

**From:** [Lennon, Tiernan](#)  
**To:** [Cindy Schulz](#); [Troy Andersen](#)  
**Cc:** [Schmidt, John](#); [Barbara Douglas](#); [Jennifer Stanhope](#)  
**Subject:** MVP Draft VASP Sections and Consultation History  
**Date:** Monday, October 16, 2017 11:56:08 AM  
**Attachments:** [VASP MVP Effects Table 10.16.17.xlsx](#)  
[DRAFT VIRGINIA SPIRAEA 10.16.17.docx](#)  
[MVP CONSULTATION HISTORY.docx](#)

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Cindy and Troy - Included below are my draft VASP sections, including the VASP effects table. I've also attached a draft consultation history, which may be missing some VAFO events.

MVP has told us that they intend on submitting additional plans detailing AMMs and conservation measures for plants, but to date we have not received those plans. The sections I've drafted do not reference these plans. I only reference information included in the initiation package or supplemental information that was submitted after initiation. As I receive additional information from MVP I will update my sections accordingly.

If you have any questions please do not hesitate to call me.

Thanks,  
Tiernan

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Table 2. Analysis of effects on Virginia spiraea.

Pipeline Activity	Subactivity	Environmental Impact or Threat	Stressor	Stressor Pathway (optional)	Exposure (Resource Affected)	Range of Response	Conservation Need Affected	Demographic Consequences	NE, NLAA or LAA	Comments
New Disturbance - Construction	Vehicle Operation and Foot Traffic	physical impacts to individuals, habitat alteration and/or degradation	crushing, soil compaction	vehicles	habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Clearing - herbaceous vegetation and ground cover	physical impacts to individuals, habitat alteration and/or degradation	burying, soil compaction, introduction of invasive species, cutting, digging up, and crushing		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Clearing - trees and shrubs	physical impacts to individuals, habitat alteration and/or degradation	crushing, burying, digging up, cutting		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	This could result in the direct removal of VASP plants or alter the habitat so that it is no longer suitable for VASP.
New Disturbance - Construction	Vegetation Disposal (upland) - dragging, chipping, hauling, piling, stacking	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
New Disturbance - Construction	Vegetation Disposal (upland) - brush pile burning	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
New Disturbance - Construction	Vegetation Clearing - tree side trimming by bucket truck or helicopter	habitat alteration and/or degradation	altered sunlight	NA	NA	discountable - beneficial	NA	NA	NLAA	Primary impacts will occur from the original clearing of the ROW. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
New Disturbance - Construction	Grading, erosion control devices	physical impacts to individuals, habitat alteration and/or degradation, temporary loss of habitat	crushing, burying, cutting roots		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Trenching (digging, blasting, dewatering, open trench, sedimentation)	physical impacts to individuals, habitat alteration and/or degradation, temporary loss of habitat	crushing, burying, cutting roots		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Pipe Stringing - bending, welding, coating, padding and backfilling	neutral	none	NA	NA	NA	NA	NA	NE	This activity will occur in areas that have already been disturbed. No additional impacts after clearing, grading, and trenching.
New Disturbance - Construction	Hydrostatic Testing (water withdrawal and discharge), new line	neutral	none	NA	NA	NA	NA	NA	NE	The water used during hydrostatic testing will be stored, if necessary, at the discharge location. The discharge location is on the other side of the river, in an upland area not suitable for VASP.
New Disturbance - Construction	Regrading and Stabilization - restoration of corridor	neutral	none	NA	NA	NA	NA	NA	NE	This activity will occur in areas that have already been disturbed. No additional impacts after clearing, grading, and trenching.
New Disturbance - Construction	Facilities - noise, lights	neutral	none	NA	NA	NA	NA	NA	NE	No impacts to this species are anticipated from this action.
New Disturbance - Construction	Access Roads - upgrading existing roads, new roads temp and permanent - grading, graveling	physical impacts to individuals, habitat alteration and/or degradation, temporary or permanent loss of habitat	crushing, changes in hydrology, contaminants, burying, digging up		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary access road ROW post-construction.
New Disturbance-Construction	Access Roads - upgrading existing roads, new roads temp and permanent - culvert installation	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance-Construction	Access Roads - upgrading existing roads, new roads temp and permanent- tree trimming and tree removal	habitat alteration and/or degradation	altered sunlight			discountable - beneficial			NLAA	Primary impacts will occur from the original clearing of the temporary access road. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
New Disturbance-Construction	Stream Crossings, flume	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance-Construction	Stream Crossings, dam & pump	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance-Construction	Stream Crossings, cofferdam	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance-Construction	Stream Equipment Crossing Structures	habitat alteration and/or degradation	sedimentation, soil compaction	NA	limited to some habitat, population, few to some individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Crossings, wetlands and other water bodies (non- riparian) - clearing	physical impacts to individuals, habitat alteration and/or degradation	burying, soil compaction, introduction of invasive species, cutting and crushing		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.

New Disturbance - Construction	Crossings, wetlands and other water bodies (non- riparian) - tree side trimming	habitat alteration and/or degradation	altered sun	NA	NA	discountable - beneficial	NA	NA	NLAA	Primary impacts will occur from the waterbody crossing. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
New Disturbance - Construction	Crossings, wetlands and other water bodies (non- riparian) - grading, trenching, regrading	physical impacts to individuals, habitat alteration and/or degradation	cutting root systems, digging up plants, burying		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Crossings, wetlands and other water bodies (non- riparian) - pipe stringing	neutral	none	NA	NA	NA	NA	NA	NE	This activity will occur in areas that have already been disturbed. No additional impacts after clearing, grading, and trenching.
Operation & Maintenance	Facilities - vehicles, foot traffic, noise	neutral	none	NA	NA	NA	NA	NA	NE	No impacts to this species are anticipated from this action.
Operation & Maintenance	Vegetation Management - mowing	physical impact to individuals	cutting, crushing	NA	NA	discountable	NA	NA	NLAA	Mowing will only be occurring along the permanent ROW, which is outside of the areas containing VASP habitat.
Operation & Maintenance	Vegetation Management - chainsaw and tree clearing	neutral	none	NA	NA	NA	NA	NA	NE	These activities will occur in areas not suitable for VASP.
Operation & Maintenance	Vegetation Management - herbicides - hand, vehicle mounted, aerial applications	neutral	none	NA	NA	NA	NA	NA	NE	Spraying of herbicides will not occur at this site.
Operation & Maintenance	Vegetation Disposal (upland) - dragging, chipping, hauling, piling, stacking	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
Operation & Maintenance	Vegetation Disposal (upland) - brush pile burning	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
Operation & Maintenance	Vegetation Management - tree side trimming by bucket truck or helicopter	habitat alteration and/or degradation	altered sunlight	NA	NA	discountable - beneficial	NA	NA	NLAA	Primary impacts will occur from the original clearing of the ROW. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
Operation & Maintenance	ROW repair, regrading, revegetation (upland) - hand, mechanical	physical impacts to individuals, habitat alteration and/or degradation	sedimentation, chemical contaminants	NA	NA	discountable	NA	NA	NLAA	E&S plans will be used to minimize effects from erosion and sedimentation on-site. No herbicides will be used at this site.
Operation & Maintenance	ROW repair, regrading, revegetation (wetland) - hand, mechanical	physical impacts to individuals, habitat alteration and/or degradation, temporary or permanent loss of habitat	crushing, burying, soil compaction, introduction of invasives	heavy equipment and machinery, imported fill and materials, storm water runoff	habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
Operation & Maintenance	ROW repair, regrading, revegetation - in stream stabilization and/or fill	physical impacts to individuals, habitat alteration and/or degradation, temporary or permanent loss of habitat	crushing, burying, soil compaction, introduction of invasives	heavy equipment and machinery, imported fill and materials, storm water runoff	habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
Operation & Maintenance	Access Road Maintenance - grading, graveling	neutral	none	NA	NA	NA	NA	NA	NE	Access roads on this site will be temporary and will be restored post-construction.
Operation & Maintenance	Access Road Maintenance - culvert replacement	neutral	none	NA	NA	NA	NA	NA	NE	Access roads on this site will be temporary and will be restored post-construction.
Operation & Maintenance	General Appurtenance and Cathodic Protection Construction - Off ROW Clearing	physical impacts to individuals, habitat alteration and/or degradation	crushing, burying, soil compaction, introduction of invasives		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	This could result in the direct removal of VASP plants or alter the habitat so that it is no longer suitable for VASP.
Operation & Maintenance	General Appurtenance and Cathodic Protection Construction - trenching, anode, bell hole	physical impacts to individuals, habitat alteration and/or degradation	crushing, burying, soil compaction, chemical contaminants, introduction of invasives		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	This could result in the direct removal of VASP plants or alter the habitat so that it is no longer suitable for VASP.
Operation & Maintenance	Inspection Activities - ground and aerial	neutral	none	NA	NA	NA	NA	NA	NE	Aerial and ground inspections will have no effect because they will not be occurring in VASP habitat.

## **VIRGINIA SPIRAEA**

### **STATUS OF THE SPECIES**

As described in Service (1992) VASP conservation needs include preserving existing populations by minimizing human disturbance and controlling invasive species. Currently, as a whole, the range-wide status of the species is stable (Service 2008). From 1992-2007, population numbers in WV remained stable (Service 2008). The primary factors influencing the status include risks posed by a limited range with increasing amounts of fragmentation, a lack of genetic variation, a lack of natural succession in the habitat, invasive species, application of herbicides, and disturbance by humans leading to “changes in hydrology by impoundment and by impact from recreational use, hydroelectric facilities, and run-off debris” (NatureServe 2016).

VASP is a clonal shrub of the rose family and was listed as threatened in 1990. It can be found among large boulders, flatrock, and flood debris along scoured streamsides and rivers, as well as roadside wet areas and wet marshy meadows. VASP requires periodic flood scouring to eliminate taller woody competitors and to create river-wash deposits and early successional habitats.

For a more detailed account of the species description, life history, population dynamics, threats, and conservation needs, refer to: <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=Q2R1>.

### **ENVIRONMENTAL BASELINE**

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated and/or ongoing impacts of all proposed federal projects in the action area that have undergone Section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress.

#### **Status of the Species within the Action Area**

The proposed action crosses portions of the Gauley, Greenbrier, and Meadow rivers in Nicholas and Summers Counties WV, which are known to provide habitat for VASP. Field surveys were completed by a Service approved plant surveyor in areas near these rivers using a pedestrian-meander search technique across the 300ft wide environmental study corridor (ESI 2015). A presence/probable absence survey for VASP was performed from August 5 - 12, 2015, in Summers and Nicholas Counties, yielding no individuals (ESI 2016). A total of 3.64 acres along 0.14 miles were surveyed during these efforts.

Due to restricted land access, a total of 2.30 acres within the proposed project workspace in Summers County, within close proximity to the Greenbrier River, was not surveyed. Absent valid surveys, the Service must use the best available scientific data in a reasonable worst case scenario to insure that any possible impacts are properly considered in the effects analysis. In areas where VASP surveys were completed along the proposed project, no plants were found and

the habitat was either characterized as unsuitable or not optimal for VASP. However, it is reasonable to assume presence here because the Service was able to identify areas of potentially suitable habitat for VASP within the proposed project workspace, using the National Wetlands Inventory (NWI) maps. Thus, for the purposes of this analysis, presence of VASP is assumed within the unsurveyed area.

