APPALACHIAN POWER COMPANY
BEFORE THE
VIRGINIA STATE CORPORATION COMMISSION
CASE NO. PUR-2021-00049

APPLICATION FOR APPROVAL AND CERTIFICATION OF ELECTRICAL TRANSMISSION LINE

Reusens to New London
138 kV Rebuild Project

VOLUME 1 OF 2

Application, Testimony, Response to Guidelines & Exhibits

April 2021

VOLUME 1 - Application, Testimony, Response to Guidelines & Exhibits

VOLUME 2 – Siting Memo & VDEQ Supplement

VOLUME 1

EXHIBITS

VOLUME 2

°	degree
ACSR	Aluminum Conductor Steel Reinforced
ACSS	Aluminum Conductors Steel Supported
AEP	American Electric Power Company, Inc. (parent company of Appalachian)
AEPSC	American Electric Power Service Corporation
APCo	Appalachian Power Company (a unit of AEP)
Appalachian	Appalachian Power Company (a unit of AEP)
Application	Collectively refers to the application requesting Commission approval for the proposed Project, together with all of the supporting testimony, Response to Guidelines, Siting Memo, VDEQ Supplement, tables, exhibits, attachments, figures and maps, etc.
ASCE	American Society of Civil Engineers
BMP	Best Management Practice
CI	Customers Interrupted
CIR	Color Infrared aerial imagery
CMI	Customer Minutes of Interruptions
cmil	circular mil
Code	Code of Virginia
Company	Appalachian Power Company (a unit of AEP)
CPCN	Certificate of Public Convenience and Necessity
DEM	Digital Elevation Model
ELF	Extremely Low Frequency
EMF	Electric and Magnetic Fields
EMF RAPID	Electric and Magnetic Fields Research and Public Information Dissemination
EPRI	Electric Power Research Institute
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHA	Federal Highway Administration of the United States Department of Transportation
GIS	Geographic Information System
Hz	hertz
IARC	International Agency for Research on Cancer
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronics Engineers
kHz	kilohertz
kV	kilovolt (1,000 volts)
kV/m	kilovolt/meter (a unit of measurement for electric fields)
LiDAR	Light Detection and Ranging imagery
Line	Transmission Line or Power Line
Load Area	The load area depicted on Figure 2 in Section I of the Response

	to Guidelines representing a combined peak load of approximately 100 MVA and comprising parts of the City of Lynchburg and Bedford County, Virginia
mG	milligauss (a unit of measurement for magnetic fields)
MVA	megavolt ampere
MVAr	megavolt amps reactive
MW	milliwatt
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NIEHS	National Institute of Environmental Health Services
NLCD	National Land Cover Database
NPL	National Priority List (maintained by USEPA)
NRCS	National Resources Conservation Service of the United States Department of Agriculture
NRHP	National Register of Historic Places
NUG	Non-Utility Generator
NWI	National Wetlands Inventory (maintained by the USFWS)
OPGW	Optical Ground Wire
PEM	Palustrine emergent wetland
PFO	Palustrine forested wetland
PJM	PJM Interconnection, L.L.C. - the RTO that coordinates the movement of wholesale electricity in parts of the Northeast, Mid-Atlantic and Midwest
POWER	POWER Engineers, Inc.
Project	The proposed transmission line rebuild, substation improvements, and other proposed work detailed in Section I of the Response to Guidelines.
PUB	Palustrine unconsolidated bottom wetland
PSS	Palustrine scrub-shrub wetland
QF	Qualifying Facilities
RCRA	Resource Conservation and Recovery Act Information System (maintained by USEPA)
Response to Guidelines	Response to “Guidelines of Minimum Requirements for Transmission Line Applications Filed under Title 56 of the Code of Virginia.”
ROW(s)	Right(s)-of-Way
RTO	Regional Transmission Organization
RTEP	Regional Transmission Expansion Plan
SCC	Virginia State Corporation Commission
SCENIHR	Scientific Committee on Emerging and Newly Identified Health Risks
Siting Memo	The Reusens to New London 138 kV Rebuild Siting Memo for the portion of the Reusens – Altavista 138 kV transmission line to be

	rebuilt
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
SSURGO	Soil Survey Geographic Database
Supplemental Work	See Section IA, Response to Guidelines
TRI	Toxics Release Inventory (maintained by USEPA)
U.S.	United States
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDEQ Supplement	The analysis included in Volume 2 of this application, which addresses the environmental and historic features associated with the Project
VDWR	Virginia Department of Wildlife Resources
VDH	Virginia Department of Health
VDHR	Virginia Department of Historic Resources
VDOF	Virginia Department of Forestry
VDOT	Virginia Department of Transportation
VGIN	Virginia Geographic Information Network
VMRC	Virginia Marine Resources Commission
VOF	Virginia Outdoors Foundation
VPDES	Virginia Pollutant Discharge Elimination System
WHO	World Health Organization

Executive Summary

In order to maintain and improve the reliability of electric service to customers in its service territory, Appalachian Power Company ("Appalachian" or "Company") is seeking permission for the Reusens to New London 138 kV Rebuild Project (the "Project"), which consists of the following:

(a) Rebuild, almost entirely within existing right-of-way ("ROW"), an 11.6-mile section of the Reusens – Altavista 138 kilovolt ("kV") transmission line asset from the Reusens Substation to the New London Substation, of which approximately 5.5 miles consists of double-circuit 138 kV construction and approximately 6.1 miles consists of single-circuit 138 kV construction;

(b) Install a 57.6 megavolt amps reactive ("MVAr") cap bank at the Brush Tavern Substation to address low voltage concerns from operations during construction outages for this Project and upcoming projects in the area; and

(c) Remove two structures and replace with one structure on the Reusens – South Lynchburg 138 kV transmission line where it crosses the Reusens – Altavista 138 kV transmission line in order to co-locate the two transmission lines onto one new structure at the point of intersection.

See Exhibit 1 for a map of the Project area.

The Project rebuilds an existing 138 kV transmission line which is over 70 years old and needs to be rebuilt in part due to the combination of risk, condition and performance of the infrastructure. The Project connects several area substations and which serve a large, combined peak load of approximately 100 megavolt amperes ("MVA"). The single-circuit section generally consists of wooden H-frame structures from the 1940s, close to 20% of which contain at least one open structural condition due to age-related deterioration, such as woodpecker damage, corroded cross arms, insect damage, or wood rot. The double-circuit section generally consists of steel lattice towers from the 1940s, which are showing signs of wear, loss of galvanizing and groundline deterioration. The shield wire and most of the conductor on both sections is over 70 years old. In addition, the typical structure used during the time of construction for both the wooden pole section and for the steel tower section fails to comply with the current National Electrical Safety Code ("NESC") 250B and 250D design standards. This section also has inadequate shielding from lightning strikes as the existing shielding angle fails to comply with current standards, making it more susceptible to lightning strikes.

With very few exceptions, the proposed transmission line route will follow the existing centerline and will be rebuilt almost entirely within the existing 100-foot-wide ROW. Where the line intersects with the Reusens – South Lynchburg 138 kV transmission line, the ROWs will be shifted slightly to enable the co-location discussed above. Where the ROW crosses a golf course, the ROW will be shifted slightly in order to relocate structures further away from the fairways and greens of the course.

The Company will rebuild the transmission line primarily using 138 kV steel monopoles with davit arms for the double-circuit portion of the Project, and 138 kV steel braced monopoles for the single-circuit section. The anticipated heights of the proposed structures on the single-circuit section of the Project range between 55 and 100 feet, with an average structure height of approximately 85 feet. The anticipated heights of the proposed structures on the double-circuit section of the Project range between 90 to 140 feet, with an average structure height of

approximately 115 feet.

The existing ROW is adequate to rebuild the portion of the Reusens – Altavista 138 kV transmission line for almost the entirety of the 11.6-mile section and therefore very limited new ROW is necessary and any shifts do not result in any newly affected landowners. Given the availability of existing ROW, the statutory preference to the use of existing ROWs, and because additional residential and environmental impacts associated with the acquisition of and construction on new ROW, the Company did not consider any alternate routes requiring significantly new ROW for the Project.

The estimated conceptual cost of the Project is approximately $39.8 million, which includes approximately $38.1 million for transmission-related work and $1.7 million for substation-related work.

The proposed in-service date for the Project is December 15, 2023. If the Commission approves the Project, the Company estimates that it will need approximately 18 months after entry of the Commission's final approving order for engineering, design, ROW acquisition, permitting, material procurement and construction to place the Project in service.

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF
APPALACHIAN POWER COMPANY **CASE NO. PUR-2021-00049**

for Approval and Certification of the
Reusens to New London 138 kV Rebuild Project
under Title 56 of the Code of Virginia

APPALACHIAN POWER COMPANY ("Appalachian" or the "Company"), a corporation duly organized and existing under the laws of the Commonwealth of Virginia, represents as follows:

1. Appalachian is a Virginia public service corporation providing electric service in Virginia and West Virginia and having an address of P.O. Box 2021, Roanoke, Virginia 24022.

2. In order to perform its legal duty to furnish adequate and reliable electric service, Appalachian must, from time to time, replace existing transmission facilities or construct new transmission facilities in its system.

3. In this Application, the Company proposes to construct, own, operate and maintain the Reusens to New London 138 kV Rebuild Project, to be located in Bedford and Campbell Counties, Virginia and in the City of Lynchburg, Virginia. This project consists of: (a) an 11.6-mile long rebuild of the Reusens – Altavista 138 kV transmission line asset between the Company's Reusens Substation and New London Substation; (b) associated improvements at the Company's Brush Tavern Substation in Campbell County, Virginia; and (c) the removal of two structures and replacement with one structure on the Reusens – South Lynchburg 138 kV transmission line where it crosses the Reusens – Altavista 138 kV transmission line in order to co-locate the two transmission lines onto one new structure at the point of intersection. All of the above is listed and more fully described in Section I of the Company's Response to Guidelines filed with this

Application, such rebuild and other improvements collectively, the "Project." The Project will rebuild infrastructure that is over 70 years old due to the combination of risk, condition and performance of the infrastructure. The Project is necessary to ensure adequate and reliable electric service and accommodate future growth in Bedford County, the City of Lynchburg, and the surrounding area.

4. Because the Project rebuilds an existing transmission line asset between the Reusens and New London Substations, the vast majority of the Project will be constructed on ROW already acquired by the Company.

5. In support of this application, the Company is filing the testimony of:

(a) Nicolas C. Koehler, P.E. as to need for the Project;

(b) Mary Jane L. McMillen, P.E., with regard to the engineering characteristics of the Project;

(c) Xin Liu, P.E., regarding electric and magnetic field levels associated with the Project; and

(d) Roya A. Pardis as to route review and certain environmental matters associated with the Project.

6. The Company is also filing: (a) a Response to Guidelines, responding to the "Guidelines of Minimum Requirements for Transmission Line Applications Filed Under Title 56 of the Code of Virginia" issued by the Commission's Division of Public Utility Regulation on August 10, 2017; (b) a Reusens to New London 138 kV Rebuild Siting Memo ("Siting Memo") and Virginia Department of Environmental Quality ("VDEQ") supplement prepared by the Company's siting and environmental consultant, POWER Engineers, Inc.; and (c) related tables, exhibits, attachments and maps (including a digital geographic information system ("GIS") constraints map and GIS shapefiles of the Project via electronic filing).

7. The Company's testimony, Response to Guidelines, Siting Memo, VDEQ supplement and related materials filed with this application establish that:

(a) The Project is needed and the public convenience and necessity require the construction of the Project by Appalachian;

(b) The Proposed Route for the Project reasonably minimizes adverse impact on the scenic assets, historic districts and environment of the area in which the Project will be located; and

(c) The Project will ensure adequate and reliable electric service and accommodate future growth in Bedford County, the City of Lynchburg, and the surrounding area.

8. The proposed in-service date for the Project is December 15, 2023. If the Commission approves the Project, the Company estimates that it will need approximately 18 months after entry of the Commission's final approving order for engineering, design, ROW acquisition, permitting, material procurement and construction to place the Project in service. Accordingly, the Company asks that the Commission expedite its consideration of this Application to the extent permitted under applicable law.

The Company therefore requests:

(a) That this Application be filed and docketed;

(b) That the Commission cause notice of this Application to be given as required by Virginia Code Section 56-46.1 and the Utility Facilities Act, Virginia Code Sections 56-265.1 et seq.;

(c) That the Commission Staff undertake an investigation of this Application and report its findings to the Commission;

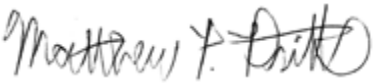
(d) That the Commission determine, as required by Virginia Code Sections 56-46.1 and 265.2 (1) that the Project is needed and the public convenience and

necessity require the construction by Appalachian of the Project; and (2) that the proposed route for the transmission line included in the Project reasonably minimizes adverse impact on the scenic assets, historic districts and environment of the area concerned;

(e) That the Commission approve the construction of the Project pursuant to Virginia Code Section 56-46.1 and any other applicable law; and

(f) That the Commission grant Appalachian a certificate of public convenience and necessity under the Utility Facilities Act and grant such other relief as may be necessary for the construction and operation of the Project.

APPALACHIAN POWER COMPANY



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APCo Exhibit No. ___
Witness: NCK

DIRECT TESTIMONY OF
NICOLAS C. KOEHLER, P.E.
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S.C.C. CASE NO. PUR 2021-00049

APCo Exhibit No. ___
Witness: NCK

SUMMARY OF DIRECT TESTIMONY OF NICOLAS C. KOEHLER, P.E.

My direct testimony supports Appalachian's Application and Response to Guidelines. I am sponsoring Exhibit 2 and Section I of the Response to Guidelines (Necessity for the Project), including the associated figures and tables.

The Company determined that a portion of the Reusens – Altavista 138 kV transmission line needs to be rebuilt between the Reusens Substation and New London Substation due to the combination of risk, condition, and performance of the infrastructure, as discussed in more detail in Section I. This line segment is comprised of two electrical circuits, New London – Reusens 138 kV and McConville – Reusens 138 kV circuits, which connect to several area substations serving various amounts of customer load. The customer risk associated with these circuits is a combined peak load of approximately 100 megavolt amperes ("MVA"). Accordingly, the Project will address Appalachian's obligation under Virginia law to provide adequate and reliable service to customers within its service territory.

The existing Reusens – Altavista 138 kV transmission line to be rebuilt is over 70 years old, contains numerous open conditions, has high outage exposure risk to area customer load, has poor lightning protection with documented lightning outage history, and does not comply with current National Electrical Safety Code ("NESC") standards. As a result, the existing Reusens – Altavista 138 kV transmission line cannot continue to adequately serve the needs of the Company and its customers. Completing the Project will support the Company's continued reliable electric service and accommodate future growth in Bedford County, the City of Lynchburg, and the surrounding area.

DIRECT TESTIMONY OF
NICOLAS C. KOEHLER
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S.C.C. CASE NO. PUR-2021-00049

Q: PLEASE STATE YOUR NAME, ADDRESS AND PRESENT POSITION.

A: My name is Nicolas C. Koehler. My position is Director, East Transmission Planning for American Electric Power Service Corporation ("AEPSC"). AEPSC supplies engineering, financing, accounting, planning, advisory, and other services to the subsidiaries of the American Electric Power ("AEP") system, one of which is Appalachian Power Company ("Appalachian" or "the Company"). My business address is 8600 Smiths Mill Road, New Albany, Ohio 43054.

Q: PLEASE REVIEW YOUR EDUCATIONAL BACKGROUND AND YOUR WORK EXPERIENCE.

A: I received a Bachelor of Science – Electrical Engineering degree from Ohio Northern University in Ada, Ohio. In 2008, I joined AEP as a Planning Engineer where I advanced through increasing levels of responsibility. I received my Professional Engineer license in the state of Ohio in 2012 (license number 76967). In May 2019, I assumed my current position.

Q. WHAT ARE YOUR RESPONSIBILITIES AS DIRECTOR OF EAST TRANSMISSION PLANNING?

A. My role includes organizing and managing all activities related to assessing the adequacy of AEP's transmission network to meet the needs of its customers in a reliable, cost-effective, and environmentally compatible manner. I participate in planning activities with Appalachian to address overall system performance.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A: The purpose of my testimony is to support certain aspects of Appalachian's Application to this Commission for approval and certification of the proposed Project, which is in the southeast portion of Appalachian's service territory. The Lynchburg area encompasses industrial, commercial and residential load. Major customers in the area include Liberty University, the Lynchburg Regional Airport, heavily commercial districts, and densely populated suburban areas.

Q: WHICH OF THE SPECIFIC MATERIALS INCLUDED IN THE RESPONSE TO GUIDELINES ARE YOU SPONSORING?

A: I am responsible for Section I, Necessity for the Proposed Project, and Exhibit 2 filed with this Application in response to the Commission Staff's "Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia."

Q: WERE THE PORTIONS OF APPALACHIAN'S FILING WHICH YOU ARE SPONSORING PREPARED BY YOU OR UNDER YOUR SUPERVISION AND DIRECTION?

A: Yes.

Q: PLEASE SUMMARIZE THE NEED FOR THE PROJECT.

A: The Company determined that a portion of the Reusens – Altavista 138 kV transmission line needs to be rebuilt due to the combination of risk, condition, and performance of the infrastructure, as discussed in more detail in Section I of the Response to Guidelines. This line segment is comprised of two 138 kV electrical circuits, New London – Reusens and McConville – Reusens circuits, which connect to several area substations serving various amounts of customer load. The customer risk associated with these circuits is a combined

peak load of approximately 100 megavolt amperes ("MVA"). Accordingly, the Project will address Appalachian's obligation under Virginia law to provide adequate and reliable service to customers within its service territory.

Q: WHAT ARE THE REASONS FOR THE REBUILD?

A: The Reusens – Altavista 138 kV transmission line to be rebuilt is over 70 years old, contains numerous open conditions, has high outage exposure risk to area customer load, has poor lightning protection with documented lightning outage history, and does not comply with current NESC standards. As a result, the transmission line cannot continue to adequately serve the needs of the Company and its customers because of the combination of risk, condition and performance of the infrastructure, as discussed in more detail in Section I. Completing the Project will support the Company's continued reliable electric service and accommodate future growth in Bedford County, the City of Lynchburg, and the surrounding area.

Q: WHY IS IT NECESSARY TO INSTALL ADDITIONAL EQUIPMENT/FACILITIES AT THE BRUSH TAVERN SUBSTATION AS PART OF THE PROJECT?

A: The Company plans to install one 138 kV 57.6 megavolt amps reactive ("MVAr") capacitor bank at the existing Brush Tavern Substation in Campbell County (22239 Timberlake Road, Timberlake, Virginia). Installation of equipment at the Brush Tavern Substation is needed in order to address low voltage concerns identified by operations during proposed construction outages for this Project and upcoming projects in the area. The improvement at the Brush Tavern Substation for which the Company is seeking approval will be entirely contained within the existing fence line of the substation.

Q: WHAT IS THE TOTAL ESTIMATED COST OF THE PROJECT?

A: The total estimated cost of the project is $39.8 million.

Q: WHAT IS THE PROPOSED IN-SERVICE DATE FOR THE PROJECT?

A: The proposed in-service date is December 15, 2023 with an estimated construction time of approximately18 months.

Q: DOES THIS CONCLUDE YOUR TESTIMONY?

A: Yes.

APCo Exhibit No. ____
Witness: MJM

DIRECT TESTIMONY OF
MARY JANE L. MCMILLEN, P.E.
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S.C.C. CASE NO. PUR-2021-00049

APCo Exhibit No. ____
Witness: MJM

SUMMARY OF DIRECT TESTIMONY OF MARY JANE L. MCMILLEN, P.E.

My direct testimony supports the transmission line engineering aspects of Appalachian's Application and Response to Guidelines in connection with the Project. I sponsor the description of the transmission lines, substations and other engineering components of the Project in Sections II (but not Sections II.A.2, 3 and 9) and V of the Response to Guidelines. I also sponsor Exhibits 4 – 11, 13 and 13-C (filed under seal), three hard copies of the Virginia Department of Transportation ("VDOT") General Highway Maps for Campbell and Bedford Counties, which include the City of Lynchburg, showing the Project, and geographic information system ("GIS") shapefiles of the Project to be submitted electronically to the Commission with the Application.

The Project includes the following supplemental work: (a) an 11.6-mile long rebuild of the Reusens – Altavista 138 kV transmission line between the Company's Reusens and New London substations; (b) associated improvements at the Company's Brush Tavern Substation; and (c) the removal of two structures and replacement with one structure on the Reusens – South Lynchburg 138 kV transmission line where it crosses the Reusens – Altavista 138 kV transmission line at the point of intersection.

