River from Joshua Falls Substation and in Amherst County is forested, rugged, and mountainous with scattered residential development along major roadways such as Galts Mill Road, Stapleton Road, and Earley Farm Road. There is a large residential community, Amherst Plantation, and a tall communication tower located on adjacent ridgelines on the north side of the river, limiting space for a potential transmission line ROW. Routing concepts were developed along the ridgelines, avoiding residential development and streams located in the valleys to the extent possible. Routing concepts along the James River and railroad were not considered because of residential development along Galts Mill Road, a large VOF easement, and an NRHP site, the Galts Mill Complex, and viewshed impacts on the James River. In addition, crossing the large floodplain areas located along the James River should be minimized, to the extent feasible. Further, there is a very prominent horseshoe-bend in the James River between Joshua Falls and Riverville substations. Paralleling the railroad along these curves in the river would result in high visual impacts to local residents and recreational users of the river and require significantly more structures, with fairly short spans to parallel the railroad and the winding nature of the river.

There is minimal buildable space to parallel the existing Amherst – Riverville 138-kV Transmission Line ROW at the Stapleton Road crossing due to the location of residences. A routing concept parallels the existing 138-kV ROW immediately adjacent to a residence, which removes their entire vegetative buffer to the existing transmission line. The Greif Paper Mill's landfill and truck parking lot is on the south side of Stapleton Road. Paralleling the west side of the Amherst – Riverville 138-kV Transmission Line conflicts with a proposed landfill expansion area and places a cemetery within the ROW. Upon further field investigation, the Siting Team noted a helipad on the paper mill property near the truck parking lot, which made routing concepts parallel to the 138-kV line from the west not practicable due to impacts to residences, the Greif Paper Mill, and a cemetery.

Routing Concepts on the south side of the river are primarily in CVEC's service territory. The town of Stonewall is on the south side of the river, in Appomattox County. The general area has seen moderate population growth. Terrain near the Joshua Falls Substation is steeper as compared to more rolling agricultural hills and fields centrally located between the two substations in Appomattox County. Southern routing concepts exit the Joshua Falls Substation paralleling the west side of the existing 765-kV transmission line. The east side of the 765 kV transmission line currently has an easement that is reserved for future use by AEP Planning. The Siting Team considered concepts that parallel the 765-kV transmission line to the west near a residential community along Mt. Athos Road. Other options cross under the 765-kV transmission line on Company-owned property and avoid crossing Mt. Athos Road. Routing concepts across Mt. Athos Road must cross under the 765-kV transmission line, where terrain limits viable crossing locations that maintain proper clearances.

The Siting Team considered several southern routing concepts to avoid residential areas. One southern routing concept crosses Appomattox CR 721 near the Stonewall area in a large undeveloped area. After the concept was developed, the Siting Team identified a 986-acre DOF conservation easement that was crossed. DOF conservation easements are similar to VOF easements in that new development, including utility corridors, are generally prohibited and as such, the routing concept that crosses the DOF easement was removed. An even farther southern concept was considered that avoids the DOF easement through largely undeveloped agricultural land. The far southern option added more than two miles in length compared to other northern routes being considered. To avoid the DOF easement and minimize total line length these southernmost routing concepts were dismissed from consideration.

3.4.2 Gladstone – Riverville 138-kV Transmission Line

Routing concepts between the Riverville and Gladstone substations are largely in CVEC's service territory. Northern routing concepts between the Riverville and Gladstone substations avoid an additional river crossing. One northern routing concept exits the Riverville Substation proposed expansion to the north and parallel the existing Amherst – Riverville 138-kV transmission line on the east side. Routing concepts parallel the existing transmission line for various lengths, largely to avoid residential development and a VOF easement, turning east to cross rolling terrain and large tracts of timbering lands. A large VOF conservation easement is on the north side of the river; routing concepts were considered north and south of the easement. A routing concept along the James River and the railroad was not considered between the Riverville and Gladstone substations for the same reasons as between the Joshua Falls and Riverville substations area.

Southern routing concepts were considered in Appomattox County in less developed areas and timbering lands, but require an additional James River crossing to connect to CVEC's Gladstone Substation. Several routing concepts consider a double-circuit in and out of the Riverville Substation and add river crossings to the east, near CVEC's Gladstone Substation. The Siting Team dismissed the two easternmost river crossing locations as both spans would likely require structures in the floodplain and/or on Smith Island and added additional line length and angles (**Map 3, Attachment A**).

3.5 Study Segment Development

The Siting Team developed a series of Study Segments based on the siting process and criteria developed in Section 2.0. Study Segments are partial alignments developed based on the routing concepts. As the siting effort evolved, Study Segments were revised, removed, or added. These eliminations or adjustments were based on the likelihood of impacts on residential, commercial and industrial areas, agricultural areas, planned and future development, and natural areas. The resulting Study Segment network evaluated by the Siting Team (described below) was presented at the in-person public open houses in November 2019 is shown in **Map 4, Attachment A**.

3.5.1 Joshua Falls – Riverville 138-kV Transmission Line

South of the James River (Appomattox and Campbell Counties)

Study Segment 1 exits the Joshua Falls Substation along the Company's existing Cloverdale – Joshua Falls 765-kV Transmission Line. The Siting Team created a Study Segment that continued to parallel the 765 kV transmission line (Study Segment 2) and one that immediately turned to the east (Study Segment 3). Study Segment 3 parallels the existing 765-kV ROW to the west and crosses a residential area along Chestnut Mountain Road/Mt. Athos Road. The terrain is relatively steep south of the Joshua Falls Substation and 765-kV line and crossing locations are limited in order to maintain adequate clearances. Study Segment 3 crosses under the 765-kV line in a feasible location, past the residential development and continues southeast through timbering areas, eventually connecting to Study Segment 8. To avoid Chestnut Mountain Road/Mt. Athos Road, Study Segments 2, 4, and 5 remain north and near the James River, crossing atop the Chestnut Mountain ridge.

The terrain south of Chestnut Mountain is less steep as compared to more rolling and agricultural areas centrally located between the two substations in Appomattox County. Study Segment 6 diverts south of the Chestnut Mountain ridge. Study Segment 8 is north of Appomattox CR 611, crossing a large timbering operation. East of the timbering operation is a small residential development along Tin Top Place, where houses are distanced from each other and located on

large parcels. Study Segment 8 crosses Tin Top Place maximizing distance from residences and paralleling parcel boundaries to the extent possible. East of Tin Top Place there is little to no development; the terrain begins to steepen around Wreck Island Creek, towards Appomattox CR 605 (Beckham Road), where wide and scenic views of these hills are highly visible from the roadway.

South of Appomattox CR 605, there is a VDACS century farm and historic farm house, dating back to the 1800s. The Siting Team developed options to avoid the potentially sensitive resources along Appomattox CR 605. Study Segments 11, 13, and 15 turn northeast from the Tin Top Place area and cross Appomattox CR 605 west of the century farm. Study Segment 14 remains south and crosses in scenic forested hills and visible from the roadway. Study Segment 14 turns north along a parcel boundary and across Appomattox CR 605 to continue towards the Riverville Substation.

The Siting Team also considered options that remain closer to the James River where terrain is steeper, but line length can be minimized. Study Segments 4, 5, 7, and 9 cross forested areas on slightly higher terrain, where development is sparse as compared to roadways at lower elevations. There is a large DOF conservation easement (approximately 275 acres) between the James River and Appomattox CR 605. DOF conservation easements are similar to VOF easements in that they are restrictive of new utility corridor crossings, unless directly serving the parcel. Therefore, the northernmost Study Segments divert south to avoid crossing the DOF easement. Study Segments 10 and 15 parallel the edge of a DOF easement and other parcel boundaries before turning north to cross the James River.

North of the James River (Amherst County)

The Company's service territory is predominantly located on the north side of the James River where the terrain varies, but is generally steeper and more rugged, especially near Beck Creek, Partridge Creek, and Christian Mill Creek. The northern Study Segments are generally a series of east-west routes with connectors to maximize constructible terrain; and avoid existing and future residential areas to the extent practicable. Northern Study Segments are located on ridgelines and through a residential area, Amherst Plantation, with homesites and roads situated on the ridgeline. Study Segments 22 and 29 cross parcels within Amherst Plantation and at the highest terrain. East of Beck Creek is Round Mountain, a constructible high point location for a transmission line structure; however, an FM radio tower is currently on the ridge. Study Segments 23 and 30 and Study Segments 24 and 31 are on adjacent ridgelines located either north or south of the FM radio tower. To avoid the FM radio tower, Study Segments 30 and 31

are located on side slopes and on less constructible terrain. All Study Segments continue northeast, unavoidably crossing Earley Farm Road and Partridge Creek, which runs north-south and connect to Galts Mill Road (a VDOT-designated Scenic Road). Study Segment 29 crosses subdivided parcels on Earley Farm Road and east of the Amherst Plantation neighborhood. Study Segments 30 and 32 remain south of the subdivided area. Study Segments 36, 37, and 38 continue straight and run along a predominate ridgeline through timbering lands east of Earley Farm Road. Study Segment 39 remains north of Stapleton Road and on higher terrain, but crosses a large farm and a recently subdivided parcel. Study Segments remain north of Stapleton Road to the extent practicable, to avoid multiple residences and places of worship along the road.

A large, private, corporate retreat center, and working farm (Townley IV Farm) consists of multiple parcels, totaling 1,400 acres according to Amherst County's parcel database, on either side of Stapleton Road. Due to the size and amount of land owned by Townley IV Farm, a transmission line crossing their property is unavoidable to reach the Riverville Substation. Study Segment 40 crosses the northern extent of the Townley IV Farm retreat property and behind their facilities, but requires crossing a gas line ROW twice. Additionally, a 200-acre VOF easement is located southeast of Townley IV Farm and is also bound by Stapleton Road. An existing Company distribution corridor crosses the VOF easement, so the Siting Team developed Study Segments 41 and 43 to parallel the distribution line to reduce length and impacts. To avoid the VOF easement, Study Segment 42 crosses Stapleton Road and a Townley IV Farm parcel, near the retreat's main entrance. Due to a home on Stapleton Road, conflicts to the Greif Paper Mill landfill, and a cemetery adjacent to the existing transmission line, the Company's existing Amherst – Riverville 138-kV Transmission Line cannot be paralleled on the western side. The Siting Team created Study Segments 44 and 45, which turn south across Stapleton Road at a feasible road crossing location, but still in close proximity to two homes. On the Greif Paper Mill property, Study Segments 44 and 45 turn east to join with a southern river crossing (Study Segment 16). All Study Segments on the north and south side of the James River use Study Segment 46 to reach the expansion at the Riverville Substation.

James River Crossings

Five river crossing Study Segments were developed to connect the southern Study Segments in Campbell and Appomattox counties to the northern Study Segments in Amherst County. Based on available terrain data, the Siting Team reviewed potential James River crossing locations on either side of the river. Two feasible river crossings are immediately north of the Joshua Falls Substation. Two VCRIS architectural resources (Steger Farm, 005-0064 and Lee Farm, 005-0065) are located on the north side of the James River and are unavoidably crossed. Neither VCRIS

resource has been formally evaluated, but NRHP-eligible structures potentially exist on the Lee Farm. Study Segment 17 wraps around the Joshua Falls Substation’s connecting Study Segments 20 and 21, spanning peak to peak across the James River. Study Segment 20 parallels a property boundary between the Steger Farm and Lee Farm. Study Segment 21 is located on Lee Farm and is a more direct route on less steep terrain.

East of Lee Farm is a VOF conservation easement and an NRHP-listed architectural site, the Galts Mill Complex. The Siting Team considered two river crossing locations to the east of the NRHP site and VOF easement. Study Segments 18 and 19 connect the southern Study Segments in Appomattox County to the northern Study Segments in Amherst County. Both crossings are in wider portions of the river without steep terrain that could require a transmission structure in the floodplain along the banks of the river. Study Segment 18 borders, and is visible from, the NRHP Site, the VOF conservation easement, and a large plantation estate along Stone Ridge Road. Study Segment 19 crosses the James River approximately two miles farther east. Study Segment 19 requires additional angles to use terrain and avoid residential development. The fifth river crossing location is at the Riverville Substation and the Greif Paper Mill (Study Segment 16). Terrain at this location is steep on both sides of the river and allows for a transmission line to cross high above and efficiently across the waterway.

3.5.2 Gladstone – Riverville 138-kV Transmission Line

South of the James River (Appomattox and Campbell Counties)

The Siting Team’s engineers determined that Study Segment 16 could be constructed as a double-circuit option to minimize the number of ROWs across the James River. Study Segments on the south side of the James River require a double-circuit transmission line crossing at the Riverville Substation and one additional river crossing to reach CVEC’s Gladstone Substation. The area south of the river is predominantly timbering lands with some residential development along Appomattox CR 605 (Beckham Road). From the double-circuit option, the Siting Team developed Study Segment 47, which parallels an existing distribution line and crosses Appomattox CR 605 at a break in residential development. Study Segment 47 continues east through large, undeveloped parcels and remains north of the Appomattox Lime Quarry.

Using available data, the Siting Team reviewed feasible line crossing locations over the James River from Study Segment 47. Two potential river crossing locations were identified to connect the southern Study Segments to the north side of the James River in Nelson County. River crossing locations had to be considered development on Allens Creek Road (north of the James River), which is lined with residential development and cultural sites. Study Segment 48 follows a timbering

access road and crosses at a narrower bend in the James River and undeveloped parcels on Allens Creek Road. Approximately one mile east of Study Segment 48, Study Segment 49 crosses the river at a wider location and closer to residences on Allens Creek Road. Two VCRIS architectural resources (Airfield, 005-0032 and Dailey House, 005-5326) that have not been evaluated for NRHP-eligibility are unavoidably crossed by Study Segment 49.

North of the James River (Amherst and Nelson Counties)

Options to connect the Riverville and Gladstone substations north of the James River avoid additional river crossings and a double-circuit transmission line over the River. In general, Study Segments cross the Greif Paper Mill property, either north and parallel the existing Amherst – Riverville 138-kV Transmission Line or northeast towards the Gladstone (CVEC) Substation. Study Segment 51 exits the Riverville Substation from the north avoiding the proposed landfill expansion, and crosses Stapleton Road between two homes, east of the existing 138-kV ROW. Study Segment 52 continues to parallel the 138-kV transmission line for an additional 1.4 miles and adding line length, but avoiding residential development between U.S. Highway 60 and Piedmont Road. Past the Nelson County line, Study Segment 52 crosses Amherst CR 600 and a residential area, then predominantly timbering lands. In order to minimize line length, Study Segment 53 diverts from paralleling the 138-kV ROW sooner (less than 0.5 mile), and crosses a large timbering tract. The Siting Team developed Study Segments 54 and 55 as options to cross Greif’s Paper Mill property in a more easterly location away from the landfill expansion and to avoid the residences at the existing 138-kV ROW crossing of Stapleton Road. Study Segment 54 continues northeast across Piedmont Road to connect Study Segment 53 and continues as a central option across timbering tracts and largely undeveloped parcels. Study Segment 57 crosses a small pocket of residential development along Old Galilee Road, but attempts to parallel parcel boundaries to the extent practicable. The northern and central options join as Study Segment 58 and continue northeast through predominantly undeveloped areas with rolling terrain towards the Gladstone (CVEC) Substation.

The Siting Team considered a southern option to reduce transmission line length between the Riverville and Gladstone substations. Study Segments 55 and 56 travel between Piedmont Road and Allens Creek Road along a narrow ridge to avoid a steep drop to the south near the riverbank and residences. At the Nelson County line, Study Segment 59 continues northeast towards the Gladstone (CVEC) Substation where there is less development and terrain becomes more rolling. All Study Segments join and reach the Gladstone (CVEC) Substation using Study Segment 60, which must unavoidably cross U.S. Highway 60 and the Company’s existing 46-kV tap before entering CVEC’s Gladstone Substation.

3.6 Study Segment Refinements (After November 2019 Open Houses)

The above Study Segments (**Map 4, Attachment A**) were presented at two open houses in November 2019 (described in Section 2.5). After the November 2019 public open houses, members of the Siting Team reviewed comments, conducted additional site visits, and met with several landowners to further refine the Study Segment network. Study Segments were added, modified or eliminated as a result of public, stakeholder and agency input, quantitative and qualitative analysis, further constructability and engineering review, the environment, and future land uses. The refined Study Segment network evaluated by the Siting Team was presented at a second set of public open houses in February 2020 and is shown in **Map 5, Attachment A**.

3.6.1 Joshua Falls – Riverville 138-kV Transmission Line

South of the James River (Appomattox and Campbell Counties)

Members of the Siting Team met with several landowners in December 2019 and reviewed the southern Study Segments presented at the November 2019 open houses. Input from residents on Pecan Drive noted locations of springs and/or wells on their properties and identified a home that was not visible on aerial photography, but was within 100 feet of Study Segment 3 and near the 765-kV crossing (**Map 4, Attachment A**). The Siting Team explored options to shift Study Segment 3 north or south, and away from the identified home; however, a shift was not feasible due to terrain and clearances crossing under the 765-kV line. Due to the clearance requirements for the 765-kV line crossing and additional length, Study Segment 3 was dismissed, and the 765-kV line crossing south of the Joshua Falls Substation (Study Segment 2) was carried forward (**Map 5, Attachment A**).

Study Segments 5 and 7 are atop Chestnut Mountain, which is a prominent ridge visible from both sides of the James River (**Map 4, Attachment A**). The Siting Team identified possible construction constraints and viewshed impacts associated with building access roads and clearing a ROW on the top of Chestnut Mountain. The Siting Team worked with the transmission line engineers and construction representatives to find a location on the south side of the mountain to minimize views on both sides of the river and to reduce constructability challenges, resulting in a new Study Segment 61, which is a modification of Study Segments 5 and 7 (**Map 5, Attachment A**).

Feedback was received at the open houses on Study Segment 8, which crosses a small residential development along Tin Top Place (**Map 4, Attachment A**). Residents expressed viewshed concerns in a predominately agricultural area. The Siting Team considered an alternate option

that parallels Appomattox CR 611, the southernmost end of Tin Top Place. The alternate option was in a drainage area, near additional residences, and near Trinity Church and cemetery. Tin Top Place runs north-south and connects two large roadways in the area, Appomattox CR 611 and CR 605; options that avoid crossing Tin Top Place require additional angles and line length without further reducing impacts to the overall community. As such, Study Segment 8 was carried forward for further analysis as it runs along parcel boundaries across Tin Top Place, and maximizes distances from homes, to the extent possible (**Map 5, Attachment A**).

The Siting Team reviewed connector Study Segments east of Tin Top Place to further refine the Study Segment network. Study Segments 11 – 14 provide options to connect the northern and southern Study Segments in Appomattox County. Study Segments 11 and 12 are longer and require a heavier angle as compared to Study Segment 10, which is more direct. Study Segments 11, 13, and 15 were compared with Study Segment 14 (**Map 4, Attachment A**). Study Segments 11, 13, and 15 are shorter than Study Segment 14 (approximately 0.6 mile); however, Study Segment 14 remains south of residential development on Appomattox CR 605 and maximizes the distance from the DOF easement. The Siting Team carried forward Study Segments 10, 14, and 15 for further analysis; Study Segments 11, 12, and 13 were dismissed (**Map 5, Attachment A**).

North of the James River (Amherst County)

Following the November 2019 public open houses, members of the Siting Team met with various landowners on the north side of the James River, at their request. The Siting Team met with or spoke with several landowners crossed by Study Segments 20 and 21 (**Map 4, Attachment A**). The landowner crossed by Study Segment 21 indicated plans for a future cabin and an air strip near the James River. The landowner to the west crossed by Study Segment 20 did not indicate future plans or concerns with a new ROW on their undeveloped property. Both Study Segments 20 and 21 are constructible river crossing locations given the terrain and a narrow portion of the river. Study Segment 20 is longer than Study Segment 21, but the crossing avoids the landowner's future cabin site and minimizes concerns for a future private air strip. In order to minimize residential impacts along Galts Mill Road to the north, the Siting Team modified a portion of Study Segment 20 and created Study Segments 69 and 75, which are farther north, away from Galts Mill Road residences (**Map 5, Attachment A**). Study Segment 21 was dismissed.

Study Segment 30 is a central option through the Amherst Plantation neighborhood. Due to the location of an FM radio tower, Study Segment 30 is on a side slope of Round Mountain. An engineering review concluded that a high wind event could cause the conductors to swing into the adjacent mountainside. Conductor impacts were not a concern for Study Segments 29 and

31, south of Round Mountain, and thus Study Segment 30 was eliminated (**Map 5, Attachment A**).

The Siting Team received input from various landowners along Earley Farm Road and Stapleton Road who noted concerns regarding viewshed, impacts to future homesites, and/or future land use plans. The Siting Team met with or spoke with several landowners crossed by Study Segments 32 and 39 (**Map 4, Attachment A**). Landowner discussions revealed future plans to subdivide larger parcels, areas that had been recently subdivided and were for sale, and a potentially historic homestead and cemetery. Study Segments 36, 38, and 40 cross an undeveloped ridgeline with fewer land use conflicts. As such, a new connector Study Segment (Study Segment 76) was developed to avoid future land use conflicts and serve as a connector between the southern and northernmost Study Segments (**Map 5, Attachment A**). Study Segment 39 was eliminated and Study Segments 36, 38, and 40 were carried forward. The modification of Study Segment 76 and elimination of Study Segment 39 resulted in the elimination of several other Study Segment connectors in the area. Study Segments near the Riverville Substation remained largely unchanged after the first open houses; however, the Siting Team eliminated Study Segment 43, which parallels the Company's distribution line across a VOF easement based on comments received from the agency.

James River Crossings

The Siting Team refined the river crossing Study Segments after the November 2019 open houses and additional desktop and field review. Central river crossing locations (Study Segments 18 and 19) between the Joshua Falls and Riverville substations were eliminated due to viewshed concerns, proximity to the VOF easement and NRHP site, and impacts in the floodplain at the crossing. Eliminating Study Segments 18 and 19 resulted in the dismissal of several connectors on the north side of the river (Study Segments 25, 26, 27, 28, and 33).

River crossings east of the Riverville Substation (Study Segments 48 and 49) require using a double-circuit option (Study Segment 16). Study Segments 47, 48, and 49 were dismissed because they added additional line length, including potentially one mile of double-circuit transmission line and an additional crossing of the James River.

A potentially historic dam is north of the Joshua Falls Substation and identified after landowner meetings. After further review of the area, the Siting Team added a river crossing location (Study Segment 66), which considers rebuilding the Company's existing Gomingo – Joshua Falls 138-kV transmission line as double-circuit across the river (**Map 5, Attachment A**). Study Segment 66 is

west of the Joshua Falls Substation and the potentially historic dam. Study Segment 66 requires one mile of additional line length and multiple heavy angles in order to turn northeast towards Riverville Substation, but crosses the river within an existing ROW.

3.6.2 Gladstone – Riverville 138-kV Transmission Line

North of the James River (Amherst and Nelson Counties)

The three main routing options connecting the Riverville and Gladstone substations were further refined. Minimal public input was received in this area and the majority of the comments received were in the vicinity of Allens Creek Road and the existing 138-kV line parallel at Stapleton Road. Study Segments 51 and 52 parallel the existing 138 kV transmission line and cross Stapleton Road in close proximity to a residence (within 250 feet), significantly reducing the tree buffer from the existing transmission line. Coordination with the Greif Paper Mill continued in January 2020 to discuss Study Segment crossings on the mill properties. Overall, Greif representatives preferred an option away from their existing and future landfill area, which is crossed by Study Segment 51. Study Segment 51 was dismissed to minimize impacts to Stapleton Road residents, Greif's future plans, and to reduce line length; Study Segments 52 and 53 were dismissed as a result (**Map 4, Attachment A**). Minor adjustments to Study Segments 54 and 57 were made for better terrain and to follow parcel boundaries to the extent practicable. Public input was received from residents on Allens Creek Road, near the James River. Study Segment 55 parallels Allens Creek Road, but was modified north to parallel an existing distribution line, away from developable properties with minimal road frontage. Study Segments 55, 56, and 59 were carried forward as a short, constructible route to connect the Riverville Substation and CVEC's Gladstone Substation.

The resulting Study Segment network was presented to the public at two open houses held in February 2020 to gain additional input (**Map 5, Attachment A**).

3.7 Study Segment Refinements (After February 2020 Open Houses)

3.7.1 Joshua Falls – Riverville 138-kV Transmission Line

North of the James River (Amherst County)

In a response letter from the VOF dated February 26, 2020, the Siting Team was informed of a proposed conservation easement on the north side of the James River between the Joshua Falls and Riverville substations, adjacent to the Galts Mill complex and existing VOF easement. Members of the Siting Team initiated conversations with the VOF and the property owner about

the proposed easement crossed by Study Segments on the north side of the river. At the time of the response, the landowner and VOF had indicated the proposed easement had not been evaluated by the VOF Board and a timeline was unknown. To minimize impacts to the agricultural/pastoral setting of the proposed VOF easement, Study Segments 22 and 29 were carried forward and central Study Segment 23 was dismissed.

The Siting Team compared Study Segments 70 and 75, which provide north and south options to cross Earley Farm Road. Both Study Segments cross the potential VOF easement, but Study Segment 70 crosses the northernmost forested corner of the property and Study Segment 75 bisects an agricultural/pastoral setting. Further, Study Segment 32 is located on the southern side of Round Mountain and on a side hill to avoid the FM radio tower. Ultimately, Study Segment 75 and the southern Early Farm Road crossing was dismissed in lieu of Study Segment 70, which avoids the scenic area of the potential VOF easement and is located on better terrain. The Siting Team reviewed Study Segments 40 – 42, which cross the Townley IV Farm. The Siting Team reviewed a potential option to extend Study Segment 40 farther east and north of the retreat buildings to further distance the transmission line. The Siting Team eliminated Study Segments 41 and 42, which crosses near the main entrance of the retreat and crosses Stapleton Road twice to avoid the VOF easement.

