

National Park Service
United States Department of the Interior

Shenandoah National Park Service
Appalachian National Scenic Trail
Virginia



Dooms-Bremo 230-kV Transmission Line Right-of-Way and Special Use Permit Environmental Assessment

April 2014

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CONTENTS

Chapter 1: Purpose and Need 1

- Introduction 1
- Purpose of and Need for Action 4
 - Objectives in Taking Action 4
- Background 5
 - Background of the Parks 5
 - Background of the Project 6
 - Applicable Laws, Policies, and Previous Planning Efforts 8
- Scoping 9
- Issues and Impact Topics 10
 - Impact Topics Retained for Analysis 10
 - Impact Topics Dismissed from Detailed Analysis 12

Chapter 2: Alternatives 19

- Descriptions of Alternatives 20
 - Alternative 1: No Action 20
 - Elements Common to All Action Alternatives 22
 - Alternative 2: Approval of the SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Right-of-Way 27
 - Alternative 3: Approval of the SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access From Skyline Drive 29
- Mitigation Measures of the Action Alternatives 33
 - Soils and Water Resources 33
 - Cultural Resource Protection 34
 - Biotic Communities (Vegetation) 35
 - Visitor Use and Experience 36
 - Wetlands and Waterways 36
- Alternatives Considered but Dismissed 36
 - Relocation of Tower near Skyline Drive 37
- NPS Preferred Alternative 37
- Environmentally Preferable Alternative 38

Chapter 3: Affected Environment and Environmental Consequences 45

- General Methodology for Establishing Impact Definitions and Measuring Impacts by Resource 45
 - General Analysis Methods 45
 - Assumptions 46
 - Impact Definitions 46
 - Cumulative Impacts Analysis 47
- Geology and Soils 48

Affected Environment	48
Environmental Consequences	49
Biotic Communities	54
Affected Environment	54
Environmental Consequences	57
Visitor Use and Experience	62
Affected Environment	62
Environmental Consequences	64
Scenic Resources	68
Affected Environment	68
Environmental Consequences	69
Soundscapes	74
Affected Environment	74
Environmental Consequences	76
Cultural Resources: Historic Structures	81
Affected Environment	81
Environmental Consequences	83
Cultural Resources: Cultural Landscapes	87
Affected Environment	87
Environmental Consequences	89
Chapter 4: Consultation and Coordination	95
List of Preparers	96
Chapter 5: Glossary and Acronyms	98
Glossary of Terms	98
Acronyms	100
Chapter 6: References	102
Personal Communications	105

TABLES

1: Applicable Laws, Policies, and Previous Planning Efforts	8
2: Existing and Proposed Towers	22
3: Summary of Environmental Consequences	39
4: Soil Unit Descriptions	48
5: Summary of KOPs	71
6: Common Sounds and Their Associated Noise Levels	75
7: Common Construction Sounds and their Associated Noise Levels	76
8: Contributing Historic Structures Located in the Study Area	83
9: Contributing Landscape Features Located in the Study Area	88

FIGURES

- 1: Parks and Project Vicinity 2
- 2: Project Location 3
- 3: Photograph from Skyline Drive looking East at the Appalachian Trail 20
- 4: Cross Section of Existing Right-of-Way (Facing West) 21
- 5: Proposed Right-of-Way Configuration 23
- 6: Proposed Limits of Disturbance (East of Skyline Drive) 25
- 7: Proposed Limits of Disturbance (Appalachian Trail) 26
- 9: Proposed Access and Limits of Disturbance West of Skyline Drive 31
- 10: 2012 Visitation—Shenandoah National Park 62
- 11: View from the Appalachian Trail toward Skyline Drive (facing west) 63
- 12: KOPs and Viewshed 70
- 13: Shenandoah National Park Wilderness Areas 79
- 14: NHL Contributing Historic Structures 82

LIST OF APPENDIXES

- Appendix A: Construction Plan
- Appendix B: Applicable Laws, Policies, And Planning Documents
- Appendix C: Public Scoping Materials
- Appendix D: Wetlands And Waterways Resource Report
- Appendix E: Threatened And Endangered Species Resource Report
- Appendix F: Visual Resource Report
- Appendix G: Invasive Species
- Appendix H: Vegetation Management Plan
- Appendix I: Consulting Agency(s) Correspondence

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CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

Dominion Virginia Power (Dominion or the applicant) has requested permits from the National Park Service (or NPS) to upgrade its existing transmission facilities across approximately 3,000 feet of national park system lands inside the boundaries of Shenandoah National Park and the Appalachian National Scenic Trail (the parks) near Waynesboro, Virginia (figure 1). The proposed action, part of the Dominion's larger effort to upgrade the entire 45 miles of its electrical transmission line between Doooms and Breomo, Virginia, would replace an existing 115-kilovolt (kV) line and associated towers with a new 230-kV line and towers (the Doooms – Breomo line) in the existing right-of-way across NPS property (figure 2). At the crossing of Skyline Drive and the Appalachian Trail, the Doooms – Breomo line is located between two other transmission lines—a 500-kV line and a 230-kV line—in the middle of the 300-foot-wide corridor, where the corridor consists of a 100-foot deeded easement owned by Dominion and a 200-foot discretionary right-of-way permit granted by the National Park Service. At the tract 444 parcel (east of Skyline Drive), the Doooms – Breomo line is adjacent to a 500-kV transmission line in a 215-foot-wide corridor. All areas where the transmission lines cross NPS boundaries will be referred to as “corridor” in this document. Within national park system lands, Dominion would remove five towers and build four towers (described further in chapter 2). The replaced towers would be generally in the same location as the existing towers. The tower that would not be replaced is tower 39/325 (figure 2). The applicant has requested permits from the National Park Service to authorize construction and use of national park system lands for this purpose. Therefore, the federal action under consideration in this environmental assessment is deciding whether and under what conditions to issue Dominion the permits it requires. Analysis in the environmental assessment focuses on the area where the corridor crosses national park system lands or where the action may affect park resources and/or values. This analysis will help the National Park Service to determine the significance of any environmental effects and examine reasonable alternatives and modifications to assist it in meeting its resource management objectives.

This environmental assessment analyzes the environmental impacts of three alternatives:

- **Alternative 1 —No Action:** The existing transmission line would continue to operate and be maintained in accordance with existing agreements (included in appendix A). No action would be taken on the request for the construction special use permit (SUP) and right-of-way permit for operation and maintenance. The existing transmission line would continue to operate and be maintained in accordance with existing agreements (included in appendix A).
- **Alternative 2 —Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor:** The National Park Service would approve the request for the construction SUP and right-of-way permit to rebuild the existing line in accordance with the construction plan (appendix A) developed collaboratively by Dominion and the National Park Service during the preparation of this environmental assessment. Access to tower



FIGURE 1: PARKS AND PROJECT VICINITY

Dooms - Brems 230-kV Transmission Line Project
Shenandoah National Park and
Appalachian National Scenic Trail

National Park Service
 U.S. Department of the Interior



<p>Legend</p> <ul style="list-style-type: none"> ■ Existing Towers on NPS Land — Dooms - Brems Centerline Existing right-of-way - - - Appalachian National Scenic Trail Appalachian National Scenic Trail Lands Shenandoah National Park — Streets 	<p>0 0.125 0.25 0.5 Miles</p> <p>Projected Coordinate System: State Plane Virginia South Datum: North American Datum of 1983 (NAD 83) Projection: Lambert Conformal Conic Linear Unit: Feet</p>	
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FIGURE 2: PROJECT LOCATION

39/336 (proposed tower 2139/131) would be from the west along the existing right-of-way with limited use of Skyline Drive.

- **Alternative 3 —Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access off Skyline Drive:** The National Park Service would approve the request for the construction SUP and right-of-way permit to rebuild the existing line in accordance with the construction plan (appendix A) developed collaboratively by Dominion and the National Park Service during the preparation of this environmental assessment. Access to tower 39/336 (proposed tower 2139/131) would be from Skyline Drive.

This environmental assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and implementing regulations, Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508, NPS Director’s Order (DO) #12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2011), and accompanying DO-12 Handbook (NPS 2001).

PURPOSE OF AND NEED FOR ACTION

The need component of an environmental assessment explains why taking action at this time is necessary, and the purpose component broadly describes the goals and objectives that the National Park Service intends to fulfill through taking action [NPS DO-12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2011), and accompanying DO-12 Handbook (NPS 2001)]. The purpose of and need for action by the National Park Service is distinct from that of the applicant.

Dominion asserts that its action is needed to increase capacity of the Doods – Bremono line, continue to provide reliable electrical service to customers served by the Doods – Bremono line, and maintain compliance with the North American Electric Reliability Corporation Reliability Standards. The NPS action is needed because Dominion has filed construction SUP applications to rebuild transmission facilities on national park system lands as part of its larger effort to upgrade the Doods – Bremono line. The purpose of the NPS action is to determine how to best respond to Dominion’s request while protecting park resources and experience.

Objectives in Taking Action

Objectives were developed in accordance with NPS DO-12 (NPS 2011). Objectives are more specific statements of purpose and must be achieved to a large degree for the action to be considered a success (NPS 2011). All action alternatives selected for detailed analysis must meet project objectives to a large degree and resolve the purpose of and need for action. Objectives must be grounded in the park’s enabling legislation, purpose, significance, and mission goals and must be compatible with direction and guidance provided in the park’s general management plans, strategic plans, and/or other management guidance. The objectives developed for this proposed action are listed below:

- **Natural Resources:** Avoid or minimize impacts on the natural resources (including botanical and aquatic resources, wildlife, and habitat) in the parks, including sensitive communities.
- **Wilderness Resources:** Maintain and protect designated wilderness areas and character.
- **Cultural Resources:** Preserve and protect the cultural value of national park system lands, including Skyline Drive and the Appalachian Trail, cattle and bridle underpasses, and the associated views from historic features and vistas.
- **Health and Safety:** Protect the health and safety of park employees, volunteers, and visitors during construction, operation, and maintenance of the facilities.
- **Visitor Experience:** Minimize and mitigate adverse impacts on visitor experience and scenic quality during and after construction.
- **Park Operation:** Minimize the burden on parks and volunteer staff's time and effort to manage the corridor.

BACKGROUND

Background of the Parks

Shenandoah National Park

Shenandoah National Park is a vital part of America's national system of parks, monuments, battlefields, recreation areas, and other natural and cultural resources. Authorized by an act of the U.S. Congress in 1926, established in 1935, and dedicated in 1936, Shenandoah National Park is located along the crest of the Blue Ridge Mountains in Virginia. The park contains approximately 197,500 acres, 80,000 acres of which are designated wilderness. The park preserves an outstanding representation of the Blue Ridge/Central Appalachian biome and makes this a valuable part of America's heritage visited by approximately 1.3 million visitors each year for their experience, enjoyment, understanding, and appreciation. The park also protects the iconic Skyline Drive, one of the nation's premier National Scenic Byways and a National Historic Landmark (NHL). The Appalachian Trail is contained within Shenandoah National Park for approximately 100 miles of the Appalachian Trail.

Appalachian National Scenic Trail

The Appalachian National Scenic Trail is a 2,175-mile-long public footpath. It traverses through the scenic, wooded, pastoral, wild, and culturally resonant lands across 14 of the eastern United States, from Mount Katahdin in Maine to Springer Mountain in Georgia. Conceived in 1921 and completed in 1937, the Appalachian Trail was built and is still maintained by volunteers, giving rise to its nickname, "the people's trail." The National Trails System Act designated the Appalachian Trail as the nation's first national scenic trail in 1968, and it is arguably the most famous hiking path in world.

It is enjoyed by an estimated 2 to 3 million people each year and lies within a day's drive of two-thirds of the U.S. population. People of all ages and abilities come to the Appalachian Trail to enjoy short walks, day hikes, long-distance backpacking journeys, or the revered "thru-hike" on this iconic trail. The Appalachian Trail offers a variety of opportunities for viewing spectacular scenery, adventure, exercise, nature study, personal exploration, and renewal (NPS 2009).

The Appalachian Trail is administered through a system of cooperative management in coordination with the National Park Service, the Appalachian Trail Conservancy, volunteers from 31 local Appalachian Trail Clubs, the U.S. Department of Agriculture, Forest Service, and dozens of other state and local land management agencies. Within this partnership, thousands of volunteers do much of the work each year to keep the Appalachian Trail open for all to enjoy. Although it is considered a unit of the National Park Service, the Appalachian Trail traverses a complex patchwork of lands consisting of 75 federal and state parks and forests in addition to the extensive corridor of NPS-managed lands (NPS 2009). In this section of the park, peak visitor use on the Appalachian Trail is from mid-May to mid-July. Calf Mountain Shelter along the Appalachian Trail is in the vicinity of the corridor (access from Jarman Gap, milepost number 97) and consists of a three-sided stone structure, which is available for overnight use by backpackers or hikers.

Background of the Project

Dominion identified the need to upgrade its 115-kV transmission facilities between the Doods and Brems substations (the Doods – Brems line) as part of its regional transmission expansion planning process in 2010. According to Dominion, demand on the Doods – Brems line is increasing, and the upgrade is needed to maintain reliable electrical service and avoid violations of the North American Electric Reliability Corporation standards. In addition, the existing line stands on wooden H-frame towers that were built in 1957 and are nearing the end of their useful lives (40 to 50 years), and these towers will require replacement regardless of the other capacity considerations for the upgrade (Dominion 2011). To achieve both these objectives, Dominion plans to replace the existing H-frame towers with new steel towers that can support greater capacity and install new, higher capacity conductors (230 kV).

The Doods - Brems line crosses about 3,000 feet of national park system lands inside the boundaries of the Shenandoah National Park and the Appalachian National Scenic Trail near Waynesboro, Virginia. It currently crosses Skyline Drive and the Appalachian Trail approximately 8 miles north of the Rockfish Gap entrance of Skyline Drive. Additionally, a parcel owned by the Appalachian National Scenic Trail (tract 444) is located approximately 1 mile east of Skyline Drive and is also crossed by the Doods – Brems line (figure 2). At the crossing of Skyline Drive and the Appalachian Trail, the Doods – Brems line is located between two other transmission lines—a 500-kV line and a 230-kV line—in the middle of the 300-foot-wide corridor. At the tract 444 parcel, the Doods – Brems line is adjacent to a 500-kV transmission line in a 215-foot-wide corridor. The areas where the transmission lines cross national park system lands are referred to as the "corridor" in this document.

Appalachian National Scenic Trail Crossing

On Appalachian National Scenic Trail property, Dominion owns easements acquired from the land's previous owners that allow Dominion to: "erect poles, towers, and other supports to guy, brace, re-locate, and maintain the same, and to string, stretch, suspend and construct thereon wires, cables, and other fixtures and appliances including telephone wires necessary or convenient for the transmission on electric current. . ." (attachment C of appendix A).

Shenandoah National Park Crossing

Within Shenandoah National Park, the land on which the Doods – Bremo line lies is owned in fee by the National Park Service, and Dominion operates the line under an NPS right-of-way permit (SUP # CX484040014) in place since 1958 that is renewed every 10 years (attachment C of appendix A) and authorizes Dominion to maintain the 115-kV and 500-kV power transmission lines across Shenandoah National Park property. In 1973, Shenandoah National Park added conditions to the SUP (revised in 1983, expanding the right-of-way to 300 feet), which included, but are not limited to:

- No other buildings or structures shall be created under the permit without prior approval;
- No timber may be cut or destroyed without first obtaining a permit from the National Park Service (exception listed below);
- Large trees outside of the right-of-way, which in falling could come within 10 feet of the conductor (danger trees) may be selectively felled after receiving prior approval from the Superintendent and cut under NPS supervision;
- Right-of-way clearing shall not exceed a total width of 300 feet;
- Laurel, azaleas, and other low growth plants and shrubs shall not be cleared from the 300 foot right-of-way, unless they are interfering with the prescribed uses. Brush log and other clearing debris shall be removed from the right-of-way and disposed of by scattering in close contact with the ground over a sufficiently wide area outside the clearing to eliminate brush piles near the edge of the right-of-way;
- General spraying of the right-of-way to control plant growth shall not be performed. Basal spraying of cut stumps to control sprouting is allowed if accomplished by competent personnel. Spraying must be done by means of low pressure and with calm winds; if weather conditions are not ideal, spraying will be delayed until weather conditions permit. All spraying must be approved by the National Park Service beforehand.
- The permittee shall take adequate measures to restrict and prevent soil erosion;
- The permit may be terminated upon breach of any of the conditions herein or at the discretion of the Director, NPS;

- The permit may not be transferred;
- Dominion shall exercise care in constructing and maintaining this facility and assumes all liability of injury or damage; and
- In the event that damage to Skyline Drive is caused by the permittee driving to or from the site, the permittee agrees to repair such damages immediately; weight limitations provided as an attachment to the permit and stated a maximum gross weight of 40,000 pounds between May 1 and November 30 and 20,000 pounds between December 1 and April 30. The Superintendent may issue a permit in writing authorizing an operator to operate a vehicle over the allowable maximum, as required for emergencies and maintenance.

As such, Dominion needs a construction SUP to install the new facilities on national park system lands. The new permits issued would replace the existing agreements and permit requirements. The issuance of these permits is the federal action prompting preparation of this environmental assessment.

Dominion received authorization to proceed with the upgrade from the Virginia State Corporation Commission in January 2012. In August 2011, Dominion submitted its application (SF-299: Transportation and Utility Systems and Facilities on Federal Lands) to the National Park Service for permits to upgrade its facilities for the portion of the line that lies on national park system lands. The NPS decision is expected in summer 2014. The Doods – Bremo line upgrade on national park system lands is scheduled to begin in the summer of 2014 and to be completed in the fall of 2014.

Applicable Laws, Policies, and Previous Planning Efforts

NPS activities are governed by laws, regulations, policies, and plans that influence its decisions and related analysis. Those that are directly applicable to the proposed action are summarized in table 1. Appendix B contains more detailed information on each item.

TABLE 1: APPLICABLE LAWS, POLICIES, AND PREVIOUS PLANNING EFFORTS

Laws and Policies	<ul style="list-style-type: none"> • National Park Service Organic Act of 1916 and the General Authorities Act (Mission and Impairment) • 36 CFR 5.7 (special use permits) • 16 U.S. Code (USC) 5, 79 (rights- of- way) • National Park Service <i>Management Policies 2006</i>—8.6 (special park uses), 1.4 (impairment)
Director’s Orders	<ul style="list-style-type: none"> • Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making; and Handbook • Director’s Order 53: Special Park Uses

**Park Plans, Policies,
and Actions**

- Comprehensive Plan for the Protection, Management, Development and Use of the Appalachian National Scenic Trail (1981)
- Shenandoah National Park General Management/Development Concept Plan
- Appalachian Trail Conservancy: 2009 Local Management Planning Guide, Chapter 4(f) Roads and Utilities

The NPS Organic Act of 1916 prohibits the impairment of park resources and values. The NPS *Management Policies 2006* define impairment as: an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. A written impairment determination will be made for the selected alternative and appended to the Finding of No Significant Impact (FONSI).

SCOPING

Council on Environmental Quality (CEQ) regulations require an “early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action” (CEQ 1978). Scoping includes both internal and external (public) components. The following describes the processes the National Park Service used to conduct internal and external scoping.

- Internal—The NPS interdisciplinary team and Dominion met during the process to identify potential issues and impact topics beginning with an initial three-day meeting on April 30, 2012, followed by two other group meetings. The group’s concerns were documented and additional studies recommended where more information was required. Internal scoping also included coordination with the appropriate state agencies, including the state historic preservation office, which, in Virginia, is the Virginia Department of Historic Resources (VDHR).
- External—The public was provided numerous methods by which to learn about and comment on the project. Public scoping was initiated in October 2012 using various methods. The National Park Service sent out 24 scoping newsletters to the following major interest groups identified through the internal scoping process to solicit their input:
 - Potomac Appalachian Trail Club (Executive Director)
 - Appalachian Trail Conservancy
 - Shenandoah National Park Trust
 - Shenandoah National Park Association
 - Elected officials
 - Neighbors (adjacent to the corridor)

The project and public scoping was announced in a press release on October 12, 2012. It was also announced on the NPS Planning, Environment, and Public Comment website for both parks (www.parkplanning.nps.gov/SHEN and www.parkplanning.nps.gov/APPA). Appendix C contains the public scoping newsletter and announcements. This public scoping period concluded on November 30, 2012. During the public comment period, the National Park Service received two comments. One comment from the general public expressed the desire to be kept informed about the project, and another comment from the Appalachian Trail Conservancy provided detailed and specific comments regarding the impacts on scenic, natural (including soils and vegetation), and cultural resources; potential impacts from all-terrain vehicles; and visitor use and recreation. Additional information on the scoping process and agency coordination is provided in “Chapter 4: Consultation and Coordination.”

ISSUES AND IMPACT TOPICS

Impact topics were developed by identifying issues or problems caused by the potential action and its interaction with individual resources in the corridor. Issues were identified through the scoping process described above and input from other agencies consulted. Discussion and analysis of the issues identified is organized into several impact topics. Each topic represents a resource of concern that would be appreciably affected by the proposed action or alternative. As more information was gathered, topics were either dismissed or carried forward depending on the degree of impact expected to occur on the resource. Only those topics with greater than negligible impact were retained for full analysis. The proposed action would affect park resources during construction, particularly geology and soils, biotic communities, noise, and visitor use, and would affect park resources including visual resources and cultural landscapes after construction due to the increased tower height.

Impact Topics Retained for Analysis

Geology and Soils

Proposed construction of new towers (e.g., clearing, drilling, coring, opening up access roads, constructing pads) would result in soil disturbance and impacts on local geology. Foundation size and depth varies based on location; however, the average foundation depth and width for towers on national park system lands would be 20 feet (maximum of 21 feet) and 6 feet, respectively (table 2 shows actual foundation depths). Activities associated with the proposed construction would include removing existing towers, placing new poles in new tower locations, using an access road during construction, and using construction pads in the corridor. Construction activities could involve disturbance to bedrock and soils and would result in the loss of soil productivity, creation of tire ruts, and an increased potential for soil erosion and loss of topsoil. In addition, grading and filling would be required to construct either access road options in the vicinity of Skyline Drive. This access road would be not retained for future use, inside the park, and the original contours would be restored inside the park for both access options.

Biotic Communities

Actions directly related to Dooms -Bremo line construction and maintenance would require the clearing of shrubs and grasses in the corridor and within the limits of disturbance. Additionally, the nature of a cleared corridor may allow for the introduction of nonnative species, which would affect native communities. However, the entire corridor would not be cleared of vegetation.

In addition, rebuilding of the Dooms -Bremo line would disrupt wildlife through disturbance and/or temporary loss of habitat during construction activities. After construction, the corridor would be rehabilitated and managed per NPS specifications to allow suitable wildlife habitat to return to the corridor. Described further under “Mitigation Measures of the Action Alternatives,” a Vegetation Management Plan (VMP) has been developed to promote the establishment of native vegetation and habitats and reduce the presence of invasive species (appendix H). In the long term, the corridor would provide sustainable areas of wildlife habitat with low-growing herbaceous plants and shrubs that would require minimal maintenance, as described in the VMP.

Visitor Use and Experience

Visitor experience may be compromised in the short term from construction and in the long term from the presence of the new 230-kV towers. Long-term impacts are due to the presence of larger transmission facilities in the corridor. The applicant’s proposal would involve construction activities that could disrupt visitor use and experience in the area of construction. During construction, visitors are likely to be affected by noise, dust, delays and/or closures on Skyline Drive, and changes to the landscape. Sediment and erosion control and safety barriers would be installed for the duration of the project. These barriers, which could include brightly colored blaze fencing and bales, may be visible from certain vantage points. Truck traffic during the construction period may be noticeable to visitors driving on Skyline Drive as well.

Scenic Resources

The corridor currently contains a 500-kV and a double circuit 230-kV transmission line, with towers comparable to or taller than the proposed rebuild of the Dooms – Bremo line. The proposed new towers for the 230-kV line would be taller than the existing 115-kV towers and could affect viewsheds and scenic resources in and near the parks and other areas identified as cultural landscapes, National Register of Historic Places (national register) properties, and visitor use areas. The transmission lines would continue to be a visual intrusion into the parks and could affect the visual experience as people walk or drive through these sections of the parks.

Soundscapes

Construction activities and equipment could cause a temporary noise disturbance to both the wilderness and visitors at certain points of construction. Temporary impacts could occur during construction as well as during routine maintenance activities and could disrupt visitors’ experience along the Appalachian Trail and Skyline Drive. During operation, electric transmission lines can generate a negligible amount of sound energy (corona), which would be a long-term impact on soundscapes, given the proximity to two other transmission lines.

Cultural Resources

Historic structures—A historic guard wall is located in the corridor and along Skyline Drive. It was determined that the guard wall is one of the original stone guardrails constructed with Skyline Drive and carries historical significance. Overall, there are seven historic structures in the study area: Skyline Drive itself, a stone guard wall, three cattle underpasses, and one historic bridle underpass and its retaining walls that are located along Skyline Drive between Rock Fish Gap and mile marker 97.4 where the transmission corridor crosses Skyline Drive.

Cultural landscapes—The Skyline Drive Historic District is considered one of Shenandoah National Park's 15 defined cultural landscapes and has been designated an NHL. Any changes to the layout or design of the road or features associated with the road, such as overlooks, could impact the cultural landscape. The Skyline Drive cultural landscape includes the associated walls, guiderails, overlooks, signs, and manicured grounds. A review of the Cultural Landscape Inventory from Shenandoah National Park showed two resources in proximity to the project and includes Skyline Drive and the Appalachian Trail. The elements of the Appalachian National Scenic Trail cultural landscape are discussed in *National Park Service Cultural Landscape Inventory Appalachian Trail—South District Shenandoah National Park* (NPS 2007). The Appalachian National Scenic Trail is considered an eligible historic district; however, there are no specific character-defining features of the Appalachian National Scenic Trail (South District) cultural landscape that have been identified within the transmission line corridor. Impacts on the historic stonewall and other individual structures along Skyline Drive are analyzed under historic structures.

Impact Topics Dismissed from Detailed Analysis

The following impact topics were eliminated from further analysis in this environmental assessment. A brief rationale for dismissal is provided for each topic. Potential impacts on these resources would be none or negligible and most likely unmeasurable.

Wetlands

A wetland delineation, using U.S. Army Corps of Engineers' methodology and DO 77-1: *Wetland Protection* guidance, was conducted in the corridor on July 6, 2012. The extent of the survey included the previously disturbed corridor, proposed access roads, and 15 feet beyond the cleared corridor. The survey found one small isolated wetland and one intermittent stream in the study area, both on the tract 444 Appalachian National Scenic Trail parcel, east of Skyline Drive and the Appalachian Trail (appendix D). The intermittent stream is located in a steep ravine on the edge of the property and in the corridor, and the wetland is located on the existing access road. The access road has been modified to avoid the wetland, and no towers or access roads are located in either resource. Dominion would maintain a minimum 10-foot buffer around the wetland, and silt fencing would be used; therefore, no impacts on wetlands would be expected. As a result, wetlands were dismissed from full analysis.

Water Quality

The 1972 federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; enhance the quality of water resources; and prevent, control, and abate water pollution. The *NPS Management Policies 2006* provides direction for the preservation, use, and quality of water originating, flowing through, or adjacent to park boundaries. Sawmill Run flows out of Shenandoah National Park, into the corridor where construction would occur, and back into national park system lands for about 1,200 feet. During construction activities, Dominion would implement strict erosion and sediment control plans to ensure that Sawmill Run is not affected. The erosion and sediment plans submitted by Dominion were reviewed by the National Park Service, and additional measures were agreed on by the National Park Service and Dominion and included in the construction plan and the VMP.

Disturbance to soil, vegetation, and slopes could result in increased erosion, potentially affecting water quality. Slope, existing vegetation cover, and road construction were reviewed, and it was determined that the portion of Sawmill Run on national park system lands is located downstream of construction. The National Park Service requested that a 100-foot buffer be placed around Sawmill Run where it crosses the corridor to ensure the existing water quality in the stream is maintained. Furthermore, no access roads would cross Sawmill Run during construction.