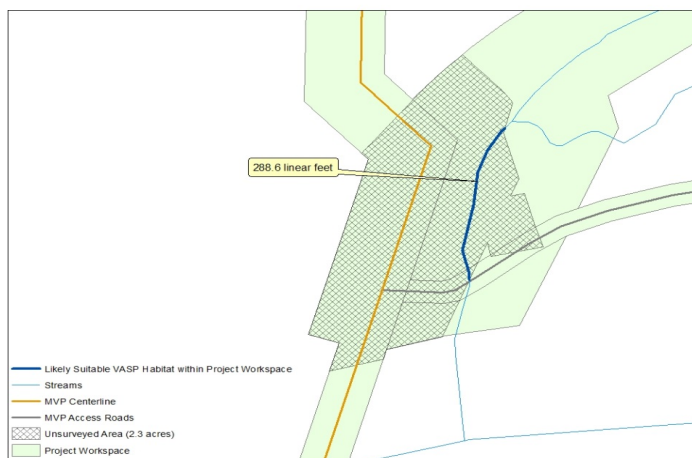
**Commented [WVFO1]:** Waiting to hear back from ESI to determine if this is true. The plant surveyor verbally stated this but I need to confirm it with their data sheets.

### Greenbrier River Population

There are 3 documented occurrences of VASP on the Greenbrier River. Two are in close proximity to each other, and were last surveyed in 2017<sup>1</sup>, and the other is located 11 miles downstream, and was surveyed in 2015 (J.J. Hajenga, WVDNR, phone call to T. Lennon, Service, October 10, 2017). For the purposes of this analysis we will refer to these 3 occurrences as the Greenbrier River population. Monitoring reports provided by the WVDNR indicate that the Greenbrier River population is stable and within the natural range of fluctuation (WVDNR 2011).

In order to estimate the coverage of VASP within the unsurveyed area, the Service compiled VASP data from existing occurrences along the Greenbrier River and averaged the data together to make a reasonable assumption regarding VASP coverage. Furthermore, since VASP is a riparian/wetland species that occurs along rivers, streams, and wetlands, the Service assumes that VASP is mostly likely to inhabit areas along a 288.6 linear ft reach of stream that overlaps with the proposed project workspace (Figure X).

Figure X. Unserved area and likely suitable habitat within the proposed project workspace.



<sup>1</sup> The 2017 survey applied a different survey method than the 1996 -2010 surveys. WV has recently modified their survey method to be more consistent with other states, which makes the recently collected data difficult to compare to previous years. The stem count method was performed on these 2 occurrences in 2017, instead of the extent of VASP coverage method used in previous years, yielding 137 and 244 stems. Based on observations made by the WVDNR, these occurrences appear to be healthy and comparable in size to previous years (P.J. Harmon, WVDNR, email to T. Lennon, Service, October 11, 2017; J.J. Hajenga, WVDNR, phone call to T. Lennon, Service, October 10, 2017). For the reasons described above, the Service has elected to not use 2017 survey data to estimate VASP coverage in the unsurveyed area.



The extent of the site was used in this Opinion as the best measure for VASP coverage (instead of number of stems) because due to the clonal nature and density of some occurrences, it is almost impossible to determine individuals in the field and this type of data was not collected in previous years (DNA 2014). According to the survey data collected at a long-term WVDNR monitoring site on the Greenbrier River, the extent of VASP coverage averaged 221.33m<sup>2</sup> (0.05 acre) over a 14 year period (Table X). Therefore, for the purposes of our analysis, the Service will assume that the extent of VASP coverage within the unsurveyed area will be 0.05 acre.

Table X. Estimated coverage of VASP at a WVDNR monitoring site on the Greenbrier River.

<b>Year</b>	<b>Extent of site (m<sup>2</sup>)</b>
1996	205.31
1997	183.00
2001	226.37
2003	226.37
2005	233.07
2007	237.61
2010	237.61
<b>Average</b>	<b>221.33</b>

All VASP occurrences along the Greenbrier River are on private land (J.J. Hajenga, WVDNR, email to T. Lennon, Service, October 10, 2017) and we are not aware of specific activities that have occurred that adversely affect the species. However, because most occurrences of VASP are located on or near the edge of the river, they have likely received some type of occasional disturbance. Potential threats within the action area may include: invasive species, such as Japanese knotweed and purple loosestrife that compete with VASP; or changes in water flow regimes from weather related factors; or construction of boat docks or other streambank modifications. All of these potential threats may affect the amount of habitat available for the species along the streambanks in the action area (Service 2008).

#### EFFECTS OF THE ACTION

Direct effects are the direct or immediate effects of the project on the species, its habitat, or designated/proposed critical habitat. Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. Direct and indirect effects of the proposed action along with the effects of interrelated/interdependent activities are all considered together as the “effects of the action.”

To standardize the effects analysis, the proposed action was divided into discrete actions described as subactivities. Defining subactivities allows for easier interpretation and consideration of complex activities. The project subactivities are defined in the species effects tables (Appendix X Tables 1-X).

The potential effects of the proposed action are described in Appendix X Table X. The project subactivities unlikely to result in any impacts to VASP are described in Appendix X Table X; NE subactivities. Most of these subactivities are not expected to occur in VASP habitat. For example, upland areas are not VASP habitat and thus, activities in those areas will not directly affect the species. Vegetation management, inspection activities, vegetation disposal, compression facility noise, and telecommunications equipment operation in these upland areas would have no effect on VASP. For those subactivities of the proposed action that are determined to result in NE to VASP, there will be no further discussion in this Opinion.

The project subactivities that may affect, but are NLAA, VASP are described in Appendix X Table X; NLAA subactivities. Most of these subactivities will occur after the primary impacts have occurred from the original clearing and construction of the project. Tree trimming, mowing, ROW repair, regrading, and revegetation would have discountable effects on VASP because these subactivities are occurring in areas that have already been disturbed by construction or are occurring in areas where the habitat has been rendered unsuitable. For those subactivities of the proposed action that are determined NLAA VASP, there will be no further discussion in this Opinion.

There are other subactivities of the project that are LAA VASP where the species is assumed to be present (Appendix X Table X; LAA subactivities). The type and magnitude of these impacts are discussed below. For some components of the proposed action that may affect VASP, AMMs have been incorporated to ameliorate those effects and those are also noted in Appendix X Table X. These subactivities are LAA VASP by physically impacting individual plants and/or altering or degrading its habitat.

The project will directly impact 0.05 acres of presumed, occupied habitat within the 2.30 acre unsurveyed proposed project workspace. The subactivities completed in VASP habitat will result in direct and indirect impacts to the exposed individuals. Ground disturbance subactivities related to grading, graveling, grubbing, increased foot and vehicle traffic, vegetation and tree clearing, stream and wetland crossings, and trenching (for temporary access roads, temporary workspaces, and the pipeline ROW) will kill VASP plants and seeds (Appendix X Table X). Conducting these activities in areas of suitable habitat may alter/degrade the habitat in such a way that the reestablishment of VASP post-construction is not likely. Additionally, the placement of fill and gravel will cause permanent habitat loss in all areas permanently maintained by MVP. The effects from these activities will likely result in the removal of the entire VASP occurrence (0.05 acre) assumed to be present within the unsurveyed area.

Direct impacts may cause individuals to experience decreased reproductive success (e.g., from minor physical damage, competition with introduced invasive species, or habitat disturbance) to death (e.g., from crushing, cutting, digging up, burying, or soil compaction). These direct impacts to VASP would occur primarily from the installation of pipeline and building of new access roads across occupied habitat. In-stream work and stream and wetland crossings may cause sedimentation that may bury plants and alter hydrology on-site resulting in unsuitable VASP habitat. Individuals may suffer decreased fitness resulting from indirect effects, such as introduction of invasive exotic plant competitors. Activities involving heavy equipment and machinery in or near species habitat may spread seeds of invasive exotic plant species.

MVP has incorporated a number of conservation measures into the project that should minimize the extent and significance of the adverse effects on VASP, if VASP is not located immediately within the proposed project workspace. These measures include: implementing sediment and erosion control measures during and after construction; ensuring restoration of pre-existing topographic contours after any ground disturbance; restoring native vegetation (where possible); developing plans and procedures for invasive species management; expediting construction within any waterbody, effectively reducing disturbance to the streambed and adjacent soils and the quantity of suspended sediments; prohibiting construction equipment, vehicles, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products from being parked, stored, or serviced within a 100 ft radius of any wetland or waterbody; and avoiding the use of herbicides and pesticides to maintain any portion of the project ROW. Furthermore, if VASP is found within the project workspace MVP has committed to relocate individuals outside of the affected area in coordination with the Service.

## **CUMULATIVE EFFECTS**

Cumulative effects are those “effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area” considered in this Opinion (50 CFR 402.02).

The Service is not aware of any future state, tribal, local, or private actions that are reasonably certain to occur within the action area at this time; therefore, no cumulative effects are anticipated.

## **JEOPARDY ANALYSIS**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on 4 components: (1) Status of the Species, (2) Environmental Baseline, (3) Effects of the Action, and (4) Cumulative Effects. The jeopardy analysis in this Opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. It is within this context that we evaluate the significance of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

### **Analysis for Jeopardy**



*Impacts to Individuals* – The proposed action includes ground disturbance, vegetation and tree clearing, and stream and wetland crossing subactivities. As discussed in the Effects of the Action, potential effects of the action include effects to VASP present within the action area year-around during construction. Effects generally include decreased fitness and reproductive success or death of individual VASP due to degradation and loss of VASP habitat caused by soil compaction, altered hydrology, sedimentation, and competition. Additionally, these activities may permanently alter and degrade habitat such that conditions are no longer favorable for VASP re-establishment. The conservation measures listed in the Effects of the Action will minimize the potential effects from sedimentation during construction and restoration and competition from invasive exotic plants. In summary, there will be impacts to individual VASP survival and fitness.

*Impacts to Populations* – As we have concluded that individual VASP are likely to experience mortality due to the proposed action, we need to assess the aggregated consequences of the anticipated losses of the exposed individuals on the populations to which these individuals belong.

We expect that the population level impacts from injury, death, and decreased fitness and reproductive success to VASP will be relatively small because the proposed action affects a small number of individuals in 1 occurrence of VASP (estimated to be 0.05 acre in size) near the Greenbrier River, which is a fraction of the number of occurrences that make up the Greenbrier River population and overall populations. The Greenbrier River population consists of 3 occurrences, not including the 0.05 acre for which presence is being assumed. Furthermore, Service (2008) estimates that there are 109 occurrences of VASP in WV and 236 occurrences throughout the range of the species, which means that 0.9% of the WV occurrences and 0.4% of the overall occurrences range-wide will be affected by the proposed project.

Following completion of each action that results in adverse effects to VASP, we expect that the Greenbrier River population, given no other major stressors, will recover. The effects of the proposed action are expected to be primarily temporary and in time VASP habitat should recover, providing favorable conditions for VASP re-establishment. Additionally, if MVP's relocation efforts are successful we anticipate that the number of VASP stems relocated will increase over time. Therefore, we conclude that the effects from the proposed action do not pose a significant risk to VASP and will not result in permanent population declines.

*Impacts to Species* – As we have concluded that populations of VASP are unlikely to experience reductions in their fitness, there will be no harmful effects (i.e., there will be no reduction in RND) on the species as a whole.

## **CONCLUSION**

We considered the current overall stable status of VASP and the similar condition of the species within the action area (environmental baseline). We then assessed the effects of the proposed action and the potential for cumulative effects in the action area on individuals, populations, and the species as a whole. These types of effects of the proposed action are currently considered primary factors influencing the status of the species. While they may temporarily compound

those factors in a very minor, inconsequential way for a small percentage of plants, as stated above, we do not anticipate any reductions in the overall RND of VASP. It is the Service's Opinion that authorization to construct and operate the pipeline, as proposed, is not likely to jeopardize the continued existence of VASP.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- Conduct surveys for VASP in areas where landowner access was denied, and suitable habitat is present, prior to construction.
- Relocate plants outside of the affected area. Dig the plants out by hand prior to the construction and move them to a safe location during construction. After the project is complete, the plants and any propagules should be planted in areas where they are most likely to thrive.
- Monitor any documented occurrences of VASP within and adjacent to the action area and conduct surveys to locate additional populations.
- Permanently protect habitat for the Greenbrier River population to further the recovery of the species.
- Contribute towards research efforts for breeding ecology (seed viability/pollinators/compatibility) and genetic diversity.
- Develop a site specific exotic/invasive species management plan to be implemented at sites occupied by VASP, as these activities will provide recovery benefits for this species.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

### LITERATURE CITED

#### Virginia Spiraea Status of the Species

U.S. Fish and Wildlife Service. 1992. Virginia spiraea (*Spiraea virginiana* Britton) recovery plan. Newton Corner, MA.