South of the James River (Appomattox and Campbell Counties)

The Siting Team reviewed the 765-kV line crossing south of the Joshua Falls Substation. To minimize placing structures on a side slope, the Siting Team extended Study Segment 2 south to continue paralleling the eastern 765-kV ROW boundary for an additional 0.1 mile to an existing 765-kV lattice tower structure atop a ridgeline. After the second set of open houses, the Siting Team met and spoke with several property owners on the south side of the James River. The Siting Team slightly adjusted Study Segment 63 to the west of the fence line and a tree, which limit views of a structure. The Siting Team also received comments from landowners near Study Segment 61, located north of the community. To provide optionality between Study Segments 61 and 63, the Siting Team reviewed a potential connector to minimize impacts to landowners on Appomattox CR 605 and avoid Tin Top Place; this option was not previously presented at the February 2020 open houses. The Siting Team contacted landowners that would be crossed by the new connector to solicit feedback and made an adjustment to parallel property boundaries to the extent practicable. The connector between the northern and southern Study Segments on the south side of the river was carried forward. The landowner south of the Riverville Substation owns approximately 421 acres (according to Appomattox County parcel database) and uses the property for short-term rentals and has plans for future cabin sites. Based on landowner input,

the Siting Team looked at options to adjust Study Segments 14 – 16 to follow the eastern parcel boundaries and avoid crossing the middle of the property.

James River Crossings

River crossing locations were refined after further engineering and constructability review. Study Segment 66 uses an existing 138-kV ROW to cross the James River west of the Joshua Falls Substation, but adds line length (approximately 2.4 miles) and heavy angles on steep slopes. Study Segments 16 and 20 were carried forward as the more efficient and constructible river crossings for the Project.

3.8 Alternative Routes

The Siting Team met frequently throughout the route development process, continually reviewing, modifying, and eliminating Study Segments based on field inspections, engineering requirements, and stakeholder input. At the end of the process, the Siting Team compiled the Study Segments into a total of six Alternative Routes for analysis and comparison. These Alternative Routes are described in the following sections and are shown in more detail on **Maps 6 – 9, Attachment A**.

3.8.1 Joshua Falls – Riverville 138-kV Transmission Line

The Siting Team developed four Alternative Routes to connect the Joshua Falls and Riverville substations (**Maps 6 and 7, Attachment A**). One Alternative Route (A) is north of the James River and three Alternative Routes (B, C, and D) are on the south side of the river.

Alternative Route A (Study Segments 20, 29, 36, 38, 40, 44, 45, 46, 69, and 70)

Study Segment 20 and the northernmost Study Segments in Amherst County were carried forward as Alternative Route A. Alternative Route A exits the Joshua Falls Substation and crosses the James River to the north. Alternative Route A remains north and crosses Amherst Plantation through steep and heavily forested landscape. Alternative Route A remains generally north of development along Stapleton Road and the Townley IV Farm retreat area and facilities. Alternative Route A turns south across Stapleton Road, between an existing VOF easement and the Amherst – Riverville 138-kV Transmission Line, to enter the Riverville Substation from the west. Alternative Route A is 11.6 miles long.

Alternative Route B (Study Segments 1, 2, 4, 9, 10, 15, 16, 46, 61, and 62)

Alternative Route B exits the Joshua Falls Substation to the south and uses the northernmost Study Segments on the south side of the James River. Alternative Route B continues east on the southside of the Chestnut Mountain ridgeline and generally remains north of major residential roadways like Appomattox CR 605 and Tin Top Place for approximately five miles, shifting slightly south to avoid a DOF conservation easement. Alternative Route B generally parallels the eastern extents of a property boundary to cross the James River and reach the Riverville Substation from the south. Alternative Route B is 10.5 miles long.

Alternative Route C (Study Segments 1, 2, 4, 14, 16, 46, 63, and 64)

Alternative Route C exits the Joshua Falls Substation the same as Alternative Route B, but diverts south to avoid crossing Chestnut Mountain. Alternative Route C uses the southernmost Study Segments in Appomattox County to cross a large timbering area west of Tin Top Place and remains south of Appomattox CR 605, through rolling hills highly visible from the roadway. Alternative Route C joins the trajectory of the Alternative Route B to cross the James River and reach the Riverville Substation. Alternative Route C is 11.1 miles long.

Alternative Route D (Study Segments 1, 2, 4, 6, 9, 10, 15, 16, 46, and Connector)

Alternative Route D is a combination of Study Segments from Alternative Routes B and C. Alternative Route D follows Alternative Route C to remain south of Chestnut Mountain. A connector joins Alternative Route D with Alternative Route B and avoid crossing Tin Top Place. Alternative Route D is a hybrid route that considers constructability and residential impacts. Alternative Route D is 11.1 miles long.

3.8.2 Gladstone – Riverville 138-kV Transmission Line

The Siting Team developed two Alternative Routes to connect the Riverville and Gladstone substations. Alternative Routes E and F are on the north side of the James River in Amherst and Nelson counties. No additional modifications or additions were made to the Study Segments between the Riverville and Gladstone substations after the February 2020 open houses.

Alternative Route E (Study Segments 50, 57, 58, 60, and 73)

Alternative Route E is a combination of the northernmost Study Segments in Amherst and Nelson counties to connect the Riverville and Gladstone substations. Alternative Route E crosses through agricultural or forested land with generally rolling terrain to reach CVEC's Gladstone Substation. Alternative Route E is 6.3 miles long.

Alternative Route F (Study Segments 50, 55, 56, 59, and 60)

Alternative Route F is the southernmost route to connect the Riverville and Gladstone substations. Alternative Route F is generally straight and in closer proximity to the James River and residential areas to minimize line length. Alternative Route F is 5.5 miles long.

4.0 ALTERNATIVE ROUTE COMPARISON

The Alternative Routes comparison provides a quantitative and qualitative analysis of potential impacts to local communities, the environment and cultural resources as well as engineering and constructability concerns. The Alternative Routes were reviewed in detail and compared using a combination of information collected in the field, GIS data sources, public input, supporting documents, and the collective knowledge and experience of the Siting Team. For the purposes of the Siting Study, Alternative Routes A, B, C, and D will be compared against one another and Alternative Routes E and F will be compared against one another; a Proposed Route will be selected between the Joshua Falls and Riverville substations, and between the Riverville and Gladstone substations.

4.1 Natural Environment

The natural environment includes water, soil, sensitive species, and wildlife habitat. Potential impacts are based on publicly available maps and data as well as coordination with federal, state and local agencies. A comparison of the natural environment considerations for the Alternative Routes are presented in **Tables 1 and 2**.

4.1.1 Geological, Soil, and Water

Water Resources are identified in **Map 10, Attachment A**.

Surface Water and Wetland Resource Characteristics

The Project features aquatic and wetland habitat within the Middle James - Buffalo sub-basin (Hydrologic Unit Code 02080203) (VDCR 2019). The Study Area is bisected by the James River and connects multiple National Hydrography Dataset (NHD) stream features. Several NHD streams on the north side of the James River include Beck Creek, Partridge Creek, Christian Mill Creek, Walkers Ford Creek, Dry Branch, and Allens Creek. Streams on the south side of the James River include Stonewall Creek and Wreck Island Creek. In addition to these named streams, there are also numerous small, unnamed tributaries located throughout the Study Area. Wherever possible, streams and wetlands will be spanned by the transmission line. Individual structures can usually be located outside stream banks, riparian zones, and wetland boundaries to avoid potential aquatic impacts or permitting requirements.

Waters of the United States (WOTUS) are subject to the USACE jurisdiction under Section 404 of the Clean Water Act (33 United States Code [U.S.C.] § 1344). The Project requires one aerial crossing over the James River, a designated Section 10 navigable waterway. Wetlands can be WOTUS and are important ecological resources that perform many functions including groundwater recharge, flood flow attenuation and conveyance, and erosion control and water quality improvement. Wetlands also provide habitat for many plants and animals, including threatened or endangered species.

The NWI is an index of locations identified by the USFWS as areas that exhibit potential wetland characteristics on aerial photography. There are very few NWI wetlands in the vicinity of all Alternative Routes. Between the Joshua Falls and Riverville substations, there is a palustrine unconsolidated bottom (PUB) wetland located on the north side of the James River and palustrine forested (PFO) wetland located in the James River. PFO wetlands, or forested wetlands, are generally the most protected wetland type and often require the most mitigation if removed or converted.

A February 14, 2020 letter from the USACE Norfolk District indicated that an Approved Jurisdictional Determination should be submitted for discharges of dredged and/or fill material into WOTUS, which will be completed prior to Project construction activities. Impacts to navigable waterways are subject to the Section 404 and Section 10 permitting requirements from the USACE for the discharge of dredged or fill material into a WOTUS. Additionally, the VMRC

regulates state waters and may require a permit if there are encroachments on or over natural rivers and streams. A February 24, 2020 letter from the VMRC indicated that the Project will require review during the Joint Permit Application process for jurisdictional river and stream crossings, including the James River, which will occur later during the Project’s environmental studies.

The VDEQ categorizes the state’s waterbodies according to the federal Clean Water Act’s water quality standards in their Water Quality Assessment Integrated Reports in accord with the Virginia Water Quality Monitoring, Information and Restoration Act. Based on their current and draft June 2020 305(b)/303(d) Water Quality Assessment Integrated Report, the VDEQ suggests listing Beck Creek and Partridge Creek as a Category 5A, which are impaired or threatened waters needing a Total Maximum Daily Load (TMDL) plan. The impairments for both creeks are related to recreational use due to elevated levels of bacteria. The VDEQ suggests listing Stonewall Creek and Wreck Island Creek as Category 4A, which recognizes the features are “water quality effluent limited” and do not require a TMDL plan. Other NHD streams crossed in the Study Area were not specifically noted in the VDEQ’s current draft report as requiring water quality assessments. According to the VDWR (previously the Virginia Department of Game and Inland Fisheries), streams located in the Study Area have not been classified as a Wild Trout Stream per their 2019 – 2028 Virginia Wild Trout Management Plan.

A letter was received from the VDEQ Office of Environmental Impact Review on February 11, 2020 indicating that a separate review with their office in coordination with the SCC filing process would be required. A letter was received from the VDEQ Blue Ridge Regional Office on March 4, 2020 indicating no specific concerns for the CVTRP; no letter was received from the Valley Regional Office, which represents Nelson County. No letter was received from the USEPA Region 3 for comment on the CVTRP.

Floodplain Resource Characteristics

Functioning floodplains provide flood management, acting as temporary storage of flood water. They also provide important and rich habitats because of the associated riparian and wetland systems. The extent of the floodplain is dependent on soil type, topography, and water-flow characteristics. Encroachment of a building or structure into a floodplain or floodway could result in flooding of or erosion damage to the encroaching structure and diversion of flows. Transmission structures will be set back from channel banks to avoid impacts, wherever possible. The mapped floodplain zones identified by the Federal Emergency Management Agency (FEMA) in the Study Area are largely associated with the James River and its connecting tributaries.

Soil Erosion Resource Characteristics

Construction activities related to the Project affecting soils include permanent and temporary land disturbance activities such as structure work areas, wire-pulling, tensioning and splicing sites, construction laydown yards, and temporary and permanent access roads. Land disturbance during construction may increase the potential for erosion, such as the removal of protective vegetation that may expose soil to potential wind and water erosion. Certain soils within the Project Area can be more sensitive to soil erosion impacts, particularly steep slopes.

Areas used for construction will be reclaimed as soon as possible, which may include regrading to original land contours, topsoil replacement, and revegetation as determined by the VDEQ requirements. Use of construction storm water Best Management Practices (BMPs) and implementation of appropriate soil design features and BMPs would be used to reduce the effects of erosion as much as possible; however, during heavy rain or wind events BMPs can have a higher risk of failure in areas of steep slopes.

Karst Topography Resource Characteristics

Potential impacts to karst topography from Project disturbance activities include discharge of runoff to sinkholes or sinking streams, and filling of sinkholes, and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat. An email received on May 27, 2020 from the VDCR's Natural Heritage Program indicated that the bedrock in the area does not support karst topography. If karst topography is encountered during Project activities, the VDCR will be contacted so that these resources can be documented, and potential adverse impacts can be minimized or avoided. No Alternative Route is anticipated to impact karst topography.

Alternative Route Comparison

Floodplains in the Study Area are generally adjacent to the James River or other major waterways. An engineering review determined that structures can be located outside of a floodplain areas at the James River crossing locations. As such, the alternative crossing locations near the Joshua Falls and Riverville substations are not anticipated to impact floodplains as the routes would span high above the James River and the associated floodplain given the steep topography at each location.

The Alternative Routes between the Joshua Falls, Riverville, and Gladstone substations are comparable in potential surface water impacts as they cross the James River once and unavoidably cross connecting streams and tributaries. Between the Joshua Falls and Riverville

substations, Alternative Route A crosses more VDEQ-designated impaired streams (Beck Creek and Partridge Creek). In the letter received from the VDCR, the Allens Creek Stream Conservation Unit is located between the Riverville and Gladstone substations and unavoidably crossed by Alternative Routes E and F to reach CVEC's Gladstone Substation. Alternative Route E crosses Allens Creek once and Alternative Route F crosses the creek three times. Alternative Routes B – D do not cross any known stream conservation units according to VDCR. Proper erosion and sediment controls will be used in order to control storm water runoff to rivers, streams, and wetlands.

Alternative Routes B – D all cross the same PFO wetland at the James River crossing; however, this particular wetland is expected to be spanned with no tree clearing or impacts anticipated to the possible PFO wetland. Between the Riverville and Gladstone substations, Alternative Routes E and F do not cross any known NWI wetlands and are not anticipated to have significant impact on wetland features. A letter was not received from the VDEQ Office of Wetland and Stream Protection's Blue Ridge and Valley regional offices for comment on the CVTRP.

Steep slopes are concentrated on the north side of the James River, as shown on Maps 7, 9 and 10. Alternative Route A crosses the steepest slopes, with approximately 3.1 miles of the centerline located on a steep slope and more susceptible to erosion and possible slips and slides during construction. Alternative Routes B – D are comparable, with approximately 1.5 miles of their centerlines crossing steep slopes, primarily near the Joshua Falls Substation. Alternative Routes C and D avoid steeper ridgelines (Chestnut Mountain) crossed by Alternative Route B and Alternative Route D avoids the steeper areas crossed by Alternative Route C south of Appomattox CR 605. Between the Riverville and Gladstone substations, the slopes are less steep, but more areas of slopes greater than 20% are found in proximity to the James River and crossed by Alternative Route F. Areas with more rolling and gentler terrain reduce the possibilities for slips and slides as crossed by Alternative Route E, and increased soil erosion on steep slopes. Further discussion on steep slopes is addressed in Section 4.3 as part of the constructability analysis.

Table 1. Natural Environment Evaluation Criteria							
Alternative Route	Unit	Joshua Falls to Riverville			Riverville to Gladstone		
		A	B	C	D	E	F
General							
Total Line Length	miles	11.6	10.5	11.1	11.1	6.3	5.5
Water Resources							
Total streams crossed (NHD)	count	16	16	21	17	11	7
PUB wetlands in the ROW (NWI)	acres	1.3	0.5	0.5	0.5	0.1	0
PFO wetlands in the ROW (NWI)	acres	1.6	1.5	1.5	1.5	0	0
PSS/PFO wetlands in the ROW (NWI)	acres	0.4	0	0	0	0	0
Total wetlands in ROW (NWI)	acres	3.3	2	2	2	0.1	0
Section 10 river crossings ¹	acres	1	1	1	1	0	0
FEMA-designated 100-year floodplain crossed by ROW	acres (feet)	5.4 (2,326)	4.2 (1,859)	3.8 (1,685)	3.8 (1,685)	2.4 (1,016)	2.4 (1,073)
<i>No PEM/PSS wetlands were identified in the ROW based on desktop available information.</i>							
Geological, Topographical, and Soil Resources							
Prime and unique farmland soil ² in the ROW	acres	12.7	36.5	24.2	27.8	12.9	12.1
Farmland of statewide importance ³ in the ROW	acres	25.6	58.4	79.2	68.2	40.6	31.0
Hydric soils crossed by ROW	acres	0.4	3.1	4.3	3.8	0	0
Steep slopes crossed by ROW (>20%)	miles	3.1	1.5	1.5	1.5	0.02	0.4
<i>Locations for karst topography or known caves or mines could not be identified from publicly available information.</i>							
Wildlife and Habitat							
Tree clearing required in the ROW (digitized based on aerial photography)	acres	122.7	103.5	96.5	93.8	66.3	52.8
<i>No known special natural areas are crossed or within 250 feet of any Alternative Route ROW.</i>							

Note: PUB=Palustrine Unconsolidated Bottom wetlands; PFO=Palustrine Forested wetlands; PEM=Palustrine emergent wetlands; PSS=Palustrine Shrub wetlands

¹The James River is a designated USACE Section 10 navigable waterway.

²Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops.

³Soils that do not meet the prime farmland category but are still recognized for their productivity by states may qualify as soils of statewide importance

4.1.2 Wildlife Habitat and Sensitive Species

Sensitive Species Resource Characteristics

The Study Area’s habitat includes a mix of mountainous and rolling hill terrain, grassland, forest, open fields, and scattered residential environments. Virginia’s special status wildlife and plant species that are designated as threatened, endangered, or candidate species are protected at the federal level by the Endangered Species Act [16 U.S.C. §1531 et seq. (1973)] and/ or at the state level for the protection of threatened and endangered species of fish and wildlife (4VAC15-20-130) through the VDWR. The USFWS Information for Planning and Consultation (IPaC) project planning tool was used to determine if any threatened and endangered wildlife or plant species that have the potential to occur in the Study Area (**Attachment D**). The results of the IPaC are below in **Table 2**.

Table 2. Threatened and Endangered Species			
Species Name	Status	Habitat Type	Note
Gray bat (<i>Myotis grisescens</i>)	Endangered	Typically occupy limestone karst areas where they hibernate and roost in deep, vertical caves.	No critical habitat has been designated for this species.
Northern long-eared bat (<i>Myotis septentrionalis</i>)	Threatened	Typically occupy caves and mines during winter hibernation and roost and forage in upland forests.	No critical habitat has been designated for this species.
Atlantic pigtoe (<i>Fusconaia masoni</i>)	Proposed Threatened	Populations tend to exist in small creeks to larger rivers where habitat is coarse sand and gravel, and silt-free.	The Project area is located outside of the proposed critical habitat for this species.
Small whorled pogonia (<i>Isotria medeoloides</i>)	Threatened	Dry, woodland areas and prefers slopes near small streams	No critical habitat has been designated for this species.
Smooth coneflower (<i>Echinacea laevigata</i>)	Endangered	Very dry hardpan forests, diabase glades or dolomite woodlands.	No critical habitat has been designated for this species.

Per the USFWS, the northern long-eared bat 4(d) rule prohibits incidental take that may occur from tree removal activities within 150 feet of a known occupied maternity roost tree during the pup season (June 1 to July 31) or within a 0.25-mile of a hibernation site, year round. Publicly available information for bat species locations and caves is not always readily available and vary among state-wide databases. The USFWS' Northern Long-eared Bat Winter Habitat and Roost Tree database was referenced, and the closest buffer is located more than 40 miles north of the Alternative Routes. No critical habitat areas have been identified for either bat species.

Tree clearing and land disturbance activities could impact the small whorled pogonia, a threatened plant species. The plant prefers hardwood forested areas with an open understory located on a slope near small streams. The smooth coneflower, an endangered plant species, prefers habitat in open lands, including transmission line ROWs and roadsides. Habitats for both species likely exist in the Study Area, with potentially small whorled pogonia habitat on the north side of the river and potentially smoother coneflower habitat on the south side of the river. Coordination with the VDWR and USFWS will be conducted to verify if any species-specific surveys are required. Prior to final engineering, environmental surveys will be conducted to identify any suitable habitat and assess impacts to the protected plants. The preferred habitat for the Atlantic pigtoe is coarse sand and gravel in small creek beds to larger rivers with silt-free water quality, which could be threatened by unmanaged erosion and sediment control during construction activities.

A letter dated March 6, 2020 was received from the VDCR and noted the James River as a designated "Threatened and Endangered Species" Water by VDWR for the green floater (*Lasmigona subviridis*). The Project unavoidably crosses the James River, but transmission structures will be placed on either side of the river with no instream work required. The VDCR letter did not indicate state-listed plants or insect habitats in the Study Area that could be impacted.

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act. Under this act, it is unlawful to take, kill, or possess any bald or golden eagle, except as regulated by authorized programs. Migratory birds are protected under the Migratory Bird Treaty Act of 1918, which is the legal cornerstone for the conservation and protection of migratory birds in the United States. The USFWS provides guidance for minimizing impacts to migratory birds and AEP has an avian protection plan in place that will be implemented on the Project to avoid impacts to migratory birds.

Wildlife Habitat Resource Characteristics

There are large areas of forested and timbering lands throughout the Project Area, with a few ecological “core areas” as identified by the VDCR’s Division of Natural Heritage letter. VDCR defines Ecological Cores as areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species. Cores are numerically categorized based on their ecological integrity and relative contribution to the ecosystem and natural heritage systems in the area. No highly categorized cores with significant ecological integrity (C1 and C2) were identified within the Study Area (Virginia Natural Heritage Data Explorer, **Figure 5**). The Alternative Routes cross lower-ranked ecological cores (C3, C4 and C5); however, C3 areas are still ranked “High” in ecological integrity and are located predominantly on the north side of the James River.

The Siting Team submitted a request to the Virginia VDCR for occurrences of natural heritage resources in the Study Area. The Allens Creek Stream Conservation Unit is crossed by Alternative Route A and has been given a biodiversity ranking of B4, or moderate significance to aquatic natural heritage resources; its tributaries consist of ideal stream conditions for its aquatic natural community. Threats to a significant aquatic community include water quality degradation related to point and non-point pollution, water withdrawal and introduction on non-native species. The VDCR recommends that the applicable state and local erosion and sediment control/storm water management methods are strictly adhered to in order to minimize potential water resource impacts.

Alternative Route Comparison

Between the Joshua Falls and Riverville substations, Alternative Route A requires the most amount of tree clearing for the ROW (122.7 acres in total, about 30 acres more than Alternative D) given largely forested, undeveloped, and mountainous terrain. It is likely that Alternative A would need even more forest clearing to account for access road construction on forested ridgelines. Alternative Route A crosses more ecological core areas with “High” and “Moderate” rankings regarding their conservation benefits. Most C3 core areas are located near existing conservation easements (i.e. VOF and DOF) where the surrounding areas are primarily forested. Alternative Routes B – D cross a large C3 core area south of the Joshua Falls Substation and near Chestnut Mountain. Tree clearing and development disrupts the natural patterns and connectivity of habitats that are designated in the Ecological Cores areas. Alternative Route A requires more tree clearing and crosses the most C3 core areas than other Alternative Routes considered between the Joshua Falls and Riverville substations. Alternative Routes E and F cross

lower-ranked ecological cores and are anticipated to have minimal impact on areas that are predominantly timbering uses. Lastly, no State Natural Area Preserves under VDCR’s jurisdiction are in the Study Area based on the feedback received.

A review through the Virginia Bald Eagle Nest Locator indicated that the closest known bald eagle nest is approximately 3.5 miles west of the Joshua Falls Substation near the City of Lynchburg; therefore, it is anticipated that the Project will not have impacts on the bald eagles or their populations.

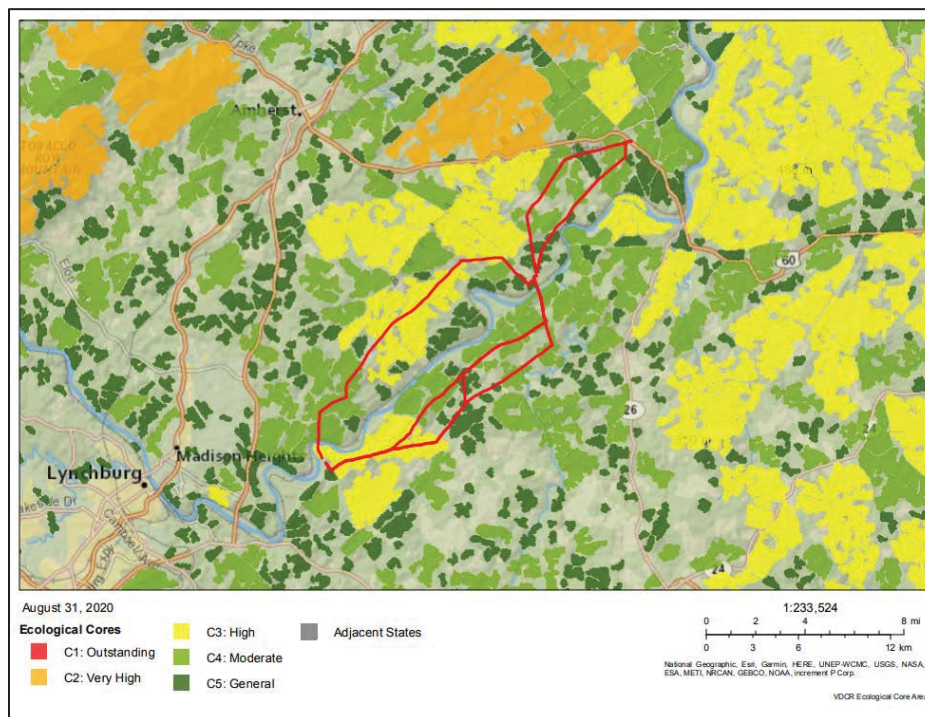


Figure 5. VDCR Ecological Cores (Virginia Natural Heritage Data Explorer)

4.2 Human Environment

The human use of the land and activities at a given location such as agricultural, forestry, residential, industrial, mining, commercial, institutional, scenic assets, and recreational uses. The Siting Study goal is to avoid or minimize conflicts with existing and proposed land uses that are not compatible with a new transmission line. A comparison of the human environment considerations for the Alternative Routes is presented at the end of this section in **Table 4**. Land use within the Study Area is shown on **Map 11, Attachment A**.

