APPENDIX E: THREATENED AND ENDANGERED SPECIES RESOURCE REPORT

DOOMS-BREMO 230 KV TRANSMISSION LINE EA

Appalachian National Scenic Trail, Virginia
Shenandoah National Park, Virginia

The National Park Service
U.S. Department of the Interior

Threatened and Endangered Species Survey

FINAL

September 2012

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EXECUTIVE SUMMARY

The National Park Service (NPS) received a proposal from Dominion Virginia Power (DVP) to upgrade a high voltage electric transmission line on an existing right-of-way within Appalachian National Scenic Trail and Shenandoah National Park in Virginia. The existing line crosses approximately 3,000 feet of NPS property. The proposed project would remove the existing 115-kilovolt (kV) transmission line and rebuild a 230-kV transmission line between the Dooms substation in Augusta County and the Bremo Substation in Fluvanna County.

An Environmental Assessment is being prepared to decide whether and under what conditions to issue DVP construction and special use permits to complete construction. In order to determine if the federally listed small whorled pogonia was present, a survey was conducted in the location where the right-of-way crosses NPS property.

On July 5-6, 2012, a small whorled pogonia survey was conducted at the project area. The right-of-way, as well as adjacent 15-foot wide forested strips, was searched. No small whorled pogonia plants were found, and the search areas were classified as currently unsuitable habitat for the target species.

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I. PROJECT BACKGROUND

i. Introduction to the Project

The National Park Service (NPS) received a proposal from Dominion Virginia Power (DVP) to upgrade a high voltage electric transmission line on an existing right-of-way within Appalachian National Scenic Trail and Shenandoah National Park in Virginia (the parks) (figure 1). The existing line crosses approximately 3,000 feet of NPS property. The proposed project would remove the existing 115-kilovolt (kV) transmission line and rebuild a 230-kV transmission line between the Dooms substation in Augusta County and the Bremo Substation in Fluvanna County (the Dooms – Bremo line).

An Environmental Assessment (EA) is being prepared to decide whether and under what conditions to issue DVP construction and special use permits to complete construction. The EA will focus on the area where the existing transmission line directly crosses NPS lands, also known as the project area.

ii. Scope of Survey

The Louis Berger Group, Inc. (LBG) was contracted to complete both the EA and necessary environmental surveys across NPS lands. The Dooms – Bremo line crosses NPS lands in two locations, on three NPS parcels. The transmission line crosses approximately 525 feet of Shenandoah National Park, immediately adjacent to approximately 740 feet of Appalachian National Scenic Trail property. At this crossing, the existing 115-kV line is collocated with two other DVP transmission lines (one single-circuit 500 kV and one double-circuit 230 kV) in a 330-foot right-of-way. About 1 mile east of Skyline Drive, the Dooms – Bremo line crosses approximately 1,600 feet of an additional Appalachian National Scenic Trail parcel. At this crossing, the existing 115-kV line is collocated with one other DVP transmission line (one single-circuit 500 kV) in a 250-foot right-of-way. Figure 1 depicts the general project location; figure 2 shows the areas of the two crossings.

A survey for the small whorled pogonia (*Isotria medeoloides*), a state and federal listed species, was required because the species may occur in the project area. The area to be surveyed includes the existing right-of-way, the proposed access road locations within NPS lands, and 15 feet on either side of the right-of-way edge. The survey areas are shown below in Figure 2.

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

National Park Service
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Legend

- NPS Lands
- Appalachian National Scenic Trail

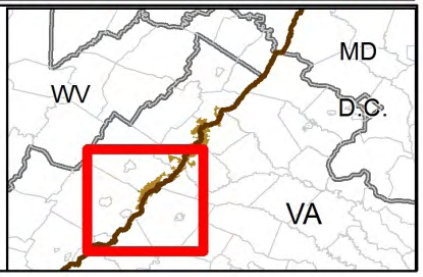
Existing Transmission Lines

- 69 kV
- 115 - 138 kV
- 230 - 500 kV

Figure 1: Appalachian Trail and Shenandoah National Park Crossings Overview

0 Miles

N



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

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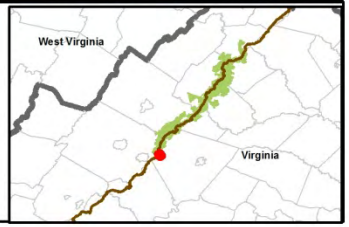
Existing ROW
County Boundary
Proposed Access Roads
Existing Towers on NPS Land
Shenandoah National Park
Appalachain National Scenic Trail Land
Appalachian National Scenic Trail