U.S. Fish and Wildlife Service. 2011. Virginia spiraea (*Spiraea virginiana*) draft 5-year review: summary and evaluation. Virginia Field Office, Gloucester, VA.

NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>.

#### Virginia Spiraea Environmental Baseline

Environmental Solutions & Innovations, Inc. 2015. Study Plan: Habitat Assessments and

Surveys for Rare Plants along the Mountain Valley Pipeline Project in Virginia and West Virginia. Report to U.S. Fish and Wildlife Service, West Virginia Field Office, Elkins, WV; U.S. Fish and Wildlife Service, Virginia Field Office, Gloucester, VA; VA Department of Game and Inland Fisheries, Henrico, VA; Department of Conservation and Recreation, Richmond, VA; and West Virginia Division of Natural Resources, Elkins, WV.

Environmental Solutions & Innovations, Inc. 2016. Surveys for Rare Plants along the Mountain Valley Pipeline Project in West Virginia. Report to U.S. Fish and Wildlife Service, West Virginia Field Office, Elkins, WV.

West Virginia Division of Natural Resources. 2011. Federal Assistance Performance Report: Endangered Species (Plants). Project E-2, Segment 24 (1 March 2010 – 28 February 2011) Elkins, WV.

Tennessee Division of Natural Areas (DNA). 2014. Federal Assistance Performance Report: Report on 2013-2014 Population Monitoring for *Spiraea virginiana*. Segment 27

Commented [WVFO2]: Need to find the full citation.

**Events highlighted in yellow are events that were not included in MVP's consultation history.**

#### CONSULTATION HISTORY

10-13-14	The U.S. Fish and Wildlife Service (Service) received an introduction to the Mountain Valley Pipeline Project (Project) from Mountain Valley Pipeline LLC (MVP).
10-30-14	MVP mailed endangered species coordination letter to the Service (Elkins).
11-03-14	MVP submitted a Bat Study Plan to the Service.
11-10-14	MVP met with the Service in Elkins, West Virginia (WV) to formally introduce the Project.
11-13-14	MVP requested a Service review of Information for Planning and Conservation (IPAC) species list.
11-14-14	The Service (Gloucester) requested an official Project review packet.
11-14-14	MVP requested clarification from the Service (Gloucester) regarding the Project review packet.
11-18-14	The Service (Gloucester) concurred with MVP's Project review packet procedure and requested that MVP complete the packet and coordinate with Virginia Department of Game and Inland Fisheries (VDGIF).
11-19-14	The Service (Elkins) provided a list of federal species potentially impacted by the Project.
11-19-14	MVP requested clarification from the Service (Elkins) regarding required surveys for each listed species on the previously provided list.
11-20-14	MVP requested additional comments from the Service (Gloucester) on the Bat Study Plan.
11-25-14	The Service (Elkins) provided federally listed species occurrences in the vicinity of the Project.
11-26-14	The Service (Gloucester) provided MVP with comments on the Bat Study Plan.
03-06-15	MVP requested concurrence from the Service (Elkins) regarding the list of federally listed plant species and proposed survey methods.
03-06-15	MVP submitted the Project Review Package to the Service (Gloucester).
03-06-15	MVP submitted revised the Bat Study Plan to the Service.
04-03-15	The Service (Gloucester) provided formal comments on the Project.

04-06-15 The Service (Elkins) and MVP discussed the Bat Study Plan and past northern long-eared bat (*Myotis septentrionalis*) captures.

04-08-15 The Service (Elkins) and MVP discussed plant surveys.

04-16-15 The Service (Elkins) and MVP discussed distribution of northern long-eared bat buffers and guidance.

04-17-15 The Service received FERC's NOI to prepare an EIS for the MVP Project.

04-24-15 MVP submitted a copy of the revised Bat Study Plan to the Service (Gloucester).

04-27-15 The Service (Elkins) provided formal comments to MVP regarding the Bat Study Plan.

04-29-15 The Service (Elkins) requested that MVP coordinate with West Virginia Division of Natural Resource (WVDNR) botanist regarding the Project.

05-05-15 The Service (Elkins) and MVP discussed additional surveys for bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles.

05-08-15 The Service (Gloucester) concurred with the Bat Study Plan.

05-21-15 MVP requested site-specific bat mist-net authorization from the Service (Elkins) and additional information on locations where eagle nest surveys are required.

06-02-15 The Service (Elkins) requested specifics regarding survey level of efforts for bats.

06-02-15 MVP submitted the bat survey level of effort information to the Service (Elkins).

06-02-15 The Service (Elkins) provided guidance on eagle nest surveys.

06-03-15 MVP submitted the Plant Study Plan to the Service.

06-04-15 The Service (Elkins) concurred with the Bat Study Plan.

06-17-15 The Service (Gloucester) concurred with the Plant Study Plan.

06-28-17 The Service received FERC's Notice of Schedule for Environmental Review of the MVP Project.

06-29-15 The Service (Elkins) concurred with the Plant Study Plan.

07-13-15 The Service (Elkins) concurred with the Mussel Study Plan.

09-09-15 The Service (Gloucester) met with MVP and VDGIF in Richmond, Virginia (VA) regarding the overall project scope and consultation with that agency to date.

09-10-15 The Service (Elkins) met with MVP in Elkins, WV regarding the overall project scope and consultation with that agency to date.

09-17-15	The Service (Gloucester) and MVP discussed Roanoke logperch and butterflies.
10-02-15	ESI provided the Service (Gloucester) with satyr butterfly occurrence records from the Virginia Department of Conservation and Recreation (VDCR) indicating that surveys not required.
10-13-15	MVP submitted its proposed eagle nest survey methods to the Service (Elkins).
11-03-15	The Service (Elkins) concurred with the proposed eagle nest survey methods.
11-13-15	MVP submitted WV-specific bat, plant, and mussel reports to the Service (Elkins).
11-13-15	MVP submitted VA-specific bat, plant, fish, and mussel reports to the Service (Gloucester).
11-13-15	MVP submitted official notification of intent to initiate formal consultation to the Service.
11-23-15	The Service (Elkins) met with MVP to discuss the biological assessment (BA).
12-09-15	The Service (Gloucester) requested updated Project shapefiles and IPAC species list.
12-17-15	MVP provided the Service (Elkins) updated shapefiles.
12-17-15	MVP provided the Service (Gloucester) updated shapefiles and an IPAC species list.
12-30-15	The Service (Elkins) completed reviews of submitted survey reports.
01-08-16	ESI submitted a Listed Bat Detailed Habitat Assessment Report to the Service.
01-08-16	ESI submitted an Eagle Nest Survey Report to the Service (Elkins).
01-11-16	The Service (Elkins) commented on the Eagle Nest Survey Report.
01-11-16	MVP submitted a Bat Portal Search Report to the Service (Elkins).
01-11-16	MVP submitted a draft aquatic species take model to Service (Gloucester) for comment.
01-13-16	MVP submitted a Bat Portal Search Report to the Service (Gloucester).
01-21-16	MVP and the Service (Elkins) discussed report confidentiality.
02-04-16	MVP submitted a Migratory Bird Conservation Plan (MBCP) to the Service.
02-18-16	MVP and the Service (Elkins) discussed review status of the MBCP and other submitted reports.

02-18-16	MVP submitted draft BA to the Service.
03-08-16	The Service (Gloucester) commented on completed listed species surveys.
03-09-16	MVP submitted a Spring Portal Trapping Study Plan to the Service (Elkins).
03-16-16	The Service (Gloucester) and MVP discussed comments regarding completed listed species surveys.
03-21-16	The Service (Elkins) denied spring portal trapping in WV.
03-24-16	The Service (Gloucester) commented on the MBCP.
04-07-16	The Service met with MVP to discuss the draft BA.
04-07-16	The Service (Elkins) commented on the draft BA.
04-22-16	MVP submitted the Little Kanawha River Mussel Survey Study Plan to the Service (Elkins).
05-19-16	MVP requested guidance from the Service (Gloucester) on methods to estimate Roanoke logperch abundance.
05-30-16	The Service (Elkins) concurred with the Little Kanawha River Mussel Survey Study Plan.
06-13-16	MVP submitted a Bat Mist-Net Report Addendum and an Eagle Nest Survey Report to the Service (Gloucester).
06-24-16	MVP submitted the updated BA to the Service.
07-28-16	MVP submitted the Little Kanawha River Mussel Report to the Service (Elkins).
08-29-16	MVP submitted the Little Kanawha River (Access Road 2) Mussel Survey Study Plan to the Service (Elkins).
09-08-16	The Service (Elkins) concurred with the Little Kanawha (Access Road 2) Mussel Survey Study Plan.
09-12-16	MVP submitted the Little Kanawha River Water Withdrawal Study Plan to the Service (Elkins).
09-16-16	The Service received FERC's Notice of Availability of the Draft EIS for the proposed MVP Project.
09-22-16	The Service (Elkins) commented on the Little Kanawha River Water Withdrawal Study Plan.
09-28-16	The Service received FERC's Draft EIS.



10-14-16 MVP submitted the 2016 VA Mussel Survey Report to the Service (Gloucester).

10-17-16 MVP submitted the 2016 VA Roanoke Logperch Survey Report to the Service (Gloucester).

10-20-16 MVP submitted the updated MBCP to the Service.

10-25-16 MVP submitted the updated BA to the Service.

10-28-16 MVP submitted the Little Kanawha River (Access Road 2) Mussel Survey Report to the Service (Elkins).

11-03-16 The Service (Gloucester) requested Project shapefiles be sent to The Nature Conservancy (TNC).

11-09-16 MVP submitted the 2016 Plant Survey Report to the Service (Elkins).

11-14-16 MVP provided TNC with the Project shapefiles per Service (Gloucester) request.

11-15-16 MVP submitted a Bog Turtle Phase I Habitat Assessment Report to the Service (Gloucester).

11-21-16 MVP submitted the 2016 Plant Survey Report to the Service (Gloucester).

12-02-16 MVP submitted Virginia Project shapefiles to the Service (Gloucester).

12-02-16 ESI submitted the Bat Portal Search and Harp Trap Report to the Service.

12-05-16 MVP submitted West Virginia Project shapefiles to the Service (Gloucester).

12-08-16 The Service met with MVP and ESI to discuss the BA.

12-14-16 MVP sent email to the Service (Gloucester and Elkins) to confirm that the Service would compile comments on the draft BA by December 23 and then those would be provided to MVP. MVP also indicated they were soliciting input for a date that would work to have a meeting regarding the MBCP.

12-19-16 The Service (Gloucester) emailed MVP requesting copies of the Project's Draft Spill Plan, Karst Plan, and Blasting Plan; additional information about stream crossings and associated listed species, if applicable; hydro-testing, water withdrawal, and discharge plans; and GIS shapefiles of action area, which should include the buffer areas.

12-20-16 MVP sent the Service (Gloucester) an email confirming that the gray bat would be included in the BA and requesting guidance on the necessity of including the Virginia big-eared bat.

12-21-16 MVP submitted action area shapefiles to the Service (Gloucester).

12-21-16 The Service discussed the MBCP with MVP.

12-22-16 The Service (Gloucester) provided MVP with example biological opinion (BO) format.

12-22-16 MVP submitted draft Appendix C (Estimate of Take for Federally Listed Species) to the Service (Elkins).