My testimony summarizes the numbers, multiple types and height ranges of the transmission structures that will be used for the Project. The majority of the Reusens – Altavista 138 kV transmission line will be constructed on the centerline of the existing ROW with the exception of two deviations required to optimize the design or avoid constraints and are described below in my testimony. Upon approval of the Project, the Company estimates that it will need approximately 18 months for engineering, design, ROW acquisition, permitting, material procurement, outage coordination and construction to place the entire Project in service.

DIRECT TESTIMONY OF
MARY JANE L. MCMILLEN, P.E.
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S.C.C. CASE NO. PUR-2021-00049

Q: PLEASE STATE YOUR NAME, PRESENT POSITION AND BUSINESS ADDRESS.

A: My name is Mary Jane L. McMillen. I am the Manager of Transmission Line Engineering for American Electric Power Service Corporation ("AEPSC"). AEPSC is a subsidiary of American Electric Power Company, Inc. ("AEP") that provides corporate support services to the operating subsidiaries of AEP, including Appalachian Power Company ("Appalachian" or "Company"). My business address is 40 Franklin Road SW, Roanoke, Virginia, 24011.

Q: PLEASE REVIEW YOUR EDUCATIONAL BACKGROUND AND YOUR WORK EXPERIENCE.

A: I graduated from Purdue University with a Bachelor of Science in Civil Engineering followed by a Master of Science in Civil Engineering with an emphasis on Structural Engineering. I am a licensed professional engineer in the Commonwealth of Virginia. I worked for a number of years with an architectural and engineering firm and I joined AEP in 2006 as a consultant. In 2013, I was hired by AEP as a full-time employee and was promoted to the position of Supervisor within Transmission Engineering Standards in 2014. I was promoted to my current position in AEPSC in 2019. I am responsible for coordinating and directing the engineering for the AEP transmission line system (including transmission lines operating at voltages from 34.5 kV through 765 kV) in Virginia, West Virginia, Tennessee, and Kentucky.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A: The purpose of my testimony is to support the transmission line, substation and other engineering components of Appalachian's Application to this Commission for approval and

certification of the proposed Project. In this connection, I am sponsoring various sections of the Response to Guidelines filed by the Company together with the Application in response to the Commission Staff's "Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia."

Q: WHAT ARE YOUR RESPONSIBILITIES AS RELATED TO THE PROJECT?

A: As a Manager of Transmission Line Engineering at AEP, my primary duties involve the oversight of the engineering, design, material procurement, and other technical requirements associated with the construction of the transmission lines associated with the Project.

Q: WHICH SPECIFIC MATERIALS INCLUDED IN THE RESPONSE TO GUIDELINES ARE YOU SPONSORING?

A: I am sponsoring: (1) the information describing the transmission line, substation and other engineering components of the Project set forth in Sections II (excluding Section II.A.2, 3 and 9 and Section II.C) and V of the Response to Guidelines; (2) Exhibits 4 to 11, 13 and 13-C; (3) three hard copies of the VDOT General Transportation Highway maps for Campbell and Bedford Counties, which include the City of Lynchburg, showing the Project (and which will be submitted electronically to the Commission with the Application); and GIS shapefiles of the Project which will be submitted electronically to the Commission with the Application.

Q: WERE THE PORTIONS OF APPALACHIAN'S FILING THAT YOU ARE SPONSORING PREPARED BY YOU OR UNDER YOUR SUPERVISION AND DIRECTION?

A: Yes.

Q: PLEASE DESCRIBE TRANSMISSION LINE ENGINEERING'S ROLE IN THE ROUTE REVIEW PROCESS.

A: Company transmission line engineers were part of the Siting Team and were involved throughout the route review process. Specifically, transmission line engineers conducted desktop and field reviews of the Proposed Route to validate feasibility of rebuilding the transmission line almost entirely within the existing ROW from an engineering and constructability standpoint. For more information on the route review process, please see witness Pardis' testimony.

Q: PLEASE DESCRIBE THE PROJECT TRANSMISSION LINE.

A: The Project includes rebuilding a portion of the Reusens – Altavista 138 kV transmission line between the Reusens and New London substations, which consists of an approximately 5.5-mile double-circuit section and an approximately 6.1-mile single-circuit section. Where the Reusens – Altavista 138 kV transmission line crosses with the Reusens – South Lynchburg 138 kV transmission line (between proposed structures 4-30A and 4-32A), the Company proposes to shift both lines' rights-of way ("ROWs") to co-locate the two transmission lines onto one new transmission structure at the point of intersection in order to optimize the design. Specifically, the Company will shift the centerlines of the Reusens – Altavista 138 kV transmission line approximately 40 feet to the west and the Reusens – South Lynchburg 138 kV transmission line approximately 40 feet to the southwest in order to co-locate the conductors onto the proposed structure 4-31A. As a result of the relocation, one existing structure on the Reusens – South Lynchburg 138 kV transmission line will be rebuilt in a nearby location (proposed structure 5-9C). This will reduce the number of transmission structures on the property (see witness Pardis' testimony for more information). The Project's transmission line is shown on Exhibit 1 and in detail on the GIS Constraints Map, which is Exhibit 3.

Q: WHAT STRUCTURE TYPES WILL BE USED FOR THE PROJECT?

A: The Project requires multiple types of transmission structures for the double-circuit and single-circuit sections as described in Section II.B of the Response to Guidelines. The proposed structures to be used for the Project will be dulled galvanized steel, which will replace the existing double-circuit steel lattice tower structures and single-circuit wooden H-frame structures (see Exhibits 4 and 5). Final structure types will be determined during final engineering, which includes ground survey and geotechnical studies. Nevertheless, based on preliminary engineering, the Company anticipates primarily using steel double-circuit monopoles with davit arms and steel single-circuit monopole and H-frame structures for the rebuilt 138 kV transmission line. The proposed structure types were selected to reduce the structure footprint compared to the existing structures, which generally have a larger structure footprint, and thus minimize impacts to the extent practicable. The proposed transmission structure types to be used for the Project are shown in Exhibits 6 – 9.

The anticipated transmission structure heights on the double-circuit section of the Project (from the Reusens Substation to proposed structure 4-31A) range from 90 feet to 140 feet tall, with an average structure height of approximately 115 feet. The anticipated structure heights on the single-circuit section of the Project (from proposed structure 4-31A to the New London Substation) range from 55 feet to 100 feet tall, with an average structure height of approximately 85 feet. For additional information, please see Exhibit 3, which provides detailed information of the proposed height of the structures.

Q: WHY DID THE COMPANY CHOOSE STEEL POLES FOR THE REBUILD STRUCTURES AS COMPARED TO THE WOOD USED ON THE EXISTING SINGLE-CIRCUIT STRUCTURES?

A: The existing wooden transmission structures have age-related damage including woodpecker damage, which is typical for this area. Galvanized steel structures are a proven, durable,

reliable and efficient structure in this area, and generally have a longer lifespan than their wooden counterparts.

Q: WILL THE COMPANY EMPLOY LOW-COST AND EFFECTIVE MEANS TO IMPROVE THE AESTHETICS OF THE PROPOSED TRANSMISSION LINE?

A: Proposed structures will use dulled galvanized steel and the conductors will be non-specular. The foregoing measures are a low-cost and effective means of improving the aesthetics of the proposed transmission lines, and thus reduce the visual presence of the new structures.

Q: WHAT IS THE COMPANY'S OPINION ON THE PROPOSED ROUTE?

A: The Company supports the Siting Team's conclusion that the Proposed Route for the Project, which mainly uses the existing ROW, is the most suitable and reasonably avoids or minimize adverse impacts on landowners, historic resources and environment of the area concerned. See Section II.A.9 of the Response to Guidelines and the direct testimony of witness Pardis for a detailed description of the Proposed Route. The Company reasonably expects that it will be able to engineer, build, operate, and maintain the transmission line to be rebuilt efficiently and effectively with minimized adverse impacts on the environment.

Q: ARE THERE ANY DWELLINGS IN THE PROPOSED 100-FOOT-WIDE ROW FOR THE PROJECT?

A: A residence, a fire station and a business have encroached on the existing 100-foot ROW. Based on engineering analysis to date, the Project can be designed as to avoid the affected buildings in the conductor zone. Accordingly, and subject to completion of final engineering and ROW negotiations with affected landowners, the Company does not expect that any residences and/or public buildings located within the ROW will need to be removed to accommodate the rebuilt line. These locations are identified in Exhibit 3, GIS Constraints Map.

Q: PLEASE DESCRIBE ANY OTHER WORK RELATED TO THE CONSTRUCTION OF THE TRANSMISSION LINE PROJECT.

A: Temporary material laydown yards and access roads for structure erection and conductor stringing will be necessary. The final location and extent of required laydown yards and access roads cannot be determined until after completion of final line design, environmental studies and subsequent field reconnaissance by the Company's construction representatives and land agents.

The Project also requires installation of equipment at the Brush Tavern Substation in order to address low voltage concerns identified by operations during proposed construction outages for this Project and upcoming projects in the area. See Exhibit 13 for the substation layout, representative photographs, and Exhibit 13-C, which is confidential and filed under seal, for the one-line diagram.

Q: THERE ARE CURRENTLY FOUR LOCATIONS WHERE THIRD-PARTY CELLULAR ANTENNAS ARE COLLOCATED ON THE EXISTING TRANSMISSION STRUCTURES TO BE REBUILT. HOW WILL THESE COLLOCATIONS BE RESOLVED?

A: The Company will work with the Cellular Companies to determine the desire to perpetuate the collocation. Collocation poles for cellular antennas may impact the height and diameter of the transmission structure to accommodate cellular antenna requirements, which is discussed in Section II.B.3 of the Response to Guidelines.

Q: IS PLACING ALL OR PART OF THE TRANSMISSION LINES UNDERGROUND A REASONABLE OPTION?

A: No. The additional cost, reliability risks and environmental impacts associated with locating a line, in whole or in part, underground are not appropriate for this Project. Additionally, the

Proposed Route reasonably avoids or minimizes adverse impacts on people and the scenic assets, historic resources and environment of the area concerned.

Q: DESCRIBE THE CONSTRUCTION ACTIVITIES FOR THE TRANSMISSION LINE COMPONENTS OF THE PROJECT.

A: Project construction activities will include the installation and maintenance of soil erosion and sedimentation control measures; temporary access road construction; minimal grading for foundation, structure, equipment and wire installations; and the subsequent rehabilitation of all areas disturbed during construction. All required environmental compliance permits and studies will be completed and a stormwater pollution prevention plan will be developed and implemented under the state's "General Permit for Discharges of Stormwater from Construction Activities."

Q: IF THE COMMISSION GRANTS THE COMPANY'S APPLICATION TO CONSTRUCT AND OPERATE THE PROJECT, HOW LONG WILL IT TAKE TO COMPLETE AND PLACE IT IN SERVICE?

A: The construction plans for the Project, including the proposed construction sequence, are detailed in Section II.A.10 of the Response to Guidelines. Upon approval of the Project, the Company estimates that it will need approximately 18 months for engineering, design, ROW acquisition, permitting, material procurement, outage coordination and construction to place the entire Project in service.

Q: DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A: Yes.

APCo Exhibit No. ____
Witness: XL

DIRECT TESTIMONY OF
XIN LIU, P.E.
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S.C.C. CASE NO. PUR-2021-00049

APCo Exhibit No. ____
Witness: XL

SUMMARY OF DIRECT TESTIMONY OF XIN LIU, P.E.

My direct testimony supports Appalachian's Application and Response to Guidelines. I sponsor Section IV of the Response to Guidelines.

The portion of the Reusens – Altavista 138 kV transmission line to be rebuilt consists of a double-circuit section and a single-circuit section. The maximum electric and magnetic field ("EMF") levels expected to occur for the proposed double-circuit section at the edge of the 100-foot-wide ROW are 0.28 kilovolt per meter ("kV/m") and 14.08 milligauss ("mG"). The maximum EMF levels expected to occur for the proposed single-circuit section at the edge of the 100-foot-wide ROW are 0.80 kV/m and 15.39 mG, respectively.

The maximum EMF levels at the edge of the ROW for the existing double-circuit section of the line are 0.18 kV/m and 15.23 mG, respectively. The maximum EMF levels at the edge of the ROW for the existing single-circuit section of the line are 0.60 kV/m and 12.85 mG, respectively.

The Project also includes a slight relocation of the Reusens – South Lynchburg 138 kV transmission line where it crosses the Reusens – Altavista 138 kV transmission line. The maximum EMF levels expected to occur at the edge of the proposed 100-foot-wide ROW at this relocation are 0.20 kV/m and 4.31 mG, respectively. The maximum existing EMF levels at the edge of the ROW of this line are 0.24 kV/m and 4.30 mG, respectively.

These maximum EMF levels for the proposed transmission line are typical and expected results for such transmission lines, and are well within the limits specified in the Institute of Electrical and Electronics Engineers ("IEEE") Standard C95.6™-2002, which sets the safety levels with respect to human exposure to electromagnetic fields.

Appalachian considered the presence and proximity of dwellings, schools, hospitals, and other community facilities as features to avoid wherever practical during its route review process in order to minimize EMF exposure. No significant adverse health effects will result from the rebuild construction and operation of the Project. Section IV of the Response to Guidelines provides further documentation and detail regarding the absence of adverse health effects from the construction and operation of the Project.

DIRECT TESTIMONY OF
XIN LIU, P.E.
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S.C.C. CASE NO. PUR-2021-00049

Q: PLEASE STATE YOUR NAME, PRESENT POSITION AND BUSINESS ADDRESS.

A: My name is Xin Liu. I am the Manager of System Performance Analysis for American Electric Power Service Corporation ("AEPSC"). AEPSC is a subsidiary of American Electric Power Company, Inc. ("AEP") that provides corporate support services to the operating subsidiaries of AEP, including Appalachian Power Company ("APCo," "Appalachian" or "Company"). My business address is 8500 Smiths Mill Road, New Albany, Ohio 43054.

Q: PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A: I received a Master of Science degree and a Ph.D. degree, both in Electrical Engineering, from The Ohio State University. I am a senior member of the Institute of Electrical and Electronics Engineers ("IEEE"), and a licensed professional engineer in the state of Ohio. I joined AEPSC in 2006 as an Engineer; was promoted to Senior Engineer in 2008, was promoted to Principal Engineer in 2012 and promoted to Manager, System Performance Analysis in 2016.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A: The purpose of my testimony is to support certain aspects of Appalachian's Application to this Commission for approval and certification of the Project.

Q: WHICH SPECIFIC MATERIALS INCLUDED IN THE APPLICATION ARE YOU SPONSORING?

A: I am sponsoring Section IV, Health Aspects of EMF, of the Response to Guidelines filed by the Company in response to the Commission Staff's "Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia."

Q: WERE THE PORTIONS OF THE FILING THAT YOU ARE SPONSORING PREPARED BY YOU OR UNDER YOUR SUPERVISION AND DIRECTION?

A: Yes.

Q: WHAT IS EMF?

A: "EMF" is an acronym for electric and magnetic fields, which exist wherever there is a flow of electricity. Electric transmission and distribution lines, electrical wiring in homes, and electric appliances all have electric and magnetic fields associated with their use. Electric fields are produced by the voltage gradient between a power line and ground; their strength is dependent upon the voltage difference of the energized line to ground, the physical characteristics of the line, and the distance from the line to the observation point at which the field strength is measured. The electric field strength is commonly measured in kilovolts per meter ("kV/m"). Magnetic fields are created by the flow of electric current in a conductor. The magnetic field density generated by a transmission line varies with the load current of the line, the physical characteristics of the line, and the distance from the line to the observation point at which the magnetic field density is measured. The magnetic field density is measured in units known as gauss, or milligauss ("mG"). The electric and magnetic fields associated with power lines and electric appliances in the United States have a frequency of 60 hertz ("Hz"), or 60 cycles per second.

Q: PLEASE DETAIL FOR THE COMMISSION YOUR EXPERIENCE IN CALCULATING AND ANALYZING EMF.

A: I have over 18 years of experience conducting, managing and directing the calculation and analysis of a variety of issues in power systems for safe, reliable, economic and environmentally-compatible operation of power equipment and transmission lines, for high-voltage grid development, for system voltage coordination, for power quality, and for development and implementation of advanced technologies. I have been a teaching assistant at the High Voltage Lab at the Ohio State University for six years while conducting and teaching EMF-related experiments. I also have extensive experience measuring the EMF under a transmission line through many research projects at the Ohio State University as well as field testing at AEP.

Q: WHAT ARE THE CALCULATED MAXIMUM EMF LEVELS ASSOCIATED WITH THE PROPOSED TRANSMISSION LINE IN THIS PROJECT?

A: As set forth in Section IV.A of the Response to Guidelines, the maximum EMF levels expected to occur at the edge of the proposed 100-foot-wide right-of-way ("ROW") for the double-circuit section are 0.28 kV/m and 14.08 mG, respectively. The maximum EMF levels expected to occur at the ROW edge for the single-circuit section are 0.80 kV/m and 15.39 mG, respectively. The maximum EMF levels for the existing double-circuit section of the line are 0.18 kV/m and 15.23 mG, respectively. The maximum EMF levels for the existing single-circuit section of the line are 0.60 kV/m and 12.85 mG, respectively.

The Project also includes a slight relocation of the Reusens – South Lynchburg 138 kV transmission line where it crosses the Reusens – Altavista 138 kV transmission line, and which is also where the Project transitions from double-circuit to single-circuit. The maximum EMF levels expected to occur at the edge of the proposed 100-foot-wide ROW at

this relocation are 0.20 kV/m and 4.31 mG, respectively. The maximum existing EMF levels at the edge of the ROW of this line are 0.24 kV/m and 4.30 mG, respectively.

Q: ARE THE CALCULATED MAXIMUM EMF LEVELS FOR THE PROPOSED TRANSMISSION LINE EXTRAORDINARY?

A: No. They are typical and expected results for such transmission lines. Both EMF levels drop sharply from the centerline to the edge of the ROW and will continue to drop with distance from the ROW edge. These field levels are well within the limits specified in IEEE Standard C95.6™-2002, which sets the safety levels with respect to human exposure to electromagnetic fields.

Q: IS THE PROPOSED ROUTE FOR THE PROJECT A PRUDENT CHOICE TO REDUCE EMF LEVELS?

A: Yes. From an EMF perspective, the Company's Proposed Route is a prudent choice and consistent with the intent of both the Virginia Department of Health and World Health Organization, which promote public safety relative to EMF. For a description of the Company's Proposed Route, please see witness Pardis' testimony.

Q: WERE PRUDENT AVOIDANCE MEASURES UTILIZED DURING THE ROUTE SELECTION PROCESS IN ORDER TO MINIMIZE EMF EXPOSURE?

A: Yes. The presence and proximity of dwellings, schools, hospitals, and other community facilities were considered throughout the route selection process as features to avoid, to the extent practical, as described in the direct testimony of witness Pardis.

Q: DOES THE COMPANY HAVE AN OPINION ON WHETHER ANY SIGNIFICANT ADVERSE HEALTH EFFECTS WILL RESULT FROM THE CONSTRUCTION AND OPERATION OF THE PROJECT?

A: Based upon the Company's ongoing review of the scientific literature on EMF, the Company's experience with its existing 138 kV transmission lines, and the fact that the calculated maximum EMF levels at the edges of the ROW for the proposed line are well within the limits specified in IEEE Standard C95.6™-2002, the Company is of the opinion that no significant adverse health effects will result from the construction and operation of the Project. This position is consistent with the conclusions expressed in the final report to the Virginia General Assembly, dated October 31, 2000, by Vickie L. O'Dell and Khizar Wasti, Ph.D. of the Virginia Department of Health, in association with this Commission, entitled "Monitoring of Ongoing Research on the Health Effects of High Voltage Transmission Lines (Final Report)" and subsequent assessments as listed in Section IV of the Response to Guidelines.

Q: DOES THIS CONCLUDE YOUR TESTIMONY?

A: Yes.

APCo Exhibit No. ____
Witness: RAP

DIRECT TESTIMONY OF
ROYA A. PARDIS
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S.C.C. CASE NO. PUR-2021-00049

APCo Exhibit No. ____
Witness: RAP

SUMMARY OF DIRECT TESTIMONY OF ROYA A. PARDIS

My direct testimony supports the Project's route review study and environmental analysis of Appalachian's Application and Response to Guidelines, including specifically:

- Exhibit 1: Project Area Map
- Exhibit 3: GIS Constraints Map
- Exhibit 12: Visual Simulations
- Exhibit 14: Public Notice Map
- Sections II.A.2, 3, and 9 of the Response to Guidelines and the information concerning scenic, environmental, and historic features set forth in Section III of the Response to Guidelines.
- The entirety of Volume 2 of the Application, which includes the *Reusens to New London 138 kV Rebuild Siting Memo* (the "Siting Memo") and Virginia Department of Environmental Quality Supplement (the "VDEQ Supplement") with their respective attachments, figures, tables, photographs, and maps.