Figure 2: Skyline Drive and Appalachian Trail Crossing

0 500 1,000 2,000 Feet

N E S W



iii. Description of Survey Areas

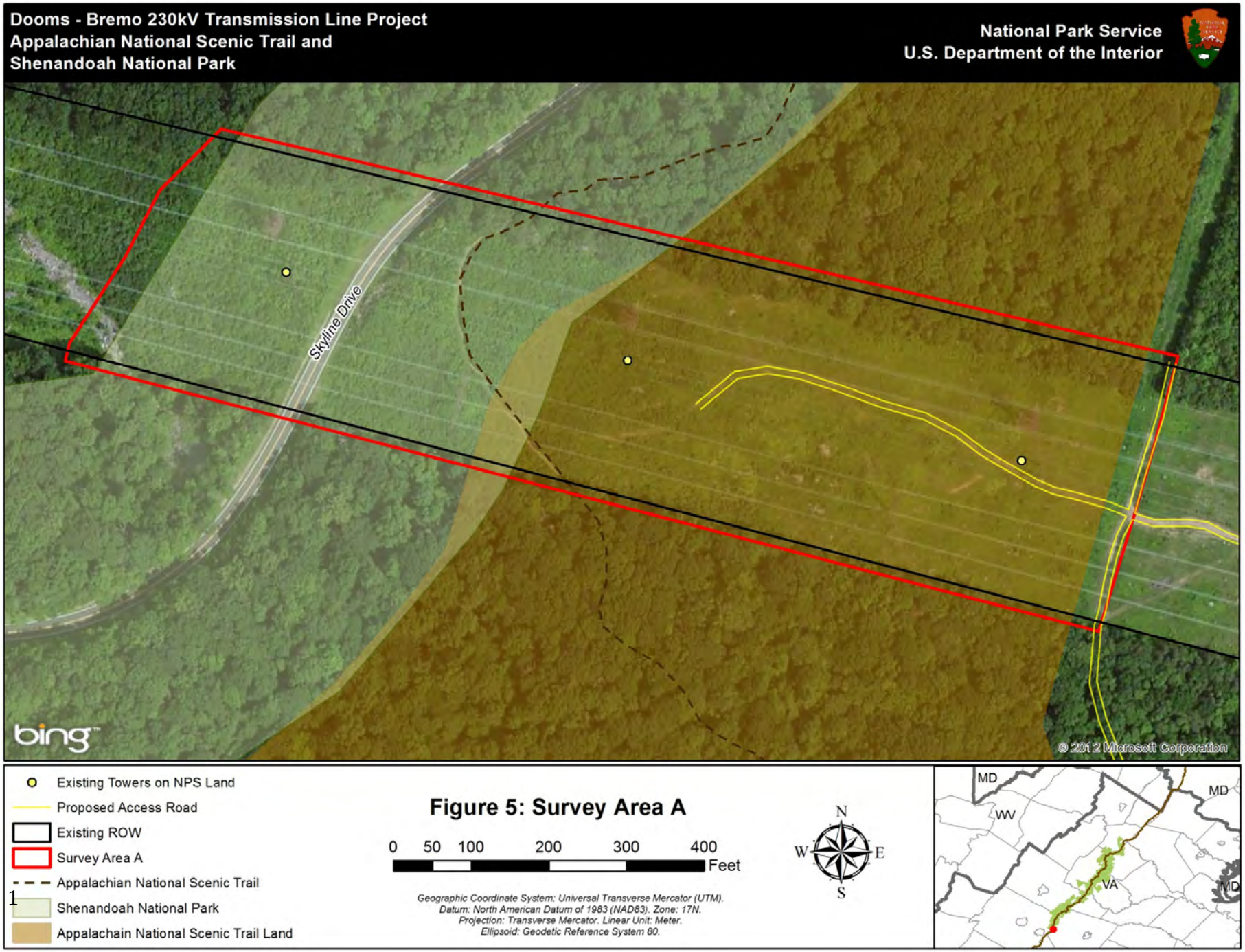
The project is located about 8 miles northeast of Waynesboro, VA, north of Calf Mountain and at the southern extent of Shenandoah National Park. The survey area was limited to the cleared right-of-way as it crosses NPS lands, proposed access roads, and 15 feet on either side of the right-of-way. The right-of-way has been previously cleared of all woody and tall vegetation and is predominantly grasses and shrubs. The survey areas are located on a ridge in rough terrain with steep slopes.

