United States Department of Agriculture

Mountain Valley Pipeline and Equitrans Expansion Project

Draft Supplemental Environmental Impact Statement

Jefferson National Forest
September 2020

Forest Service

Bureau of Land Management

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Mountain Valley Pipeline and Equitrans Expansion Project
Draft Supplemental Environmental Impact Statement

Jefferson National Forest; Monroe County, West Virginia; Giles and Montgomery Counties, Virginia

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Cooperating Agency	**USDI Bureau of Land Management**
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Abstract: The Mountain Valley Pipeline (MVP) and Equitrans Expansion Project (EEP) Draft Supplemental Environmental Impact Statement (DSEIS) supplements the June 2017 Federal Energy Regulatory Commission (FERC) Final Environmental Impact Statement (FEIS). The Forest Service, as the lead agency, and the Bureau of Land Management (BLM), as a Federal cooperating agency, have decisions to be made based on a review of the 2017 FEIS.

The purpose for agency action is to respond to a proposal from Mountain Valley, LLC, relating to the MVP and EEP. The proposal seeks approval to construct and operate a buried 42-inch natural gas pipeline across approximately 3.5 miles of the Jefferson National Forest (JNF). A project-specific Forest Plan amendment is required. The Forest Service would provide construction and operation terms and conditions to protect resources and the public interest. Additionally, the proposal requires a right-of-way (ROW) grant, in this case, from the BLM to cross the JNF. The BLM would review the proposal and issue a decision consistent with the Mineral Leasing Act (MLA). A decision to issue a ROW grant/temporary use permit for a term of 30 years would include terms and conditions. The Forest Service would need to provide concurrence to the BLM prior to the BLM's decision to issue the ROW grant and the permit.

This DSEIS responds to the July 27, 2018 United States Court of Appeals for the Fourth Circuit decision that vacated and remanded the Forest Service's decision approving the JNF's plan amendment. The Court also vacated the BLM's ROW decision and ROW grant/temporary use permit across National Forest System (NFS) lands. The supplemental analysis addresses the issues identified by the Court and any relevant new information and changed circumstances. The DSEIS evaluates the no action and the proposed action alternative.

This project will not be subject to the project level 36 CFR 218 Subparts A and B pre-decisional administrative review process because the responsible official is the Under Secretary of Agriculture, Natural Resources and Environment (36 CFR 218.13(b)).

The 45-day comment period would begin following the publication of the Environmental Protection Agency's Notice of Availability for the DSEIS in the *Federal Register*. It is important that reviewers provide their comments at such times and in such a way that they are useful to the Agency's preparation of the Final Supplemental Environmental Impact Statement. Therefore, comments should be provided in writing prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. The submission of timely and specific written comments can affect a reviewer's ability to participate in subsequent administrative review or judicial review. Comments received in response to this solicitation, including names and addresses of those who comment, would be part of the public record for this proposed action. Comments submitted anonymously would be accepted and considered; however, anonymous comments would not provide the respondent with standing to participate in subsequent administrative or judicial reviews.

Send Written Comments to:	**Jim Hubbard, Under Secretary** **U.S. Department of Agriculture** **c/o Jefferson National Forest** **MVP Project** **5162 Valleypointe Parkway** **Roanoke, VA 24019**
Send Electronic Comments to:	https://cara.ecosystem-management.org/Public//CommentInput?Project=50036
Comments Must be Received:	**Midnight, Eastern Standard Time on November 2, 2020**

Summary

The Forest Service, and the Bureau of Land Management (BLM) as a cooperating agency, prepared this draft supplemental environmental impact statement (DSEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations[1]. According to Title 40 of the Code of Federal Regulations (CFR) § 1502.9(c)(1)(ii), a supplemental environmental impact statement (SEIS) shall be prepared if: (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to concerns and bearing on the proposed action or its effects. This DSEIS supplements the June 2017 Federal Energy Regulatory Commission's (FERC) Mountain Valley Project and Equitrans Expansion Project Final Environmental Impact Statement (FERC FEIS).

Background

The Mountain Valley Pipeline (MVP) is a proposed 303.5-mile interstate natural gas pipeline that would cross about 3.5 miles of the Jefferson National Forest (JNF), in Monroe County, West Virginia and Giles and Montgomery counties, Virginia. The Forest Service and BLM participated as cooperating agencies with the FERC in the preparation of the FERC FEIS. On June 29, 2017, the Notice of Availability for the FERC FEIS and the Forest Service Draft Record of Decision for the Mountain Valley Project Land and Resource Management Plan Amendment was published in the *Federal Register*.

On December 1, 2017, the Forest Service adopted the FERC FEIS and a Record of Decision (ROD) was signed by the JNF Forest Supervisor (Forest Service 2017). The ROD amended the January 2004 Jefferson National Forest Revised Land and Resource Management Plan (Forest Plan) to modify certain Forest Plan standards that precluded the use of standard pipeline construction methods for the MVP. The ROD included resource protection terms and conditions that would condition the Forest Service's concurrence to the project, should BLM decide to grant a right-of-way (ROW).

Project implementation began in December 2017 and continued until July 27, 2018, when the United States Court of Appeals for the Fourth Circuit (Fourth Circuit or the Court) vacated and remanded the Forest Service's decision approving the Forest Plan amendment based on violations of the National Forest Management Act (NFMA) and NEPA. The court vacated BLM's Mineral Leasing Act (MLA) ROW decision for the portion through National Forest System (NFS) lands based on violations of MLA.

On May 1, 2020, Mountain Valley Pipeline, LLC (Mountain Valley) submitted a revised MLA ROW application to the BLM seeking to construct and operate the natural gas pipeline across the JNF. Mountain Valley also requested that the Forest Service amend the Forest Plan consistent

[1] On September 14, 2020, the Council on Environmental Quality's (CEQ) revised NEPA regulations became effective (see 85 FR 43304). Those regulations apply to NEPA processes begun after September 14, 2020 (40 CFR 1506.13). While agencies may apply CEQ's revised regulations to ongoing activities and environmental documents begun before September 14, 2020, the Forest Service has elected to complete this NEPA process using the prior regulations, recognizing that where existing agency NEPA procedures are inconsistent with CEQ's revised regulations, CEQ's revised regulations govern unless there is a clear and fundamental conflict with the requirements of another statute.

with the issues identified by the Court. On May 28, 2020, the BLM deemed Mountain Valley's revised application complete.

Purpose and Need

The Forest Service's purpose and need for action is to respond to a proposal from Mountain Valley to construct and operate a buried 42-inch interstate natural gas pipeline that would cross NFS lands on the JNF along a proposed 3.5-mile corridor. A Forest Service decision is needed because the project would not be consistent with several Forest Plan standards. Relatedly, there is a need to determine what terms and conditions, or stipulations should be provided to the BLM for incorporation into the ROW grant in order to protect resources and the public interest consistent with the MLA (30 U.S.C. § 185(h)). In addition, there is a need for the Forest Service, at a minimum, to demonstrate that an independent review of the sedimentation analysis has occurred, that predicted effects are supported with rationale, and that previous concerns and comments related to erosion and its effects have been satisfied.

The BLM's purpose and need for action is to respond to Mountain Valley's revised MLA ROW application for the MVP project to construct and operate a natural gas pipeline across NFS lands consistent with the MLA at 30 U.S.C. § 185 and BLM's implementing regulations at 43 CFR Part 2880. Under the MLA, the BLM has responsibility for reviewing Mountain Valley's ROW application and authority to issue a decision on whether to approve, approve with modifications, or deny the application.

Proposed Action

The Proposed Action includes the following interrelated components: issuance of a ROW; construction, operation, and maintenance of a pipeline; and amendment of the 2004 Jefferson National Forest Revised Land and Resource Management Plan.

The Proposed Action for BLM is the issuance of a ROW through the JNF to allow for the construction, operation, and maintenance of the MVP. The issuance of the ROW includes any terms and conditions (including stipulations) that are required for protection of the environment and the public interest. In accordance with 43 CFR Part 2880, Mountain Valley is required to provide the BLM with a final plan of development (POD), which details and guides pipeline construction, operation, and maintenance.

The Forest Service would provide construction and operation terms and conditions, or stipulations (terms) as needed for the actions listed below. The terms would be submitted to the BLM for inclusion in the ROW grant. Forest Service concurrence would be needed for the temporary use during construction and for the BLM's issuance of the 30-year ROW.

Eleven Forest Plan standards on the JNF are proposed to be amended to make the project compliant with the Forest Plan, which would allow the BLM to grant a ROW. Standards include: FW-248 (utility corridors); FW-5 (revegetation); FW-8 (soil compaction in water saturated areas); FW-9 (soil effects from heavy equipment use); FW-13 and FW14 (exposed soil and residual basal area within the channeled ephemeral zone); 11-003 (exposed soil within the riparian corridor); 6C-007 and 6C-026 (tree clearing and utility corridors in the old growth management area); 4A-028 (Appalachian National Scenic Trail [ANST] and utility corridors); and FW-184 (scenic integrity objectives).