I also describe the methods used by the Siting Team, which included representatives of the Company and POWER Engineers, Inc. ("POWER"), in conducting the route review and the submitted in support of Appalachian's Application, and discuss the Proposed Route for the Project.

The Siting Team used a traditional siting methodology that began with reviewing the existing ROW to confirm the ability to rebuild the Project on the existing centerline. The Siting Team's analysis shows that the Proposed Route for the Project is the most suitable and minimizes overall human and natural environment impacts by maximizing the use of existing ROW. The Project is not anticipated to affect any federally- or state-protected species, but habitat studies or species-specific surveys will be conducted prior to construction to ensure compliance with existing environmental regulations and laws.

DIRECT TESTIMONY OF
ROYA A. PARDIS
FOR APPALACHIAN POWER COMPANY
IN VIRGINIA S. C. C. CASE NO. PUR-2021-00049

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Roya A. Pardis. My current business address is 11 S. 12th Street, Suite 315, Richmond, Virginia 23219.

Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?

A. I serve as an Environmental Planner in the Central Environmental Service Project Management Division at POWER Engineers, Inc. ("POWER").

Q. DOES POWER HAVE EXPERIENCE IN ENVIRONMENTAL ANALYSIS AND ROUTING TRANSMISSION LINES AND IDENTIFYING SUBSTATION SITES?

A. Yes. POWER was founded in 1976 and employs more than 2,700 employees nationwide and overseas. POWER has successfully sited and/or permitted over 400 transmission line projects covering thousands of miles of high voltage transmission lines and associated facilities. Further, POWER has previously supported or provided written testimony to this Commission for five Appalachian projects, including the Central Virginia Transmission Reliability Project (SCC Case No. PUR-2021-00001), Glendale Area Improvements 138 kV Transmission Project (SCC Case No. PUR-2018-00188), South Abingdon 138 kV Extension transmission line (SCC Case No. PUE-2016-00011), the Huntington Court-Roanoke 138 kV transmission line (SCC Case No. PUE-2008-00096), and the Matt Funk 138 kV transmission line (SCC Case No. PUE-2008-00079).

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. No; however, I have provided support on the Company's two previous filings to the Commission, which include the Central Virginia Transmission Reliability Project and Glendale Area Improvements 138 kV Transmission Project.

Q. WHAT IS YOUR ROLE WITH APPALACHIAN'S PROPOSED PROJECT?

A. I serve as the lead Siting Specialist providing management and oversight for the Project's route review process and environmental analysis.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to support the route review process and environmental analysis completed as part of the Company's Application to this Commission for approval and certification of the proposed Project. For this Application, I am sponsoring various sections of the Response to Guidelines filed by Appalachian together with the Application in response to the Commission Staff's "Guidelines for Transmission Line Applications Filed under Title 56 of the Code of Virginia," as well as the Siting Memo and the VDEQ Supplement filed with the Application.

Q. WHICH SPECIFIC MATERIALS ARE YOU SPONSORING?

A. In Volume 1 of the Application, I am sponsoring:

- Exhibit 1 (the "Project Area Map").
- Exhibit 3 (the "GIS Constraints Map").
- Exhibit 12 (the "Visual Simulations").
- Exhibit 14 (the "Public Notice Map").

- Sections II.A.2, 3, and 9, of the Response to Guidelines; and the information concerning scenic, environmental, and historic features set forth in Section III of the Response to Guidelines.
- The entirety of Volume 2 of the Application, which includes the Siting Memo and the VDEQ Supplement, and their respective attachments, figures, tables, photographs and maps.

Q. WERE THE PORTIONS OF APPALACHIAN POWER'S FILING THAT YOU ARE SPONSORING PREPARED BY YOU OR UNDER YOUR SUPERVISION AND DIRECTION?

A. Yes.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. In 2015, I received a Bachelor of Science degree in Environmental Policy and Planning from Virginia Tech and in 2018, I received a Master of Business Administration from the Virginia Commonwealth University. I have been associated with POWER since 2017 and have had technical and supervisory roles for multiple electric utility transmission siting projects, many of which have been associated with the Company. In my previous experience, I was the Environmental Compliance Coordinator and Interim Director of Community Development for a locality in eastern Virginia. I have a combined seven years of experience working on the siting of electric transmission lines and land use planning. I routinely oversee the work of and help support POWER technical staff members responsible for siting aspects of POWER's transmission line projects. I have served as an Environmental Planner or Lead Siting Specialist or otherwise supported

routing, siting, planning and permitting for transmission line projects, particularly in Virginia, West Virginia, Kentucky, South Carolina, and Florida.

Q. SPECIFICALLY, HOW IS THIS PRIOR EXPERIENCE APPLICABLE TO THE CURRENT PROJECT?

A. My experience siting electrical facilities across various land use types such as developed (densely populated or planned for development) and undeveloped (agricultural, forested, or mountainous) has given me extensive knowledge and understanding of routing opportunities and constraints. I aided in the route development and selection studies for transmission line projects submitted to this Commission that were located in areas similar to the Project area.

This experience has equipped me to determine the types of information and analyses necessary to develop a transmission line route that minimizes impacts to the natural environment, land use, and visual, recreational and cultural resources, while also considering engineering concerns and constructability issues. Minimizing impacts on the scenic assets, historic districts, and environment of the area are primary route selection objectives for the Company.

Q. PLEASE DESCRIBE FOR THE COMMISSION YOUR PRIMARY DUTIES AS RELATED TO THE PROPOSED PROJECT.

A. POWER was retained by Appalachian to develop and evaluate the portion of the Reusens – Altavista 138 kV transmission line to be rebuilt. As the lead Siting Specialist for the Project, my primary duties involved planning, organizing, coordinating and controlling activities related to (a) identifying constraints in evaluating the use of existing ROW for the Project; and (b) selecting a Proposed Route that reasonably minimizes adverse

impacts on the scenic assets, historic districts and environment of the Project area, and is consistent with Project routing and technical criteria. The Siting Team assisted with the evaluation of the Project.

Q. WHO WAS ON THE SITING TEAM?

A. The Siting Team for the Project consisted of a multi-disciplinary team, including employees of POWER, Appalachian, and other consultants retained by or on behalf of the Company, who supported the route review and public involvement process. The Siting Team members have experience in transmission line siting, impact assessment for a wide variety of natural resources and the human environment, and impact mitigation. Additionally, members of the Siting Team have experience in disciplines such as transmission line, substation, and distribution engineering, ROW, public outreach, outage planning and construction management.

Q: DID THE SITING TEAM CONSIDER ISSUES AND CONCERNS ADDRESSED IN THE VIRGINIA ENVIRONMENTAL JUSTICE ACT (VIRGINIA CODE SECTIONS 2.2-234 AND 235)?

A: The Virginia Environmental Justice Act was enacted in April 22, 2020 and went into effect on July 1, 2020. It is the Company's long-standing practice in its route review and route development processes to avoid or reasonably minimize impacts to the human environment, which includes environmental justice communities and fenceline communities within the meaning of the Act. For the Project, the Company is using the existing ROW, which has been in place for more than 70 years and will not be relocated to other communities not already affected by the transmission line. The Company believes that the route review employed by the Siting Team, as described in more detail

in my testimony below, is consistent with the goals of the Act.

Q. PLEASE DESCRIBE FOR THE COMMISSION THE PURPOSE OF THE SITING MEMO FOR THE PROJECT.

A. The primary purpose of the Siting Memo is to document the route review and proposed route selection for the Project. The Siting Memo summarizes the siting methodology of reviewing the existing ROW and evaluating the constraints and opportunities within the Project area. Consequently, the Siting Memo discusses the natural and human environment constraints and opportunity, documents public involvement, and describes the selection of a Proposed Route between the Reusens and New London substations. The Siting Memo is included in Volume 2 of the Application.

Q. PLEASE DESCRIBE THE SITING METHODOLOGY EMPLOYED FOR THE PORTION OF THE REUSENS – ALTAVISTA 138 KV TRANSMISSION LINE TO BE REBUILT.

A. The methodology employed by the Siting Team includes a review of the existing ROW and is summarized in Section II.A.9 of the Response to Guidelines and is described in the Siting Memo (included in Volume 2 of the Application).

Q. PLEASE DESCRIBE THE REVIEW OF THE EXISTING ROW.

A. The Company's route review methodology for transmission line rebuild projects begin with a review of existing ROW. The existing ROW crosses predominantly forested areas, agricultural, pasturelands, and commercially developed land uses and residential areas in the City of Lynchburg and Bedford County. Using the existing ROW generally minimizes impacts on the natural and human environments, including minimizing tree clearing, and is a significant opportunity for the Project. Specifically, this approach is

consistent with Sections 56-46.1 and 56-259 of the Code of Virginia ("Code"), which provide that existing ROWs should be given priority when adding new transmission facilities, and which promote the use of existing ROW for new transmission facilities. Various methods of data collection were employed to review the existing ROW and is further discussed in the Siting Memo.

Q. DID THE COMPANY CONSIDER STAKEHOLDER AND PUBLIC INPUT DURING THE REVIEW OF EXISTING ROW?

A. Public participation and stakeholder input is important to Appalachian and used during the review of existing ROW. 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 review process. Twenty-seven agencies were contacted on October 16, 2020 as part of the data collection effort and six responses have been received to date. Copies of the agency letters, contact list, and correspondence are included in Attachment C of the Siting Memo in Volume 2.

An in-person public open house was not advisable, given the travel restriction and social distancing recommendations and requirements of the Centers for Disease Control and Prevention and the Executive Orders issued by the Governor of the Commonwealth during the COVID-19 pandemic. In lieu of an in-person public meeting, a virtual open house was created on the Project website (www.AppalachianPower.com/Reusens-NewLondon). The Project was publicly announced with a news release and virtual open house on October 9, 2020. Landowners within a 500-foot corridor (250 feet on either side of a route centerline) of the transmission line to be rebuilt were notified. The public

involvement process and extent of comments received is further detailed in Section 2.4 of the Siting Memo. The public notice map is included as Exhibit 14.

Q. WHY WERE ALTERNTIVE ROUTES NOT CONSIDERED FOR THE PROJECT?

A. Alternative routes were not considered for the Project given the opportunity to use existing ROW, which is consistent with Sections 56-46.1 and 56-259 of the Code and minimizes impacts of the natural and human environments.

Q. ARE THERE ANY AREAS WHERE THE PROJECT PROPOSES TO REBUILD OFF THE CENTERLINE OF THE EXISTING ROW?

A. The Project will be constructed largely within existing ROW; however, two minor deviations from the existing centerline will be required to optimize the design or avoid constraints. The first deviation occurs at the crossing with the Reusens – South Lynchburg 138 kV transmission line, which is also where the Project transitions from double-circuit to single-circuit. The second deviation occurs between proposed structures 4-41A and 4-47A on the Colonial Hills Golf Club course. These relocations are shown in Exhibit 3 and further described in Section II.A.4 of the Response to Guidelines in Volume 1 and in the Siting Memo in Volume 2.

Q. PLEASE DESCRIBE TO THE COMMISSION THE PROPOSED ROUTE FOR THE PROJECT.

A. The Proposed Route for the Project is 11.6 miles long and includes two minor deviations from the existing centerline to optimize the design or avoid constraints. The double-circuit section of the Proposed Route begins at the Reusens Substation, off Old Trents Ferry Road, and continues in existing ROW for approximately 5.5 miles through the City

of Lynchburg. The first deviation occurs at the crossing with the Reusens – South Lynchburg 138 kV transmission line (between proposed structures 4-30A and 4-32A). At the first deviation, the centerlines of the Reusens – Altavista 138 kV transmission line will be shifted approximately 40 feet to the west and the Reusens – South Lynchburg 138 kV transmission line approximately 40 feet to the southwest in order to co-locate the conductors onto the proposed structure 4-31A. The Proposed Route transitions to single-circuit at proposed structure 4-31A and continues in existing ROW until the second deviation occurs between proposed structures 4-41A and 4-47A on the Colonial Hills Golf Club course in order to minimize recreational impacts to the fairways and greens of the course. From the Colonial Hills Golf Club, the Proposed Route continues in existing ROW to the New London Substation in Bedford County. The Proposed Route is depicted in Exhibit 3, GIS Constraints Map. Photo simulations of the existing and proposed structures are provided in Exhibit 12.

Q. PLEASE DESCRIBE TO THE COMMISSION THE FILING CORRIDOR USED FOR THE PROPOSED ROUTE?

A. An approximately 100-foot-wide ROW will be sited within an approximately 200-foot-wide filing corridor. The corridor allows for flexibility to shift the centerline no more than 50 feet in either direction from the proposed centerline, as necessary and after completion of ground surveys, environmental studies, additional interviews with landowners, and final engineering. Nonetheless, the Company believes the Proposed Route for the Project is the most suitable alignment as it uses an existing ROW for the majority of its length. The Filing Corridor was widened from 200 feet to 250 feet in one location to allow for additional landowner discussions and engineering where the

Proposed Route crosses the Colonial Hills Golf Club course. The Filing Corridor also includes the portion of the Reusens – South Lynchburg 138 kV transmission line ROW, which will be slightly relocated as a result of the Project. The Filing Corridor for the Project is depicted in Exhibit 3, GIS Constraints Map.

Q. PLEASE DESCRIBE THE VIRGINIA OUTDOORS FOUNDATION ("VOF") CONSERVATION EASEMENTS, AS IT PERTAINS TO SECTIONS 10.1-1009 – 1016 OR 10.1-1700 – 1705 OF THE CODE, WHICH ARE CROSSED BY THE PROJECT.

A. The existing ROW crosses three existing Virginia Outdoors Foundation ("VOF") conservation easements, one of which requires a small deviation from the existing centerline (see Map Tile 5 of Exhibit 3, GIS Constraints Map). The Company requested comments on the Project from the VOF in a letter dated October 16, 2020 and met virtually with staff on October 19, 2020 to discuss the Project. Members of the Project Team discussed where the Project deviates from the existing ROW on one of the VOF easements, at the Reusens – Altavista and Reusens – South Lynchburg 138 kV transmission lines crossing. After a review of the current easements, the Company submitted a summary of rights and exhibit to the VOF. The VOF staff reviewed the Company's summary of land rights provided to them on January 19, 2021 and agreed with the conclusions that the existing easement grants the right to build, operate, and maintain both 138 kV lines crossing the parcel and no additional documentation from the VOF was required for the slight deviation (see the Siting Memo in Volume 2).

Q. IS IT ANTICIPATED THE PROJECT WILL AFFECT ANY FEDERALLY OR STATE PROTECTED SPECIES?

A. No. Habitat studies or species-specific surveys will be conducted prior to construction to ensure protected species impacts are avoided or mitigated to the extent practicable. Compliance with existing regulations and laws relating to protected species is of high importance to Appalachian.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

RESPONSE TO GUIDELINES

SECTION I. NECESSITY FOR THE PROPOSED PROJECT

A. State the primary justification for the proposed project (for example, the most critical contingency violation including the first year and season in which the violation occurs). In addition, identify each transmission planning standard(s) (of the Applicant, regional transmission organization ["RTO"], or North American Electric Reliability Corporation) projected to be violated absent construction of the facility.

Response:

The proposed Reusens to New London 138 kV Rebuild Project (the "Project") involves rebuilding an 11.6-mile portion of an existing 138 kV transmission line asset due to the infrastructure's inability to meet current National Electrical Safety Code ("NESC") standards, inadequate lightning protection and age-related deterioration of the infrastructure. The transmission line to be rebuilt is over 70 years old, contains numerous open conditions, has high outage exposure risk to area customer load, has poor lightning protection with documented lightning outage history, and does not comply with current NESC standards.

The purpose of the Project is to address the combination of risk, condition and performance of the infrastructure in order to maintain reliability of the existing transmission network that serve customers in the region. The 11.6-mile section of the Company's existing Reusens – Altavista 138 kV transmission line to be rebuilt is located in Bedford County and the City of Lynchburg, Virginia, which is in the southeastern part of Appalachian's service territory. A map of the Project and surrounding Lynchburg area transmission system is shown in Figure 1 below. The Lynchburg area encompasses industrial, commercial and residential load. Major customers in the area include Liberty University, the Lynchburg Regional Airport, heavily commercial districts, and densely populated suburban areas. Due to the limited amount of generation within the eastern portion of Appalachian's service territory, the customers in the Lynchburg area depend on the reliability of the transmission system that transfers power from generating facilities located farther away on the transmission system.

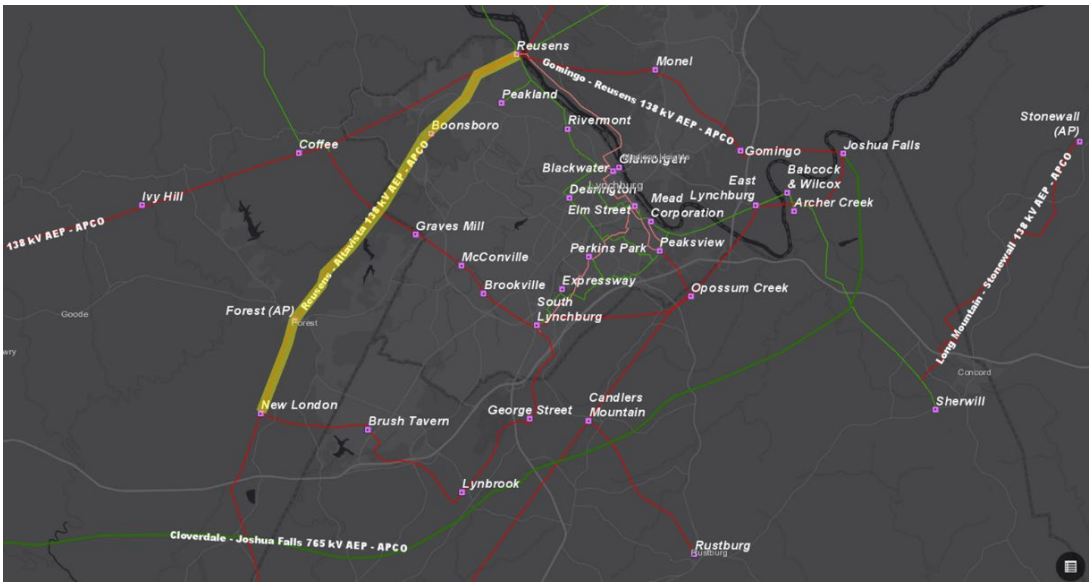


Figure 1
Project Area and Surrounding Lynchburg Transmission System

Today, AEP's transmission system consists of approximately 40,000 miles of transmission lines, 3,600 stations, 5,000 power transformers, 8,000 circuit breakers, and operating voltages between 23 kV and 765 kV in three different RTOs, connecting over 30 different electric utilities while providing service to over 5.4 million customers in 11 different states. AEP's interconnected transmission system was established in 1911 and is comprised of a large and diverse combination of line, station and telecommunication assets. AEP is obligated to manage and maintain this diverse set of assets to provide for a safe, adequate, reliable, flexible, efficient, and cost-effective and resilient transmission system that meets the needs of all customers while complying with federal, state, RTO and industry standards. This requires that AEP determine when the useful life of these transmission assets is coming to an end so that appropriate improvements can be deployed. AEP identifies these needs through the criteria and guidelines set forth in a document entitled AEP Transmission Planning Criteria and Guidelines for End-Of-Life and Other Asset Management Needs, a current copy of which is included as Exhibit 2. This document constitutes the transmission planning criteria and guidelines for End-Of-Life and other asset management needs as required in the Federal Energy Regulatory Commission ("FERC")-approved Attachment M-3 to the PJM Tariff.

Annually, AEP identifies and addresses transmission asset condition, performance and risk through a three step process.

Step one is the Needs Identification. AEP gathers information from many internal and external sources to identify assets with various needs. Internal sources include inspection reports on asset conditions, reports of outages resulting from equipment failures or inadequate lightning protection, and reports on abnormal conditions. External sources include stakeholder input, customer feedback, and RTO or Independent System Operator issued notices. AEP also reviews assets for compliance with industry standards and guidelines for design, safety and other issues. These inputs are reviewed and analyzed to

identify the transmission assets that are exhibiting unacceptable condition, performance, and risk.