The Project is located in four central Virginia counties: Amherst, Appomattox, Campbell, and Nelson. Various land uses exist with the different counties, but the Study Area includes agricultural and timbering areas with some concentrated residential development on county or state-maintained roadways. The James River contributes to the steep topography in the Study Area, which includes areas of rolling terrain and mountainous ridgelines. The major land uses, identified by the National Land Cover Database (NLCD), include pastureland and forested land, with developed areas concentrated along county roadways, and an industrial land use at the Greif Paper Mill.

4.2.1 Existing and Proposed Developed Land Use

Resource Characteristics

The existing land use is a mix of timbered land, agricultural fields, and residential development along major roadways and the James River. The James River bisects the Study Area and has contributed to the various landscapes. The north side of the James River consists largely of various mountainous deciduous or mixed forest with clusters of residential development around Amherst Plantation and Earley Farm Road. On the south side of the river, more hay and pasture lands are present. Throughout the Study Area, the topography is generally mountainous in Amherst and Appomattox counties near the James River and rolling agricultural areas and timbering land uses in Nelson County. Timbering land uses are more concentrated on the south side of the river (evergreen forests area shown on **Map 11**). In areas where the terrain is generally rolling, agricultural and pasturelands exist. Industrial development is concentrated near the Riverville Substation and the Greif Paper Mill properties. Representative photographs of the Study Area landscape are shown below (**Photos 1 – 5**).



Photo 1. Forested and Mountainous Landscape (Amherst County)



Photo 2. Pastoral and Farmland Landscape (Appomattox County)



Photo 3. Residential Development Landscape (Tin Top Place, Appomattox County)



Photo 4. Industrial Development Landscape (Greif Paper Mill)



Photo 5. James River (East of Joshua Falls Substation)

The Siting Team considers future land use plans during the route development process in an attempt to avoid or minimize potential impacts to proposed development areas. In addition to meeting with local jurisdictions, members of the Siting Team reviewed each county's comprehensive plan. The comprehensive plans give the Siting Team valuable information on where future development patterns may be encouraged or envisioned by the local jurisdiction. The Siting Team reviewed future land uses and county-specific goals to evaluate areas of constraints and opportunities.

Alternative Routes on the northern side of the James River are located in the southern extents of Amherst County (Alternative Routes A, E, and F). In the *2017 Amherst County Comprehensive Plan*, the southern extents of the county are primarily zoned Agricultural (A-1). Near the Riverville Substation and the Greif Paper Mill, the land use is dominated by manufacturing uses. The southern extents of the county are intended to remain predominantly agricultural as public services and infrastructure such as roads and utilities are less available in these areas. According to Amherst County's plan, future development areas are more likely to be concentrated along the State Route (SR) 29 corridor (outside the Study Area) where infrastructure and public services

are more available and encourage development growth. Utility infrastructure is not specified in their plan, but county staff did not indicate concern for the future reliability improvements. The majority of Alternative Route A is located in Amherst County (nearly 93% of its total line length) and is in an area with anticipated slow development growth, and away from Amherst County's proposed future development areas. Nearly half of the total line routes for Alternative Routes E and F are located in Amherst County, and are located away from future development areas as determined in the county's plan.

Alternative Routes B, C, and D are located in the northern extents of Appomattox County. The "Primary Growth Areas" and "Suburban Growth Areas" are concentrated around the towns of Appomattox and Pamplin, outside of the Study Area. In the *2016 Appomattox County Comprehensive Plan*, the Study Area is predominantly in Agricultural (A-1) zoning and encourage the continuation of rural land characteristics and discourage future development by land subdivision restrictions and larger parcel acreage requirements. Similar to Amherst County, Alternative Routes B, C, and D will traverse through areas with generally slow development growth and minimize impacts to intended growth areas to the south.

A small portion of Alternative Routes to connect the Joshua Falls and Riverville substations are in the northernmost extents of Campbell County. In the *Campbell County Comprehensive Plan 2014-2029*, the Joshua Falls Substation and surrounding area are currently located in Industrial Heavy (I-H) and Residential-Manufactured Housing (R-MH) zoning classifications. The future land uses intended for this area reflects a change to Medium to High Density Commercial near the Joshua Falls Substation and along Mt. Athos Road/Maple Lane, south of the substation. In addition, county growth is expected to continue along major transportation corridors outside of the Study Area and near the City of Lynchburg. South of the Joshua Falls Substation, Alternative Routes B, C, and D cross Company-owned property and remain north of the Mt. Athos Road area, outside of the planned residential and commercial land uses.

Alternative Routes E and F are partly located in the southern extents of Nelson County. In the *2002 Nelson Comprehensive Plan*, the Gladstone Substation and surrounding area are noted as Business District (B-1) and Residential District (R-1) zoning classifications in addition to Agricultural (A-1) zoning districts. The future land uses in or near the Study Area are intended to remain rural with light commercial uses given the proximity to U.S. Highway 60; however, most future development is anticipated to be north near the SR 29 corridor and outside the Study Area.

All Alternative Routes are anticipated to have minimal impact, if any, to the counties future planned land uses.

Alternative Route Comparison

Alternative Route A crosses the most parcels (54) and unique landowners (28) than any other route between the Joshua Falls and Riverville substations, with Alternative C crossing the least with 33 and 18, respectively. Similarly, more residences are in closer proximity to Alternative Route A than other routes; seven homes are located within 250 feet as compared to two homes within 250 feet for Alternative Routes C and D. Although no known habitable residences are located within 100 feet of any Alternative Routes, the higher proximity to homes on Alternative A is attributed largely due to the Amherst Plantation neighborhood and Earley Farm Road crossings. The Siting Team reached a representative of the Amherst Plantation Homeowner's Association (HOA) to get input on Study Segments on the north side of the James River and if future development plans exist. A HOA representative who commented indicated that multiple undeveloped, 2- to 5-acre lots are bisected by Alternative Route A and a 100-foot ROW would prohibit future residential plans and could impact the sale of the properties. Alternative Route D maximizes the distance from homes with the least number of residences within 250 feet and 500 feet (2 and 8, respectively). Alternative Route C is comparable in regard to proximity to homes, but Alternative Route D avoids Tin Top Place, a residential area located in an open pastoral setting. Alternative Routes on the south side of the river attempt to follow parcel boundaries to the extent practicable whereas Alternative Route A has limited paralleling opportunities given terrain and the need to follow ridgelines, often bisecting lots. Generally, parcels on the north side of the river are smaller and due to terrain there is limited availability to adjust the centerline farther from homes. On the south side of the river, parcels are generally larger and on flatter terrain allowing for more flexibility to adjust the centerline and thus maximize distance from homes. Lastly, Alternative Routes on the south side of the river are closer to Stonewall, a populated area in Appomattox County, nearly two miles south. Alternative Routes C and D are the closest to the Stonewall area.

Alternative Routes E and F cross primarily pasture land and forested areas, except near the river where residential development is prominent along Allens Creek Road. Alternative Route F crosses nine more landowners and unique parcels than Alternative Route E given the proximity to Allens Creek Road. Further, Alternative Route F has twice as many homes within 500 feet of the centerline compared with Alternative E (14 and 28, respectively). Alternative Route E minimizes impacts to residents and individual landowners by avoiding Allens Creek Road and development near the James River.

4.2.2 Agricultural and Forestry Resources

Resource Characteristics

Agriculture and forestry are predominant land uses within the Study Area as shown in **Map 11, Attachment A**.

Most of the agricultural lands in the Study Area are in Appomattox County between the Joshua Falls and Riverville substations. Some agricultural lands are present on the north side of the river; however, most of the area is forested with development concentrated in areas along the James River. Prime farmlands are lands with the best combination of physical and chemical characteristics for producing crops, occur generally during construction and can result from poor erosion and sediment control practices. Potential soil impacts to prime farmland (discussed in Section 4.1.1) from transmission line construction include soil erosion, damage to agricultural drainage and irrigation systems, mixing of topsoil and subsoil, potential loss of topsoil, and soil compaction. Prime farmland can be described as land that has the best combination of physical and chemical characteristics for producing crops. Prime farmland within the construction zone may be unavailable to agriculture production during the construction timeframe. Prime farmland would be reclaimed as soon as possible, which may include regrading to original land contours, relieving compaction, topsoil replacement, and revegetation.

Several VOF conservation easements exist in the Study Area. In a letter on February 26, 2020, VOF noted two easements that have important soils that contribute to prime farmland and forest conservation. One VOF easement fronts Allen's Creek, a James River tributary, and the property contains approximately 53% Prime Farmland Soils or Soils of Statewide Importance. Another larger VOF easement located between the Riverville and Gladstone substations contains approximately 70% of those soils. Soils that contribute to prime farmland, as defined by the USDA, NRCS meet the nation's short- and long-range needs for food and fiber. No Alternative Route crosses either VOF conservation easement that contributes to important farmland soils.

Initial correspondence with Amherst, Appomattox, Campbell and Nelson counties did not indicate any important farmlands as specified in § 3.2-205 B of the Virginia State Code. No response was received from the USDA's NRCS for comment on agricultural lands related to the Project, including the 138-kV line routes. There is a VDACS-designated Virginia Century Farm property located on the south side of the James River in Appomattox County. Virginia Century Farms are established under the VDACS in an effort to recognize farmlands that have been operational and in the same family for a consecutive century or more. Members of the Siting Team met with the landowner of a Virginia Century Farm, which is crossed by Alternative Route

C. Although there are no known restrictions for a transmission line crossing through a Virginia Century Farm, there were viewshed concerns noted as Alternative Route C is located in the viewshed of the historic farmhouse.

Lastly, several large timbering companies own and operate tree farming operations throughout the Study Area.

Alternative Route Comparison

Agricultural and farmlands are dominant in Appomattox County between the Joshua Falls and Riverville substations. Alternative Route B crosses more prime and unique farmland than Alternative Routes C and D, and nearly three times more than Alternative Route A, located on the north side. Alternative Routes C and D cross more farmland of statewide importance (80.3 and 68.4 acres, respectively) as compared to Alternative Route B. Agricultural areas are dominant in Amherst County between the Riverville and Gladstone substations, where the terrain transitions. Alternative Routes E and F are comparable in potential impacts to agricultural soils, Alternative Route E crosses more agricultural areas due to its longer length. Overall impacts to farmland or soils are not anticipated for any Alternative Routes as the only loss of soil or farmable land is limited to foundations of each structure, which are a minimal loss of farmland. Further, the minimum ground-to-conductor clearance is sufficient to accommodate typical farming equipment, so agricultural activities can continue within the ROW and are considered a compatible use.

Large tracts of timbering lands are predominantly on the south side of the river and crossed by Alternative Routes C and D, and near Trinity Road. Nearly 21 acres of timbering areas are crossed by Alternative Route D, the most of the Alternative Routes between the Joshua Falls and Riverville substations. Generally timbering areas are compatible with a transmission line, as it is farther from residences, in more remote areas, and often have existing access roads that can be used for construction. Once the ROW is cleared through timbering areas it will need to remain a scrub shrub and trees will not be allowed to regrow. Members of the Siting Team reached out to various timbering companies to solicit input on the routes. Some input was received regarding construction and safety for transmission line crossing through an active timbering operation. The Company will continue to work with timbering companies as necessary throughout the Project.

4.2.3 Recreation and Conservation Lands

Resource Characteristics

Research was conducted to identify areas that include federal/state forests, parks, designated

wilderness areas, game lands/public hunting areas, trails and local recreation within the Study Area. As mentioned in Section 2.3, coordination was initiated with various agencies including the VDWR, the DOF, and the VOF.

There are no local parks, designated wilderness areas, or game lands located in the Study Area or in proximity to any Alternative Route. In a letter received from the VDCR on March 6, 2020, no State Natural Area Preserves were identified in the Project Area, including the 138-kV line routes. There are two public boat launches maintained by the Virginia DWR in the Study Area: a boat slide launch is located upstream of the Joshua Falls Substation (the Joshua Falls Boat) and the second is a concrete boat ramp located in a state conservation land east of Riverville and where US Route 60 crosses the James River (Bent Creek Boat). The James River corridor within the Study Area has been designated by DCR as a potentially scenic river and includes recreational activities such as canoeing, kayaking and fishing. All Alternative Routes must cross the James River.

There are multiple large VOF and DOF conservation easements located throughout the Study Area, which provide protection of water quality, productive soils, natural heritage resources, historic resources, and scenic viewsheds. VOF easements in the Study Area are located on the north side of the James River and DOF conservation easements are located on the south side. DOF easements are similar to VOF easements in that they typically prohibit future development, including utility infrastructure, in an effort to conserve and preserve the open-space values of the property in perpetuity.

Alternative Route Comparison

All Alternative Routes avoid designated recreational and conservation lands. However, Alternative Route A crosses the James River closer to a boat launch and at a more sensitive and visual location and in a more visible to recreational river users, compared to Alternative Routes B – D. Additional impacts associated with viewshed on the James River are discussed below in Section 4.2.5. Alternative Route A is located within 1,000 feet of two existing VOF easements, including the property encompassing the Galts Mill Complex. A 201-acre VOF easement with a high ranking in forest conservation value is between the Riverville and Gladstone substations. Alternative Routes E and F and are either north or south of large VOF easement and avoid crossing it. Alternative Routes B and D are located within 100 feet of the DOF easement, but both ROWs avoid the easement. No Alternative Route ROWs cross a DOF or VOF easement.

4.2.4 Historic and Archaeological Resources

Resource Characteristics

Background research was conducted for the Study Area to identify all previously recorded and potential cultural resource locations through the review of historic documents, agency and public input, and various archives including the VDHR database. A desktop and field analysis consistent with VDHR guidance was completed in May 2020 to evaluate cultural features in the Study Area and is summarized below. Historic properties include architectural and archaeological resources, historic and cultural landscapes, battlefields, and historic districts.

A review of the VDHR VCRIS inventory revealed a total of 42 previously recorded architectural resources within one mile of the Study Area. Of these 42 resources, five are either NRHP-listed, a designated Virginia Century Farm, or were noted as potentially eligible based on field review or through public input. The Study Area is not located within one mile of any portions of a defined battlefield per the National Park Service database. Additionally, there are no National Historic Landmarks in close proximity to the Study Area. The five architectural resources that were reviewed during the cultural analysis and field inspected are identified in **Table 3** and **Map 12, Attachment A**. The remaining 37 resources reviewed in the VCRIS database have not been formally evaluated by the VDHR.

Table 3. Historic Architectural Resources within 1 mile						
VDHR Resource No.	Resource Name	Alternative Route A (miles)	Alternative Route B (miles)	Alternative Route C (miles)	Alternative Route D (miles)	NRHP Status
005-0005	Edge Hill	0.4	0.7	0.7	0.7	Listed
005-0035	Brightwells Mill Complex	0.9	2.6	2.6	2.6	Listed
005-5037	Galts Mill Complex	0.9	1.3	1.3	1.3	Listed
Unrecorded	Carrie's Acres Farm	>1	0.5	975 feet	0.5	None
Unrecorded	Tin Top House	>1	0.9	<500 feet	0.9	None

Edge Hill (VDHR #005-0005)

Edge Hill is an NRHP-listed site built in 1833 and located in Amherst County, approximately one mile west of the Riverville Substation. The house is intact with its architectural features and the surrounding grounds and outbuildings retain much of their historical integrity. The house is located 0.4 mile from the nearest portion of Alternative Route A. In order to assess the potential impact, a visual inspection of the setting was conducted around the Edge Hill property from a public roadway. The intervening landscape is rolling and mostly wooded so visual impacts to the resource as a result of Alternative Route A are anticipated to be minimal (**Photo 6**). Alternative Routes B – D cross the James River near the NRHP-listed resource, but are screened by topography (**Photo 7**). The intervening distance, topography, and existing vegetation in the area will provide screening for the Alternative Routes. Alternative Routes E and F, between the Riverville and Gladstone substations, are located within one mile of Edge Hill. Impacts to the Edge Hill resource are low for Alternative Routes E and F.



Photo 6. Edge Hill Facing Northeast, Alternative Route A



Photo 7. Edge Hill Facing South, Alternative Routes B – D

Brightwells Mill Complex (VDHR# 005-0035)

The Brightwells Mill Complex is an NRHP-listed site in Amherst County and includes a 1942 mill and dam structure in addition to the 1830s Miller’s House and outbuildings. A field inspection determined that all buildings and structures included in the NRHP remain extant and in a similar condition to when they were evaluated. The complex consists of a mill area adjacent to Beck Creek and a farm area on the hill, north of the mill. Alternative Route A is the closest to the mill (approximately 0.9 mile) and all other Alternative Routes are on the south side of the James River located more than 2.5 miles away. A visual inspection noted that the surrounding landscape remains mostly rural with rolling topography. The landscape is also heavily wooded, which coupled with the terrain, inhibits long-distance views in any direction, including towards Alternative Route A (**Photo 8**). However, inspection from the road just uphill revealed partial visibility of the ridge on which Alternative Route A could potentially be seen, although views would likely be seasonal (**Photo 9**).



Photo 8. Brightwells Mill Facing Southeast, Alternative Route A

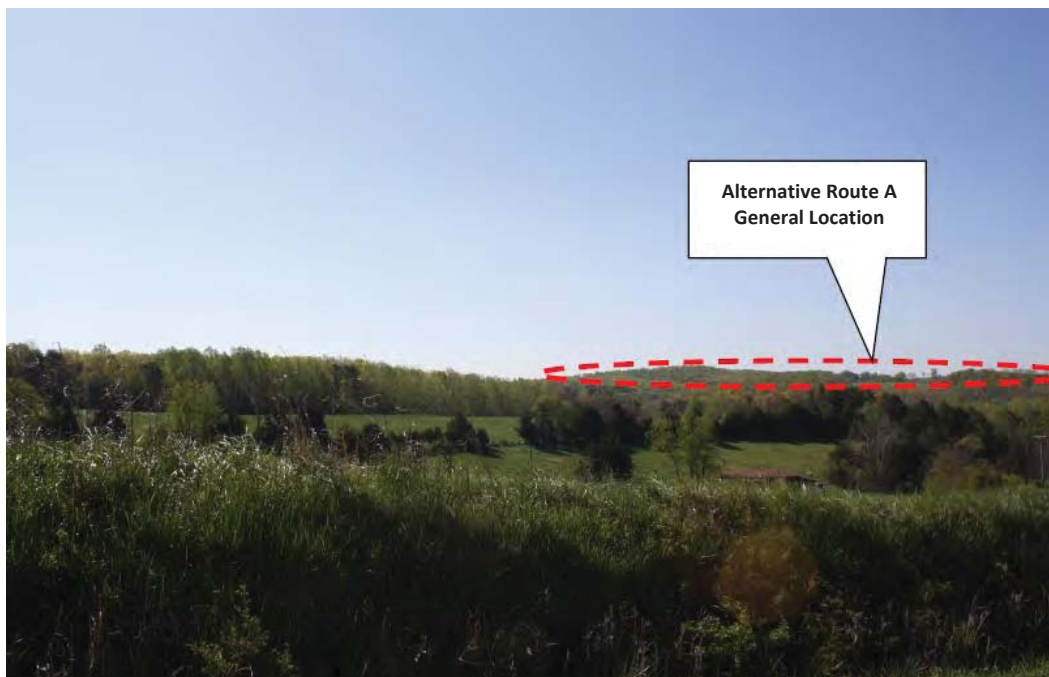


Photo 9. Brightwells Mill Farm House Facing Southeast, Alternative Route A

Galts Mill Complex (VHDR# 005-5037)

The Galts Mill complex is an NRHP-listed site located adjacent to Beck’s Creek where it meets the James River. In addition, the Galts Mill Complex is located within a VOF conservation easement. The Galts Mill and the Brightwells Mill Complex are two of four nineteenth century mill buildings that exist in Amherst County. Inspection of the Galts Mill Complex revealed all of the buildings and structures included in the NRHP remain extant and in a similar condition to when inventoried. There is also potential for archaeological sites associated with the mill and other non-extant buildings. No Alternative Routes cross the resource; however, Alternative Route A is closest. Alternative Route A is located within 0.92 mile of the mill building and the boundary of the 535-acre property is roughly 0.25 mile from the centerline. The intervening landscape in both directions is rolling and mostly wooded. The topography around the mill complex is generally rolling terrain, but Alternative Route A is located on a high ridge north of the resource. A visual inspection noted that wooded vegetation would likely screen views of Alternative Route A from the mill site near the river, and views across the river towards Alternative Routes B – D would be obstructed by the southside of a ridge (**Photos 10 and 11**). A tenant farmhouse is located uphill on the property near Galts Mill Road where there are more open and distant views; there is limited visibility of the ridge where Alternative Route A would be located (**Photo 12**).



Photo 10. Galts Mill Complex Facing Northwest, Alternative Route A

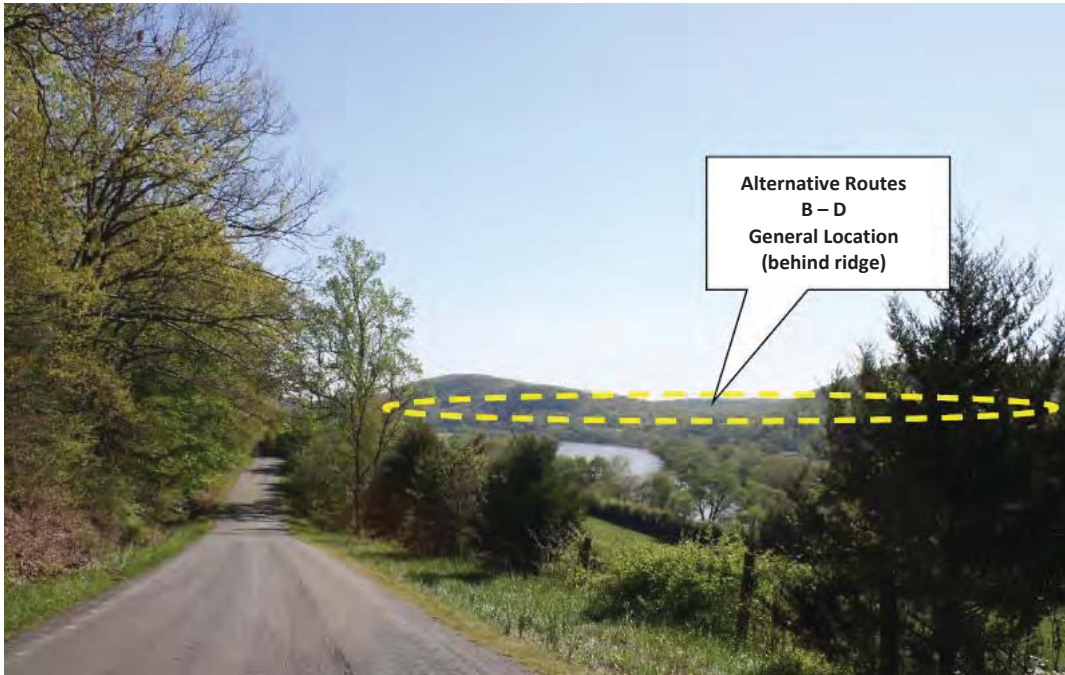


Photo 11. Galts Mill Road Facing East, Alternative Routes B – D

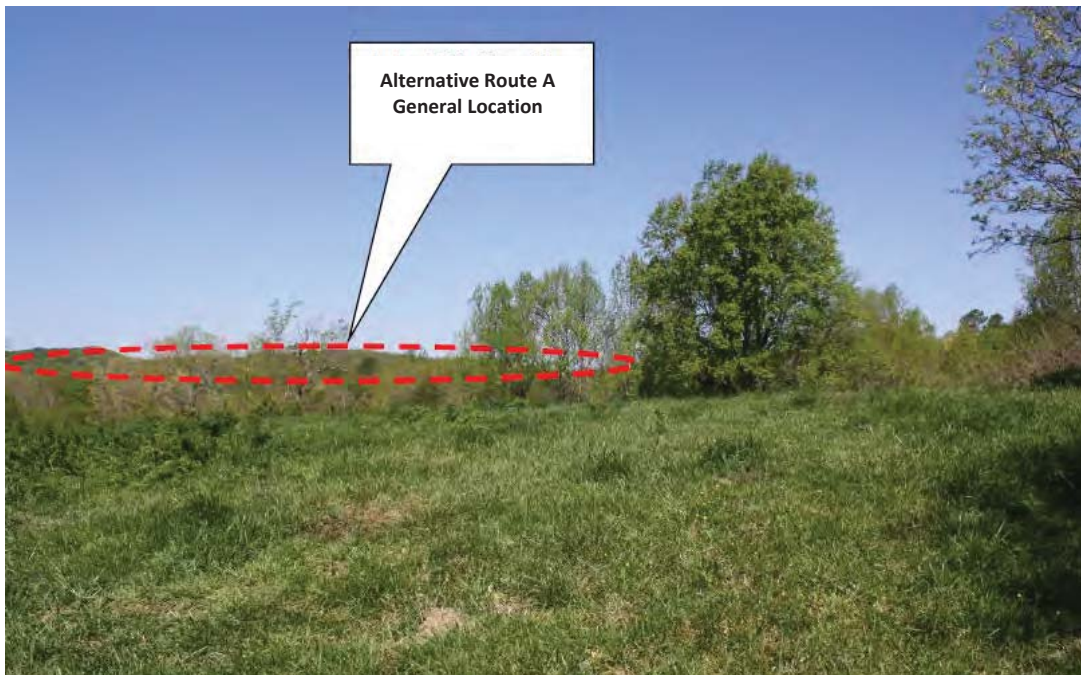


Photo 12. Galts Mill Tenant House Facing Northwest, Alternative Route A

Tin Top House (Unrecorded)

According to local records, the Tin Top House was built in 1851 along Tin Top Place in Appomattox County (**Photo 13**). Alternative Routes on the south side of the river were reviewed for impacts to the potential historic home based on the feedback from residents in the area. The home has not been recorded in VCRIS or formally evaluated by the VDHR but is recognized by the public as a locally significant historic property. Alternative Route C crosses Tin Top Place and the centerline is located less than 500 feet from the home. Alternative Routes B and D avoid crossing Tin Top Place and do not impact viewsheds through the open pasture area. The landscape near Alternative Route C and the Tin Top House is a mix of rolling agricultural fields, rural development, and woodland. Field inspections of the Tin Top Place residential area noted there is new residential construction recently built across the road from the historical home. The Tin Top House sits atop a slight knoll overlooking the surrounding pasture landscape and would be within the viewshed of Alternative Route C (**Photo 14**). Views to the north and west reveal that the intervening distance (0.85 mile), vegetation, and topography between the Tin Top House and Alternative Routes B and D will provide screening and thus are anticipated to have minimal impact (**Photo 15**). The current crossing of Alternative Route C maximizes the distance between other residential homes along Tin Top Place and follows property boundaries.