The project was broken into two survey areas, Survey Area A (**Figures 3 and 5**) and Survey Area B (**Figures 4 and 6**). Survey Area A includes both parks, Skyline Drive and the Appalachian Trail. The parcel is accessible via Skyline Drive or Calf Mountain Road. Skyline Drive is located along the side of ridge, with a harsh 25% down slope to the west and east. While the terrain is very steep on either side of Skyline Drive, it levels off slightly east of the Appalachian Trail. Vegetation is low growing grasses and shrubs, approximately 3 to 5 feet tall. There is a cleared right-of-way access road from Calf Mountain Road to the west that cuts through the majority of the survey area, east of the Appalachian Trail.

Figure 3: Survey Area A - Looking west and east (respectively) from Skyline Drive

Survey Area B includes a small Appalachian National Scenic Trail parcel west of Survey Area A. Survey Area B consists of very rough terrain with thick vegetation. The right-of-way is located in an area of the ridge that slopes down both north and east on a 30% slope. Terrain and vegetation density becomes progressively steeper and denser, respectively, on the east side of the survey area closer to the base of the ridge.

Figure 4: Survey Area B – Looking northwest and southeast from survey area


Dooms - Bremo 230kV Transmission Line Project
Appalachian National Scenic Trail and
Shenandoah National Park
National Park Service
U.S. Department of the Interior
Skyline Drive
bing
© 2012 Microsoft Corporation
Existing Towers on NPS Land
Proposed Access Road
Existing ROW
Survey Area A
Appalachian National Scenic Trail
Shenandoah National Park
Appalachain National Scenic Trail Land
Figure 5: Survey Area A
0 50 100 200 300 400
Feet
Geographic Coordinate System: Universal Transverse Mercator (UTM).
Datum: North American Datum of 1983 (NAD83). Zone: 17N.
Projection: Transverse Mercator. Linear Unit: Meter.
Ellipsoid: Geodetic Reference System 80.
N
W
E
S
MD
WV
MD
VA
MD

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

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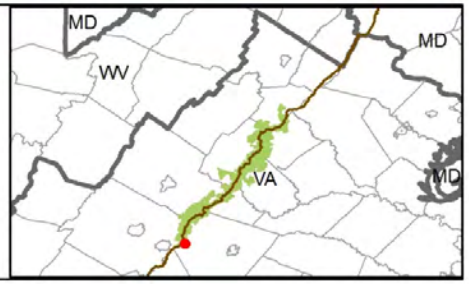
Existing Towers on NPS Land
Proposed Access Roads
Existing ROW
1 Survey Area B
Appalachain National Scenic Trail Land

Figure 6: Survey Area B

0 50 100 200 300 400 500 Feet

Geographic Coordinate System: Universal Transverse Mercator (UTM).
Datum: North American Datum of 1983 (NAD83). Zone: 17N.
Projection: Transverse Mercator. Linear Unit: Meter.
Ellipsoid: Geodetic Reference System 80.