AEP's Needs Identification methodology considers factors including severity of the asset condition and overall system impacts. In assessing the condition of transmission line assets, AEP considers factors such as age, structure type (wood, steel, lattice), conductor type, static wire type, shielding and grounding design criteria, and NESC standards compliance (structural strength, clearances, etc.). AEP also considers the physical condition, such as the open conditions on the transmission line assets.

Needs Identification also assesses the historical performance of the asset in question, including outage rates, outage durations, customer minutes of interruption (CMI), number of customers interrupted (CI), and system average interruption indices. AEP also determines the asset's level of risk by reviewing the severity of the reported condition of the asset and the possible impact to customers and to the AEP transmission system from an outage. AEP keeps in mind certain equipment that has resulted in operational, restoration, environmental, or safety issues in the past that cannot be directly quantified, but that remain as acknowledged risks. These include things such as wood pole construction, poor lightning and grounding performance, and radial facilities.

Step two is the Solution Development. AEP applies appropriate industry standards, engineering judgment, and good utility practices to develop solution options. AEP solicits customer and external stakeholder input on potential solutions through stakeholder summits and the PJM Project Submission process. Solution options consider many factors such as environmental condition, community impacts, land availability, permitting requirements, customer needs, system needs, and asset conditions in ultimately identifying the best solution to the identified need. Selected solutions are then reviewed to determine if the proposed solution does not adversely impact or create baseline planning criteria violations on other parts of the system. AEP then considers the existing portfolio of baseline planning criteria driven projects to see if there can be a combination of projects into a more efficient and cost-effective solution.

Step Three is the Solution Scheduling. Solution Scheduling depends on factors such as severity of the asset condition, overall system impacts, outage availability, siting requirements, availability of labor and material, constructability, and available capital funding. AEP uses its discretion and engineering judgment to determine suitable timelines for project execution.

Following the application of the above criteria, the Company determined that a portion of the Reusens – Altavista 138 kV transmission line (between Reusens and New London substations) needs to be rebuilt due to the combination of risk, condition and performance of the infrastructure. The line segment subject to this Application carries portions of two electrical circuits, New London – Reusens 138 kV and McConville – Reusens 138 kV circuits, which connect to several area substations serving various amounts of customer load. The customer risk associated with these circuits is a combined peak load of approximately 100 MVA. The documented condition and performance of the line, discussed below, further raises the risk of future outage impacts associated with this line.

Between the Reusens Substation and the New London Substation, the Reusens – Altavista 138 kV transmission line asset consists of an approximately 5.5-mile double-circuit section between the Reusens Substation and existing structure 5-10, and an approximately 6.1-mile single circuit section between existing structure 5-10 and the New London Substation.

The Company constructed the double-circuit transmission line in 1949 using double-circuit steel lattice towers, which are now over 70 years old. The self-supporting steel lattice towers are protected by galvanizing that is corroding. Once the galvanizing has been depleted, bare steel will experience an accelerated deterioration rate. The lattice towers on this line are supported by buried steel foundations and the tower legs are showing corrosion at the ground intersection point. Another issue is that the typical lattice steel structure used during the time of construction fails to comply with the 2017 NESC Grade B loading criteria, fails to comply with current AEP structural strength requirements, and fails to comply with the current American Society of Civil Engineers ("ASCE") structural strength requirements. Additionally, the shield wire and most of the conductor are also over 70 years old. Insulators have experienced arcing damage from flashover events. The connecting elements including the tower attachment holes and the insulator hooks also have experienced serious section loss due to corrosion and wear. This loss of metal cross-section significantly reduces the capacity of the connections.

The Company constructed the single-circuit transmission line in 1949 using wood H-frame structures, which are now over 70 years old. Typical structural degradation on this segment includes pole and crossarm splitting, rot, decay, woodpecker damage, and pole cavities. The wood pole structure used during the time of construction, fails to comply with 2017 NESC Grade B loading criteria, fails to comply with current AEP structural strength requirements, and fails to comply with the current ASCE structural strength requirements. Additionally, the shield wire and most of the conductor are also over 70 years old. Insulators have experienced arcing damage from flashover events.

Additional concerns related to the entirety of this Reusens – Altavista 138 kV transmission line segment include the inadequate shielding from lightning strikes, outage history, and the poor condition of the structures. The existing shielding angle for the shield wire is 50 degrees (°). This angle fails to comply with current standards, which specify a maximum shielding angle of 30°. The current shielding angle leaves the overhead conductor more susceptible to lightning strikes; therefore, the line is at a greater risk of outages during lightning events, negatively affecting power quality. As shown below in Section I.K, seven of the twelve outages recorded in the past five years (2016-2020) were attributed to lightning. Further, as shown below in Section I, there are thirteen structures with at least one open structural condition. In total, these thirteen structures represent 18% of the structures between the Reusens and New London Substations. Open conditions include woodpecker damage, corrosion, insect damage, and rot.

If approved, the Project would enable the Company to maintain the overall long-term reliability of its transmission system. The Company proposes the following improvements with the submittal of this Application:

- Rebuild an 11.6-mile portion of the Reusens – Altavista 138 kV transmission line asset between the Company's Reusens Substation and New London Substation.

- Install a 57.6 MVAr cap bank at Brush Tavern Substation to address low voltage concerns identified by operations during proposed construction outages for this Project and upcoming projects in the area.

- Remove two structures and replace with one structure on the Reusens – South Lynchburg 138 kV transmission line where it crosses the Reusens-Altavista 138 kV transmission line in order to co-locate the two transmission lines onto one new structure at the point of intersection.

AEP is a member of PJM Interconnection, LLC ("PJM"), the regional transmission organization that operates to a large portion of the eastern United States ("U.S."). PJM oversees the ongoing Regional Transmission Expansion Plan ("RTEP") process to ensure that the regional transmission system owned by its members can reliably meet the projected demand of the customers served by that system.

Outcomes of the RTEP process include three types of transmission system upgrades or projects: (i) baseline upgrades are those that address planning criteria violations caused by network load; (ii) network upgrades are those that address planning criteria violations caused by proposed generation, merchant transmission, or long-term firm transmission service requests; and (iii) supplemental projects are those that are initiated by the transmission owner in order to interconnect new customer load, address degraded equipment performance, improve operational flexibility and efficiency, and increase infrastructure resilience.

Supplemental projects are planned subject to the Attachment M-3 process wherein Transmission Owners review assumptions, needs, and solutions with PJM stakeholders through the regional and sub-regional RTEP meetings to solicit input and feedback from stakeholders. PJM then performs do-no-harm analysis for all supplemental solutions to ensure proposed solutions do not cause any reliability violations before those projects are submitted for inclusion into the Local Plan and integration into the RTEP. The components of the Project (as outlined above) have been presented to PJM stakeholders through the Attachment M-3 process. PJM has completed the do-no-harm analysis and assigned project number s2192 to the Project. The Company developed the Project as a comprehensive solution to address the asset renewal needs and is seeking approval to complete this work.

B. Detail the engineering justifications for the proposed project (for example, provide narrative to support whether the proposed project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Applicant's system, etc.). Describe any known future project(s), including but not limited to generation, transmission, delivery point or retail customer projects, that require the proposed project to be constructed. Verify that the planning studies used to justify the need for the proposed project considered all other generation and transmission facilities impacting the affected load area, including generation and transmission facilities that have not yet been placed into service. Provide a list of those facilities that are not yet in service.

Response:

(1) Engineering Justification for Project

The Project pertains to an existing 138 kV line asset which is over 70 years old and which needs to be rebuilt due to the combination of risk, condition and performance of the infrastructure. For a detailed description of the engineering justification of the proposed Project, see Section I.A.

(2) Known Future Projects

There are no known future projects that require the Project to be constructed. The Project is required by the Company's asset-renewal criteria as described in Section I.A and to continue service to the existing customers directly connected to the line at Boonsboro and Forest Substations. PJM completed do-no-harm analysis as part of the submittal of the Project, which considers all known future generation and transmission facilities in the area. PJM found no reliability issues with the Project and assigned supplemental ID s2192.

(3) Planning Studies

See Section I. D.

(4) Facilities List

Not applicable.

C. Describe the present system and detail how the proposed project will effectively satisfy present and projected future electrical load demand requirements. Provide pertinent load growth data (at least five years of historical summer and winter peak demands and ten years of projected summer and winter peak loads where applicable). Provide all assumptions inherent within the projected data and describe why the existing system cannot adequately serve the needs of the Applicant (if that is the case). Indicate the date by which the existing system is projected to be inadequate.

Response:

The portion of the Reusens – Altavista 138 kV transmission line to be rebuilt directly serves customers at the Boonsboro and Forest substations, which are located in the City of Lynchburg and Bedford County, Virginia, respectively (see Figure 2).

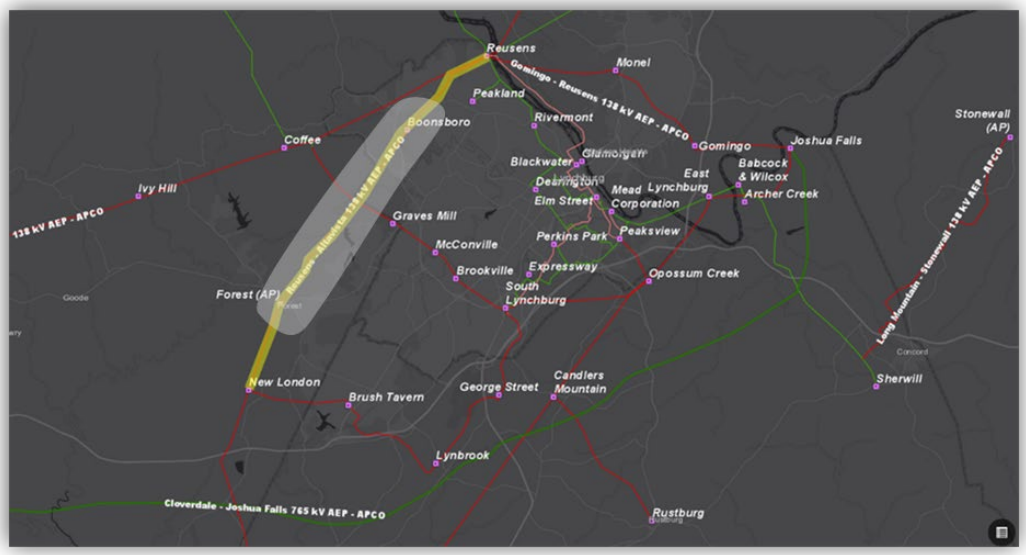


Figure 2
Load Area (Boonsboro and Forest Substations)

AEP developed a load forecast for the Load Area using an econometric model that forecasts peak demand. This model had explanatory variables for the gross regional product for Bedford County and the City of Lynchburg, the combined, minimum and maximum temperatures on the day of the peak and binary variables. The Load Area is winter peaking. The model used historical data for the period from the winter of 2010/11 through winter of 2019/20. Gross county product forecast data were obtained from Moody's Analytics. AEP developed forecasts of maximum and minimum temperatures on the day of the peak from an average of historical temperatures.

Tables 1 and 2 and Figures 3 and 4 show historical and projected summer and winter peak loads for the Load Area. These figures show the actual summer and winter peak loads for the previous ten years and the projected summer and winter peak loads for the next ten years.

Reusens-New London 138 kV Load Area

	Actual Peak Load (MW)										Projected Peak Load (MW)									
Summer	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Peak	48.5	50.4	48.1	47.3	48.0	48.5	47.9	48.4	50.2	49.2	50.7	51.9	52.7	53.3	53.8	54.3	54.9	55.4	56.0	56.5

Table 1
Historical and Forecasted Summer Peak Load Data

Reusens-New London 138 kV Load Area

	Actual Peak Load (MW)										Projected Peak Load (MW)									
Winter	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Peak	61.1	53.7	57.7	67.6	69.1	61.2	66.3	67.8	62.4	58.0	63.2	65.0	66.1	67.0	67.6	68.3	69.0	69.7	70.4	71.1

Table 2
Historical and Forecasted Winter Peak Load Data

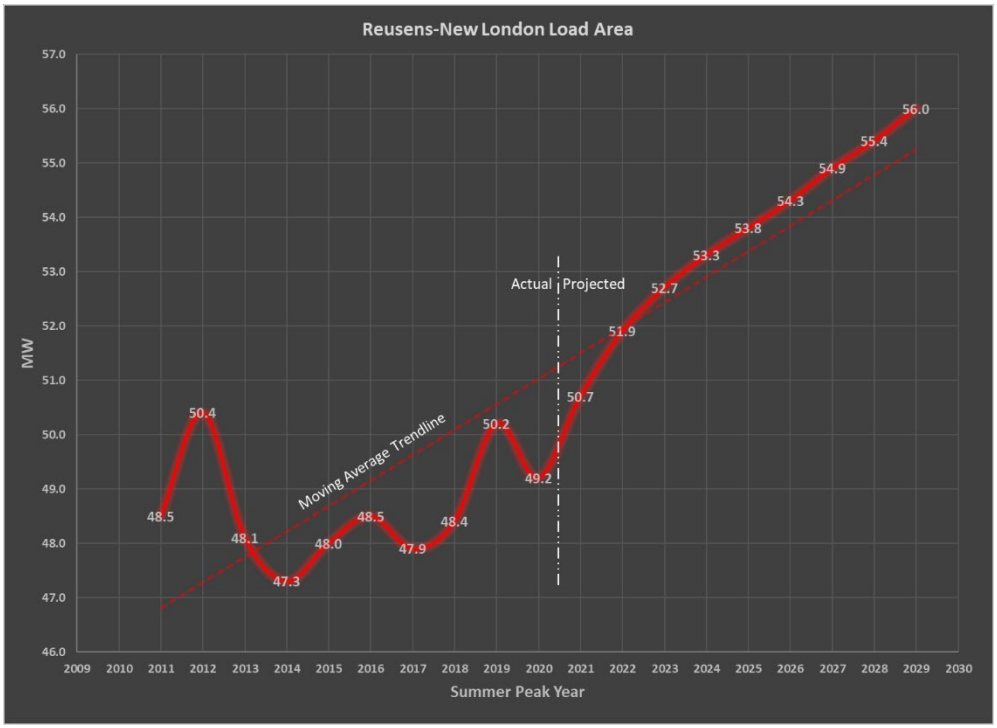


Figure 3
Project Load Area
Historical and Forecasted Summer Peak Load Data

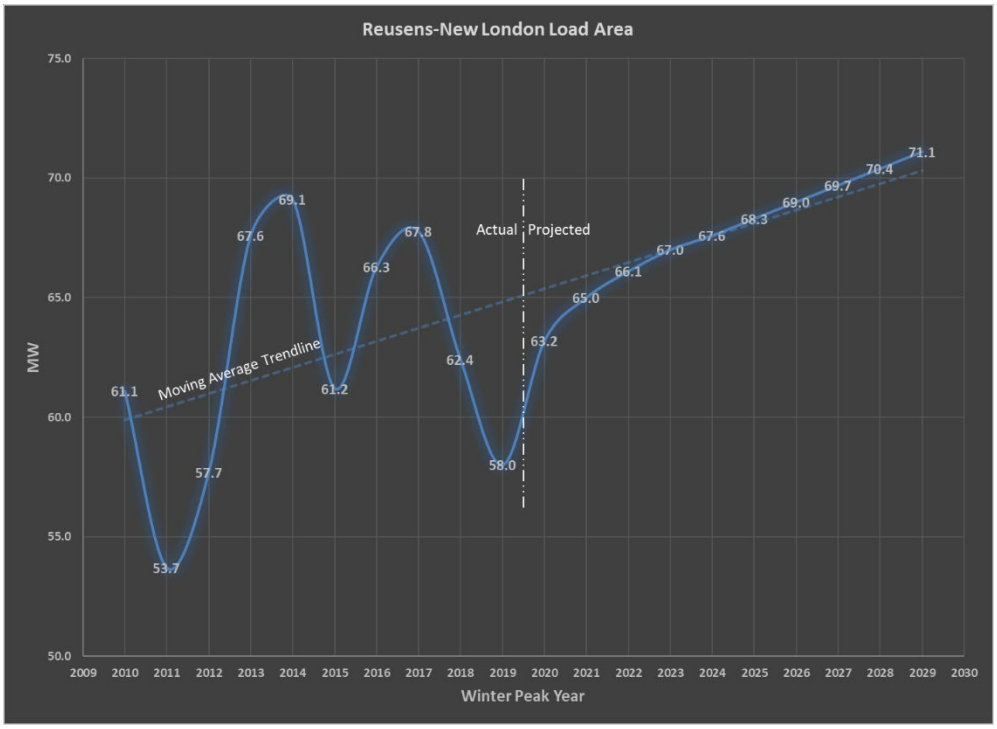


Figure 4
Project Load Area
Historical and Forecasted Winter Peak Load Data

The Load Area summer and winter peak demand are anticipated to grow at an average annual rate of approximately 1.25% over the course of the next ten years, beginning in 2020.

The existing Reusens – Altavista 138 kV transmission line cannot continue to adequately serve the needs of the Company and its customers because of the infrastructure's inability to meet current NESC standards, inadequate lightning protection, and age-related deterioration, as discussed in Section I.A. Completing the Project will support the Company's continued reliable electric service to retail and wholesale customers and will support the future overall growth in the area.

D. If power flow modeling indicates that the existing system is, or will at some future time be, inadequate under certain contingency situations, provide a list of all these contingencies and the associated violations. Describe the critical contingencies including the affected elements and the year and season when the violation(s) is first noted in the planning studies. Provide the applicable computer screenshots of single-line diagrams from power flow simulations depicting the circuits and substations experiencing thermal overloads and voltage violations during the critical contingencies described above.

Response:
Not applicable, as the Project is not a baseline project.

E. Describe the feasible project alternatives, if any, considered for meeting the identified need including any associated studies conducted by the Applicant or analysis provided to the RTO. Explain why each alternative was rejected.

Response:
A build in the clear alternative was considered for the Project; however, the existing ROW could be used for construction. Due to the additional impact and risk associated with acquisition of new ROW and to minimize the impact to landowners, an in the clear alternative was not considered viable for this Project.

Retirement of the line is not practical due to the location of the existing stations and customers served from this line.

F. Describe any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.

Response:
The Project involves the removal and replacement of existing facilities on the Reusens – Altavista 138 kV transmission line asset as described above. There will be no lines permanently taken out of service as part of the proposed Project.

The proposed rebuild of the Reusens – Altavista 138 kV transmission line asset between the Reusens and New London substations is comprised of two electrical circuits, New

London – Reusens 138 kV (11.6 miles) and McConville – Reusens 138 kV (approximately 5.5 miles) circuits.

The resulting Summer Normal/Summer Emergency/Winter Normal/Winter Emergency (SN/SE/WN/WE) ratings in MVA after the rebuild are:

- New London – Reusens 138 kV Circuit (11.6 miles)
    - Reusens – Boonsboro Section
        - 136/173/179/206 (MVA)
        - Limited by station conductor at Reusens
    - Boonsboro – Forest Section
        - 219/255/277/303 (MVA)
        - Limited by station conductor at Boonsboro
    - Forest – New London Section
        - 219/255/277/303 (MVA)
        - Limited by station conductor at New London
- McConville – Reusens 138 kV Circuit (approximately 5.5 miles)
    - Reusens – Graves Mill Section
        - 167/245/210/271 (MVA)
        - Limited by overhead conductor
    - Graves Mill – McConville Section
        - 167/245/210/271 (MVA)
        - Limited by overhead conductor

G. Provide a system map, in color and of suitable scale, showing the location and voltage of the Applicant's transmission lines, substations, generating facilities, etc., that would affect or be affected by the new transmission line and are relevant to the necessity for the proposed line. Clearly label on this map all points referenced in the necessity statement.

Response:
See Exhibit 1, Project Area Map.

H. Provide the desired in-service date of the proposed project and the estimated construction time.

Response:
The desired in-service date is December 15, 2023 with an estimated construction time of 18 months.

I. Provide the estimated total cost of the project as well as total transmission-related costs and total substation-related costs. Provide the total estimated cost for each

feasible alternative considered. Identify and describe the cost classification (e.g. "conceptual cost," "detailed cost," etc.) for each cost provided.

Response:
Functional estimated substation related cost is $1.7 M
Functional estimated transmission line related cost is $38.1 M
Functional estimated total cost of the project is $39.8 M

Functional estimates are based on project scopes developed by AEP engineering using information obtained from tabletop studies and design criteria.

J. If the proposed project has been approved by the RTO, provide the line number, regional transmission expansion plan number, cost responsibility assignments, and cost allocation methodology. State whether the proposed project is considered to be a baseline or supplemental project.

Response:
The proposed Project is supplemental and has been assigned PJM Project number s2192.