Key Issues

This SEIS focuses only on key issues that are relevant to the decisions to be made by the Forest Service and the BLM that have not already been analyzed in the 2017 FERC FEIS.

Key issues that are the focus of the SEIS analysis, including those identified by the Court, are: (1) The purpose and effect of the Forest Plan amendment on the utility corridor management area and resources including soil; riparian; water; threatened and endangered species; old growth; the ANST; and scenic integrity; (2) The feasibility and practicality of utilizing ROWs in common on federal land; (3) The potential for erosion, sedimentation, and adverse water quality effects in relation to the anticipated effectiveness of mitigation measures, and a disclosure on how previous Forest Service comments submitted to the FERC on erosion and sedimentation have been addressed and remedied.

Decision to be Made

The responsible official will review the proposed action including the POD, alternatives, the terms and conditions, stipulations, the environmental consequences that would be applicable to NFS lands, public comments, and the project record in order to make the following decisions: (1) Whether to approve a Forest Plan amendment that would modify 11 standards in the Forest Plan; (2) Determine whether to issue a concurrence letter to BLM for the ROW grant and what terms, conditions, or stipulations should be included in that letter; and (3) Whether to adopt all or portions of the FERC FEIS that are relevant to NFS lands.

Alternatives

Alternative 1 – No Action

Under the No Action alternative, the Forest Plan would not be amended, and no concurrence would be provided to the BLM for granting of a ROW across NFS lands for the construction, operation, and maintenance of the MVP. Concurrence for issuing the temporary use permit (TUP) for the construction phase of the project would not be provided. BLM would not issue a ROW or a TUP. The current Forest Plan would continue to guide management of the project area. Mountain Valley would have to utilize other lands for the pipeline in order to satisfy the stated demand for natural gas and energy in the project area, or end users would have to seek alternate energy from other sources such as other natural gas transporters, fossil fuels, or renewable energy (FERC FEIS, Section 3.1).

Mountain Valley would be required to restore the JNF project area to its pre-project condition. Materials including sections of pipe would be removed from the ROW (pipe has been laid on the ROW surface, but no trenching has occurred and no pipe has been installed), stockpiled topsoil would be amended as needed and spread over the disturbed portion of the ROW, and the ROW would be restored. Upon successful restoration, erosion control devices (ECDs) would be removed.

Alternative 2 – The Proposed Action

The Forest Service's proposed action is to amend the Forest Plan as necessary to allow for the MVP to cross the JNF. The Forest Service would provide construction, operation, and maintenance terms and conditions, or stipulations (terms) as needed for the actions listed below. The Forest Service would submit the terms to the BLM for inclusion in the ROW grant. The Forest Service would provide concurrence to the BLM to proceed with the ROW grant and with

issuing a TUP for the construction phase. Consistent with the Forest Service's plan amendment, the BLM would grant a ROW and a TUP under the MLA, 30 U.S.C. § 185, for the project to cross the JNF. The MLA ROW would include terms to protect the environment and the public. The construction, operation, and maintenance actions that need terms (and Forest Service concurrence) include:

- Construction of a 42-inch pipeline across 3.5 miles of the JNF.
- The use of a 125-foot-wide temporary construction ROW for pipeline installation and trench spoil. The width would be reduced to approximately 75 feet to cross most wetlands. Once construction is complete, the MVP would retain a 50-foot permanent ROW to operate the pipeline.
- The use of above-ground facilities, limited to pipeline markers (e.g., at road and trail crossings) to advise the public of pipeline presence, and cathodic pipeline protection test stations that are required by DOT.

Since publication of the FERC FEIS, it has been determined that the ROW can be accessed using only off-NFS roads; use of Pocahontas and Mystery Ridge roads is not part of the Proposed Action in this SEIS.

Since publication of the FERC FEIS, Mountain Valley has requested a variance from FERC to change the crossing method of the four unnamed tributary streams on NFS lands from a dry-ditch open cut method as indicated in the FERC FEIS to conventional bores in order to reduce effects to Waters of the United States and potential sedimentation effects in the JNF (MVP 2020u). Water Crossing Plans can be found in the POD, Appendix K (MVP 2020v) and are discussed in the 2020 Biological Opinion (BO) (FWS 2020b). This SEIS analyzes both the originally proposed dry-ditch open cut crossing method and the conventional bore method in the variance request. Conservation measures would be implemented to reduce potential risks to aquatic habitats during construction of stream crossings (see Section 2.2.2.2).

Comparison of Alternatives

This section briefly compares the environmental consequences of the two alternatives based on the effects analyses presented in Chapter 3.

Alternative 1 – No Action

Soils

With continued implementation and monitoring of ECDs, adverse effects on soil resources would be minor and would occur over the short term. Given consideration of these factors, effects under the No Action Alternative would be consistent with those analyzed in the FERC FEIS. To facilitate restoration activities, soil amendments would be used to increase soil quality of stockpiles and help restore soil productivity to pre-project conditions over the long-term.

Water Resources

With continued implementation and monitoring of ECDs, adverse effects on water resources would be minor and would occur over the short term. Given consideration of these factors, effects would be consistent with those analyzed in the FERC FEIS and associated studies including the

updated *Hydrologic Analysis*. Long-term water resource effects would be minor and are associated with restoring the JNF project area to its pre-project condition.

Threatened, Endangered, and Sensitive Species

No detrimental effects to threatened and endangered species would occur as a result of the No Action Alternative beyond those which already occurred during the partial pipeline implementation. Long-term effects would be minor and beneficial as restoration activities would return the project area to its pre-project condition.

National Forest Management Act

The JNF Forest Plan would not be amended and there would be no effects.

Alternative 2 – The Proposed Action

Soils

Short-term effects would be associated with construction and would be minor to moderate, which is consistent with the conclusions in the FERC FEIS. Long-term impacts would be associated with post-construction restoration, and operation and maintenance and would be minor in intensity, which is consistent with the conclusions in the FERC FEIS. Mitigation measures in the POD and project design requirements would minimize construction-related effects to soils, such as clearing, grading, trench excavation, backfilling, contouring, and the movement of construction equipment. To facilitate restoration activities, soil amendments would be used to increase the soil quality of stockpiles and help restore soil productivity to pre-project conditions over the long-term.

Water Resources

Short-term impacts would be associated with construction and would be minor, which is consistent with the conclusions in the FERC FEIS. Construction activities are not likely to significantly affect groundwater resources because the majority of construction would involve shallow excavations. The project would prevent or adequately minimize accidental spills and leaks of hazardous materials into groundwater resources during construction, operation, and maintenance by adhering to its spill prevention, control, and countermeasure plan in the POD. To reduce effects on waterbodies, the POD identifies measures to minimize effects, such as Best Management Practices (BMPs) and ECDs. Long-term impacts would be associated with post-construction restoration, operation, and maintenance and would be minor in intensity, which is consistent with the conclusions in the FERC FEIS.

Threatened, Endangered, and Sensitive Species

A total of 12 federally listed and 17 Regional Forester Sensitive Species (RFSS) species could be affected by the MVP in or adjacent to the JNF. The Forest Service determined that the MVP *May Affect and Is Likely to Adversely Affect* the following species: candy darter, Indiana bat, northern long-eared bat, and Virginia spiraea. While the overall project *May Affect and Is Likely to Adversely Affect* the Roanoke logperch, no suitable habitat was found within the JNF. Roanoke logperch are known to occur downstream of the MVP waterbody crossings within the North Fork Roanoke River; however, the occurrences are outside of the project area and are beyond the extent of increased sedimentation modeled for the waterbody crossings within the JNF. The United States Fish and Wildlife Service (FWS) 2020 BO determined appropriate avoidance and mitigation measures for potential effects to federally listed species (FWS 2020b). The Forest

Service determined that the project would be unlikely to cause a Trend Toward Federal Listing or Loss of Viability for RFSS. Implementation of required conservation measures in the POD will help reduce project effects to threatened, endangered, and sensitive species.

National Forest Management Act

Utility Corridors. Short- and long-term beneficial effects to the local and regional economy are expected to occur.

Soil and Riparian. Modifications to six soils and riparian standards would result in greater adverse effects in the JNF to erosion and sedimentation, soil compaction, soil porosity, runoff potential, soil fertility, revegetation potential, and soil carbon budget. Mitigation measures, ECDs, and BMPs included in the POD would ensure that a substantial lessening of protections to soils, riparian, and water resources do not occur (36 CFR 219).

Old Growth Management Area. Amendments to Standard 6C-007 and 6C-026 would allow effects to old growth forest as well as create more forest edge habitat. However, the limited area (2 acres out of approximately 30,200 acres of JNF old growth or about 0.07% of the total old growth on JNF) of effect on old growth forests results in a minor effect that was adequately analyzed in the FERC FEIS.