II. SCOPE OF THE ANALYSIS AND BACKGROUND INFORMATION

i. Rare, Sensitive, and Botanical Resources

Shenandoah National Park confirmed that the small whorled pogonia was the only species of concern for the project due to the scale and location of the project. Thus, the scope of the survey only included the federally listed small whorled pogonia.

ii. Small Whorled Pogonia Geographic Range and Ecological Considerations

The PLANTS database (USDA 2012) indicates that the small whorled pogonia is a perennial species that occurs in 18 eastern and midwestern states including Virginia. Gleason and Cronquist, in their *Manual of the Vascular Plants of Northeastern United States and Adjacent Canada* (1991), indicate that it occurs in rich woods from Maine south to North Carolina, west to southern Ontario, Michigan, and Missouri. Radford, Ahles, and Bell, in their *Manual of the Vascular Flora of the Carolinas* (1964), mention wooded slopes and along streams. In *Gray's Manual of Botany*, Fernald (1950) cites dry woodlands from New Hampshire and Vermont south to North Carolina and southeastern Missouri. Correll (1950) also gives an eastern and Midwestern distribution and mentions that it occurs in "..mixed hardwood forest or under hemlocks in moist or dry leaf mold, in rather dry flat open woods, on rocky wooded slopes along streams, mostly on acid soils, but sometimes on limestone hills (in Missouri)." In their *Herbaceous Plants of Maryland*, Brown and Brown (1984) state that it occurs in dry acid soil. The *Atlas of the Virginia Flora III* (Harvill et al. 1992) show eight counties in which it occurs, including Prince William County; the more current *Digital Atlas of the Virginia Flora* (Virginia Botanical Associates 2009) version, however, shows 13 counties.

The small whorled pogonia generally occurs on gentle to moderate slopes with eastern or northern exposures, although it can occur at times on slopes with other aspects (Harvill, 1991). Additional environmental factors associated with the small whorled pogonia include the presence of leaf litter and acidic sandy loam soils with low nutrient contents (Mehrhoff 1989). Two of the references cited in the previous paragraph also mention acid soils.

The small whorled pogonia has been reported to have a long resting period and remain dormant underground for long periods of time, sending up no leaves or flowers (Correll 1950), although in certain areas it is known to bloom annually (Porter 1979).

Two sites in southeastern Prince William County have been visited by W.S. Sipple almost annually to observe small whorled pogonia plants and note the environmental site

conditions and associated plant species present. Both are mesic sites supporting mature mixed hardwoods, including large American beech (*Fagus grandifolia*). Other common trees include tulip poplar (*Lireodendron tulipifera*), white oak (*Quercus alba*), and northern red oak (*Quercus rubra*). Scrub/shrub and herbaceous plant densities in these areas are low to moderate with ample light reaching the forest floor. Species in the ground cover (i.e., herbs and small low woody plants, both of which are referred to here as herbaceous) associated with these and/or similar sites in Prince William County include Indian cucumber (*Medeola virginiana*), Solomon's-seal (*Polygonatum biflorum*), false Solomon's-seal (*Maianthemum racemosum*), large whorled pogonia (*Isotria verticillata*), American strawberry bush (*Euonymus americanus*), naked-flowered tick-trefoil (*Desmodium nudiflorum*), striped wintergreen (*Chimaphila maculata*), partridgeberry (*Mitchella repens*), Christmas fern (*Polystichum acrostichoides*), New York fern (*Thelypteris noveboracensis*), crow's-foot clubmoss (*Lycopodium digitatum*), and may-apple (*Podophyllum peltatum*). Although none of these ground cover species is necessarily restricted to small whorled pogonia sites, the presence of a number of them in low to moderate densities suggests potentially favorable conditions.

III. SEARCH METHODOLOGY

This rare plant survey was conducted by William S. Sipple, a plant ecologist, botanist, and principal in W.S. Sipple Wetland & Environmental Training & Consulting. Mr. Sipple was familiar with the small whorled pogonia prior to the site visit. However, as a quality control measure, the morphological characteristics of this species were reviewed prior to the field visit using the botanical sources cited above as well as some supplemental reference materials. The surveyor also reviewed the species description and illustration in the technical floras, which are identified above and in the *References* section of this report. Using this information, Mr. Sipple developed a small whorled pogonia search image for the onsite survey. This information expedited the search for the target species, which was conducted on July 5-6, 2012.