Impacts on groundwater would not occur. A soil boring sample was conducted at tower 333 (one tower outside of national park system lands). This soil boring reached a depth of 36 feet and did not encounter groundwater, and groundwater was not observed upon removal of augers. Given that the proposed foundation depth within the national park system lands would be approximately 20 feet deep, well above the water table, there would be no impacts to groundwater.

Wilderness

Designated wilderness areas have the highest level of conservation protection and can only be designated by the U.S. Congress. Congress has designated 79,579 acres of Shenandoah National Park as wilderness. A portion of Shenandoah National Park designated as wilderness area is in the vicinity of the project (figures 1 and 13) and could be temporarily affected by the noise of construction and routine maintenance activities. These impacts are analyzed under soundscapes. Therefore, wilderness was dismissed from full analysis.

Special Status/Endangered or Threatened Species

As noted by Shenandoah National Park staff, the Shenandoah salamander (*Plethodon shenandoah*) and the small whorled pogonia (*Isotria medeoloides*) are two federally listed species that could be found in Shenandoah National Park or on Appalachian National Scenic Trail property in the corridor. Personal communication with Shenandoah National Park staff concluded that the corridor was not in the habitat for the Shenandoah salamander (Shenandoah National Park, Beck-Herzog and Wofford, pers. comm. 2012a). A survey for the small whorled pogonia was conducted on July 5 and 6, 2012. The extent of the survey included the previously disturbed corridor, proposed access roads, and 15 feet beyond the cleared corridor. Results of the survey concluded that the small whorled

pogonia was not present in the corridor. Appendix E contains details on the survey. Through communication with Shenandoah National Park staff, no state-listed species of concern were considered relevant to this environmental assessment due to the scale, location, and known habitat of the corridor (Shenandoah National Park, Beck-Herzog and Wofford, pers. comm. 2012b).

In addition, a review of the U.S. Fish and Wildlife Service's (USFWS) online IPaC—Information, Planning, and Conservation System—identified the potential for the James spiny mussel (*Pleurobema collina*), swamp pink (*Helonias bullata*), Indiana bat (*Myotis sodalis*), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*) to be located in the corridor. The James spiny mussel “exists only in small, headwater tributaries of the upper James River basin in Virginia and West Virginia” (USFWS 2003). The habitat for the swamp pink flowering plant includes perennially saturated, spring-fed, nutrient-poor shrub swamps and forested wetlands (VDCR 2013). Neither of these species' habitats is found in the corridor.

Indiana bat and Virginia big-eared bat surveys were not conducted by Dominion for the overall permitting of the transmission line rebuild project. Because the proposed Doods – Bremo line is located in the middle of an existing corridor and no trees or bat habitat would be removed as part of the rebuild, the project is not anticipated to have any impacts on sensitive bat species.

NPS biologists reviewed this species list, and based on species distributions, habitat requirements, and potential disturbance from the proposed action, it was determined that the action would have “no effect” on these federally listed species. As a result, no formal consultation was necessary on this action.

Health and Safety

The health and safety of the park visitors and staff would be a concern during construction activities. To avoid compromising visitor safety, the Dominion construction plan would include a number of safety precautions if the construction plan is approved by the parks. Safety precautions include the use of warning signs, flagging, flaggers, guard structures, and fencing, as necessary. With these measures, there would be negligible effects on the health and safety of visitors.

Air Quality

Shenandoah National Park is an NPS Class I air quality area because of its size (greater than 6,000 acres) and the amount of wilderness area it contains (more than 5,000 acres). Class I areas deserve the highest level of air-quality protection according to the Clean Air Act. Augusta and Albemarle counties are in attainment for all criteria pollutants regulated under the Clean Air Act.

Hauling materials and operating equipment would result in increased vehicle exhaust and emissions during the construction period. Hydrocarbons, nitrogen dioxide, and sulfur dioxide emissions would be rapidly dissipated by air drainage because air stagnation is uncommon at the corridor. Fugitive dust plumes from construction equipment would occasionally increase airborne particulates in the area near the corridor. Based on projects of similar scale and nature, it is expected that these temporary sources of emissions from construction vehicles and increased dust would not impact the Class I designation or change regional air quality. Overall, there would be a slight and temporary

degradation of local air quality due to dust and vehicle emissions generated from construction activities, but these effects would be short term, localized, and negligible. To reduce impacts during construction, dust control measures would be implemented. Dust control measures are similar to soil control measures and include washing down trucks before they exit the site and using gravel on the temporary roads. The parks' current levels of air quality are not expected to be measurably affected by the proposed action or to last for extended periods.

Prime and Unique Farmlands

Prime farmlands have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique agricultural land is land other than prime farmland that is used for production of specific, high-value food and fiber crops. Both categories require that the land be available for farming uses (CEQ 1980). Lands and soils in the parks are not available for farming and therefore do not meet these definitions.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The Council on Environmental Quality provides guidelines for implementing this executive order under the National Environmental Policy Act (CEQ 1997). According to the U.S. Environmental Protection Agency (EPA), environmental justice is defined as follows:

The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. The goal of this "fair treatment" is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts (EPA 1998).

There are both minority and low-income populations in the general vicinity of the parks. However, environmental justice was dismissed as an impact topic for the following reasons:

- NPS staff actively solicited public participation as part of the planning process and gave equal consideration to input from all persons, regardless of age, race, income status, or other socioeconomic or demographic factors.
- Impacts associated with implementation of the proposed action would not disproportionately affect any minority or low-income populations or communities.

- Implementation of the proposed action would not result in any identified effects that would be specific to any minority or low-income populations or communities.
- NPS staff does not anticipate that any adverse impacts on public health or the socioeconomic environment would fall appreciably more severely or result in disproportionately high and adverse impacts on minority or low-income populations or communities in the area.

Socioeconomic Resources

Possible impacts from rebuilding the Dooms - Bremo line include impacts on property or home values on adjacent lands. Facilities already exist at the corridor; the construction of facilities for the proposed action would change facility size and appearance, but would not change the presence of the corridor or line in the area and would not impact population characteristics or demographics, local economic characteristics, housing characteristics, community services or facilities, or types of local businesses that operate near the corridor. Only negligible impacts to socioeconomic resources would occur from implementing the proposed action.

Climate Change and Greenhouse Gas Emissions

Climate change refers to any significant changes in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality and storm frequency) lasting for an extended period (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change provide evidence that climate change is occurring as a result of rising greenhouse gas (GHG) emissions and could accelerate in the coming decades. Although climate change is a global phenomenon, it manifests differently depending on regional and local factors. General changes that are expected to occur in the future as a result of climate change include hotter, drier summers; warmer winters; warmer water; higher ocean levels; more severe wildfires; degraded air quality; more heavy downpours and flooding; and increased drought. Climate change is a far-reaching, long-term issue that could affect the parks, their resources, visitors, and management. Although some effects of climate change are considered known or likely to occur, many potential impacts are unknown. Much depends on the rate at which the temperature would continue to rise and whether global GHG emissions can be reduced or mitigated. Climate change science is a rapidly advancing field, and new information is being collected and released continually.

Construction activities associated with implementation of the proposed action would contribute to increased GHG emissions, but such emissions would be short term, ending with the completion of construction. Any effects of construction-related GHG emissions on climate change would neither increase the parks' carbon footprint nor be discernible at a regional scale because it is not possible to meaningfully link the GHG emissions of such limited, individual project actions to quantitative effects on regional or global climatic patterns.

Indian Trust Resources

Secretarial Order 3175 requires explicitly addressing any anticipated impacts to Indian trust resources from a proposed project or action by U.S. Department of the Interior agencies in

environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

The lands comprising the Appalachian National Scenic Trail and Shenandoah National Park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Further, scoping documents were sent to two tribes and the national tribes with no response or further consultation. Therefore, Indian trust resources were dismissed as an impact topic.

Cultural Resources

Archaeological resources—The National Historic Preservation Act (16 USC 470 et seq.), the National Environmental Policy Act, NPS 1916 Organic Act, NPS *Management Policies 2006* (NPS 2006), DO-12: *Conservation Planning, Environmental Impact Analysis, and Decision Making*, and DO-28: *Cultural Resources Management Guideline* require the consideration of impacts on any cultural resources that might be affected, and, in particular, on cultural resources either listed in or eligible to be listed in the national register. Based on a cultural resources survey completed by Cultural Resources, Inc., one previously identified archaeological site, Skyline Drive (44PA0277), was identified in the corridor and on national park system lands (Magoon, DeChard, and Stewart 2012). The Virginia Department of Historic Resources concurred with the findings of the report on December 18, 2012. Copies of this correspondence can be found in appendix I. Any potential impacts on Skyline Drive are covered under the Cultural Landscapes and Historic Districts impact topics. Within the corridor, no new archeological resources were identified on NPS property.

Historic districts—Skyline Drive was long considered a historic district and in the national register; however, the U.S. Department of the Interior has recently (2008) designated it as an NHL. The Appalachian Trail is a historic district and is eligible for inclusion in the national register. The proposed action directly crosses the Appalachian Trail footpath and associated historic district. Potential impacts on the historic guard wall along Skyline Drive are analyzed under historic structures. Potential impacts to the Appalachian Trail Historic District and Skyline Drive Historic District NHL are covered under Cultural Landscapes.

Ethnographic resources—The National Park Service defines ethnographic resources as any “site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it” (DO-28: *Cultural Resource Management Guideline*, 181). Two ethnographic groups are associated with Shenandoah National Park: Native Americans and mountain residents. There is no evidence that Native American groups ever permanently resided within the current boundaries of the park or in the vicinity of the corridor; however, hunter/gatherer parties may have used the corridor. Mountain residents predate the creation of the park, but they were no longer in residence after its creation (1935). In addition, mountain residents do not represent a defined cohesive ethnographic community (Shenandoah National Park, Engle, pers. comm. 2007). Because no known ethnographic resources would be affected by the proposed action and because appropriate steps would be taken to

protect any human remains, funerary objects, sacred objects, or objects of cultural patrimony inadvertently discovered, ethnographic resources was dismissed as an impact topic.

Museum collections—The proposed action would have no effect on how museum collections (prehistoric and historic objects, artifacts, works of art, archival material, and natural history specimens) would be acquired, accessioned and cataloged; preserved; protected; or made available for access and use according to NPS standards and guidelines. Therefore, museum collections were dismissed as an impact topic.

CHAPTER 2: ALTERNATIVES

The National Environmental Policy Act requires that federal agencies explore a range of reasonable alternatives in their NEPA documents. The alternatives under consideration must include the no-action alternative as prescribed by 40 CFR 1502.14. Project alternatives may originate from the proponent agency, local government officials, members of the public, or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies. The alternatives analyzed in this document, in accordance with the National Environmental Policy Act, are the result of internal scoping, further coordination by the NPS interdisciplinary team, and the development of a construction plan by Dominion that includes measures proposed by the National Park Service to mitigate adverse impacts.

The National Park Service explored several alternatives and selected three for detailed evaluation in this environmental assessment:

- **Alternative 1—No Action:** The parks would maintain the status quo, and no action would be taken on Dominion’s request for the SUP and right-of-way permit for operation and maintenance. The existing transmission line would continue to operate and be maintained in accordance with existing agreements.
- **Alternative 2—Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access Up the Corridor:** The National Park Service would approve the request for the construction SUP and right-of-way permit to rebuild the existing line in accordance with the construction plan (appendix A) developed collaboratively by Dominion and the National Park Service during the preparation of this environmental assessment. Access to tower 39/336 (proposed tower 2139/131) would be from the west along the existing right-of-way, with limited use of Skyline Drive.
- **Alternative 3—Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access from Skyline Drive:** The National Park Service would approve the request for the construction SUP and right-of-way permit to rebuild the existing line in accordance with the construction plan (appendix A) developed collaboratively by Dominion and the National Park Service during the preparation of this environmental assessment. Access to tower 39/336 (proposed tower 2139/131) would be from Skyline Drive only.

Construction actions associated with the alternatives are described in the following sections.

DESCRIPTIONS OF ALTERNATIVES

Alternative 1: No Action

The no-action alternative serves as the baseline to which all other alternatives are compared. Under this alternative, the existing electrical transmission line configuration in the corridor of both parks would remain. The corridor would continue to contain three transmission lines—a 500-kV line, a 115-kV line (the subject of this environmental assessment), and a 230-kV line—at the Skyline Drive and Appalachian Trail crossing and a 500-kV line, the Doooms -Bremono 115-kV line at the tract 444 crossing. The corridor crosses approximately 3,000 feet of national park system lands, in which there are five towers associated with the Doooms - Bremono 115-kV line. Currently, the 115-kV wooden H-frame towers range from 65 to 75 feet tall with a base width (between legs of H-frame) of 15 feet, and an average diameter of each leg between 18 and 24 inches. Figure 3 shows a photograph looking east from Skyline Drive, and Figure 4 shows the existing cross section of the corridor. For the tract 444 parcel, only the 115-kV and lattice 500-kV transmission lines are within the corridor.



FIGURE 3: PHOTOGRAPH FROM SKYLINE DRIVE LOOKING EAST AT THE APPALACHIAN TRAIL

Under alternative 1, the parks would take no action on the request for the construction SUP and right-of-way permit. Dominion currently follows its transmission vegetation management and maintenance plan for maintaining its rights-of-ways. Dominion's Forest Coordinator conducts yearly surveys of each electric transmission line (substation to substation) to collect information on access, environmentally sensitive area, species composition and density, conductor clearances, erosion, pest infestations and/or diseases, and encroachments (Dominion 2012). It currently manages its right-of-way through routine brush control, which eliminates tall-growing vegetation through herbicide application, machine/mechanized cutting, or hand cutting (Dominion 2012). Maintenance activities include yearly field inspections, selective removal of danger trees immediately adjacent to the right-of-way along with any tall-growing brush every three years, and spot treatment

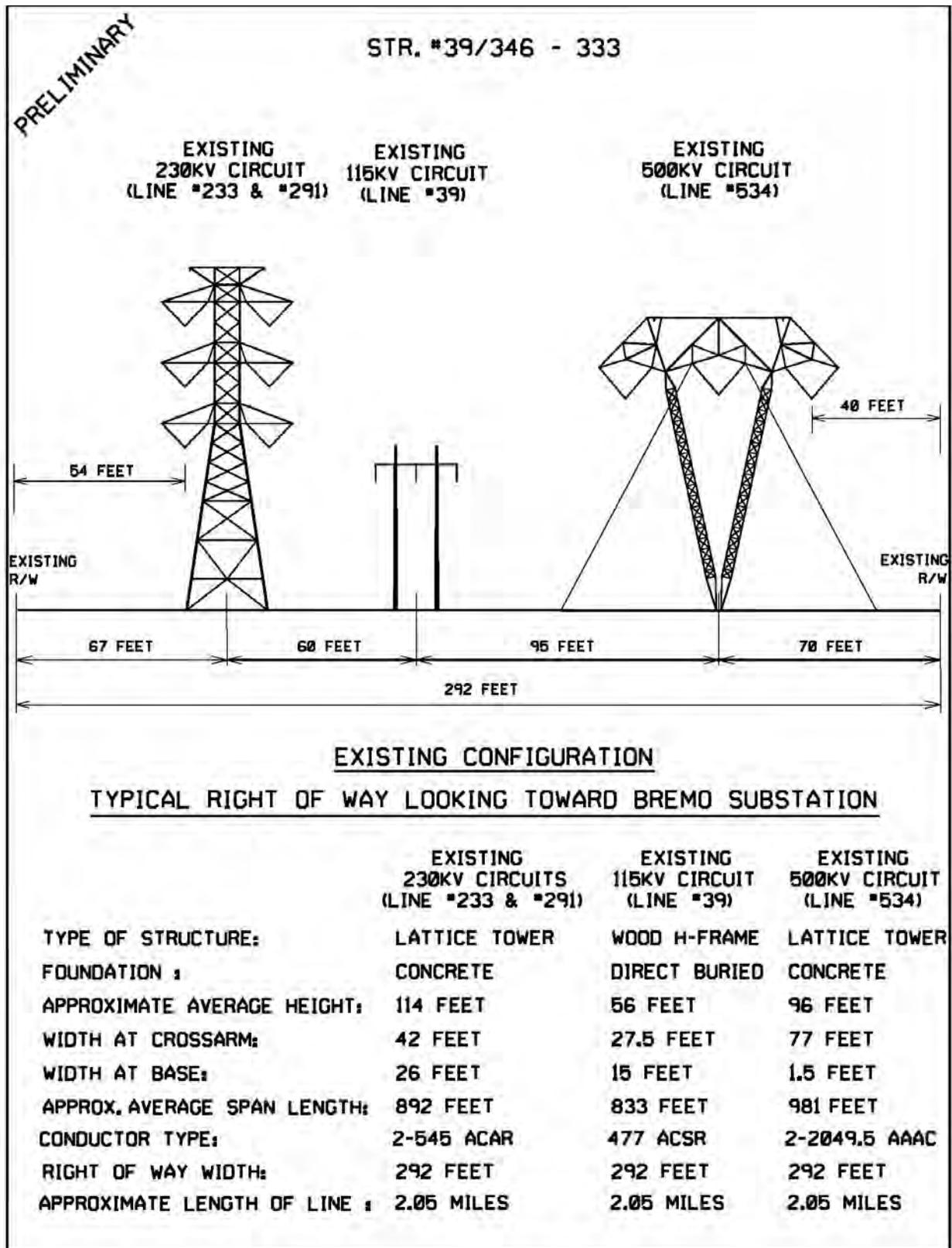


FIGURE 4: CROSS SECTION OF EXISTING RIGHT-OF-WAY (FACING WEST)

with EPA-approved herbicides, as needed. However, because many species within the corridor may grow more than 10 feet tall, large portions of the corridor are often mowed.

Elements Common to All Action Alternatives

Under action alternatives 2 and 3, the National Park Service would approve the request for a construction SUP at Appalachian National Scenic Trail and Shenandoah National Park and one right-of-way permit on national park system lands in Shenandoah National Park. In the negotiated terms of the above construction SUP, the existing 115-kV transmission line (including five towers) would be removed and replaced with a 230-kV transmission line (including four towers).

Replacement of the transmission line would include the installation of four new self-rusting steel monopole towers on national park system lands: three on Appalachian National Scenic Trail land and one on Shenandoah National Park land. The proposed towers would be taller and would replace the existing towers one for one, with the exception of one tower on the Appalachian National Scenic Trail, where one tower would be removed, and not rebuilt. Table 2 summarizes the specific changes proposed for each tower.

TABLE 2: EXISTING AND PROPOSED TOWERS

115-kV Existing Tower Numbers	115-kV Before Height (feet)	115-kV Diameter of Each Foundation (inches)	230-kV Proposed Tower Numbers	230-kV Proposed Height (feet)	Change in Height (feet)	Depth of Foundation (feet)	Diameter of Foundation (feet)
39/324	65	18 to 24	2139/123	115	+ 50	19	5
39/325	65	18 to 24	No replacement	n/a	n/a	n/a	n/a
39/334	65	18 to 24	2139/129	115	+ 50	21	6
39/335	70	18 to 24	2139/130	110	+ 40	21	5' 6"
39/336	75	18 to 24	2139/131	110	+ 35	21	7

The height increase would be required to accommodate the increased voltage of the line and mandated safety clearances to stay in the current right-of-way and avoid the removal and replacement of adjacent towers on the 230-kV and 500-kV lines. The existing adjacent towers range in height from 85 to 135 feet tall with average heights of 114 feet and 96 feet (see figure 5). The monopole towers would be installed an average of approximately 20 feet below grade and would be on average 6 feet in diameter at the base of each tower (table 2). Figure 5 shows a cross section of the proposed corridor configuration at Skyline Drive and the Appalachian Trail. Photo-simulations were completed as part of the project and can be found in appendix F.

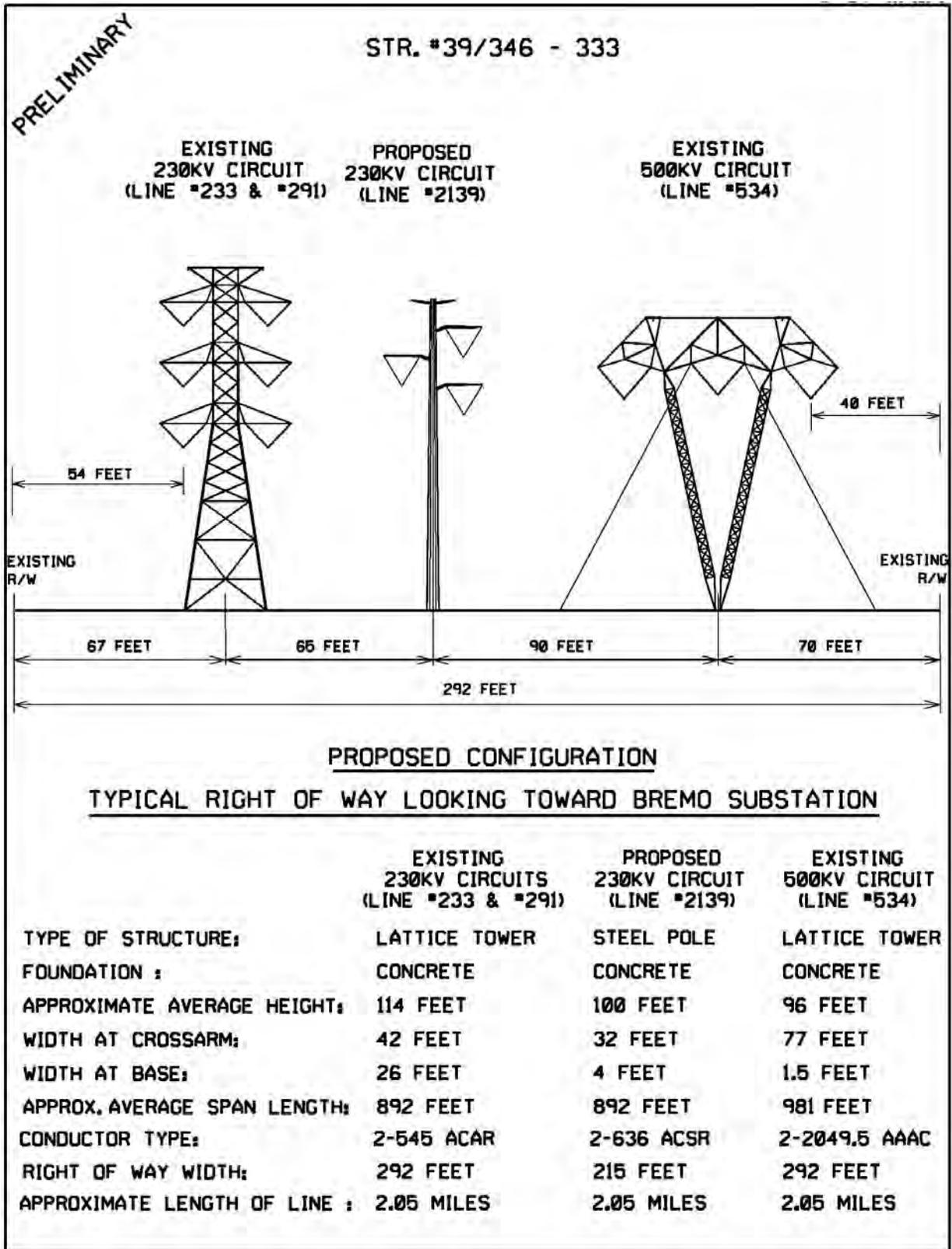


FIGURE 5: PROPOSED RIGHT-OF-WAY CONFIGURATION

General Construction Preparation

Construction of the Dooms – Bremono line on national park system lands is anticipated to begin after the National Park Service approves the construction SUP and right-of-way permit (anticipated summer 2014). If access road construction begins in July 2014, all construction, including energizing the lines, would be expected to be completed by October 2014 (approximately 3 months) on national park system lands. Construction of the lines could be intermittent due to weather and scheduled outages.

Prior to construction, Dominion would conduct a survey to stake the tower locations, construction pads, corridor boundary, access roads, Appalachian Trail footpath, and any NPS sensitive resources identified by the parks. Brush would be cleared within limits of disturbance (figures 6, 7, 8, and 9), as needed for the construction of the access roads and construction pads. Construction pads would be approximately 100-foot by 100-foot squares (or smaller) and are shown on the limits of disturbance drawings (below). Removed vegetation would be spread in the corridor, as further described in the VMP.

Note: figures 6, 7, 8, and 9 represent conceptual engineering drawings for comparison purposes of the environmental assessment. Once a preferred alternative has been identified, 100% engineering drawings would be developed and acreage of disturbance and cut and fill dimensions would likely change. Currently, the National Park Service expects that the net cut dimensions would be reduced to 2,185 cubic yards for alternative 2. These numbers would continue to change as detailed engineering is developed. For the purposes of the environmental assessment, and equal comparisons between alternatives, conceptual drawings were used throughout the document.

Construction Sequence

Details of the proposed construction activities can be found in the construction plan (appendix A). In general, the proposed construction sequence would proceed in the following manner:

- Establish access to the corridor by either creating new access roads or enhancing existing access roads (approximately one month).
- Create construction pads adjacent to each existing and proposed tower (approximately one month).
- Install foundations for all new towers on national park system lands (one foundation per tower). It would take approximately three months to pour the new foundations and one month to remove the existing poles. This time frame would be shorter for the work done only on national park system lands; however, this is the current estimate.
- Remove the existing wooden H- frame towers (approximately one month). These towers are currently direct- buried with no foundations.
- Bring in and erect the new steel towers (approximately two months). This time frame may be shorter for the work done only on national park system lands; however, this is the current estimate.