Appalachian National Scenic Trail (ANST). Minor temporary adverse effects to trail users would occur from noise, dust, and visual intrusions from crossing underneath the ANST via a 600-foot-long bore. The long-term effects would be minor due to an approximate 300-foot buffer on either side of the trail and vegetative screening of the bore holes.

Scenery Integrity Objectives (SIO). Degradation of scenic quality may be inconsistent with the JNF Forest Plan SIOs. Although this is an adverse effect to scenery, it is not a substantial adverse effect due to the limited extent of the project crossing the JNF (FERC FEIS p. 4-347), the project's proposed mitigation measures that would apply to temporary workspace and the temporary and permanent ROW that are found in the updated POD (Section 7.9).

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Acronyms and Abbreviations

Acronym or Abbreviation	Description
ACP	Atlantic Coast Pipeline
ANST	Appalachian National Scenic Trail
APE	Area of Potential Effect
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Compost Filter Sock
CGV	Columbia Gas of Virginia
DOT	Department of Transportation
DSEIS	Draft Supplemental Environmental Impact Statement
ECD	Erosion Control Device
EEP	Equitrans Expansion Project
EIS	Environmental Impact Statement
ERFO	Emergency Relief for Federally Owned Roads Program
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
Forest Plan	2004 Jefferson National Forest Revised Land and Resource Management Plan
Forest Service	United States Forest Service
Fourth Circuit	United States Court of Appeals for the Fourth Circuit
FR	Federal Register
FS	Forest Service
FWS	United States Fish and Wildlife Service
GWJ	George Washington and Jefferson (National Forests)
HUC	Hydrologic Unit Code
JNF	Jefferson National Forest
LNG	Liquefied Natural Gas
LOD	Limit of Disturbance
LRMP	Land and Resource Management Plan
MLA	Mineral Leasing Act
Mountain Valley	Mountain Valley Pipeline, LLC
MVP	Mountain Valley Pipeline
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NOI	Notice of Intent

Acronym or Abbreviation	Description
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PA	Programmatic Agreement
POD	Plan of Development
RFSS	Regional Forester Sensitive Species
ROD	Record of Decision
ROW	Right-of-way
RUSLE	Revised Universal Soil Loss Equation
SBA	Supplemental Biological Assessment
SDR	Sediment Delivery Ratio
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Office
SIO	Scenic Integrity Objective
TES	Threatened or Endangered Species
The Court	United States Court of Appeals for the Fourth Circuit
TSS	Total Suspended Solids
TUP	Temporary Use Permit
USDA	United States Department of Agriculture
U.S.C.	United States Code
VDGIF	Virginia Department of Game and Inland Fisheries
VDEQ	Virginia Department of Environmental Quality
WERMS	Wildlife Environmental Review Map Service

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1 Purpose of and Need for Action

1.1 Introduction

The Forest Service, and Bureau of Land Management (BLM) as a cooperating agency, prepared this draft supplemental environmental impact statement (DSEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations[2]. According to Title 40 of the Code of Federal Regulations (CFR) § 1502.9(c)(1)(ii), a supplemental environmental impact statement (SEIS) shall be prepared if: (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to concerns and bearing on the proposed action or its effects. This DSEIS supplements the June 2017 Federal Energy Regulatory Commission's (FERC) Mountain Valley Project and Equitrans Expansion Project Final Environmental Impact Statement (FERC FEIS).

1.2 Background

The Mountain Valley Pipeline (MVP) is a proposed 303.5-mile interstate natural gas pipeline that would cross about 3.5 miles of the Jefferson National Forest (JNF), in Monroe County, West Virginia and Giles and Montgomery counties, Virginia (Figure 1). The Forest Service and BLM participated as cooperating agencies with the FERC in the preparation of the FERC FEIS. On June 29, 2017, the Notice of Availability for the FERC FEIS and the Forest Service Draft Record of Decision for the Mountain Valley Project Land and Resource Management Plan Amendment was published in the *Federal Register* (FR).

On December 1, 2017, the Forest Service adopted the FERC FEIS and a Record of Decision (ROD) was signed by the JNF Forest Supervisor. The ROD amended the January 2004 Jefferson National Forest Revised Land and Resource Management Plan (LRMP or Forest Plan) to modify certain Forest Plan standards that precluded the use of standard pipeline construction methods for the MVP. The ROD included resource protection terms and conditions that would condition the Forest Service's concurrence to the project, should BLM decide to grant a right-of-way (ROW).

Under the Mineral Leasing Act (30 United States Code [U.S.C.] § 185 et seq.) (MLA), the BLM is the Federal agency responsible for issuing ROW grants for natural gas pipelines across Federal lands under the jurisdiction of two or more Federal agencies. The BLM is, therefore, responsible for considering the issuance of a ROW grant for the MVP for pipeline construction and operation across the lands under the jurisdiction of the Forest Service and the United States Army Corps of Engineers. In 2017, the BLM received written concurrence to the project from both federal agencies and on December 20, 2017, issued a ROD approving the MLA ROW grant to construct

[2] On September 14, 2020, the Council on Environmental Quality's (CEQ) revised NEPA regulations became effective (see 85 FR 43304). Those regulations apply to NEPA processes begun after September 14, 2020 (40 CFR 1506.13). While agencies may apply CEQ's revised regulations to ongoing activities and environmental documents begun before September 14, 2020, the Forest Service has elected to complete this NEPA process using the prior regulations, recognizing that where existing agency NEPA procedures are inconsistent with CEQ's revised regulations, CEQ's revised regulations govern unless there is a clear and fundamental conflict with the requirements of another statute.

and operate the MVP across Federal lands. The BLM ROD included a temporary use authorization to allow the proponent to use and occupy the land necessary to construct the pipeline.

Project implementation began in December 2017 and continued until July 27, 2018[3], when the United States Court of Appeals for the Fourth Circuit (Fourth Circuit or the Court) vacated and remanded the Forest Service's decision approving the Forest Plan amendment based on violations of the National Forest Management Act (NFMA) and NEPA. The court also vacated and remanded BLM's MLA ROW decision for the portion through National Forest System (NFS) lands based on violations of MLA.

The Court found that the Forest Service, in amending certain Forest Plan standards with the 2017 ROD, did not comply with its regulations for implementing NFMA (Planning Rule), because the agency failed to properly identify which Planning Rule requirements were directly related to the amended standard as required under 36 CFR 219.13(b)(5).

The Court also found the 2017 Forest Service ROD violated NEPA because the agency was arbitrary and capricious in adopting the sedimentation analysis in the 2017 FERC FEIS. The Court found the Forest Service failed to properly conduct an independent review of the FERC FEIS and ensure that the agency's concerns regarding the sedimentation analysis were satisfied as required under 40 CFR 1506.3(c).

The Court found BLM's decision approving the MLA ROW across the JNF failed to comply with MLA (30 U.S.C. § 185(p)) because the BLM did not analyze and determine whether the proposed route utilized ROWs in common (i.e., collocation with other existing ROWs) to the extent practical. However, the Court did not vacate the ROW across U.S. Army Corps of Engineers lands and that decision remains in place. The Court also upheld the BLM's adoption of and reliance on FERC's FEIS as satisfying the requirements of NEPA in support of the MLA ROW decision across federal lands.

On May 1, 2020, Mountain Valley Pipeline, LLC (Mountain Valley) submitted a revised MLA ROW application to the BLM seeking to construct and operate the natural gas pipeline across the JNF. Mountain Valley also requested that the Forest Service amend the Forest Plan consistent with the issues identified by the Court. On May 28, 2020, the BLM deemed Mountain Valley's revised application complete (43 CFR § 2884.11). More detailed information on the background and history of the MVP project is available on the project website.

[3] To date, 256 miles of the 303.5 miles of pipe is laid and 155 miles of land along the pipeline ROW is in final restoration.