12-22-16 The Service discussed potential mitigation strategies under the Endangered Species Act (ESA) with MVP.

12-23-16 MVP requested input regarding the value of completing aquatic habitat assessments along a stretch of Craig Creek within the Action Area potentially impacted by sediment.

01-04-17 The Service (Gloucester) provided MVP notice of the publishing of the Service's Final Compensatory Mitigation Policy.

01-05-17 MVP requested information from the Service regarding mitigation.

01-06-17 MVP provided the Service with copies of the Draft Spill Plan, Karst Plan, Blasting Plan, Karst Hazards Assessment, and hydrostatic testing water withdrawal and discharge plans. MVP also provided additional information regarding stream crossings and associated listed species.

01-06-17 MVP and the Service (Gloucester) discussed additional stream analysis, mitigation updates, Virginia big-eared bats, and the status of comments on the BA, and the example BO format.

01-06-17 The Service (Gloucester) emailed MVP regarding rusty patched bumble bee area of influence for Project review in Virginia.

01-10-17 The Service (Gloucester) requested the inclusion of the Virginia big-eared bat in the BA.

01-10-17 The Service (Gloucester) informed MVP it was not ready to discuss mitigation for the Project.

01-11-17 The Service (Gloucester) and MVP discussed the general approach to mitigation, the fact that the Service expected mitigation for bats and Roanoke logperch in the BA, and the fact that the Service (Gloucester) was deferring to the Commonwealth of Virginia for migratory birds.

01-12-17 The Service (Gloucester) and MVP discussed the rusty patched bumble bee and how to address the species for the Project.

01-17-17 The Service (Elkins) provided information regarding rusty patched bumble bee surveys for 2017 and proactive conservation measures.

01-18-17 The Service provided comments on the draft BA.

01-19-17 MVP notified the Service (Elkins) of reaching out to regional office for clarification on the rusty patched bumble bee and mitigation.

01-19-17 MVP requested a meeting with the Service (Gloucester) to discuss rusty patched bumble bee and mitigation.

01-23-17 MVP and the Service (Gloucester) discussed meeting topics for scheduled conference call.

01-24-17 MVP and the Service (Gloucester) discussed rusty patched bumble bee mitigation, Agency comments on the BA, and schedule for submission of revised BA to Federal Energy Regulatory Commission (FERC).

01-25-17 The Service (Gloucester) and MVP discussed James spinymussel occurrence record in Craig Creek.

01-25-17 MVP requested clarification from the Service (Gloucester) regarding shapefiles requested in 01-18-17 comments on the BA.

01-26-17 MVP and the Service (Gloucester) discussed rusty patched bumble bee, mitigation, and request for third-party monitors.

01-26-17 MVP requested clarification regarding protective buffers for Indiana and northern long-eared bat hibernacula.

01-26-17 The Service (Gloucester) requested a hydrologic and geologic analysis report.

01-27-17 The Service (Gloucester) provided a response regarding protective buffers for Indiana and northern long-eared bat hibernacula.

02-02-17 MVP notified the Service (Gloucester) that the comment matrix issued by the Service to MVP on 01-18-17 will be filed as part of FERC data response.

02-07-17 MVP submitted a draft report regarding hydrologic and geologic analysis of Canoe and Tawney's caves.

02-09-17 MVP requested clarification from the Service (Elkins) regarding ESA mitigation to be addressed in BA.

02-09-17 MVP and the Service (Gloucester) discussed the hydrologic and geologic analysis, Craig Creek, and ESA mitigation to be addressed in the BA.

02-14-17 MVP presented a hydrologic and geologic analysis for Canoe and Tawney's caves and updated sedimentation information for Craig Creek to the Service (Gloucester).

02-15-17 The Service (Gloucester) notified MVP of the rusty patched bumble bee listing rule extension.

02-16-17 MVP requested information from the Service (Gloucester) regarding the rusty patched bumble bee.

02-21-17 The Service (Gloucester) informed MVP that information regarding the rusty patched bumble bee is not yet available.

02-21-17 MVP requested information from the Service (Elkins) regarding gray and Virginia big-eared bat records in proximity to the Project.

02-22-17 MVP submitted Project Limits of Disturbance (LOD) shapefiles to the Service (Elkins).

02-23-17 MVP requested information from the Service regarding non-Project bat captures in proximity to Project that may need to be included in the impacts analysis.

02-24-17 The Service (Gloucester) provided an update to the IPaC area of influence for the rusty patched bumble bee.

02-24-17 MVP requested input from the Service (Gloucester) regarding tree-clearing windows and bat mist-net survey expirations.

02-27-17 MVP and the Service (Elkins) discussed mitigation strategies for the Project.

02-28-17 MVP and the Service (Gloucester) discussed bat mist-net survey expirations in Virginia.

03-06-17 MVP requested input from the Service (Elkins) on how to address remaining plant surveys in West Virginia within the BA.

03-08-17 MVP and the Service (Elkins) discussed remaining plant surveys within West Virginia. The Agency (Elkins) suggested assuming presence of plants in question within the BA until more information can be provided by the Regional Director.

03-09-17 The Service (Elkins) requested a meeting with the MVP to discuss migratory bird and forest mitigation.

03-13-17 The Service (Gloucester) discussed supplemental information to the BA and setting up a meeting to discuss migratory bird and forest mitigation.

03-14-17 The Service (Gloucester) requested a meeting to discuss MVP's mitigation model.

03-14-17 MVP confirmed a meeting to discuss MVP's mitigation model.

03-14-17 MVP submitted Draft BA to FERC and the Service.

03-16-17 The Service (Gloucester) requested information about the buffer around Canoe Cave.

03-16-17 MVP confirmed the agenda for upcoming meeting to discuss the MBCP and MVP's mitigation model.

03-17-17 The Service (Gloucester) requested a copy of the revised BA, responses to comments, candy darter, and request to include Elkins and The TNC in meeting scheduled for 03-23-17.

03-20-17 The Service (Gloucester) provided contact information for TNC.

03-20-17 MVP provided track changes version of revised BA, responses to comments in matrix, shapefiles of areas not surveyed, shapefiles of mainline valve locations, update on supplemental information to the BA, update on hydrologic and geologic analysis information, Karst Specialist Team list, Water Resources Identification and Testing Plan, update on alternatives analysis for stream crossing methods, and update on candy darter.

03-20-17 MVP requested clarification regarding question about buffer around Canoe Cave.

03-23-17 MVP, the Service, and TNC met to discuss MVP's mitigation model, summary of revisions in BA, and updates to MBCP.

03-23-17 The Service (Gloucester) requested coordination with landowner regarding buffer around Canoe Cave.

03-30-17 The Service (Gloucester) requested copy of presentation from 03-23-17 meeting.

03-30-17 The Service (Gloucester) stated that MVP should coordinate migratory bird mitigation with the Commonwealth of Virginia.

03-31-17 MVP provided the Service with a copy of presentation from 03-23-17 meeting.

03-31-17 MVP provided the Service (Gloucester) with shapefiles for proposed route.

03-31-17 The Service received FERC's Notice of Revised Schedule for Environmental Review of the MVP Project.

04-03-17 MVP requested the landowner accommodate a site visit to confirm entrance location of Canoe Cave.

04-03-17 The Service (Gloucester) requested updates on information provided in January.

04-05-17 MVP provided the Service (Gloucester) with updates to information provided in January, including WV Spill Prevention, Control, and Countermeasure (SPCC) Plan, VA SPCC Plan, Karst Mitigation Plan, Draft Blasting Plan, stream crossing table, and hydrostatic testing plans.

04-07-17 MVP provided the Service (Elkins) with the survey results for the 2016 Bald Eagle Nest Surveys in WV.

04-10-17 The Service received FERC's Administrative Draft FEIS.

04-13-17 MVP provided update on request for landowner to accommodate a site visit to confirm the entrance location of Canoe Cave.

04-19-17 MVP requested an update on the BA schedule and requested a meeting to discuss avian surveys.

04-19-17 MVP provided specific questions regarding avian surveys.

04-26-17 MVP and the Service (Gloucester) discussed the BA schedule and avian surveys.

04-27-17	MVP and the Service discussed mitigation.
05-02-17	MVP provided an update on the entrance location of Canoe Cave.
05-03-17	The Service had a conference call with FERC to discuss comments on the BA.
05-08-17	MVP and the Service (Gloucester and Elkins) discussed the Service's comments on the BA.
05-08-17	MVP requested additional information regarding site-specific blasting plans.
05-10-17	MVP filed the updated MBCP.
05-16-17	Service received MVP's Final MBCP.
05-18-17	MVP filed responses to comments received on the BA.
05-22-17	MVP provided electronic copies of the MBCP and responses to comments received on the BA.
06-22-17	MVP provided specific questions regarding preparation of a conference BA.
06-23-17	The Service received FERC's Notice of Availability of the Final EIS for the MVP Project.
06-27-17	The Service (Gloucester) provided responses to conference BA questions.
06-28-17	MVP and the Service (Gloucester) discussed plant avoidance and minimization measures, voluntary conservation measures, BO schedule, and conference BA questions.
06-28-17	MVP provided information regarding potential Roanoke River restoration project.
07-05-17	Service received FERC's Final EIS for the MVP Project.
07-10-17	MVP provided locations for MVP proposed riparian restoration locations.
07-10-17	The FERC submitted the BA and requested initiation of formal consultation.
07-14-17	MVP and the Service (Gloucester) discussed supplemental information to the BA in support of formal consultation.
07-19-17	MVP provided agenda and proposed plant avoidance and minimization measures for discussion during upcoming meeting.
07-20-17	MVP and the Service (Gloucester and Elkins) discussed plant avoidance and minimization measures, voluntary conservation measures, BO schedule, and conference BA questions.
07-21-17	MVP provided shape files for remaining plant survey areas.

- 07-27-17      The Service received Supplemental Information to the BA from MVP.
- 08-02-17      MVP provided the Service with an updated plant survey report.
- 08-04-17      The Service submitted a letter to FERC initiating formal consultation.
- 09-05-17      The Service received MVP's Upland Forest Impact Assessment and Voluntary Mitigation Plan.
- 09-07-17      The Service received the Analysis of Comments by VA Dept. of Conservation and Recreation on MVP's Forest Impact Analysis.
- 09-08-17      The Service sent a letter to FERC regarding MVP's Final MBCP.
- 09-27-17      MVP provided the Service with updated information on a new portal found in Nicholas County, WV.

## OR

A detailed project history starting from 2014, when the Service was first approached regarding the potential construction of the Mountain Valley Pipeline Project, through July 21, 2017, is provided in the July 27, 2017, Supplemental Information to the BA and is incorporated here by reference. Additional recent key events, and events that were not included in the Supplemental Information to the BA document, are outlined below. The Service, FERC, WVDNR, VADCR, EQT, and EQT's consultants have routinely communicated informally throughout this consultation process.

- 04-17-15      The Service received FERC's NOI to prepare an EIS for the MVP Project.
- 06-28-17      The Service received FERC's Notice of Schedule for Environmental Review of the MVP Project.
- 09-16-16      The Service received FERC's Notice of Availability of the Draft EIS for the proposed MVP Project.
- 09-28-16      The Service received FERC's Draft EIS.
- 03-31-17      The Service received FERC's Notice of Revised Schedule for Environmental Review of the MVP Project.
- 04-07-17      MVP provided the Service (Elkins) with the survey results for the 2016 Bald Eagle Nest Surveys in WV.
- 04-10-17      The Service received FERC's Administrative Draft FEIS.
- 05-03-17      The Service had a conference call with FERC to discuss comments on the BA.