K. If the need for the proposed project is due in part to reliability issues and the proposed project is a rebuild of an existing transmission line(s), provide five years of outage history for the line(s), including for each outage the cause, duration and number of customers affected. Include a summary of the average annual number and duration of outages. Provide the average annual number and duration of outages on all Applicant circuits of the same voltage, as well as the total number of such circuits. In addition to outage history, provide five years of maintenance history on the line(s) to be rebuilt including a description of the work performed as well as the cost to complete the maintenance. Describe any system work already undertaken to address this outage history.

Response:
See Tables 3 through 9.

Circuit Outage Cause Summary			
Opossum Creek – Reusens 138kV Circuit* (01/01/2016 – 04/17/2017)			
Date	Cause	Duration (Hours)	CI
03/14/16	Weather - Lightning/Tstorm	0	0
06/16/16	Weather - Lightning/Tstorm	0	0
07/28/16	Weather - Lightning/Tstorm	0	0
*Defunct Circuit; Sectionalized at McConville and South Lynchburg Substations 04/17/2017			

Table 3
Reusens – Altavista 138 kV Line
Opossum Creek – Reusens 138 kV Circuit Outage History

Circuit Outage Cause Summary			
McConville - Reusens 138kV Circuit (04/18/2017 – 12/31/2020)			
Date	Cause	Duration (Hours)	CI
06/14/17	Equip-Station-Relay	0	0
09/28/17	Distribution	0.12	0
09/08/18	Weather - Lightning/Tstorm	0	0
11/21/18	Distribution	0.13	0

Table 4
Reusens – Altavista 138 kV Line
McConville – Reusens 138 kV Circuit Outage History

Circuit Outage Cause Summary			
New London – Reusens 138kV Circuit (01/01/2016 – 12/31/2020)			
Date	Cause	Duration (Hours)	CI
05/01/17	Weather - Lightning/Tstorm	4.48	0
06/22/17	Error - Field	2.80	0
09/01/18	Weather - Lightning/Tstorm	0	0
12/01/18	Unknown	0	0
07/02/19	Weather - Lightning/Tstorm	0	0

Table 5
Reusens – Altavista 138 kV Line
New London-Reusens 138 kV Circuit Outage History

APCo VA 138kV Circuits Annual Outage Averages		
5 Years (2016 - 2020)		
# of 138kV Circuits	Frequency	Duration (Hours)
113	1.47	0.04

Table 6
Appalachian Power Company (APCo) VA
138 kV Circuit Outages

Circuit Annual Outage Averages		
5 Years (2016 - 2020)		
Circuit Name	Frequency	Duration (Hours)
New London - Reusens 138kV	1.00	0.73

Table 7
New London – Reusens 138 kV Circuit Outage Averages

Circuit Annual Outage Averages		
01/01/2016 - 04/17/2017		
Circuit Name	Frequency	Duration (Hours)
Opossum Creek – Reusens 138kV	2.32	0
04/18/2017 - 12/31/2020		
McConville - Reusens 138kV	1.08	0.03

Table 8
Opossum Creek – Reusens 138 kV and McConville – Reusens 138 kV Circuit Outage Averages

Line Maintenance History		
5 Years (2016-2020)		
Year	Work Performed	Cost ($)
2017	Str. 4-34 to 4-35 Emergency Work	20,021.20
2018	Str. 4-32 Emergency Crossarm Replacement	8,268.69
2018	ROW Widening	3,254.52
2020	Hazard Tree Removals	75,015.00

Table 9
5-Year Line Maintenance History

L. If the need for the proposed project is due in part to deterioration of structures and associated equipment, provide representative photographs and inspection records detailing their condition.

Response:
The Reusens – Altavista 138 kV transmission line is being rebuilt between the Reusens and New London substations to address the deterioration of structures and associated equipment. Based on the most recent Reusens – Altavista 138 kV transmission line inspection report (updated on November 30, 2020), there are thirteen structures with at least one open structural condition, which is 18% of the structures on this line segment.

On those thirteen structures, there are 17 different open structural conditions, which include woodpecker-damaged poles (5), damaged poles (4), corroded crossarms (2), insect damaged crossarms (2), rot top crossarms (2), a broken crossarm (1), and a rot top pole (1). There are two open conductor conditions related to broken strands and gunshot damage. There are 15 open forestry conditions related to brush clearance (9), close/narrow ROW edge (3), and vines (3).

See Figures 5 through 17 showing representative photographs regarding the condition of the existing Reusens – Altavista 138 kV transmission line subject to the Project.

Figure 5
Structure 2: Structure Attachment Points, Corrosion of Insulator Hardware, and Degradation of Insulator Attachment Hook

Figure 6
Structure 11: Structure Attachment Points and Corrosion of Insulator Hardware

Figure 7
Structure 11: Insulator Flashover/ Arcing Damage

Figure 8
Structure 17: Structure Attachment Points, Corrosion of Insulator Hardware, and Degradation of Insulator Attachment Hook

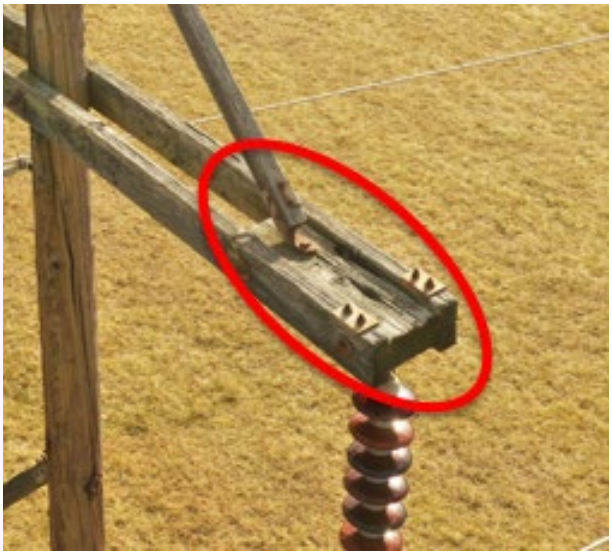


Figure 9
Structure 32: Crossarm Block Splitting

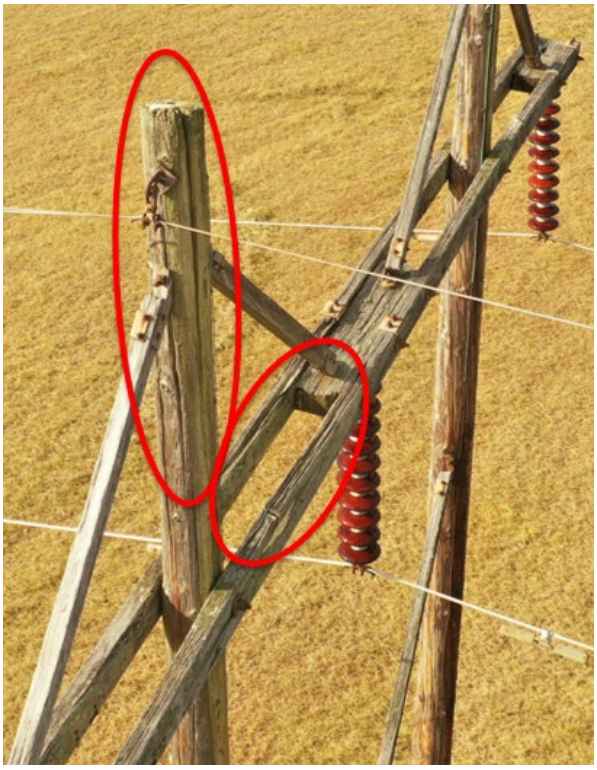


Figure 10
Structure 32: Crossarm Splitting and Upper Pole Splitting and Decay

Figure 11
Structure 33: Pole Cavities

Figure 12
Structure 33: Upper Pole Splitting and Decay

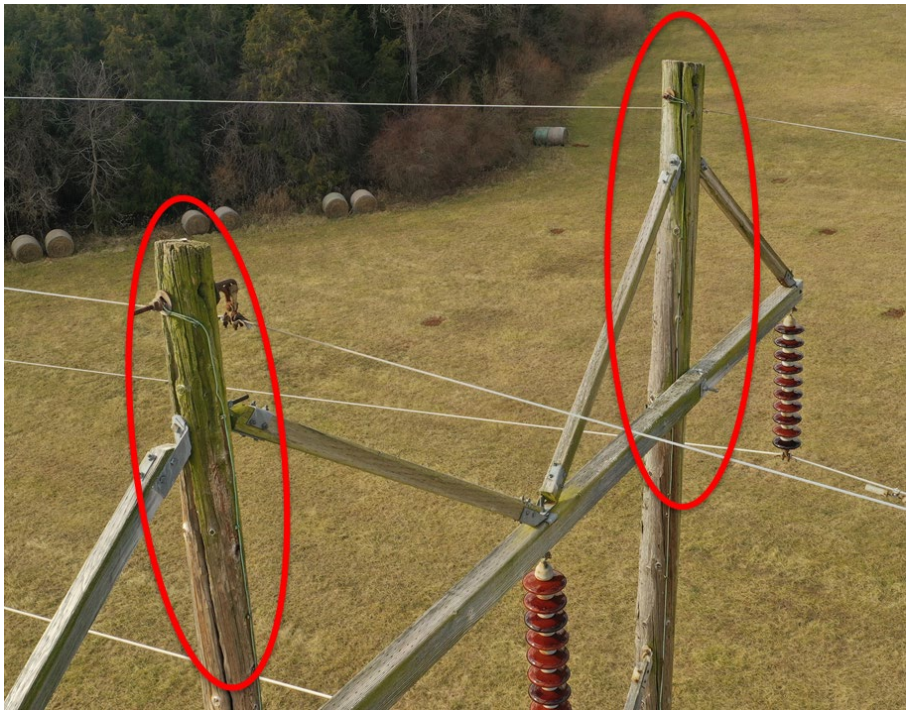


Figure 13
Structure 37: Upper Pole Splitting and Decay

Figure 14
Structure 37: Vertical Pole Splitting from Base

Figure 15
Structure 47: Pole Top Cavity, Broken Insulator in String, and Pole Rot Top

Figure 16
Structure 47: Insulators with Flashover/Arcing Damage

Figure 17
Structure 2: Groundline Corrosion of Steel Tower Leg

M. In addition to all other information required by these guidelines, applications for approval to construct facilities and transmission lines inter-connecting a Non-Utility Generator (NUG) and a utility shall include the following information.

1. The full name of the NUG as it appears in its contract with the utility and the dates of the initial contract and any amendments;

2. A description of the arrangements for financing the facilities, including information on the allocation of costs between the utility and the NUG;

3. a. For Qualifying Facilities (QFs) certificated by Federal Energy Regulatory Commission (FERC) order, provide the QF or docket number, the dates of all certification or recertification orders, and the citation to FERC Reports, if available;

b. For self-certified QFs, provide a copy of the notice filed with the FERC;

4. In addition to the information required in 3a or 3b, provide the project number and project name used by the FERC in licensing hydro-electric projects, also provide the dates of all orders and citations to FERC Reports, if available; and

5. If the name provided in 1 above differs from the name provided in 3 above, give a full explanation.

Response:
N/A.

N. Describe the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations and other ground facilities associated with the proposed project.

Response:
No new substations, switching stations or other facilities are being proposed as part of this Project.

SECTION II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-Way ("ROW")

1. Provide the length of the proposed corridor and viable alternatives.

Response:
The Proposed Route for the Project is 11.6 miles long, of which approximately 5.5 miles consists of a double-circuit section and approximately 6.1 miles consists of a single-circuit section. The Project will be constructed almost entirely within existing transmission line ROW. The Proposed Route includes two minor deviations from the existing centerline to optimize the design or avoid constraints. Because the existing ROW was available to rebuild the Project, no alternative routes were identified or evaluated. Any alternatives from the existing centerline would require acquisitions of new ROW and were not considered feasible or reasonable under the circumstances. See Section II.A.9 and the *Reusens to New London 138 kV Rebuild Siting Memo* (the "Siting Memo"), located in Volume 2 of the Application, for an explanation of the Company's route selection process.

2. Provide color maps of suitable scale (including both general location mapping and more detailed GIS-based constraints mapping) showing the route of the proposed line and its relation to: the facilities of other public utilities that could influence the route selection, highways, streets, parks and recreational areas, scenic and historic areas, open space and conservation easements, schools, convalescent centers, churches, hospitals, burial grounds/cemeteries, airports and other notable structures close to the proposed project. Indicate the existing linear utility facilities that the line is proposed to parallel, such as electric transmission lines, natural gas transmission lines, pipelines, highways, and railroads. Indicate any existing transmission ROW sections that are to be quitclaimed or otherwise relinquished. Additionally, identify the manner in which the Applicant will make available to interested persons, including state and local governmental entities, the digital GIS shape file for the route of the proposed line.

Response:
A Project area map is attached as Exhibit 1. A detailed GIS constraints mapping illustrating the Project and various resources and sensitive features in the vicinity of the Project is attached as Exhibit 3. The shapefile for the Proposed Route will be provided electronically. The Proposed Route is located in or near existing ROW for its entire length (11.6 miles). In addition, the Project generally parallels the Company's existing Reusens – Roanoke 138 kV transmission line for approximately one mile as it exits the Reusens Substation.

No portion of the Reusens – Altavista 138 kV transmission line will be removed and not rebuilt; therefore, no ROW is proposed to be quitclaimed or relinquished.

3. Provide a separate color map of a suitable scale showing all the Applicant's transmission line ROWs, either existing or proposed, in the vicinity of the proposed project.

Response:
See Exhibit 1, Project Area Map.

4. To the extent the proposed route is not entirely within existing ROW, explain why existing ROW cannot adequately service the needs of the Applicant.

Response:
The majority of the Proposed Route is on the centerline of the existing ROW, with minor deviations. In two places, deviations from the existing centerline are necessary to optimize the design or avoid constraints. The first deviation is at the intersection with the Reusens – South Lynchburg 138 kV transmission line (between proposed structures 4-30A and 4-32A). Both transmission line ROWs will be shifted slightly in order to combine the lines onto one transmission structure at the point of intersection, thus resulting in the elimination of one transmission structure on the parcel. The second deviation is where the existing ROW crosses the Colonial Hills Golf Club course (between proposed structures 4-41A and 4-47A). The Company proposes a minor shift out of the ROW in order to relocate certain structures a greater distance from the fairways and greens of the course. The relocation is being done with the consent of the property owner. The deviations from the existing centerline are detailed in Exhibit 3, GIS Constraints Map.

5. Provide drawings of the ROW cross section showing typical transmission line structure placements referenced to the edge of the ROW. These drawings should include:

a) ROW width for each cross section drawing;

b) Lateral distance between the conductors and edge of ROW;

c) Existing utility facilities on the ROW; and

d) For lines being rebuilt in existing ROW, provide all of the above (i) as it currently exists, and (ii) as it will exist at the conclusion of the proposed project.

Response:
See Exhibits 4 and 5 for the typical existing ROW cross section. See Exhibits 6 – 9 for the proposed ROW cross sections.

6. Detail what portions of the ROW are subject to existing easements and over what portions new easements will be needed.

Response:
All portions of the ROW for the proposed rebuilt transmission line are subject to existing easements, dating from the 1940s and 1950s. The existing ROW is 100 feet wide and the Proposed Route will follow the centerline of the existing ROW for most of its length. A small minority of the existing easement agreements contain some special provisions, such as those limiting the type of the structures permitted (e.g., wood vs. steel), and the Company intends to address this through the acquisition of supplemental easements. In addition, there may be minor deviations from the existing centerline to optimize design or avoid constraints and based upon the results of ground survey, geotechnical and environmental surveys, landowner input, ROW negotiations and final line design.

7. Detail the proposed ROW clearing methods to be used and the ROW restoration and maintenance practices planned for the proposed project.

Response:
The entire width of the existing transmission line ROW is currently maintained for operation of the existing transmission facilities.

The following are Appalachian's typical transmission ROW clearing, restoration and maintenance practices. Case-by-case exceptions are considered to address sensitive environmental areas/features and/or property owner requests while maintaining Appalachian and NESC safety clearances.

<u>ROW Clearing</u>

a. In areas with 100 feet or more conductor-to-ground design clearance, the ROW is typically not cleared, except in the following instances:

    - Trees with less than 25 feet clearance from the conductor (at maximum sag conditions) will be removed.
    - Where a conductor stringing path is specified.
    - Where wire setup areas and other work areas are required.

b. In locations with less than 100-foot vertical clearance from conductor (at maximum sag conditions) to ground, all woody stemmed vegetation will be removed to the appropriate ROW width, leaving the cleared area of the ROW populated with grasses and herbaceous growth.

c. Cutting vegetation will be done by either manual or mechanical methods. Worker safety is first and foremost in determining a method; land use and landowner preference may influence the method utilized. Factors influencing safety include terrain, access, tree height, etc. Manual clearing involves the use of contract personnel using chain saws to cut vegetation. Mechanical clearing includes mowers, feller-

bunchers, and other heavy operator-run equipment. Mechanical pruning operations employ a variety of configurations of boom-mounted saws mounted on vehicles capable of traversing the ROW. In very difficult terrain or inaccessible areas (high safety risk areas), an aerial saw may be employed for side trimming the ROW.

d. Where reasonable and practical, Appalachian will utilize selective clearing methods to retain low-growth shrubs and other compatible vegetation within:

- 50 feet of all year-round streams, ponds or wetlands and will undertake erosion control measures where necessary.
- 50 feet of road crossings.
- 25 feet of karst features and outcrops of limestone or dolomite rock.

e. Trees will be felled in a manner to minimize damage to crops, fences and other facilities.

f. Where tree pruning is required, best management practices and standards established by the International Society of Arboriculture, the American Standards Institute, and the Tree Care Industry Association will be used together with best management practices.

g. Logs, including fallen timber, may be left in tree lengths, log lengths or as otherwise designated by the property owner. The property owner will retain ownership of all logs and may dispose of them by commercial sale, use them as firewood or provide them for use as firewood by others. If the property owner does not want to retain ownership and wants the logs removed, Appalachian will dispose of them in a suitable location.

h. The disposal by Appalachian of all trees, brush and slash will, where possible, be consistent with property owner preferences, wildlife values and particular site conditions. Typical disposal methods consist of one or more of the following:

- Windrowing - the cut material will be windrowed at either or both sides of the ROW. This is the preferred method where slopes are 30% or less.
- Chipping - woody vegetation will be chipped and either scattered over the ROW area or disposed of in a suitable location. Logs will be windrowed on either or both sides of the ROW, as designated. The ROW must be accessible to chipping equipment for this option to be viable.
- Let Lie - the cut material will be left in a scattered manner over the ROW area. This is recommended where slopes exceed 30% in order to reduce erosion and otherwise minimize impact on soils. All woody vegetation will be lopped and scattered so that it lays as close to the ground as practical, but not to exceed two

feet in height. This will accelerate the decomposition of this material and will improve the aesthetic impact by allowing more rapid vegetation coverage of the cut material.

i. All clearing debris will be kept out of streams, ponds and other water areas, wetlands, pastures, and fields.

ROW Restoration

a. Where stream banks are disturbed, they will be restored (by planting of low-growing species, where necessary) in order to prevent bank erosion.

b. Appalachian will take measures to drain and stabilize the surfaces of all construction roads both during construction and during future line maintenance phases.

c. Restoration, including temporary and permanent seeding, will be coordinated with the construction activities to ensure that revegetation and soil stabilization are achieved at the earliest practical time. Following construction, all structure sites, construction sites and access roads will be seeded with a suitable grass seed mixture.

d. Revegetation techniques will, where possible, seek to enhance the ROW for wildlife food and habitat.

e. Qualified personnel will perform all permanent reseeding and revegetation.

f. After restoration is complete, Appalachian will periodically inspect the ROW to discover areas of erosion, sedimentation and inadequate revegetation conditions. Upon discovery of such conditions, prompt efforts will be taken to correct them.

g. Fences and gates will be kept in sufficient state of repair to confine livestock satisfactorily and gates will be kept closed when not in immediate use. All fences cut or damaged will be restored to a condition as good as, or better than, the condition as found. Where frequent access is required, gates will be installed at no cost to the property owner.

ROW Maintenance

a. All herbicides used will be applied in accordance with applicable state and federal laws and regulations.

b. All herbicides used shall be registered with the Environmental Protection Agency and with the Virginia Department of Agriculture and Consumer Services. Herbicides will be used in accordance with label and manufacturer directions.

c. All herbicide applications will be performed under the direct supervision of certified applicators.

d. Regarding herbicide applications:

- Herbicides will not be applied when rainfall is imminent, during rainfall or within one day of large rain events (usually greater than 1.0 centimeter) that result in soil moisture capacity occurring above field capacity.