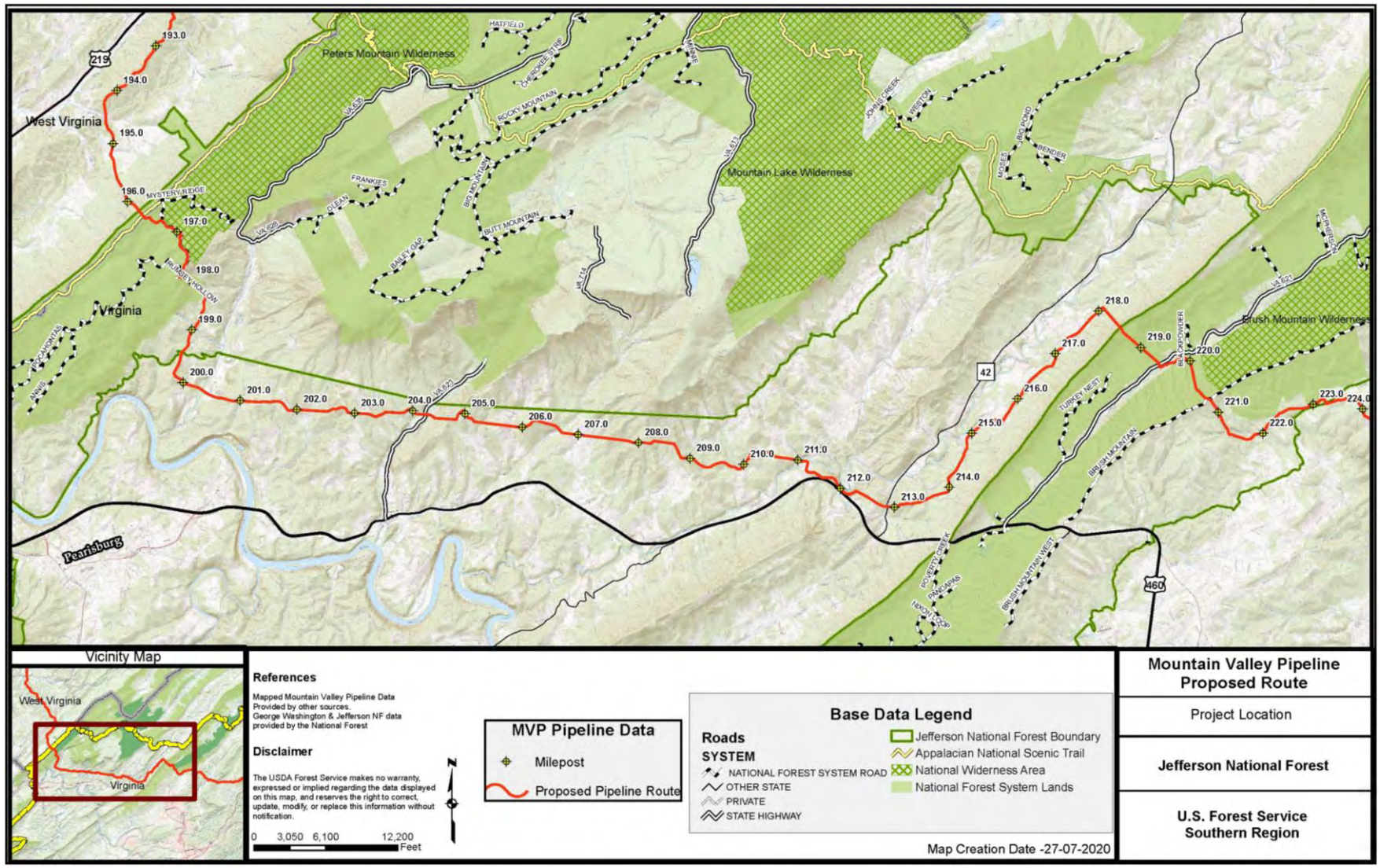

Figure 1. Project Location on the Jefferson National Forest

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1.3 Purpose and Need for Action

The overall purpose of the MVP project is described in the FERC FEIS and is generally to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States. Specific description of the purpose of the MVP project is found in the FERC FEIS, page 1-8. Despite the remand of the 2017 Forest Service ROD and the BLM's MLA ROW decision, the project purpose articulated in the FERC FEIS remains valid.

However, the Forest Service's and BLM's purpose and need for this SEIS is narrower than that described in the FERC FEIS because the agencies' decisions are narrower and within the context of the FERC decision to issue a Certificate of Public Convenience and Necessity for the MVP project, which is still valid.

The Forest Service's purpose and need for action is to respond to a proposal from Mountain Valley to construct and operate a buried 42-inch interstate natural gas pipeline that would cross NFS lands on the JNF along a proposed 3.5-mile corridor. A Forest Service decision is needed because the project as proposed would not be consistent with several Forest Plan standards including utility corridors, soil, riparian, old growth, the Appalachian National Scenic Trail (ANST), and scenic integrity without a project-specific amendment. Relatedly, there is a need to determine what terms and conditions, or stipulations should be provided to the BLM for incorporation into the ROW grant in order to protect resources and the public interest consistent with the MLA (30 U.S.C. § 185(h)). In addition, there is a need for the Forest Service, at a minimum, to demonstrate that an independent review of the sedimentation analysis has occurred, that predicted effects are supported with rationale, and that previous concerns and comments related to erosion and its effects have been satisfied.

The BLM's purpose and need for action is to respond to Mountain Valley's revised MLA ROW application for the MVP project to construct and operate a natural gas pipeline across NFS lands consistent with the MLA at 30 U.S.C. § 185 and BLM's implementing regulations at 43 CFR Part 2880. Under the MLA, the BLM has responsibility for reviewing Mountain Valley's ROW application and authority to issue a decision on whether to approve, approve with modifications, or deny the application. Consistent with 30 U.S.C. §185(p), BLM must require utilization of rights-of-way in common to the extent practical. The BLM's review of the ROW application will focus, in part, on the Forest Service supplemental analysis for NFS lands to make their decision, but also intends to rely on the FERC FEIS, consistent with the Fourth Circuit's decision. The BLM will work as a cooperating agency with the Forest Service to complete the necessary environmental analysis to address the issues identified by the Fourth Circuit.

1.4 Proposed Action

The Proposed Action includes the following interrelated components:

- Issuance of a ROW
- Construction, operation, and maintenance of a 42-inch nature gas pipeline
- Amendment of the Forest Plan

1.4.1 BLM Issuance of a ROW and Temporary Use Permit

The Proposed Action for BLM is the issuance of a ROW through the JNF to allow for the construction, operation, and maintenance of the MVP. The issuance of the ROW includes any terms and conditions (including stipulations) that are required for protection of the environment and the public interest. In accordance with 43 CFR Part 2880, Mountain Valley is required to provide the BLM with a final plan of development (POD), which details and guides how the pipeline construction, operation, and maintenance would be conducted.

The Forest Service is required to provide concurrence to the BLM to proceed with the ROW grant across NFS lands. The BLM decision for the ROW grant across federal lands would be documented in a ROD issued by the BLM. Additionally, the BLM would issue a Temporary Use Permit (TUP) in association with the ROW authorizing the use of temporary workspace outside of the permanent ROW that is needed for ancillary construction needs on the JNF during the construction phase and other activities associated with implementation. This temporary use authorization on NFS lands also requires Forest Service concurrence.

The environmental effects of a ROW or TUP depend upon how the ROW will be used. In this instance, the TUP and ROW effects will be the same effects as those incurred by the construction, operation, and maintenance of a pipeline and the implementation of stipulations. Therefore, the effects for the ROW and TUP are considered through the analysis of the other components of the Proposed Action.

1.4.2 Construction, Operation, and Maintenance of a Pipeline

In response to the purpose and need, the Forest Service would provide construction, operation, and maintenance terms and conditions, or stipulations (terms) as needed for the actions listed below. The terms would be submitted to the BLM for inclusion in the ROW grant. Forest Service concurrence would be needed for the temporary use during construction and for the BLM's issuance of the 30-year ROW grant. Actions that need terms and Forest Service concurrence include:

- Construction of a 42-inch diameter pipeline across 3.5 miles of the JNF.
- The use of a 125-foot-wide temporary construction ROW for pipeline installation and trench spoil. The width would be reduced to approximately 75 feet to cross most wetlands. The BLM would issue a TUP to authorize use within the construction ROW. Once construction is complete, the BLM would issue a 50-foot ROW to operate the pipeline.
- The use of above-ground facilities, limited to pipeline markers (e.g., at road and trail crossings) to advise the public of pipeline presence, and cathodic pipeline protection test stations that are required by Department of Transportation (DOT).

The pipeline would be designed, constructed, operated, and maintained in accordance with DOT regulations under 49 CFR 192 and other applicable federal and state requirements. Mountain Valley would comply with siting and maintenance requirements under 18 CFR 380.15 and other applicable federal and state regulations and implement various forms of mitigations as defined in 40 CFR 1508.20. They would adopt FERC's general construction, restoration, and operational mitigation measures as outlined in FERC's Upland Erosion Control Revegetation and Maintenance Plan (FERC Plan) (FERC 2013a) and Wetland and Waterbody Construction and Mitigation Procedures (FERC Procedures) (FERC 2013b). Construction plans include some

modifications to FERC Procedures and more details can be found in Section 2.4.1.1 of the 2017 FERC FEIS (FERC 2017a).

An integral part of the proposed action for the Agencies is the POD that guides pipeline construction, operation, and maintenance. The POD is a detailed project description plan which requires the applicant/proponent to provide details about the project they are applying for on federal lands. It is as specific as possible in describing the project, its location, and dimensions. The POD thoroughly describes the project from the initial construction phase through termination and restoration of the public land. The POD includes resource mitigation for reducing or eliminating effects to resources. It also describes any temporary or short-term use areas needed in conjunction with a ROW. All disturbances must be within the boundary of the approved ROW/TUP.