Photo 13. Tin Top House

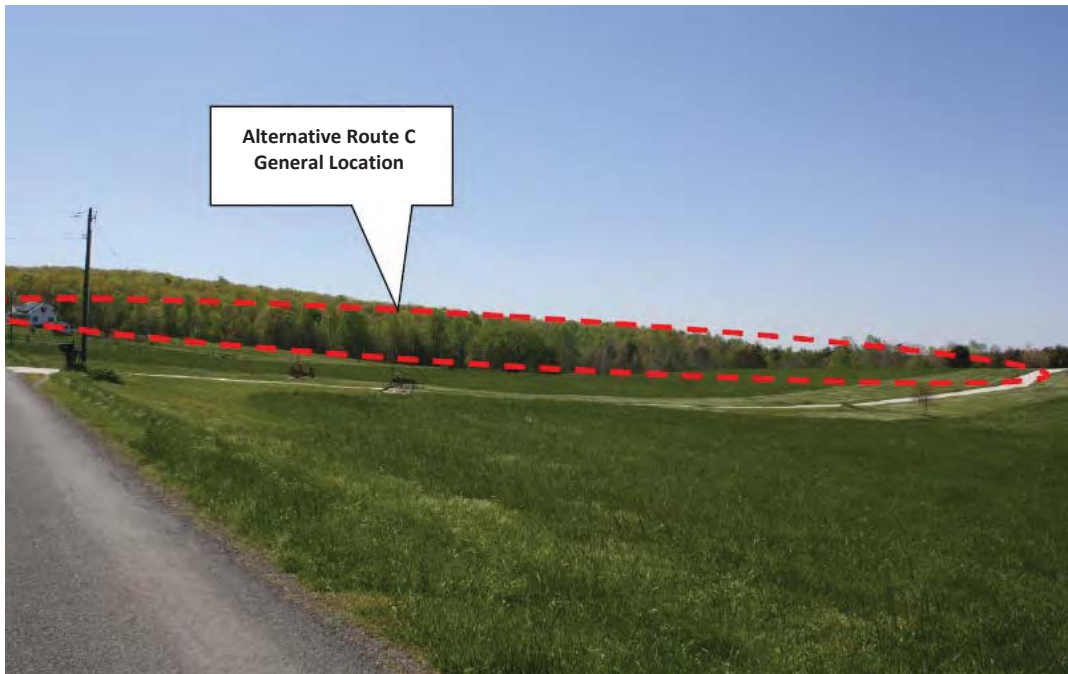


Photo 14. Tin Top House Facing Southwest, Alternative Route C

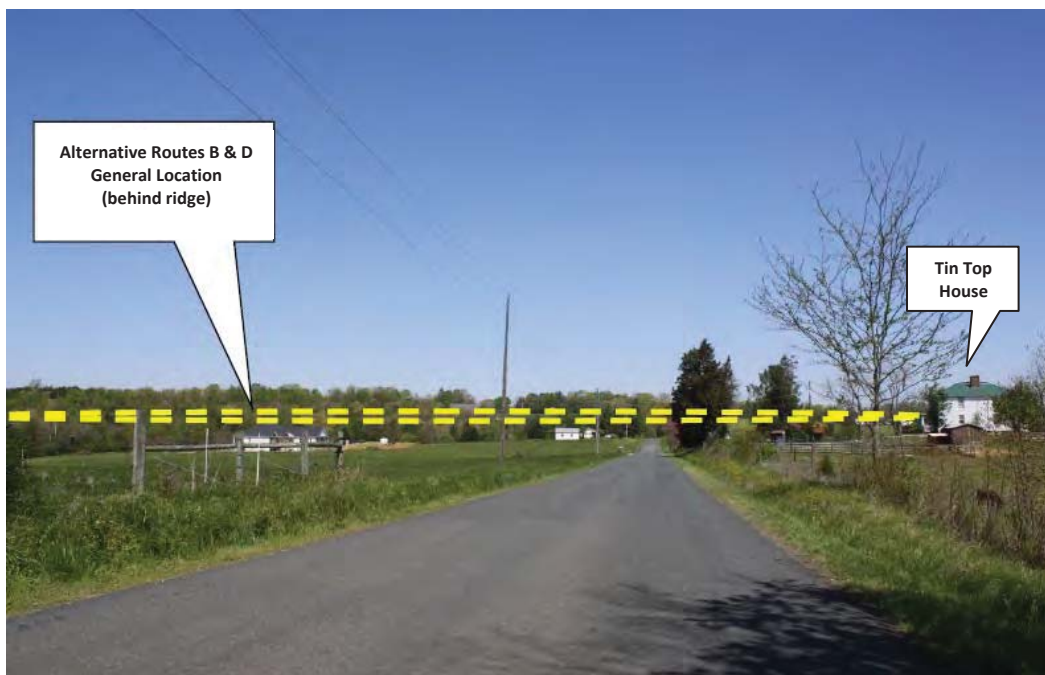


Photo 15. Tin Top Place Facing Northwest, Alternative Routes B and D

Carrie’s Acres Farm (Unrecorded)

According to local records, the Carrie’s Acres Farmhouse was built in 1900 along Carrie Lane in Appomattox County (**Photo 16**). Alternative Routes on the south side of the river were reviewed for impacts to the potential historic home. The residence has not been recorded in VCRIS or formally evaluated by the VDHR, but has been designated a Virginia Century Farm by the VDACS, having been owned and farmed by members of the family for over a century and is publicly recognized. Alternative Route C crosses the family farm properties on the south side of Appomattox CR 605. The farmhouse is located roughly 1,000 feet from the centerline of Alternative Route C. The landscape between Alternative Routes B and D and Carrie’s Acres Farm is gently rolling with a mix of open pasture and woodland. Members of the Siting Team met with a family member on the property to discuss and view the potential visual impacts of Alternative Route C from a newer residence and the historic farmhouse. Based on a field inspection, Alternative Route C crosses the property in both cleared and wooded areas and would likely be seen from the historic farmhouse (**Photo 16**). Alternative Routes B and D avoid crossing the farm property and remain north, approximately 0.5 mile. The Siting Team reviewed options to maximize the distance of Alternative Route C from the farmhouse; however, the terrain to the south is steep and becomes more challenging for construction access and farther from the main road, Appomattox CR 605.



Photo 16. Carrie’s Acres Farmhouse

In regard to archaeological sites, there are three known sites within or immediately adjacent to Alternative Route A's ROW. No other Alternative Route crosses or is in proximity to known archaeological sites. These include two prehistoric artifact scatters, both of which have been determined not eligible for listing in the NRHP by the VDHR; and a historic dam that spans the James River between Amherst and Appomattox counties, roughly 12 miles downstream of the City of Lynchburg. The Joshua Falls Lock and Dam (VDHR# 44AH0176) was initially built circa 1840 and is historically associated with the James River and Kanawha Canal system, which has been listed in the NRHP. The dam could not be accessed in the field but is considered significant given its known historical association and from discussions with landowners in the vicinity who revealed that the remnants of the dam still remain. Although not formally evaluated as an archaeological site, Alternative Route A would be visible from the shoreline abutments and lock in the immediate vicinity based on topographical maps and aerial imagery. Additionally, the centerline of Alternative Route A is located less than 500 feet where it crosses the James River north of the Joshua Falls Substation. The Siting Team reviewed other options to shift the river crossing location of Alternative Route A to minimize impacts to the dam, but the current location parallels parcel boundaries to minimize impacts to landowners and is a feasible span for construction. The remaining Alternative Routes are not anticipated to have any impact on the dam because they cross the James River in a different location.

Alternative Route Comparison

Between the Joshua Falls and Riverville substations, Alternative Routes on the south side of the James River reduce impacts to evaluated historic resources by maximizing distance from the three NRHP-listed resources (Edge Hill, Galts Mill Complex, and Brightwells Mill Complex). Further, Alternative Routes B and D avoid the Tin Top House and Carrie's Acres Farmhouse, which could be significant historic resources and are crossed by or in closer proximity to Alternative Route C. Alternative Routes E and F are located within one mile of Edge Hill, but visual impacts are low given the Greif Paper Mill and intervening landscape. No other cultural resources evaluated for the NRHP are located in proximity to Alternative Routes E and F; however, Alternative Route F is located near multiple unevaluated VCRIS resources along Allens Creek Road.

4.2.5 Scenic Resources

Resource Characteristics

Aesthetics are defined as a mix of landscape visual character, the context in which the landscape is viewed (view/user groups), and the scenic integrity of the landscape. This study reviewed the potential visibility and visual impact of the Alternative Routes through landscape character assessment, field evaluation, viewshed analysis, and environmental factor tabulations.

Visual character encompasses the patterns of landform (topography), vegetation, land use, and aquatic resources (i.e., lakes, streams, and wetlands). Multiple elements influence visual character, such as natural systems, human interactions, and land use. In natural settings, the visual character attributes are natural elements such as forested mountains or scenic rivers and lakes, whereas rural or pastoral/agricultural settings may include manmade elements such as fences, walls, barns and outbuildings, and occasional residences. In a more developed setting, the visual character may include commercial or industrial buildings, manicured lawns, pavement, and other infrastructure.

Viewer/User Groups

Visual sensitivity is defined as the measure of viewer concern for the landscape and viewer concern for change to that landscape. Many factors influence the visual impact of any route and the viewer is one of these factors. A viewer's assessment of visual impact is shaped by their expectations, activities, and frequency of viewing the line. Sensitive viewpoints located within the Study Area were identified from landowner and stakeholder input, land use data, and field reviews. Three main types of viewers exist within the Study Area: local residents, commuters to the Greif Paper Mill, and recreational users of the James River.

Local residents may view the line from their yards or homes, while driving on local roads, or during other daily activities. The sensitivity of local residents to visual impact is higher given no transmission line exists in the area to mitigate the frequent exposure, which resulted in a significant factor in the alternative route comparison. Commuters are people who travel past the transmission line on their way to other destinations. Typically, drivers will have limited views of the transmission line where vegetation or buildings provide screening and where the line crosses high above the road surface. Under these conditions, commuters will likely have a relatively low visual perception of the line because they are typically moving and have a short duration of visual exposure to the line. Recreational users primarily include local residents and/or visitors involved in recreational activities along the James River. Two public boat launches are located in the Study

Area, one of which is southwest and upstream of the Joshua Falls Substation (Joshua Falls Boat Launch) and the other is downstream of the Riverville Substation (Bent Creek Boat Ramp). For some recreational users, scenery may be an important part of their experience as their activities may include attentiveness to views of the landscape for long periods, while doing activities such as canoeing, fishing and kayaking on the James River. Such viewers also may have a high appreciation for visual quality and high sensitivity to visual change.

Scenic Integrity and Visual Absorption

Scenic integrity is the degree by which the landscape character deviates from a natural or natural-appearing landscape in line, form, color, and texture. In general, natural and natural-appearing landscapes have the greatest scenic integrity. As human-made incongruities are added to the landscape, the scenic integrity diminishes. Some landscapes have a greater ability to absorb alterations with limited reduction in scenic integrity. The landscape character and complexity, as well as environmental factors, influence its ability to absorb changes. A new transmission line next to an existing line provides less contrast, and therefore can be better absorbed into that landscape than introducing a transmission line as a new feature in a previously undeveloped area. Scenic integrity refers to the degree of intactness and wholeness of the landscape character. New transmission and substation facilities are more likely to “blend in” with surroundings where existing facilities exist and would not change the integrity of the landscape.

Alternative Route Comparison

The Joshua Falls Boat Launch is located off Mt. Athos Road and approximately 0.5 mile downstream from the Joshua Falls Substation. The Joshua Falls Boat Launch is mainly for kayak, canoe, or self-propelled boats, as there is not a concrete boat ramp. Kayakers or canoers from the Joshua Falls Boat Launch would first approach the Company’s existing Gomingo – Joshua Falls 138-kV Transmission Line over the James River and approximately 0.75 mile farther downstream, users would cross under Alternative Route A. Alternative Routes B, C, and D cross high above the James River and approximately 12 miles downstream and likely not to be seen frequently from users of the Joshua Falls Boat Launch due to the distance required to paddle. The Bent Creek Boat Ramp is approximately seven miles downstream of where Alternative Routes B, C, and D cross the James River and there is a concrete ramp that allows for motorized boats to access the river. Boaters may travel upstream and cross under Alternative Routes B, C, and D; however, given the distance above the river and likely speed of travel, the transmission lines are likely not be visible for extended periods of time or visible to these recreational users.

Within the Study Area, open agricultural and pastoral areas with little or scattered development are expected to have the greatest scenic integrity and the lowest visual absorption capacity. These areas are predominantly located along Galts Mill Road and Piedmont Road on the north side of the river, along Appomattox CR 605 and CR 611, and Tin Top Place where the terrain is rolling and there are wide views of the landscape, particularly in places along Appomattox CR 605. Areas in close proximity to the substations are expected to have the lowest scenic integrity and the greatest visual absorption capacity given the existing utility and linear infrastructure and industrial development in those areas. In particular, the Company's existing Cloverdale – Joshua Falls 765-kV and Amherst – Riverville 138-kV transmission lines connect to the Joshua Falls and Riverville substations and are in proximity to the Alternative Routes. The Greif Paper Mill is next to the Riverville Substation and has a high capacity for visual absorption as the viewshed has been heavily altered by previous development.

Alternative Route A is located generally in mountainous area where wide views of the transmission line are not possible near the ROW due to its location atop forested ridgelines; however, the ROW clearing will be a stark change to the existing viewshed given the heavily forested ridges. These forested ridgelines are visible for large distances as they can be seen throughout the Study Area, particularly from the south side of the James River. As Alternative Route A approaches the Townley IV Farm retreat area, the land becomes more open and rolling. Alternative Route A crosses Galts Mill Road and is the only route to cross a Virginia Scenic Road.

Alternative Routes B – D cross areas with varying visual integrity. Between the Joshua Falls Substation and Tin Top Place, the terrain is more mountainous, forested, and undeveloped. The terrain becomes more rolling and agricultural east of Tin Top Place and scenic integrity increases as larger views of the landscape are visible from major residential streets. Alternative Route C crosses forested hillsides that are visible from several pastoral open views along Tin Top Place, and Appomattox CR 605, which has scenic views south of the roadway. Alternative Routes B and D avoid the open and scenic area east of Tin Top Place and are in less visible locations from roadways, compared with Alternative Route C. Alternative Routes B – D do not cross any known Virginia Scenic Roads or Byways.

Between the Riverville and Gladstone substations, Alternative Routes E and F are comparable regarding visual integrity and absorption capacity; however Alternative Route E is farther from homes and will not be viewed by as many local residents in the area. Both routes are in areas of moderate visual integrity due to the rolling terrain, openness of the agricultural areas, and the lack of other industrial or utility development that result in the low to moderate visual absorption capacity in these areas.

Viewshed Analysis

To gain a basic understanding of the potential visual impacts on the landscape by the Alternative Routes, the Siting Team conducted a viewshed analysis for each Alternative Route using GIS software and publicly available data to determine the potential visibility of structures within 10 miles. The results of this analysis identified those areas where an observer might be able to see the structures and those areas were then mapped (**Maps 13 – 18, Attachment A**).

The viewshed calculation was performed using a USGS 10-meter digital elevation model that provides an estimate of the ground surface elevation for the entire Study Area in 10- by 10-meter cells. With this data source, the effects of terrain on line-of-sight visibility between an observer and its target area can be modeled while considering those areas that can and cannot be seen because of intervening topography. Vegetation and overlaying forest cover data was not considered so that a larger viewshed area could be reviewed; hand digitizing tree cover within 10 miles of each Alternative Route was not feasible for the analysis, but it is likely that vegetation may block some views from each Alternative Route. The Siting Team’s engineers completely a high level engineering review to determine structure locations and likely heights for each Alternative Route. On average, the above ground structure heights are approximately 70 feet tall. **Maps 13 – 18** show a graduated color scale from yellow to red, and represent the number of proposed structure tops that may be visible, based on a current design average, from observation locations. Red indicates the highest number of structures whereas yellow indicates the lowest number. To configure the graduated color scale, the viewshed analysis identifies the cells in an input raster that can be seen from one or more observation locations. Each cell in the output raster receives a value that indicates how many observer points can be seen from each visible structure location. The input raster is developed using bare-earth DEM’s (digital elevation models) representing the ground elevation within 10-miles of a route centerline. The output value recorded correlates to the number of structure locations visible within each raster cell and colored accordingly.

Alternative Route Comparison

Alternative Route A crosses a mountainous area with less pastureland and farmland, but some residential development atop ridges, including Amherst Plantation. Alternative Route A requires the most tree clearing than other Alternative Routes. Tree clearing for a new ROW and access roads in heavily forested and undisturbed areas can be highly visible on the landscape. Based on field investigation and landowner meetings, the mountainous terrain on the north side of the river can be seen on the south side of the river in certain locations (**Photo 17**). The viewshed

associated with Alternative Route A demonstrates darker red or more visible locations extending farther out from the centerline as compared to other Alternative Routes. While the FM radio tower located off Round Mountain and south of Amherst Plantation neighborhood is much taller than the proposed transmission line structure heights, it demonstrates that a vertical structure on a cleared mountain top is highly visible from various locations on the south side of the river. Alternative Route A is potentially visible in a more widespread area and in more populous areas of Amherst County, near SR 29, and at least three miles to the south and across the river in Appomattox County, north of the Stonewall area (**Map 13, Attachment A**).

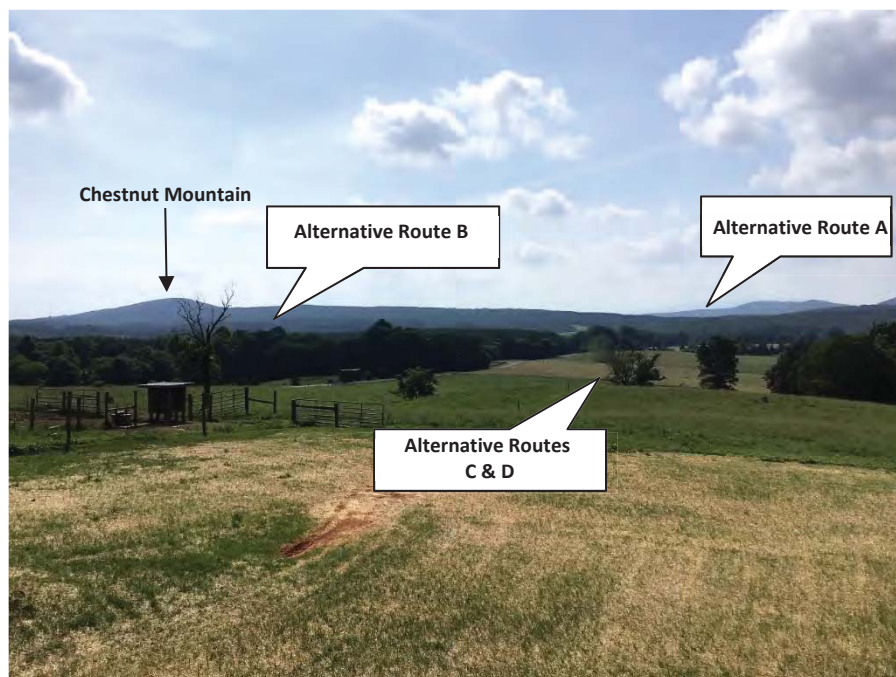


Photo 17. Appomattox CR 611, Facing Northwest (South of James River)

Alternative Routes B – D cross steep terrain outside the Joshua Falls Substation however, Alternative Route B remains on high terrain closer to the James River and results in greater viewshed impacts, shown by more high visual impact areas on the viewshed map (**Map 14, Attachment A**). During a meeting with a landowner, members of the Siting Team viewed Chestnut Mountain and its connecting ridges in Appomattox County from the north side of the river. Alternative Routes B, C, and D exit the Joshua Falls Substation and continue northeast towards the Chestnut Mountain area. Chestnut Mountain is highly visible and identifiable from the north side of the river given its elevation (**Photo 18**). As a result, Alternative Routes B – D were shifted south and on the southside of the prominent mountain, minimizing visual impacts from the north side of the river. After Chestnut Mountain, the Alternative Routes divert and Alternative Routes C and D continue east at lower elevation compared to Alternative Route B.

The structures and ROW for Alternative Route B are likely to be more visible than Alternative Routes C and D given the location on higher terrain, proximity to the river, and requiring more tree clearing (**Maps 14 – 16, Attachment A**).



Photo 18. View of Chestnut Mountain, Facing Southeast (North of James River)

The potential viewsheds for Alternative Routes C and D are similar, but have one main difference. Alternative Route D avoids the scenic, open areas of Tin Top Place and Appomattox CR 605 (**Maps 15 and 16, Attachment A**). Generally, Alternative Routes C and D are less visible from distances farther than ten miles because they are on lower terrain in several places and vegetation will limit wide views as viewers are at the same elevation as the Alternative Routes.

Alternative Routes E and F are comparable in regard to potential viewshed impacts, but Alternative Route F is closer to the river, on higher terrain, and crosses through more developed areas along Allens Creek Road (**Maps 17 and 18, Attachment A**). Alternative Route E requires more tree clearing, given the additional line length, but crosses predominantly timbering lands and an area with less residential development. In general, the viewshed for Alternative Route F impacts more residents in an area where vegetative screening would be minimized.

Table 4. Human Environment Evaluation Criteria							
Alternative Route	Unit	Joshua Falls to Riverville				Riverville to Gladstone	
		A	B	C	D	E	F
General							
Line length in Company service territory	miles	11.6	1.7	1.7	1.7	0.8	0.7
Line length in CVEC service territory	miles	0	8.8	9.4	9.4	5.6	4.9
Total line length	miles	11.6	10.5	11.1	11.1	6.3	5.5
Number of parcels ¹ crossed by ROW	count	54	41	33	37	30	39
Unique landowners ² within ROW	count	28	22	18	21	25	34
Parallel to parcel boundaries	miles	1.4	2	2.4	1.6	0.6	0.8
Counties Crossed							
Amherst County	miles	11.1	0.6	0.6	0.6	3.2	3.0
Appomattox County	miles	0	8.6	9.2	9.2	0	0
Campbell County	miles	0.5	1.3	1.3	1.3	0	0
Nelson County	miles	0	0	0	0	3.1	2.5
Residential³							
Outbuildings ⁴ in the ROW	count	0	0	0	0	0	0
Residences within ROW	count	0	0	0	0	0	0
Residences within 100 feet of route centerline	count	0	0	0	0	0	0
Residences within 250 feet of route centerline	count	7	3	2	2	3	8
Residences within 500 feet of route centerline	count	12	8	11	8	14	28
<i>No multi-family dwellings including, but not limited to, townhomes, condominiums, apartment complexes, duplexes, etc., are located in proximity to any Alternative Route.</i>							
Commercial/Industrial							

Table 4. Human Environment Evaluation Criteria

Alternative Route	Unit	Joshua Falls to Riverville				Riverville to Gladstone	
		A	B	C	D	E	F
Businesses/commercial buildings ⁵ within 500 feet of route centerline	count	0	0	0	0	1	0
Industrial properties crossed in ROW	count	1	1	1	1	1	1
<i>No business or commercial buildings are crossed or within 250 feet of any Alternative Route. No mining areas or quarries are crossed by any Alternative Route.</i>							
Agricultural							
Pasture/rangeland crossed in ROW (based on NLCD data)	acres	12.7	36.5	24.2	27.8	12.9	12.1
Cropland crossed in ROW (based on NLCD data)	acres	25.6	58.4	79.2	68.2	40.6	31
Timbering areas crossed in ROW	acres	15.5	0	17.4	20.7	19.2	2.6
<i>No known tree farms or orchards are crossed by the ROW of any Alternative Route.</i>							
Community/Recreational Facilities							
Cemeteries within 250 feet of route centerline	count	0	1	0	0	0	3
VDOT Scenic Roads crossed by ROW	count	1	0	0	0	0	0
<i>No hospitals and/or assisted living facilities are located in proximity to the Project Area. No Virginia Byways or Scenic Parkways are crossed by any Alternative Route. No schools, designated places of worship, or parks and recreation areas are within 1,000 feet of any Alternative Route centerline.</i>							
Protected Land							
Conservation easements within 250 feet of route centerline	count	1	1	0	1	0	0
Cultural Resources							

Table 4. Human Environment Evaluation Criteria

Alternative Route	Unit	Joshua Falls to Riverville				Riverville to Gladstone	
		A	B	C	D	E	F
NRHP-listed historic resources within one mile of route centerline	count	3	3	3	3	1	1
Previously recorded archaeological sites within ROW	count	1	0	0	0	0	0
<i>No National Historic Landmarks or portions of any defined battlefields (per National Park Service) are located in proximity to any Alternative Route. No known NRHP-eligible historic resources are located within one mile of any Alternative Route centerline.</i>							

¹ The number of parcels crossed refers to the number of individual plots of owned land recorded by Amherst, Appomattox, Campbell or Nelson counties.

² The number of landowners within the 100-foot ROW represents the number of individual landowners, who each may own one or more parcels.

³ Footprints for buildings were obtained from publicly available data sources and LIDAR imagery.

⁴ Outbuildings include, but are not limited to, barns, sheds, garages and silos, and excludes known abandoned features.

⁵ Commercial development includes retail, service, office, restaurants, and lodging establishments.

4.3 Constructability

Constructability is the ability to efficiently and cost effectively engineer, acquire ROW, construct, operate, and maintain the proposed transmission line. Major factors include safety, steep topography, condensed ROWs, heavy angles, access, proximity to major highways, etc. A comparison of the constructability considerations for the Alternative Routes is presented at the end of this section in **Table 4** and in **Maps 7, 9, and 10**.