- Buffer zones will be maintained around streams, ponds, karst features, springs, wetlands, and water supply wells in accordance and compliance with herbicide label directions.

- In areas within the boundaries of any karst feature and any channelized drainage way (perennial or intermittent) draining to a karst feature, wetland-approved herbicides shall be used in accordance with label and manufacturer directions.

Long-term ROW Maintenance Plan

Appalachian will periodically inspect the ROW for areas of erosion, sedimentation and inadequate revegetation conditions. Upon discovery of such conditions, prompt efforts will be taken to correct them. Any property owner concerns will also be investigated. Additionally, Appalachian will implement a comprehensive vegetation management program designed to ensure that vegetation along each transmission line is managed at the proper time, and in the most cost-effective, environmentally sound manner. The plan will be reviewed periodically to ensure that the goals and objectives are being addressed.

Compatible Tree Species

Where reasonable and practical, Appalachian will utilize selective clearing methods to retain low-growth shrubs and other compatible vegetation. The following is a partial list of compatible tree species that may be allowed within Appalachian's transmission line ROW, depending upon the particular line and circumstances and subject to the approval of the Company's forestry staff:

COMMON NAME	**BOTANICAL NAME**
Trident Maple	*Acer buergeranum*
Amur Maple	*Acer ginnala*
Japanese Maple	*Acer palmatum*
Serviceberry	*Amelanchier arborea or canadensis*
Redbud	*Cercis Canadensis*
Fringetree	*Chionanthus retusus or viginicus*
Pink Dogwood	*Cornus florida "Rubra"*
Dogwood	*Cornus florida "White"*
Kousa Dogwood	*Cornus kousa*
Washington Hawthorn	*Crataegus phaenopyrum*
Golden Raintree	*Koelreuteria paniculata*
Crape Myrtle	*Lagerstroemia indica*
Galaxy Magnolia	*Magnolia "Galaxy"*
Star Magnolia	*Magnolia stellata*
Saucer Magnolia	*Magnolia x soulangeana*
Flowering Crabapple	*Malus spp.*
Kwansan Cherry	*Prunus serrulata*
Japanese Weeping Cherry	*Prunus subhirtella*

COMMON NAME	BOTANICAL NAME
Purple-leaf Plum	*Prunus x accolade*
Cleveland Select Flowering Pear	*Pyrus x blireiana*
Japanese Tree Lilac	*Syringa reticulate*
Pyramidal Arborvitae	*Thuja occidentalis pyrimidalis*
Littleleaf Linden	*Tilia cordata*
Leatherleaf Viburnum	*Viburnum rhytidophyllum*

8. Indicate the permitted uses of the proposed ROW by the easement landowner and the Applicant.

Response:
Under the existing transmission line easements, the property owner retains the right to use the easement area for uses such as grazing, pasture lands, gardens, cultivated fields, driveways, parking, and bike and walking paths or any other use that is consistent with the Company's right to construct, operate, maintain or remove its electric transmission line. The Company retains the right to clear and keep the easement clear of buildings and/or other obstructions together with the right to clear any woody vegetation within the ROW or which is adjacent to the ROW but which may endanger the safe operation of the electric transmission line.

Generally, the same can be stated with respect to any supplemental easements to be acquired for the rebuild of the transmission line.

9. Describe the Applicant's route selection procedures. Detail the feasible alternative routes considered. For each such route, provide the estimated cost and identify and describe the cost classification (e.g., "conceptual cost," "detailed cost"). Describe the Applicant's efforts in considering these feasible alternatives. Detail why the proposed route was selected and other feasible alternatives were rejected. In the event that the proposed route crosses, or one of the feasible routes was rejected in part due to the need to cross, land managed by federal, state, or local agencies or conservation easements or open space easements qualifying under §§ 10.1-1009 – 1016 or §§ 10.1-1700 – 1705 of the Code (or a comparable prior or subsequent provision of the Code), describe the Applicant's efforts to secure the necessary ROW.

Response:
The Company's route selection procedures for transmission line rebuild projects begin with a review of existing ROW. Using the existing ROW generally minimizes impacts on the natural and human environments. Specifically, this approach is consistent with Sections 56-46.1 and 56-259 of the Code, which provide that existing ROWs should be given priority when adding new transmission facilities, and which promote the use of existing ROW for new transmission facilities. After review of the existing ROW, the Siting Team determined that the Proposed Route for the Project can follow the centerline of the existing ROW for most of its length and minimize impacts on the natural and human environments. There are two minor deviations from the existing centerline; however, these deviations are to optimize design and avoid constraints (see Siting Memo

in Volume 2). Given the availability of existing ROW, the statutory preference to the use of existing ROW, and because additional residential and environmental impacts associated with the acquisition of and construction on new ROW, the Company did not consider any alternate routes requiring significantly new ROW for the Project. For the Reusens – Altavista 138 kV transmission line, the generally 100-foot-wide ROW is adequate.

There are three Virginia Outdoors Foundation ("VOF") conservation easements crossed by the existing ROW, which qualify under Sections 10.1-1009 – 1016, or 10.1-1700 – 1705, of the Code (or a comparable prior or subsequent provision of the Code). For two of the three VOF conservation easements crossed by the Project, the rebuild will remain on the existing centerline, with structures in generally the same location. On the third VOF easement, two transmission line ROWs (the Reusens – Altavista and Reusens – South Lynchburg 138 kV transmission lines) cross the parcel; this is also where the Project transitions from double-circuit to single-circuit. The Company plans to remove two structures and replace it with one structure on the Reusens – South Lynchburg 138 kV transmission line in order to co-locate the two transmission lines onto one new structure at the point of intersection, and thus reduce the number of transmission structures on the parcel.

As a result, the Company will shift the centerlines of the Reusens – Altavista 138 kV transmission line approximately 40 feet to the west of the existing centerline and the Reusens – South Lynchburg 138 kV transmission line approximately 40 feet to the southwest of the existing centerline in order to co-locate the conductors onto the proposed structure 4-31A. The Company sent a summary to the VOF detailing the Company's existing easement rights on the parcel, which allowed for the proposed minor relocation, as described above. The VOF responded with concurrence on the rights to slightly relocate the transmission lines. No other land managed by federal, state, or local agencies or conservation easements or open space easements qualifying under Sections 10.1-1009 – 1016 or 10.1-1700 – 1705 of the Code (or a comparable prior or subsequent provision of the Code) are crossed by the Project.

10. Describe the Applicant's construction plans for the project, including how the Applicant will minimize service disruption to the affected load area. Include requested and approved line outage schedules for affected lines as appropriate.

Response:
Project construction activities include the installation and maintenance of soil erosion and sedimentation control measures; access road construction; foundation, structure, and wire installation; and the subsequent rehabilitation of all areas disturbed during construction. All required environmental compliance permits and studies will be completed and a stormwater pollution prevention plan will be developed and implemented under the state's "General Permit for Discharges of Stormwater from Construction Activities."

As a result, the Company estimates that it will take approximately 18 months to engineer, coordinate outages, and build the Project in its entirety after a final order authorizing the Project is entered.

As noted above, the proposed Project will be constructed on existing centerline with the exception of two minor deviations. Outages are needed on the Reusens – Altavista and Reusens – South Lynchburg 138 kV transmission lines in order to rebuild on existing centerline. Neither line is outage constrained and can be taken out of service and in sections in order to minimize disruptions to the affected Load Area. A complete outage on the Reusens – Altavista 138 kV transmission line is not feasible due to reliability concerns. The McConville – Reusens 138 kV circuit, located on the Reusens – South Lynchburg 138 kV transmission line, is an interconnect with Dominion Energy and has outage limitations depending on the time of year. Proposed structure 4-31A will replace existing structure 5-10 and will have a co-locate for the Reusens – South Lynchburg 138 kV transmission line.

To limit service disruption to the affected Load Area, the Company plans to first rebuild the Reusens – Altavista 138 kV transmission line section between Forest Substation to existing structure 5-10 (proposed structure 4-31A), followed by the section between New London Substation to Forest Substation, then Boonsboro Substation to existing structure 5-10 (proposed structure 4-31A), and lastly the Boonsboro Substation to Reusens Substation section. Following SCC approval, engineering, RTO outage approvals, and any necessary ROW acquisition, the estimated construction sequence can be summarized briefly as follows:

1. Begin the "in the clear" work and obtain daily outages as necessary to complete the work on the New London – Reusens and McConville – Reusens 138 kV Circuits, between Forest Substation to Reusens Substation, installing concrete pier foundations.

2. Take the Forest Substation to existing structure 5-10 (proposed structure 4-31A) of the Reusens – Altavista 138 kV transmission line out of service and begin the rebuild of that section. During this time, the Boonsboro Substation will be fed from the Reusens Substation, and the Forest Substation will be fed from New London Substation.

3. Energize the rebuild section between the Forest Substation to existing structure 5-10 (proposed structure 4-31A).

4. Take the New London Substation to Forest Substation section of the Reusens – Altavista 138 kV transmission line out of service and begin the rebuild of that section. During this time, the Forest Substation will be fed from Reusens Substation.

5. Energize the rebuild section between the New London Substation to Forest Substation.

6. Take the Boonsboro Substation to existing structure 5-10 (proposed structure 4-31A) of the Reusens – Altavista 138 kV transmission line out of service and begin the rebuild of that section. During this time, Boonsboro Substation will be fed from the Reusens Substation, and Forest Substation will be fed from the New

London Substation.

7. Energize the rebuild section between the Boonsboro Substation to existing structure 5-10 (proposed structure 4-31A).

8. Take the Boonsboro Substation to Reusens Substation section of the Reusens – Altavista 138 kV transmission line out of service and begin the rebuild of that section. During this timeframe, the Boonsboro, Graves Mill, and McConville substations will be fed from the Forest Substation.

9. Energize the rebuild section between the Boonsboro Substation to Reusens Substation.

10. Take an outage on the Skimmer to South Lynchburg portion of the Reusens – South Lynchburg 69 kV circuit.

11. Co-locate on proposed structure 4-31A and energize the line section from Skimmer Substation to South Lynchburg Substation.

11. Indicate how the construction of this transmission line follows the provisions discussed in Attachment 1 of these Guidelines.

Response:
Protecting environmental resources such as natural, historic, scenic, and recreation values is of high importance to the Company. The siting and construction phases of the Project will generally follow the above-referenced guidelines to the extent practical. For a detailed discussion of the attention given to environmental resources and siting process used for this Project, see the Siting Memo and the VDEQ Supplement prepared by the Siting Team, included in Volume 2 of this Application. Additionally, see Section III of this Response to Guidelines. For a summary of the route review process, see Section II.A.9 above.

12. a. Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the Applicant's certificated service area: (1) identify each electric utility affected; (2) state whether any affected electric utility objects to such construction; and (3) identify the length of line(s) proposed to be located in the service area of an electric utility other than the Applicant; and

Response:
The Proposed Route for the Project is 11.6 miles long and crosses Bedford County (approximately 6.1 miles) and the City of Lynchburg (approximately 5.5 miles). The portion of the Reusens – South Lynchburg 138 kV transmission line to be relocated is located in Bedford County (0.3 mile). No transmission line upgrades are associated with the Brush Tavern Substation, which is located in Campbell County. The Brush Tavern Substation will be upgraded to accommodate future electrical upgrades associated with the Project. No portion of the Project will be located outside of the Company's certificated service territory. See Exhibit 10, Virginia Department of Transportation

("VDOT") General Highway Maps.

b. Provide three (3) color copies of the Virginia Department of Transportation "General Highway Map" for each county and city through which the line will pass. On the maps show the proposed line and all previously approved and certificated facilities of the Applicant. Also, where the line will be located outside of the Applicant's certificated service area, show the boundaries between the Applicant and each affected electric utility. On each map where the proposed line would be outside of the Applicant's certificated service area, the map must include a signature of an appropriate representative of the affected electric utility indicating that the affected utility is not opposed to the proposed construction within its service area.

Response:
Three (3) copies of the VDOT General Highway Maps for Bedford and Campbell Counties, which includes the extents of the City of Lynchburg, are being provided separately to the Commission Staff with this Application. Reduced copies of these maps are included as Exhibit 10 to this Application. The maps include the proposed Project and the Company's existing transmission facilities. No portion of the Project will be located outside of the Company's certificated service territory.

B. Line Design and Operational Features

1. Detail the number of circuits and their design voltage, initial operational voltage, any anticipated voltage upgrade, and transfer capabilities.

Response:
The proposed rebuilt Reusens – Altavista 138kV transmission line will be a combination of single-circuit and double-circuit with each circuit comprising of a three-phase design and a nominal phase-to-phase voltage of 138 kV. A voltage upgrade is not anticipated for the Project. The maximum load transfer capability is 491 MVA (summer emergency rating) and 518 MVA (winter emergency rating).

2. Detail the number, size(s), type(s), coating and typical configurations of conductors. Provide the rationale for the type(s) of conductor(s) to be used.

Response:
From the Reusens Substation to proposed structure 4-31A (Double-circuit)
Each of the proposed three-phase double 138 kV circuits (the New London – Reusens and McConville – Reusens 138 kV circuits) will consist of three 795,000 circular mil ("cmil") Aluminum Conductors Steel Supported ("ACSS") "Drake" conductors with 26/7 stranding (1.108-inch diameter). The circuits will typically be arranged in a vertical configuration with one conductor per phase.

The proposed double-circuit transmission line section will typically use one Alumoweld ground wire and one 0.646-inch diameter optical ground wire ("OPGW") for lightning protection. The OPGW is composed of aluminum clad steel strands surrounding a stainless-steel tube containing fiber optic strands used for utility operations and communication.

The proposed conductors and ground wires were selected to meet the electrical requirements of the Project including load capacity, system stability, and efficiency. The mechanical strength and impacts on constructability are also considered in the selection process.

From proposed structure 4-31A to the New London Substation (Single-circuit)
The proposed three-phase single 138 kV circuit (New London – Reusens 138 kV circuit) will consist of three 795,000 cmil ACSS "Drake" conductors with 26/7 stranding (1.108-inch diameter). The circuit will typically be arranged in a delta configuration with one conductor per phase.

The proposed single-circuit transmission line section will typically use one Alumoweld ground wire and one 0.646-inch diameter OPGW for lightning protection. The OPGW is composed of aluminum clad steel strands surrounding a stainless-steel tube containing fiber optic strands used for utility operations and communication.

The proposed conductors and ground wires were selected to meet the electrical requirements of the Project including load capacity, system stability, and efficiency. The mechanical strength and impacts on constructability are also considered in the selection process.

3. With regard to the proposed supporting structures over each portion of the ROW for the preferred route, provide diagrams (including foundation reveal) and descriptions of all the structure types, to include:

a) mapping that identifies each portion of the preferred route;

b) the rationale for the selection of the structure type;

c) the number of each type of structure and the length of each portion of the ROW;

d) the structure material and rationale for the selection of such material;

e) the foundation material;

f) the average width at cross arms;

g) the average width at the base;

h) the maximum, minimum and average structure heights;

i) the average span length; and

j) the minimum conductor-to-ground clearances under maximum operating conditions.

Response:
Structure types will be determined during final engineering, which includes ground surveys and geotechnical studies. Nevertheless, based on preliminary engineering, the Company anticipates primarily using double-circuit steel monopoles with davit arms and single-circuit monopole structures for the rebuilt 138 kV transmission line.

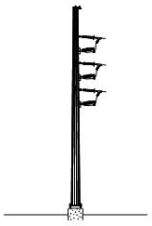
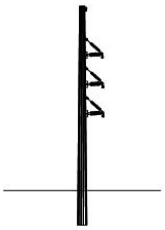
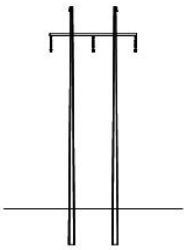
From the Reusens Substation to proposed structure 4-31A

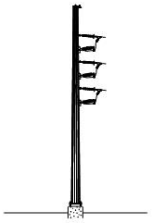
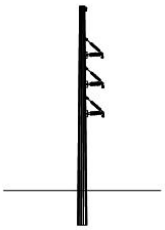
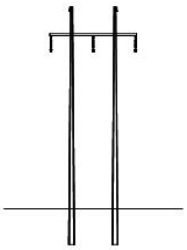
Structure Type	 **138 kV Monopole with Davit Arms** **Double Circuit** See Exhibit 6
a. mapping that identifies each portion of the preferred route;	See Exhibit 3
b. rationale for the selection of the structure type;	The proposed 138 kV monopole dead-end with davit arms is best suited for short-to-medium spans. Reduces impacts on existing land use due to the condensed structure footprint.
c-1. estimated number of each type of structure;	31 (Including proposed structure 4-31A)
c-2. estimated length of each portion of the ROW;	5.5 miles
d-1. structure material;	Dulled galvanized steel
d-2. rationale for the selection of such material;	Galvanized steel was chosen for its durability and proven reliability in this region. A dulled finish was selected to minimize visual impacts.
e. foundation material;	Drilled concrete pier with an average depth of 30'. The typical concrete pier reveal height will be 1' above grade.
f. average width at cross arms;	29'
g. average width at the base;	6'-0" Diameter Pole* 7'-0" Diameter Concrete Pier
h-1. approximate average height of structures (above ground);	115'

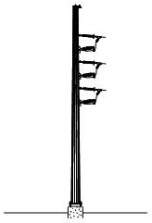
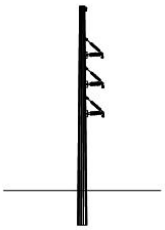
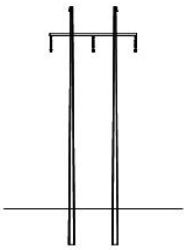
Structure Type	 **138 kV Monopole with Davit Arms** **Double Circuit** See Exhibit 6
h-2. approximate typical structure height range (above ground);	90' to 140'*
i. average span length;	950’
j. minimum conductor-to-ground clearances under maximum operating conditions.	22'-7"

* Collocation poles for cellular antennas may be larger in diameter and taller to accommodate cellular antenna requirements. Existing structures 4-11, 4-12, 4-13, and 4-18A are collocation sites for cellular antennas (see Exhibit 3, GIS Constraints Map).

From proposed structure 4-31A to the New London Substation

Structure Type	 **138 kV Monopole** **Single Circuit** See Exhibit 7	 **138 kV Braced Monopole** **Single Circuit** See Exhibit 8	 **138 kV H-Frame** **Single Circuit** See Exhibit 9
a. mapping that identifies each portion of the preferred route;	See Exhibit 3	See Exhibit 3	See Exhibit 3
b. rationale for the selection of the structure type;	The proposed 138 kV monopole dead-end structure is best suited for heavy line angle locations, breaking wire tension, and provides a condensed structure footprint.	The proposed 138 kV braced-post structure is best suited for short-to-medium spans and provides a condensed structure footprint.	The proposed 138 kV H-frame is best suited for medium-to-long spans and reduces visual impacts due to its low profile.

Structure Type	 **138 kV Monopole Single Circuit** See Exhibit 7	 **138 kV Braced Monopole Single Circuit** See Exhibit 8	 **138 kV H-Frame Single Circuit** See Exhibit 9
c-1. estimated number of each type of structure;	10	33	2
c-2. estimated length of each portion of the ROW;	0.6 mile	5.25 mile	0.25 mile
d-1. structure material;	Dulled galvanized steel	Dulled galvanized steel	Dulled galvanized steel
d-2. rationale for the selection of such material;	Galvanized steel was chosen for its durability and proven reliability in this region. A dulled finish was selected to minimize visual impacts.	Galvanized steel was chosen for its durability and proven reliability in this region. A dulled finish was selected to minimize visual impacts.	Galvanized steel was chosen for its durability and proven reliability in this region. A dulled finish was selected to minimize visual impacts.
e. foundation material;	Drilled concrete pier with an average depth of 25'. The typical concrete pier reveal height will be 1' above grade.	Steel poles will be direct embedded to an average depth of 12'.	Steel poles will be direct embedded to an average depth of 11'.
f. average width at cross arms;	2'	11'	39’
g. average width at the base;	6'-0" Diameter Pole 7'0" Diameter Concrete Pier	3'-0" Diameter Pole	3'-0" Diameter Pole
h-1. approximate average height of structures (above ground);	85'	90'	75'
h-2. approximate typical structure height range (above ground);	80' to 95'	70' to 100'	55' to 90'
i. average span length;	500'	750'	800'

Structure Type	 **138 kV Monopole Single Circuit** See Exhibit 7	 **138 kV Braced Monopole Single Circuit** See Exhibit 8	 **138 kV H-Frame Single Circuit** See Exhibit 9
j. minimum conductor-to-ground clearances under maximum operating conditions.	22'-7"	22'-7"	22'-7"

4. With regard to the proposed supporting structures for all feasible alternate routes, provide the maximum, minimum and average structure heights with respect to the whole route.