The small whorled pogonia was searched for consistent with its expected habitat and within the requisite flowering/fruiting period. Based upon the various habitat and other ecological parameters listed above, Mr. Sipple developed the following classification system for judging the potential favorability of a site to support the small whorled pogonia:

a. *Highly Favorable Habitat:* Areas that have optimal habitat conditions for the small whorled pogonia. Their physical and biological characteristics are similar to those described above relative to slope, aspect, soils, vegetation, and flora.

b. *Somewhat Favorable Habitat*: These areas somewhat approach the favorable habitat, but one or two of the optimal habitat conditions are less than favorable or missing. Such conditions include the presence of scattered individuals of generally dry site species like the Virginia pine (*Pinus virginiana*), Chestnut oak (*Quercus prinus*), black locust (*Robinia pseudoacacia*), and/or black cherry (*Prunus serotina*), which normally would not occur with the small whorled pogonia. Other examples include the presence of very steep dry slopes with otherwise normally suitable aspects, the presence of somewhat dense scrub/shrub or herbaceous layers in otherwise normally favorable habitat, and the absence or limited occurrence of the ground cover species mentioned above that are frequently found growing in areas supporting the small whorled pogonia.

c. *Unfavorable Habitat:* Areas that generally would not be expected to support the small whorled pogonia because of one or more unfavorable environmental conditions. Examples of unfavorable habitat include open water areas, vegetated wetlands, extremely dense scrub/shrub or herbaceous vegetation, steep western and southern slopes, areas with young forest growth, and areas dominated by Virginia pine.

Using this classification system during a reconnaissance survey, the two reaches of the right-of-way (Survey Areas A and B) were traversed by meander transects. Straight transects were walked in the 20-foot strips of the natural forest. As necessary in the field, the *Manual of Vascular Plants of Northeastern United States and Adjacent Canada* (Gleason and Cronquist, 1991) was consulted to identify the vascular plants and help classify the suitability of the different areas for the small whorled pogonia. Notes were also taken on dominant and/or characteristic plants present for use in habitat descriptions. Dried specimens of two similar-looking species were reviewed including the large whorled pogonia and the Indian cucumber; both of which have whorled leaves.

Nick Tatalovich, from the Louis Berger Group, Inc., assisted with the rare plant search. Mr. Tatalovich's main role was to operate the global positioning system to establish the boundaries of the search area and document the location of the small whorled pogonia, if found. Prior to conducting the search, Mr. Sipple reviewed the morphological characteristics of the small whorled pogonia, including illustrations and photographs, with Mr. Tatalovich.

Scientific nomenclature for all species mentioned in this report follows the PLANTS database (USDA 2012).

IV. SUMMARY OF FINDINGS

Survey Areas A and B of the existing right-of-way in the project area both have, for the most part, extremely dense scrub/shrub vegetation and other undesirable attributes making them both unfavorable for the existence of the small whorled pogonia.

Survey Area A has an undesirable western exposure. West of Skyline Drive is very steep, quite rocky, and has extremely dense scrub/shrub vegetation. The dominant woody species are slippery elm (*Ulmus rubra*), sassafras (*Sassafras albidum*), and a grape species (*Vitis* sp.); the dominant herbs are false Solomon's-seal and Enchanter's nightshade (*Circaea lutetiana*). East of Skyline Drive the exposure is similar, but the slope is not as steep. The vegetation remains quite thick, with mostly dense herbaceous growth at the eastern end. The soils in both areas are quite dry and rocky with silt loams.