05-16-17	Service received MVP's Final MBCP.
06-23-17	The Service received FERC's Notice of Availability of the Final EIS for the MVP Project.
07-05-17	The Service received FERC's Final EIS for the MVP Project.
07-10-17	The FERC submitted the BA and requested initiation of formal consultation.
07-27-17	The Service received Supplemental Information to the BA from MVP.
08-02-17	MVP provided the Service with an updated plant survey report.
08-04-17	The Service submitted a letter to FERC initiating formal consultation.
09-05-17	The Service received MVP's Upland Forest Impact Assessment and Voluntary Mitigation Plan.
09-07-17	The Service received the Analysis of Comments by VA Dept. of Conservation and Recreation on MVP's Forest Impact Analysis.
09-08-17	The Service sent a letter to FERC regarding MVP's Final Migratory Bird Conservation Plan.
09-27-17	MVP provided the Service with updated information on a new portal found in Nicholas County, WV.

## VIRGINIA SPIRAEA

### STATUS OF THE SPECIES

As described in Service (1992) VASP conservation needs include preserving existing populations by minimizing human disturbance and controlling invasive species. Currently, as a whole, the range-wide status of the species is stable (Service 2008). From 1992-2007, population numbers in WV remained stable (Service 2008). The primary factors influencing the status include risks posed by a limited range with increasing amounts of fragmentation, a lack of genetic variation, a lack of natural succession in the habitat, invasive species, application of herbicides, and disturbance by humans leading to “changes in hydrology by impoundment and by impact from recreational use, hydroelectric facilities, and run-off debris” (NatureServe 2016).

VASP is a clonal shrub of the rose family and was listed as threatened in 1990. It can be found among large boulders, flatrock, and flood debris along scoured streamsides and rivers, as well as roadside wet areas and wet marshy meadows. VASP requires periodic flood scouring to eliminate taller woody competitors and to create river-wash deposits and early successional habitats.

For a more detailed account of the species description, life history, population dynamics, threats, and conservation needs, refer to: <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=Q2R1>.

### ENVIRONMENTAL BASELINE

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated and/or ongoing impacts of all proposed federal projects in the action area that have undergone Section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress.

#### Status of the Species within the Action Area

The proposed action crosses portions of the Gauley, Greenbrier, and Meadow rivers in Nicholas and Summers Counties WV, which are known to provide habitat for VASP. Field surveys were completed by a Service approved plant surveyor in areas near these rivers using a pedestrian-meander search technique across the 300ft wide environmental study corridor (ESI 2015). A presence/probable absence survey for VASP was performed from August 5 - 12, 2015, in Summers and Nicholas Counties, yielding no individuals (ESI 2016). A total of 3.64 acres along 0.14 miles were surveyed during these efforts.

Due to restricted land access, a total of 2.30 acres within the proposed project workspace in Summers County, within close proximity to the Greenbrier River, was not surveyed. Absent valid surveys, the Service must use the best available scientific data in a reasonable worst case scenario to insure that any possible impacts are properly considered in the effects analysis. In areas where VASP surveys were completed along the proposed project, no plants were found and

the habitat was either characterized as unsuitable or not optimal for VASP. However, it is reasonable to assume presence here because the Service was able to identify areas of potentially suitable habitat for VASP within the proposed project workspace, using the National Wetlands Inventory (NWI) maps. Thus, for the purposes of this analysis, presence of VASP is assumed within the unsurveyed area.

**Commented [WVFO1]:** Waiting to hear back from ESI to determine if this is true. The plant surveyor verbally stated this but I need to confirm it with their data sheets.

### Greenbrier River Population

There are 3 documented occurrences of VASP on the Greenbrier River. Two are in close proximity to each other, and were last surveyed in 2017<sup>1</sup>, and the other is located 11 miles downstream, and was surveyed in 2015 (J.J. Hajenga, WVDNR, phone call to T. Lennon, Service, October 10, 2017). For the purposes of this analysis we will refer to these 3 occurrences as the Greenbrier River population. Monitoring reports provided by the WVDNR indicate that the Greenbrier River population is stable and within the natural range of fluctuation (WVDNR 2011).

In order to estimate the coverage of VASP within the unsurveyed area, the Service compiled VASP data from existing occurrences along the Greenbrier River and averaged the data together to make a reasonable assumption regarding VASP coverage. Furthermore, since VASP is a riparian/wetland species that occurs along rivers, streams, and wetlands, the Service assumes that VASP is mostly likely to inhabit areas along a 288.6 linear ft reach of stream that overlaps with the proposed project workspace (Figure X).

Figure X. Unserved area and likely suitable habitat within the proposed project workspace.



<sup>1</sup> The 2017 survey applied a different survey method than the 1996 -2010 surveys. WV has recently modified their survey method to be more consistent with other states, which makes the recently collected data difficult to compare to previous years. The stem count method was performed on these 2 occurrences in 2017, instead of the extent of VASP coverage method used in previous years, yielding 137 and 244 stems. Based on observations made by the WVDNR, these occurrences appear to be healthy and comparable in size to previous years (P.J. Harmon, WVDNR, email to T. Lennon, Service, October 11, 2017; J.J. Hajenga, WVDNR, phone call to T. Lennon, Service, October 10, 2017). For the reasons described above, the Service has elected to not use 2017 survey data to estimate VASP coverage in the unsurveyed area.

The extent of the site was used in this Opinion as the best measure for VASP coverage (instead of number of stems) because due to the clonal nature and density of some occurrences, it is almost impossible to determine individuals in the field and this type of data was not collected in previous years (DNA 2014). According to the survey data collected at a long-term WVDNR monitoring site on the Greenbrier River, the extent of VASP coverage averaged 221.33m<sup>2</sup> (0.05 acre) over a 14 year period (Table X). Therefore, for the purposes of our analysis, the Service will assume that the extent of VASP coverage within the unsurveyed area will be 0.05 acre.

Table X. Estimated coverage of VASP at a WVDNR monitoring site on the Greenbrier River.

<b>Year</b>	<b>Extent of site (m<sup>2</sup>)</b>
1996	205.31
1997	183.00
2001	226.37
2003	226.37
2005	233.07
2007	237.61
2010	237.61
<b>Average</b>	<b>221.33</b>

All VASP occurrences along the Greenbrier River are on private land (J.J. Hajenga, WVDNR, email to T. Lennon, Service, October 10, 2017) and we are not aware of specific activities that have occurred that adversely affect the species. However, because most occurrences of VASP are located on or near the edge of the river, they have likely received some type of occasional disturbance. Potential threats within the action area may include: invasive species, such as Japanese knotweed and purple loosestrife that compete with VASP; or changes in water flow regimes from weather related factors; or construction of boat docks or other streambank modifications. All of these potential threats may affect the amount of habitat available for the species along the streambanks in the action area (Service 2008).

#### EFFECTS OF THE ACTION

Direct effects are the direct or immediate effects of the project on the species, its habitat, or designated/proposed critical habitat. Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. Direct and indirect effects of the proposed action along with the effects of interrelated/interdependent activities are all considered together as the “effects of the action.”

To standardize the effects analysis, the proposed action was divided into discrete actions described as subactivities. Defining subactivities allows for easier interpretation and consideration of complex activities. The project subactivities are defined in the species effects tables (Appendix X Tables 1-X).

The potential effects of the proposed action are described in Appendix X Table X. The project subactivities unlikely to result in any impacts to VASP are described in Appendix X Table X; NE subactivities. Most of these subactivities are not expected to occur in VASP habitat. For example, upland areas are not VASP habitat and thus, activities in those areas will not directly affect the species. Vegetation management, inspection activities, vegetation disposal, compression facility noise, and telecommunications equipment operation in these upland areas would have no effect on VASP. For those subactivities of the proposed action that are determined to result in NE to VASP, there will be no further discussion in this Opinion.

The project subactivities that may affect, but are NLAA, VASP are described in Appendix X Table X; NLAA subactivities. Most of these subactivities will occur after the primary impacts have occurred from the original clearing and construction of the project. Tree trimming, mowing, ROW repair, regrading, and revegetation would have discountable effects on VASP because these subactivities are occurring in areas that have already been disturbed by construction or are occurring in areas where the habitat has been rendered unsuitable. For those subactivities of the proposed action that are determined NLAA VASP, there will be no further discussion in this Opinion.

There are other subactivities of the project that are LAA VASP where the species is assumed to be present (Appendix X Table X; LAA subactivities). The type and magnitude of these impacts are discussed below. For some components of the proposed action that may affect VASP, AMMs have been incorporated to ameliorate those effects and those are also noted in Appendix X Table X. These subactivities are LAA VASP by physically impacting individual plants and/or altering or degrading its habitat.

The project will directly impact 0.05 acres of presumed, occupied habitat within the 2.30 acre unsurveyed proposed project workspace. The subactivities completed in VASP habitat will result in direct and indirect impacts to the exposed individuals. Ground disturbance subactivities related to grading, graveling, grubbing, increased foot and vehicle traffic, vegetation and tree clearing, stream and wetland crossings, and trenching (for temporary access roads, temporary workspaces, and the pipeline ROW) will kill VASP plants and seeds (Appendix X Table X). Conducting these activities in areas of suitable habitat may alter/degrade the habitat in such a way that the reestablishment of VASP post-construction is not likely. Additionally, the placement of fill and gravel will cause permanent habitat loss in all areas permanently maintained by MVP. The effects from these activities will likely result in the removal of the entire VASP occurrence (0.05 acre) assumed to be present within the unsurveyed area.

Direct impacts may cause individuals to experience decreased reproductive success (e.g., from minor physical damage, competition with introduced invasive species, or habitat disturbance) to death (e.g., from crushing, cutting, digging up, burying, or soil compaction). These direct impacts to VASP would occur primarily from the installation of pipeline and building of new access roads across occupied habitat. In-stream work and stream and wetland crossings may cause sedimentation that may bury plants and alter hydrology on-site resulting in unsuitable VASP habitat. Individuals may suffer decreased fitness resulting from indirect effects, such as introduction of invasive exotic plant competitors. Activities involving heavy equipment and machinery in or near species habitat may spread seeds of invasive exotic plant species.

MVP has incorporated a number of conservation measures into the project that should minimize the extent and significance of the adverse effects on VASP, if VASP is not located immediately within the proposed project workspace. These measures include: implementing sediment and erosion control measures during and after construction; ensuring restoration of pre-existing topographic contours after any ground disturbance; restoring native vegetation (where possible); developing plans and procedures for invasive species management; expediting construction within any waterbody, effectively reducing disturbance to the streambed and adjacent soils and the quantity of suspended sediments; prohibiting construction equipment, vehicles, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products from being parked, stored, or serviced within a 100 ft radius of any wetland or waterbody; and avoiding the use of herbicides and pesticides to maintain any portion of the project ROW. Furthermore, if VASP is found within the project workspace MVP has committed to relocate individuals outside of the affected area in coordination with the Service.

## **CUMULATIVE EFFECTS**

Cumulative effects are those “effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area” considered in this Opinion (50 CFR 402.02).

The Service is not aware of any future state, tribal, local, or private actions that are reasonably certain to occur within the action area at this time; therefore, no cumulative effects are anticipated.

## **JEOPARDY ANALYSIS**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on 4 components: (1) Status of the Species, (2) Environmental Baseline, (3) Effects of the Action, and (4) Cumulative Effects. The jeopardy analysis in this Opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. It is within this context that we evaluate the significance of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

### **Analysis for Jeopardy**

*Impacts to Individuals* – The proposed action includes ground disturbance, vegetation and tree clearing, and stream and wetland crossing subactivities. As discussed in the Effects of the Action, potential effects of the action include effects to VASP present within the action area year-around during construction. Effects generally include decreased fitness and reproductive success or death of individual VASP due to degradation and loss of VASP habitat caused by soil compaction, altered hydrology, sedimentation, and competition. Additionally, these activities may permanently alter and degrade habitat such that conditions are no longer favorable for VASP re-establishment. The conservation measures listed in the Effects of the Action will minimize the potential effects from sedimentation during construction and restoration and competition from invasive exotic plants. In summary, there will be impacts to individual VASP survival and fitness.