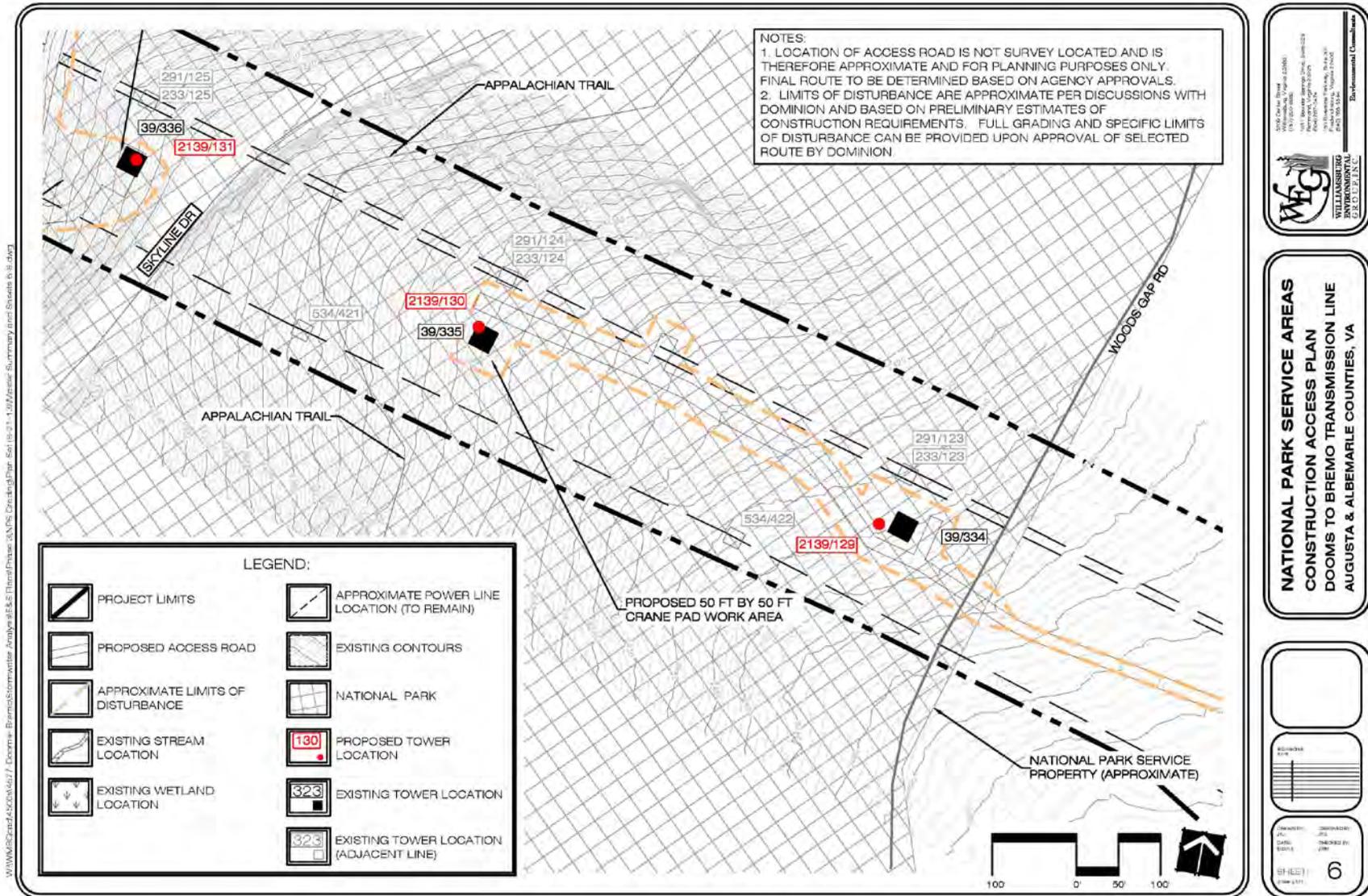


FIGURE 6: PROPOSED LIMITS OF DISTURBANCE (EAST OF SKYLINE DRIVE)

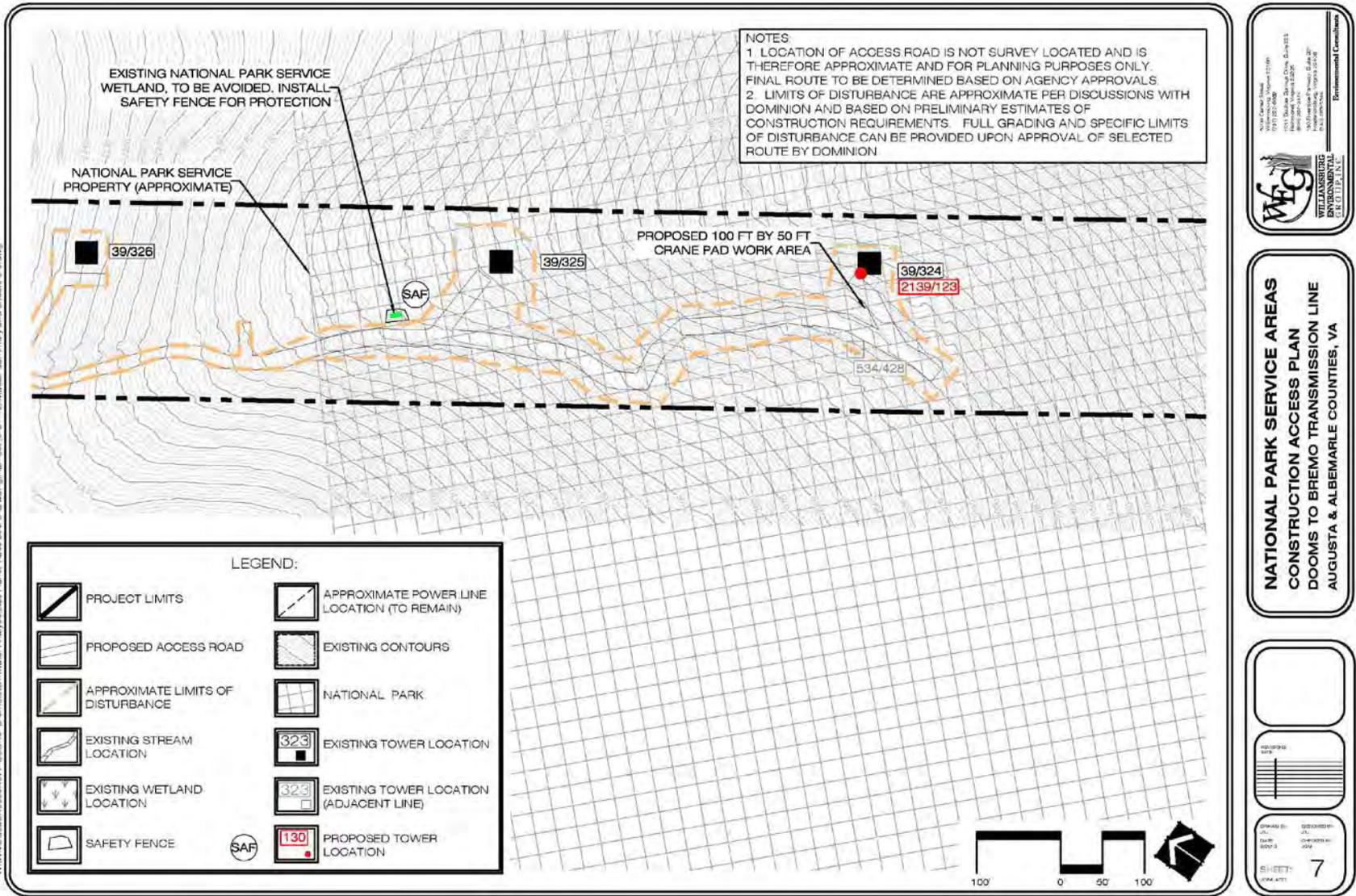


FIGURE 7: PROPOSED LIMITS OF DISTURBANCE (APPALACHIAN TRAIL)

- String in the wire conductor on both lines and energize the lines (approximately two months). This time frame may be shorter for the work done only on national park system lands; however, this is the current estimate.
- Rehabilitate the corridor. Rehabilitation activities are included in appendix A and include removal of gravel from the access roads and restoration of the original contours, where required. Rehabilitation also includes measures described in the VMP.

Construction Access

Figures 6 and 7 show the location of proposed access roads and towers common to both action alternatives. Construction access to existing towers 39/324 (proposed tower 2139/123) and 39/325 (not replaced) would be from the northwest off Woods Gap Road (figure 7). Similarly, access to existing towers 39/334 (proposed tower 2139/129) and 39/335 (proposed tower 2139/130) would be from the southeast off Woods Gap Road (figures 6 and 7). These two existing access roads are currently two-track dirt roads and would be upgraded to facilitate the rebuild of the Dooms – Breomo line. As stated in the construction plan, all access roads must be an average of 12 feet wide during times of construction to accommodate large machinery and necessary construction equipment. Widening would include the clearing of vegetation on either side of the road and grading to create a level road surface for construction vehicles. Gravel would not be added to the access roads unless measures are required for erosion and sediment control. Given the steep slopes on the eastern Appalachian Trail parcel, gravel would likely be added to the road surface. If gravel is added on national park system lands, it would be removed after the construction is complete. The total limits of disturbance for the enhancements of these two access roads and the construction pads at the tower sites would be approximately 2.5 acres.

Alternative 2: Approval of the SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Right-of-Way

As described in the “Elements Common to All Action Alternatives” section, alternative 2 would include the NPS approval of the request for a construction SUP inclusive of the Appalachian National Scenic Trail and Shenandoah National Park and one right-of-way permit on national park system lands in Shenandoah National Park. Under alternative 2, access to existing tower 39/336 (proposed tower 2139/131) would be from the west along the existing right-of-way with limited use of Skyline Drive for certain construction activities (figure 8). Due to safety concerns regarding the slope of the road west of Skyline Drive, limited use of Skyline Drive would be approved under alternative 2. Use of Skyline Drive would be approved for the delivery of concrete for foundations (truck weighing 47,000 pounds for six round trips, one day), the delivery of structure parts via tractor trailer (48,000 pounds for three round trips, one day), and the removal of guy wires via boom truck (80,000 pounds for one round trip, one day). The use of the boom truck exceeds the weight limits in Shenandoah National Park guidance; however, this exception would be approved by NPS staff, per conversations with NPS staff during the preparation of this environmental assessment (Shenandoah National Park, Beck-Herzog, pers. comm. 2014). The limited construction activities using Skyline Drive would occur in the following order: 1) clipping guy wires; 2) pouring foundation; and 3)

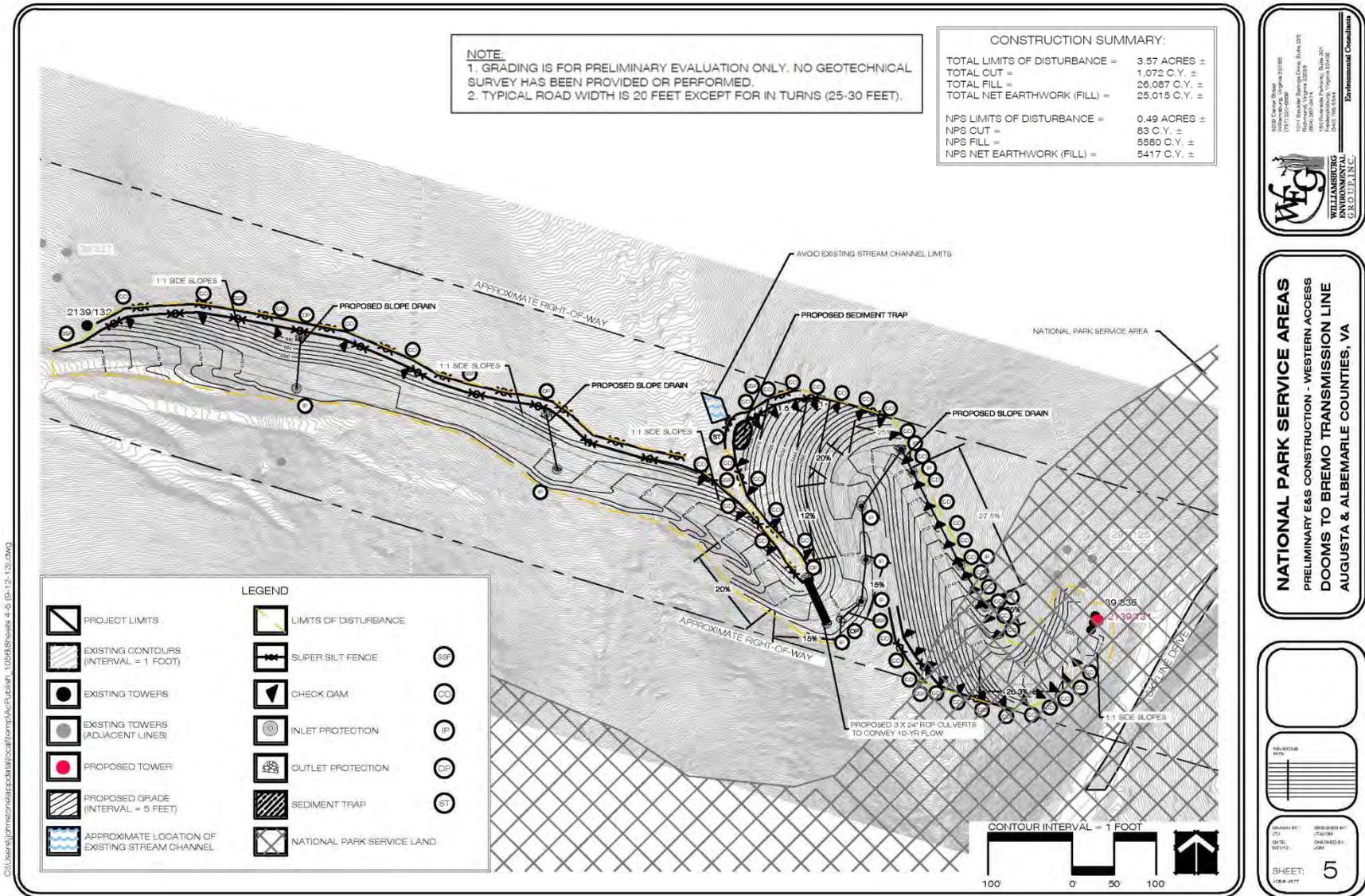


FIGURE 8: PROPOSED ACCESS AND LIMITS OF DISTURBANCE WEST OF SKYLINE DRIVE

delivering the structure parts. Each of these activities is anticipated to take one day, but they would be scheduled at different times, potentially weeks apart. For each of these activities, one lane of Skyline Drive would be closed to traffic; however, construction crews would let traffic through in each direction at least every 15 minutes to avoid major traffic delays during the lane closure.

As described in the “Elements Common to all Alternatives” section, the other two existing access roads would result in 2.5 acres of disturbance. A new access road would be constructed within the existing corridor for the removal and replacement of the existing structure west of Skyline Drive. The slope west of Skyline Drive is very steep and would require a substantial amount of grading and modification of contours for the appropriate construction equipment to be delivered to the tower replacement location on national park system lands. Based on the conceptual drawings, the total length of the access road would be approximately 1,650 feet and would result in approximately 3.57 acres of disturbed area, inside and outside of national park system lands. The portion of the road on national park system lands would be approximately 220 feet; the total limits of disturbance on national park system lands would be approximately 0.49 acre. The width of the access road under this alternative would be greater than a typical access road because of the sharp turns necessary on the steep slope. The access road under alternative 2 is expected to be an average of 20 feet wide with a width of 25 to 30 feet in turns and up to 40 feet at the road flares. Given the steep slopes of the access road, gravel would be added to the roadbed surface and be removed after the construction is complete. Based on the conceptual drawings, the construction of the road would require approximately 83 cubic yards of cut and 5,580 cubic yards of fill, for a net earthwork total of 5,417 cubic yards of earth-moving disturbance on national park system lands. On and off national park system lands, approximately 26,087 cubic yards of fill and 1,072 cubic yards of cut, for a total of 25,015 cubic yards of earth-moving disturbance would occur for the construction of the access road. These numbers are subject to change based on more detailed engineering. Overall, approximately 3 acres of national park system land would be disturbed for the construction of the access road west of Skyline Drive, the enhancements of the two other access roads and construction pads (2.5 acres), and the new access road and construction pad (0.49 acre) (figures 6, 7, and 8).

Alternative 3: Approval of the SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access From Skyline Drive

As described in the “Elements Common to All Action Alternatives” section, alternative 3 would include the NPS approval of the request for a construction SUP, inclusive of both the Appalachian National Scenic Trail and Shenandoah National Park, and one right-of-way permit on national park system lands in Shenandoah National Park. Under alternative 3, access to tower 39/336 (proposed tower 2139/131) would be from Skyline Drive (figure 9). As shown on figure 9, an access road or construction work area would be constructed immediately west of Skyline Drive; however, no access road would be constructed up the right-of-way west of Skyline Drive, as described under alternative 2.

All construction materials and equipment would enter Skyline Drive at the Rockfish Gap entrance, located approximately 8 miles south of the corridor along Skyline Drive. The largest piece of equipment required for construction is the Drill Rig Watson 4400 (drill rig), which would be brought

to the project site on a 12-axle tractor trailer. Given the size of this piece of equipment, and its inability to make tight turns, Skyline Drive would be completely shut down two times (on two different days) to bring the drill rig to and from the corridor. The two full closures of Skyline Drive would occur at night to minimize impacts to visitor use. Each closure would affect the area between Swift Run Gap (30 miles north of the corridor) and Rockfish entrance stations, leaving a portion of Skyline Drive (north of Swift Run Gap) open to visitors. While the tractor trailer and drill rig are on Skyline Drive, the roadway would be completely shut down in both directions to ensure no visitors are traveling southbound or northbound at the same time. Skyline Drive would be shut down for a maximum of one hour to allow time for the 12-axle tractor trailer with drill rig to drive from Rockfish Gap to the corridor. It is unknown at this time if the tractor trailer would be able to turn around at the corridor entrance, therefore, for the purposes of this environmental assessment, the tractor trailer would have to leave the project site via Swift Run Gap. It is anticipated that it would take the tractor trailer approximately 4 hours to drive from the corridor to Swift Run Gap (30 miles). Additionally, it would take approximately 1.5 hours to unload the drill rig. The process would repeat when the drill rig is removed from the corridor. Overall, Skyline Drive would be shut down for approximately of 6.5 hours each time the drill rig is brought to and from the corridor. Two additional 1.5-hour lane closures would be required when the crane is brought to and from the construction site. During this time, flaggers would halt traffic for up to 15 minutes at a time.

As described in the “Elements Common to all Alternatives” section, the other two existing access roads would result in 2.5 acres of disturbance. The new access road on national park system lands would be approximately 220 feet and include one entrance from Skyline Drive, away from the historic guard wall. The width of the access road would be up to 15 feet. The limits of disturbance for this access alternative is approximately 0.36 acre and includes 830 cubic yards of cut and 826 cubic yards of fill, for a net earthwork total of 4 cubic yards of earth-moving disturbance, all of which would occur on national park system lands. Overall, approximately 2.8 acres of national park system lands would be disturbed (including the 2.5 acres of disturbance for the other access roads) for the construction of the access road off Skyline Drive, the enhancements of the two other access roads, and the creation of the construction pads (figures 6, 7, and 9).

Several equipment trucks and materials would be accessing the corridor from Skyline Drive at various times during construction. None of the construction equipment would require any vegetation or canopy trimming while on Skyline Drive. A summary of equipment weights that would likely be accessing Skyline Drive is shown below:

- Kenworth road tractor and low-boy trailer: Permitted to 100,000 pounds
- Watson drill rig, model 4400: 132,000 pounds (transfer weight)
- Crane 50 ton Rough Terrain: 166,900 pounds
- Road tractor and TAG trailer: Permitted to 80,000 pounds
- Roll back: Permitted to 62,000 pounds

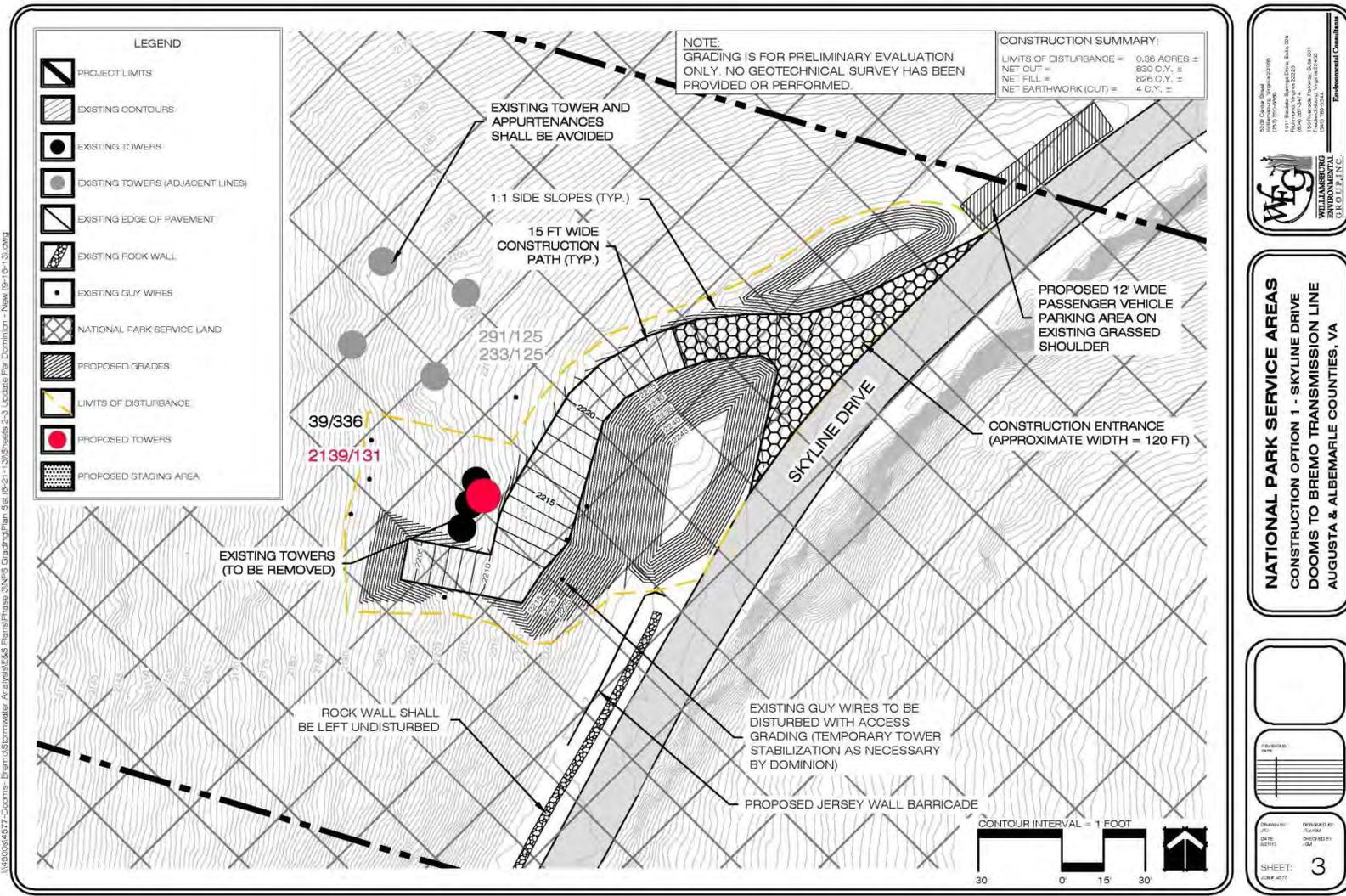


FIGURE 9: PROPOSED ACCESS AND LIMITS OF DISTURBANCE WEST OF SKYLINE DRIVE

- 320 CAT excavator with rock hammer: 58,000 pounds
- 135 excavator: 32,000 pounds
- 650 dozer: 20,000 pounds
- Smooth drum roller: 15,750 pounds
- Quad axle dump truck (fully loaded): 68,000 pounds
- Mini-excavator (possibly): 12,300 pounds
- Skid steer (possibly): 9,800 pounds

A summary of roundtrips required for each piece of major construction equipment is shown below:

- Kenworth road tractor and low-boy trailer carrying the 320 CAT excavator: one roundtrip
- Kenworth road tractor and low-boy trailer carrying the Watson drill rig, model 4400: two roundtrips
- Kenworth road tractor and low-boy trailer empty: two roundtrips
- Crane 50 ton Rough Terrain: one roundtrip
- Road tractor with TAG trailer carrying the 135 excavator: one roundtrip
- Road tractor with TAG trailer carrying the smooth drum roller: one roundtrip
- Road tractor with TAG trailer empty: one roundtrip
- Roll back carrying 650 dozer: one roundtrip
- Quad axle dump trucks delivering stone: 30 roundtrips
- Quad axle dump trucks hauling out excess cut (as plans indicate): six roundtrips
- Concrete trucks (32 to 42 cubic yards): four to seven roundtrips
- Standard pick-up trucks: four to five roundtrips, carrying materials such as rebar, pipes, and tools

MITIGATION MEASURES OF THE ACTION ALTERNATIVES

The National Park Service places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, Dominion would implement the protective measures described below and detailed in appendixes A and H. During the construction phase, Dominion would ensure compliance with all appropriate regulations to help ensure that protective measures are properly executed and achieving their intended results.

When crossing the parks, Dominion would adhere to standards of the Virginia Department of Historic Resources, U.S. Army Corps of Engineers, and Virginia Department of Environmental Quality regulatory requirements and project construction specifications, including those pertaining to safety, environmental inspection, the stormwater pollution prevention plan, and erosion and sediment control measures.

Soils and Water Resources

The erosion and sediment control measures specific to this project are detailed in the construction plan and Dominion's 2011 erosion and sedimentation control specifications (appendix A, attachment D), which details both standard erosion and sediment control techniques as well as special procedures for activities on NPS properties. Furthermore, NPS-approved plant material would be used on NPS properties (further described in appendix H).

Dominion would also file a Virginia stormwater management plan, as required for the project, and would comply with all conditions of the related permit. More information regarding protection of soil and water resources is described in appendix A, including the following measures required by the National Park Service:

- Provide portable sanitary facilities on site at all times and service such facilities as appropriate.
- Prohibit the use of chemicals, not including fuels and oils, during excavation or construction or concrete-curing compounds commonly used for foundation construction.
- Load construction debris into a container and remove debris containers.
- Load litter into a container and remove litter containers as needed.

A proposed concrete washdown area would receive rinse water used to clean concrete trucks after foundations are poured. Dominion's contractor would use plastic "baby" pools for concrete washdown stations. No on-site, on-ground washdown of concrete would occur on national park system lands.

Cultural Resource Protection

As part of the project planning, Dominion conducted cultural resource surveys of the area of potential effects on national park system lands. A cultural resource survey was completed in June 2012 for the entire Doods – Bremono transmission line project, and no new cultural resources were identified on NPS property; however, the survey did include two previously surveyed cultural resources: the national register-listed and NHL Skyline Drive and the national register-eligible Appalachian Trail (Archeological Resources Protection Act Permit #2012.SHEN.001).

All construction activities for both action alternatives would remain as far away from the historic guard wall (located in the corridor) as possible to ensure protection of the resource (figure 9). Under alternative 3, the entrance to the construction area would be on the north side of the corridor, away from the historic guard wall, located on the south side of the corridor (figure 9). To ensure protection to the historic guard wall, Dominion would install jersey barriers between the guard wall and the area of disturbance and between the guard wall and Skyline Drive under either action alternative.

Dominion would hire a construction monitor, who would also be a field archeologist, to be present on site at all times during construction. Dominion has developed an unanticipated discoveries plan that defines the procedures to be followed in the event that cultural materials are uncovered during construction. If cultural and/or paleontological resources are discovered during construction activities on national park system lands, Dominion would immediately stop construction and inform the NPS superintendents (or representatives), who would work with the Virginia Department of Historic Resources to define appropriate mitigation measures. More information and specifications on the unanticipated discoveries plan is available in appendix A.

Additionally, Dominion would install orange construction and silt fencing on the west side of the guard wall. All jersey barriers and fencing would be placed about 10 feet from the historic guard wall, to the extent practical due to the topography, to further ensure protection of the resource. A construction monitor would be present at all times during construction activities on national park system lands and ensure the buffer remains in place and the guard wall protected.

Protection of the Skyline Drive roadbed would be essential. Under alternative 3, construction equipment would be using Skyline Drive to access tower 39/336 (proposed tower 2139/131). According to 36 CFR 4.11, combination gross weight limits for vehicles using five or more axles on Skyline Drive are 66,000 pounds, which would be exceeded under alternative 3. The drill rig is the heaviest piece of equipment and would be brought to the site on a 12-axle tractor trailer. A 12-axle tractor trailer would be used to carry the drill rig because it most effectively dissipates weight on a roadbed (combined weight of approximately 214,950 pounds). Loading and unloading the drill rig from the tractor trailer to the construction pad and access road could potentially impact the roadbed. Dominion would try to avoid having the drill rig contact the roadbed; however, to ensure protection of the roadbed, rubber tire mats or fiberglass mats would be placed on the roadbed surface when moving the drill rig from the tractor trailer to the construction pad and moving the drill rig from the construction pad to the tractor trailer.

There are no historic cattle or bridle underpasses or bridges between the corridor and the Swift Run entrance. Four historic cattle or bridle underpasses (and retaining wall) are located between the Rockfish Gap entrance to Skyline Drive and the corridor. These underpasses are unique to this section of Skyline Drive. A pre-construction and post-construction structural assessment of the bridges would be conducted to document any potential damages. Given the weight of the construction materials required to access the corridor from Skyline Drive, Dominion would inspect all bridges prior to construction to evaluate the structural integrity of the bridges and determine if reinforcements would be necessary for equipment to cross. If reinforcements are necessary, Dominion would submit a proposal to the National Park Service for approval to ensure proposed reinforcements are completed in a way that avoids impacts to the bridges and underpasses. Dominion conducted a preliminary review of the bridges and underpasses and indicated that they were structurally sound to handle the proposed equipment. Further, under alternative 3, Dominion would cross the bridges and underpasses at idle to slow speeds to minimize potential impacts.