4.3.1 Engineering, Topographic and Geotechnical

Potential engineering and construction challenges are important to consider when siting a transmission line. Heavy angles, steep topography, nearby communication towers, antennas, and airfields along with narrow ROW alignments are all elements that could ultimately require extensive or non-standard engineering and lead to increases in impacts and overall cost.

The proximity to existing roadway, transmission, and gas pipeline infrastructure could also pose potential engineering and construction challenges. As with paralleling existing infrastructure, crossing over transmission lines, distribution lines, and gas pipelines may require specialized construction techniques and scheduled outages on the existing lines. The Company attempted to minimize engineering challenges during route development. Generally, the north side of the river has rugged, forested, and mountainous terrain with steep ridgelines and deep valleys. Ridgelines often have a rockier substrate that can impact structure foundation design and construction. The south side of the river is similar near the Joshua Falls Substation, but transitions to more rolling farther east. The forested ridgelines transition to agricultural fields and hillsides. Building a transmission line is possible in either landscape; however, there are fewer challenges and more flexibility for structure placements in flatter terrain.

A letter received from the Virginia Department of Aviation on February 5, 2020 indicated that no portion of the overall Project, including the 138-kV line routes, are located within 20,000 linear feet of a public use airport. The closest public airports (Lynchburg Regional Airport and Falwell Airport) are located more than five miles from the Study Area and in the City of Lynchburg. There is an existing private airstrip located near the Stonewall area in Appomattox County and 1.5 miles south of Alternative Routes C and D, but impacts are not anticipated. During the first set of public open houses, the Siting Team was informed of future plans for a private airstrip east of the Joshua Falls Substation. Alternative Route A is located west of the future airstrip and could potentially impact possible flight patterns (see Section 3.6.1); however, the plans were not definite and the river crossing location north of the Joshua Falls Substation is constructible. No structures will

reach a height of 200 feet above ground level and therefore, an airspace study is not expected to be required by the Federal Aviation Administration for any Alternative Route.

Alternative Route Comparison

The more favorable transmission line route from an engineering and constructability perspective is typically the shortest and straightest route. Given the constraints within the Study Area, a straight and direct route is not possible.

Alternative Route A is the longest route. The most constructible locations for transmission structures are the tops of ridgelines or at the higher terrain, which are often occupied by homes or other infrastructure. Also, there is generally a higher chance of encountering rock on ridgelines during construction. Given the terrain, there is little flexibility to make centerline adjustments for residential development, as even a slight shift could put a transmission line structure on a steep hillside. Additionally, if rock is encountered and a structure cannot be moved, foundations may require a more complicated design and specialized drilling equipment. Alternative Route A is located on ridgelines where homes are in closer proximity to the centerline with little flexibility to adjust the route and maximize the distance from homes. In comparison, the flatter terrain near Alternative Routes C and D allow for more flexibility in centerline shifts to maximize distance from residential homes and as a result, a fewer number of homes are in proximity to the centerlines.

Alternative Route A requires more heavy angles than other routes considered. Heavy angle structures on steep terrain can be challenging for construction given the size of the structure foundations and equipment required to build them. There are significantly more steep slopes (greater than 20%) on the north side of the river and in proximity to the river on the south side, as shown on **Map 10**. Alternative Routes C and D avoid most of these steep slope areas, which are concentrated along the James River, and traverse through flatter terrain and more and agricultural lands. Alternative Route A crosses twice as many slopes exceeding 20% than Alternative Routes B – D (3.1 and 1.5 miles, respectively). Collectively, Alternative Routes B – D are comparable in regard to crossing steep slopes; however, Alternative Routes D avoids steeper ridgelines near Chestnut Mountain and Appomattox CR 605.

Between the Riverville and Gladstone substations, Alternative Route E is farther north and 0.8 miles longer than Alternative Route F in order to avoid a VOF easement, residential areas near Allens Creek Road, and cross timbering lands. Although shorter, Alternative Route F crosses more steep slopes closer to the James River and requires an additional heavy angle to avoid residences and aid constructability.

4.3.2 Access Roads

Routing a transmission line close to existing roads (such as county or secondary roads) allows for easier access to the transmission line ROW and it avoids the need to build long, costly access roads that disturb a greater number of landowners, impact viewsheds, and fragment habitat and forested areas. Steep topography can compromise feasible access road and structure placement. The terrain is moderately steep throughout the Study Area, but predominantly near the James River and prominent mountainsides, such as Chestnut Mountain in Appomattox County and Round Mountain in Amherst County.

Proximity to state or county maintained roads for construction is an important consideration for construction access. Being closer to maintained roadways often reduces the amount of new access roads to be built and make access easier future maintenance activities. On the north side of the river the only major county maintained roads in the vicinity of Alternative Route A are Galts Mill Road (a VDOT-designated Scenic Road) and Stapleton Road, which are located generally along the James River and not viable access points to a transmission ROW located on the ridgeline. There are some roads associated with the Amherst Plantation community and near Alternative Route A; however, these are gravel roads maintained by the local HOA. A field review of the community roads confirmed that the roads were heavily rutted and would require significant upgrades for construction. On the south side of the river there are significantly more maintained and paved roads in close proximity to the Alternative Routes; major county maintained roads include Appomattox CR 611 and CR 605. Field review of roads on the south side of the river, confirmed most local roads were in good condition and paved.

The Siting Team received a response from VDOT on March 6, 2020 regarding comment on the CVTRP. According to VDOT, multiple resurfacing projects and road maintenance projects are planned in southern Amherst County along Galts Mill Road and Beck Creek Road, which are crossed by Alternative Route A, but they are not anticipated to conflict with the Project. In addition, a paving project is planned for Appomattox CR 605 where Alternative Route C crosses, and for Piedmont Road where Alternative Route E crosses, but neither project is anticipated to be impacted given the proposed schedule. No other input was received for future transportation improvement projects that could be impacted by the Alternative Routes.

Alternative Route Comparison

In general, the rolling terrain on the south side of the James River allows for better constructability and access. The lack of state or county maintained roads in close proximity to Alternative A requires more access road construction or major upgrades to other gravel

community roads. Alternative Routes C and D are in closer proximity to Appomattox CR 611 and CR 605 and other paved roadways. Further, in flatter terrain or agricultural fields access roads can often be located within the ROW and not require additional roads to be built outside the ROW or affect additional landowners.

Alternative Routes E and F (between the Riverville and Gladstone substations) are in closer proximity to county roadways and can use large, undeveloped parcels as an opportunity to minimize impacts to the community. Both routes are comparable in regard to likely access roads.

4.3.3 Right-of-Way

The Siting Team attempted to minimize route length and overall ROW easement acquisition as to minimize impacts to the community. Where possible and practical, the Company considers using existing transmission ROW, paralleling existing electric lines, or paralleling other infrastructure (i.e., roadways, railways or gas lines). The Project requires a new 138-kV transmission line and is not a rebuild of an existing line nor has an existing ROW.

Alternative Route Comparison

Alternative Routes B, C, and D parallel the Company's existing 765-kV transmission line south of the Joshua Falls Substation for a short distance (approximately 1,600 feet). The final six Alternative Routes do not parallel utility infrastructure for significant lengths as existing rights-of-way in the direction of the Project End-Points were not available in the Study Area. A Colonial Pipeline Company gas line ROW is located on the north side of the James River and is crossed twice by Alternative Route A; no gas lines are crossed by Alternative Routes B - D. For new 138-kV transmission lines, perpendicular crossings of gas lines versus paralleling is preferred and avoids timely and costly mitigation studies, such as interference studies to minimize possible impacts to the underground pipe. The Alternative Routes do not parallel other linear facilities, such as roadways and railroads, as they are located near development, have many turns, and/or terrain is difficult to construct. Alternative Route E is approximately 0.8 mile longer than Alternative Route F, but crosses nine fewer properties and landowners and as such, fewer landowners are located in the ROW.

Table 5. Constructability Evaluation Criteria

Alternative Route	Unit	Joshua Falls to Riverville						Riverville to Gladstone			
		A	B	C	D	E	F				
General											
Total Line Length	miles	11.6	10.5	11.1	11.1	6.3	5.5				
Transportation Resources											
U.S. highways crossed	count	0	0	0	0	1	1				
State highways crossed	count	0	0	0	0	0	0				
State-maintained roads and streets crossed	count	4	2	4	2	4	1				
Local roads and streets crossed	count	6	4	1	3	1	5				
Railroads crossed	count	1	1	1	1	0	0				
Airports/heliports ¹ within one mile of the centerline	count	1	1	1	1	1	1				
<i>No interstate highways are crossed by any Alternative Route ROW.</i>											
Utility Resources											
Oil and gas pipelines crossing	count	2	0	0	0	1	1				
Existing 765-kV Transmission Lines crossed	count	0	1	1	1	0	0				
Existing 138-kV Transmission Lines crossed	count	1	0	0	0	0	0				
Existing 46-kV Transmission Lines crossed	count	0	0	0	0	1	1				
<i>No communication towers, including AM and FM radio towers, are located within 1,000 feet of any Alternative Route centerline.</i>											
Engineering and Geotechnical Considerations											
Steep slopes crossed by ROW (>20%)	miles	3.1	1.5	1.5	1.5	0.02	0.4				
Heavy angles, greater than 30 degrees	count	8	3	4	6	3	4				

¹A private heliport, operated by Greif, is located on their properties, but used for emergency purposes. Greif did not indicate any concern for line routes in proximity to the heliport and noted it could be relocated.

5.0 IDENTIFICATION OF THE PROPOSED ROUTE

Following an extensive data gathering, route development, and comparative analysis process, the Siting Team identified Alternative Routes D and E as the Proposed Route (Maps 19 and 20, Attachment A). The **Proposed Route** for the Joshua Falls – Riverville – Gladstone 138-kV Transmission Lines is 17.4 miles long. The Siting Team selected a Proposed Route based on the accumulation of siting decisions made throughout the process, the knowledge and experience of the Siting Team, stakeholder input, and the comparative analysis of potential impacts.

The following summarizes the process used by the Siting Team to select the Proposed Route. First, the Siting Team identified a Study Area between the three existing substation endpoints (**Map 2**) and collected constraints data. Based on the constraints and opportunities identified in the Study Area, the Siting Team developed Routing Concepts to connect the Joshua Falls, Riverville, and Gladstone substations (**Map 3**). The Routing Concepts were modified after further desktop and field analysis into a Study Segment Network (60 total segments), which was then presented at a set of public open houses (**Map 4**). Using public and stakeholder input, additional desktop analysis, field reviews, and meeting with numerous landowners, the Study Segment Network was modified into a Refined Study Segment Network (**Map 5**). The Refined Study Segment Network was presented at a second set of public open houses for further community input. The Siting Team collected additional information from public input, constructability reviews, and field and desktop analysis and identified six Alternative Routes between the three substations (**Maps 6 – 9**). The Siting Team reviewed and analyzed the Alternative Routes based on resource constraints in the Study Area (**Maps 10 – 18**) and selected the Proposed Route (**Maps 19 and 20**). The following summarizes the rationale for the selection of Alternative Routes D and E as the Proposed Route.

The Proposed Route has fewer residential impacts. Alternative Routes D and E are located in proximity to the fewest number of residences and cross the fewest parcels. Alternative Route D has eight (8) residences within 500 feet of its centerline; whereas, Alternative Route A (its north counterpart) has 12. Further, within 250 feet of their centerlines (500-foot corridor) Alternative Route D has two (2) homes and Alternative Route A has seven (7). Alternative Route E has 14 residences within 500 feet, compared to 28 for Alternative Route F. The ROW of Alternative Route B crosses 37 parcels as compared to 54 parcels crossed by the ROW of Alternative Route A. Alternative Route E crosses 30 parcels versus 39 parcels crossed by Alternative Route F. Alternative Route D avoids crossing existing and future residential areas, including Amherst Plantation (crossed by Alternative Route A) and Tin Top Place (crossed by Alternative Route C).

Additionally, Alternative Route E avoids the concentrated residential development and steeper terrain along Allens Creek Road. In general, the Proposed Route minimizes impacts to existing and future subdivided residential development, considers landowner input, and reduces visual impacts on residences by crossing timbering areas and remaining on lower elevation.

The Proposed Route minimizes impacts on the James River. In the Project area, the James River is designated as a potentially scenic river by the VDCR and includes recreational uses such as kayaking and canoeing. Alternative Routes B – D cross the river at the existing Riverville Substation and in a predominantly industrial location and existing visual impacts from the Greif Paper Mill. Compared to the Alternative Route A James River crossing, which is located closer to a recreational boat launch, historic dam, and not previously disturbed landscape. Alternative Routes B – D cross the river at a narrow location where the topography is high on both sides of the river, allowing the transmission line to cross high above the river water. No intermediate structures will be located in the floodplain and the Proposed Route crossing is shorter, high above the river, and farther from river access points, such as public boat launches.

The Proposed Route has less potential for environment impacts. The Proposed Route (Alternative Route D) has approximately 30 acres less of ROW clearing compared to the northern Alternative Route A, and the least amount of forest clearing of any Alternative Route (93.8 acres). The Proposed Route crosses the most commercial timbering areas (areas where natural habitat is not diverse). Reducing forest clearing minimizes impacts to natural and unfragmented wildlife habitat and Alternative Route A has a greater impact given the natural and native forested mountainsides crossed by the route. The steep terrain associated with Alternative Route A increases erosion and sediment runoff risks and potential impacts on water resources. Alternative Route E compared to Alternative Route F requires more tree clearing, but it is mostly within commercial timbering tracts and is not a naturally forested and diverse habitat.

The Proposed Route has less potential for visual impacts. Alternative Route A traverses more forested, rugged terrain and generally follows ridgelines with residential development. Tree clearing in mountainous areas for a transmission line ROW and access roads have potential visual impacts that can be seen for greater distances, especially when a transmission line is day-lighted on a high ridge and the ROW is cut on the forested landscape. Alternative Route A is located on higher terrain and is potentially more visible to the greater regional area as determined by the viewshed analysis conducted for all Alternative Routes. Alternative Route D is located in more rolling and gentle terrain where visual impacts will be limited to foreground and middle-ground views that are often blocked by vegetation. Additionally, Alternative Route D has significantly less ROW cut and tree clearing. Alternative Route E avoids the more abundant residential

development along Allens Creek Road as compared to Alternative Route F, reducing potential visual impacts on homes and local residents. Alternative Route D crosses the James River south of the Riverville Substation and at an existing visual impact of the Greif Paper Mill, while Alternative Route A crosses the James River at a location with more scenic integrity, particularly for recreational users, and near a potentially historic dam.

The Proposed Route has less potential for construction and engineering challenges. Alternative Route A is located on the north side of the James River in forested, rugged and steep terrain with less access to state or county maintained roads. Due to the terrain, Alternative Route A generally follows ridgelines where there is less flexibility to make adjustments for engineering or individual landowner input. There is also a higher chance of encountering rock on ridgelines. If rock is encountered and a structure cannot be moved, foundations may require a more complicated design. Additionally, the overall steeper slopes and additional 30 acres of forest clearing increase landslide risks, costs, and construction issues associated with ROW clearing, structure crane pads, and access road construction. In contrast, the Proposed Route (Alternative Route D) is located on the south side of the James River. After exiting the Joshua Falls Substation and past Chestnut Mountain, the Proposed Route crosses more open agricultural fields and the terrain becomes rolling and gentle. As a result, the Proposed Route has more engineering flexibility to adjust the alignment within the SCC-approved filing corridor and is not restricted by steep slopes and mountainsides as compared to the north side of the river. Further, there is closer access to state or county maintained roads for construction, less chance of encountering rock, less cut/fill disturbance for structure crane pads, less forest clearing, and less overall risk for landslides during construction.

Collectively, the Siting Team believes the Proposed Route: (1) is most consistent with the siting guidelines; (2) reasonably minimize adverse impacts on area land uses and the natural and cultural environment; (3) minimizes special design requirements and unreasonable costs; and (4) can be constructed and operated in a safe, timely, and reliable manner.

6.0 REFERENCES

- Amherst County. November 21, 2017. *The 2017 Amherst County Comprehensive Plan*. Available at <https://www.countyofamherst.com/>. Accessed June 1, 2019.
- Appomattox County. June 20, 2016. *Appomattox County Comprehensive Plan*. Available at <https://www.appomattoxcountyva.gov/>. Accessed June 1, 2019.
- Campbell County. December 2, 2014. *Campbell County Comprehensive Plan 2014-2029*. Available at <https://www.co.campbell.va.us>. Accessed June 1, 2019.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. Laroe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. United States Department of Interior, Fish and Wildlife Service. FWS/OBS-79/31. p.103
- Nelson County. October 8, 2002. *2002 Nelson County Comprehensive Plan*. Available at <https://www.nelsoncounty-va.gov/>. Accessed June 1, 2019.
- United States Fish and Wildlife Service (USFWS). 2018. Information for Planning and Consultation project planning tool. Available at <https://ecos.fws.gov/ipac/>. Accessed August 24, 2020.
- Virginia Department of Conservation and Recreation (VDCR). 2019. Hydrologic Unit Geography. Available at <http://www.dcr.virginia.gov/soil-and-water/hu>. Accessed September 23, 2020.
- Virginia Department of Game and Inland Fisheries. 2019. Virginia Wild Trout Management Plan 2019 – 2028. Available at <https://dwr.virginia.gov/wp-content/uploads/media/Virginia-Wild-Trout-Management-Plan-2019-2028.pdf>. Accessed December 2, 2020.
- Virginia Natural Heritage Data Explorer. 2017. Planning tool to identify ecological core areas through the Virginia Natural Landscape Assessment. Accessed August 31, 2020.

Attachment B: GIS Data Sources

Attachment B. GIS Data Sources		
Siting Criteria	Source	Description
Natural Environment		
Tree clearing within the ROW	Digitized based on ortho imagery sources VBMP (2019) and Esri (2018); NLCD Tree Canopy Cover (2019)	Acres of forest within the ROW
Number of NHD stream and waterbody crossings within the ROW	USGS NHD (2020)	The NHD is a comprehensive set of digital spatial data prepared by the USGS that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells
Acres of NWI wetland crossings within the ROW	USFWS NWI (2020)	The NWI produces information on the characteristics, extent, and status of the Nation’s wetlands and deepwater habitats
Acres of 100-year floodplain crossing within the ROW	U.S. Federal Emergency and Management Agency (FEMA) (2017)	Acres of 100-year floodplain within the ROW
Miles of public lands crossed by the route	The Protected Areas Database of the United States (PAD-US) (2018)	Miles of federal, state and local lands crossed by the ROW
Threatened, endangered, rare or sensitive species occurrence within the Project vicinity	USFWS (2020)	Known occurrences; locations of potential habitat based on land use
Special natural areas crossed by the ROW and within 250 feet	USFWS (2020)	Location of special natural areas in proximity to ROWs

Attachment B. GIS Data Sources

Siting Criteria	Source	Description
Percent of hydric soils within the ROW	United States Department of Agriculture (USDA-NRCS), Natural Resources Conservation Service Soil Survey Geographic (SSURGO), State Soil Geographic (STATSGO) Database (Amherst County data 2009; downloaded 2020), (Appomattox County data 2008; downloaded 2020), (Campbell County data 1977; downloaded 2020); (Nelson County data 2010; downloaded 2020)	Percent of soil associations crossed by the ROW characterized as hydric, predominantly hydric, partially hydric and non-hydric
Percent of prime farmland soils and soils of statewide importance within the ROW	USDA-NRCS SSURGO Database (Amherst County data 2009; downloaded 2020), (Appomattox County data 2008; downloaded 2020), (Campbell County data 1977; downloaded 2020); (Nelson County data 2010; downloaded 2020)	Percent of soil associations crossed by the ROW characterized as prime farmland or farmland of statewide importance
Number of known caves or mines within the ROW	Virginia Department of Mines, Minerals and Energy (DMME) (2020)	Count of known mines or caves
Human Environment		
Number of parcels and unique landowners crossed by the ROW	Virginia Geographic Information Network (2020); Campbell County (2020), Appomattox County (2020), Nelson County (2020); and Amherst County (2020)	Count of the number of parcels and landowners crossed by the ROW

Attachment B. GIS Data Sources

Siting Criteria	Source	Description
Number of residences within 250 feet of the route centerline	Digitized from Virginia Information Technologies Agency [VITA] (2019) and digitized from LiDAR survey results (September 2020)	Count of the number of residences within the ROW and within 250 feet of potential routes
Number of commercial buildings within 250 feet of the route centerline	Digitized from VITA (2019) and digitized from LiDAR survey results (September 2020)	Count of the number of commercial buildings within the ROW and within 250 feet of potential routes
Land use acreage and distance crossed by the ROW	National Land Cover Database [NLCD] (2019)	The NLCD (2019) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium includes 15 classes of land cover from Landsat satellite imagery
Acres of conservation easements crossed by the ROW and within 250 feet of route centerline	National Conservation Easement Database [NCED] (2020), VOF (2020), DOF (2020)	Private conservation easements crossed by or in proximity to the routes from the NCED which is comprised of voluntarily reported conservation easement information from land trusts and public agencies. Conservation lands and easements including VOF and DOF easements were referenced.
Acres of agricultural district land crossed	NLCD (2019)	Protected land that is devoted exclusively to agricultural production or devoted to and qualified for compensation under a federal land retirement or conservation program that is at least 10 acres in size, or produces an average yearly gross income of at least \$2,500 during a 3-year period
Number of archeological resources within the ROW and within 100 feet of route centerline	VDHR's Virginia Cultural Information System (VCRIS) (2020)	Previously identified archeological resources listed or eligible on the National Register of Historic Places (NRHP) acquired through VDHR's VCRIS (2020)
Number of historic architectural resources within the ROW, within one mile	VDHR's VCRIS (2020)	Previously identified historic architectural resource sites and districts listed or eligible on the NRHP acquired through VDHR's VCRIS

Attachment B. GIS Data Sources

Siting Criteria	Source	Description
Institutional uses (schools, places of worship, parks, and cemeteries) within 1,000 feet of the route centerline	USGS's Geographic Names Information System (GNIS) (2020)	This dataset includes the locations of cemeteries, churches, hospitals, parks, and schools. Features within 1,000 feet of potential routes were field verified.
Constructability		
Route length	Measured in GIS	Length of route in miles
Number of heavy angle structures	Developed in GIS	Anticipated number of angled structures greater than 30 degrees based on preliminary design
Number of road crossings	VBMP's Road Centerline Program (RCL) (2019)	Count of federal, state and local roadway crossings
Airfield and heliports within one mile of the route centerline	USGS's GNIS (2020) and the Federal Aviation Administration (FAA) database (2020)	Distance from airfields and heliports
Communication towers within 1,000 feet of the route centerline	Federal Communications Commission [FCC] (2020)	Count of communication towers, including AM and FM radio towers, within 1,000 feet of the route centerline
Number of pipeline crossings	S&P Global Platts NGL Refined Product Pipelines (2019) and Platts GIS Data (2020)	Number of known pipelines crossed by the transmission ROW
Number of transmission line crossings	AEP TGIS	Number of high voltage (69 kV or greater) transmission lines crossed by the ROW
Distance of steep slopes crossed	Derived from seamless Digital Elevation Models (DEMs) obtained from the USGS (2020)	Miles of slope greater than 20% for angle structures and more than 30% for tangent structures crossed by the routes
Length of transmission line parallel	AEP TGIS and measured in GIS	Miles of the route parallel to existing high voltage transmission lines
Length of pipeline parallel	S&P Global Platts NGL Refined Product Pipelines (2019) and measured in GIS	Miles of the route parallel to existing pipelines

Attachment B. GIS Data Sources

Siting Criteria	Source	Description
Length of road parallel	VBMP RCL (2019) and measured in GIS	Miles of the route parallel to existing roadways