After the POD has been finalized (through project implementation), any requests made by the company for activities not included in the approved POD or that fall outside of the ROW must be requested to the Forest Service and BLM as a variance and, if accepted, becomes a POD Plan Amendment. The Amendment must be approved prior to the activity taking place (POD, Appendix N).

Prior to issuing a ROD granting a ROW, the BLM is again required to submit a Notice to Congress demonstrating intent to issue a ROW together with detailed findings regarding the BLM's proposed terms and conditions it will impose in the ROW grant. At that time, a Final POD must be submitted by Mountain Valley before BLM can move forward with a decision of approval.

The POD can be found on the project website.

1.4.3 Forest Plan Amendment

Eleven Forest Plan standards on the JNF are proposed to be amended to make the project compliant with the Forest Plan, which would allow the BLM to grant a ROW. Standards include: FW-248 (utility corridors); FW-5 (revegetation); FW-8 (soil compaction in water saturated areas); FW-9 (soil effects from heavy equipment use); FW-13 and FW14 (exposed soil and residual basal area within the channeled ephemeral zone); 11-003 (exposed soil within the riparian corridor); 6C-007 and 6C-026 (tree clearing and utility corridors in the old growth management area); 4A-028 (ANST and utility corridors); and FW-184 (scenic integrity objectives).

The Forest Service's Planning Rule at 36 CFR § 219.13(b)(2) requires responsible officials to provide notice of which substantive requirements of 36 CFR §§ 219.8 through 219.11 are likely to be directly related to the amendment. Whether a Planning Rule provision is directly related to an amendment is determined by any one of the following: the purpose for the amendment, a beneficial effect of the amendment, a substantial adverse effect of the amendment, or a lessening of plan protections by the amendment (36 CFR § 219.13(b)(5)).

Based on those criteria, the substantive Planning Rule provisions that are likely to be directly related to the amended standards are: § 219.8(a)(1) (terrestrial ecosystems); § 219.8(a)(2)(ii) (soils and water productivity); § 219.8(a)(2)(iv) (water resources); § 219.8(a)(3)(i) (ecological integrity of riparian areas); § 219.9(b) (contributions to recovery of threatened and endangered species); § 219.10(a)(3) (utility corridors); § 219.10(b)(1)(vi) (other designated areas); §

219.10(b)(1)(i) (scenic character); and § 219.11(c) (timber harvesting for purposes other than timber production).

Additional Information on the Proposed Action

See Section 2.2.2 for additional details on the proposed action alternative, including the existing and proposed modification of the Forest Plan standards.

1.5 Decision Framework

For the Forest Service, the responsible official is the USDA Under Secretary for Natural Resources and Environment. For the BLM, the responsible official is the Eastern States State Director.

1.5.1 Nature of Decision to Be Made

1.5.1.1 Forest Service

The FERC, as the lead federal agency for proposals under the Natural Gas Act, prepared the 2017 FEIS to assess the environmental effects that were predicted to occur from constructing and operating the MVP and issued its decision in an Order and a Certificate of Necessity. The Forest Service was a cooperating agency under NEPA to the FERC FEIS. For this SEIS and its issues specific to NFS land, the role of the Forest Service has changed to a lead agency. Although the Forest Service's role is now lead agency, the Fourth Circuit affirmed the Forest Service's limited role in the broader MVP project stating "the Forest Service was tasked with determining whether to amend its Forest Plan, and whether to join in the BLM's decision to grant a right of way (U.S. Court of Appeals 2018a). It was *not* tasked with approving the project as a whole – nor could it under the Natural Gas Act."[4]

Given the purpose and need, the Forest Service responsible official will review the proposed action including the POD, alternatives, the terms and conditions, stipulations, the environmental consequences that would be applicable to NFS lands, public comments, and the project record in order to make the following decisions: (1) Whether to approve a Forest Plan amendment that would modify 11 standards in the Forest Plan; (2) Determine what terms and conditions, or stipulations should be included with the Forest Service concurrence to the project; and (3) Whether to adopt all or portions of the FERC FEIS that is relevant to NFS lands.

1.5.1.2 Bureau of Land Management

Consistent with the MLA, 30 U.S.C. § 185, and BLM's implementing regulations, 43 CFR Part 2880, the BLM will review Mountain Valley's revised MLA ROW application, the FERC FEIS, and the Forest Service supplemental analysis to determine whether to approve, approve with modifications, or deny the MLA ROW application and temporary use authorization through the NFS lands. As a cooperating agency, the BLM intends to rely on and adopt the Forest Service supplemental analysis for its decision, as long as the analysis provides sufficient evidence to support the decision. Before issuing a decision on Mountain Valley's application, the BLM would need the Forest Service's written concurrence. The Forest Service may condition its concurrence to the BLM by including any stipulations that are deemed necessary to protect the environment and otherwise protect the public interest consistent with 30 U.S.C. § 185(h); 43 CFR § 2885.11. If the decision is to approve the ROW grant, the BLM also would need to determine whether the proposed route utilized ROWs in common (co-location with other

[4] Sierra Club Inc., et al. v. United States Forest Serv., 897 F.3d 582, 600 (4th Cir. 2018) (emphasis in original).

existing ROWs) to the extent practical, as required by the MLA, 30 U.S.C. § 185(p). As noted earlier, the BLM and Forest Service will be issuing separate RODs.

1.6 Public Involvement

The FERC FEIS, Section 1.4 (pp. 1-27 to 1-38), documents the public involvement that occurred from April 2015 through the DEIS comment period that ended on December 22, 2016, and is incorporated by reference. In summary, Section 1.4 describes the publication of the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) in the FR on April 17, 2015. The NOI was sent to 2,846 parties, including federal, state, and local government agencies; elected officials; environmental groups and non-government organizations; Native Americans and Indian tribes; affected landowners; local libraries and newspapers; and other stakeholders who had indicated an interest in the MVP.

The NOI initiated a 60-day formal scoping period and the FERC sponsored six public scoping meetings in the project area. Approximately 650 people attended those meetings. In addition to the NOI and the public scoping meetings, the FERC sent out brochures that updated the status of the environmental review process. The FERC received 964 comment letters during the scoping period and 428 letters after the scoping period had ended.

Table 1.4-1 in the FERC FEIS summarizes the environmental issues and concerns identified by the commenters during the scoping process and identifies the EIS section where each issue is addressed. The topics that generated the most interest and concerns over potential effects included water quality and aquatic resources, socioeconomics, and geology and soils.

On September 16, 2016, the Notice of Availability for the DEIS was published in the FR, and the 90-day comment period ran until December 22, 2016. The notice was sent to approximately 4,400 parties and during the comment period, seven meetings were held in the vicinity of the project area. The FERC received 1,237 written individual letters or electronic filings commenting, and Table 1.4-2 in the FERC FEIS summarizes the topics and where they are addressed in the FEIS. The topics that were of most concern included water quality and aquatic resources (including wetlands) and geology and soils.

In response to issues relative to the project and NFS lands, the FERC evaluated route alternatives and eliminated from detailed analysis some routes that would have located the project off of NFS lands (FERC FEIS, Section 3.4). Environmental effects specific to the JNF are disclosed in Section 4.

Some time passed after the Fourth Circuit remanded and vacated the Forest Service ROD in 2018 (Section 1.2 of this SEIS). The environmental analysis for the project was re-initiated in 2020 when the BLM accepted the updated MVP application and the NOI to prepare a supplemental EIS was published in the FR (July 30, 2020).

The Forest Service SEIS NOI clarified that scoping, a requirement for an EIS (40 CFR 1501.7; 36 CFR 220.4(c)(1)), was completed and summarized in the FERC FEIS (FEIS, Section ES-1.4). White House Council on Environmental Quality (CEQ) regulations do not require scoping for an SEIS. Written, specific comments, including those that were relevant to NFS lands, identified concerns and issues that were addressed in the FEIS, particularly in Section 3.4 (Route Alternatives) and Section 4.0 (Environmental Analysis). The Forest Service SEIS NOI stated additional opportunities for public comment would be provided when the Draft SEIS became available. Additionally, the Forest Service SEIS NOI served as the public notification

requirements of the proposed MLA application consistent with the BLM's MLA implementing regulations at 43 CFR 2884.20(a).

1.7 Scope of Analysis

The scope of analysis refers to the proposed action, alternatives to the proposed action, and potential effects of the proposed action that the Forest Service will consider in this SEIS. This SEIS supplements the analysis in FERC's FEIS. The scope of analysis for this SEIS seeks to address the deficiencies identified in the Fourth Circuit's decision and any changed circumstances and new information from June 2017 (i.e., the date of the FERC FEIS) until present identified by the Forest Service or the BLM that are relevant to the environmental concerns, decision framework, and bearing on the proposed action or its effects.