Any damages to the roadbed surface in the vicinity of the construction site (including paving) would be the responsibility of Dominion to repair. Under both action alternatives, a bond (an amount to be determined as a condition to the construction permit) would be issued by Dominion to account for any potential future damages to the roadbed surface, underlying structure of Skyline Drive, the cattle or bridle underpasses (and retaining wall), or any other accidental damages that could occur during construction.

Biotic Communities (Vegetation)

A VMP was completed for the restoration of national park system lands after construction to address short-term and long-term management of the corridor (appendix H). Short-term vegetation management and restoration would include returning contours that may have been disturbed or changed to as close to pre-construction conditions as possible, except contours disturbed by the construction pads. This would be accomplished through spreading topsoil; dispersing rock; installing permanent erosion and sediment control devices, as appropriate; and seeding and mulching. Details of vegetation management for the project and associated short- and long-term maintenance are described in the VMP. The VMP would include the planting of an NPS-approved seed mix and specific plantings for promotion of low-growing vegetation (10 feet and under). In addition to limiting tall growing woody vegetation and reducing the amount of required maintenance, a key component to long-term maintenance would be preventing invasive species from further populating the corridor. As part of this project, the National Park Service conducted an invasive and nonnative species inventory. Fourteen invasive nonnative vascular species were found during the survey (appendix G). The VMP would include the treatment of newly established and existing invasive species and long-term management methods to reduce the presence of invasive species within the corridor in the future. More information regarding the type, number, and location of existing invasive species within the corridor can be found in appendix G. Goals of the VMP would be to create a low-maintenance and low-growing sustainable plant community to promote wildlife habitat within the corridor, create vegetation screening along the Appalachian Trail and Skyline Drive, and reduce the presence of invasive species within the corridor.

Visitor Use and Experience

Under alternative 2, limited use of Skyline Drive would be authorized. Given the current schedule of the project, construction would likely occur during peak visitor use months. To reduce impacts to visitor use, Dominion would make every attempt to schedule the use of Skyline Drive during the week and avoid use of Skyline Drive on the weekends. During these times, temporary lane closures would be required for the pouring of the concrete foundations, the delivery of structure materials, and the removal of guy wires. Each of these activities is anticipated to take one day, but activities would be scheduled at different times, potentially weeks apart. For each of these activities, one lane of Skyline Drive would be closed to traffic; however, construction crews would let traffic through in each direction at least every 15 minutes to avoid major traffic delays during the lane closure events.

Under alternative 3, Skyline Drive would be completely shut down two times for 6.5 hours when the drill rig would be brought to and from the corridor. The closure would only affect the area between Swift Run Gap and Rockfish entrance stations, which would leave a portion of Skyline Drive (north of Swift Run Gap) open to visitors. Given the current schedule, construction would start in summer 2014 and likely occur, partially, during peak visitor use months for both parks. To reduce impacts to visitor use, the drill rig would be brought to and from the corridor at night and during the week when fewer visitors are on Skyline Drive. The vehicle would be held at a property owned by Phil Delany (an abandoned gas station) during the day so that the drill could be brought in at night. Skyline Drive would be shut down completely while the drill rig would be brought to the corridor, unloaded or loaded, and when removed from the corridor, approximately 6.5 hours total. Lastly, appropriate signage would be installed for the duration of construction, on either side of Skyline Drive and the Appalachian Trail to caution visitors of ongoing construction activities and the location of the truck entrance and the corridor.

Wetlands and Waterways

The small wetland found as part of the surveys on national park system lands would be clearly flagged and avoided as part of the project. A 10-foot buffer (created with silt fencing) would be kept around the wetland at all times. A construction monitor would be present at all times during any construction activity on national park system lands and ensure the buffer remains in place during construction. If the wetland would need to be crossed for any reason (not anticipated), the National Park Service would be made aware prior to crossing and wetland mats would be required. Lastly, the use of proper erosion and sediment control measures would further ensure protection of the wetland and water resources.

ALTERNATIVES CONSIDERED BUT DISMISSED

CEQ regulations for implementing the National Environmental Policy Act require federal agencies to explore and objectively evaluate all reasonable alternatives to the applicant's proposal and to briefly discuss the rationale for eliminating any alternatives that were not considered in detail. This section describes those alternatives that were eliminated from further evaluation and documents the rationale for their elimination. During the course of scoping, one alternative was considered but was

deemed to be unreasonable and was not carried forward for analysis in the environmental assessment. Justification for eliminating options from further analysis was based on the following factors:

- technical or economic feasibility
- inability to meet project objectives or resolve need
- duplication with other, less environmentally damaging or less expensive alternatives
- conflict with an up-to-date and valid park plan, statement of purpose and significance, or other policy, such that a major change in the plan or policy would be needed
- too great an environmental impact

The following alternatives were considered but dismissed for the listed reasons.

Relocation of Tower near Skyline Drive

The National Park Service requested that Dominion move tower 39/336 farther west and away from Skyline Drive. Dominion responded that the proposed location for the replacement tower 39/336 could not feasibly move more than 25 feet farther west of Skyline Drive from its current designed location. Several compounding factors, including existing transmission lines on either side of the Doods – Bremo line and existing topography, were the reasons for the inability to move the structure. Placing the new 230-kV single-circuit towers adjacent to the existing, double-circuit 230-kV towers would allow Dominion to safely operate the new transmission line at the widest range of wind conditions, while maintaining minimum clearance values to the adjacent transmission lines. If the tower were located farther west of Skyline Drive, the conductors may violate minimum clearance values to other circuits or adjacent towers during a high wind event. Furthermore, westward of the proposed tower location, the topography drops significantly and a taller tower would have been required to maintain the appropriate clearance from the ground, creating additional visual impacts to the area. As a result, the National Park Service decided that the current placement of the tower would be the only alternative carried forward in this analysis.

NPS PREFERRED ALTERNATIVE

Alternative 2 is the NPS preferred alternative. This alternative largely meets NPS objectives and fulfills the purpose and need for action. Dominion would implement a number of mitigation measures developed by the National Park Service to reduce and manage the impacts to natural and cultural resources from the construction and installation of a new higher voltage transmission line, while also maintaining the safety of the construction activity. Although the new structures would be taller than the existing towers, the impact on the viewshed would be minimal because the two adjacent lines are the same height or taller than the proposed structures. Further, the proposed structures would be constructed of self-rusting steel to further blend into the surrounded landscape.

Alternative 2 minimizes or eliminates potential impacts to several important cultural resources by avoiding major use of Skyline Drive and the potential impacts to historic structures from the repeat use of heavy construction equipment. Alternative 2 also minimizes impacts on visitor use and experience by eliminating the need for full closures of Skyline Drive and repeat use of Skyline Drive during peak visitor use months. Lastly, the existing transmission line stands on wooden H- frame towers that, according to Dominion, have reached the end of their useful life and require replacement regardless of voltage capacity considerations. The existing wooden towers, if not replaced, could cause a threat to visitor safety.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

In accordance with the DO-12 Handbook, the National Park Service identifies the environmentally preferable alternative in its NEPA documents for public review and comment [section 4.5 E (9)]. The environmentally preferable alternative is the alternative that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified on consideration and weighing, by the responsible official, of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative (43 CFR 46.30).

In this instance, the environmentally preferable alternative is alternative 1. The no-action alternative would result in no further construction disturbance, would only include routine tower or wire maintenance, and would not increase impacts on the viewshed. There would be negligible impacts on soils and geology, scenic resources, soundscapes, historic structures, and cultural landscapes. See table 3 for a summary of the environmental consequences of the alternatives brought forward for analysis. However, because the no-action alternative would not meet the purpose and need for taking action, it was not selected as the preferred alternative.

The interdisciplinary team identified no other projects planned or known in the study area or in the immediate vicinity of the proposed action, including any actions on properties owned or managed by the National Park Service that would have measurable impacts on the resources evaluated. All existing permits or easement agreements would be updated, and previous terms of the SUP would be void as a result of this action. Existing permit agreements are considered baseline, no projects were identified that would be considered as contributing to the cumulative impacts on the resources analyzed in this environmental assessment, and there are no cumulative impacts included in the analyses or in table 3.

TABLE 3: SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Alternative 1: No Action	Alternative 2: Access Up the Right-of-Way (Preferred Alternative)	Alternative 3: Access from Skyline Drive
Soils and Geology	Alternative 1 would result in continued long-term negligible impacts to soils in the corridor from continued maintenance, tree removal, vegetation trimming or mowing, and use of approved herbicides. No impacts to geologic resources are expected under alternative 1.	Implementation of alternative 2 would result in impacts on soils through compaction, modification, disturbance, and a loss of soil productivity as a result of construction activities. The removal and replacement of towers would result in a net gain of 11 square feet (0.00025 acre) of soils, resulting in slight beneficial impacts. The reestablishment of the construction pads and widening of two access roads would result in short-term minor impacts to soils. Given the steep slope west of Skyline Drive, a large amount of grading (25,015 cubic yards for the entire road on and off national park system lands) would be required to establish the access road. Because of the high potential for soil erosion and run-off, impacts to soils would be short term and moderate, when considering proposed mitigation measures and the reestablishment of the natural slope on national park system land. Impacts to geologic features would be long term and minor due to the installation of four new concrete foundations up to 21 feet below grade	Impacts to geology and soils as a result of establishment of construction pads, removal/replacement of the existing towers, and the enhancement of the existing two-track access roads would be the same as those described for alternative 2 and would be short term and minor to soils and long term and minor to geological resources. Impacts to soils associated with the access road off Skyline Drive would be short term because the access road would not be retained for future use and existing contours would be restored. Based on the small amount of soil moved (net 4 cubic yards) and implementation of mitigation measures, impacts to soils under alternative 3 would be short term and minor.

Impact Topic	Alternative 1: No Action	Alternative 2: Access Up the Right-of-Way (Preferred Alternative)	Alternative 3: Access from Skyline Drive
<p>Biotic Communities</p>	<p>Under the no-action alternative, current maintenance activities would continue. These include the treatment, mowing, and/or removal of trees and tall-growing vegetation within the corridor, resulting in continued long-term minor adverse impacts to vegetation. There would be no new impacts on biotic communities under the no-action alternative; however, short-term minor adverse impacts would occur due to ongoing maintenance activities.</p>	<p>Under alternative 2, vegetation clearing and temporary displacement of wildlife would occur during construction or reestablishment of access roads and construction pads and result in short-term minor adverse impacts on biotic communities. The permanent net gain of vegetation at tower locations would result in slight beneficial impacts on biotic communities. After construction, vegetation would be reestablished within the corridor per the VMP, which includes establishing a low-growing sustainable plant community, planting vegetation screening, and proper long-term management of invasive species. Maintenance activities would have long-term minor direct adverse impacts to biotic communities from the selective treatment of potentially tall-growing species and the occasional removal of danger trees, as necessary. Nevertheless, long-term beneficial impacts would be expected from the implementation of the VMP, resulting in the overall reduction or stabilization of invasive species and the establishment of a sustainable low-growing plant community.</p>	<p>Under alternative 3, the gain of vegetation from the removal and construction of towers on national park system lands would result in slight beneficial impacts to biotic communities. Disturbance to biotic communities from construction activities, including ground disturbance and noise, would have short-term negligible to minor adverse impacts. After construction, vegetation in the corridor would be reclaimed, as described under alternative 2, resulting in long-term minor adverse impacts from the selective treatment of potentially tall-growing species and the occasional removal of danger trees, as necessary. Nevertheless, long-term beneficial impacts would be expected from the implementation of the VMP, resulting in an overall reduction of invasive species and establishment of a sustainable low-growing plant community.</p>

Impact Topic	Alternative 1: No Action	Alternative 2: Access Up the Right-of-Way (Preferred Alternative)	Alternative 3: Access from Skyline Drive
<p>Visitor Use and Experience</p>	<p>Implementation of alternative 1 would result in short- and long-term minor adverse impacts on visitor use and experience due to the continued presence of the transmission towers crossing the footpath and associated operational maintenance activities within the corridor.</p>	<p>Implementation of alternative 2 would result in localized short-term minor to moderate adverse impacts on visitors during construction from the limited lane closures of Skyline Drive and the presence of construction equipment and other maintenance materials. Once construction is complete, there would be long-term minor adverse impacts to visitor experience from the taller towers; however, the overall existing characteristics of the corridor for visitor use and experience would not change.</p>	<p>Implementation of alternative 3 would result in localized short-term moderate adverse impacts on visitors during construction from the four temporary closures of Skyline Drive, lane closures, slowed traffic, and presence of construction equipment and other maintenance materials during peak visitor use time. Once construction is complete, there would be long-term minor adverse impacts to visitor use and experience from the taller towers; however, the overall existing characteristics of the corridor for visitor use and experience would not change.</p>

Impact Topic	Alternative 1: No Action	Alternative 2: Access Up the Right-of-Way (Preferred Alternative)	Alternative 3: Access from Skyline Drive
Scenic Resources	<p>Alternative 1 would result in continued long-term negligible to minor adverse impacts on scenic resources due to the presence of the transmission towers crossing Skyline Drive and the Appalachian Trail. Short-term minor adverse impacts to visual resources would occur from operational and maintenance activities. There would be no further impacts on scenic resources under alternative 1.</p>	<p>Implementation of alternative 2 would result in short-term minor to moderate adverse impacts during construction activities due to the construction of the access road west of Skyline Drive, the presence of brightly colored construction fencing, and the presence of machinery and equipment. Although there would be few places where park users would be able to see the taller towers, an increase in tower height would slightly increase tower visibility, resulting in continued long-term minor impacts on scenic resources. Also, there would be long-term beneficial impacts to scenic resources from implementation of the VMP, which would reduce the amount of mowing within the corridor and include the establishment of vegetative screening along Skyline Drive and the Appalachian Trail.</p>	<p>Implementation of alternative 3 would result in short-term moderate adverse impacts during construction activities due to the construction of the access road off Skyline Drive, the presence of brightly colored construction fencing, and the presence of machinery and equipment. Although there would be few places where park users would be able to see the taller towers, an increase in tower height would slightly increase tower visibility, resulting in continued long-term minor impacts on scenic resources. Also, there would be long-term beneficial impacts to scenic resources from implementation of the VMP, which would reduce the amount of mowing within the corridor and include the establishment of vegetative screening along Skyline Drive and the Appalachian Trail.</p>

Impact Topic	Alternative 1: No Action	Alternative 2: Access Up the Right-of-Way (Preferred Alternative)	Alternative 3: Access from Skyline Drive
Soundscapes	Implementation of the no-action alternative would result in short-term minor adverse impacts and long-term negligible adverse impacts on soundscapes, including the slight corona emitted by the transmission lines and noise resulting from maintenance activity.	Implementation of alternative 2 would result in short-term moderate adverse impacts and long-term negligible adverse impacts on soundscapes, including the slight corona emitted by the transmission lines and noise resulting from the construction and/or enhancement of the new 230-kV line and three access roads. Alternative 2 would also result in short-term negligible adverse impacts to wilderness.	Impacts under alternative 3 would be similar to those described under alternative 2; however, impacts to soundscapes during construction could be slightly greater than those impacts described under alternative 2 because of the proximity of construction activities to Skyline Drive. Implementation of alternative 3 would result in short-term moderate adverse impacts and long-term negligible adverse impacts on soundscapes, including the slight corona emitted by the transmission lines and noise resulting from the construction or enhancement of the new line and access roads. Alternative 3 would also result in short-term negligible adverse impacts to wilderness.
Historic Structures	Implementation of alternative 1 would have long-term negligible impacts on historic structures due to continued presence of transmission facilities.	Implementation of alternative 2 would have short-term minor impacts on historic structures from the presence of construction equipment and long-term negligible impacts on historic structures from the continued presence of transmission facilities. No impacts are expected from the limited use of Skyline Drive for construction.	Implementation of alternative 3 would have short-term moderate impacts on historic structures due to the presence of construction activities, and long-term minor impacts on historic structures from the use of Skyline Drive as an access road because of the proposed mitigation efforts.

Impact Topic	Alternative 1: No Action	Alternative 2: Access Up the Right-of-Way (Preferred Alternative)	Alternative 3: Access from Skyline Drive
Cultural Landscapes	Implementation of alternative 1 would have long-term negligible impacts on cultural landscapes from the trimming of vegetation in the viewshed.	Implementation of alternative 2 would have long-term minor impacts due to the taller, more noticeable towers and short-term minor-to-moderate impacts from construction equipment in the corridor on the cultural landscapes, resulting in no adverse impacts. There would be limited access to the corridor from Skyline Drive, including one vehicle that exceeds the permitted weight limits; however, no impacts are expected, and there would be no impact to the landscape features listed in table 9.	Implementation of alternative 3 would have long-term minor impacts due to the taller, more noticeable towers short-term minor to moderate impacts from construction equipment in proximity to Skyline Drive. Long-term minor impacts would result from the moving and replacing of natural contours immediately adjacent to Skyline Drive.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes existing environmental conditions and environmental consequences in the areas potentially affected by the alternatives evaluated. The “Affected Environment” section describes the following resource areas: soils and geology, biotic communities, visitor use and experience, scenic resources, soundscapes, and cultural resources.

After the baseline environmental conditions are provided by impact topic, the “Environmental Consequences” section analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered in this environmental assessment. This section also includes impact definitions (e.g., negligible, minor, moderate, and major), methods used to analyze impacts, and the analysis methods used for determining cumulative impacts. As required by CEQ regulations implementing the National Environmental Policy Act, a summary of the environmental consequences for each alternative is provided in table 3 in “Chapter 2: Alternatives.”

GENERAL METHODOLOGY FOR ESTABLISHING IMPACT DEFINITIONS AND MEASURING IMPACTS BY RESOURCE

The following elements were used in the general approach for establishing impact definitions and measuring the effects of the alternatives on each resource category:

- general analysis methods as described in guiding regulations, including the context and duration of environmental effects
- basic assumptions used to formulate the specific methods used in this analysis
- definitions used to define the level of impact resulting from each alternative
- methods used to evaluate the cumulative impacts of each alternative in combination with any unrelated factors or actions affecting park resources that have been identified

These elements are described in the following sections.

General Analysis Methods

Analysis of impacts follows CEQ guidelines and DO-12 procedures (NPS 2011) and is based on the underlying goal of providing unique scenic and other natural values and provisions for use and enjoyment of the outdoor recreation resources at the parks. This analysis incorporates the best available literature applicable to the setting and the actions being considered in the alternatives.

For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including assumptions and impact intensity definitions.

Assumptions

Several guiding assumptions were made to provide context for this analysis. These assumptions are described below.

Analysis Period

The analysis period for this assessment includes the expected period of construction to remove the existing 115-kV transmission line towers and rebuild new 230-kV towers in the corridor. Construction of the Doods-Bremo line on national park system lands is anticipated to begin in summer 2014, after the FONSI has been signed and the National Park Service approves the construction SUP and right-of-way permit. If access road construction begins in July 2014, all construction, including energizing the lines, would be expected to be completed on national park system lands by October 2014. The analysis period for some resource areas may extend beyond the period of construction. The specific analysis period for each impact topic is defined at the beginning of each topic discussion.

Geographic Area Evaluated for Impacts (Area of Analysis)

The geographic study area (or area of analysis) for this assessment is the corridor for the Doods – Bremo line through Shenandoah National Park and the Appalachian National Scenic Trail. The area of analysis extends beyond the corridor for scenic resources, cultural landscapes, and soundscapes. The specific area of analysis for each impact topic is defined at the beginning of each topic discussion.

Impact Definitions

Determining the intensity of impacts is a key component in applying NPS *Management Policies 2006* and DO-12. These impact definitions provide the reader with an idea of the intensity of a given impact on a specific topic. The impact intensity is determined primarily by comparing the effect on a relevant standard based on applicable or relevant/appropriate regulations or guidance, scientific literature and research, or best professional judgment. Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document. Intensity definitions are provided throughout the analysis for negligible, minor, moderate, and major impacts. In all cases, the impact intensities are defined for adverse impacts. Beneficial impacts are addressed qualitatively.

Potential impacts of all alternatives are described in terms of type (beneficial or adverse). Adverse impacts are also described in context, duration (short or long term), and intensity (negligible, minor, moderate, or major). Definitions of these descriptors are included below:

Beneficial: Beneficial impacts result in a positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

- Adverse:* Adverse impacts result in a change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.
- Context:* Context is the affected environment in which an impact would occur, such as local, parkwide, regional, global, affected interests, society as whole, or any combination of these. Context is variable and depends on the circumstances involved with each impact topic. As such, the impact analysis determines the context, not vice versa.
- Duration* The duration of the impact is described as short term or long term. Duration is variable with each impact topic; therefore, definitions related to each impact topic are provided in the specific impact analysis narrative.
- Intensity:* Because definitions of impact intensity (negligible, minor, moderate, and major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed.

Cumulative Impacts Analysis

The CEQ regulations to implement the National Environmental Policy Act require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). As stated in the CEQ handbook, *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997), cumulative impacts must be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on effects that are truly meaningful. Cumulative effects can result from individually minor but collectively moderate or major actions that take place over a period of time. Cumulative impacts are considered for all alternatives, including the no-action alternative.

The interdisciplinary team determined that no other projects are planned or known in the corridor or in the immediate vicinity of the proposed action, including any actions on properties owned or managed by the National Park Service that would have measurable impacts on the resources evaluated. All existing permits or easement agreements would be updated, and previous terms of special use permits would be void as a result of this action. Existing permit agreements are considered baseline, no projects were identified that would be considered as contributing to the cumulative impacts on the resources analyzed in this environmental assessment, and there are no cumulative impacts included in the analyses. The project involves construction activities within the corridor and would not impact any lands outside of the right-of-way on national park system lands.

GEOLOGY AND SOILS

Affected Environment

Shenandoah National Park and the portions of the Appalachian National Scenic Trail that reside within the corridor are classified as being part of the western portion of the Blue Ridge geologic province. Geologic formations in the parks are composed of three major bedrock units of different age (approximately 1.1 to 1 million years ago) and composition: basement rock (otherwise known as igneous/metamorphic rock), greenstone, and quartzite (otherwise known as metasedimentary rock). The corridor is located in the quartzite unit. These different bedrock geologic types have distinct chemical and physical properties that directly influence the location, physical character, and soil characteristic of the bedrock and rock exposures (USGS 2009). Quartzite formations form flatiron and hogback ridges and erode into block and talus fields, and thin acidic soils supporting sparse vegetation. Quartzite contains very hard, strong rock, and is difficult to erode. The combination of hard, resistant quartzite layers and easily eroded silty layers results in a very rugged landscape with steep slopes and deep ravines that erode into other rocks. Soil development is non-existent to minimal at most quartzite rock outcrops (NPS 2012a). Within the corridor, rock exposures are prevalent primarily due to the steepness of the topography, particularly west and directly east of Skyline Drive and on the east Appalachian Trail parcel and from the predominance of shallow surficial soil.

The information presented below, which describes soils in the corridor, is taken from the Soil Survey of Albemarle and Augusta counties, Virginia, part of the National Cooperative Soil Survey conducted by the Natural Resources Conservation Service (NRCS) (NRCS 2013). The corridor is located in both Albemarle and Augusta counties. This area overlies the Hartleton and Lew soil types in Augusta County in the location of proposed 2139/131 (39/336), 2139/130 (39/335), 2139/129 (39/334) transmission towers and access roads. The Lew and Myersville-Catoctin soil types are in Albemarle County in the location of the proposed tower 2139/123. In each of these soil types, soils are broken down further primarily by slopes and composition. Detailed descriptions of each of the soil types present on national park system lands in the corridor are presented in table 4. Soil depth is determined by the distance from grade until bedrock; soils with 40 inches or more are considered deep, those over 50 inches are considered very deep, and those from 30 to 39 inches are considered moderately deep (NRCS 2013).

TABLE 4: SOIL UNIT DESCRIPTIONS

Soil Type	Slope (%)	Drainage	Permeability	Erosion Hazard	Depth
Hartleton (Augusta County)	25–75	Well-drained	Moderate	Severe	Moderately deep to very deep
Lew very stony silt loam (Augusta County)	7–25	Well-drained	Moderate	Severe	Very deep
Lew very stony silt loam (Albemarle County)	7–15	Well-drained	Moderate	Severe	Very deep

Soil Type	Slope (%)	Drainage	Permeability	Erosion Hazard	Depth
Myersville-Catoctin very stony silt loam (Albemarle County)	25–60	Well-drained	Moderate	Severe	Very deep

Source: NRCS 2013

Each soil type located in the corridor has a severe potential for erosion (meaning soils have an acute susceptibility to wind or water erosion) that can be attributed primarily to the presence and magnitude of steep slopes. In areas of extreme slopes, severe erosion potential could lead to mass wasting (i.e., slope movement) in the event of excessive weathering. The steepest slopes in the corridor are located in the area of the proposed access road west of Skyline Drive under alternative 2 and range from 28 to 48% grade. The majority of the soils located in the corridor have been previously disturbed and compacted from the construction and operation of the existing transmission lines. Disturbance and compaction usually changes soils properties, mixes the soil structure, and has the potential to increase runoff and erosive properties of the soil, potentially decreasing the soil's ability to provide habitat and nutrients for vegetation and limiting the soil's building potential. Signs of erosion were not present on Shenandoah National Park property or in the vicinity of the Appalachian Trail likely because of dense vegetation cover; however, signs of erosion were present along the existing two-track access road that leads into the tract 444 Appalachian Trail parcel. Previously disturbed sites may require future soil management, and further construction can magnify the impacts from the previous disturbance.

A formal soil survey of the corridor or the parks has not been conducted in several decades. Information presented above regarding soils in the corridor is based on available NRCS data and describes general characteristics of the soil types to provide a general idea of characteristics of soils present. Dominion completed soil borings for most angle structures, outside of national park system lands, including proposed tower 2139/128 (39/333), which is approximately 550 feet from tower 39/334 (on national park system lands). The soil boring data can be used as a representative sample of the characteristics and depth of soils in the corridor. The results of the soil boring indicate that the surficial soil layer is 0.4 foot deep, followed by a moist, firm to stiff brown, silty lean clay with trace sand and little gravel soil. From 0.4 to 3 feet below the surface, the residuum layer is moist, firm to hard brown, clayey silt with trace sand and is 16 feet deep. From 19 to 36 feet below the surface, a soft weathered rock is present with very dense, yellowish – brown and silty fine sand characteristics. The boring was 36 feet deep, and groundwater was not encountered or observed during the soil boring.

Environmental Consequences

Methodology and Assumptions

Potential impacts were assessed based on the extent of disturbance to soils and geology, including natural undisturbed soils, the potential for soil erosion resulting from disturbance, foundation drilling, and limitations associated with soils. Analysis of possible impacts on soils was based on

review of existing literature and maps, information provided by the National Park Service and other agencies, Dominion's soil boring information, and professional judgment. This section assesses the potential effects construction may have on the corridor.

Study Area

The geographic study area for impacts on soils includes the existing corridor on national park system lands. For analysis purposes, the affected area would be the soils and geologic features in the existing corridor across national park system lands. It is expected that construction activities would not occur outside these areas on national park system lands.

Impact Definitions

- Negligible:* The action would result in a change to soils, but the change would be so small that it would not have any measurable or perceptible consequence.
- Minor:* The action would result in impacts on soils, but the change would be small and localized and of little consequence. Mitigation would be needed to offset adverse impacts, would be relatively simple to implement, and would likely be successful.
- Moderate:* The action could result in a change to soils; the change would be measurable and of consequence. Mitigation measures would be necessary to offset adverse impacts and would likely be successful.
- Major:* The action would result in a noticeable change to soils; the change would be measurable and would result in a severely adverse impact. Mitigation measures necessary to offset adverse impacts would be needed and would be extensive, and their success would not be guaranteed.
- Beneficial:* A beneficial impact would occur when actions were taken to actively preserve, stabilize, or return soils to their pre-existing conditions.
- Duration:* Short-term impacts would occur during the implementation of the alternative; long-term impacts would extend beyond implementation of the alternative.