Attachment C: Agency Correspondence

Jurisdiction	Response Received	First Name	Last Name	Title	Organization	Email Address
Stakeholder	3/6/2020 (Chuck Ward - Manager Engineering Services)	Bruce	Maurhoff	Senior VP and COO	CVEC	bmaurhoff@mycvec.com
	3/6/2020	Chuck	Ward, Jr.	Engineering Services Manager	CVEC	cward@mycvec.com
	N	Alex	Kessinger	Maintenance and Engineering Manager	Greif Corporation	alex.kessinger@greif.com
	N	Ricky	Jones	Land Use Forester	Weyerhaeuser Company	ricky.jones@weyerhaeuser.com
Local	N	Dean	Rodgers	County Administrator	Amherst County	dcredgers@countyofamherst.com
	N	Jeremy	Bryant	Director of Planning and Zoning	Amherst County	jsbryant@countyofamherst.com
	N	Michael	Martineau	Planning Commissioner - District 1	Amherst County	mkmartineau@countyofamherst.com
	N	Susan	Adams	County Administrator	Appomattox County	susan.adams@appomattoxcountyva.gov
	N	Johnnie	Roark	Director of Community Development	Appomattox County	johnnie.roark@appomattoxcountyva.gov
	N	Josh	Mills	Planning Commission - Wreck Island District	Appomattox County	PlanningCommission@appomattoxcountyva.gov
	N	Annie	Trent	Planning Commission - Piney Mountain District	Appomattox County	PlanningCommission@appomattoxcountyva.gov
	N	Frank	Rogers	County Administrator	Campbell County	administration@campbellcountyva.gov
	N	Paul	Harvey	Director of Community Development	Campbell County	paul.harvey@campbellcountyva.gov
	N	Richard	Metz	Planning Commission - Concord District	Campbell County	GCM3441@aol.com
	2/21/2020 (Email via Steve Carter)	Steve	Carter	County Administrator	Nelson County	scarter@nelsoncounty.org
	2/21/2020 (Email via Steve Carter)	Dylan	Bishop	Zoning Director	Nelson County	dbishop@nelsoncounty.org
	2/21/2020 (Email via Steve Carter)	Chuck	Miller	Building Official	Nelson County	cmiller@nelsoncounty.org
	2/21/2020 (Email via Steve Carter)	Mary Kathryn	Allen	Planning Commission - South District	Nelson County	mkallen@nelsoncounty.org
	2/21/2020 (Email via Steve Carter)	Charles	Amante	Planning Commission - East District	Nelson County	camante@nelsoncounty.org
	N	Kent	White	Community Development Director	City of Lynchburg	kent.white@lynchburgva.gov
	N	Bonnie	Svrcek	City Manager	City of Lynchburg	bonnie.svrcek@lynchburgva.gov
N	Robert	Bowden III	Planning Commission - Ward 1	City of Lynchburg	NA	
State	N	Amy	Ewing	Biologist	VDGIF Environmental Services Section	Amy.Ewing@dgif.virginia.gov
	5/27/2020 via email	Wil	Orndorff	Karst Protection Coordinator	VDCR Natural Heritage Program	wil.orndorff@dcr.virginia.gov
	3/6/2020	René	Hypes	Environmental Review Coordinator	VDCR Natural Heritage Program	Rene.Hypes@dcr.virginia.gov
	N	Irvine	Wilson	Natural Area Protection Specialist	VDCR Planning and Recreation	irvine.wilson@dcr.virginia.gov
	N	Amy	Thatcher Owens	Regional Director	VDEQ Valley Regional Office	amy.owens@deq.virginia.gov
	3/4/2020 (Kevin Harlow, EIR Coordinator)	Robert	Weld	Regional Director	VDEQ Blue Ridge Regional Office	Robert.Weld@deq.virginia.gov
	N	Michelle	Henichack	Senior Wetland Ecologist	VDEQ Central Office	michelle.henichack@deq.virginia.gov
	2/11/2020	Bettina	Rayfield	Manager, Environmental Impact review	VDEQ Office of Environmental Impact Review	Bettina.Rayfield@deq.virginia.gov
	N	Jay	Roberts	VWP Permit Manager	VDEQ Office of Wetland and Stream Protection - Blue Ridge Regional Office	Jesse.Roberts@deq.virginia.gov
	N	Keith	Roberts	VWP Permit Manager	VDEQ Office of Wetland and Stream Protection - Valley Regional Office	Keith.Fowler@deq.virginia.gov
	2/24/2020 (Mike Johnson - Env Engineer)	Tony	Watkinson	Chief of Habitat Management	VMRC Habitat Management	Tony.Watkinson@mr.virginia.gov
	3/6/2020 (Renee Hypes, VDCR)	Jules	Umberger		VDACS-Southwest Region Office	jules.umberger@vdacs.virginia.gov
	N	Roger	Kirchen	Director, Review & Compliance Division	VDHR Division of Review and Compliance	roger.kirchen@dhr.virginia.gov
	2/26/2020	Martha	Little	Deputy Director of Stewardship	VOF	mlittle@vofonline.org
	N	Mike	Santucci	Forestland Conservation Program Manager	VDOF	mike.santucci@dof.virginia.gov
	N	Patrick	Murphy	Senior Area Forester	VDOF Heartland Work Area	patrick.murphy@dof.virginia.gov
	N	Martha	Warring	Senior Area Forester	VDOF James River Work Area	martha.warring@dof.virginia.gov
2/5/2020	Scott	Denny	Senior Aviation Planner	Virginia Department of Aviation	Scott.Denny@doav.virginia.gov	
2/24/2020 (Thomas Bibb, Engineering Manager)	Phil	Skorupa	Director, Division of Geology and Mineral Resources	Virginia Department of Mines, Minerals, and Energy	dgmrimfo@dmme.virginia.gov	
N	Jeffrey	Wells	Office of Drinking Water	Virginia Department of Health, Danville Field Office	Jeff.Wells@vdh.virginia.gov	
N	Chris	Winstead	District Engineer	VDOT Lynchburg District	chris.winstead@VDOT.virginia.gov	
N	Kevin	Bradley	District Environmental Manager, Lynchburg	VDOT	Kevin.Bradley@VDOT.virginia.gov	
Federal	2/14/2020 (Dana Heston - Env Scientist)	Jennifer	Frye	Chief, Western Virginia Regulatory Section	USACE Norfolk District, Western Section	jennifer.s.frye@usace.army.mil
	N	Servidio	Cosmo	Regional Administrator	U.S. Environmental Protection Agency Region 3	R3_RA@epa.gov
	N	Bridgett	Costanzo	State Coordinator	USFWS Virginia Ecological Services	bridgett_costanzo@fws.gov
	N	John	Bricker	State Conservationist	U.S. Department of Agriculture Natural Resources Conservation Service Virginia	jack.bricker@va.usda.gov
	N	John	Simpkins	Planning and Environment team Lead	USDOT Federal Highway Administration Virginia Division	john.simpkins@dot.gov
	N	Jeff	Slaughter	Manager	USDOT-FAA Flight Standards District Office	N/A
N	Arnold	Fouch	Manager	FAA Eastern Region Planning and Programming Branch -Roanoke	arnold.fouch@faa.gov	



POWER ENGINEERS, INC.
11 S. 12TH STREET
SUITE 315
RICHMOND, VA 23219 USA

January 30, 2020

[NAME]
[ADDRESS]
[CITY],[STATE]
[ZIP]

RE: Appalachian Power Company – Central Virginia Transmission Reliability Project: Albemarle, Amherst, Appomattox, Campbell and Nelson Counties and the City of Lynchburg, Virginia

[NAME],

Appalachian Power Company is proposing the Central Virginia Transmission Reliability Project (the Project), which is comprised of several components. Appalachian Power Company contracted POWER Engineers, Inc. (POWER) to conduct siting studies for the Project's components and prepare the Certificate of Public Convenience and Necessity application for filing with the Virginia State Corporation Commission (SCC). On behalf of Appalachian Power Company, POWER is requesting your input on three phases: Joshua Falls – Gladstone, Shipman – Schuyler and Amherst – Reusens. The Project provides a new electrical source to the region, increases reliability to customers and supports the retirement of aging infrastructure in Albemarle, Amherst, Appomattox, Campbell and Nelson counties.

Joshua Falls – Gladstone consists of the following:

- Construct approximately 15 miles of new single-circuit 138 kilovolt (kV) transmission line between the Joshua Falls, Riverville and Gladstone substations (Amherst, Appomattox, Campbell and Nelson counties).
- Expand the Amherst and Riverville substations (Amherst and Nelson counties).
- Upgrade the Boxwood Substation (Amherst County).

Shipman – Schuyler consists of the following:

- Build the new James River 138 kV Substation and short new double-circuit 138 kV transmission line tap in Nelson County. The James River Substation will replace the existing Shipman 46 kV Substation, which will be retired.
- Build the new Soapstone 138 kV Substation and short new double-circuit 138 kV transmission line tap in Nelson County. The Soapstone Substation will replace the existing Schuyler 46 kV Substation.

Amherst – Reusens consists of the following:

- Rebuild approximately 12 miles of existing single-circuit 69 kV transmission line between the Amherst and Reusens substations (Amherst County and the City of Lynchburg).

The Joshua Falls – Gladstone and Shipman – Schuyler components support the future retirement of Appalachian Power's aging 46 and 69 kV transmission system (approximately 30 miles) upon completion of the Project. The Amherst – Reusens component is needed as a direct result of the

Project resulting in thermal violations. The Project will provide a new robust 138 kV source in the region and thus strengthen the local grid while reducing the likelihood of extended outages to customers.

Appalachian Power Company and POWER have identified preliminary study segments for the proposed Joshua Falls – Gladstone 138 kV transmission line and a study area for the proposed 138 kV substations and Amherst – Reusens rebuild. **Attachment 1** shows the preliminary study segments for the new 138 kV transmission line. **Attachment 2** shows the proposed 138 kV substations vicinities. **Attachment 3** shows the existing 69 kV transmission line to be rebuilt.

Appalachian Power Company is interested to know if your agency has any specific concerns about the above mentioned Project phases. We appreciate your input and your comments will be incorporated into the filing with the SCC. Please distribute this notification to staff members who may be involved with the phases for review and comment.

Should you have questions, please contact me via email at emily.larson@powereng.com or by phone at 609-570-2772. If you wish to speak with an Appalachian Power Company representative, please contact Scott Kennedy via email at skennedy@aep.com or by phone at 540-759-5608.

Sincerely,

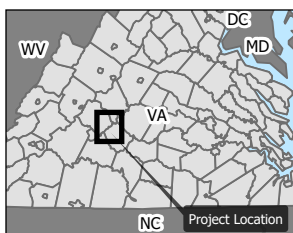
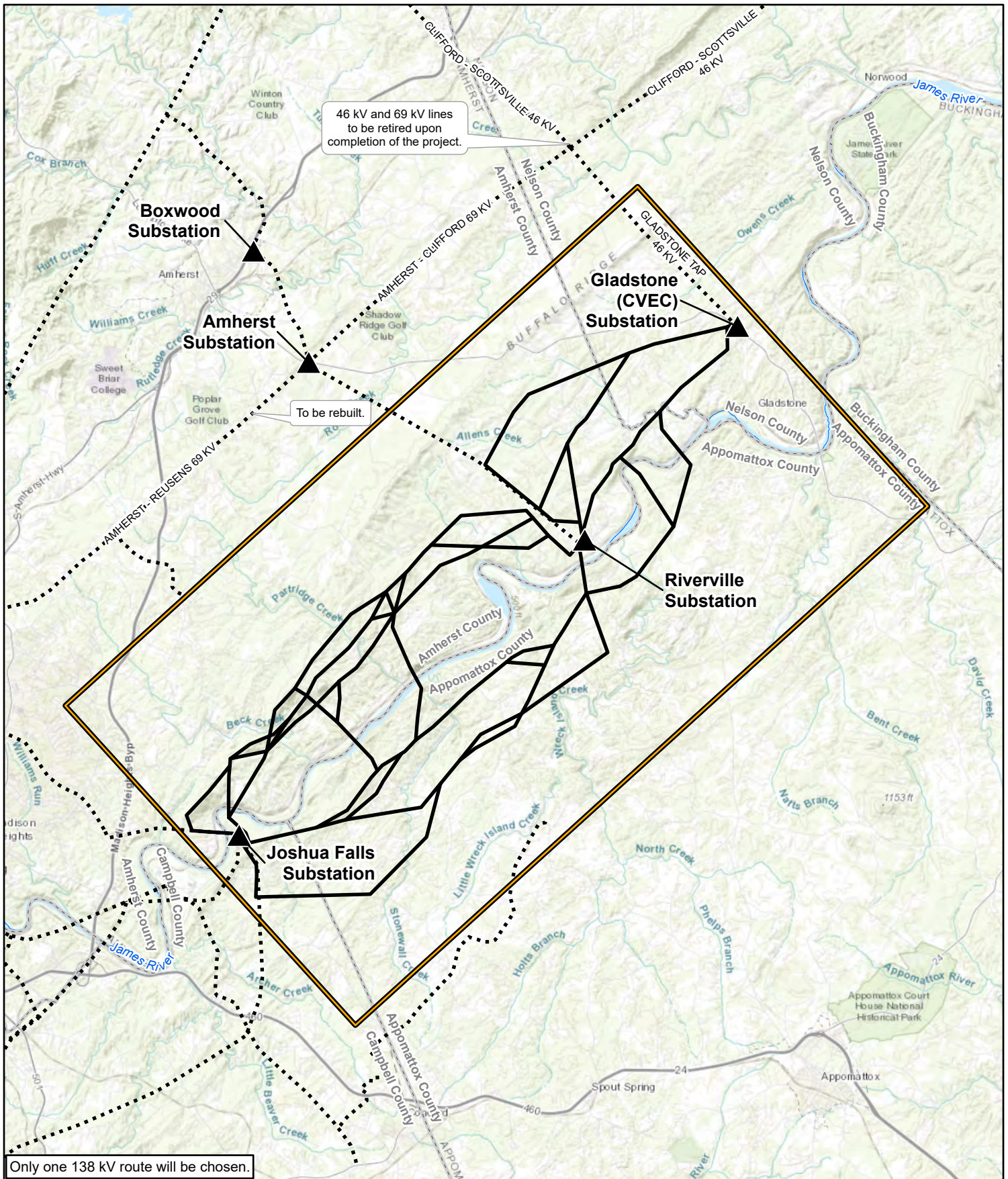


Emily Larson
POWER Engineers, Inc.

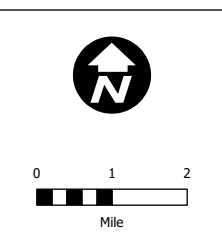
Enclosure(s): Attachment 1: Joshua Falls – Gladstone 138 kV Preliminary Study Segments Map
Attachment 2: Shipman – Schuyler 138 kV Substations Vicinities Map
Attachment 3: Amherst – Reusens 69 kV Transmission Line to be Rebuilt Map

ATTACHMENT 1

JOSHUA FALLS – GLADSTONE 138 KV PRELIMINARY STUDY SEGMENTS MAP



- Existing Substation
- 138 kV Preliminary Study Segments
- Existing Transmission Line
- County Boundary
- Project Study Area



Amherst, Appomattox,
Campbell, and Nelson Counties
Virginia

NAD 1983 HARN StatePlane Virginia South FIPS 4502 Feet
Foot US
Lambert Conformal Conic
North American 1983 HARN

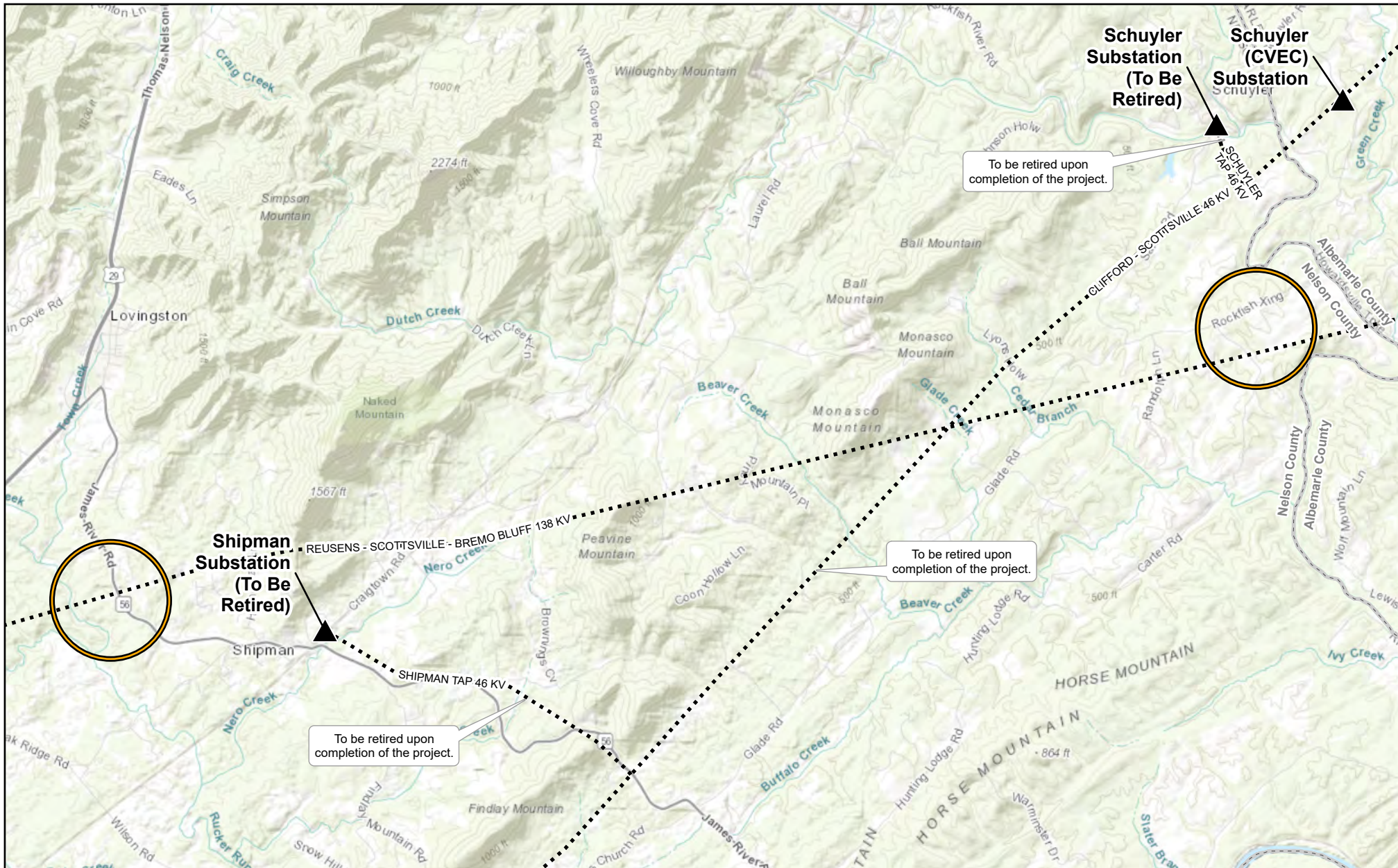
Date: 1/8/2020
Author: KK
Project: 153520, 153521





Central Virginia Transmission Reliability Project


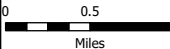

Joshua Falls - Gladstone

ATTACHMENT 2

SHIPMAN – SCHUYLER 138 KV SUBSTATIONS VICINITIES MAP



-  Existing Substation
-  Existing Transmission Line
-  Proposed 138 kV Substation Vicinity
-  County Boundary







Nelson County
Virginia

NAD 1983 HARN StatePlane Virginia South FIPS 4502 Feet
Lambert Conformal Conic
North American 1983 HARN

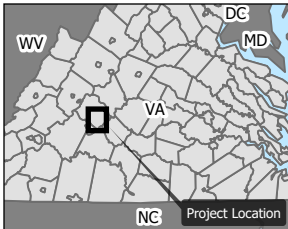
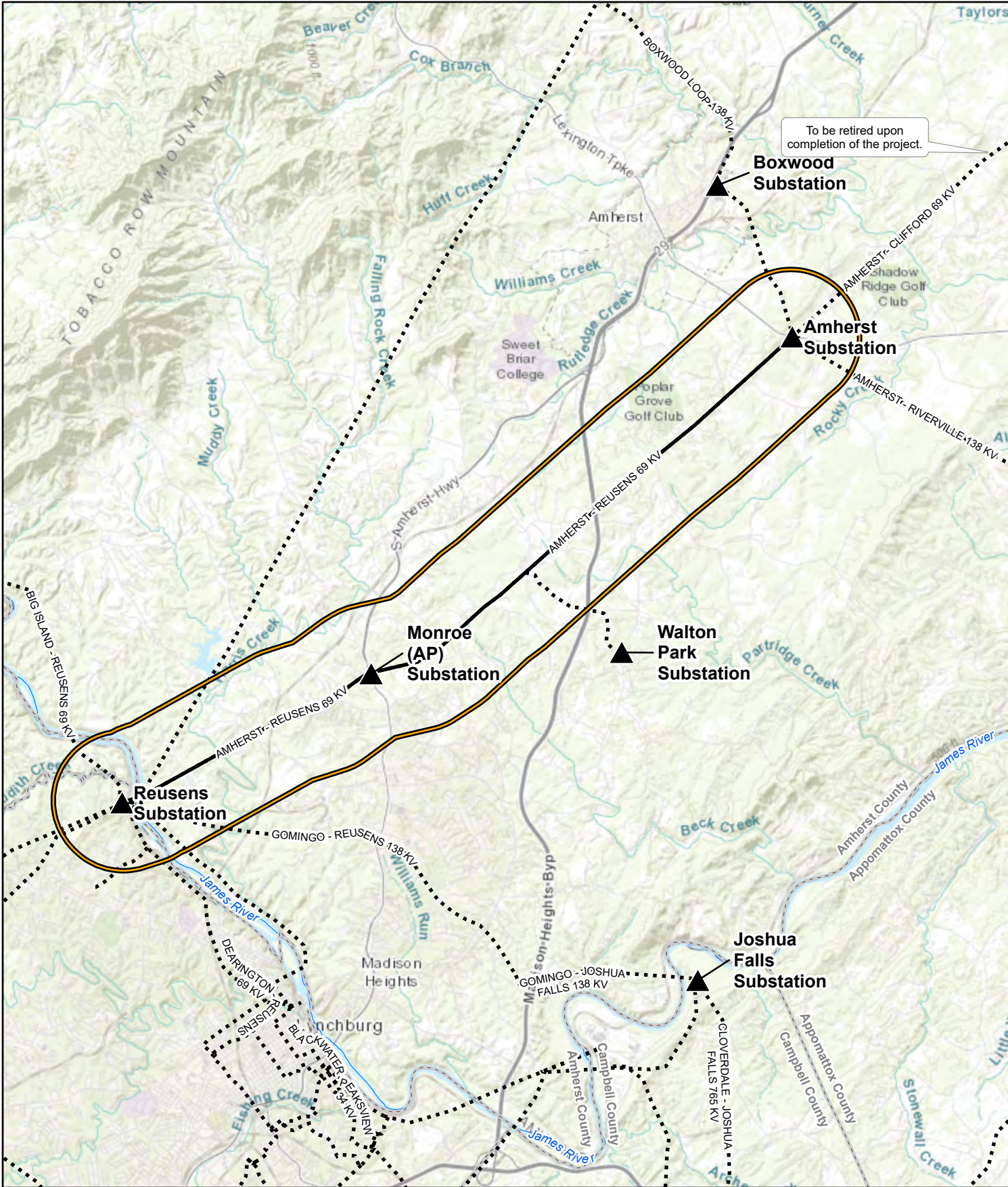
Date: 1/8/2020
Author: KK
Project: 149231, 149232

**Central Virginia Transmission
Reliability Project**
Shipman - Schuyler

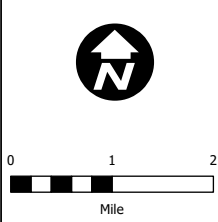



ATTACHMENT 3

AMHERST – REUSENS 69 KV TRANSMISSION LINE TO BE REBUILT MAP



- ▲ Existing Substation
- 69 kV Transmission Line to be Rebuilt
- Existing Transmission Line
- ▭ City/County Boundary
- ▭ Project Study Area



Amherst County & Lynchburg City
Virginia

NAD 1983 HARN StatePlane Virginia South FIPS 4502 Feet
Foot US
Lambert Conformal Conic
North American 1983 HARN

Date: 1/8/2020
Author: KK
Project: 153520, 153521

Central Virginia Transmission Reliability Project

Amherst - Reusens



COMMONWEALTH of VIRGINIA

Mark K. Flynn
Director

Department of Aviation
5702 Gulfstream Road
Richmond, Virginia 23250-2422

V/TDD • (804) 236-3624
FAX • (804) 236-3635

February 5, 2020

Ms. Emily Larson
Power Engineers, Inc.
11 South 12th Street, Suite 315
Richmond, Virginia 23219

RE: Appalachian Power Company Projects

Dear Ms. Larson:

The Virginia Department of Aviation has reviewed the information package you provided dated January 30, 2020. Based on the information within the package, it does not appear as though any portion of any of the projects identified will be located within 20,000 linear feet of a public use airport. Therefore, unless any of the structures (including temporary construction crane) will reach an overall height of 200' above ground level, an airspace study will not be required by the Federal Aviation Administration.

Please note that this comment letter is in reference to the following projects:

- Joshua Fall-Gladstone 138kV transmission line and substation construction
- Amherst-Rusens rebuild of substations and 68kV transmission line construction
- Shipman-Schuyler James River Substation and 138kV transmission line construction

If you have any additional questions regarding this matter, please contact me at (804) 236-3638.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Scott Denny".

S. Scott Denny
Senior Aviation Planner
Virginia Department of Aviation



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

February 11, 2020

Emily Larson
POWER Engineers, Inc
11S. 12th Street, Suite 315
Richmond, Virginia 23219
Emily.larson@powereng.com

RE: Central Virginia Transmission Reliability Project; Albermarle, Amherst, Appomattox, Cambell and Nelson Counties and the City of Lynchburg, Virginia

Dear Ms. Larson:

This letter is in response to the scoping request for the above-referenced project.

As you may know, the Department of Environmental Quality, through its Office of Environmental Impact Review (DEQ-OEIR), is responsible for coordinating Virginia's review of environmental impacts for electric power generating projects and power line projects in conjunction with the licensing process of the State Corporation Commission.

DOCUMENT SUBMISSIONS

In order to ensure an effective coordinated review of the environmental impact analysis may be sent directly to OEIR. We request that you submit one electronic to eir@deq.virginia.gov (25 MB maximum) or make the documents available for download at a website, file transfer protocol (ftp) site or the VITA LFT file share system (Requires an "invitation" for access. An invitation request should be sent to eir@deq.virginia.gov). The required "Wetlands Impact Consultation" can be sent directly to Michelle Henicheck at michelle.henicheck@deq.virginia.gov or at the address above.

ENVIRONMENTAL REVIEW UNDER VIRGINIA CODE 56-46.1

While this Office does not participate in scoping efforts beyond the advice given herein, other agencies are free to provide scoping comments concerning the preparation of the environmental impact analysis document. Accordingly, Dominion should coordinate with the following state agencies and those localities and Planning District Commissions, including but not limited to:

- Department of Environmental Quality:
- DEQ Regional Office
 - Air Division
 - Office of Wetlands and Stream Protection

- Office of Local Government Programs
 - Division of Land Protection and Revitalization
 - Office of Stormwater Management
- Department of Conservation and Recreation
 Department of Health
 Department of Agriculture and Consumer Services
 Department of Game and Inland Fisheries
 Virginia Marine Resources Commission
 Department of Historic Resources
 Department of Mines, Minerals, and Energy
 Department of Forestry
 Department of Transportation

DATA BASE ASSISTANCE

Below is a list of databases that may assist you in the preparation of a NEPA document:

- DEQ Online Database: Virginia Environmental Geographic Information Systems

Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory:

- www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx

- DEQ Virginia Coastal Geospatial and Educational Mapping System (GEMS)

Virginia's coastal resource data and maps; coastal laws and policies; facts on coastal resource values; and direct links to collaborating agencies responsible for current data:

- <http://128.172.160.131/gems2/>

- MARCO Mid-Atlantic Ocean Data Portal

The Mid-Atlantic Ocean Data Portal is a publicly available online toolkit and resource center that consolidates available data and enables users to visualize and analyze ocean resources and human use information such as fishing grounds, recreational areas, shipping lanes, habitat areas, and energy sites, among others.