Survey Area B has an overall southeastern exposure with steep, dry, rocky slopes and silt loam soils. These steep, rocky slopes, in conjunction with its dense scrub/shrub and tall herbaceous vegetation, make this a very difficult area to traverse. The northwestern end has tall herbaceous vegetation that eventually grades into scrub/shrub vegetation down slope. The southeastern end is traversed by a northeast dipping rocky ravine supporting a low forest canopy of tree-of-heaven (*Ailanthus altissima*) and princesstree (*Paulownia tomentosa*) with a thick understory of wine raspberry (*Rubus phoenicolasius*).

Much of Survey Area B, as well as some areas in the southeastern end of Area A, is dominated by a number of non-native invasive plants. Patches of these dominant species or combinations thereof are listed below and can be found in a separate Invasive Species Report for the project area. Non-native invasive species include:

- Spinny plumeless thistle (*Carduus acanthoides*)
- Spotted knapweed (Centaurea stoebe spp. micranthos)
- Princesstree (*Paulownia tomentosa*)
- Japanese honeysuckle (*Lonicera japonica*)
- Tree-of-heaven (*Ailanthus altissima*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Wine raspberry (*Rubus phoenicolasius*)
- Multflora 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*)

The adjacent forested areas (15 to 20 feet wide on either side of the right-of-way) were also surveyed for the small whorled pogonia. These rocky areas support dry, sloping forest with silt loam soils. Both areas are deemed unfavorable for the small whorled pogonia due to multiple parameters, particularly their steep dry slopes, exposures, and dense shrub and/or sapling vegetation. Three small whorled pogonia associates, as defined above, were found in the forested areas in both survey areas during the site visit. These include false Solomon's-seal, Christmas fern (*Polysticum acrostichoides*), and naked-flowered tick-trefoil (*Desmodium nudiflorum*).

For the most part, forested areas in Survey Area A are dominated by chestnut oak, pignut hickory (*Carya glabra*), and hop hornbeam, with an understory shrubs, mostly maple-leaved viburnum (*Viburnum acerifolium*), and herbs such as Enchanter's nightshade and longleaf summer bluet (*Houstonia tenuifolia*).

The forested areas in Survey Area B are generally dominated by chestnut oak, pignut hickory, and hop hornbean, with white ash (*Fraxinus americana*), American basswood (*Tilia americana*), red oak, and red maple (*Acer rubrum*) are abundant as well. The most abundant shrubs are maple-leaved viburnum, witch hazel (*Hamamelis virginiana*), pawpaw (*Asimina triloba*), and spicebush (*Lindera benzoin*), and there is an assortment of herbaceous plants, such as hay-scented fern (*Dennsaedtia punctilobula*) and tall bellflower (*Campanulastrum americanum*). Again, the shrub/sapling layer was fairly dense.

V. LIMITATIONS REGARDING RARE VASCULAR PLANTS

The rare plant survey was based upon an examination of the habitat conditions of the area at the time of the search. It did not address habitat conditions that may occur in the future, given that such conditions change over time. Long-term plant successional changes could occur at the site, and vegetation management and other factors could impact the species present in the future. The rare plant field survey was conducted in accordance with accepted sampling methods for searching and identifying rare, threatened, or endangered vascular plants. It did not address the general ecological significance of the site because the stated goal was to determine only the presence or absence of the small whorled pogonia.

VI. LIST OF SURVEY PERSONNEL

William S. Sipple Wetland and Environmental Training and Consulting

William S. Sipple: Botanist with more than 30 years of experience. Mr. Sipple is currently on the U.S. Fish & Wildlife Service's list of approved surveyors to conduct plant searches for the following federally listed threatened or endangered plant species: the small whorled pogonia (*Isotria medeoloides*), harparella (*Ptilimnium nodosum*), swamp pink (*Helonias bullata*), and sensitive joint-vetch (*Aeschynomene virginica*).

The Louis Berger Group, Inc.

Nick Tatalovich: An environmental scientist with 3 years of experience in assisting botanical searches and creating maps in ArcGIS both for field teams and private/federal clients.

Emily Larson: An environmental scientist with 5 years of experience in environmental sciences and regulatory compliance for both private and federal clients, primarily relating to utilities and infrastructure planning.

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