Alternative 1: No Action

Analysis—The no-action alternative represents the current conditions in the corridor. There would be no grading, excavation of soils, or removal of vegetation under alternative 1, and no upgrades of the existing transmission lines would occur. Continued maintenance of the corridor would occur and include yearly field inspections, NPS-approved selective tree removal for danger trees, mowing or trimming of vegetation, and spot treatment with NPS-approved herbicides. However, many species within the corridor have the potential to grow taller than 10 feet, and large portions of the

corridor are often mowed. Current field inspections use the existing two-track access roads to access the corridor and personnel and pick-up truck movement within the corridor could potentially disturb and compact soils. It is anticipated that activities associated with inspections would be routine and that any changes to soils from the periodic inspections would result in no impacts given the use of existing access roads. Continued use of herbicides could potentially impact soil productivity; however, the total area of soil to be affected would be relatively small, resulting in long-term negligible impacts to soil productivity. No impacts to geologic resources are expected under alternative 1.

Conclusion—Alternative 1 would result in continued long-term negligible impacts to soils in the corridor from continued maintenance, tree removal, vegetation trimming or mowing, and use of approved herbicides. No impacts to geologic resources are expected under alternative 1.

Alternative 2: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor

Analysis—Under alternative 2, the construction SUP and right-of-way permit would be issued as described in chapter 2. At the start of construction, vegetation within the areas of disturbance (figures 6, 7, and 8) would be removed for construction or enhancement of access roads and construction pads. Construction activities would temporarily compact, modify, and disturb approximately 3 acres of soil in the limits of disturbance on national park system land (for all access roads and construction pads) and 3.15 additional acres off NPS property for construction of an access road up the corridor, which leads to national park system land.

Construction pads should be present at each existing tower location from the initial construction of the Dooms – Bremono line; however, additional grading would likely be required for the reestablishment of the construction pads and to accommodate modern construction equipment. Construction pads would be approximately 100 feet by 100 feet (or smaller) and would remain after construction. Construction of the construction pads and the removal of the existing towers would disturb, compact, and modify existing soil conditions. The existing H-frame towers are directly buried (i.e., with no concrete foundation) and would be completely removed from the soil. Soils in the footprint of the existing towers would be restored and rehabilitated after construction. With an existing footprint diameter of 24 inches per foundation (each existing tower has two foundations) an 8-square-foot area would be restored per tower. Given that five structures would be removed, 40 square feet of soil would be restored. The proposed towers would have an average diameter of 6 feet. Assuming four towers would be replaced, a total of 29 square feet of permanent soil loss would occur. The net gain of soil from the demolition and construction of towers on national park system lands would be 11 square feet or 0.00025 acre. The net permanent gain of soil and reestablishment of the construction pads would result in slight beneficial impacts to soils.

Two existing access roads would be enhanced for the rebuild of the Dooms – Bremono line (described in chapter 2). The existing access roads in the corridor are currently maintained as two-track dirt roads for use during routine maintenance and inspections. These two access roads would be enhanced and widened to facilitate construction activities and equipment. The existing access roads

would be returned to their pre-construction condition (two-track dirt road). The area of impact for the enhancements of the roads and the creation of the construction pads would be approximately 2.5 acres. Impacts on soils associated with the use of existing access roads have largely already occurred, and additional impacts would be short term and minor because of the proposed modifications.

One temporary access road would be constructed under alternative 2 and would be located west of Skyline Drive. The limits of disturbance for the access road west of Skyline Drive and on national park system land would be approximately 0.49 acre. An additional 3.15 additional acres of disturbance would be required for construction of access road outside of national park system lands. The construction of the access road west of Skyline Drive would require a large amount of grading on a steep slope (28 to 48% grade). The net fill dimensions on national park system lands would be 5,417 cubic yards; however, 25,015 cubic yards of net fill would be required to construct the entire access road to proposed tower 2139/131. These numbers are subject to change based on more detailed engineering, which would be available and included in the construction SUP. Soil types located in the corridor have a severe erosion potential that can be primarily attributed to the steep slopes of the area. Construction and grading on a steep slope greatly increase the potential for soil erosion and run-off. Adherence to erosion and sediment control measures and stormwater specifications and soil compaction mitigation measures would be required (including the avoidance of equipment on heavily saturated soils) and implemented during construction to limit erosion and run-off potential. A high rainfall event could cause increased erosion, run-off, or mass failure, given the steep slopes and high erosion potential; however, a third-party contractor would be responsible for monitoring all erosion and sediment controls weekly, both during and after construction. After every measurable rainfall event (0.25 inch of rain or greater over 24 hours), Dominion contractors would examine all erosion and sediment controls to ensure all erosion and sediment control measures are in place and determine whether any improvements are required. Erosion and sediment controls, including monitoring, would remain in place after construction until stabilization is achieved and the controls are removed. After construction, the new access road on national park system lands would be restored to the original contours, or as close as practical, resulting in the movement of 5,417 cubic yards of soil again to reestablish the existing slope. The access road off national park system lands would not be restored to the original contours and the road would remain as a two-track dirt road. Detailed engineering drawings would be developed showing how the remaining and the restored roads would blend together. Mitigation measures would minimize impacts for soil erosion and run-off; however, considering the amount of soil movement and grading on the steep slope that would be required to create the access road and reestablish existing contours, short-term moderate impacts to soils would occur.

Geologic features that had been disturbed during the initial construction of the Dooms – Bremo line could be disturbed again with the removal of the towers, and additional impacts to geological features would occur from the construction of the new towers. The replaced towers would be installed on concrete foundations that would be drilled on average 20 feet below grade. The soil boring completed on an adjacent structure noted that soft weathered rock is found 19 feet below the surface. Based on the foundation depth, the foundations could impact geologic features during the drilling of the foundations for each tower. No impacts on geologic features are expected within the limits of disturbance or from the construction or enhancement of the access roads. Impacts would be long term; however, based on the amount of disturbance on the surface (0.00067 acre per

foundation) and the lack of important geologic features in the area, impacts to geology would be minor.

Conclusion—Implementation of alternative 2 would result in impacts on soils through compaction, modification, disturbance, and a loss of soil productivity as a result of construction activities. The removal and replacement of towers would result in a net gain of 11 square feet (0.00025 acre) of soils, resulting in slight beneficial impacts. The reestablishment of the construction pads and widening of two access roads would result in short-term minor impacts to soils. Given the steep slope west of Skyline Drive, a large amount of grading (25,015 cubic yards for the entire road on and off national park system lands) would be required to establish the access road. Because of the high potential for soil erosion and run-off, impacts to soils would be short term and moderate, when considering proposed mitigation measures and the reestablishment of the natural slope on national park system land. Impacts to geologic features would be long term and minor due to the installation of four new concrete foundations up to 21 feet below grade.

Alternative 3: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line In Accordance with the Construction Plan with Access from Skyline Drive

Analysis—Under alternative 3, the construction SUP and right-of-way permit would be issued as described in chapter 2. Impacts to geology and soils as a result of the reestablishment of construction pads, removal and replacement of the towers, and the enhancement of existing access roads would be the same as described under alternative 2, resulting in short-term minor and negligible impacts to soils and geology. However, under alternative 3, construction to existing tower 39/336 (proposed tower 2139/131) would be from Skyline Drive, rather than west of Skyline Drive. Construction activities would temporarily compact, modify, and disturb approximately 2.8 acres of soil in the limits of disturbance on national park system land for construction or enhancement of all access roads and construction pads. Alternative 3 would not require grading or soil movement up the slope west of Skyline Drive.

Temporary access to existing tower 39/336 (proposed tower 2139/131) would be located in a generally flat location, resulting in very little grading and movement of soil. Under alternative 3, construction of the new access road off Skyline Drive would require approximately 0.36 acre of disturbance and a net earthwork cut of 4 cubic yards (figure 9) and would include 830 cubic yards of cut and 826 cubic yards of fill. Construction of the new access road would temporarily alter the existing contours and would compact, modify, and disturb soils resulting in a temporary loss of soil productivity in this area. Construction of the access road off Skyline Drive could lead to an increased potential for erosion during construction; however, because of the relatively flat, small area of disturbance and adherence to erosion and sediment control measures and stormwater specifications, impacts would be minimized and mitigated. Impacts to soils associated with the access road off Skyline Drive would be short term because the access road would not be retained for future use and existing contours would be restored. Based on the amount of soil moved, relatively flat topography, and implementation of mitigation measures, impacts to soils under alternative 3 would be short term and minor. No impacts on geologic features would be expected as a result of construction of the access road.

Conclusion—Impacts to geology and soils as a result of establishment of construction pads, removal/replacement of the existing towers, and the enhancement of the existing two-track access roads would be the same as those described for alternative 2 and would be short term and minor to soils and long term and negligible to geological resources. Impacts to soils associated with the access road off Skyline Drive would be short term because the access road would not be retained for future use and existing contours would be restored. Based on the small amount of soil moved (net 4 cubic yards) and implementation of mitigation measures, impacts to soils under alternative 3 would be short term and minor.

BIOTIC COMMUNITIES

Affected Environment

Specific survey resource reports were completed within the existing corridor on national park system lands for threatened and endangered species, wetlands and waterways, and invasive species (see appendixes E, D, and G, respectively, for detailed descriptions and photographs of vegetation at the time of surveys).

According to the National Vegetation Classification System (NVCS), the dominant vegetation type within the surrounding forest area in Shenandoah National Park is the Central Appalachian Dry – Mesic Chestnut Oak – Red Oak Forest (National Vegetation Classification Standard [NVCS] Community Element Code [CEGL] 6057) and Central Appalachian Basic Oak – Hickory forest (NVCS CEGL 8514) (Young et al. 2009). Field observations of Shenandoah National Park and Appalachian National Scenic Trail lands identified a predominantly oak-hickory forest surrounding Skyline Drive and the Appalachian Trail. The geographic area for biotic communities is limited to the area within the corridor and on national park system lands. The corridor is dominated by thick ground cover of scrub-shrub and steep rocky slopes. Woody edge vegetation is maintained and trimmed, as necessary, to remove tall-growing vegetation and maintain safe and reliable operation of the transmission lines within the corridor.

Vegetation

The corridor, inclusive of Skyline Drive and the Appalachian Trail, is rocky and steep and consists of a large amount of scrub-shrub vegetation. Vegetation on the edge of the corridor consists of chestnut oak (*Quercus prinus*), pignut hickory (*Carya glabra*), and hophornbeam (*Ostrya virginiana*) with an understory of shrubs, mostly maple-leaved viburnum (*Viburnum acerifolium*). Enchanter's nightshade (*Circaea alpina*) and longleaf summer bluet (*Houstonia tenuifolia*) were the dominant herb species identified on the edge of the corridor. In the corridor, the dominant species include slippery elm (*Ulmus rubra*), sassafras (*Sassafras albidum*), and a grape species (*Vitis* sp.); the dominant herbs are false Solomon's-seal (*Maianthemum racemosum*) and enchanter's nightshade (*ircaea lutetiana*).

The tract 444 Appalachian Trail parcel consists of rocky steep slopes with a large amount of scrub-shrub and tall herbaceous vegetation. The forested edge of this parcel is similar to the corridor crossing described above, but it includes white ash (*Fraxinus americana*), American basswood (*Tilia*

americana), red oak (*Quercus rubra*), and red maple (*Acer rubrum*). The dominant shrubs at the edge of the corridor are witch hazel (*Hamamelis virginiana*), pawpaw (*Asimina triloba*), and spicebush (*Lindera benzoin*), and the dominant herbaceous plants include hay-scented fern (*Dennstaedtia punctilobula*) and tall bellflower (*Campanulastrum americanum*). The corridor contains various grass species, red maple and red oak saplings, along with witch hazel and sassafras.

As noted above, an invasive and nonnative species survey was completed on national park system lands and within the corridor (appendix G). Fourteen invasive vascular species were identified during the 2012 invasive species survey (photographs can be found in appendix G). All species are listed as invasive for Virginia on the Mid-Atlantic Exotic Pest Plant Council list or the Virginia Department of Conservation and Recreation's *Invasive Alien Plant Species of Virginia* and include:

- spiny plumeless thistle (*Carduus acanthoides*)
- spotted knapweed (*Centaurea stoebe ssp. micranthos*)
- princess tree (*Paulownia tomentosa*)
- Japanese honeysuckle (*Lonicera japonica*)
- tree-of-heaven (*Ailanthus altissima*)
- oriental bittersweet (*Celastrus orbiculatus*)
- wine raspberry (*Rubus phoenicolasius*)
- multiflora rose (*Rosa multiflora*)
- sericea lespedeza (*Lespedeza cuneata*)
- common burdock (*Arctium minus*)
- Japanese barberry (*Berberis thunbergii*)
- common mullein (*Verbascum thapsus*)
- black locust (*Robinia pseudoacacia*)
- garlic mustard (*Alliaria petiolata*)

While the Black locust is a native species, it is considered invasive in Virginia and on the Mid-Atlantic Exotic Pest Plant Council list and the Virginia Department of Conservation and Recreation's *Invasive Alien Plant Species of Virginia*. On the other hand, catnip (*Nepeta cataria*) is not listed in Virginia or on the Mid-Atlantic Exotic Pest Plant Council list; however, it is listed as exotic in Maryland. Catnip is quite aggressive and should be considered a noxious and invasive species on the

corridor. Likewise, the coralberry (*Symphoricarpos orbiculatus*) is not shown on the list for any mid-Atlantic state, but it is known to be aggressive on some exposed outcrop areas.

No invasive species were found in the area west of Skyline Drive or immediately surrounding the Appalachian Trail. Patches of spotted knapweed, oriental bittersweet, Japanese honeysuckle, tree-of-heaven, princess tree, coralberry, and wineberry occupied a portion of the corridor east of the Appalachian Trail and near Calf Mountain Road. The Appalachian Trail parcel to the east contained more invasive species, including patches of tree-of-heaven, princess tree, spiny plumeless thistle, oriental bittersweet, spotted knapweed, sericea lespedeza, Japanese honeysuckle, wine raspberry, multiflora rose, and coralberry. In addition, patches of dead garlic mustard were identified within and adjacent to the corridor. Garlic mustard is an aggressive biennial and requires ongoing monitoring to control its spread. Overall, the invasive nonnative plants were not dominant in the corridor. Invasive nonnative species were not found within Shenandoah National Park; however, numerous patches were found on the tract 444Appalachian National Scenic Trail parcel (appendix G).

Wildlife

Shenandoah National Park and the Appalachian National Scenic Trail contain a variety of different mammals, birds, and reptile and amphibian species. Forty-nine species of mammals are known to live in the parks, although 10 other species have been documented in surrounding counties (NPS 2012b). There are no federally listed threatened and endangered wildlife known in this portion of the parks.

Diversity in the patchwork of low-growing trees and herbaceous plants in the corridor creates a suitable habitat for several species, specifically white-tailed deer, eastern cottontail, saw-whet owl (*Aegolius acadicus*), Blackburnian warbler (*Dendroica fusca*), red fox, black bear, field mice (*Microtus pennsylvanicus*), and many species of song and nesting birds.

Forty-one species of neotropical migratory birds, which include ground-nesting species, are known to visit the Shenandoah National Park annually (NPS 2012b). Nesting birds that typically reside in the corridor include wild turkey (*Meleagris gallopavo*), eastern meadowlark (*Sturnella magna*), American kestrel (*Falco sparverius*), field sparrow (*Spizella pusilla*), grasshopper sparrow (*Ammodramus savannarum*), northern bobwhite quail (*Colinus virginianus*), indigo bunting (*Passerina cyanea*), American goldfinch (*Spinus tristis*), song sparrow (*Melospiza melodia*), brown-headed cowbird (*Molothrus ater*), and the fox sparrow (*Passerella iliaca*) (Shenandoah National Park, Gubler, pers. comm. 2013). Many of the ground-nesting species are known to nest in the corridor between late April and early June. Other bird species that use the corridor for hunting include broadwing hawk (*Buteo platypterus*), northern harrier (*Circus cyaneus*), and red-tailed hawk (*Buteo jamaicensis*) (Shenandoah National Park, Gubler, pers. comm. 2013).

No federally listed bird species are found in this region of the parks; however, there are two state listed bird species: peregrine falcon (*Falco peregrinus*) and bald eagle (*Haliaeetus leucocephalus*). Bald eagles and peregrine falcons are observed in Shenandoah National Park, but there are no known

nests or major waterways or cliffs are found in the corridor; therefore, it is very unlikely that these species would be expected to be near the corridor on national park system lands.

Numerous species of reptiles and amphibians potentially may use the corridor, including rat snakes (*Elaphe obsoleta*), box turtles (*Terrapene carolina*), eastern fence lizards (*Sceloporus undulatus*), red-backed salamanders (*Plethodon cinereus*), and American toads (*Bufo americanus*). No population effects are anticipated, but individual reptiles or amphibians may be directly and indirectly affected by the project

Environmental Consequences

Methodology and Assumptions

Potential impacts were assessed based on the extent of disturbance to biotic communities (vegetation, wildlife, and wildlife habitat) within the corridor. This analysis focuses on general vegetation, wildlife, and habitat, including known sensitive species, and incorporates the best available research related to the construction and operation of transmission facilities and their impacts on these communities.

Data used in the analysis were collected from available literature and park staff. In addition, site surveys were completed in July 2012 to search for invasive and sensitive species and general habitat (appendix G). Analysis of potential impacts on vegetation and wildlife was based on the potential for species that occur within the corridor.

Study Area

The geographic study area for biotic communities is the boundary of the existing corridor across national park system lands, including Skyline Drive and the Appalachian Trail, including the access roads and tower foundations. Construction would not occur outside the corridor on national park system lands.

Impact Definitions

Negligible: There would be no observable or measurable impacts on native species populations, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.

Minor: Impacts on native species populations, their habitats, or the natural processes sustaining them would be detectable. Occasional responses to disturbance by some individuals could be expected. Small changes to local population numbers, population structure, and other demographic factors might occur. Sufficient habitat in the parks would remain functional to maintain the viability of the species in the parks.

Moderate: Impacts on native species populations, their habitats, or the natural processes sustaining them would be detectable. Frequent responses to disturbance by some individuals could be expected. Some impacts might occur in key characteristics of habitat in the parks. However, sufficient population numbers or habitat in the parks would remain functional to maintain the viability of the species in the parks.

Major: Impacts on native species populations, their habitats, or the natural processes sustaining them would be detectable and permanent. Frequent responses to disturbance by some individuals would be expected. Local population numbers, population structure, and other demographic factors might experience large declines.

Duration: Short-term impacts would occur during construction and last less than one year. Long-term impacts would last more than one year.

Alternative 1: No Action

Analysis—Under alternative 1, the upgrade of the Dooms – Bremo line would not occur. Vegetation in the corridor would continue to be an early successional plant community that provides habitat for white-tailed deer, eastern cottontail, fox, black bear, mice, and many species of song birds. Overall, populations of these species that currently live in and around the corridor would continue to exist under this alternative.

Maintenance and operation of vegetation in the corridor would continue to occur. Dominion would keep the corridor clear of all trees and tall-growing vegetation that could affect the reliability of the transmission lines. Maintenance activities include field inspections every year; selective removal of danger trees immediately adjacent to the corridor, as needed every three years; and spot treatment with herbicides approved by the U.S. Environmental Protection Agency and National Park Service (on national park system lands), as needed, every six years. However, because many species within the corridor have the potential to grow more than 10 feet, large portions of the corridor are often mowed. Temporary disturbance could occur to wildlife in the area during maintenance activities because noise and human presence would deter wildlife from using this area. These activities would be infrequent and of short duration, and wildlife would be expected to return to the corridor after completion of the maintenance activity.

Activities that establish or maintain a right-of-way corridor increase the potential transfer of invasive species from one location to another. Recent field surveys have shown nondominant patches of 14 invasive nonnative botanical species in the corridor (appendix G). Under alternative 1, current maintenance activities would continue as previously conducted; therefore, the current level of invasive botanical species in the corridor would be expected to remain.

Conclusion—Under the no-action alternative, current maintenance activities would continue. These include the treatment, mowing, and/or removal of trees and tall-growing vegetation within the corridor, resulting in continued long-term minor adverse impacts to vegetation. There would be no

new impacts on biotic communities under the no-action alternative; however, short-term minor adverse impacts would occur due to ongoing maintenance activities.

Alternative 2: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor

Analysis—Under alternative 2, the existing Dooms – Brems line would be replaced within the existing corridor. No additional tree clearing within the park would occur, and no danger trees would be removed because the Dooms – Brems line is located in the middle of the corridor. Similar to impacts described under soils, construction would require removing existing towers (allowing vegetation to be reclaimed) and construction of new towers, resulting in a small, but permanent, loss of vegetation at the base of each new foundation. A total of five H-frame towers, with two foundations each, would be removed and replaced with four towers each with one foundation. The net gain of vegetation from the removal and construction of towers on national park system lands would be 11 square feet or 0.00025 acre, resulting in a long-term slight beneficial impact to vegetation.

Under alternative 2, access to tower 39/336 (proposed tower 2139/131) would be from the corridor west of Skyline Drive. The limits of disturbance for this access alternative alone would be approximately 0.49 acre on national park system land (and an additional 3.15 acres off NPS property) and require the removal of vegetation for earth-moving activities (figure 8). The two other existing two-track access roads would be enhanced to accommodate heavy equipment, which would result in a minimal amount of temporary vegetation loss (approximately 2.5 acres) (figures 6 and 7). Intermediate seeding events would occur throughout active construction to promote soil stabilization in disturbed areas. During intermediate seeding events, a seed mix, including species such as winter wheat or barley, would be used to address temporary stabilization issues and adhere to erosion and sediment control measures. Impacts to vegetation would be short term and minor adverse because of the temporary removal of vegetation in the limits of disturbance.

Construction activities would create a temporary noise disturbance, sometimes with noises up to 85 A-weighted decibels (dBA) at the source (see “Soundscapes” section) and bring an increased human presence, which would result in a temporary short-term minor displacement of wildlife. In particular, many bird species nest in the corridor between late April and early June. Dominion would coordinate with the National Park Service to try to reduce or avoid clearing during the time birds are typically nesting. Once construction is completed and reclamation of the site has occurred, wildlife species are expected to resume using the habitat in the corridor. Overall, impacts on vegetation and wildlife during construction would be short term and minor to moderate due to the temporary removal of vegetation and displacement of wildlife.

Once construction activities are complete, the limits of disturbance would be reclaimed by re-contouring the slope west of Skyline Drive within the corridor and replanting the corridor with NPS-approved plant material, per the VMP. Native vegetation and seed mixes would be used to restore vegetation removed by construction activities. Additionally, native woody vegetation would be planted to screen both sides of the Appalachian Trail and along the western border of Skyline

Drive. Island clusters of native woody vegetation would be planted within the corridor west of Skyline Drive to promote natural vegetation growth in a highly visible area. The VMP requires the use of naturally low-growing species so that the maximum height of the vegetation would be maintained at 10 feet to avoid any reliability issues with the transmission line. In the VMP, short-term, post-construction monitoring would focus on watering needs, installing and maintaining deer fencing around the shrub plantings, assessing the health of plants and replacing as necessary, and removing/controlling any invasive botanical species.

The VMP would include the treatment of newly established and existing invasive species, and long-term management methods. As mentioned under alternative 1, recent field surveys have shown nondominant patches of 14 invasive nonnative species in the corridor (appendix G). The VMP identifies methods that would be taken pre-construction and post-construction to reduce the presence of invasive species within the corridor. Construction operations would be monitored and washdown stations would be used to reduce the spread of current invasive species during construction and to minimize post-construction establishment. The VMP would identify the most effective treatment methods at each step of pre-construction, during construction, and post-construction, and would include methods to treat, control, and set goals to prevent invasive species from populating the corridor. Because it is unlikely that invasive species could be completely eradicated from the corridor, long-term negligible to minor impacts would occur from the presence of invasive botanical species in the corridor.

Long-term maintenance of the VMP would focus on maintaining natural and self-sustaining low-growing vegetation in the corridor. However, through natural succession, seedlings from the adjacent forested area may establish along the edges or within the corridor. To prevent these species from maturing to a height that could come too close to the conductor wire zone, crews would remove seedlings and saplings at each long-term monitoring event (every three to five years) through treatment as described in the VMP. Occasionally, danger trees adjacent to the corridor may need to be removed to maintain the reliability of the transmission lines; these trees would be removed per specifications and requirements included in the VMP. It is expected that implementation of the VMP would reduce or eliminate the need to mow or spray herbicides on large portions of the corridor. Overall, the VMP was developed to identify suggested practices that would improve both the short- and long-term condition of the vegetation in the corridor, resulting in long-term beneficial impacts to vegetation from the control of invasive species and establishment of a natural low-growing community.

Under existing conditions, there are no documented avian collision problems. Under alternative 2, new tower construction would increase the height of the transmission line; however, the rebuilt towers would not be taller than the existing double-circuit 230-kV towers immediately adjacent to the proposed 230-kV transmission line. With no current collision problems in the parks and the adjacent taller towers, the probability of impacts to avian species would be low with the construction of the new towers, and impacts are expected to be negligible.

Conclusion—Under alternative 2, vegetation clearing and temporary displacement of wildlife would occur during construction or reestablishment of access roads and construction pads and result in short-term minor adverse impacts on biotic communities. The permanent net gain of vegetation at

tower locations would result in slight beneficial impacts on biotic communities. After construction, vegetation would be reestablished within the corridor per the VMP, which includes establishing a low-growing sustainable plant community, planting vegetation screening, and proper long-term management of invasive species. Maintenance activities would have long-term minor direct adverse impacts to biotic communities from the selective treatment of potentially tall-growing species and the occasional removal of danger trees, as necessary. Nevertheless, long-term beneficial impacts would be expected from the implementation of the VMP, resulting in the overall reduction or stabilization of invasive species and the establishment of a sustainable low-growing plant community.

Alternative 3: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access from Skyline Drive

Analysis—Under Alternative 3, Skyline Drive would be used to access existing tower 39/324 (proposed tower 2139/123). The total limits of disturbance under alternative 3 would be 2.8 acres as shown on figures 6, 7, and 9. Permanent loss of vegetation from the construction of four new monopole towers would be the same as described under alternative 2 and the net gain of vegetation from the removal and construction of towers on national park system lands would be 11 square feet or 0.00025 acre, resulting in slight beneficial impacts to vegetation.

As described under alternative 2, the two existing two-track access roads would be enhanced to accommodate heavy equipment, which would result in minimal temporary vegetation loss (approximately 2.5 acres). Temporary access off Skyline Drive on national park system land would be approximately 220 feet and would include 0.36 acre of vegetation removal. Wildlife would be temporarily displaced during construction and within the corridor. The proximity of the access road to Skyline Drive would minimize impacts to wildlife because wildlife in the area is currently disrupted or displaced by vehicle traffic and Skyline Drive. As a result, impacts to vegetation and wildlife during construction would be short term and negligible to minor.

As described under alternative 2, intermediate seeding events would occur throughout active construction to promote soil stabilization in disturbed areas. The VMP would be implemented under alternative 3, and other impacts to biotic communities would be the same as those described above for alternative 2.

Conclusion—Under alternative 3, the gain of vegetation from the removal and construction of towers on national park system lands would result in slight beneficial impacts to biotic communities. Disturbance to biotic communities from construction activities, including ground disturbance and noise, would have short-term negligible to minor adverse impacts. After construction, vegetation in the corridor would be reclaimed, as described under alternative 2, resulting in long-term minor adverse impacts from the selective treatment of potentially tall-growing species and the occasional removal of danger trees, as necessary. Nevertheless, long-term beneficial impacts would be expected from the implementation of the VMP, resulting in an overall reduction of invasive species and establishment of a sustainable low-growing plant community.