<http://portal.midatlanticocean.org/visualize/#x=-73.24&y=38.93&z=7&logo=true&controls=true&basemap=Ocean&tab=data&legends=false&layers=true>

- DHR Data Sharing System.

Survey records in the DHR inventory:

- www.dhr.virginia.gov/archives/data_sharing_sys.htm

- DCR Natural Heritage Search

Produces lists of resources that occur in specific counties, watersheds or physiographic regions:

- www.dcr.virginia.gov/natural_heritage/dbsearchtool.shtml

- DGIF Fish and Wildlife Information Service

Information about Virginia's Wildlife resources:

- <http://vafwis.org/fwis/>

- Total Maximum Daily Loads Approved Reports

- <https://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx>

- Virginia Outdoors Foundation: Identify VOF-protected land

- <http://vof.maps.arcgis.com/home/index.html>

- Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems

Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL:

- www.epa.gov/superfund/sites/cursites/index.htm

- EPA RCRAInfo Search

Information on hazardous waste facilities:

- www.epa.gov/enviro/facts/rcrainfo/search.html

- Total Maximum Daily Loads Approved Reports

- <https://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx>

- EPA Envirofacts Database

EPA Environmental Information, including EPA-Regulated Facilities and Toxics Release Inventory Reports:

- www.epa.gov/enviro/index.html

- EPA NEPAassist Database

Facilitates the environmental review process and project planning:

- <http://nepaassisttool.epa.gov/nepaassist/entry.aspx>

If you have questions about the environmental review process, please feel free to contact me (telephone (804) 698-4204 or e-mail bettina.rayfield@deq.virginia.gov).

I hope this information is helpful to you.

Sincerely,

A handwritten signature in black ink that reads "Bettina Rayfield". The signature is written in a cursive, flowing style.

Bettina Rayfield, Program Manager
Environmental Impact Review and
Long-Range Priorities



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

February 14, 2020

Western Virginia Regulatory Section
Action ID Number: NAO-2020-00284

Ms. Emily Larson
POWER Engineers, Inc.
11 S. 12th Street, Suite 315
Richmond, Virginia 23219

Dear Ms. Larson:

This letter is in response to your request for an environmental review of the Central Virginia Transmission Reliability Project. The proposed project is located in the Counties of Albemarle, Amherst, Appomattox, Campbell and Nelson, Virginia. The project involves constructing new transmission line, substations, and upgrading existing infrastructure to strengthen the local grid, reducing extended outages. The project has been assigned Action ID Number: NAO-2020-00284; please reference this number on any future correspondence.

Upon review of the maps you provided with your January 30, 2020 letter, along with available electronic and online resources, it appears that portions of this project may result in discharges of dredged and/or fill material into waters of the United States. As you are probably aware, both temporary and permanent discharges of dredged and/or fill material into waters of the United States are subject to the permitting requirements of Section 404 of the Clean Water Act (33 CFR 323). The proposed project may also impact navigable waters, subject to the permitting requirements of Section 10 of the Rivers and Harbors Act of 1899.

We strongly recommend that the proponent of this project submit a request to the U.S. Army Corps of Engineers, Norfolk District for an approved jurisdictional determination for the proposed project area prior to any construction activities.

Please be aware that through the Corps permitting processes, we must ensure that your project complies with other Federal Laws, such as the Endangered Species Act, the National Environmental Policy Act, and the National Historic Preservation Act. Based on our cursory review of the project area and a potential for the presence of Federally-listed Threatened and/or Endangered Species and cultural resources within our scope of analysis, the Corps would most likely initiate consultation with both the U.S. Fish and Wildlife Service (USFWS) and the Virginia Department of Historic Resources (VDHR). We strongly recommend that you coordinate this proposal with not only the USFWS and VDHR, but also the Virginia Department of Environmental Quality

CENAO-WRR-W
NAO-2020-00284

(VDEQ), the Virginia Marine Resources Commission (VMRC) and the Virginia Department of Game and Inland Fisheries (VGDIF).

We appreciate the opportunity to provide comments on your proposed project. Should you have any questions or concerns, please do not hesitate in contacting me at (540) 344-1409 or via email at dana.m.heston@usace.army.mil.

Sincerely,

A handwritten signature in cursive script that reads "Dana Heston".

Dana Heston
Environmental Scientist
Western Virginia Regulatory Section

From: [Larson, Emily](#)
To: [Pardis, Roya](#)
Subject: Fwd: Nelson County Re: Appalachian Power - Central VA Transmission Reliability Project
Date: Friday, February 21, 2020 2:25:52 PM

Emily Larson
301-848-8404

Begin forwarded message:

From: Steve Carter <SCarter@nelsoncounty.org>
Date: February 21, 2020 at 2:19:55 PM EST
To: "Larson, Emily" <emily.larson@powereng.com>, "skennedy@aep.com" <skennedy@aep.com>
Cc: Grace Mawyer <gmawyer@nelsoncounty.org>, Amanda Spivey <aspivey@nelsoncounty.org>
Subject: Nelson County Re: Appalachian Power - Central VA Transmission Reliability Project

Good afternoon Ms. Larson and Mr. Kennedy,

Thank you for the letter dated January 30, 2020 pertinent to the referenced subject. The communication on AP's transmission project has been forwarded to the members of Nelson County's Board of Supervisors, who have not submitted any questions, concerns or requests for additional information. County staff also have no comments to provide on the project other than to encourage Appalachian Power to complete the project as expeditiously as possible.

Please do not hesitate to contact this office if County staff can be of assistance to you as AP moves forward with implementing and completing this important project.

Respectfully,

Steve Carter



COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Matthew J. Strickler
Secretary of Natural Resources

Steven G. Bowman
Commissioner

February 24, 2020

POWER Engineers, Inc.
Attn: Emily Larson
11 S. 12th Street, Suite 315
Richmond VA 23219

Re: Comment Request
Appalachian Power Company: Central Virginia
Transmission Reliability Project

Dear Ms. Larson:

This will respond to the request for comments regarding the Appalachian Power Company Central Virginia Transmission Reliability Project, prepared by POWER Engineers, Inc, on behalf of Appalachian Power Company. Specifically, Appalachian Power Company has proposed to construct new transmission lines and substations to improve reliability in Albemarle, Amherst, Appomattox, Campbell, and Nelson Counties and the City of Lynchburg, Virginia. We reviewed the provided project documents and found the proposed project WILL require one or more permits from the Virginia Marine Resources Commission (VMRC) for jurisdictional river and stream crossings.

Please be advised that the VMRC, pursuant to §28.2-1200 et seq of the Code of Virginia, has jurisdiction over any encroachments in, on, or over the beds of the bays, ocean, rivers, streams, or creeks which are the property of the Commonwealth. Accordingly, if any portion of the subject project involves any encroachments channelward of ordinary high water along non-tidal, natural rivers and streams with a drainage area greater than 5-square miles, a permit may be required from our agency. Any jurisdictional impacts will be reviewed by the VMRC during the JPA process.

If you have any questions please contact me at (757) 247-2255 or by email at mike.johnson@mrc.virginia.gov. Thank you for the opportunity to comment.

Sincerely,


Mike Johnson
Environmental Engineer, Habitat Management

JMJ/keb
HM

An Agency of the Natural Resources Secretariat
www.mrc.virginia.gov

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD



DIVISIONS
ENERGY
GAS AND OIL
GEOLOGY AND
MINERAL RESOURCES
MINED LAND RECLAMATION
MINERAL MINING
MINES
ADMINISTRATION

COMMONWEALTH OF VIRGINIA

Department of Mines, Minerals and Energy

Division of Mineral Mining
900 Natural Resources Drive, Ste. 400
Charlottesville, Virginia 22903
(434) 951-6310 FAX (434) 951-6325
www.dmme.virginia.gov

February 24, 2020

Ms. Emily Larson
Power Engineers, Inc.
11 South 12th Street, Suite 315
Richmond VA 23219

Re: Central Virginia Transmission Reliability Project

Dear Ms. Larson:

Thank you for your letter of January 30, 2020, and our recent telephone conversation.

Based on the data you provided, the VA Division of Mineral Mining does not have any concerns about the proposed locations shown in your letter.

If we can be of any further service, please let me know.

Very truly yours,

A handwritten signature in blue ink that reads "TC Bibb".

Thomas C. Bibb, P.E.
Engineering Manager

Xc: file



February 26, 2020

Ms. Emily Larson
POWER Engineers, Inc.
11 St. 12th Street, Ste. 315
Richmond, VA 23219
By email only: emily.larson@powereng.com

RE: Appalachian Power Company – Central
VA Transmission Reliability Project

Dear Ms. Larson:

We are writing in response to your recent request for input on a newly proposed 138 kV transmission line, 69 kV transmission line rebuild and new or upgraded substations (**"Project"**). **The Project, as described in your letter of January 30, 2020, may impact multiple open space easement properties in Albemarle, Amherst, Appomattox, Campbell and Nelson counties as shown on the maps attached to your letter.**

VOF, an agency of the Commonwealth, was established by the General Assembly in 1966 to promote the preservation of Virginia's natural and cultural resources by encouraging private philanthropy in fulfillment of state policy. As a result of Virginia's commitment to ensure a vibrant natural environment for today and future generations, VOF owns thousands of acres managed for public access and holds more than 4,000 open-space easement properties across the Commonwealth, which protect over 850,000 acres.

An open-space easement is a legal interest in real property that creates a relationship between the holders of the easement and the property owner. By means of the easement, VOF has an interest in specific conservation values of the property and a legal obligation to protect these values. VOF easements provide important public benefits by protecting in perpetuity significant tracts of mostly undeveloped land which may contribute to the protection of water quality, productive soils, natural heritage resources, historic resources, and scenic viewsheds. VOF easements represent over \$1 billion of public investment and fulfillment of Title XI of the Virginia Constitution and other public policies to ensure conservation of natural and cultural resources.

We have reviewed the potential alignments and new substation locations and found the following:

Existing Open-Space Easements traversed by a new 138kV transmission line alignment option

- AMH-02996

In addition, a proposed open-space easement in southern Amherst County may be impacted by this new line.

Existing Open-Space Easements within 500' of the new 138kV transmission line alignment option

- AMH-02486
- NEL-04073/AMH-04074

Existing Open-Space Easement within one mile of a new 138kV transmission line alignment option

- AMH-03707

Existing Open-Space Easements within a new substation area

- NEL-02358
- NEL-02800
- NEL-03880

Existing Open-Space Easements within 1.5 miles of a new substation area:

- NEL-00852
- NEL-03934

There are no easements or proposals within 1.5 miles of the 69kV transmission line rebuild segments.

Summary of Protected Conservation Values

AMH-02996

197 acres known as Rosedale with a substantially unaltered early nineteenth-century farmhouse, cabin that predates the farmhouse, and period graveyard. The property lies within ~1,000 feet of the James River within the Chesapeake Bay Watershed, and contains predominantly forest cover and small wooded streams, and maintenance of the Property in its undeveloped state contributes to the water quality of the James River and the Chesapeake Bay.

AMH-02486

530 acres known as Galt's Mill contains 1.65 miles of frontage on the James River, wooded slopes and open pastures, which provide scenic enjoyment for River travelers and the driving public on Galts Mill Road, and Becks Creek Road. The Property lies in a pristine rural and agricultural area of Amherst County and contributes to the agricultural viability and open-space values of that area. The historic house, Mill and grocery are of historic significance.

NEL-04073/AMH-04074

201 acres with ~2,000 feet of frontage **on Allen's Creek**, a James River tributary. The James River is a primary source of drinking water for many downstream localities in the Commonwealth, and preservation of the Property in a relatively undeveloped state will serve to protect the quality of water in these public systems. Approximately 90% of the property has been identified by the Virginia Department of Forestry with a high ranking in forest conservation value. Protection of the Property helps to ensure that the forested areas remain available for wood products, watershed protection, and wildlife habitat. The property contains approximately 53% Prime Farmland Soils or Soils of Statewide Importance as defined by the U. S. Department of Agriculture, Natural Resource Conservation Service, and prime farmland is of **major importance in meeting the nation's** short- and long-range needs for food and fiber.

AMH-03707

323 acres with ~7,000 feet along Route 613, a public road, which along with topography that slopes away from the road and periodic openness of the land cover, the landscape affords scenic enjoyment to the public traveling the road. Approximately 70% of the soils on the property are designated by the United States Department of **Agriculture's soil survey as either Prime or Soils of Statewide Importance, and protection** of the property in open space will assure the availability of the agricultural resource base for the future. Virginia Department of Forestry has **designated approximately 69% of the Property as possessing high "Forest Conservation Value" and protection** of the property will maintain this resource for future forest production and watershed protection. The property, being an unusually large tract of open space in an urbanizing area with a variety of land cover types and natural features, contains a **diversity of habitat for wildlife, and enhances the protection of the Nature Conservancy's Chestnut Mountain matrix block** within their designated Terrestrial Portfolio which adjoins the property on two sides.

NEL-02358

104 acres with ~4,300 linear feet of frontage on the Rockfish River, a Designated State Scenic River, and ~2,639 linear feet of frontage on State Route 722, a proposed Recreational Trail and Bicycle Route. The property contributes to the scenic views enjoyed by the public from the road and its bridge across River at property corner. The property is within the Chesapeake Bay watershed and contributes in its undeveloped state to the water quality of the Chesapeake Bay and its watershed.

NEL-02800

221 acres known as White Plains Farm is the family seat of one of Nelson County's founding families. In agricultural production for almost three centuries, it adjoins the historic house known as White Plains. The property presents rolling terrain and fertile soils, suitable for a variety of agricultural endeavors as well as providing wildlife habitat. The property fronts on Virginia Route 56 and provides views of the fields and mountains in the distance, all of which provide scenic enjoyment to the public traveling Route 56.

NEL-03880

235 acres known as Rockfish River Farm with 1.75 miles of frontage on the Rockfish River, a State Scenic River, and an unnamed perennial tributary to the River, which flows into the James River, and is within the Chesapeake Bay watershed. These waters contribute to the public water supply of downstream communities including the City of Richmond. Protection of the property from intensive development also helps contribute to the scenic enjoyment of the citizens of the Commonwealth using the river for recreational purposes. The Property is comprised of pasture and forest land adjacent to other conserved lands and helps to create a 388.492-acre contiguous block of land under open-space easement. The property lies within the area designated by the Audubon Naturalist Society as the Central Piedmont Important Bird Area, one of several regions in Virginia supporting habitat and species diversity for species in decline. Approximately 32% of the property has been identified by the Virginia Department of Forestry with a high ranking in forest conservation value. Limiting development on the Property helps to ensure the forested areas remain available for wood products, watershed protection, and wildlife habitat in the future. The Property contains productive agricultural lands, with approximately 58% of the soils thereon having been classified as Soils of Statewide Importance or Prime Agricultural Soils by the Natural Resource Conservation Service of the United States Department of Agriculture. Protecting these soils by limiting development of the Property helps to ensure they will be available for future agricultural use.

NEL-00852

170 acres containing mostly forested land with mountain slopes and pasture. The easement protects Meadow Creek with a 50-foot riparian buffer.

NEL-03934

400 acres known as Schuylark Farm is predominantly wooded with slopes of Ball Mountain and approximately 1.5 miles of frontage on the Rockfish River and perennial streams which flow into the Rockfish River. The Rockfish River flows into the Hardware River, a primary tributary of the James River, which is a primary source of drinking water for several downstream communities. The property lies within the Chesapeake Bay watershed and contributes in its relatively undeveloped state to the water quality of the Chesapeake Bay and the watercourses in its watershed. **The property lies within the Nature Conservancy's Sugarloaf Mountain/Rockfish/Shield's Gap terrestrial portfolio. It also lies within the area designated by the Audubon Society, another private conservation organization, as the "Central Piedmont Important Bird Area." Approximately 93% of the property is ranked by the Virginia Department of Forestry as the highest or second highest priority "Forest Conservation Area" and protecting the property in a relatively undeveloped state assures its availability for timber production and other forest uses in the future.**

Given the potential negative impacts that the Project may have to the protected conservation values, including scenic viewsheds, high quality agricultural and forested lands, important wildlife habitat and water quality, VOF urges the Appalachian Power Company to avoid the open-space easements within the potential path of this Project.

If avoidance of open-space easements is not possible, Section 10.1-1704(A) of the Virginia Open-Space Land Act states:

A. No open-space land, the title to or interest or right in which has been acquired under this chapter and which has been designated as open-space land under the authority of this chapter, shall be converted or diverted from open-space land use unless (i) the conversion or diversion is determined by the public body to be (a) essential to the orderly development and growth of the locality and (b) in accordance with the official comprehensive plan for the locality in effect at the time of conversion or diversion and (ii) there is substituted other real property which is (a) of at least equal fair market value, (b) of greater value as permanent open-space land than the land converted or diverted and (c) of as nearly as feasible equivalent usefulness and location for use as permanent open-space land as is the land converted or diverted. The public body shall assure that the property substituted will be subject to the provisions of this chapter.

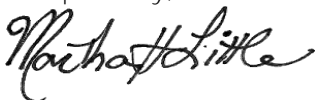
The VOF Board of Trustees is the public body that makes these determinations, including the satisfaction of the substitute land requirement. Previous conversion or diversion of open space cases demonstrate that the substitute real property must represent greater conservation value than the land converted or diverted. This results in properties with significant natural and cultural resources and public benefit and much larger undeveloped tracts of protected land. VOF requires site specific mitigation measures as well for utility rights-of-way crossing easements.

For those open-space easements potentially in the viewshed of the Project, we strongly advocate for the new structures and associated Project components to have less of a presence on the landscape by an overall reduction in height and size and the use of materials that blend in with the surrounding landscape.

It is our hope that full consideration will be given to the importance of these open-space easement properties that provide critical public benefits by protecting in perpetuity lands with significant and extensive conservation values.

Please contact me at 804-577-3337 or via email at mlittle@vof.org with any questions, comments or concerns.

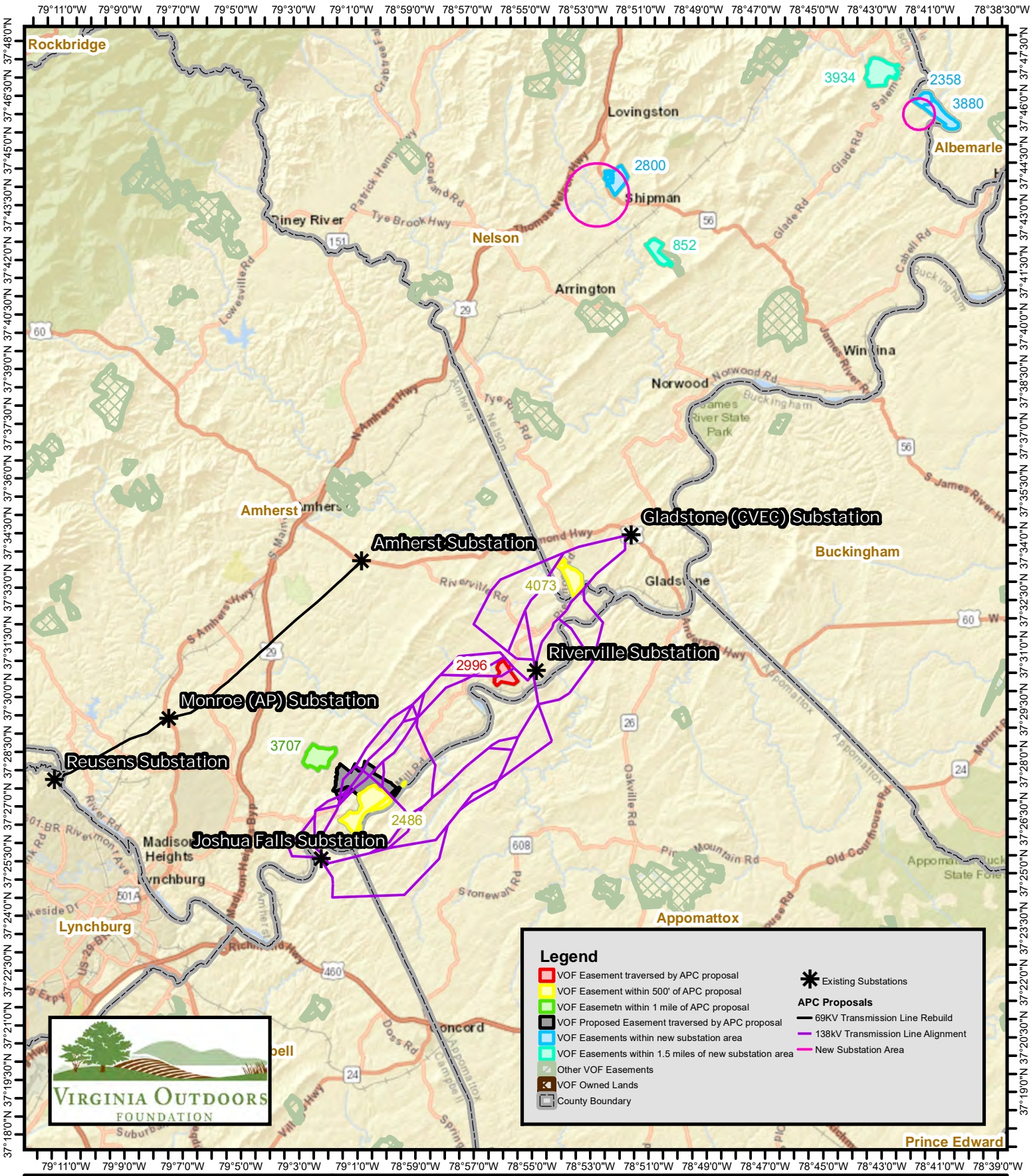
Respectfully,



Martha Little
Director of Stewardship

Attachment: Open-Space Easement Map

CC [EMAIL ONLY]:
Scott Kennedy, Appalachian Power Company
Julia Welman, Environment Impact Review Coordinator, DEQ



Projection: Lambert Conformal Conic
GCS North America 1983
Datum: D North America 1983

Map created 02/26/2020 by Tyler McGilvery.
Source data provided by APC - proposed lines/substations;
VOF - all else.
ESRI - World Street Basemap
This map is for general reference and display purposes only.

Impact Map

APC Central VA

Reliability Project

0 Feet 10625 21250

1:255,000





COMMONWEALTH of VIRGINIA

Matthew J. Strickler
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY

Blue Ridge Regional Office

901 Russell Drive, Salem, Virginia 24153
(540) 562-6700; Fax (540) 562-6725
www.deq.virginia.gov

David K. Paylor
Director

Robert J. Weld
Regional Director

March 4, 2020

Emily Larson
Power Engineers, Inc.
11 S. 12th Street
Suite 315
Richmond, VA 23219

<via email only>

Re: APC - Central Virginia Transmission Reliability Project: Albemarle, Amherst, Appomattox, Campbell, and Nelson Counties and the City of Lynchburg, VA;
Request for Comments

Dear Ms. Larson:

DEQ received your above submittal dated January 30, 2020 on February 6, 2020. The proposed Central Virginia Transmission Reliability Project in the Counties of Albemarle, Amherst, Appomattox, Campbell, and Nelson and the City of Lynchburg, Virginia is comprised of three phases: Joshua Falls – Gladstone, Shipman – Schuyler, and Amherst – Reusens. The project includes expanded, and upgraded substations and new 138 kV substations, retirement of 46 kV substations, construction of 138 kV transmission line, and rebuild of 69 kV transmission line.

Based upon the information submitted, no specific concerns regarding the above-mentioned project phases have been identified at this time provided the project is carried out in strict accordance with all applicable state, federal, and local laws and regulations.

Additional comments may be provided in a subsequent review phase. If you have any questions, please feel free to contact me by phone at (540) 562-6788 or by email at Kevin.Harlow@deq.virginia.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kevin A. Harlow'.

Kevin A. Harlow
Regional EIR Coordinator

cc: Ellie L. Irons, DEQ-OEIR w/ copy of request

From: [Larson, Emily](#)
To: [Pardis, Roya](#)
Subject: FW: AEP - Central Virginia Transmission Reliability Project: Albemarle, Amherst, Appomattox, Campbell, and Nelson Counties and the City of Lynchburg, Virginia
Date: Monday, March 09, 2020 3:48:36 PM

EMILY LARSON
609-570-2772 (office)
301-848-8404 (cell)

From: Chuck Ward <cward@MyCVEC.com>
Sent: Friday, March 06, 2020 11:35 AM
To: Larson, Emily <emily.larson@powereng.com>
Cc: Bruce Maurhoff <bmaurhoff@MyCVEC.com>
Subject: AEP - Central Virginia Transmission Reliability Project: Albemarle, Amherst, Appomattox, Campbell, and Nelson Counties and the City of Lynchburg, Virginia

Hi Emily. Central Virginia Electric Cooperative (CVEC) does not have any specific concerns about the subject project and supports these projects. CVEC looks forward to the increased reliability provided by the projects as they relate specifically to the CVEC Gladstone and Schuyler substations and transmission feeds.

Please let me know if I can be of further assistance. Thank you.

Charles (Chuck) E. Ward, Jr., P.E.
Manager of Engineering Services
Central Virginia Electric Cooperative
P.O. Box 247
Lovingston, VA 22949
434-263-8336 Ext. 1401 Office
800-367-2832 Ext. 1401 Office
434-263-7630 Direct
434-484-0364 Cell
cward@mycvec.com

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

Thomas L. Smith
Deputy Director of Operations

March 6, 2020

Emily Larson
Power Engineers, Inc.
11 S. 12th Street, Suite 315
Richmond, VA 23219

Re: Central Virginia Transmission Reliability Project

Dear Ms. Larson:

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.