Recent federal court decisions related to NEPA, NFMA, and the MLA have been issued which further inform the Forest Service's responsibilities and decision space as it relates to the MVP project. For instance, the D.C. Circuit Court upheld the FERC Certificate of Need and FEIS for the MVP project.[5] A Fourth Circuit panel took issue with portions of the NFMA and NEPA analysis conducted by the Forest Service when the Forest Service was responsible for issuing a Special Use Authorization for the Atlantic Coast Pipeline.[6] That panel also held that the Forest Service lacked authority under the MLA to issue a pipeline crossing of the ANST when the ANST traversed NFS lands, which was overturned by the Supreme Court of the United States.[7] These decisions have changed the legal framework within which the Forest Service must make its determinations.

In July 2018, the Fourth Circuit found the Forest Service's December 2017 ROD to be in violation of NEPA and NFMA and the BLM's 2017 decision in violation of the MLA. This SEIS is developed in response to the changed condition of the vacatur of the decisions and new information contained in the decision. This SEIS responds to the narrow and specific Court-identified deficiencies which were:

- The Forest Service acted arbitrarily and capriciously in adopting the 2017 FEIS because the agency failed to explain how the FEIS took a hard look at sedimentation given the agency's concerns during review of the hydrologic analysis drafts. Mountain Valley has since provided an updated hydrologic analysis, and the Forest Service conducted an independent review of this analysis to confirm its adequacy. See the soils, water resources, and threatened and endangered species sections in Chapter 3 for information on how the hydrologic analysis was used to inform environmental consequences.

- The Forest Service improperly applied the Planning Rule (36 CFR 219) in the Forest Plan amendment, specifically the Court found the Forest Service did not apply FS Planning Rule requirements to soil and riparian resources and evaluate both the purpose and the effects of the amendment to threatened and endangered aquatic species, consistent with 36 CFR § 219.13(b)(5). However, to ensure all resources potentially

[5] Appalachian Voices v. Fed. Energy Regulatory Comm'n, No. 17-1271, 2019 WL 847199, at *2 (D.C. Cir. Feb. 19, 2019)
[6] Cowpasture River Pres. Ass'n v. Forest Serv., 911 F.3d 150, 157 (4th Cir. 2018), cert. granted sub nom. United States Forest Serv. v. Cowpasture River Pres. Ass'n, 140 S. Ct. 36, 204 L. Ed. 2d 1193 (2019), and cert. granted sub nom. Atl. Coast Pipeline, LLC v. Cowpasture River Pres. Ass'n, 140 S. Ct. 36, 204 L. Ed. 2d 1193 (2019), and rev'd and remanded sub nom. United States Forest Serv. v. Cowpasture River Pres. Ass'n, 140 S. Ct. 1837 (2020)
[7] United States Forest Serv. v. Cowpasture River Pres. Ass'n, 140 S. Ct. 1837, 1843 (2020)

affected by the amendment receive equal consideration the Planning Rule requirements and evaluation of the purpose and effect of the amendment to water, botanical threatened and endangered species, old growth, the ANST, and scenic integrity will be considered.

- The BLM failed to demonstrate that alternatives that would make greater use of existing ROWs were impractical as required by the MLA. To address this concern, the BLM conducted a practicality analysis of collocation, which is included as Appendix A in this SEIS.

Consistent with 40 CFR 1502.9(c)(1), Federal Agencies must prepare supplemental EISs if there are changed circumstances and/or new information that has "substantial relevance" to environmental concerns and/or bearing on the proposed action or its effects. The Forest Service and the BLM reviewed the FERC FEIS to identify if there are changed circumstances or new information that should be analyzed in this SEIS. The majority of the analyses within the FERC FEIS are still applicable and relevant, however, there are some portions of the analyses that warrant supplementation because of changed circumstances or new information, including:

- In framing the scope of the MVP SEIS analysis, the Forest Service reviewed the Fourth Circuit's decision in *Cowpasture River Preservation Association v. Forest Service* due to its similarities to the MVP proposal. The *Cowpasture* decision was for a pipeline project that crossed National Forest and the ANST and included a forest plan amendment.
    - The Fourth Circuit found in this case that the Forest Service failed to properly analyze whether the project's need could be reasonably met on non-NFS lands as required by a George Washington Forest Plan and Forest Service manual. In the case against the MVP project, the Fourth Circuit did not find the agency violated the Jefferson Forest Plan or agency direction with respect to demonstration of whether the MVP project's need could be reasonably met on non-NFS lands. However, an analysis of non-NFS lands alternatives is included in the SEIS to ensure consistency with the Jefferson Forest Plan and agency policy.
    - The FERC-approved route for crossing the ANST proposes to bore an approximately 600-foot-long route below the surface of the NFS lands where the ANST traverses. A legal challenge to FS's authority to authorize a pipeline crossing the ANST when the ANST traverses NFS lands was brought under the MLA in relation to a different project. The Supreme Court of the United States ultimately held that "the lands that the [ANST] crosses remain under the Forest Service's jurisdiction and, thus, continue to be 'Federal lands' under the Leasing Act." Therefore, the Forest Service's consent to the BLM to issue a ROW is consistent with the Supreme Court ruling.
- Changes to the application for the MVP project:
    - Changes in road access, operation, and maintenance needs since 2017.
    - Addition of an optional underground boring construction method for proposed JNF stream crossings.
- Potential change in soil productivity as a result of topsoil segregation and storage for a period of two years.

- Changes to the Regional Forester Sensitive Species (RFSS) list.
- Additional surveys for federally listed species and RFSS in the project area.
- New information regarding the candy darter (*Etheostoma osburni*). In December 2018, the candy darter was listed as endangered under the Endangered Species Act by the U.S. Fish and Wildlife Service (FWS).
- Change in potential effects to 12 species and to the mitigation measures and/or requirements that are part of the FWS BO.
- Update of the 2017 cumulative effects analysis to reflect a change in status or the addition of new projects that are reasonably foreseeable within the watersheds affected by the proposed pipeline.
- FWS issued a new BO for the project on September 4, 2020.

This SEIS is narrow in scope to address only those aspects of the proposed pipeline within the JNF. Actions outside of NFS lands are beyond the jurisdiction of the Forest Service and the BLM, and thus, are covered within the FERC FEIS. However, effects related to the Court-identified deficiencies, changed circumstances or new information, and which result from actions occurring on NFS lands, including those effects off NFS lands resulting from actions on NFS lands, are addressed in this SEIS.

1.8 Issues

Section 1.1. of the FERC FEIS identified the issues that were addressed. The actions and issues analyzed in the FERC FEIS are the same as the proposed action analyzed in this SEIS, except for those issues identified below. This is consistent with the CEQ requirements for adopting a prior environmental review (§1506.3). This SEIS focuses only on key issues that are relevant to the decisions to be made by the Forest Service and the BLM that have not already been analyzed in the FERC FEIS.

Key issues that are the focus of the SEIS analysis, including those identified by the Court, are: (1) The purpose and effect of the Forest Plan amendment on the utility corridor management area and resources including soil; riparian; water; threatened and endangered species; old growth; the ANST; and scenic integrity; (2) The feasibility and practicality of utilizing ROWs in common on federal land; (3) The potential for erosion, sedimentation, and adverse water quality effects in relation to the anticipated effectiveness of mitigation measures, and a disclosure on how previous Forest Service comments submitted to the FERC on erosion and sedimentation have been addressed and remedied. Indicators for each Issue are presented below discussing how the Agencies will determine whether each Issue has been adequately addressed in the SEIS.

1.8.1 Issue 1: Forest Plan Amendment – Purpose and Effect and Consistency with the Planning Rule and the NFMA

A Forest Plan amendment has been proposed to ensure the project can be approved and implemented consistent with the Forest Plan. The Plan amendment may result in substantial, adverse environmental effects to the utility corridor management area and several resources including soil; riparian; water; threatened and endangered species; old growth; the ANST; and scenic integrity. The Court found a need to identify the purpose and the effects of the amendment to be consistent with the Planning Rule and the NFMA. If the substantive requirements are not

accurately identified and the purpose as well as effects (beneficial or adverse) are not adequately analyzed, the amendment may not be consistent with the Planning Rule and may violate the NFMA.

Indicators: (1) A qualitative description of the purpose of the amendment within a scope and scale context, (2) A qualitative and quantitative effect (acre, mile, percent) of plan amendment components; and (3) A qualitative evaluation of consistency with the Planning Rule (NFMA).

1.8.2 Issue 2. Feasibility and Practicality of Routes that are not on NFS lands

The FERC identified several route variations including highway collocation, two hybrid alternatives, and Atlantic Coastal Pipeline collocation alternative. The FERC evaluated how effects (including those to NFS lands) would vary when compared with the proposed MVP route. However, no alternative that would have avoided the use of NFS lands was analyzed in detail (FERC FEIS, Sec. 3.4.1).