VISITOR USE AND EXPERIENCE

Affected Environment

Shenandoah National Park

Shenandoah National Park receives approximately 1.2 million recreational visits per year (NPS 2013a). Most visitors to the park come during May through November (NPS 2013b) with the majority arriving by vehicle. Figure 10 displays the monthly visitation for 2012, showing an obvious peak in visitor use during October. Visitors can enter the linear park at Front Royal, Thornton Gap, Swift Run Gap, and Rockfish Gap. There are two visitor centers, four campgrounds, and seven picnic areas. Delaware North manages three lodging facilities, five food service outlets, one service station, and six merchandise outlets. Approximately 516 miles of trails are in the park, including 101 miles of the Appalachian Trail and 200 miles of designated horse trails (NPS 2013c).

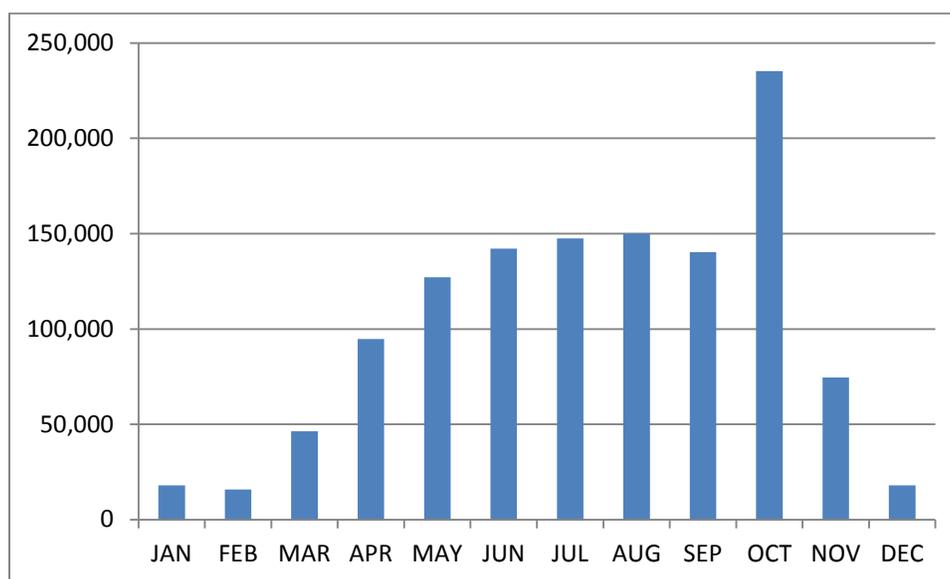


FIGURE 10: 2012 VISITATION—SHENANDOAH NATIONAL PARK

Many visitors experience the park from their vehicles by driving along Skyline Drive. Some of the most popular out-of-the-car activities are hiking, picnicking, camping in developed campgrounds or in the backcountry, participating in ranger-guided activities, viewing audio-visual programs or exhibits at visitor centers, fishing, enjoying the panoramic views from overlooks, or just relaxing in the peaceful surroundings. Other opportunities include auto-touring, backpacking, biking, bird watching, climbing, horseback riding, stargazing, and wildlife viewing. The closest access point to the corridor is Rockfish Gap, approximately 8 miles south of the corridor. The corridor contains hiking trails, including the Appalachian Trail, as well as a small portion of Skyline Drive. There are no scenic overlook pull-offs at this crossing; however, removal of tall-growing vegetation for the establishment of the corridor creates wide views of the adjacent valley. The three existing transmission lines within the corridor are clearly visible in the opening.

Appalachian National Scenic Trail

Based on the Appalachian National Scenic Trail Pilot Survey, the Appalachian National Scenic Trail has an estimated 1.95 million visitors per year. This estimate is based on a survey conducted for one year along the entire 2,178 miles of the Trail (Zarnoch et al. 2011). The Appalachian Trail's natural and remote landscape attracts the attention of large numbers of visitors. The Appalachian Trail offers 280 shelter sites and 44 designated overnight-use areas, as well as approximately 4,000 undesignated (visitor-created) campsites. This allows visitors to enjoy the Appalachian Trail for a variety of purposes, including quick day trips to multiday or multiweek journeys along longer stretches. The Appalachian Trail is open year-round to anyone who wishes to hike; however, peak usage time varies seasonally with the lowest level occurring in the winter.

In the corridor, the Appalachian Trail parallels Skyline Drive on top of a steep embankment to the east of the roadway (figure 11). Duration of visits to this section of the Appalachian Trail varies; visitors may use the Appalachian Trail for brief day trips or for extended trips covering hundreds of miles and crossing many state borders. Most visitors explore the Appalachian National Scenic Trail for recreational uses, and the peak months of public access on this section are from mid-May to mid-July. These people seek experiences such as fishing, hiking, jogging, nature study, picnicking, backpacking, and camping. The Appalachian Trail Conservancy is working to expand the 2011 Visitor Count Survey pilot project to gain more detailed visitor use data for the Appalachian Trail. However, this study was only conducted between Harpers Ferry, West Virginia, and Carlisle, Pennsylvania; the corridor vicinity was not included. Therefore, no specific visitor use data are available for this portion of the Appalachian Trail (Appalachian National Scenic Trail, Sickley, pers. comm. 2009).



FIGURE 11: VIEW FROM THE APPALACHIAN TRAIL TOWARD SKYLINE DRIVE (FACING WEST)

The portion of the Appalachian Trail that would be crossed by the corridor is located approximately 8 miles north of the Rockfish Gap entrance to Shenandoah National Park. No formal camping areas are located within 15 miles of the corridor; however, backcountry camping is permitted and could occur near the corridor. The nearest camp area is Loft Mountain campground at mile 79.5 of Skyline Drive, about 22 miles north of the corridor crossing. Calf Mountain Shelter along the Appalachian Trail is also located in the vicinity of the project (access is from Jarman Gap at milepost number 97) and consists of a three-sided stone structure, which is available for overnight use by backpackers or hikers. With the exception of two scenic overlooks about 1 mile on either side of the corridor, there are no visitor amenities in the corridor.

Environmental Consequences

Methodology and Assumptions

Impacts to visitor use and experience were determined by considering the effect of the existing conditions and the proposed construction/operation of the transmission lines on the overall experience of those park visitors and Appalachian Trail users. Additionally, if access road construction begins in the summer of 2014, all construction, including energizing the lines, would be expected to be completed by the fall of 2014 on national park system lands.

Study Area

The geographic study area for visitor use and experience is the Appalachian Trail footpath within the corridor and areas in the vicinity on both sides of the corridor, as well as the portion of Skyline Drive in the corridor.

Impact Definitions

- Negligible:* Visitors would likely be unaware of impacts associated with implementation of the alternative. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.
- Minor:* Changes in visitor use and/or experience would be slight and detectable but would not appreciably limit or enhance critical characteristics of the visitor experience. Visitor satisfaction would remain stable.
- Moderate:* Few critical characteristics of the desired visitor experience would change. The number of participants engaging in a specified activity would be altered. Some visitors who desire their continued use and enjoyment of the activity/visitor experience might be required to pursue their choices in other available local or regional areas. Visitor satisfaction would begin to decline.
- Major:* Multiple critical characteristics of the desired visitor experience would change, and/or the number of participants engaging in an activity would be greatly reduced or increased. Visitors who desire their continued use and enjoyment of the activity/visitor experience would be required to pursue their choices in

other available local or regional areas. Visitor satisfaction would markedly decline.

Duration: Short-term impacts would be immediate, occurring during construction. Long-term impacts would persist after construction.

Alternative 1: No Action

Analysis—Under alternative 1, the existing Dooms - Breomo line would continue to operate in the corridor. Visitors would continue to use the Appalachian Trail for camping and hiking, and visitors would continue to view the corridor from Skyline Drive. The 65- to 75-foot-tall wooden H-frame towers would remain in place and would be seen by visitors who are walking on the footpath or driving on Skyline Drive. Current visitor trends would continue.

Visitors hiking or recreating in this area would continue to be aware of the presence of transmission towers, but they would not appreciably limit the critical characteristics of the visitor experience or visitor use of the property because visitors pass under the transmission lines quickly and because there is no established pull-off / scenic overlook specifically in this location. Once out from direct exposure to the transmission lines, the infrastructure is not readily visible along Skyline Drive or the Appalachian Trail. Noise from the line is minimal when compared to the adjacent 500-kV line in the same right-of-way and would not appreciably interfere with visitor use or experience during the time spent crossing the corridor (see the “Soundscapes” section). Overall, the continued presence of the Dooms – Breomo line would result in long-term local minor adverse impacts.

Under alternative 1, no construction would occur, and there would be no temporary closures of visitor use areas and no restrictions to visitor access. Maintenance and operation of the facilities in the corridor would continue to occur. Maintenance activities include field inspections every year; selective removal of danger trees immediately adjacent to the edge of the corridor every three years; and spot treatment with herbicides approved by the U.S. Environmental Protection Agency and the National Park Service (on national park system lands), as needed, every six years. However, because many species within the corridor have the potential to grow more than 10 feet, large portions of the corridor are often mowed.

Visitor use could be temporarily disturbed during the short duration of the maintenance activities because construction equipment and noise would be present in the corridor. Maintenance activities may temporarily affect hikers but would not likely affect visitors driving along Skyline Drive. These activities would be infrequent and short term and would not increase the length of time needed for visitors to hike through the affected area. Therefore, impacts on visitor use and experience under alternative 1 would be short term and long term, minor, and adverse.

Conclusion—Implementation of alternative 1 would result in short- and long-term minor adverse impacts on visitor use and experience due to the continued presence of the transmission towers crossing the footpath and associated operational maintenance activities within the corridor.

Alternative 2: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor

Analysis—Under alternative 2, the construction SUP and right-of-way permit for activities related to the upgrade of the Dooms -Bremo line would be issued as described in chapter 2, including removing five existing 65- to 75-foot towers from the corridor and replacing them with four towers ranging from 110 to 115 feet tall in the parks. Upgrade of the towers would follow the construction plan (see appendix A) and elements described in this environmental assessment.

Brightly colored blaze fencing, certified weed-free straw bales, and silt fencing would likely be installed for the duration of the intermittent construction as part of sediment and erosion control and safety measures. These could be visible to Appalachian Trail users and visitors from certain vantage points as they enter the corridor and potentially to visitors traveling along Skyline Drive. Property line flagging and truck traffic during the construction period may be noticeable to visitors as they approach the corridor along the footpath; however, visitors' exposure to the construction area would be transient as they pass through the small cleared area continuing along the Appalachian Trail or along Skyline Drive. Vegetation clearing and grading along the portion of the corridor west of Skyline Drive would be a noticeable change to the existing conditions that visitors experience. This visual impact would be temporary and is described further in the "Scenic Resources" section of this environmental assessment.

During specific construction activities, including pouring concrete, clipping guy wires, and delivery of structure parts, there would be limited lane closures along Skyline Drive. These closures would be no longer than one day at a time and would close only one lane of the roadway. During these periods, traffic could be stopped for up to 15 minutes at a time in any one direction. Public notice would be provided in advance of these activities, and Dominion would make every attempt to avoid any closures on the weekend, especially during peak visitor use times. Additionally, there would likely be brief and infrequent instances when foot traffic along the Appalachian Trail would be suspended for safety reasons, such as when the wire is strung on the new transmission structures. Due to the intermittent lane closures of Skyline Drive during peak visitor use times, impacts to visitor use would be short term, minor to moderate, and adverse.

The equipment needed to perform construction activities would have both visual and noise impacts for the visitor and is addressed in more detail in the "Soundscapes" and "Scenic Resources" sections of this environmental assessment. Impacts on visitor use during construction activities would be short term, localized and minor, and adverse.

Once construction activities are complete, all areas in and around the corridor would be returned to pre-construction conditions, and the taller towers would be in place. Visitors hiking in this area could be aware of the presence of taller transmission towers, but they would not appreciably limit the critical characteristics of the visitor experience or visitor use of the property. The existing corridor also contains two additional transmission lines, and the upgrade would not change the existing conditions for visitor use and experience of the Appalachian Trail or Skyline Drive.

It is not expected that visitors would be substantially affected by the short-term presence of equipment required for maintenance activities, but there would be short-term minor to moderate impacts to visitor use from the temporary lane closures of Skyline Drive during construction. Therefore, impacts on visitor use and experience from maintenance actions would be long term, minor, and adverse once construction is complete and the taller towers are in place.

Conclusion—Implementation of alternative 2 would result in localized short-term minor to moderate adverse impacts on visitors during construction from the limited lane closures of Skyline Drive and the presence of construction equipment and other maintenance materials. Once construction is complete, there would be long-term minor adverse impacts to visitor experience from the taller towers; however, the overall existing characteristics of the corridor for visitor use and experience would not change.

Alternative 3: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access from Skyline Drive

Analysis—Under alternative 3, the construction SUP and right-of-way permit for activities related to the upgrade of the existing transmission line would be issued as described in chapter 2. Similar to alternative 2, the presence and operation of construction equipment would be localized short-term moderate impacts from brightly colored flagging, signage, and equipment. The equipment needed for construction activities would cause both visual and noise impacts to visitors; these impacts are addressed in more detail in the “Soundscapes” and “Scenic Resources” sections of this environmental assessment.

Unlike alternative 2, Skyline Drive would be used to access tower 39/336 (proposed tower 2139/131). As a result, Skyline Drive would be completely shut down two times for up to 6.5 hours each time when the tractor trailer is brought to the construction site (via Rockfish Gap) and when the tractor trailer leaves the site (via Swift Run Gap). Visitors would not be able to enter at Rockfish Gap or drive south from Swift Run Gap during these periods. Once the tractor trailer is brought to the corridor, it would take approximately 1.5-hours to unload and reload the drill rig. It is anticipated that the full Skyline Drive closures associated with the drill rig would occur at night to minimize disruptions to visitor use. Two additional 1.5-hour lane closures would be required when the crane is brought to and from the construction site. During this time, flaggers would halt traffic for up to 15 minutes at a time. All Skyline Drive closures would be posted on the park website to make visitors aware of the potential delays due to construction. Also, visitors on Skyline Drive may notice increased truck traffic on the roadway from smaller trucks bringing materials to and from the construction site (listed in chapter 2). Traffic might be slightly slowed at times as trucks enter and leave the access road off Skyline Drive or when driving uphill. During active construction times, visitors along Skyline Drive would experience short-term moderate adverse impacts because of the two complete closures of Skyline Drive, intermittent lane closures, and potential slow-moving traffic during peak visitor use times.

Unlike alternative 2, there would be less vegetation removal and grading along the corridor west of Skyline Drive. The visual impact of the construction site would be smaller, as described in the “Scenic Resources” section of this environmental assessment.

Similar to alternative 2, once construction activities are complete, all areas in and around the corridor would be returned to pre-construction conditions, and the taller towers would be in place. Visitors hiking in this area could be aware of the presence of taller transmission towers, but these would not appreciably limit the critical characteristics of the visitor experience or visitor use of the property because the existing corridor also contains two additional and taller transmission lines and the upgrade would not change the existing condition of the Appalachian Trail or Skyline Drive. Maintenance activities would occur as described under alternative 2, resulting in long-term minor adverse impacts.

Conclusion—Implementation of alternative 3 would result in localized short-term moderate adverse impacts on visitors during construction from the four temporary closures of Skyline Drive, lane closures, slowed traffic, and presence of construction equipment and other maintenance materials during peak visitor use time. Once construction is complete, there would be long-term minor adverse impacts to visitor use and experience from the taller towers; however, the overall existing characteristics of the corridor for visitor use and experience would not change.

SCENIC RESOURCES

Affected Environment

The existing corridor crosses national park system lands for approximately 3,000 feet and includes three existing overhead transmission lines. This portion of Skyline Drive and the Appalachian Trail are known for the scenic qualities and aesthetic attributes associated with the mountainous landscape and rural communities in the neighboring valley. The viewscape of a given area consists of the landforms, vegetation, water features, and cultural modifications (physical changes caused by human activities) that impart an overall visual impression of the area landscape. The area surrounding the corridor is mountainous with steep changes in topography. Skyline Drive and the Appalachian Trail run mostly along ridge tops and are surrounded by dense vegetation and mature forests with the occasional scenic overlook on Skyline Drive or open area along the Appalachian Trail. The views of the surrounding landscape are limited when driving on Skyline Drive or walking or hiking in this area due to the tall and dense vegetation cover.

A visual resource report was completed as part of this project (see appendix F). As part of the resource report, a viewshed analysis or a zone of visual influence was created, using geographic information system software to identify and map those areas where an observer might be able to see the towers (detailed methodology and model factors are found in appendix F). Taking into consideration where the existing transmission facilities can currently be seen on the landscape and the projected change according to the viewshed, key observation points (KOPs) were identified. KOPs are those locations considered to be visually sensitive to a visitor or viewer of the parks. The National Park Service identified eight KOPs using knowledge of existing conditions and the results of the viewshed analysis. Figure 12 shows the KOPs with the zone of visual influence overlaid. The areas in yellow are the areas from which it is predicted that the rebuilt towers in the parks would be visible, and the light green areas are areas from which the rebuilt towers in the parks would be visible

if there were no intervening forest cover. Table 5 provides a summary of the KOPs and their existing conditions. Further detail, including photographs of each KOP, is provided in appendix F.

Environmental Consequences

Methodology and Assumptions

A viewshed analysis determined where rebuilt towers would be potentially visible. Once potentially visible areas seen from KOPs were identified, a field survey was conducted to determine whether the existing towers were visible and to take photographs to complete photographic simulations to estimate the extent of potential visibility if the Dooms – Bremo transmission line is rebuilt.

Study Area

The geographic study area for scenic resources was limited to the eight KOPs (described below in table 5) because they are considered and determined to be the most visually sensitive and potentially visible areas in this portion of the parks.

Impact Definitions

- Negligible:* Visitors would likely be unaware of impacts associated with implementation of the alternative. There would be no noticeable change to the scenic views and visual resources or in any defined indicators of the scenic landscape.
- Minor:* Changes in scenic views and visual resources would be slight and detectable but would not appreciably limit or enhance critical characteristics of the Appalachian Trail and Skyline Drive. Visitor satisfaction would remain stable.
- Moderate:* Few critical characteristics of the desired scenic views and visual resources would change. The number of participants engaging in a specified activity would be altered. Some visitors who want to continue using and enjoying the Appalachian Trail or Skyline Drive might be required to pursue their choices in other available local or regional areas. Visitor satisfaction would begin to either decline or increase.
- Major:* Multiple critical characteristics of the desired scenic views and visual resources would change and/or the number of participants engaging in an activity would be greatly reduced. Visitors who want to continue using and enjoying the Appalachian Trail or Skyline Drive might be required to pursue their choices in other available local or regional areas. Visitor satisfaction would markedly decline or increase.
- Duration:* Short-term impacts would be immediate, occurring during construction. Long-term impacts would persist after construction.

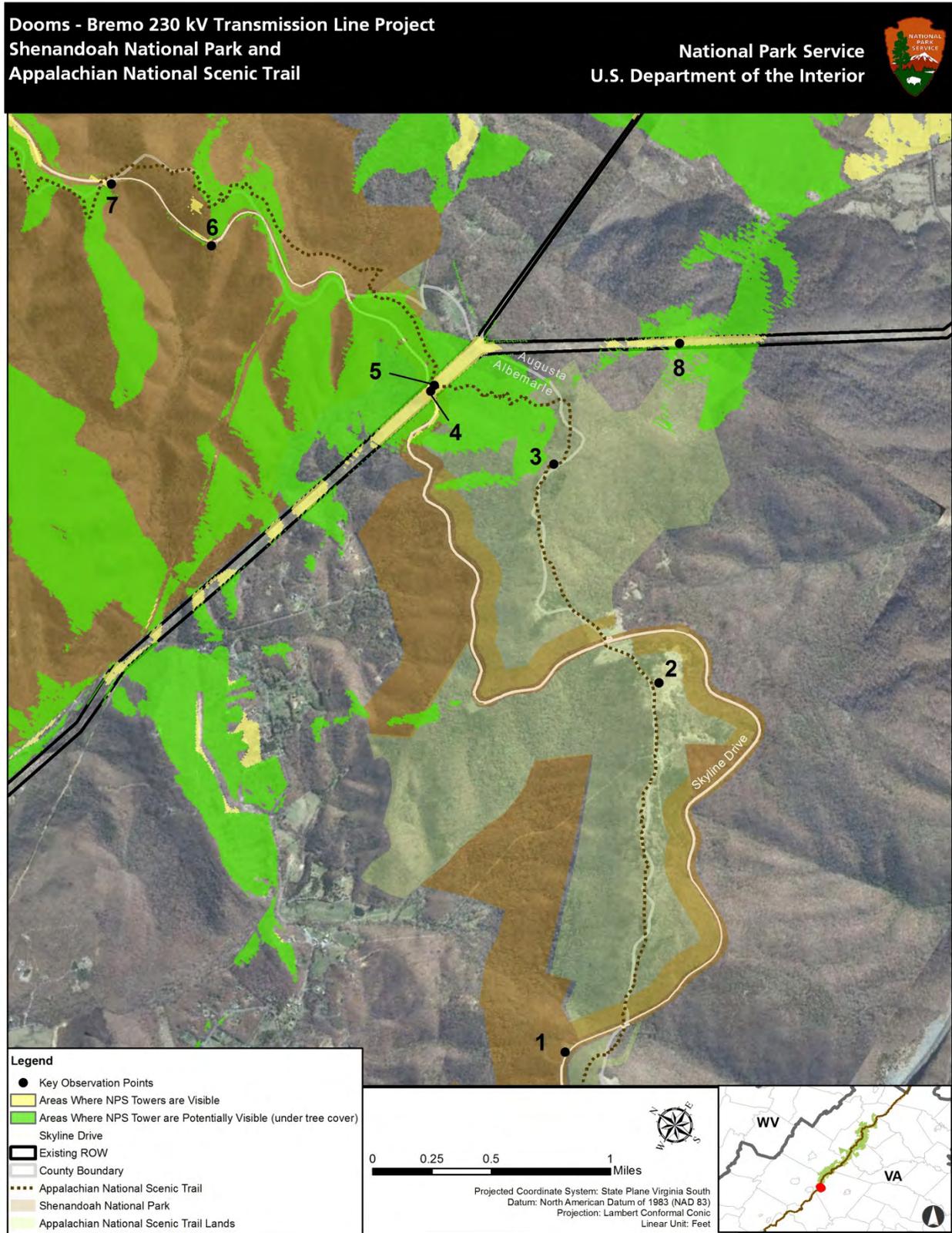


FIGURE 12: KOPS AND VIEWSHED

TABLE 5: SUMMARY OF KOPS

KOP	Description of Landscape
1	McCormick Gap Overlook. Wide views of the landscape are available at this location and include trees and ridges in the foreground, towns and rural development in the valley, and forested mountains occupying the background. The existing transmission right-of-way (including all three transmission lines) is barely visible in the background and between ridges at this location.
2	Calf Mountain. A site visit confirmed that the existing corridor and towers were not visible from this location due to dense vegetation along the Appalachian Trail and immediately adjacent to the small clearing at the top of the mountain.
3	Appalachian Trail. The viewshed indicated that there may be some visibility along the Appalachian Trail at KOP 3; however, the field visit confirmed that the existing transmission lines were not visible from KOP 3 due to dense vegetation surrounding the Appalachian Trail.
4	Skyline Drive. The cleared corridor allows for a broad view of forested ridges down the western slope off Skyline Drive. The existing towers and wires are clearly visible from Skyline Drive; however, they are not readily visible from the approach to the corridor due to the curvature in the road. The existing corridor opening through otherwise forested mountains provides a distinct alteration to an otherwise largely uninterrupted landscape.
5	Appalachian Trail. On the Appalachian Trail and in the corridor, the surrounding area appears open due to the cleared vegetation and the lack of forest canopy. However, the tree canopy is very dense surrounding the Appalachian Trail and the corridor and towers are not readily visible approaching from the north or south. It is not until a viewer is at the edge of the corridor and immediately within the right-of-way that the infrastructure becomes visible. From within the corridor, the lines are very visible, particularly the existing 500-kV structures, given the size and proximity to the Appalachian Trail. The existing 115-kV Doods – Brems line tower is located upslope from the Appalachian Trail and east of the footpath and is not one of the more noticeable towers. The cleared corridor allows for wide views looking down over Skyline Drive, the corridor as it continues west over the mountain, and the surrounding forested ridgelines.
6	Sawmill Overlook. The designated overlooks offer broad views of several forested ridgelines in the foreground, middle ground, and background. The existing transmission line is located between the ridge in the foreground and the middle ground, greatly limiting views of the existing transmission lines. Some of the existing lattice towers on the 230-kV or 500-kV transmission line are slightly visible from the overpass, but only detectable if a viewer were actively looking for the towers on the landscape.
7	Sawmill Overlook. This KOP offered a similar landscape as described under KOP 6.
8	Eastern Appalachian Trail Parcel. The view from this parcel includes a heavily forested mountainous landscape with views of the rural valley in the distance, only visible due to the current right-of-way clearing activities. This portion of the park is considered a seldom seen area, does not have any recreation, and is highly unlikely to have any visitors who would see the Doods - Brems line from this location.

Alternative 1: No Action

Analysis—Under alternative 1, no construction activities would occur, and the existing Dooms – Bremo line would continue to operate in the existing corridor. The 65- to 75-foot-tall wooden H-frame towers would remain in place and continue to be seen by visitors driving on Skyline Drive and walking the Appalachian Trail and from KOPs 4 and 5. The maintained low-growth vegetation would continue to fragment the naturally forested area surrounding Skyline Drive and the Appalachian Trail. The existing towers were constructed almost 60 years ago and have since become a part of the existing landscape. The current impacts are negligible to minor; however, no further permanent impacts on scenic resources would occur under alternative 1.

Under alternative 1, existing transmission facilities would continue to operate, and no construction related to the rebuilding of the transmission line would occur; however, regular maintenance of the facilities and corridor would continue. Current maintenance activities include field inspections every three years; selective removal of danger trees immediately adjacent to the corridor every three years; and spot treatment with herbicides approved by the U.S. Environmental Protection Agency and the National Park Service (on national park system lands), as needed, every six years. However, because many species within the corridor have the potential to grow more than 10 feet, large portions of the corridor are often mowed. After each maintenance event, the trimmed vegetation allows for wider views of the landscape, looking west toward Skyline Drive and at the valley. Due to the steep slope west of Skyline Drive, vegetation does not grow tall enough to block views of the ridges and valley.

Temporary disturbances during maintenance activities would affect scenic resources by cutting vegetation screening, but only in areas where Skyline Drive and the Appalachian Trail are in the corridor. These activities would be infrequent and of short duration, and it is expected that it would not take visitors long to cross through the area. Short- and long-term minor adverse impacts would occur under alternative 1.

Conclusion—Alternative 1 would result in continued long-term negligible to minor adverse impacts on scenic resources due to the presence of the transmission towers crossing Skyline Drive and the Appalachian Trail. Short-term minor adverse impacts to visual resources would occur from operational and maintenance activities. There would be no further impacts on scenic resources under alternative 1.

Alternative 2: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor

Analysis—Under alternative 2, the construction SUP and right-of-way permit for construction activities related to the upgrade of the existing transmission line would be issued as described in chapter 2. This would include removing five existing 65- to 75-foot towers from the corridor and replacing them with four steel monopole towers ranging from 110 to 115 feet in height.

Photographic simulations were completed for the above-described KOPs and are presented in the visual resource report (appendix F). The simulations demonstrate that views of the rebuilt

transmission line from the KOPs would be very limited with the exception of the area directly within the corridor. Views from the Sawmill Run and the McCormick Gap overlooks have very limited views of the towers as a result of intervening topography and tree cover. Furthermore, the views from those locations are currently affected by the existing 500-kV and 230-kV towers, which are taller than or comparable to the rebuilt Dooms – Bremono line towers.