*Impacts to Populations* – As we have concluded that individual VASP are likely to experience mortality due to the proposed action, we need to assess the aggregated consequences of the anticipated losses of the exposed individuals on the populations to which these individuals belong.

We expect that the population level impacts from injury, death, and decreased fitness and reproductive success to VASP will be relatively small because the proposed action affects a small number of individuals in 1 occurrence of VASP (estimated to be 0.05 acre in size) near the Greenbrier River, which is a fraction of the number of occurrences that make up the Greenbrier River population and overall populations. The Greenbrier River population consists of 3 occurrences, not including the 0.05 acre for which presence is being assumed. Furthermore, Service (2008) estimates that there are 109 occurrences of VASP in WV and 236 occurrences throughout the range of the species, which means that 0.9% of the WV occurrences and 0.4% of the overall occurrences range-wide will be affected by the proposed project.

Following completion of each action that results in adverse effects to VASP, we expect that the Greenbrier River population, given no other major stressors, will recover. The effects of the proposed action are expected to be primarily temporary and in time VASP habitat should recover, providing favorable conditions for VASP re-establishment. Additionally, if MVP's relocation efforts are successful we anticipate that the number of VASP stems relocated will increase over time. Therefore, we conclude that the effects from the proposed action do not pose a significant risk to VASP and will not result in permanent population declines.

*Impacts to Species* – As we have concluded that populations of VASP are unlikely to experience reductions in their fitness, there will be no harmful effects (i.e., there will be no reduction in RND) on the species as a whole.

## **CONCLUSION**

We considered the current overall stable status of VASP and the similar condition of the species within the action area (environmental baseline). We then assessed the effects of the proposed action and the potential for cumulative effects in the action area on individuals, populations, and the species as a whole. These types of effects of the proposed action are currently considered primary factors influencing the status of the species. While they may temporarily compound



those factors in a very minor, inconsequential way for a small percentage of plants, as stated above, we do not anticipate any reductions in the overall RND of VASP. It is the Service's Opinion that authorization to construct and operate the pipeline, as proposed, is not likely to jeopardize the continued existence of VASP.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- Conduct surveys for VASP in areas where landowner access was denied, and suitable habitat is present, prior to construction.
- Relocate plants outside of the affected area. Dig the plants out by hand prior to the construction and move them to a safe location during construction. After the project is complete, the plants and any propagules should be planted in areas where they are most likely to thrive.
- Monitor any documented occurrences of VASP within and adjacent to the action area and conduct surveys to locate additional populations.
- Permanently protect habitat for the Greenbrier River population to further the recovery of the species.
- Contribute towards research efforts for breeding ecology (seed viability/pollinators/compatibility) and genetic diversity.
- Develop a site specific exotic/invasive species management plan to be implemented at sites occupied by VASP, as these activities will provide recovery benefits for this species.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

### LITERATURE CITED

#### Virginia Spiraea Status of the Species

U.S. Fish and Wildlife Service. 1992. Virginia spiraea (*Spiraea virginiana* Britton) recovery plan. Newton Corner, MA.

U.S. Fish and Wildlife Service. 2011. Virginia spiraea (*Spiraea virginiana*) draft 5-year review: summary and evaluation. Virginia Field Office, Gloucester, VA.

NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>.

#### Virginia Spiraea Environmental Baseline

Environmental Solutions & Innovations, Inc. 2015. Study Plan: Habitat Assessments and

Surveys for Rare Plants along the Mountain Valley Pipeline Project in Virginia and West Virginia. Report to U.S. Fish and Wildlife Service, West Virginia Field Office, Elkins, WV; U.S. Fish and Wildlife Service, Virginia Field Office, Gloucester, VA; VA Department of Game and Inland Fisheries, Henrico, VA; Department of Conservation and Recreation, Richmond, VA; and West Virginia Division of Natural Resources, Elkins, WV.

Environmental Solutions & Innovations, Inc. 2016. Surveys for Rare Plants along the Mountain Valley Pipeline Project in West Virginia. Report to U.S. Fish and Wildlife Service, West Virginia Field Office, Elkins, WV.

West Virginia Division of Natural Resources. 2011. Federal Assistance Performance Report: Endangered Species (Plants). Project E-2, Segment 24 (1 March 2010 – 28 February 2011) Elkins, WV.

Tennessee Division of Natural Areas (DNA). 2014. Federal Assistance Performance Report: Report on 2013-2014 Population Monitoring for *Spiraea virginiana*. Segment 27

**Commented [WVFO2]:** Need to find the full citation.

Table 2. Analysis of effects on Virginia spiraea.

Pipeline Activity	Subactivity	Environmental Impact or Threat	Stressor	Stressor Pathway (optional)	Exposure (Resource Affected)	Range of Response	Conservation Need Affected	Demographic Consequences	NE, NLAA or LAA	Comments
New Disturbance - Construction	Vehicle Operation and Foot Traffic	physical impacts to individuals, habitat alteration and/or degradation	crushing, soil compaction	vehicles	habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Clearing - herbaceous vegetation and ground cover	physical impacts to individuals, habitat alteration and/or degradation	burying, soil compaction, introduction of invasive species, cutting, digging up, and crushing		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Clearing - trees and shrubs	physical impacts to individuals, habitat alteration and/or degradation	crushing, burying, digging up, cutting		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	This could result in the direct removal of VASP plants or alter the habitat so that it is no longer suitable for VASP.
New Disturbance - Construction	Vegetation Disposal (upland) - dragging, chipping, hauling, piling, stacking	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
New Disturbance - Construction	Vegetation Disposal (upland) - brush pile burning	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
New Disturbance - Construction	Vegetation Clearing - tree side trimming by bucket truck or helicopter	habitat alteration and/or degradation	altered sunlight	NA	NA	discountable - beneficial	NA	NA	NLAA	Primary impacts will occur from the original clearing of the ROW. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
New Disturbance - Construction	Grading, erosion control devices	physical impacts to individuals, habitat alteration and/or degradation, temporary loss of habitat	crushing, burying, cutting roots		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Trenching (digging, blasting, dewatering, open trench, sedimentation)	physical impacts to individuals, habitat alteration and/or degradation, temporary loss of habitat	crushing, burying, cutting roots		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Pipe Stringing - bending, welding, coating, padding and backfilling	neutral	none	NA	NA	NA	NA	NA	NE	This activity will occur in areas that have already been disturbed. No additional impacts after clearing, grading, and trenching.
New Disturbance - Construction	Hydrostatic Testing (water withdrawal and discharge), new line	neutral	none	NA	NA	NA	NA	NA	NE	The water used during hydrostatic testing will be stored, if necessary, at the discharge location. The discharge location is on the other side of the river, in an upland area not suitable for VASP.
New Disturbance - Construction	Regrading and Stabilization - restoration of corridor	neutral	none	NA	NA	NA	NA	NA	NE	This activity will occur in areas that have already been disturbed. No additional impacts after clearing, grading, and trenching.
New Disturbance - Construction	Facilities - noise, lights	neutral	none	NA	NA	NA	NA	NA	NE	No impacts to this species are anticipated from this action.
New Disturbance - Construction	Access Roads - upgrading existing roads, new roads temp and permanent - grading, graveling	physical impacts to individuals, habitat alteration and/or degradation, temporary or permanent loss of habitat	crushing, changes in hydrology, contaminants, burying, digging up		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary access road ROW post-construction.
New Disturbance - Construction	Access Roads - upgrading existing roads, new roads temp and permanent - culvert installation	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance - Construction	Access Roads - upgrading existing roads, new roads temp and permanent- tree trimming and tree removal	habitat alteration and/or degradation	altered sunlight			discountable - beneficial			NLAA	Primary impacts will occur from the original clearing of the temporary access road. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
New Disturbance - Construction	Stream Crossings, flume	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance - Construction	Stream Crossings, dam & pump	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance - Construction	Stream Crossings, cofferdam	neutral	none	NA	NA	NA	NA	NA	NE	Activity not proposed within VASP habitat.
New Disturbance - Construction	Stream Equipment Crossing Structures	habitat alteration and/or degradation	sedimentation, soil compaction	NA	limited to some habitat, population, few to some individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Crossings, wetlands and other water bodies (non-riparian) - clearing	physical impacts to individuals, habitat alteration and/or degradation	burying, soil compaction, introduction of invasive species, cutting and crushing		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Crossings, wetlands and other water bodies (non-riparian) - tree side trimming	habitat alteration and/or degradation	altered sun	NA	NA	discountable - beneficial	NA	NA	NLAA	Primary impacts will occur from the waterbody crossing. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
New Disturbance - Construction	Crossings, wetlands and other water bodies (non-riparian) - grading, trenching, regrading	physical impacts to individuals, habitat alteration and/or degradation	cutting root systems, digging up plants, burying		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
New Disturbance - Construction	Crossings, wetlands and other water bodies (non-riparian) - pipe stringing	neutral	none	NA	NA	NA	NA	NA	NE	This activity will occur in areas that have already been disturbed. No additional impacts after clearing, grading, and trenching.
Operation & Maintenance	Facilities - vehicles, foot traffic, noise	neutral	none	NA	NA	NA	NA	NA	NE	No impacts to this species are anticipated from this action.
Operation & Maintenance	Vegetation Management - mowing	physical impact to individuals	cutting, crushing	NA	NA	discountable	NA	NA	NLAA	Mowing will only be occurring along the permanent ROW, which is outside of the areas containing VASP habitat.
Operation & Maintenance	Vegetation Management - chainsaw and tree clearing	neutral	none	NA	NA	NA	NA	NA	NE	These activities will occur in areas not suitable for VASP.
Operation & Maintenance	Vegetation Management - herbicides - hand, vehicle mounted, aerial applications	neutral	none	NA	NA	NA	NA	NA	NE	Spraying of herbicides will not occur at this site.
Operation & Maintenance	Vegetation Disposal (upland) - dragging, chipping, hauling, piling, stacking	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
Operation & Maintenance	Vegetation Disposal (upland) - brush pile burning	neutral	none	NA	NA	NA	NA	NA	NE	VASP is a riparian/wetland species and is not found in upland areas. No impacts to riparian/wetland habitats are anticipated from this action.
Operation & Maintenance	Vegetation Management - tree side trimming by bucket truck or helicopter	habitat alteration and/or degradation	altered sunlight	NA	NA	discountable - beneficial	NA	NA	NLAA	Primary impacts will occur from the original clearing of the ROW. VASP is not a shade tolerant species; overtopping from arboreal species will eventually eliminate VASP. Therefore, effects from side trimming along the ROW may range from discountable to beneficial over an extended period of time.
Operation & Maintenance	ROW repair, regrading, revegetation (upland) - hand, mechanical	physical impacts to individuals, habitat alteration and/or degradation	sedimentation, chemical contaminants	NA	NA	discountable	NA	NA	NLAA	E&S plans will be used to minimize effects from erosion and sedimentation on-site. No herbicides will be used at this site.
Operation & Maintenance	ROW repair, regrading, revegetation (wetland) - hand, mechanical	physical impacts to individuals, habitat alteration and/or degradation, temporary or permanent loss of habitat	crushing, burying, soil compaction, introduction of invasives	heavy equipment and machinery, imported fill and materials, storm water runoff	habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
Operation & Maintenance	ROW repair, regrading, revegetation - in stream stabilization and/or fill	physical impacts to individuals, habitat alteration and/or degradation, temporary or permanent loss of habitat	crushing, burying, soil compaction, introduction of invasives	heavy equipment and machinery, imported fill and materials, storm water runoff	habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	Will kill VASP plants and seeds. Conducting these activities may alter/degrade suitable habitat (e.g. by changing hydrology, introducing invasive species, compacting soil, sedimentation, etc) and ultimately prevent the reestablishment of VASP in the temporary construction ROW and temporary work space areas post-construction.
Operation & Maintenance	Access Road Maintenance - grading, graveling	neutral	none	NA	NA	NA	NA	NA	NE	Access roads on this site will be temporary and will be restored post-construction.
Operation & Maintenance	Access Road Maintenance - culvert replacement	neutral	none	NA	NA	NA	NA	NA	NE	Access roads on this site will be temporary and will be restored post-construction.
Operation & Maintenance	General Appurtenance and Cathodic Protection Construction - OFF ROW Clearing	physical impacts to individuals, habitat alteration and/or degradation	crushing, burying, soil compaction, introduction of invasives		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	This could result in the direct removal of VASP plants or alter the habitat so that it is no longer suitable for VASP.
Operation & Maintenance	General Appurtenance and Cathodic Protection Construction - trenching, anode, bell hole	physical impacts to individuals, habitat alteration and/or degradation	crushing, burying, soil compaction, chemical contaminants, introduction of invasives		habitat, population, individuals	injury, death	reproduction, nutrition, habitat	numbers, reproduction	LAA	This could result in the direct removal of VASP plants or alter the habitat so that it is no longer suitable for VASP.
Operation & Maintenance	Inspection Activities - ground and aerial	neutral	none	NA	NA	NA	NA	NA	NE	Aerial and ground inspections will have no effect because they will not be occurring in VASP habitat.