The Court ruled that prior to issuing its 2017 ROD, the BLM did not analyze and determine whether the proposed route utilized ROWs in common to the extent practical, as required by the MLA, 30 U.S.C. § 185(p). Relatedly, in *Cowpasture*, where the Forest Service issued the Special Use Permit and amended two National Forest Plans, the Court ruled that the Forest Service adopted the FERC alternatives without documenting that it had conducted an independent review of routes that would minimize or avoid the use of NFS lands. The Court determined that no evidence was provided as to why the project cannot be reasonably accommodated on non-NFS lands. For the Forest Service, the Court ruled this was a violation of NEPA and NFMA (U.S. Court of Appeals 2018b).

Indicators: (1) A qualitative and quantitative analysis of the MVP project's needs and whether they can be reasonably met on non-NFS lands; and (2) A practicality analysis and assessment of routes using ROWs in common.

1.8.3 Issue 3. Erosion and Sediment Effects

The Court ruled that the Forest Service violated NEPA by failing to take a hard and independent look at the effects related to erosion and sedimentation and ensure that the agency's concerns regarding the sedimentation analysis were satisfied as required under 40 CFR 1506.3(c). The Court stated that the previous analysis lacked the evidence and rationale needed to support the predicted effects including the effectiveness of the erosion control devices. This resulted in the adoption of analysis that appeared to be unsupported.

Indicators: A quantitative and qualitative re-evaluation of: (1) Evidence that validates erosion and sedimentation effects and erosion control device effectiveness; and, (2) Potential sediment effects (tons per acre, turbidity) to soil, water, and threatened and endangered species.

1.9 Other Related Efforts

NEPA directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with…other environmental review laws and executive orders" 40 CFR 1502.25(a).

The FERC remains the lead agency for re-initiating consultation with the FWS on the entire pipeline. Mountain Valley would have to comply with applicable provisions of the reasonable

and prudent measures and terms and conditions in the 2020 FWS BO for the project (FWS 2020b). This SEIS incorporates FWS findings and includes FWS reasonable and prudent measures, terms and conditions, and monitoring and reporting requirements that are in the 2020 BO (see SEIS Section 2.2.2 and Section 2.2.2.2). Per 50 CFR 402.16, reinitiation of consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. As described in the 2020 BO, FERC could initiate emergency consultation with FWS for "situations involving acts of God, disasters, casualties, national defense or security emergencies, etc." Emergency consultation was completed under the 2017 BO for 2.47 acres of slip[8] repair in Wetzel County, West Virginia (off NFS lands).

The FERC remains the lead agency for compliance with Section 106 of the National Historic Preservation Act (NHPA). FERC and the other cooperating Federal agencies, including FS and the BLM, executed a single Programmatic Agreement (PA) with the West Virginia and Virginia State Historical Preservation Offices (SHPOs), which reflects the obligations for compliance with the NHPA. Under the PA, FERC has responsibility to ensure that the stipulations in the PA are followed and that any required cultural resource treatment plans for sites on NFS lands have been completed.

See the FERC FEIS, Section 1.5, for a complete list of requirements for the MVP that is managed by the FERC.

1.10 Adoption, Tiering, and Incorporation by Reference

A cooperating agency may adopt an EIS of a lead agency when, after an independent review of the statement, the cooperating agency concludes that its comments and suggestions have been satisfied (40 CFR 1506.3). The Forest Service and BLM were cooperating agencies for the FERC FEIS and previously relied on and adopted that FEIS as reflected in each of their respective RODs. The Fourth Circuit subsequently found that the Forest Service improperly adopted the sedimentation analysis in the FEIS because no documentation existed to corroborate that the FERC FEIS satisfied the Forest Service's comments and suggestions on specific issues. The Fourth Circuit, however, did not find any error in the BLM's adoption and reliance on the FERC FEIS.

In light of the Fourth Circuit's decision, the Forest Service seeks to correct the issues raised by supplementing the FERC FEIS. The Forest Service is adopting the FERC FEIS, and augmenting it based on additional analysis. The Forest Service and the BLM intend to rely on the FERC FEIS and this SEIS to inform the responsible officials in making the agencies' final decisions consistent with the requirements of NEPA. In addition, this SEIS incorporates by reference the FERC FEIS project record.

Tiering is appropriate for higher level EISs, such as a forest plan, to a lesser scope or site-specific statement or analysis (40 CFR 1508.28). This DSEIS tiers to and incorporates by

[8] Slips are a type of slope failure that result in a downward falling or sliding of a mass of soil, rock, trees, and other debris from a steep slope onto an area below (FWS 2020b).

reference the JNF Forest Plan and the FEIS for the Forest Plan. In addition, this DSEIS incorporates by reference the JNF Forest Plan record.

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2 Alternatives, Including the Proposed Action

2.1 Introduction

This chapter describes and compares the alternatives considered for the MVP. It responds to the Court ruling to demonstrate that an independent review of reasonable off-forest routes including the use of other ROWs has been considered as practicable and were given a hard look under NEPA and the MLA.

The alternatives analyzed in the FERC FEIS are not presented again since this SEIS supplements or augments the 2017 FERC FEIS and to reduce bulk of this SEIS. However, a summary table of the alternatives in the 2017 FERC FEIS is found in Table 3. In addition, the alternatives presented in this SEIS reflect the narrow scope and decision space the Forest Service and BLM have in context of the broader FERC decision.

2.2 Alternatives Considered in Detail

The Forest Service includes the No Action alternative as required by the NEPA regulations and the Proposed Action alternative developed to respond to the purpose and need for the project.

2.2.1 Alternative 1 – No Action

Under the No Action alternative, the Forest Plan would not be amended, and no concurrence would be provided to the BLM for granting of a ROW across NFS lands for the construction and operation of the MVP. Concurrence for issuing the TUP for the construction phase of the project would not be provided. BLM would not issue a ROW or a TUP. The current Forest Plan would continue to guide management of NFS lands in the project area. Mountain Valley would have to utilize other lands for the pipeline in order to satisfy the stated demand for natural gas and energy in the project area, or end users would have to seek alternate energy from other sources such as other natural gas transporters, fossil fuels, or renewable energy (FERC FEIS, Section 3.1).

Mountain Valley would be required to restore the JNF project area to its pre-project condition. Materials including sections of pipe would be removed from the ROW (pipe has been laid on the ROW surface, but no trenching has occurred and no pipe has been installed on the JNF), stockpiled topsoil would be amended as needed and spread over the disturbed portion of the ROW, and the ROW would be revegetated. Upon successful restoration, erosion control devices (ECDs) would be removed.

The project was partially implemented prior to the Court ruling and, as a result, some resource effects as described in the FERC FEIS (Section 4.0 to 5.0) have already occurred.

Therefore, the effects associated with the No Action alternative are effects associated with the removal of materials and restoring the project area to its pre-project condition.

2.2.2 Alternative 2 – The Proposed Action

The Forest Service's proposed action is to amend the Forest Plan as necessary to allow for the MVP to cross the JNF. The Forest Service would provide construction, operation, and maintenance terms and conditions, or stipulations (terms) as needed for the actions listed below. The Forest Service would submit the stipulations to the BLM for inclusion in the ROW grant.

The Forest Service would provide concurrence to the BLM to proceed with the ROW grant and with issuing a TUP for the construction phase. Consistent with the Forest Service's plan amendment, the BLM would grant a ROW and a TUP under the MLA, 30 U.S.C. § 185, for the project to cross the JNF. The MLA ROW would include terms to protect the environment and the public. The construction and operation and maintenance actions that need terms (and Forest Service concurrence) include:

- Construction of a 42-inch pipeline across 3.5 miles of the JNF.
- The use of a 125-foot-wide temporary construction ROW for pipeline installation and trench spoil. The width would be reduced to approximately 75 feet to cross most wetlands. Once construction is complete, the MVP would retain a 50-foot permanent ROW to operate the pipeline.
- The use of above-ground facilities, limited to pipeline markers (e.g., at road and trail crossings) to advise the public of pipeline presence, and cathodic pipeline protection test stations that are required by DOT.

The FWS issued a BO to the FERC for the MVP on September 4, 2020 (FWS 2020b). The BO analyzes five species, two of which have the potential to be affected by activities conducted under the proposed action on NFS lands: Indiana bat and northern long-eared bat. The ROW grant and TUP would incorporate the BO's applicable reasonable and prudent measures, terms and conditions, and monitoring and reporting requirements for these two species. Because the 2020 BO addresses the entire project, applicable measures and terms and conditions would apply to the SEIS proposed action (i.e., activities on NFS lands). The list of reasonable and prudent measures, terms and conditions, and monitoring and reporting requirements is provided in the 2020 BO and discussed in Sections 2.2.2.2 and 3.4.3.

Since publication of the FERC FEIS, it has been determined that the ROW can be accessed using only off-NFS roads; use of Pocahontas and Mystery Ridge roads is not part of the Proposed Action in this SEIS.