Response:
The anticipated structure heights on the double-circuit section of the Project (from the Reusens Substation to proposed structure 4-31A) range from 90 feet to 140 feet tall, with an average structure height of approximately 115 feet.

The anticipated structure heights on the single circuit section of the Project (from proposed structure 4-31A to the New London Substation) range from 55 feet to 100 feet tall, with an average structure height of approximately 85 feet.

5. For lines being rebuilt, provide mapping showing existing and proposed structure heights for each individual structure within the ROW, as proposed in the application.

Response:
See Exhibit 3, GIS Constraints Map.

6. Provide photographs for typical existing facilities to be removed, comparable photographs or representations for proposed structures, and visual simulations showing the appearance of all planned transmission structures at identified historic locations within one mile of the proposed centerline and in key locations identified by the Applicant.

Response:
See Exhibit 11 for photographs of existing structures, Exhibits 4 – 9 for comparable structure photographs, and Exhibit 12 for representations of proposed structures using visual simulations. For visual simulations showing the appearance of all planned transmission structures at identified historic locations within one mile of the proposed centerline, see the VDEQ Supplement in Volume 2 of the Application.

C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project. Include size, acreage, and bus configurations. Describe substation expansion capability and plans. Provide one-line diagrams for each.

Response:
There are no new substations or expansions planned for the Project. The Company plans to install one 138 kV 57.6 MVAr capacitor bank at the existing Brush Tavern Substation in Campbell County. The improvement at the Brush Tavern Substation for which the Company is seeking approval will be entirely contained within the existing fence line of the substation.

See Exhibit 13 for the substation layout, representative photographs, and Exhibit 13-C, which is confidential and filed under seal, for the one-line diagram.

SECTION III. IMPACT TO THE LINE ON SCENIC, ENVIRONMENTAL, AND HISTORIC FEATURES

The Siting Memo and the VDEQ Supplement included in Volume 2 of this Application address scenic, environmental, and historic features associated with the Project. Brief responses to the Section III guideline questions are provided below, but for in-depth discussion of these issues, please refer to the Siting Memo and the VDEQ Supplement in Volume 2. A Project area map is included as Exhibit 1 and a more detailed GIS constraints map, which illustrates the various resources and sensitive features relative to the proposed Project, is included as Exhibit 3.

A. Describe the character of the area that will be traversed by this line, including land use, wetlands, etc. Provide the number of dwellings within 500 feet, 250 feet and 100 feet of the centerline, and within the ROW for each route considered. Provide the estimated amount of farmland and forestland within the ROW that the proposed project would impact.

Response:

The general character of the Project area is characterized predominantly by forested, agricultural, pasturelands, and commercially developed land uses and residential areas. The Project will be constructed largely within the existing transmission line ROW. The Proposed Route includes two minor deviations from the existing centerline to optimize the design or avoid constraints. The double-circuit section is located in the northern extents of the City of Lynchburg, and crosses residential and commercially developed areas. The eastern extents of Bedford County are crossed by the single-circuit section, which includes areas of forested, agricultural, pasturelands, and commercial and residential land uses. Residential development is located predominantly along state-maintained roadways and highways such as U.S. Route 501 Business (Boonsboro Road) and State Routes 645 (Trents Ferry Road), 620 (Wiggington Road), and 622 (Everett Road). The existing Reusens – Altavista 138 kV transmission line was built in the 1940s and largely predates the existing residential and commercial areas that have developed along the ROW edges over the years. Impacts to wetlands and streams are expected to be minimal as there is already an existing transmission line, cleared ROW, and wetlands and streams can be spanned in most instances. Further, there are no major wetland complexes or rivers crossed by the Project. Because the existing ROW was available to rebuild the Project, no viable alternative routes were evaluated, as they would add significant impacts to human and natural resource environments.

The estimates provided below of the residences, cropland and forest for the Proposed Route are based on a 100-foot-wide ROW on the centerline and consider Light Detection and Ranging ("LiDAR") survey and National Land Cover Database ("NLCD") data. There are 298 dwellings located within 500 feet, 122 dwellings within 250 feet, and 34 dwellings within 100 feet of the Proposed Route centerline. A residence, a fire station and a business have encroached on the existing 100-foot ROW. Based on its engineering analysis to date, the rebuilt line can be designed as to avoid the affected buildings in the conductor zone. Accordingly, and subject to completion of final engineering and ROW negotiations with affected landowners, the Company does not expect that any residences

and/or public buildings located within the 100-foot ROW will need to be removed to accommodate the rebuilt line.

The Proposed Route has approximately 112.7 acres of either prime farmland or farmland of statewide importance located within the ROW based on United States Department of Agriculture Natural Resources Conservation Service ("NRCS") Soil Survey Geographic Database ("SSURGO") data. There are approximately 52 acres of pasture/rangeland or cropland crossed by the Proposed Route, according to the SSURGO data. As the ROW has been in use since the 1940s, it is not expected that the Project will permanently impact farmland, as most farming uses currently co-exist with the transmission line. Minimal tree clearing will be required to maintain the generally 100-foot-wide ROW. Tree clearing will be conducted to remove danger trees that may be located within or immediately adjacent to the existing ROW.

B. Describe any public meetings the Applicant has had with neighborhood associations and/or officials of local, state or federal governments that would have an interest or responsibility with respect to the affected area or areas.

Response:

Federal, State and Local Government Coordination

As described in Section 2.0 of the Siting Memo, the Siting Team initiated the Project by contacting various federal, state, and local agencies and/or officials to inform them of the Project and request data for the route planning process. Letters and maps regarding the Project were sent to 27 representatives of federal, state, and local government agencies on October 16, 2020 as part of the data collection effort and a total of six responses have been received to date. A full list of agencies receiving a map and letter and copies of any responses received is included as Attachment C to the Siting Memo. The Company also met with local agencies and interested stakeholders, and landowners throughout the siting process, which is described in the Siting Memo located in Volume 2 of the Application.

Bedford County and City of Lynchburg

Members of the Siting Team met with representatives of Bedford County and the City of Lynchburg in a virtual setting on September 25 and 30, 2020, respectively. The purpose of these meetings was to introduce the Project to local officials, review the existing ROW, and obtain information to aid in the route review process. Local officials noted several neighborhood associations or homeowners association groups that could be a potential stakeholder in the Project area. Because the Proposed Route will use existing ROW through residential areas, the Company will continue to work with landowners and identified stakeholders throughout the duration of the Project. The Siting Team also met virtually with VOF staff on October 19, 2020 to discuss the Project and three conservation easements crossed by the existing ROW. Correspondence with the VOF is explained in further detail in Section 3.3.1 of the Siting Memo.

Public Involvement

An in-person public open house was not advisable during the COVID-19 pandemic given the travel restriction and social distancing recommendations and requirements of the Centers for Disease Control and Prevention and the Executive Orders issued by the

Governor of the Commonwealth. In lieu of an in-person public meeting, a virtual open house was created on the Project website (www.AppalachianPower.com/Reusens-NewLondon) and landowners within 250 feet of the transmission line to be rebuilt were mailed an informational packet, including a letter, postcard, fact sheet, comment card with a prepaid postage return envelope, and trifolds of Project information.

The Project was publicly announced with a news release and virtual open house on October 9, 2020. The content provided during the virtual open house was made similar to that of in-person public open houses. For additional information regarding the virtual open house, see Section 2.4 in the Siting Memo (Volume 2 of the Application). A total of 29 comments cards were either returned to the Company or received through the Project website. Those comments were entered into the Project public comment database, and generally related to how the rebuild will differ from the existing line, whether it will affect landowner property in the vicinity, and if there will be impacts to landowners or the environment due to construction access.

C. Detail the nature, location, and ownership of each building that would have to be demolished or relocated if the project is built as proposed.

Response:
The Company determined the Project will largely be located within the existing ROW. A residence, a fire station and a business have encroached on the existing 100-foot ROW. Based on the engineering analysis to date, the rebuilt line can be designed as to avoid the affected buildings from being located within the conductor zone. Accordingly, and subject to completion of final engineering and ROW negotiations with affected landowners, the Company does not expect that any residences and/or public buildings located within 50 feet of the centerline will need to be removed to accommodate the rebuilt line.

Based on available information, seven outbuildings (including, but not limited to, barns, sheds, and garages) are located within 50 feet of the centerline, based on the best available aerial photography and preliminary engineering. Additional field work, engineering, and discussions with landowners are needed to determine if these outbuildings will need to be removed prior to construction. These locations are identified in Exhibit 3, GIS Constraints Map.

No buildings will need to be demolished or relocated as a result of the slight relocation of the Reusens – South Lynchburg 138 kV transmission line and in-fence upgrades at the Brush Tavern Substation.

D. Identify existing physical facilities that the line will parallel, if any, such as existing transmission lines, railroad tracks, highways, pipelines, etc. Describe the current use and physical appearance and characteristics of the existing ROW that would be paralleled, as well as the length of time the transmission ROW has been in use.

Response:
The Project will largely follow existing centerline except in two locations where the centerline slightly deviates from its current alignment. For approximately one mile outside the Reusens Substation, the Project generally parallels the Company's existing Reusens – Roanoke 138 kV transmission line, which predates the Reusens – Altavista 138 kV transmission line. The Project does not parallel pipeline, highway, or railroad corridors.

E. Indicate whether the Applicant has investigated land use plans in the areas of the proposed route and indicate how the building of the proposed line would affect any proposed land use.

Response:
The Siting Team considers impacts to existing and future land uses that may not be compatible with transmission facilities; however, the transmission line to be rebuilt predates the majority of residential and commercial developments that have occurred. The Project is located in the northern extents of the City of Lynchburg and eastern extents of Bedford County. At the start of the route review process, the Company met with local officials to discuss existing and future land use plans as it may relate to the Project. Neither locality raised any potential conflicts between the Project and future land use plans; therefore, it is anticipated the Project will not affect proposed land uses as identified by the local jurisdictions. The Siting Team reviewed the Comprehensive Plans of the localities to evaluate the potential Project impacts to future development. The placement and construction of electric transmission lines is not addressed within either plan. Because the Project will largely rebuild in the existing ROW, it is anticipated that impacts to existing and proposed land uses would be minimal as the transmission corridor has been in use for more than 70 years.

F. Government Bodies

1. Indicate if the Applicant determined from the governing bodies of each county, city and town in which the proposed facilities will be located whether those bodies have designated the important farmlands within their jurisdictions, as required by § 3.2-205 B of the Code.

Response:
The Siting Team's review of available planning documents and meetings with local staff determined that the ROW of the Proposed Route does not cross any designated important farmlands in Bedford County or the City of Lynchburg. The proposed Project is not expected to impact current land uses given the Project will largely be rebuilt in the existing

ROW that has been in use since the 1940s.

2. If so, and if any portion of the proposed facilities will be located on any such important farmland:

a) Include maps and other evidence showing the nature and extent of the impact on such farmlands;

Response:
N/A

b) Describe what alternatives exist to locating the proposed facilities on the affected farmlands, and why those alternatives are not suitable; and

Response:
N/A

c) Describe the Applicant's proposals to minimize the impact of the facilities on the affected farmland.

Response:
N/A

G. Identify the following that lie within or adjacent to the proposed ROW:

Per the *Guidelines for Assessing Impacts of Proposed Electric Facilities on Historic Resources in the Commonwealth of Virginia* (2008) (the "Guidelines"), issued by the Virginia Department of Historic Resources ("VDHR"), The Siting Team contracted Dutton + Associates to complete a Pre-Application Analysis for the proposed Project (see Attachment 2.H.1 to the VDEQ Supplement included in Volume 2 of this Application).

1. Any district, site, building, structure, or other object included in the National Register of Historic Places maintained by the U.S. Secretary of the Interior;

Response:
The following seven National Register of Historic Places ("NRHP")-listed and/or National Historic Landmarks ("NHL") resources are located in proximity to the Proposed Route for Project, but are not within the proposed or existing ROW.

- Poplar Forest NHL (VDHR# 009-0027)
- Woodbourne (VDHR# 009-0033)
- Rothsay (VDHR# 009-0065)
- Bowling Eldridge House (VDHR# 009-5283)
- Locust Grove (VDHR# 118-0219)
- Virginia Episcopal School (VDHR# 118-0224)
- Presbyterian Orphans Home (VDHR# 118-5240)

Poplar Forest (VDHR# 009-0027) is a designated NHL and located 1.12 miles from the Proposed Route; however, the historical home is centrally located on the property and roughly 1.86 miles from the Proposed Route. The landscape between the Poplar Forest property and the Proposed Route is moderately to densely developed with a mix of suburban residential and commercial properties in the Forest area and thus no impact is anticipated. There are six NRHP-listed architectural sites located within one mile of the Proposed Route. The Rothsay and Woodbourne historical properties are located in Bedford County and approximately 0.2 mile from the Proposed Route; however, the homes on the historic properties are located farther and the intervening vegetation limits views of the Project. No more than a minimal impact is anticipated to these NRHP-listed historical resources identified in Bedford County. The Bowling Eldridge House, Virginia Episcopal School, and Presbyterian Orphans Home architectural resources are located in the City of Lynchburg and more than 0.5 mile from the Proposed Route. Minimal impact is anticipated for these NRHP-listed resources in the City of Lynchburg given intervening vegetation and development largely limits visibility of the Project. The NHL and six NRHP-listed resources are discussed in the Pre-Application analysis in the VDEQ Supplement, located in Volume 2.

2. Any historic architectural, archeological, and cultural resources, such as historic landmarks, battlefields, sites, buildings, structures, districts or objects listed or determined eligible by the Virginia Department of Historic Resources ("VDHR");

Response:
The Reusens Dam (VDHR# 118-0218) is an NRHP-eligible architectural resource located within 0.5 mile of the Proposed Route, northeast of the Reusens Substation and at the James River. The Proposed Route is screened by topography and travels south and away from the resource, and no impact is anticipated. The NRHP-eligible resource is discussed in the Pre-Application analysis in the VDEQ Supplement, located in Volume 2.

3. Any historic district designated by the governing body of any city or county;

Response:
None.

4. Any state archaeological site or zone designated by the Director of the DHR, or its predecessor, and any site designated by a local archaeological commission, or similar body;

Response:
None.

5. Any underwater historic assets designated by the DHR, or predecessor agency or board;

Response:
None.

6. Any National Natural Landmark designated by the U.S. Secretary of the Interior;

Response:
None.

7. Any area or feature included in the Virginia Registry of Natural Areas maintained by the Virginia Department of Conservation and Recreation ("DCR");

Response:
None.

8. Any area accepted by the Director of the DCR for the Virginia Natural Area Preserves System;

Response:
None.

9. Any conservation easement or open space easement qualifying under §§ 10.1-1009 – 1016, or §§ 10.1-1700 – 1705, of the Code (or a comparable prior or subsequent provision of the Code);

Response:
There are three VOF conservation easements crossed by the existing ROW, which qualify under Sections 10.1-1009 – 1016, or Sections10.1-1700 – 1705, of the Code (or a comparable prior or subsequent provision of the Code). The existing Reusens – Altavista 138 kV transmission line ROW crosses approximately seven acres of VOF easements and the existing Reusens – South Lynchburg 138 kV Transmission Line ROW crosses approximately three acres of VOF easements. The Company requested comments on the Project from the VOF and Virginia Department of Forestry ("VDOF") in letters dated October 16, 2020. No input was received from the VDOF and no known existing or proposed VDOF conservation easements are crossed by the Project.

Members of the Siting Team met virtually with VOF staff to discuss the VOF easements crossed by the existing ROW, where easement agreements are in place. The Project will be rebuilt on existing centerline on two VOF conservation easements; however, the Project proposes a slight deviation on a third VOF easement where the two 138 kV transmission lines cross to optimize engineering design and reduce the number of transmission structures on the easement (see Exhibit 3, GIS Constraints Map).

10. Any state scenic river;

Response:
None.

11. Any lands owned by a municipality or school district; and

Response:
Six parcels owned by a municipality or school district are crossed by or adjacent to the ROW of the Proposed Route. Two parcels are owned by the City of Lynchburg, three parcels owned by the City of Lynchburg's Economic Development Authority, and one parcel owned by Bedford County's School Board is near the Proposed Route. The existing ROW will remain unchanged on all of the above parcels. In discussions with City of Lynchburg and Bedford County officials, no impacts to future development plans were noted.

12. Any federal, state or local battlefield, park, forest, game or wildlife preserve, recreational area, or similar facility. Features, sites, and the like listed in 1 through 11 above need not be identified again.

Response:
No local, state or federally operated recreational areas or preserves are crossed by the ROW. The Project crosses the Colonial Hills Golf Club course. The Company proposes a minor shift of the ROW at this location between proposed structures 4-41A and 4-47A in order to relocate certain structures a greater distance from the fairways and greens of the course. The deviations from the existing centerline are detailed in Exhibit 3, GIS Constraints Map.

H. List any registered aeronautical facilities (airports, helipads) where the proposed route would place a structure or conductor within the federally-defined airspace of the facilities. Advise of contacts, and results of contacts, made with appropriate officials regarding the effect on the facilities' operations.

Response:
No public airport is located within 20,000 linear feet of the Reusens to New London 138 kV Rebuild Project according to a letter received from the Virginia Department of Aviation on October 20, 2020 (see Attachment C in the Siting Memo in Volume 2).

The Company reviewed the Federal Aviation Administration's ("FAA") Obstruction Evaluation/Airport Airspace Analysis tool early in the route review process to identify potential FAA concerns. The proposed structure heights do not exceed flight traverseways; however, given the proximity to navigation facilities within five miles and potential impacts of navigation signal reception, the Company plans to file all proposed structures and continue coordination with the FAA and Virginia Department of Aviation during the Project permitting process (see the VDEQ Supplement in Volume 2).

I. Advise of any scenic byways that are in proximity to or that will be crossed by the proposed transmission line and describe what steps will be taken to mitigate any visual impacts on such byways. Describe typical mitigation techniques for other highways' crossings.

Response:
No scenic byways as designated by the Federal Highway Administration or the VDOT are crossed by the Project.

J. Identify coordination with appropriate municipal, state, and federal agencies.

Response:
The Siting Team coordinated with various federal, state, and local agencies and/or officials early in the route review process to inform them of the Project and solicit feedback. A list of the agency contacts, letter, map and associated responses for the Project is included as Attachment C to the Siting Memo found in Volume 2 of the Application. A total of six responses to date have been received. The Siting Team also coordinated with local government agencies/officials to aid the route development process as is described in the Siting Memo.

K. Identify coordination with any non-governmental organizations or private citizen groups.

Response:
Coordination with known non-governmental organizations and/or private citizen groups was made early and throughout the route development process to solicit information and gain feedback on the Project through the virtual public open house and by reaching out to landowners. The input received on the Project is summarized throughout the Siting Memo in Volume 2 of the Application.

L. Identify any environmental permits or special permissions anticipated to be needed.

Response:
The following is a list of environmental permits or special permissions that are anticipated to be needed for the Project:

- A general Virginia Pollutant Discharge Elimination System Permit for Discharges of Stormwater from Construction Activities from the VDEQ.
- Surveys and coordination with the United States Fish and Wildlife Service and the Virginia Department of Wildlife Resources will be conducted for potential occurrence of state- and federally-protected species.
- If impacts to cultural resources occur, compliance with Section 106 of the National Historic and Preservation Act of 1966 Compliance and coordination with the VDHR will be required.
- A general Land Use Permit for work within designated ROW from the VDOT.

SECTION IV. HEALTH ASPECTS OF EMF

A. State the calculated maximum EMF levels that are expected to occur at the edge of the right-of-way. If the new transmission line is to be constructed on an existing electric transmission line ROW, provide the present EMF levels as well as the maximum levels calculated at the edge of ROW after the new line is operational.

Response:
The following is an analysis of EMF associated with the Project.

The Project's proposed rebuild of the Reusens – Altavista 138 kV transmission line consists of a double-circuit and a single-circuit section. The double-circuit section will be rebuilt using primarily using steel double-circuit monopoles with davit arms with an optimal phase configuration known as a "superbundle" (3-2-1/3-2-1, top-to-bottom). The single-circuit section will be built primarily using steel single-circuit monopole and H-frame structures.

EMF levels were computed at the ROW edges of the existing and proposed line configurations at the point of minimum ground clearance, where EMF is the highest. Lower EMF levels are expected beyond the ROW edges, as levels decline with distance. Factors that affect EMF include the ROW width, operating voltage, current flow and direction, electrical unbalance, line configuration, conductor height above ground, and other nearby objects. Nominal voltages and balanced conditions are assumed, with maximum current levels and directions expected during normal system operation. No trees, shrubs, buildings or other objects that can block EMF are assumed in proximity to the existing and proposed lines.