**Events highlighted in yellow are events that were not included in MVP's consultation history.**

#### CONSULTATION HISTORY

10-13-14	The U.S. Fish and Wildlife Service (Service) received an introduction to the Mountain Valley Pipeline Project (Project) from Mountain Valley Pipeline LLC (MVP).
10-30-14	MVP mailed endangered species coordination letter to the Service (Elkins).
11-03-14	MVP submitted a Bat Study Plan to the Service.
11-10-14	MVP met with the Service in Elkins, West Virginia (WV) to formally introduce the Project.
11-13-14	MVP requested a Service review of Information for Planning and Conservation (IPAC) species list.
11-14-14	The Service (Gloucester) requested an official Project review packet.
11-14-14	MVP requested clarification from the Service (Gloucester) regarding the Project review packet.
11-18-14	The Service (Gloucester) concurred with MVP's Project review packet procedure and requested that MVP complete the packet and coordinate with Virginia Department of Game and Inland Fisheries (VDGIF).
11-19-14	The Service (Elkins) provided a list of federal species potentially impacted by the Project.
11-19-14	MVP requested clarification from the Service (Elkins) regarding required surveys for each listed species on the previously provided list.
11-20-14	MVP requested additional comments from the Service (Gloucester) on the Bat Study Plan.
11-25-14	The Service (Elkins) provided federally listed species occurrences in the vicinity of the Project.
11-26-14	The Service (Gloucester) provided MVP with comments on the Bat Study Plan.
03-06-15	MVP requested concurrence from the Service (Elkins) regarding the list of federally listed plant species and proposed survey methods.
03-06-15	MVP submitted the Project Review Package to the Service (Gloucester).
03-06-15	MVP submitted revised the Bat Study Plan to the Service.
04-03-15	The Service (Gloucester) provided formal comments on the Project.



04-06-15 The Service (Elkins) and MVP discussed the Bat Study Plan and past northern long-eared bat (*Myotis septentrionalis*) captures.

04-08-15 The Service (Elkins) and MVP discussed plant surveys.

04-16-15 The Service (Elkins) and MVP discussed distribution of northern long-eared bat buffers and guidance.

04-17-15 The Service received FERC's NOI to prepare an EIS for the MVP Project.

04-24-15 MVP submitted a copy of the revised Bat Study Plan to the Service (Gloucester).

04-27-15 The Service (Elkins) provided formal comments to MVP regarding the Bat Study Plan.

04-29-15 The Service (Elkins) requested that MVP coordinate with West Virginia Division of Natural Resource (WVDNR) botanist regarding the Project.

05-05-15 The Service (Elkins) and MVP discussed additional surveys for bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles.

05-08-15 The Service (Gloucester) concurred with the Bat Study Plan.

05-21-15 MVP requested site-specific bat mist-net authorization from the Service (Elkins) and additional information on locations where eagle nest surveys are required.

06-02-15 The Service (Elkins) requested specifics regarding survey level of efforts for bats.

06-02-15 MVP submitted the bat survey level of effort information to the Service (Elkins).

06-02-15 The Service (Elkins) provided guidance on eagle nest surveys.

06-03-15 MVP submitted the Plant Study Plan to the Service.

06-04-15 The Service (Elkins) concurred with the Bat Study Plan.

06-17-15 The Service (Gloucester) concurred with the Plant Study Plan.

06-28-17 The Service received FERC's Notice of Schedule for Environmental Review of the MVP Project.

06-29-15 The Service (Elkins) concurred with the Plant Study Plan.

07-13-15 The Service (Elkins) concurred with the Mussel Study Plan.

09-09-15 The Service (Gloucester) met with MVP and VDGIF in Richmond, Virginia (VA) regarding the overall project scope and consultation with that agency to date.

09-10-15 The Service (Elkins) met with MVP in Elkins, WV regarding the overall project scope and consultation with that agency to date.

09-17-15	The Service (Gloucester) and MVP discussed Roanoke logperch and butterflies.
10-02-15	ESI provided the Service (Gloucester) with satyr butterfly occurrence records from the Virginia Department of Conservation and Recreation (VDCR) indicating that surveys not required.
10-13-15	MVP submitted its proposed eagle nest survey methods to the Service (Elkins).
11-03-15	The Service (Elkins) concurred with the proposed eagle nest survey methods.
11-13-15	MVP submitted WV-specific bat, plant, and mussel reports to the Service (Elkins).
11-13-15	MVP submitted VA-specific bat, plant, fish, and mussel reports to the Service (Gloucester).
11-13-15	MVP submitted official notification of intent to initiate formal consultation to the Service.
11-23-15	The Service (Elkins) met with MVP to discuss the biological assessment (BA).
12-09-15	The Service (Gloucester) requested updated Project shapefiles and IPAC species list.
12-17-15	MVP provided the Service (Elkins) updated shapefiles.
12-17-15	MVP provided the Service (Gloucester) updated shapefiles and an IPAC species list.
12-30-15	The Service (Elkins) completed reviews of submitted survey reports.
01-08-16	ESI submitted a Listed Bat Detailed Habitat Assessment Report to the Service.
01-08-16	ESI submitted an Eagle Nest Survey Report to the Service (Elkins).
01-11-16	The Service (Elkins) commented on the Eagle Nest Survey Report.
01-11-16	MVP submitted a Bat Portal Search Report to the Service (Elkins).
01-11-16	MVP submitted a draft aquatic species take model to Service (Gloucester) for comment.
01-13-16	MVP submitted a Bat Portal Search Report to the Service (Gloucester).
01-21-16	MVP and the Service (Elkins) discussed report confidentiality.
02-04-16	MVP submitted a Migratory Bird Conservation Plan (MBCP) to the Service.
02-18-16	MVP and the Service (Elkins) discussed review status of the MBCP and other submitted reports.

02-18-16	MVP submitted draft BA to the Service.
03-08-16	The Service (Gloucester) commented on completed listed species surveys.
03-09-16	MVP submitted a Spring Portal Trapping Study Plan to the Service (Elkins).
03-16-16	The Service (Gloucester) and MVP discussed comments regarding completed listed species surveys.
03-21-16	The Service (Elkins) denied spring portal trapping in WV.
03-24-16	The Service (Gloucester) commented on the MBCP.
04-07-16	The Service met with MVP to discuss the draft BA.
04-07-16	The Service (Elkins) commented on the draft BA.
04-22-16	MVP submitted the Little Kanawha River Mussel Survey Study Plan to the Service (Elkins).
05-19-16	MVP requested guidance from the Service (Gloucester) on methods to estimate Roanoke logperch abundance.
05-30-16	The Service (Elkins) concurred with the Little Kanawha River Mussel Survey Study Plan.
06-13-16	MVP submitted a Bat Mist-Net Report Addendum and an Eagle Nest Survey Report to the Service (Gloucester).
06-24-16	MVP submitted the updated BA to the Service.
07-28-16	MVP submitted the Little Kanawha River Mussel Report to the Service (Elkins).
08-29-16	MVP submitted the Little Kanawha River (Access Road 2) Mussel Survey Study Plan to the Service (Elkins).
09-08-16	The Service (Elkins) concurred with the Little Kanawha (Access Road 2) Mussel Survey Study Plan.
09-12-16	MVP submitted the Little Kanawha River Water Withdrawal Study Plan to the Service (Elkins).
09-16-16	The Service received FERC's Notice of Availability of the Draft EIS for the proposed MVP Project.
09-22-16	The Service (Elkins) commented on the Little Kanawha River Water Withdrawal Study Plan.
09-28-16	The Service received FERC's Draft EIS.

10-14-16 MVP submitted the 2016 VA Mussel Survey Report to the Service (Gloucester).

10-17-16 MVP submitted the 2016 VA Roanoke Logperch Survey Report to the Service (Gloucester).

10-20-16 MVP submitted the updated MBCP to the Service.

10-25-16 MVP submitted the updated BA to the Service.

10-28-16 MVP submitted the Little Kanawha River (Access Road 2) Mussel Survey Report to the Service (Elkins).

11-03-16 The Service (Gloucester) requested Project shapefiles be sent to The Nature Conservancy (TNC).

11-09-16 MVP submitted the 2016 Plant Survey Report to the Service (Elkins).

11-14-16 MVP provided TNC with the Project shapefiles per Service (Gloucester) request.

11-15-16 MVP submitted a Bog Turtle Phase I Habitat Assessment Report to the Service (Gloucester).

11-21-16 MVP submitted the 2016 Plant Survey Report to the Service (Gloucester).

12-02-16 MVP submitted Virginia Project shapefiles to the Service (Gloucester).

12-02-16 ESI submitted the Bat Portal Search and Harp Trap Report to the Service.

12-05-16 MVP submitted West Virginia Project shapefiles to the Service (Gloucester).

12-08-16 The Service met with MVP and ESI to discuss the BA.

12-14-16 MVP sent email to the Service (Gloucester and Elkins) to confirm that the Service would compile comments on the draft BA by December 23 and then those would be provided to MVP. MVP also indicated they were soliciting input for a date that would work to have a meeting regarding the MBCP.

12-19-16 The Service (Gloucester) emailed MVP requesting copies of the Project's Draft Spill Plan, Karst Plan, and Blasting Plan; additional information about stream crossings and associated listed species, if applicable; hydro-testing, water withdrawal, and discharge plans; and GIS shapefiles of action area, which should include the buffer areas.

12-20-16 MVP sent the Service (Gloucester) an email confirming that the gray bat would be included in the BA and requesting guidance on the necessity of including the Virginia big-eared bat.

12-21-16 MVP submitted action area shapefiles to the Service (Gloucester).

12-21-16 The Service discussed the MBCP with MVP.



12-22-16 The Service (Gloucester) provided MVP with example biological opinion (BO) format.

12-22-16 MVP submitted draft Appendix C (Estimate of Take for Federally Listed Species) to the Service (Elkins).

12-22-16 The Service discussed potential mitigation strategies under the Endangered Species Act (ESA) with MVP.

12-23-16 MVP requested input regarding the value of completing aquatic habitat assessments along a stretch of Craig Creek within the Action Area potentially impacted by sediment.

01-04-17 The Service (Gloucester) provided MVP notice of the publishing of the Service's Final Compensatory Mitigation Policy.

01-05-17 MVP requested information from the Service regarding mitigation.

01-06-17 MVP provided the Service with copies of the Draft Spill Plan, Karst Plan, Blasting Plan, Karst Hazards Assessment, and hydrostatic testing water withdrawal and discharge plans. MVP also provided additional information regarding stream crossings and associated listed species.