Amherst-Reusens 69kV and James River Substation

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Joshua Falls-Gladstone 138kV

According to the information currently in our files, Allens Creek Stream Conservation Unit (SCU) is located within the project area. SCUs identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Allens Creek SCU has been given a biodiversity ranking of B4, which represents a site of moderate significance. The natural heritage resource associated with this site is:

Aquatic Natural Community (NP-Middle James-Buffalo Third Order Stream) G2?/S2?/NL/NL

The documented Aquatic Natural Community is based on Virginia Commonwealth University's **INSTAR** (*Interactive Stream Assessment Resource*) database, which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade A, as per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds as a "Outstanding" stream designation as per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of this

600 East Main Street, 24th Floor | Richmond, Virginia 23219 | 804-786-6124

*State Parks • Soil and Water Conservation • Outdoor Recreation Planning
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation*

stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (6th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present.

Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species. To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow.

In addition, the James River has been designated as a “Threatened and Endangered Species” Water by VDGIF for the Green floater (*Lasmigona subviridis*).

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

Soapstone Substation

According to the information currently in our files, the Rockfish River Stream Conservation Unit (SCU) is located within the project area. The Rockfish River SCU has been given a biodiversity ranking of B3, which represents a site of high significance. The natural heritage resource associated with this site is:

Aquatic Natural Community (NP-Middle James-Buffalo Fifth Order Stream) G2?/S2?/NL/NL

The documented Aquatic Natural Community is based on Virginia Commonwealth University's **INSTAR** (*Interactive Stream Assessment Resource*) database which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade A, as per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds as a “Healthy” stream designation as per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of this stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (6th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present.

Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species. To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow.

DCR recommends the development and implementation of an invasive species plan to be included as part of the maintenance practices for the right-of-way (ROW). The invasive species plan should include an invasive species inventory for the project area based on the current DCR Invasive Species List (<http://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2014.pdf>) and methods for treating the invasives. DCR also recommends the ROW restoration and maintenance practices planned include appropriate revegetation using native species in a mix of grasses and forbs, robust monitoring and adaptive management plan to provide guidance if initial revegetation efforts are unsuccessful or if invasive species outbreaks occur.

If permanent tree removal is proposed, the project will fragment Ecological Core(s) (C2, C3, C4 C5) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaconvisvnl>), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

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 preserve the natural patterns and connectivity of habitats that are key components of biodiversity. The deleterious effects of fragmentation can be reduced by minimizing edge in remaining fragments; by retaining natural corridors that allow movement between fragments; and by designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

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. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity. Please note, the Rockfish River has been designated as a scenic river in the state of Virginia and DCR recommends coordination with Lynn Crump of the DCR-Division of Planning and Recreational Resources at 804-786-5054 or Lynn.Crump@dcr.virginia.gov.

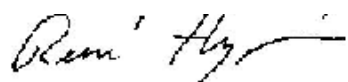
New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of \$395.00 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 Virginia Department of Game and Inland Fisheries (VDGIF) 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 <http://vafwis.org/fwis/> or contact Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dgif.virginia.gov.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

A handwritten signature in black ink, appearing to read "S. René Hypes". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

S. René Hypes
Natural Heritage Project Review Coordinator

Cc: Ernie Aschenbach, VDGIF
Lynn Crump, DCR-PRR

VDOT REVIEW OF PROPOSED AEP ROUTES

< Filter

Note: map links must be opened in internet explorer. Consider using this sheet in internet explorer.
 Note: maps updated as of 02/28/2020, number of routes reduced

Nelson Route 60		Programming Section Comments	Planning Section Comments	L&D Section Comments	Traffic Engineering Comments	Residency Comments	Office of Land Use Comments	
From: Rte. 626	Support	No projects.	Support	No current or planned smart scale projects.	Support	This section is good shape and not currently on a resurfacing plan	Support	Good alignment plant mix primary road. CE has potential sight distance issues for WB traffic.
To: Rte. 622	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
1 Crossing	Oppose		Oppose		Oppose		Oppose	
Map Link	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Amherst Route 600		Programming Section Comments	Planning Section Comments	L&D Section Comments	Traffic Engineering Comments	Residency Comments	Office of Land Use Comments	
From: Rte. 622	Support	No projects.	Support	No current or planned smart scale projects.	Support	Route 600 is scheduled to be resurface treated in Fiscal Year 2021.	Support	Posted No Thru Trucks at Rte. 600 & 823. Damage is expected from heavy loads. Recommend that CE (s) be placed at locations meeting minimum sight distance. Rte. 823 west is 18 ft. plant mix roadway.
To: Rte. 601	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
1 Crossing	Oppose		Oppose		Oppose		Oppose	
Map Link	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Amherst Route 601		Programming Section Comments	Planning Section Comments	L&D Section Comments	Traffic Engineering Comments	Residency Comments	Office of Land Use Comments	
From: Rte. 600	Support	No projects.	Support	No current or planned smart scale projects.	Support	no planned work.	Support	Winding 16 ft. surface treated roadway way. Damage is expected from heavy loads. Recommend that CE (s) be placed at locations meeting minimum sight distance.
To: Rte. 601	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
1 Crossing	Oppose		Oppose		Oppose		Oppose	
Map Link	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Appomattox Rte. 605		Programming Section Comments	Planning Section Comments	L&D Section Comments	Traffic Engineering Comments	Residency Comments	Office of Land Use Comments	
From: Rte. 721	Support		Support	No current or planned smart scale projects.	Support	Route 605 is scheduled in 2022 to be surface treated as a maintenance project. If this route is chosen, then coordination with the paving project will need to be done.	Support	From Route 721 to Route 624, the road is 12 feet wide and gravel surfaced. The remainder of the road varies from 16 feet wide to 18 feet wide and this section is surface treated. There is a bridge on Dreaming Creek that will not support large trucks. Access to this project can be obtained from the Rte 26 side or the 460 side depending on where you need to be. Recommend that CE (s) be placed at locations meeting minimum sight distance.
To: Rte. 667	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3 Crossings	Oppose		Oppose		Oppose		Oppose	
Map Link	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Amherst Route 622		Programming Section Comments	Planning Section Comments	L&D Section Comments	Traffic Engineering Comments	Residency Comments	Office of Land Use Comments	
From: Rte. 663	Support	No projects.	Support	No current or planned smart scale projects.	Support	Route 622 is scheduled to be resurface treated in Fiscal Year 2021.	Support	7 potential crossings. Winding 14 -16 ft surface treated roadway. Damage is expected from heavy loads. Recommend that CE (s) be placed at locations meeting minimum sight distance.
To: Nelson CL	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
7 Crossings	Oppose		Oppose		Oppose		Oppose	
Map Link	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Apomattox Route. 623		Programming Section Comments	Planning Section Comments	L&D Section Comments	Traffic Engineering Comments	Residency Comments	Office of Land Use Comments	
From: Dead End	Support	No projects.	Support	No current or planned smart scale projects.	Support	No Maintenance Projects planned	Support	The roadway is 18 feet wide with surface treatment. Recommend that CE (s) be placed at locations meeting minimum sight distance.
To: Rte. 605	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1 Crossing	Oppose		Oppose		Oppose		Oppose	
Map Link	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Amherst Route 624		Programming Section Comments	Planning Section Comments	L&D Section Comments	Traffic Engineering Comments	Residency Comments	Office of Land Use Comments	
From: Rte. 604	Support	No projects.	Support	No current or planned smart scale projects.	Support	no planned work.	Support	Winding 12 ft surface treated roadway between Rte. 655 and Rte. 814. Winding 14 ft. gravel road NW of Rte. 814 with two 18 Ton Posted single lane bridges. Damage is expected from heavy loads. Recommend that CE (s) be placed at locations meeting minimum sight distance.
To: Rte. 624	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	

VDOT REVIEW OF PROPOSED AEP ROUTES

Amherst County

	Programming Section		Planning Section		L&D Section		Traffic Engineering		Residency		Office of Land Use	
	Support	Comments	Support	Comments	Support	Comments	Support	Comments	Support	Comments	Support	Comments
Route 685	<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input checked="" type="checkbox"/>	Winding 16 ft. surface treated roadway way with 35 MPH speed limit. Damage is expected from heavy loads. Limited SSD for SB travel, may require flagging operation at CE.
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Route 1242	<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input checked="" type="checkbox"/>	20 ft. surface treated roadway within residential subdivision with 25 MPH speed limit. Damage is expected from heavy loads. Limited SSD at crossing, may require flagging operation at CE.
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Route 130	<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input checked="" type="checkbox"/>	Good alignment plant mix primary road. Steep cut embankments at crossing. Question CE access.
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Route 675	<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input checked="" type="checkbox"/>	20 ft. plant mix roadway on good alignment. Relocate new tower poles outside of VDOT ROW and beyond clear zone and remove existing.
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Route 1332	<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input checked="" type="checkbox"/>	20 ft. surface treated roadway within residential subdivision with 25 MPH speed limit. Damage is expected from heavy loads. Relocate new tower poles outside of VDOT ROW and beyond clear zone and remove existing at Int. Rte. 796, 1322 & 1327.
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Route 1327	<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input checked="" type="checkbox"/>	20 ft. surface treated roadway within residential subdivision with 25 MPH speed limit. Damage is expected from heavy loads. Relocate new tower poles outside of VDOT ROW and beyond clear zone and remove existing at Int. Rte. 796, 1322 & 1327.
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Route 29 Bus.	<input checked="" type="checkbox"/>	No conflicts.	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>	TE / Operations to install a controller actuated beacon along the SBL of 29B approximately 1/2-mile south of the existing crossing. The project concept is not currently funded, nor does it have a planned schedule, but is being considered for funding by CO. The potential conflict may be with the work	<input type="checkbox"/>		<input checked="" type="checkbox"/>	Good alignment plant mix primary road. West side has guardrail and question point of access from SB Travel Lane.
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	Route 29B sidewalk contrac	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Route 657	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	
	Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	16 ft. surface treated roadway. Damage is expected from heavy loads. Relocate new tower poles outside of VDOT ROW and beyond clear zone. Remove existing tower poles on west side of roadway.
	Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>	
Route 671	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	
	Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	16 ft. surface treated roadway. Damage is expected from heavy loads.
	Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>	
Route 604	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	
	Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	Good alignment plant mix road.
	Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>	
Route 750	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	
	Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	16 Ft. surface treated roadway. No issues.
	Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>	
Route 663	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	
	Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	Good alignment plant mix road.
	Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>	
Route 840	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	
	Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	20 ft. surface treated roadway within residential subdivision with 25 MPH speed limit. Damage is expected from heavy loads. Limited SSD at crossing, may require flagging operation at CE.
	Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>	
Route 604	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	
	Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	No conflicts.	Support <input type="checkbox"/>		Support <input checked="" type="checkbox"/>	Good alignment plant mix road.
	Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>		Oppose <input type="checkbox"/>	
	Programming Section Comments		Planning Section Comments		L&D Section Comments		Traffic Engineering Comments		Residency Comments		Office of Land Use Comments	

From: Larson, Emily
Sent: Wednesday, May 27, 2020 10:44 AM
To: Pardis, Roya
Subject: Fwd: [EXTERNAL] Central VA Transmission Reliability Project

Emily Larson
301-848-8404

Begin forwarded message:

From: "Orndorff, William" <wil.orndorff@dcr.virginia.gov>
Date: May 27, 2020 at 10:43:04 AM EDT
To: "Larson, Emily" <emily.larson@powereng.com>
Cc: "skennedy@aep.com" <skennedy@aep.com>
Subject: [EXTERNAL] Central VA Transmission Reliability Project

CAUTION: This Email is from an **EXTERNAL** source. **STOP. THINK** before you **CLICK** links or **OPEN** attachments.

Hi Emily and Scott,

I realize I never replied to your letter of 30 January, 2020.

There are no karst concerns associated with this project.

If you haven't already, please coordinate with the DCR office of project review for potential impacts to other Natural Heritage Resources. The contact person is Rene Hypes - Rene.Hypes@dcr.virginia.gov.

Thanks,

wil

Rob Farrell
State Forester



COMMONWEALTH of VIRGINIA

Department of Forestry

900 Natural Resources Drive, Suite 800 • Charlottesville, Virginia 22903
(434) 977-6555 • Fax: (434) 296-2369 • www.dof.virginia.gov

July 6, 2020

Emily Larsen, POWER Engineers, Inc.
emily.larson@powereng.com
Electronic/e-mail Delivery

Dear Ms. Larsen:

I am writing on behalf of the Virginia Department of Forestry (VDOF) in response to your letter to VDOF, dated January 30, 2020, requesting comments on potential impacts to conserved “open space” properties related to the Central Virginia Transmission Reliability Project (CVTRP).

You provided GIS files of the location of preliminary study segments to VDOF, at our request, on June 22, 2020, which data was used by VDOF to prepare the attached map. All preliminary study segments were buffered out by 250-ft from the centerline to look for potential overlap with open space easement properties.

Upon review of the above mentioned materials, VDOF staff have identified an area of overlap between the preliminary study segment and a VDOF open space easement. The VDOF’s Rockcliffe Farm easement (APP-2010-001) shows approximately 6.9 acres of overlap with one of the Joshua Falls Preliminary Study Segments (see attached map).

VDOF reviewed the Rockcliffe Farm easement deed (Appomattox County Instrument #201000133, recorded 01/29/10) and state and federal environmental databases to provide the following site specific comments:

(1) VDOF accepted this deed of gift of easement in 2010 to protect in perpetuity the following conservation values (paraphrased): preservation of land for forestal use, natural habitat and biological diversity, watershed preservation, preservation of scenic open space, and preservation of general open space.

(2) The open space easement was written to prohibit construction of utilities that do not serve the property, except when these conditions are all met (paraphrased): the utility must be placed underground, construction and maintenance must not significantly impair the Property’s conservation values, and if said utility project is not otherwise prohibited by section 2(i) through (ix) of the deed – then Grantee – in its sole and absolute discretion – should give prior written approval (see deed pages 8-9).

(3) The 6.9 acre area of potential impact includes a stream protected by a riparian buffer, the purpose of which is to maintain forest cover on the edges of the stream, reducing sedimentation into the stream from land uses such as construction, forestry and agriculture. The deed prohibits the removal of trees within this buffer (see deed page 12). The riparian buffer area shows up in the U.S. Fish and Wildlife Service's National Wetlands Inventory as a Freshwater Forested / Shrub Wetland. Please note that VDOF is not responsible for permitting impacts to inventoried wetlands.

Conclusions:

The VDOF Rockcliffe Farm open space easement does not permit the sort of utility construction and maintenance activities that are proposed within 250-ft of the centerline of the study segment. VDOF would anticipate unavoidable scenic, water quality, habitat, and forest health impacts, should Appalachian Power Company encroach upon the Rockcliffe Farm property with any temporary construction or permanent utility easement(s).

Please locate any temporary construction and/or permanent utility easement(s) entirely off of the Rockcliffe Farm property.

Thank you for following up with VDOF staff to collect our comments on the CVTRP.

Sincerely,

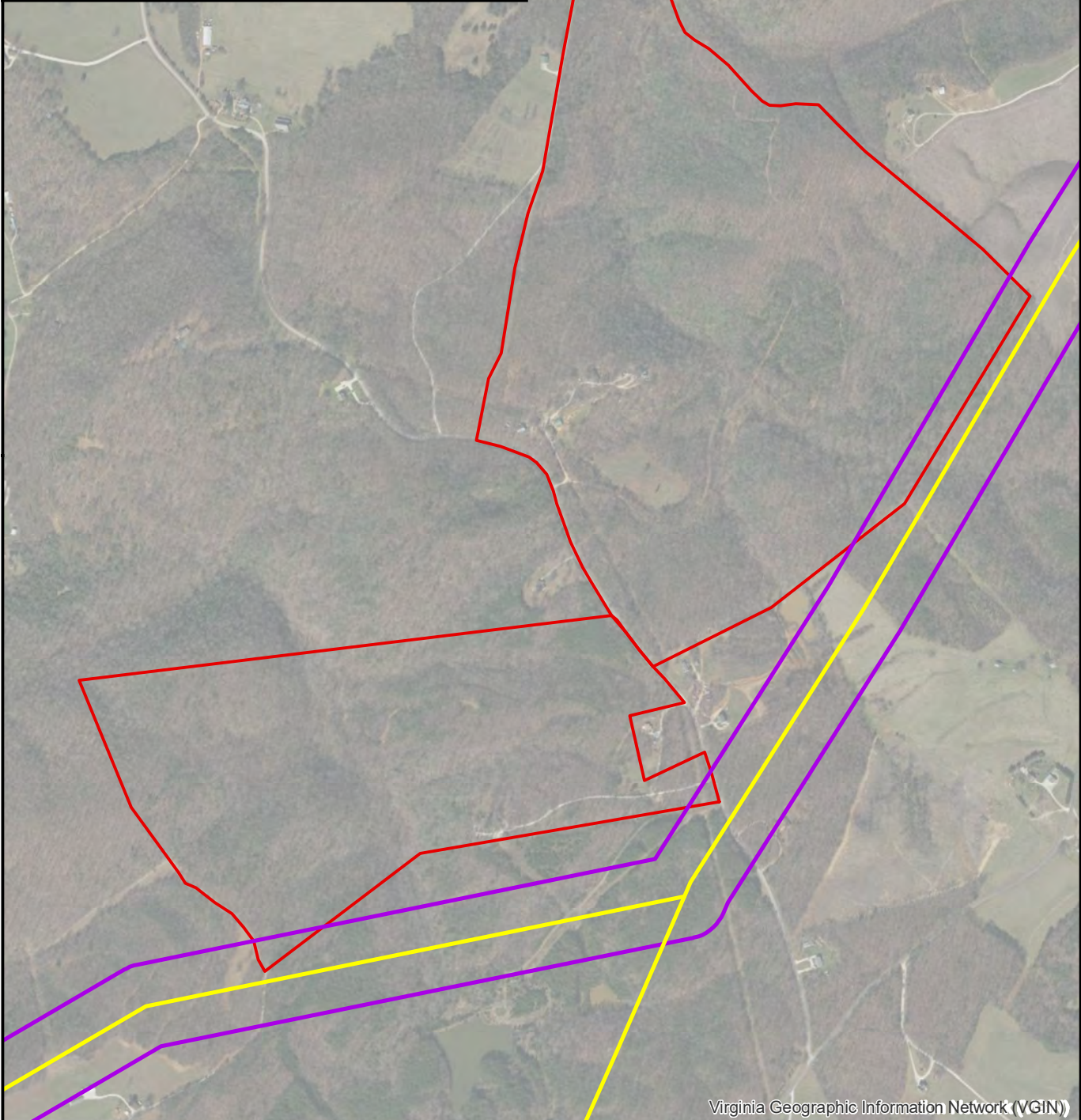
A handwritten signature in cursive script that reads "Andrew Fotinos".

Andrew Fotinos
Forestland Conservation Specialist
434-270-4090

Rockcliffe Farm
APP-2010-001
VDOF Open Space Easement

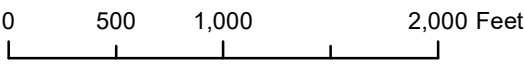
Legend

-  Rockcliffe Farm Open Space Easement
-  Joshua Falls Prelim Study Segment
-  250-ft from study segment centerline



Virginia Geographic Information Network (VGIN)

This map is for general reference purposes only and is not to be construed as a survey.



Attachment D: USFWS IPaC Report

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



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 species¹ 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 Fisheries²).

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.
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

Gray Bat *Myotis grisescens* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/6329>

Northern Long-eared Bat *Myotis septentrionalis* Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9045>

Clams

NAME	STATUS
Atlantic Pigtoe <i>Fusconaia masoni</i> There is proposed critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5164	Proposed Threatened

Flowering Plants

NAME	STATUS
Small Whorled Pogonia <i>Isotria medeoloides</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	Threatened
Smooth Coneflower <i>Echinacea laevigata</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3473	Endangered

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 Act¹ and the Bald and Golden Eagle Protection Act².

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.)

Bald Eagle *Haliaeetus leucocephalus*

Breeds Sep 1 to Jul 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.

<https://ecos.fws.gov/ecp/species/1626>

<p>Eastern Whip-poor-will <i>Antrastomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Aug 20
<p>Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 20 to Aug 20
<p>Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Jul 31
<p>Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 1 to Jul 31
<p>Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Sep 10
<p>Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds elsewhere
<p>Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	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.
- 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 $0.05/0.25 = 0.2$.
 - 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.

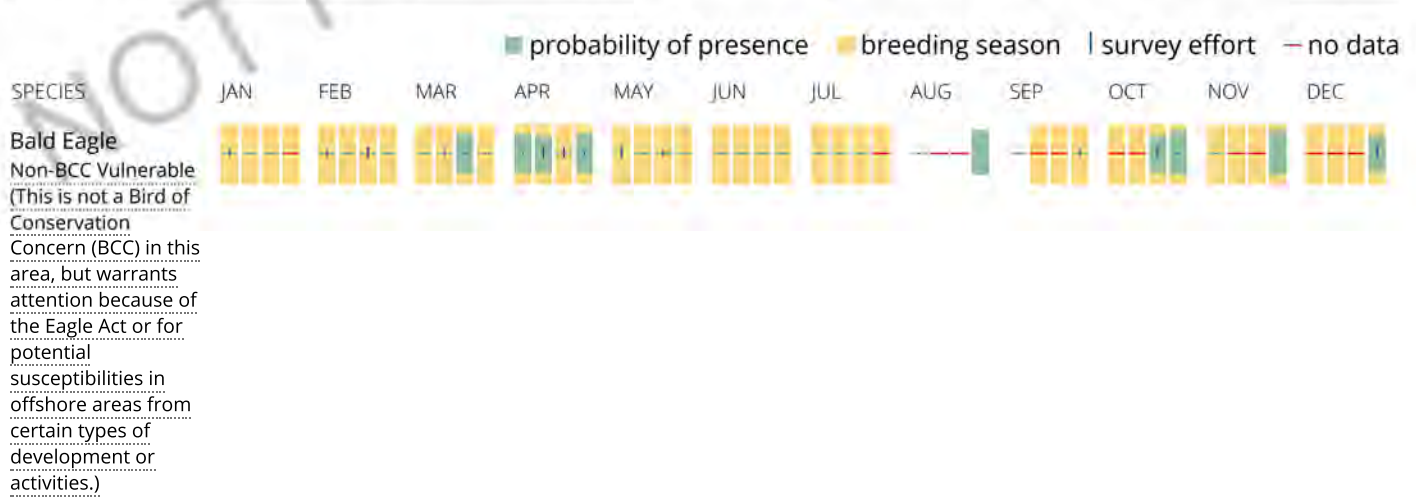
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

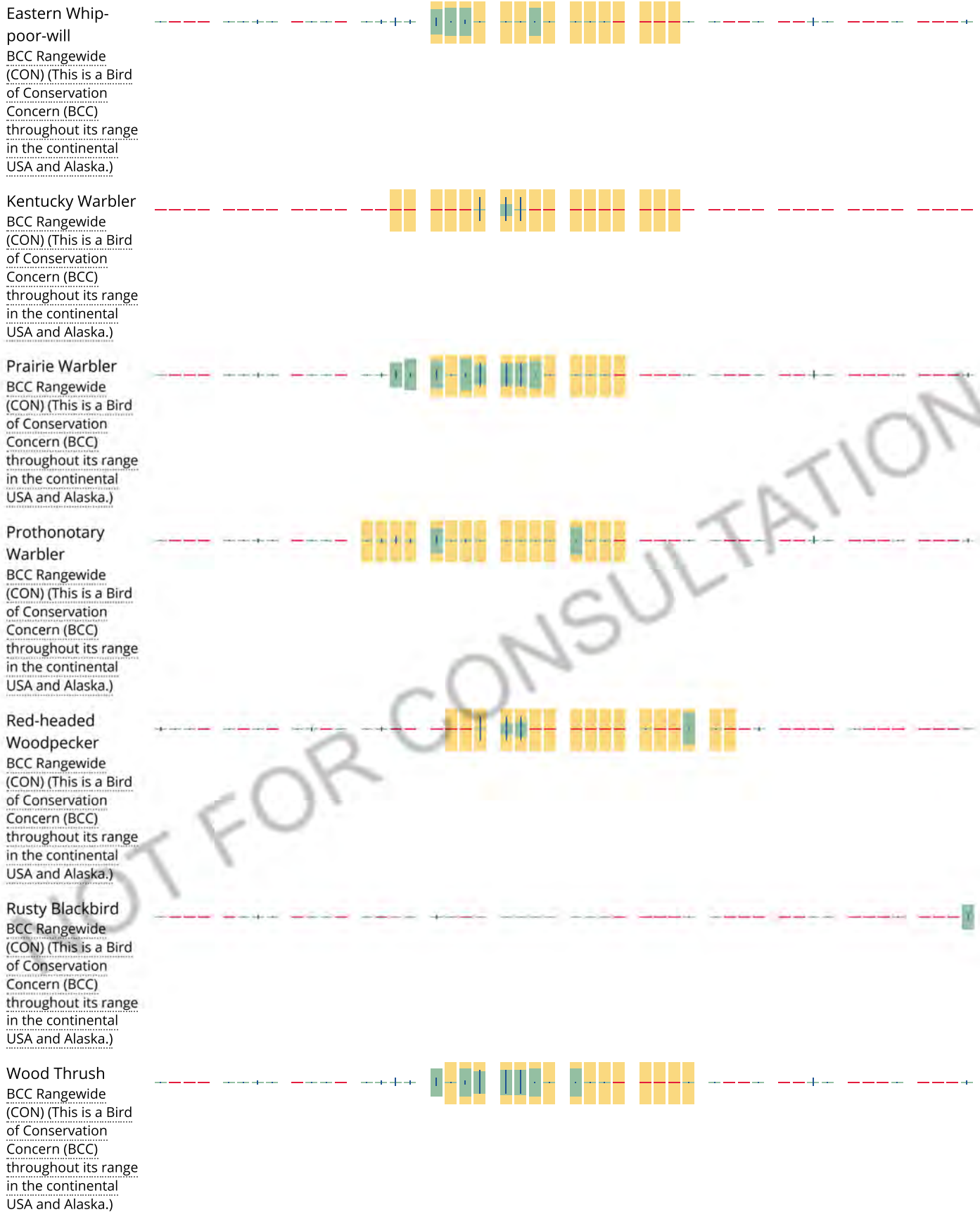
No Data (—)

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.





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](#) and/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 Rangelwide" 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 rangelwide 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 tubercid 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.

NOT FOR CONSULTATION