Normal maximum loading levels, representing peak load conditions, were assumed in the analysis to maximize the calculated magnetic fields. These loading levels are based on winter 2025-2026 projected system conditions. Daily/hourly loads will fluctuate below these levels. All calculations were obtained at the height of 3.28 feet (one meter) above ground using the Electric Power Research Institute ("EPRI") EMF Workstation computer program.

Based on the foregoing, the maximum EMF levels expected to occur at the ROW edge of the Project's proposed double-circuit section are 0.28 kV/m and 14.08 mG, respectively. The maximum EMF levels expected to occur at the ROW edge of the Project's proposed single-circuit section are 0.80 kV/m and 15.39 mG, respectively.

The maximum existing EMF levels for the existing double-circuit section of the line are 0.18 kV/m and 15.23 mG, respectively. The maximum existing EMF levels for the existing single-circuit section of the line are 0.60 kV/m and 12.85 mG, respectively.

The Project also includes a relocation of a short portion of the Reusens – South Lynchburg 138 kV transmission line. The maximum EMF levels expected to occur at the ROW edge of the Project are 0.20 kV/m and 4.31 mG, respectively (assuming a 100-foot-wide ROW). The maximum existing EMF levels for the section of this line are 0.24 kV/m and 4.30 mG, respectively.

B. If Company is of the opinion that no significant health effects will result from the construction and operation of the line, describe in detail the reasons for that opinion and provide references or citations to supporting documentation.

Response:

EMFs occur naturally in the environment. An electric field is present between the earth and its atmosphere, and can discharge as lightning during thunderstorms. The earth also has a magnetic field, which provides an operating basis for the magnetic compass. EMF exists wherever there is a flow of electricity, including electrical appliances and power equipment.

Electric fields are produced by voltage or electric charge. A lamp cord that is plugged in produces an electric field even if the lamp is turned off. These fields commonly are measured in kV/m; the higher the voltage, the greater is the electric field. Magnetic fields are created by the flow of current in a wire. As current increases, the magnetic field strength also increases; these fields are measured in units known as gauss, or milligauss ("mG").

Electric fields are blocked by trees, shrubs, buildings and other objects. Magnetic fields are not easily blocked and can pass through most objects. The strength of these fields decreases rapidly with distance from the source.

EMF associated with power lines and household appliances oscillate at the power frequency (60 Hz in the U.S.). When people are exposed to these fields, small electric currents are produced in their bodies. These currents are weaker than natural electric currents in the heart and nervous system.

Possible health effects from exposure to EMF have been studied for several decades. Initial research, focused on electric fields, found no evidence of biologic changes that could lead to adverse health effects. Subsequently, a large number of epidemiologic studies examined the possible role of magnetic fields in the development of cancer and other diseases in adults and children. While some studies have suggested an association between magnetic fields and certain types of cancer, researchers have been unable to consistently replicate those results in other studies. Similarly, inconclusive or inconsistent results have been reported in laboratory studies of animals exposed to magnetic fields that are representative of common human exposures. A summary of such exposures, found in residential settings, is provided in Table IV-1

Appliance Type	Number of Devices	Magnetic Field (mG)		
		1.2" (0.1 feet)	12" (1.0 feet)	User Distance
AC Adapters	3	1.4 – 863	0 - 7.5	0 - 0.8
Blood Pressure Monitors	4	4.2 - 39.6	0 - 0.3	0 – 0.2
Bluetooth Headsets	3	0	0	0
Coffee Grinders	3	60.9 – 779	0.3 – 6.5	0.8 - 40.9
Compact Fluorescent Bulbs	15	0 – 32.8	0 - 0.1	0 - 0.6
Compact Fluorescent Bulb Ballast	1	8.5 – 23.5[1]	0 – 0.1[1]	0 - 0.1[1]
Computers, Desktop	3	3.8 – 68.9	0 -1.1	0.1 – 0.5
Computers, Laptop	4	0 – 5.1	0	0 – 0.1
Digital Cameras	3	0	0	0
Digital Photo Frames	5	0	0	0
Digital Video Recorders	4	0 – 29.6	0 – 0.2	0
Dimmer Switches	4	11.5 – 32.1	0 – 0.8	0 – 0.8
DVD Players	5	0 – 28.9	0 – 0.5	0
Electric Lawn Mower	1	1939	156	14.1
Electric Leaf Blowers	4	272 – 4642	17.1 – 155	28.3 – 61.5
Electric Toothbrushes	5	3.6 - 742	0 – 4.8	3.6 – 742
Electric Toothbrush Chargers	5	0 – 4.2	0	0
External Hard Drives	4	0.6 – 1.7	0	0
Gaming Consoles	10	0 – 215	0 – 0.5	0 – 0.6
GPS, Handheld	5	0 – 0.1	0	0
Hobby Tools	2	126 – 438	1.4 – 2.4	1.4 - 438
Hot Glue Guns	3	0 – 0.9	0	0
LCD Computer Monitors	4	0 – 4.5	0	0
LCD Televisions	4	1.1 – 3.9	0 – 2.5	0 – 0.6
Massagers/Massage Chairs	3	81.9 – 500	0.6 – 2.3	21.4 - 500
MP3 Players	5	0	0	0
Noise Cancellation Headphones	1	0	0	0
Paper Shredders	4	11.0 – 4841	0.5 – 102	0.5 – 33.4
Plasma Televisions	2	45.1 – 73.6	1.4 – 2.2	0 – 0.1
Power Tools – Corded	3	784 – 982	8.8 – 31.3	46.8 - 123
Power Tools – Cordless	6	9.0 – 227	0 – 2.2	0 – 13.7
Printers	5	0.1 – 6.2	0 – 0.3	0 – 0.3
Scanners	3	0.6 – 6.7	0 – 0.3	0
Security System Panels	3	0 – 0.3	0	0
Tankless Hot Water Heater	1	10.1 – 21.9[2]	1.2	0.2
Track Lighting	5	0.2 – 4.0	0 – 0.3	0
Vacuum Cleaners, Personal/Car	3	75.5 – 2226	0.6 – 23.3	0.1 – 23.1
Wireless Game Controllers	11	0	0	0
Wireless Routers	4	0 – 0.5	0	0-0.3

Table IV-1. Magnetic Fields from Household Electrical Appliances and Devices
(Source: EPRI[1])

As part of the National Energy Policy Act of 1992, U.S. Congress enacted the Electric and Magnetic Fields Research and Public Information Dissemination ("EMF RAPID") program. The National Institute of Environmental Health Sciences ("NIEHS") was charged with overseeing the health research and conducting an EMF risk evaluation. In its final report to Congress, issued in 1999, NIEHS concluded that power-frequency "EMF exposure cannot be recognized at this time as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard." Nonetheless, the report stated that "this finding is insufficient to warrant aggressive regulatory concern." [2]

In 2001, the Standing Committee on Epidemiology of International Commission on Non-Ionizing Radiation Protection ("ICNIRP") wrote in its review of the epidemiologic literature on EMF and health that "given the methodological uncertainties and in many cases inconsistencies of the existing epidemiologic literature, there is no chronic disease outcome for which an etiological [causal] relation to EMF exposure can be regarded as

established." [3]

Also, in 2001, International Agency for Research on Cancer ("IARC") published the results of an EMF health risk evaluation conducted by an expert scientific working group, which concluded that power-frequency "magnetic fields are 'possibly carcinogenic to humans,' based on consistent statistical associations of high level residential magnetic fields with a doubling of risk of childhood leukemia."[4] IARC assigns its 'possibly carcinogenic to humans' classification (Group 2B) if there is "limited evidence" of carcinogenicity in both humans and experimental animals, or if there is "sufficient evidence" in animals, but "inadequate evidence" in humans. Group 2B includes some 288 "agents" such as coffee, pickled vegetables, carpentry, textile manufacturing and gasoline, among others (last update: October 26, 2015).

A comprehensive assessment of the EMF health risks was published by the World Health Organization ("WHO") in 2007. In its assessment, WHO wrote: "Scientific evidence suggesting that every day, chronic, low-intensity (above 0.3-0.4 μT) [3-4 mG] power-frequency magnetic field exposure poses a possible health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia." [5] It added, however, that "virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level extremely low frequency ("ELF") magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern."

Regarding acute effects, WHO noted, "Acute biological effects have been established for exposure to ELF electric and magnetic fields in the frequency range up to 100 kilohertz ("kHz") that may have adverse consequences on health. Therefore, exposure limits are needed. International guidelines exist that have addressed this issue. Compliance with these guidelines provides adequate protection for acute effects." [5]

In summary, some studies have reported an association between long-term magnetic field exposure and particular types of health effects, while other studies have not. The nature of the reported association remains uncertain as no known mechanism or laboratory animal data exist to support the cause-and-effect relationship.

In view of the scientific evidence, the IEEE and other organizations have established guidelines limiting EMF exposure for workers in a controlled environment and for the general public. These guidelines focus on prevention of acute neural stimulation. No limits have been established to address potential long-term EMF effects, as the guideline organizations consider the scientific evidence insufficient to form the basis for such action. For power-frequency EMF, IEEE Standard C95.6TM-20026 recommends the following limits:

	General Public	Controlled Environment
Electric Field Limit (kV/m)	5.0	20.0*
Magnetic Field Limit (mG)	9,040	27,100

* 10.0 kV/m within power line ROW.

To address public concerns about EMF, the Government of Canada in 2012 updated its website with the latest knowledge on the subject. It contains the following statements on the EMF health-related risks: "Health Canada does not consider that any precautionary measures are needed regarding daily exposures to EMFs at ELFs. There is no conclusive evidence of any harm caused by exposures at levels found in Canadian homes and schools, including those located just outside the boundaries of power line corridors." [7]

Similarly, in 2013, the updated website of the World Health Organization concluded: "to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health." [8]

Most recently, in its January 2015 report, the Scientific Committee on Emerging and Newly Identified Health Risks, an independent advisory body to the European Commission on Public Health, issued the following opinion: "Overall, existing studies do not provide convincing evidence for a causal relationship between extremely low frequency magnetic field ("ELF MF") exposure and self-reported symptoms." [9]

AEP has been following the EMF scientific developments worldwide, participating in and sponsoring EMF studies, and communicating with customers and employees on the subject. Also, AEP is a member of Electric Power Research Institute, an independent, non-profit organization sponsoring and coordinating EMF epidemiological, laboratory and exposure studies.

The line rebuild construction proposed in this Project will be compliant with the EMF limits specified in IEEE Standard C95.6TM-2002.

C. Describe any research studies the Company is aware of that meet the following criteria:

1. **Became available for consideration since the completion of the Virginia Department of Health's most recent review of studies on EMF and its subsequent report to the Virginia General Assembly in compliance with 1985 Senate Joint Resolution No. 126;**

2. **Include findings regarding EMF that have not previously been reported and/or provide substantial additional insight into previous findings; and**

3. **Have been subjected to peer review.**

In its report to the Virginia General Assembly, issued on October 31, 2000, the Virginia Department of Health stated the following: "the Virginia Department of Health is of the opinion that there is no conclusive and convincing evidence that exposure to extremely low frequency electromagnetic fields emanated from nearby high voltage transmission lines is causally associated with an increased incidence of cancer or other detrimental health effects in humans." [10]

Key publications on the subject, which became available after that report, are included below as references to the discussion contained in Section IV.B of this Response to Guidelines.

Section IV References

[1] "Magnetic Fields from Electrical Appliances and Devices," Electric Power Research Institute, Product ID 1021221, September 28, 2010.

[2] "NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields," National Institute of Environmental Health Sciences, National Institutes of Health, NIH Publication No. 99-4493, May 4, 1999 (http://www.niehs.nih.gov/about/materials/niehs-report.pdf).

[3] "Review of the Epidemiologic Literature on EMF and Health," International Commission for Non-Ionizing Radiation Protection (ICNIRP) Standing Committee on Epidemiology, Environmental Health Perspectives, Volume 109, Supplement 6, December 2001 (http://www.icnirp.de/documents/epireview1.pdf).

[4] "IARC Finds Limited Evidence that Residential Magnetic Fields Increase Risk of Childhood Leukemia," International Agency for Research on Cancer, Press Release No 136, June 27, 2001 (http://www.iarc.fr/en/media-centre/pr/2001/pr136.html).

[5] "Extremely Low Frequency Field (Environmental Health Criteria 238)," World Health Organization, June 1, 2007 (http://www.who.int/peh-emf/publications/Complet_DEC_2007.pdf).

[6] "C95.6™ IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0-3 kHz," IEEE Standards Coordinating Committee 28, October 23, 2002.

[7] "Electric and Magnetic Fields from Power Lines and Electrical Appliances," Healthy Canadians, November 7, 2012 (http://www.healthycanadians.gc.ca/environment-environnement/home-maison/emf-cem-eng.php).

[8] "What are Electromagnetic Fields? Summary of Health Effects," World Health Organization, 2013, (http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html)

[9] "Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF)," Scientific Committee on Emerging and Newly Identified Health Risks, SCENIHR, January 27, 2015 (http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_041.pdf).

[10] "Monitoring of Ongoing Research on the Health Effects of High Voltage Transmission Lines (Final Report)," Virginia Department of Health, October 31, 2000 (http://www.vdh.state.va.us/Epidemiology/DEE/publichealthtoxicology/documents/pdf/highfinal.PDF).

SECTION V. NOTICE

A. Furnish a proposed route description to be used for public notice purposes. Provide a map of suitable scale showing the route of the proposed project. For all routes that the Applicant proposes to be noticed, provide minimum, maximum and average structure heights.

Response:
A description of the Project's Proposed Route is provided below. The requested public notice map is included as Exhibit 14.

The Proposed Route for the Project is 11.6 miles long and will be constructed almost entirely within existing transmission line ROW. The Proposed Route begins at the Company's existing Reusens Substation located in the northern portion of the City of Lynchburg and on the west side of the James River (200 Old Trents Ferry Road, Lynchburg, Virginia). The Proposed Route exits the Reusens Substation and travels southwest for approximately 0.5 mile crossing Old Trents Ferry Road and then State Route 645 (Trents Ferry Road), approximately 2,000 feet farther west. The Proposed Route turns southwest for approximately one mile through a residential area, crossing Locksview Road and Fieldale Road and then paralleling Old Spring Way, before reaching U.S. Route 501 Business (Boonsboro Road). The Proposed Route crosses Boonsboro Road at the Lynchburg Fire Department Station 5. On the west side of Boonsboro Road, the Proposed Route is immediately north of the Boonsboro Village Apartments complex and continues approximately one mile in another residential area, crossing Burnt Bridge Road, Hickory Hill Drive, Bon Ton Road and New Britain Drive.

The Proposed Route crosses Irvington Springs Road and enters the Boonsboro Substation (180 Irvington Springs Road, Lynchburg, Virginia). After the Boonsboro Substation, the Proposed Route continues southwest for an additional 0.5 mile and crosses U.S. Route 501(Northwest Expressway). After crossing Northwest Expressway, the Proposed Route continues for 1.3 miles where it crosses the Reusens – South Lynchburg 138 kV transmission line and the Project transitions from double circuit to single circuit. After the 138 kV line crossing, the Proposed Route is single-circuit and continues southwest for approximately 0.3 mile crossing State Route 660 (Hawkins Mill Road). After crossing Hawkins Mill Road, the Proposed Route continues southwest for approximately 1.9 miles crossing State Route 621 (Cottontown Road), Ivy Wolf Lane, and the Colonial Hills Golf Club course located off Gumtree Road. After the golf course, the Proposed Route continues across two Virginia Outdoor Foundation conservation easements for approximately one mile before crossing U.S. Route 221 (Forest Road) to enter the Forest Substation (15105 Forest Road, Forest, Virginia). The Proposed Route then turns south for 1.1 miles crossing several residential streets, including Woodbrook Lane, Old Hickory Lane and Otterview Road before reaching State Route 622 (Everett Road). After crossing Everett Road, the Proposed Route continues approximately 1.4 miles to enter the New London Substation (1810 Overland Road, Bedford, Virginia), located approximately 1.7 miles west of the Campbell County line.

Structure types will be determined during final engineering, which includes ground surveys and geotechnical studies. Nevertheless, based on preliminary engineering, the Company anticipates primarily using steel double-circuit monopole structures and steel single-circuit monopole and H-frame structures for the Project. The anticipated structure heights on the double-circuit section of the Project (from the Reusens Substation to proposed structure 4-31A) range from 90 feet to 140 feet tall, with an average structure height of approximately 115 feet. The anticipated structure heights on the single circuit section of the Project (from proposed structure 4-31A to the New London Substation) range from 55 feet to 100 feet tall, with an average structure height of approximately 85 feet.

B. List Applicant offices where members of the public may inspect the application. If applicable, provide a link to website(s) where the application may be found.

Response:
This Application and all exhibits, tables, and maps made a part hereof will be available for inspection at the following locations:

Forest Library
15583 Forest Road
Forest, VA 24551

Timbrook Library
18891 Leesville Road
Lynchburg, VA 24501

This Application, exhibits, and maps are also available at the Company's Project website: www.AppalachianPower.com/Reusens-NewLondon.

C. List all federal, state, and local agencies and/or officials that may reasonably be expected to have an interest in the proposed construction and to whom the Applicant has furnished or will furnish a copy of the application.

Response:
Federal
United States Army Corps of Engineers, Norfolk District, Western Section
United States Environmental Protection Agency, Region 3
United States Fish and Wildlife Services, Virginia Field Office
United States Department of Transportation Federal Aviation Administration, Flight Standards District Office
United States Department of Transportation, Federal Highway Administration, Virginia Division
United States House of Representatives, 5th District (Bob Good) **
United States House of Representatives, 6th District (Ben Cline)**

State
Virginia Department of Environmental Quality**
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation, Division of Natural Heritage
Virginia Department of Conservation and Recreation, Karst Protection Program
Virginia Department of Conservation and Recreation, Planning and Recreation
Virginia Department of Historic Resources, Division of Review and Compliance
Virginia Department of Forestry
Virginia Department of Wildlife Resources, Environmental Services Section
Virginia Department of Mines, Minerals, and Energy
Virginia Department of Transportation (Central Office - Richmond)
Virginia Department of Transportation (Lynchburg District)
Virginia Department of Health, Danville Field Office
Virginia Marine Resources Commission
Virginia Outdoors Foundation
Senate of Virginia, 22nd District (Mark J. Peake) **
Senate of Virginia, 23rd District (Stephen D. Newman) **
Virginia House of Delegates (Wendell S. Walker) **
Virginia House of Delegates (Kathy J. Byron)**

Local
Bedford County, Board of Supervisors (Tommy Scott, Board Chair)
Bedford County, Board of Supervisors (Tammy Parker, Vice Chair)
Bedford County, Administrator (Robert Hiss)*
Bedford County, Attorney (Patrick Skelley)

Campbell County, Board of Supervisors (Jon R. Hardie, Board Chair)
Campbell County, Board of Supervisors (Matt Cline, Vice Chair)
Campbell County, Administrator (Frank J. Rogers)*
Campbell County, Attorney (F.E. “Tripp” Isenhour)

City of Lynchburg, Mayor (MaryJane Dolan)
City of Lynchburg, Interim City Manager (Dr. Reid A. Wodicka)*
City of Lynchburg, Attorney (Walter C. Erwin, III)
City of Lynchburg, City Planner (Tom Martin)
City of Lynchburg, Environmental Planner (Kate Miller)

* Appalachian will distribute a hard copy of the Application and related materials to these officials.
** Appalachian will provide access to an electronic copy of the Application and related materials to these officials or agencies.

D. If the application is for a transmission line with a voltage of 138 kV or greater, provide a statement and any associated correspondence indicating that prior to the filing of the application with the SCC the Applicant has notified the chief administrative officer of every locality in which it plans to undertake construction of the proposed line of its intention to file such an application, and that the Applicant gave the locality a reasonable opportunity for consultation about the proposed line (similar to the requirements of § 15.2-2202 of the Code for electric transmission lines of 150 kV or more).

Response:

As detailed in Section III.B, representatives of Appalachian met with the counties and localities in which the Reusens – Altavista 138 kV transmission line will be rebuilt to inform them of the Project and solicit input. The Company met with Bedford County and City of Lynchburg officials in a virtual setting on September 25 and 30, 2020, respectively. The purpose of the meetings was to update the localities on the Project. In the above meetings, the officials were advised that the Company plans to file an application with the SCC for approval of the Project.