01-06-17 MVP and the Service (Gloucester) discussed additional stream analysis, mitigation updates, Virginia big-eared bats, and the status of comments on the BA, and the example BO format.

01-06-17 The Service (Gloucester) emailed MVP regarding rusty patched bumble bee area of influence for Project review in Virginia.

01-10-17 The Service (Gloucester) requested the inclusion of the Virginia big-eared bat in the BA.

01-10-17 The Service (Gloucester) informed MVP it was not ready to discuss mitigation for the Project.

01-11-17 The Service (Gloucester) and MVP discussed the general approach to mitigation, the fact that the Service expected mitigation for bats and Roanoke logperch in the BA, and the fact that the Service (Gloucester) was deferring to the Commonwealth of Virginia for migratory birds.

01-12-17 The Service (Gloucester) and MVP discussed the rusty patched bumble bee and how to address the species for the Project.

01-17-17 The Service (Elkins) provided information regarding rusty patched bumble bee surveys for 2017 and proactive conservation measures.

01-18-17 The Service provided comments on the draft BA.

01-19-17 MVP notified the Service (Elkins) of reaching out to regional office for clarification on the rusty patched bumble bee and mitigation.

01-19-17	MVP requested a meeting with the Service (Gloucester) to discuss rusty patched bumble bee and mitigation.
01-23-17	MVP and the Service (Gloucester) discussed meeting topics for scheduled conference call.
01-24-17	MVP and the Service (Gloucester) discussed rusty patched bumble bee mitigation, Agency comments on the BA, and schedule for submission of revised BA to Federal Energy Regulatory Commission (FERC).
01-25-17	The Service (Gloucester) and MVP discussed James spinymussel occurrence record in Craig Creek.
01-25-17	MVP requested clarification from the Service (Gloucester) regarding shapefiles requested in 01-18-17 comments on the BA.
01-26-17	MVP and the Service (Gloucester) discussed rusty patched bumble bee, mitigation, and request for third-party monitors.
01-26-17	MVP requested clarification regarding protective buffers for Indiana and northern long-eared bat hibernacula.
01-26-17	The Service (Gloucester) requested a hydrologic and geologic analysis report.
01-27-17	The Service (Gloucester) provided a response regarding protective buffers for Indiana and northern long-eared bat hibernacula.
02-02-17	MVP notified the Service (Gloucester) that the comment matrix issued by the Service to MVP on 01-18-17 will be filed as part of FERC data response.
02-07-17	MVP submitted a draft report regarding hydrologic and geologic analysis of Canoe and Tawney's caves.
02-09-17	MVP requested clarification from the Service (Elkins) regarding ESA mitigation to be addressed in BA.
02-09-17	MVP and the Service (Gloucester) discussed the hydrologic and geologic analysis, Craig Creek, and ESA mitigation to be addressed in the BA.
02-14-17	MVP presented a hydrologic and geologic analysis for Canoe and Tawney's caves and updated sedimentation information for Craig Creek to the Service (Gloucester).
02-15-17	The Service (Gloucester) notified MVP of the rusty patched bumble bee listing rule extension.
02-16-17	MVP requested information from the Service (Gloucester) regarding the rusty patched bumble bee.
02-21-17	The Service (Gloucester) informed MVP that information regarding the rusty patched bumble bee is not yet available.

02-21-17 MVP requested information from the Service (Elkins) regarding gray and Virginia big-eared bat records in proximity to the Project.

02-22-17 MVP submitted Project Limits of Disturbance (LOD) shapefiles to the Service (Elkins).

02-23-17 MVP requested information from the Service regarding non-Project bat captures in proximity to Project that may need to be included in the impacts analysis.

02-24-17 The Service (Gloucester) provided an update to the IPaC area of influence for the rusty patched bumble bee.

02-24-17 MVP requested input from the Service (Gloucester) regarding tree-clearing windows and bat mist-net survey expirations.

02-27-17 MVP and the Service (Elkins) discussed mitigation strategies for the Project.

02-28-17 MVP and the Service (Gloucester) discussed bat mist-net survey expirations in Virginia.

03-06-17 MVP requested input from the Service (Elkins) on how to address remaining plant surveys in West Virginia within the BA.

03-08-17 MVP and the Service (Elkins) discussed remaining plant surveys within West Virginia. The Agency (Elkins) suggested assuming presence of plants in question within the BA until more information can be provided by the Regional Director.

03-09-17 The Service (Elkins) requested a meeting with the MVP to discuss migratory bird and forest mitigation.

03-13-17 The Service (Gloucester) discussed supplemental information to the BA and setting up a meeting to discuss migratory bird and forest mitigation.

03-14-17 The Service (Gloucester) requested a meeting to discuss MVP's mitigation model.

03-14-17 MVP confirmed a meeting to discuss MVP's mitigation model.

03-14-17 MVP submitted Draft BA to FERC and the Service.

03-16-17 The Service (Gloucester) requested information about the buffer around Canoe Cave.

03-16-17 MVP confirmed the agenda for upcoming meeting to discuss the MBCP and MVP's mitigation model.

03-17-17 The Service (Gloucester) requested a copy of the revised BA, responses to comments, candy darter, and request to include Elkins and The TNC in meeting scheduled for 03-23-17.

03-20-17 The Service (Gloucester) provided contact information for TNC.

- 03-20-17 MVP provided track changes version of revised BA, responses to comments in matrix, shapefiles of areas not surveyed, shapefiles of mainline valve locations, update on supplemental information to the BA, update on hydrologic and geologic analysis information, Karst Specialist Team list, Water Resources Identification and Testing Plan, update on alternatives analysis for stream crossing methods, and update on candy darter.
- 03-20-17 MVP requested clarification regarding question about buffer around Canoe Cave.
- 03-23-17 MVP, the Service, and TNC met to discuss MVP's mitigation model, summary of revisions in BA, and updates to MBCP.
- 03-23-17 The Service (Gloucester) requested coordination with landowner regarding buffer around Canoe Cave.
- 03-30-17 The Service (Gloucester) requested copy of presentation from 03-23-17 meeting.
- 03-30-17 The Service (Gloucester) stated that MVP should coordinate migratory bird mitigation with the Commonwealth of Virginia.
- 03-31-17 MVP provided the Service with a copy of presentation from 03-23-17 meeting.
- 03-31-17 MVP provided the Service (Gloucester) with shapefiles for proposed route.
- 03-31-17 The Service received FERC's Notice of Revised Schedule for Environmental Review of the MVP Project.
- 04-03-17 MVP requested the landowner accommodate a site visit to confirm entrance location of Canoe Cave.
- 04-03-17 The Service (Gloucester) requested updates on information provided in January.
- 04-05-17 MVP provided the Service (Gloucester) with updates to information provided in January, including WV Spill Prevention, Control, and Countermeasure (SPCC) Plan, VA SPCC Plan, Karst Mitigation Plan, Draft Blasting Plan, stream crossing table, and hydrostatic testing plans.
- 04-07-17 MVP provided the Service (Elkins) with the survey results for the 2016 Bald Eagle Nest Surveys in WV.
- 04-10-17 The Service received FERC's Administrative Draft FEIS.
- 04-13-17 MVP provided update on request for landowner to accommodate a site visit to confirm the entrance location of Canoe Cave.
- 04-19-17 MVP requested an update on the BA schedule and requested a meeting to discuss avian surveys.
- 04-19-17 MVP provided specific questions regarding avian surveys.
- 04-26-17 MVP and the Service (Gloucester) discussed the BA schedule and avian surveys.

04-27-17	MVP and the Service discussed mitigation.
05-02-17	MVP provided an update on the entrance location of Canoe Cave.
05-03-17	The Service had a conference call with FERC to discuss comments on the BA.
05-08-17	MVP and the Service (Gloucester and Elkins) discussed the Service's comments on the BA.
05-08-17	MVP requested additional information regarding site-specific blasting plans.
05-10-17	MVP filed the updated MBCP.
05-16-17	Service received MVP's Final MBCP.
05-18-17	MVP filed responses to comments received on the BA.
05-22-17	MVP provided electronic copies of the MBCP and responses to comments received on the BA.
06-22-17	MVP provided specific questions regarding preparation of a conference BA.
06-23-17	The Service received FERC's Notice of Availability of the Final EIS for the MVP Project.
06-27-17	The Service (Gloucester) provided responses to conference BA questions.
06-28-17	MVP and the Service (Gloucester) discussed plant avoidance and minimization measures, voluntary conservation measures, BO schedule, and conference BA questions.
06-28-17	MVP provided information regarding potential Roanoke River restoration project.
07-05-17	Service received FERC's Final EIS for the MVP Project.
07-10-17	MVP provided locations for MVP proposed riparian restoration locations.
07-10-17	The FERC submitted the BA and requested initiation of formal consultation.
07-14-17	MVP and the Service (Gloucester) discussed supplemental information to the BA in support of formal consultation.
07-19-17	MVP provided agenda and proposed plant avoidance and minimization measures for discussion during upcoming meeting.
07-20-17	MVP and the Service (Gloucester and Elkins) discussed plant avoidance and minimization measures, voluntary conservation measures, BO schedule, and conference BA questions.
07-21-17	MVP provided shape files for remaining plant survey areas.

- 07-27-17      The Service received Supplemental Information to the BA from MVP.
- 08-02-17      MVP provided the Service with an updated plant survey report.
- 08-04-17      The Service submitted a letter to FERC initiating formal consultation.
- 09-05-17      The Service received MVP's Upland Forest Impact Assessment and Voluntary Mitigation Plan.
- 09-07-17      The Service received the Analysis of Comments by VA Dept. of Conservation and Recreation on MVP's Forest Impact Analysis.
- 09-08-17      The Service sent a letter to FERC regarding MVP's Final MBCP.
- 09-27-17      MVP provided the Service with updated information on a new portal found in Nicholas County, WV.

## OR

A detailed project history starting from 2014, when the Service was first approached regarding the potential construction of the Mountain Valley Pipeline Project, through July 21, 2017, is provided in the July 27, 2017, Supplemental Information to the BA and is incorporated here by reference. Additional recent key events, and events that were not included in the Supplemental Information to the BA document, are outlined below. The Service, FERC, WVDNR, VADCR, EQT, and EQT's consultants have routinely communicated informally throughout this consultation process.

- 04-17-15      The Service received FERC's NOI to prepare an EIS for the MVP Project.
- 06-28-17      The Service received FERC's Notice of Schedule for Environmental Review of the MVP Project.
- 09-16-16      The Service received FERC's Notice of Availability of the Draft EIS for the proposed MVP Project.
- 09-28-16      The Service received FERC's Draft EIS.
- 03-31-17      The Service received FERC's Notice of Revised Schedule for Environmental Review of the MVP Project.
- 04-07-17      MVP provided the Service (Elkins) with the survey results for the 2016 Bald Eagle Nest Surveys in WV.
- 04-10-17      The Service received FERC's Administrative Draft FEIS.
- 05-03-17      The Service had a conference call with FERC to discuss comments on the BA.

05-16-17	Service received MVP's Final MBCP.
06-23-17	The Service received FERC's Notice of Availability of the Final EIS for the MVP Project.
07-05-17	The Service received FERC's Final EIS for the MVP Project.
07-10-17	The FERC submitted the BA and requested initiation of formal consultation.
07-27-17	The Service received Supplemental Information to the BA from MVP.
08-02-17	MVP provided the Service with an updated plant survey report.
08-04-17	The Service submitted a letter to FERC initiating formal consultation.
09-05-17	The Service received MVP's Upland Forest Impact Assessment and Voluntary Mitigation Plan.
09-07-17	The Service received the Analysis of Comments by VA Dept. of Conservation and Recreation on MVP's Forest Impact Analysis.
09-08-17	The Service sent a letter to FERC regarding MVP's Final Migratory Bird Conservation Plan.
09-27-17	MVP provided the Service with updated information on a new portal found in Nicholas County, WV.