The area of highest visibility is from directly within the corridor. The current corridor crosses Skyline Drive and the Appalachian Trail at a perpendicular angle, limiting extended views of the Dooms - Bremono line. Travelers on Skyline Drive and hikers on the Appalachian Trail would likely see the Dooms -Bremono line within the corridor only transiently when immediately approaching and directly within the corridor. Exposures to the Dooms -Bremono line would not occur for long periods or for long distances. It would take a driver less than 10 seconds to drive and a hiker approximately 5 to 10 minutes, depending on walking speeds, to move through the affected area. The rebuilt steel monopoles would be more visible and taller than the currently existing wooden monopole towers; however, given that the adjacent 500-kV and 230-kV lattice towers are of similar height or taller than the proposed rebuilt towers, the use of weathering, self-rusting steel monopoles, and the current low scenic integrity, the scenic resources would not be measurably changed. Given the brief period of exposure and the presence of existing infrastructure, visual impacts are expected to be long term and minor.

Under alternative 2, construction activities would include marking park boundaries or sensitive resources with brightly colored flagging and/or stakes, cutting vegetation, creating access roads, installing foundations for the new lines, removing the towers, and erecting the new lines; all of these activities would occur temporarily during construction. The construction of the access road from the western side of Skyline Drive would result in a large amount of grading, visibly changing the appearance of the slope, during construction and restoration activities. During construction activities, the access road and construction equipment stored in the corridor would be clearly visible from Skyline Drive and from the Appalachian Trail. Construction activities would occur in phases, so the level of activity would change depending on the stage of construction; however, equipment and other material would still be present and visible in the corridor in times of lower activity. The presence of construction equipment, personnel, and brightly colored markings or signs during construction activities would result in short-term minor to moderate adverse visual impacts on drivers or hikers in this area.

Under alternative 2, the VMP would be implemented. The VMP would include planting vegetative screening along Skyline Drive and on either side of the Appalachian Trail. Additionally, long-term goals of the VMP include establishment of self-maintaining and low-growing vegetation in the corridor, reducing the need to mow large portions of the corridor. Reduced mowing and establishment of vegetative screening would have long-term beneficial impacts on scenic resources.

Conclusion—Implementation of alternative 2 would result in short-term minor to moderate adverse impacts during construction activities due to the construction of the access road west of Skyline Drive, the presence of brightly colored construction fencing, and the presence of machinery and equipment. Although there would be few places where park users would be able to see the taller towers, an increase in tower height would slightly increase tower visibility, resulting in continued

long-term minor impacts on scenic resources. Also, there would be long-term beneficial impacts to scenic resources from implementation of the VMP, which would reduce the amount of mowing within the corridor and include the establishment of vegetative screening along Skyline Drive and the Appalachian Trail.

Alternative 3: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access from Skyline Drive

Analysis—Under alternative 3, the construction SUP and right-of-way permit for activities related to the upgrade of the existing transmission line would be issued as described in chapter 2. Under alternative 3, access to tower 39/336 (proposed tower 2139/131) would be from Skyline Drive. Impacts to scenic resources during construction would be similar to those impacts described under alternative 2; however, construction of the access road directly off Skyline Drive would result in increased visibility of construction equipment from Skyline Drive and greater temporary impacts to scenic resources due to the proximity of construction activity to the roadway. Construction activities would be similar to those described above under alternative 2 and would result in short-term moderate adverse impacts on scenic resources within the corridor.

Impacts associated with the taller towers and routine maintenance activities would be the same as described under alternative 2 and would result in long-term minor impacts from the taller towers and long-term beneficial impacts from the reduction in maintenance activities.

Conclusion—Implementation of alternative 3 would result in short-term moderate adverse impacts during construction activities due to the construction of the access road off Skyline Drive, the presence of brightly colored construction fencing, and the presence of machinery and equipment. Although there would be few places where park users would be able to see the taller towers, an increase in tower height would slightly increase tower visibility, resulting in continued long-term minor impacts on scenic resources. Also, there would be long-term beneficial impacts to scenic resources from implementation of the VMP, which would reduce the amount of mowing within the corridor and include the establishment of vegetative screening along Skyline Drive and the Appalachian Trail.

SOUNDSCAPES

Affected Environment

According to the National Park Service, the acoustical environment is the combination of all the acoustic resources in a given area including natural, cultural, and historic sounds. A soundscape is defined as the human perception of these acoustic resources (NPS 2013d). Specifically, a park's natural soundscape is composed of all the natural sounds that occur in that park, including the physical capacity for transmitting those natural sounds and the interrelationships among the park's natural sounds of different frequencies and volumes (NPS 2006). In Shenandoah National Park and on the Appalachian National Scenic Trail, natural sounds may range from wildlife calls, bird songs, and insect chirps to sounds produced by physical processes such as thunder, running water, or wind

in the trees. Additional sounds present in and around the corridor include noise from local residential homes, as well as road traffic on Skyline Drive. One of the homes is located approximately 0.12 mile east of tower 39/334, and several other homes are located in a 0.25-mile radius to the east and northeast of tower 39/334.

Because there are up to three existing transmission lines in the corridor, noise from operation of the transmission lines, known as corona, exists. The corona can typically be heard as a crackling or hissing. During relatively dry conditions, there can be a continuous noise level of 40 to 50 dBA in proximity to and directly under the transmission lines. Currently, the most audible corona is associated with the 500-kV transmission line in the portion of the corridor across the Appalachian Trail and Skyline Drive; the corona from the existing 115-kV line was not audible at the time of the site visit. During extremely humid conditions or when it is raining, the corona can be higher, closer to 50 to 60 dBA (CPUC 2009). In addition, Aeolian noise can result from wind blowing through the conductors and/or towers. Aeolian noise depends on wind velocity and direction, and if the wind blows steadily in a perpendicular direction to the lines, it can cause Aeolian vibration (CPUC 2009).

Without the corona or Aeolian noise, noise levels in the project vicinity would be expected to have the noise equivalent of a quiet rural area at night (32 to 35 dBA). For comparison, table 6 lists common sounds and their associated levels.

TABLE 6: COMMON SOUNDS AND THEIR ASSOCIATED NOISE LEVELS

Source	Level (dBA)
Normal breathing	10
Rustling leaves	20
Whisper	20–30
Quiet rural area at night	32–35
Ambient noise in an average home	50
Pickup truck	55
Normal conversation at 3 feet	60–65
Vacuum cleaner	60–82
Freeway traffic at 165 feet	70
Garbage disposal at 3 feet	80
Chain Saw	85
Rock concert	90–115
Jet flyover at 1,000 feet	110

Source: CPUC 2009

Transmission line maintenance occurs at various times throughout the year for selective repair of damaged transmission lines or corridor clearing. Routine inspection, maintenance, and repair of the transmission lines are accomplished by vehicular access from the existing access roads in the

corridor. Maintenance and inspection typically involves equipment such as trucks and chainsaws, which produce sounds at the levels detailed in table 7.

TABLE 7: COMMON CONSTRUCTION SOUNDS AND THEIR ASSOCIATED NOISE LEVELS

Source	Level (dBA) at 50 feet
Backhoe	80
Chain saw	85
Dump truck	84
Tractor	84
Crane	85
Generator	82
Front-end loader	80
Jackhammer	85
Pickup truck	55
Rock drill	85

Source: FHWA 2013

Sensitive receptors are areas that would be more sensitive to changes in noise. In the vicinity of the corridor, sensitive receptors include nearby residences in a 0.25-mile radius from tower 39/334 and the wilderness area located approximately 2.2 miles west of the corridor and along the right-of-way.

Environmental Consequences

Methodology and Assumptions

The purpose of this impact analysis is to assess the effects of the alternatives on the ambient noise level in the areas that would be affected by the proposed action, including the construction of access roads. To determine impacts, the current ambient noise level of the area was considered, and the potential effects of the proposed construction and installation on the level were analyzed. Beneficial noise impacts would reduce decibel levels, whereas adverse impacts would increase levels. For this analysis, the intensity of noise impacts is based on the degree of predicted change in sound levels from baseline conditions. The area for analysis is defined as 6,400 feet from any construction activity and is the distance at which construction noise is expected to decrease to about the approximate background level. This distance was calculated assuming an average construction noise level of 85 dBA (average calculated from table 7) and a noise level decrease of approximately 7.5 dBA for every doubling of distance from the noise source with an intervening soft surface such as vegetation (CDOT 1998). Therefore, at 6,400 feet, it is assumed that a construction noise of 85 dBA at the source would attenuate to 32.5 dBA, which is in the 32 to 35 dBA range expected in the corridor. Changes of 5 dBA are readily noticeable. A 10-dBA increase of noise levels is judged by most people as a doubling of sound loudness (CDOT 1998).

Study Area

The geographic study area for soundscapes includes the existing corridor (including transmission lines) and areas along Skyline Drive, the Appalachian Trail and property, and adjacent wilderness areas in the Shenandoah National Park, and west of Skyline Drive, where construction noise could be heard above rural background noise levels (approximately 6,400 feet). For this analysis, the affected area would mainly be the accessible parts of the corridor, as well as surrounding sensitive receptors, including nearby wilderness areas and residences.

Impact Definitions

- Negligible:* The change in sound levels would not be perceptible and would have no discernible effect.
- Minor:* The change in sound levels would be slightly detectable but would not be expected to have an overall effect.
- Moderate:* The change in sound levels would be clearly detectable and could have an appreciable effect.
- Major:* The change in sound levels would have a substantial, highly noticeable effect.
- Duration:* Short-term impacts would occur during construction and last less than one year. Long-term impacts would last more than one year.

Alternative 1: No Action

Analysis—The no-action alternative represents a continuation of the existing operations and maintenance of the Dooms - Breomo line in accordance with the existing right-of-way permit and easements. No additional upgrades would be constructed, and no major construction and subsequent noise activity would occur. Corona and Aeolian noise emitted by the transmission lines would continue to occur and be heard as a crackling or hissing when standing directly under or immediately adjacent to the transmission lines within the corridor. During dry conditions, the corona level could range from 40 to 50 dBA in proximity to the transmission lines within the corridor, and during humid conditions or precipitation, noise would reach closer to 50 to 60 dBA (CPUC 2009). As a result of this continuous corona, there would be long-term negligible adverse impacts on soundscapes.

Under the no-action alternative, maintenance and operation of the facilities would continue, including routine inspections and corridor clearing. This activity could potentially result in a temporary noise disturbance but would be limited to the period when maintenance activity takes place, resulting in short-term minor adverse impacts on soundscapes.

Conclusion—Implementation of the no-action alternative would result in short-term minor adverse impacts and long-term negligible adverse impacts on soundscapes, including the slight corona emitted by the transmission lines and noise resulting from maintenance activity.

Alternative 2: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor

Analysis—Under alternative 2, the construction SUP and right-of-way permit for upgrade of the Dooms – Brems line would be approved as described in chapter 2. No blasting would be used for construction.

The main impacts on soundscapes would result from the various equipment and vehicles needed for construction. Table 7 lists the potential construction equipment needed for this effort. As detailed in “Methodology and Assumptions,” it is assumed that construction equipment noise (85 dBA) would attenuate to background noise level at approximately 6,400 feet and possibly less if the equipment emits noise below 85 dBA and given the dense vegetation in the area. There are sensitive receptors including residences and wilderness within 6,400 feet of the proposed construction activities that could be affected by the increase in noise from construction activities. Although increases in noise are expected to be detectable, they are not expected to have a long-term effect. In addition, construction activities would comply with Albemarle County and Augusta County noise ordinances and would only be performed between the hours of 7:00 a.m. and 10:00 p.m.

A Wilderness Minimum Requirement Analysis worksheet was not completed as part of this environmental assessment because all actions would occur outside of designated wilderness areas. Construction activities would occur within the existing corridor and outside of national park system lands in the vicinity of wilderness. Approximately 2.2 miles west of Skyline Drive, the existing right-of-way is located near a Shenandoah National Park designated wilderness area (figure 13). East of the Shenandoah National Park designated wilderness area, the three transmission lines split with the 500-kV and the proposed Dooms – Brems 230-kV transmission line shifting to the south and the existing double-circuit 230-kV transmission line shifting to the north, closer to the wilderness area. The existing double-circuit 230-kV transmission line is immediately adjacent to the wilderness area and would not be changed as part of this project. The Dooms – Brems line would be approximately 500 feet south of the wilderness area at the closest point (figure 13).

There are potential impacts on wildlife in the wilderness area as a result of construction noise, but impacts would be short term and cease when construction is complete. Approximately 900 feet of designated wilderness area is located approximately 500 feet from the corridor and approximately 2.2 miles west from the crossing of Skyline Drive (figure 13). Dooms Crossing Road and residential development are located between the designated wilderness and the Dooms – Brems line. It is likely that ongoing traffic and residential noise currently disrupt the edges of the wilderness area. Given that construction would occur at least 500 feet away from the edge of the wilderness area and the area has existing noise disruptions, it is expected that short-term negligible impacts to wilderness would occur during construction. As a result of the proposed construction activities, there would be

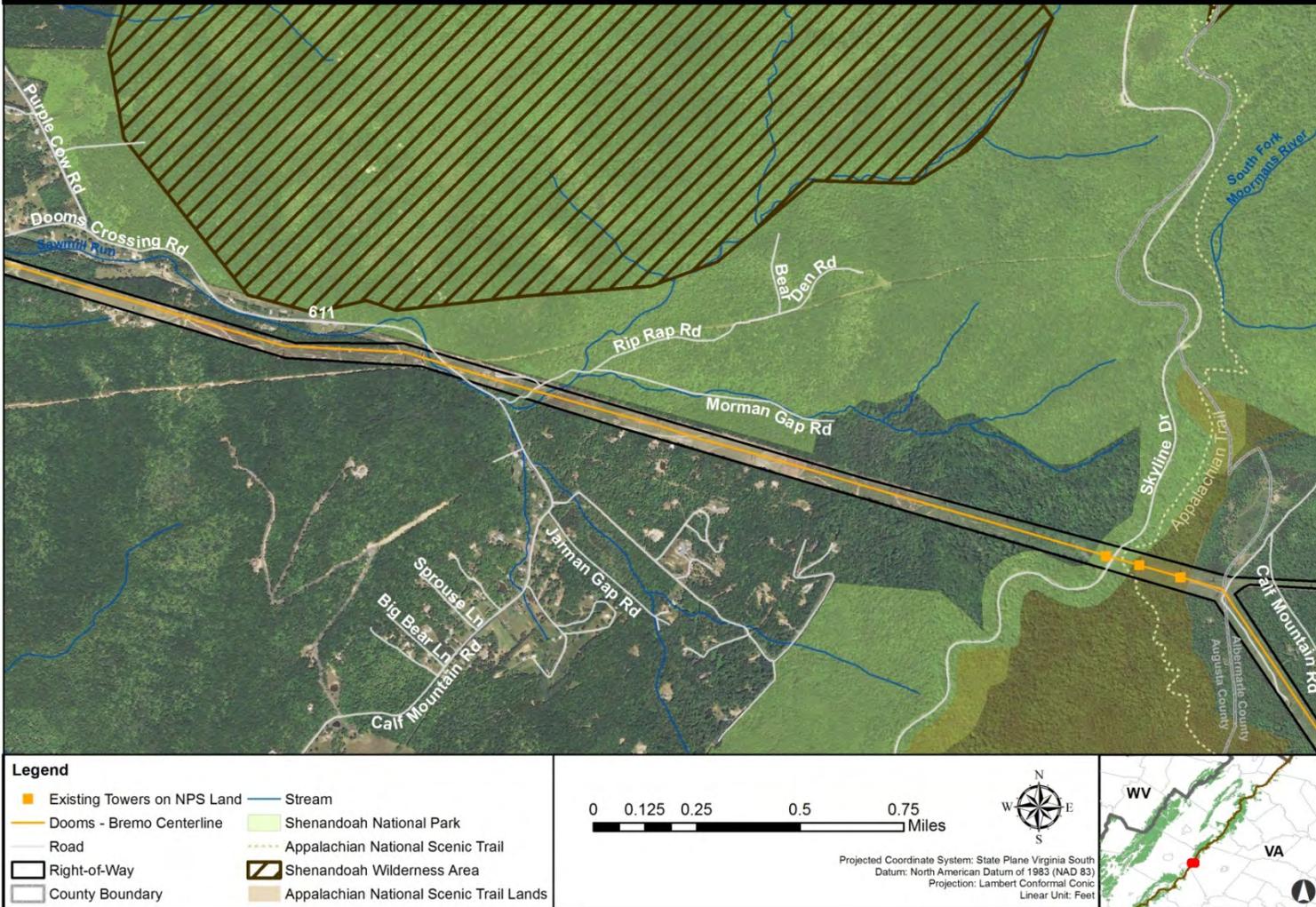


FIGURE 13: SHENANDOAH NATIONAL PARK WILDERNESS AREAS

localized, short-term moderate adverse impacts on the natural soundscapes of the corridor, and short-term negligible impacts to designated wilderness.

Continued operation and maintenance of the 230-kV transmission line would result in ongoing corona associated with operation. However, the corona is expected to remain unchanged or unnoticeable from the current operation of the Dooms - Breomo line, resulting in long-term negligible adverse impacts on noise levels in the immediate vicinity of the line. The change would not be noticeable over current conditions. In addition, annual maintenance activities could result in additional short-term noise impacts, as described under the no-action alternative.

Conclusion—Implementation of alternative 2 would result in short-term moderate adverse impacts and long-term negligible adverse impacts on soundscapes, including the slight corona emitted by the transmission lines and noise resulting from the construction and/or enhancement of the new 230-kV line and three access roads. Alternative 2 would also result in short-term negligible adverse impacts to wilderness.

Alternative 3: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access from Skyline Drive

Analysis—Under alternative 3, the construction SUP and right-of-way permit for activities related to the upgrade of the existing transmission line would be issued as described in chapter 2. Impacts to soundscapes during construction could be slightly greater than those impacts described under alternative 2, due to the proximity of construction activities to the roadway. Impacts to soundscapes would be localized short term, moderate, and adverse on the natural soundscapes of the corridor with short-term negligible impacts to designated wilderness from the presence and operation of construction equipment in the vicinity.

Similar to alternative 2, once construction activities are complete, noise resulting from the corona would occur. However, the corona is expected to remain unchanged or unnoticeable from the current operation of the Dooms - Breomo line, resulting in long-term negligible adverse impacts on noise levels in the immediate vicinity of the line. The change would not be noticeable over current conditions.

Conclusion—Impacts under alternative 3 would be similar to those described under alternative 2; however, impacts to soundscapes during construction could be slightly greater than those impacts described under alternative 2 because of the proximity of construction activities to Skyline Drive. Implementation of alternative 3 would result in short-term moderate adverse impacts and long-term negligible adverse impacts on soundscapes, including the slight corona emitted by the transmission lines and noise resulting from the construction or enhancement of the new line and access roads. Alternative 3 would also result in short-term negligible adverse impacts to wilderness.

CULTURAL RESOURCES: HISTORIC STRUCTURES

Affected Environment

The term *historic structures* refers to historic properties that are buildings, structures, or objects listed in or eligible for inclusion in the national register individually or as part of a larger district. In order for an historic structure to be listed in the national register, it must meet one or more of the national register criteria (36 CFR 63). It must also be associated with an important historic context. In other words, it must possess significance—the meaning or value ascribed to such properties—and retain the integrity of those character-defining features necessary to convey its significance (i.e., location, design, setting, workmanship, materials, feeling, and association); see National Register Bulletin 15: *How to Apply the National Register Criteria for Evaluation* (NPS 1995).

All historic structures associated with the project are located in Shenandoah National Park and are contained in specific historic districts and/or part of 1 of 15 defined components of the cultural landscapes. No previously identified historic structures are considered individually eligible for inclusion in the national register.

Contributing Structures in the Study Area—Skyline Drive Historic District, National Historic Landmark

Skyline Drive was designed as the backbone of Shenandoah National Park. It is the main transportation route for automobiles and provides access to most trails, campgrounds, and waysides in Shenandoah National Park. It was designated as an NHL on October 6, 2008. Skyline Drive and its adjoining picnic areas, campgrounds, development areas, waysides, stone guard walls, and overlooks are considered nationally significant under NHL criteria 1 and 3, which correspond to national register criteria A and C.

The study area for historic structures is the area of Skyline Drive between the Rockfish Gap entrance and the corridor crossing, located in the South District of Skyline Drive and was opened to traffic on August 29, 1939. The section south of Jarman Gap, where corridor is located, was originally built as part of the Blue Ridge Parkway (McClelland and Engle 2008; NPS 2010). The corridor is located at mile marker 97.4 of Skyline Drive (McClelland and Engle 2008). The design of Skyline Drive evident in the circulation plan, construction materials, vegetation, and rustic-style buildings and structures demonstrate the planning, landscape design, and style that was used by the National Park Service and the Bureau of Public Roads in the 1930s and 1940s. The roadbed, guard walls, overlooks, and parking areas remain much as they were built originally (NPS 2010).

The study area for historic structures is the area located on national park system land that can potentially be affected by one of the project alternatives. There are seven historic structures in the study area: Skyline Drive itself, a stone guard wall, three cattle underpasses and one historic bridge underpass and its retaining walls that are located along Skyline Drive between Rock Fish Gap and mile marker 97.4 where the transmission corridor crosses Skyline Drive. These resources are contributing resources to the Skyline Drive Historic District NHL and summarized in figure 14 and table 8.

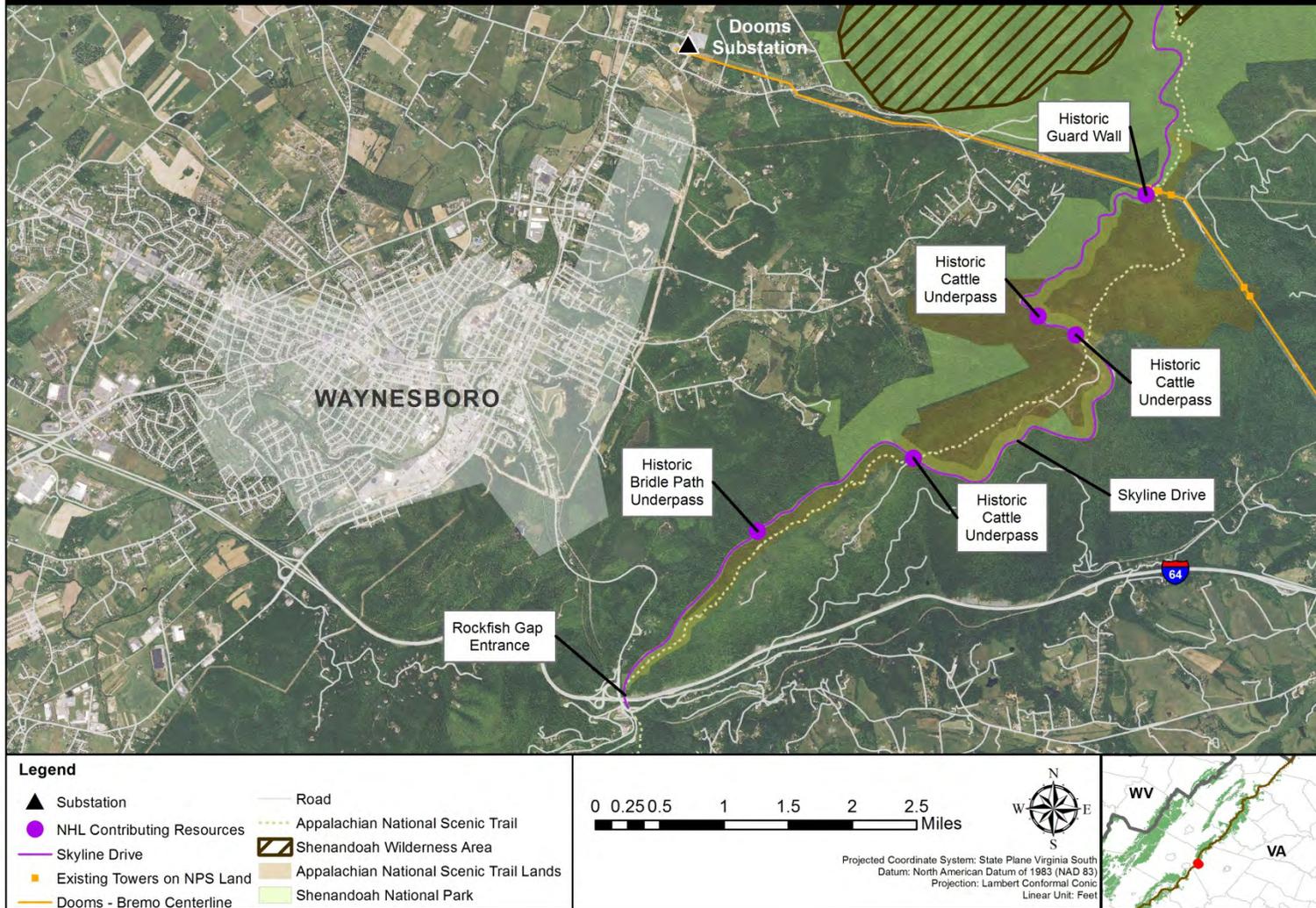


FIGURE 14: NHL CONTRIBUTING HISTORIC STRUCTURES

TABLE 8: CONTRIBUTING HISTORIC STRUCTURES LOCATED IN THE STUDY AREA

List of Classified Structures Number	Structure Type	Location by Mile Marker	Eligibility
82968	Skyline Drive—road bed	0–105.5	Contributing to Skyline Drive NHL
83188	Stone guard wall	97.4	Contributing to Skyline Drive NHL
83217	Cattle underpass	99.1	Contributing to Skyline Drive NHL
83218	Cattle underpass	99.6	Contributing to Skyline Drive NHL
82960	Cattle underpass	102.2	Contributing to Skyline Drive NHL
82961	Bridle underpass	103.6	Contributing to Skyline Drive NHL
82962	Bridle underpass retaining walls	103.6	Contributing to Skyline Drive NHL

Environmental Consequences

Methodology and Assumptions

The National Park Service categorizes cultural resources by the following categories: archeological resources, cultural landscapes, historic districts and structures, museum collections, and ethnographic resources. As noted in “Issues and Impact Topics” section of chapter 1, only impacts on historic structures and cultural landscapes are of potential concern for this project. There would be no impacts on archeological resources, ethnographic resources, or museum collections, so these topics were dismissed from consideration. Analyses of effects on historic structures and/or their character-defining features included in, or eligible for inclusion in, the national register that are presented in this section respond to the separate NEPA requirements. Section 106 and determination of any adverse effect was handled by the National Park Service separately from this document.

The NPS guidance for evaluating impacts (DO-12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*) (NPS 2011) requires that impact assessment be scientific, accurate, and quantified to the extent possible. For cultural resources, it is seldom possible to measure impacts in quantifiable terms; therefore, impact definitions must rely heavily on the professional judgment of resource experts.

CEQ regulations and DO-12 also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, for example, reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under the National Environmental Policy Act only.

Study Area

The study area is limited to the sections of the corridor located on national park system lands and any other areas of national park system lands that have the potential to be affected by construction

access and activities. A viewshed analysis was conducted for the project (figure 12) and showed that the transmission line would be visible from the within the transmission line corridor, and other areas would be potentially visible through tree cover or if the tree cover were removed. The boundary of the Skyline Drive Historic District NHL is 125 feet on either side of Skyline Drive's centerline or a 250-foot-wide corridor. The study area is between the Rockfish Gap entrance up to and including the corridor that crosses Skyline Drive and the Appalachian National Scenic Trail at mile marker 97.4 of Skyline Drive.

Impact Definitions—Historic Structures

For purposes of analyzing potential adverse impacts on historic structures, the definitions of change for the intensity of an impact are defined as follows:

Negligible: The impact is at the lowest levels of detection or barely perceptible and not measurable.

Minor: The impact would not affect the character- defining features of a historic property listed in or eligible for listing in the national register.

Moderate: The impact would alter a character- defining feature or features of the historic property but would not diminish the integrity of the historic property to the extent that its national register eligibility would be jeopardized.

Major: The impact would alter a character- defining feature(s) of the historic property, diminishing the integrity of the resource to the extent that it would no longer be eligible for listing in the national register.

Duration: Short- term impacts would last for the duration of construction activities associated with the proposed alternative; long- term impacts would last beyond the construction activities.

Alternative 1: No Action

Analysis—The no-action alternative represents a continuation of the existing operations and maintenance of the Doods - Bremo line in accordance with existing right-of-way permit and easement agreements. Under alternative 1, the existing transmission line would remain in place and there would be no construction adjacent to the historic guard wall or the Skyline Drive roadbed. These resources are within the viewshed of the existing Doods – Bremo line now and would continue to be in the viewshed; therefore, continued negligible long-term impacts are expected under alternative 1.

Conclusion—Implementation of alternative 1 would have long-term negligible impacts on historic structures due to continued presence of transmission facilities.

Alternative 2: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor

Analysis—Under alternative 2, the National Park Service would approve the construction SUP and right-of-way permit, authorizing the reconfiguration and upgrade of the Doods - Bremo line in the parks. Five wooden H-frame towers would be removed and replaced with four self-rusting steel monopoles towers in the existing corridor on national park system lands. The new towers would increase in height between 35 and 50 feet but would be shorter than the existing 230-kV transmission line also located in the corridor. The majority of construction activities would occur in the existing corridor; however, limited use of Skyline Drive would be authorized for certain construction activities. Under this alternative, Dominion would access existing tower 39/324 (proposed tower 2139/123) from the corridor west of Skyline Drive for the majority of construction. Restricting most construction equipment from using Skyline Drive would ensure protection of the historic roadbed and the historic cattle underpasses and bridle underpasses. There is a historic guard wall, a contributing feature to the Skyline Drive Historic District NHL, located in the corridor adjacent to Skyline Drive. During construction and to ensure protection to the historic guard wall, Dominion would install jersey barriers between the guard wall and the area of disturbance and between the guard wall and Skyline Drive. Additionally, Dominion would install orange construction and silt fencing on the west side of the guard wall. All jersey barriers and fencing would be placed about 10 feet from the historic guard wall, to the extent practical due to the topography, to further ensure protection of the resource. Furthermore, Dominion would hire a construction monitor, who would also be a field archeologist, to be present on site at all time during construction to ensure protection of the resource. The project would have no impacts on the historic structures because mitigation measures would ensure protection of the historic guard wall through the use of jersey barriers and fencing. Under alternative 2, limited authorized use of Skyline Drive would be approved. One construction vehicle (boom truck) would exceed the permitted weight limits (66,000 pounds) established by the National Park Service by 14,000 pounds; however, because only one round trip would be required, no impacts are expected.

Viewshed analysis showed that the Doods - Bremo line would only be visible from the corridor but other areas would be potentially visible through the tree cover or if the tree cover were removed (figure 12). The guard wall is currently located within the corridor. It is within the viewshed of the Doods - Bremo line and would continue to be in the viewshed after the transmission line is rebuilt; therefore, negligible long-term impacts are expected under alternative 2. However, the project would have short-term minor impacts on the viewshed from the presence of construction materials and equipment within the corridor while construction activities are taking place.

Conclusion—Implementation of alternative 2 would have short-term minor impacts on historic structures from the presence of construction equipment and long-term negligible impacts on historic structures from the continued presence of transmission facilities. No impacts are expected from the limited use of Skyline Drive for construction.

Alternative 3: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access from Skyline Drive

Analysis—Under alternative 3, the construction SUP and right-of-way permit for activities related to the upgrade of the existing transmission line would be issued as described in chapter 2. Under alternative 3, access to tower 39/336 (proposed tower 2139/131) would be from Skyline Drive. All construction materials and equipment would enter and exit Skyline Drive at the Rockfish Gap entrance, located approximately 8 miles south of the corridor along Skyline Drive, except the drill rig, which may exit the park via the Swift Run entrance if it cannot turn around at the proposed access road.

Heavy equipment used for this alternative (see further description in chapter 2) could cause damage to the roadbed of Skyline Drive or any of the historic cattle and bridle underpasses that are located between Rock Fish Gap and the corridor. There are no historic cattle or bridle underpasses or bridges between the corridor and the Swift Run entrance. According to 36 CFR 4.11, vehicles that exceed a gross weight of 40,000 pounds and that would access Skyline Drive between May 1 and November 30 would require a permit. A permit under 36 CFR 4.11 states that the combination gross weight limits for vehicles using five or more axles on Skyline Drive is 66,000 pounds, which would exceed the weight limits under alternative 3 (NPS 2012c). The largest piece of equipment required for construction is the drill rig, which would be carried on a low-boy trailer (combined weight of approximately 214,950 pounds), and it would weigh almost 150,000 pounds more than the permitted weight limit (66,000 pounds) for Skyline Drive. In addition to the drill rig, a 50 ton crane (166,900 pounds) would be needed for construction and is two and one half times the weight limit suggested in 36 CFR 4.11. Each of these, as well as 10 other vehicles and pieces of construction equipment of various weights (some under the weight limits and some potentially over the weight limit) would use Skyline Drive to access the corridor. Under alternative 3, all equipment and materials would be brought to the corridor over these contributing resources multiple times. Given the weight of and frequency that the construction equipment would access the corridor along Skyline Drive, damage to the underpasses could be possible. Dominion would inspect all underpasses prior to construction to evaluate the structural integrity of the bridges and determine if reinforcements would be necessary for equipment to cross. If reinforcements are necessary, Dominion would submit a proposal to the National Park Service for approval to ensure proposed reinforcements are completed so as to avoid impacts to the historic structures and protect the historic integrity. Additionally, a pre-construction and post-construction structural assessment of the cattle and bridle underpasses would be conducted to document existing conditions and to catalog any damage caused by construction. Any damage to the cattle or bridle underpasses and/or roadbed surface of Skyline Drive in the vicinity of the construction site (including paving) would be the responsibility of Dominion to repair to their original historical integrity or existing condition. Additionally, a bond (an amount determined as a condition to the permit) would be issued by Dominion to account for any potential future damages to roadbed surface, underlying structure of Skyline Drive, the cattle and bridle underpasses, and/or the historic guard wall.

The access road off Skyline Drive would be built adjacent to the stone guard wall. Mitigation measures, described under alternative 2, would prevent damage to the guard wall, through the

installation of jersey barriers and orange fencing. Furthermore, Dominion would hire a construction monitor, who would also be a field archeologist, to be present on site at all time during construction to ensure protection to the resource. Alternative 3 would result in long-term moderate impacts due to the potential irreparable damage to historic structures that may be caused by the use of construction equipment that exceeds the weight limit established for Skyline Drive and the proximity of construction activity to the historic guard wall.

Viewshed analysis showed that the transmission line would only be visible from the corridor but other areas would be potentially visible through the tree cover or if the tree cover were removed (figure 12). The guard wall is currently located within the corridor; it is within the viewshed of the existing line and would continue to be in the viewshed after the transmission line is rebuilt; therefore, long-term negligible impacts are expected under alternative 3. However, the project would have short-term minor impacts on the viewshed from the presence of construction materials and equipment within the corridor.

Conclusion—Implementation of alternative 3 would have short-term moderate impacts on historic structures due to the presence of construction activities, and long-term minor impacts on historic structures from the use of Skyline Drive as an access road because of the proposed mitigation efforts.

CULTURAL RESOURCES: CULTURAL LANDSCAPES

Affected Environment

According to DO-28, a cultural landscape is an “expression of human manipulation and adaptation of the land” (NPS 1998). Cultural landscapes are the result of the long interaction between people and the land and reflect the influence of human beliefs and actions over time on the natural landscape. Shaped through time by historical land-use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area’s past and a visual chronicle of its history. The dynamic nature of modern human life, however, contributes to the continual reshaping of cultural landscapes, making them a valuable source of information about specific times and places on one hand, but rendering their long-term preservation a challenge on the other.

In order for a cultural landscape to be listed in the national register, it must possess significance (the meaning or value ascribed to the landscape) and retain the integrity of those features necessary to convey its significance as well as meet one or more of the national register criteria (36 CFR 63). The character-defining features of a cultural landscape include spatial organization and land patterns; topography; vegetation; circulation patterns; water features; and structures/buildings, site furnishings, and objects. Individual features of the landscape are never examined alone but only in relationship to the overall landscape. The arrangement and interrelationships of a cultural landscape’s organizational elements and character-defining features provide the key to determining the potential impacts and effects of proposed undertakings on a cultural landscape [see *The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (NPS 1992)].

Shenandoah National Park

Several cultural landscape inventories have been prepared for Shenandoah National Park with the newest completed in 2010. The National Park Service has identified 15 cultural landscapes in the boundaries of Shenandoah National Park. Twelve component landscapes are contained in the Skyline Drive Historic District NHL. Only two of those landscapes are included in the study area: Skyline Drive (South District) and the Appalachian Trail (South District) (NPS 2010).

Skyline Drive (South District), National Historic Landmark

The elements of the cultural landscape are discussed in *National Park Service Cultural Landscape Inventory Skyline Drive—South District Shenandoah National Park* (NPS 2010). Skyline Drive’s circulation is designed to provide scenic views, and overlooks were established showcasing dramatic vistas of the Blue Ridge Mountains. The parking lots were placed to access various trails, including the Appalachian Trail. All these features were designed by the planners and architects at the National Park Service and Bureau of Public Roads (NPS 2010).

The study area is located between the corridor located at mile marker 97.4 of Skyline Drive and Rockfish Gap. Several of the individual character-defining features (such as the roadbed, the stone guard wall, and various bridges) of the Skyline Drive cultural landscape were discussed and evaluated in the “Historic Structures” section. However, other landscape features include the overlooks at McCormick Gap and Calf Mountain, as well as the planting islands in both those locations, an early 20th century farm road near Beagle Gap, and Rockfish Gap itself. These features are described below in table 9.

TABLE 9: CONTRIBUTING LANDSCAPE FEATURES LOCATED IN THE STUDY AREA

List of Classified Structures Number	Structure Type	Location by Mile Marker	Eligibility
82964	McCormick Gap Overlook	102.4	Contributing to Skyline Drive NHL
82964	Planting Island, McCormick Gap Overlook	102.4	Contributing to Skyline Drive NHL
82959	Farm Road, Beagle Gap	99.7	Contributing to Skyline Drive NHL
83216	Calf Mountain Overlook	98.9	Contributing to Skyline Drive NHL
83216	Planting Island, Calf Mountain Overlook	98.9	Contributing to Skyline Drive NHL
82967	Rockfish Gap	105.5	Contributing to Skyline Drive NHL

Appalachian National Scenic Trail (South District)

Cultural landscape inventories were prepared for each of the three component landscapes that comprise the Appalachian National Scenic Trail in Shenandoah National Park. The elements of the cultural landscape are discussed in *National Park Service Cultural Landscape Inventory Appalachian Trail—South District Shenandoah National Park* (NPS 2007).

The Appalachian National Scenic Trail is considered an eligible historic district under Criterion A as the first long-distance hiking trail in the United States. It is also eligible under Criterion C for its design and construction, as well as the use of a common design standard. The Appalachian National Scenic Trail is unique in its construction as a long-distance hiking path that is also buffered in many places by public lands. It creates a natural habitat for plants and animals and preserves natural spaces for people to enjoy (VDHR 2013).

There are no specific character-defining features of the Appalachian National Scenic Trail (South District) cultural landscape that have been identified within the corridor. The closest individual landscape feature, a section of stone edging, is located outside of the 200-foot corridor (Area of Potential Effects) and approximately 70 feet from the closest H-frame tower. The transmission line corridor crosses the Appalachian Trail, and the nearest H-frame transmission tower is located roughly 150 feet away from the footpath.

Environmental Consequences

The proposed alternatives could potentially impact the Skyline Drive Historic District NHL and the Appalachian National Scenic Trail, which is considered a historic district eligible for listing in the national register.

Methodology and Assumptions

The analyses of effects on cultural landscapes and or their character-defining features included in, or eligible for inclusion in, the national register that are presented in this section respond to the separate requirements of the National Environmental Policy Act. Section 106 and determination of any adverse effect was handled by the National Park Service separately from this document.

The NPS guidance for evaluating impacts (DO-12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*) (NPS 2011) requires that impact assessment be scientific, accurate, and quantified to the extent possible. For historic properties, it is seldom possible to measure impacts in quantifiable terms; therefore, impact definitions must rely heavily on the professional judgment of resource experts.

Study Area

The study area is limited to the sections of the corridor that are located on national park system land and any other areas of national park system land that have the potential to be affected by construction access and activities. The boundary of the Skyline Drive Historic District NHL is 125 feet on either side of Skyline Drive's centerline or a 250-foot-wide corridor. The boundary of the

Appalachian National Scenic Trail landscape is 10 feet on either side of the Appalachian Trail's centerline for a 20-foot-wide corridor (rough boundaries from the cultural landscape inventory). The additional tract 444 Appalachian Trail parcel to the east of Skyline Drive and the footpath of the Appalachian Trail is not considered part of the cultural landscape. The corridor crosses both the Skyline Drive NHL and the Appalachian National Scenic Trail.

Under the VDHR (2008) *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*, a viewshed analysis was completed. The study area for the impact analysis is 1.5 miles on either side of the centerline of the transmission line corridor, where it crosses Skyline Drive, resulting in a 3-mile-wide corridor. The viewshed analysis (figure 12) showed that the transmission line rebuild would only be visible from the corridor. Other areas may have a view of the transmission line but only through tree cover or if the tree cover were removed.

Impact Definitions—Cultural Landscapes

For purposes of analyzing potential adverse impacts on cultural landscapes, the definitions of change for the intensity of an impact are defined as follows:

- Negligible:* The impact is at the lowest levels of detection or barely perceptible and not measurable.
- Minor:* The impact would not affect the character- defining features of a historic property listed in or eligible for listing in the national register.
- Moderate:* The impact would alter a character- defining feature or features of the historic property but would not diminish the integrity of the historic property to the extent that its national register eligibility would be jeopardized.
- Major:* The impact would alter a character- defining feature(s) of the historic property, diminishing the integrity of the resource to the extent that it would no longer be eligible for listing in the national register.
- Duration:* Short- term impacts would last for the duration of construction activities associated with the proposed action; long- term impacts would last beyond the construction activities.

Alternative 1: No Action

Analysis—Under alternative 1, the existing Doom – Bremo line would remain unchanged. No construction activities would occur under this alternative, and there would be no further impacts on cultural landscapes. Operation of the existing transmission lines would continue to include maintenance activities by Dominion and the parks. As stated in the Dominion easement, Dominion may keep the corridor clear of all trees, stumps, roots, and undergrowth. Additional stipulations allow Dominion, with the approval of the park superintendent, to trim or remove any tree outside

the corridor that may endanger the safe or proper operation of the transmission facilities. In between maintenance activities, grasses and shrubs are allowed to grow tall enough to block the direct line of sight of a visitor walking on the Appalachian Trail. Currently, every three years Dominion cuts or trims the vegetation in the corridor, allowing for wider views of the landscape, looking west toward Skyline Drive and the valley. Due to the steep slope west of Skyline Drive, vegetation does not grow tall enough to block views of the ridges and valley. As a result, routine maintenance activities and trimming of vegetation would have long-term negligible impacts on the viewshed of the cultural landscapes.

Conclusion—Implementation of alternative 1 would have long-term negligible impacts on cultural landscapes from the trimming of vegetation in the viewshed.

Alternative 2: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access up the Corridor

Analysis—Under alternative 2, the National Park Service would approve the construction SUP and right-of-way permit, authorizing the reconfiguration and upgrade of the existing Doods – Bremo line in the parks. The four new towers would be located close to the existing H-frames that are being replaced (figures 5, 6, and 7). The new towers would increase in height between 35 and 50 feet but would still be shorter than the average height of the existing, and adjacent, double-circuit 230-kV transmission line towers. All construction activities would be limited to the corridor. Under this alternative, Dominion would access existing tower 39/324 (proposed tower 2139/123) from a temporary access road constructed in the corridor west of Skyline Drive, with limited use of Skyline Drive for the three construction activities, listed in chapter 2. Only one construction vehicle would exceed the weight limits of Skyline Drive; this exception would be approved by the National Park Service for the project.

Under alternative 2, construction equipment would never directly cross the Appalachian National Scenic Trail. Dominion would improve two access roads (east of the Appalachian Trail) and construct a new access road west of Skyline Drive. Because of the topography and proximity to Skyline Drive and the Appalachian Trail, the westernmost access road would be the most visible on the landscape during construction. The access road and construction pad would alter the mountain vista from Skyline Drive to the west because the road and pad would alter the existing landscape. On national park system lands, the access road and construction pad would be temporary and the alterations to the current slope contours of the landscape would be restored to its pre-construction state. The access road outside of national park system land would not be restored to pre-construction conditions; however, vegetation would be allowed to grow, which would alleviate the appearance of changes to the landscape outside of the park.

Currently, the access road off Woods Gap Road is slightly visible from the Appalachian National Scenic Trail; however, during construction, the enhanced access road would be more visible because it would be widened and vegetation removed. The third access road on the tract 444 Appalachian National Scenic Trail parcel would not be visible from Skyline Drive or the Appalachian Trail. Any improvements, such as the addition of gravel, to these two access roads would be removed, and the

access roads would return to two-track roads, similar to their existing condition. Lastly, the closest equipment staging area or laydown yard would be located more than 3 miles away (“as the crow flies”) and out of the viewshed of the cultural landscapes.

The improvement and construction of the access roads would cause short-term minor to moderate impacts due to the visual impacts associated with the construction of an access road on the landscape and within the corridor. Construction equipment would temporarily alter the view and vistas from Skyline Drive and the Appalachian Trail. As a result, short-term minor-to-moderate impacts would occur from the presence of construction equipment, flagging, and signage in the transmission line corridor.

Currently, three transmission lines are located within the corridor, all of which are visible from both Skyline Drive and the Appalachian Trail. A viewshed analysis (figure 12) was completed for a 2-mile-wide area surrounding the Skyline Drive and Appalachian Trail crossing and the east Appalachian Trail parcel, taking into account the taller proposed towers. The results showed that the taller towers would continue to be visible from Skyline Drive and the Appalachian Trail within the corridor and not from the surrounding areas due to topography and vegetation cover. The taller towers may be visible from other sections of national park system lands directly adjacent to the corridor through the tree cover or if tree cover were removed. The proposed towers would be taller and likely more noticeable from Skyline Drive or the Appalachian Trail and within the corridor; however, the towers would be made of self-rusting weathering steel, which allows the towers to blend into the surrounding background and mitigate impacts to the cultural landscape. The Dooms – Bremono line rebuild would have long-term minor impacts to cultural landscapes that would be mitigated by the weathering steel material of the monopoles that would allow them to blend better into the landscape.

Conclusion—Implementation of alternative 2 would have long-term minor impacts due to the taller, more noticeable towers and short-term minor-to-moderate impacts from construction equipment in the corridor on the cultural landscapes, resulting in no adverse impacts. There would be limited access to the corridor from Skyline Drive, including one vehicle that exceeds the permitted weight limits; however, no impacts are expected, and there would be no impact to the landscape features listed in table 9.

Alternative 3: Approval of the Construction SUP and Right-of-Way Permit for the Upgrade of the Existing Transmission Line in Accordance with the Construction Plan with Access from Skyline Drive

Analysis—Under alternative 3, the National Park Service would approve Dominion’s request for a construction SUP and right-of-way permit on national park system lands. Under alternative 3, access to tower 39/336 (proposed tower 2139/131) would be from Skyline Drive. All construction materials and equipment would enter Skyline Drive at the Rockfish Gap entrance, located approximately 8 miles south of the project site along Skyline Drive.

Under alternative 3 there would be a 15-foot-wide access road and a construction pad directly off Skyline Drive. The heavy equipment necessary for construction would be visible from Skyline Drive and would be placed adjacent to the roadbed on the access road (figure 8). The proximity of the

access road to Skyline Drive would increase the visibility of construction equipment. As a result, construction of the temporary access road from Skyline Drive would result in short-term minor to moderate impacts to cultural landscapes. Lastly, while original contours would be restored after construction, remnants or slight differences from the moving and replacing of natural contours immediately adjacent to Skyline Drive may be visible on the landscape. These slight discrepancies would result in long-term minor impacts to cultural landscapes.

All other impacts to cultural landscapes would be the same as described under alternative 2.

Conclusion—Implementation of alternative 3 would have long-term minor impacts due to the taller, more noticeable towers short-term minor to moderate impacts from construction equipment in proximity to Skyline Drive. Long-term minor impacts would result from the moving and replacing of natural contours immediately adjacent to Skyline Drive.

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CHAPTER 4: CONSULTATION AND COORDINATION

Coordination with state and federal agencies was conducted during the NEPA process to identify issues and/or concerns related to natural and cultural resources, including the cattle and bridle underpasses, in the parks.

Internal Scoping

The NPS interdisciplinary team and Dominion met during the process to identify potential issues and impact topics beginning with an initial 3-day meeting on April 30, 2012, followed by two other group meetings. The group's concerns were documented and additional studies recommended where more information was required.

Public Scoping

The project and public scoping was announced in a press release on October 12, 2012. It was also announced on the NPS Planning, Environment, and Public Comment website for both parks (www.parkplanning.nps.gov/SHEN and www.parkplanning.nps.gov/APPA). During the public scoping period, the National Park Service received two comments from the public regarding the proposed action. One comment expressed the desire to be kept informed on the project, and another comment from the Appalachian Trail Conservancy provided detailed and specific comments regarding the impacts on scenic, natural (including soils and vegetation), and cultural resources; potential impacts from all-terrain vehicles; and visitor use and recreation.

This environmental assessment will be made available to the public and distributed to affected/interested agencies for a 30-day review and comment period. Notice of its availability will be posted on the NPS Planning, Environment, and Public Comment website at www.parkplanning.gov/SHEN and www.parkplanning.gov/APPA

Agency Consultation

Endangered Species Act, Section 7 Consultation—In accordance with consultation requirements outlined in section 7 of the Endangered Species Act of 1973, a species list was requested from the U.S. Fish and Wildlife Service in April 2013 via the IPaC—an online Information, Planning, and Conservation System. An official species list identified the potential for the James spiny mussel (*Pleurobema collina*), swamp pink (*Helonias bullata*), Indiana bat (*Myotis sodalis*), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*) to be impacted by the project. NPS biologists reviewed this species list and, based on species distributions, habitat requirements, and potential disturbance from the proposed action, it was determined that the action would have “no effect” on these federally listed species. As a result, no consultation is necessary on this action.

Section 106 of the National Historic Preservation Act Consultation—The proposed actions described in this environmental assessment are subject to section 106 of the National Historic Preservation Act, as amended (16 USC 470 et seq.). The section 106 process is being completed outside of this environmental assessment.

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CHAPTER 5: GLOSSARY AND ACRONYMS

GLOSSARY OF TERMS

Affected Environment—The affected environment is the existing environment to be affected by a proposed action and alternatives.

Consultation—Consultation refers to the act of seeking and considering the opinions and recommendations of appropriate parties about undertakings that might affect properties in the national register. Appropriate parties ordinarily include the state historic preservation officer (VDHR) and Advisory Council on Historic Preservation. Consultation is very formal and procedurally oriented. Correct procedures are promulgated in 36 CFR 800.

Contributing Resource—A building, site, structure, or object that adds to the historic significance of a property or district.

Council on Environmental Quality—The Council on Environmental Quality was established by the U.S. Congress within the Executive Office of the President with passage of the National Environmental Policy Act. The Council on Environmental Quality coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

Cultural Landscape—The cultural landscape is a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Cultural Resources—Cultural resources include historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason.

Cumulative Impacts—Under NEPA regulations, the incremental environmental impact or effect of an action together with the effects of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR 1508.7).

Enabling Legislation—Enabling legislation refers to NPS legislation setting forth the legal parameters by which each park may operate.

Endangered Species Act (ESA) (16 USC 1531 et seq.)—An Act to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and to provide a program for the conservation of such endangered species and threatened species.

Environmental Assessment—An environmental assessment is an analysis prepared pursuant to the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require a more detailed environmental impact statement.

Executive Order—An executive order is an official proclamation issued by the U.S. President that may set forth policy or direction or establish specific duties in connection with the execution of federal laws and programs.

National Environmental Policy Act of 1969 (USC 4321-4347)—The National Environmental Policy Act as amended articulates the federal law that mandates protecting the quality of the human environment. It requires federal agencies to systematically assess the environmental impacts of their proposed activities, programs, and projects, including the no- action alternative of not pursuing the proposed action. The National Environmental Policy Act requires agencies to consider alternative ways of accomplishing their missions in ways that are less damaging to the environment.

National Historic Preservation Act of 1966 (16 USC 470 et seq.)—The National Historic Preservation Act established a program for the preservation of historic properties throughout the nation. The act was approved on October 15, 1966 (Public Law 89- 665; 80 Stat. 915; 16 USC 470 as amended by Public Law 91- 243, Public Law 93- 54, Public Law 94- 422, Public Law 94- 458, Public Law 96- 199, Public Law 96- 244, Public Law 96- 515, Public Law 98- 483, Public Law 99- 514, Public Law 100- 127, and Public Law 102- 575).

National Historic Landmark (NHL)—Nationally significant historic places designated by the Secretary of the Interior. NHLs possess exceptional value or quality in illustrating the heritage of the United States.

Organic Act—The Organic Act was enacted in 1916 and commits the National Park Service to making informed decisions that perpetuate the conservation and protection of park resources unimpaired for the benefit and enjoyment of future generations.

Planning, Environment, and Public Comment—This refers to the NPS website for public involvement. This site provides access to current plans, environmental impact analyses, and related documents on public review. Users of the site can submit comments for documents available for public review.

Scoping—Scoping, as part of the National Environmental Policy Act, requires examining a proposed action and its possible impacts; establishing the depth of environmental analysis needed; and determining analysis procedures, data needed, and task assignments. The public is encouraged to participate and submit comments on proposed actions during the scoping period.

Section 106—This refers to section 106 of the National Historic Preservation Act of 1966, which requires federal agencies to take into account the effects of their proposed undertakings on properties included or eligible for inclusion in the national register and give the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed undertakings.

State Historic Preservation Officer—This official is appointed by the governor of each state and U.S. territory and is responsible for certain responsibilities relating to federal undertakings in the state. In Virginia, the state historic preservation officer is an official with the Virginia Department of Historic Resources.

ACRONYMS

Applicant	Dominion Virginia Power
CDOT	California Department of Transportation
CEQ	Council on Environmental Quality
CEGL	Community Element Code
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
dBA	A- weighted decibels
DO	Director's Order
Dominion	Dominion Virginia Power
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
KOP	key observation point
kV	kilovolt
national register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NVCS	National Vegetation Classification System
parks	Appalachian National Scenic Trail and Shenandoah National Park
SUP	special use permit
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VDCR	Virginia Department of Conservation and Recreation
VDHR	Virginia Department of Historic Resources
VMP	Vegetation Management Plan

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- 2012b E- mail message from Karen Beck- Herzog, public affairs officer, and Jeb Wofford, fish and wildlife biologist, to Emily Larson, Louis Berger Group, Inc., July 30, 2012, stating that there were no relevant state species in the project area due to the scale and location of the project.
- 2013 E- mail message from Rolf Gubler, biologist, to Emily Larson, Louis Berger Group, Inc., April 9, 2013, listing the typical nest and hunting bird species that can be found in the right- of- way and providing information regarding typical nesting seasons.
- 2014 Phone conversation with Karen Beck- Herzog, public affairs officer, with project team indicating that the boom truck would be allowed to use Skyline Drive to access the site in order to remove guy wires.

Appalachian National Scenic Trail

- 2009 E- mail message from Bob Sickley, Trail Resources Manager, to Emily Larson, Biologist, The Louis Berger Group, Inc., on July 15, 2009, regarding visitor use data and information in the project area.

LIST OF APPENDIXES

Appendix A: Construction Plan

Appendix B: Applicable Laws, Policies, And Planning Documents

Appendix C: Public Scoping Materials

Appendix D: Wetlands And Waterways Resource Report

Appendix E: Threatened And Endangered Species Resource Report

Appendix F: Visual Resource Report

Appendix G: Invasive Species

Appendix H: Vegetation Management Plan

Appendix I: Consulting Agency(s) Correspondence



As the nation’s principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.