Since publication of the FERC FEIS, Mountain Valley has requested a variance from FERC to change the crossing method of the four streams on NFS lands from a dry-ditch open cut method as indicated in the FERC FEIS to conventional bores in order to reduce effects to Waters of the United States and potential sedimentation effects in the JNF (MVP 2020u). This SEIS analyzes both the originally proposed dry-ditch open cut crossing method and the conventional bore method in the variance request. Dry-ditch open cut crossings would require Clean Water Act Section 404 and 401 permits.

Table 1 displays the acres and miles of NFS lands that would be required for the construction, operation, and maintenance of the MVP.

Table 1. NFS Lands Required for MVP Construction, Operation, and Maintenance

Area	Units impacted*
NFS lands crossed	3.5 miles
125-foot temporary ROW	50.9 acres
50-foot permanent ROW	24.5 acres[1]

* Rounded to the nearest tenth (source: MVP 2020a)

[1] Included within the temporary ROW acreage

2.2.2.1 Forest Plan Amendment

Purpose of the Proposed Amendment

The NFMA requires proposed projects, including proposals from non-federal entities subject to permits or ROW grants, be consistent with the applicable Forest Plan (16 U.S.C. § 1604(i)). The Jefferson National Forest Plan states that, "[p]rojects are evaluated to determine if they are consistent with the management direction in the Revised Plan," and that, "[d]eviation from a standard requires a Forest Plan amendment" (JNF LRMP, p. 2-1). The MVP Project cannot achieve several Forest Plan standards that are intended to protect soil, water, riparian, visual, old growth, and recreational resources. Therefore, the purpose of the proposed amendment is to make the project consistent with the LRMP.

In the Fourth Circuit decision, the Court stated:

> "Thus, the clear purpose of the amendment is to lessen requirements protecting soil and riparian resources so that the pipeline project could meet those requirements."[9]

The Court is correct in that we will achieve the purpose of the amendment (i.e., making the project consistent with the LRMP) by lessening the protections for soil and riparian resources within the 50 acres of the temporary MVP ROW, and ultimately the 25 acres of the permanent MVP MLA ROW. As described in Section 3.4.4 of this SEIS, we have used this definition of the purpose of the amendment in arriving at a determination of which of the substantive requirements of the 2012 Planning Rule are directly related to the proposed amendment.

The purpose of the amendment is not the same as the applicant's purpose of the project. The applicant's purpose of the project, in general, is to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States. Specific description of the purpose of the MVP project is found in the FERC FEIS, page 1-8. Despite the remand of the Forest Service's 2017 MVP ROD, the project purpose articulated in the FERC FEIS has not changed.

Proposed Amendment

The proposed Forest Plan amendment would modify 11 JNF Forest Plan standards so that the project is consistent with the Plan, but only for the limited purpose of the construction, operation,

[9] Sierra Club, Inc. v United States Forest Serv., 897 F.3d 582 (4th Cir. 2018).

and maintenance of the MVP project within the project's ROW. Specifically, the 11 standards proposed to be modified for the MVP project are listed in Table 2; modifications to the standards are shown in *italics*.

Table 2. JNF Forest Plan Standards and Proposed Modifications Specific to the MVP Project.

Jefferson NF Forest Plan Standards	Proposed Modification for the MVP Project
Part 1 – Utility Corridors	
Standard FW-248: Following evaluation of the above criteria, decisions for new authorizations outside of existing corridors and designated communication sites will include an amendment to the Forest Plan designating them as Prescription Area 5B or 5C (JNF LRMP, p. 2-60).	Standard FW 248: Following evaluation of the above criteria, decisions for new authorizations outside of existing corridors and designated communication sites will include an amendment to the Forest Plan designating them as Prescription Area 5B or 5C. *However, this requirement does not apply to the operational right-of-way for the MVP Project.*
Part 2 – Soil and Riparian	
Standard FW-8: To limit soil compaction, no heavy equipment is used on plastic soils when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limit. Soil moisture exceeds the plastic limit when soil can be rolled to pencil size without breaking or crumbling (JNF LRMP, p. 2-7).	Standard FW-8: To limit soil compaction, no heavy equipment is used on plastic soils when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limit, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*. Soil moisture exceeds the plastic limit when soil can be rolled to pencil size without breaking or crumbling.
Standard FW-9: Heavy equipment is operated so that soil indentations, ruts, or furrows are aligned on the contour and the slope of such indentations is 5 percent or less (JNF LRMP, p. 2-7).	Standard FW-9: Heavy equipment is operated so that soil indentations, ruts, or furrows are aligned on the contour and the slope of such indentations is 5 percent or less, *with the exception of the operational rights-of-way and the construction zone for the Mountain Valley Pipeline, for which applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*.
Standard FW-13: Management activities expose no more than 10% mineral soil in the channeled ephemeral zone (JNF LRMP, p. 2-8).	Standard FW-13: Management activities expose no more than 10% mineral soil in the channeled ephemeral zone, w*ith the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*.

Table 2 (continued). JNF Forest Plan Standards and Proposed Modifications Specific to the MVP Project.

Jefferson NF Forest Plan Standards	Proposed Modification for the MVP Project
Standard FW-14: In channeled ephemeral zones, up to 50% of the basal area may be removed down to a minimum basal area of 50 square feet per acre. Removal of additional basal area is allowed on a case-by-case basis when needed to benefit riparian dependent resources (JNF LRMP, p. 2-8).	Standard FW-14: In channeled ephemeral zones, up to 50% of the basal area may be removed down to a minimum basal area of 50 square feet per acre. Removal of additional basal area is allowed on a case-by-case basis when needed to benefit riparian-dependent resources, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*.
Standard 11-003: Management activities expose no more than 10 percent mineral soil within the project area riparian corridor (JNF LRMP, p. 3-182).	Standard 11-003: Management activities expose no more than 10 percent mineral soil within the project area riparian corridor, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline for which applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*.
Part 3 – Old Growth Management Area	
Standard 6C-007: Allow vegetation management activities to: maintain and restore dry-mesic oak forest, dry and xeric oak forest, dry and dry-mesic oak-pine old growth forest communities; restore, enhance, or mimic historic fire regimes; reduce fuel buildups; maintain rare communities and species dependent on disturbance; provide for public health and safety; improve threatened, endangered, sensitive, and locally rare species habitat; control non-native invasive vegetation(JNF LRMP, pp. 3-82 to 3-83).	Standard 6C-007: Allow vegetation management activities to: maintain and restore dry-mesic oak forest, dry and xeric oak forest, dry and dry-mesic oak-pine old growth forest communities; restore, enhance, or mimic historic fire regimes; reduce fuel buildups; maintain rare communities and species dependent on disturbance; provide for public health and safety; improve threatened, endangered, sensitive, and locally rare species habitat; control non-native invasive vegetation, *and clear the trees within the construction zone associated with the Mountain Valley Pipeline*.
Standard 6C-026: These areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites. Existing uses are allowed to continue (JNF LRMP, p. 3-84)	Standard 6C-026: These areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites, *with the exception of the Mountain Valley Pipeline right-of-way*. Existing uses are allowed to continue.

Table 2 (continued). JNF Forest Plan Standards and Proposed Modifications Specific to the MVP Project.

Jefferson NF Forest Plan Standards	Proposed Modification for the MVP Project
Part 4 – Appalachian National Scenic Trail	
Standard 4A-028: Locate new public utilities and rights-of-way in areas of this management prescription area where major impacts already exist. Limit linear utilities and rights-of-way to a single crossing of the prescription area, per project (JNF LRMP, p. 3-23).	Standard 4A-028: Locate new public utilities and rights-of-way in areas of this management prescription area where major impacts already exist, *with the exception of the Mountain Valley Pipeline right-of-way*. Limit linear utilities and rights-of-way to a single crossing of the prescription area, per project.
Part 5 – Scenery Integrity Objectives	
Standard FW-184: The Forest Scenic Integrity Objectives (SIOs) Maps govern all new projects (including special uses). Assigned SIOs are consistent with Recreation Opportunity Spectrum management direction. Existing conditions may not currently meet the assigned SIO (JNF LRMP, p. 2-48).	Standard FW-184: The Forest Scenic Integrity Objectives (SIOs) Maps govern all new projects (including special uses), *with the exception of the Mountain Valley Pipeline right-of-way. MVP shall attain the existing SIOs within five years after completion of the construction phase of the project, to allow for vegetation growth*. Assigned SIOs are consistent with Recreation Opportunity Spectrum management direction. Existing conditions may not currently meet the assigned SIO.

2.2.2.2 Mitigation and Compliance Monitoring

An integral part of the proposed action is the POD which outlines the steps that MVP must follow during the construction, operation, and maintenance of the project on federal lands, including mitigation measures and project design features. The POD includes resource mitigation for reducing or eliminating effects to resources. Specific resource mitigation plans are included in the POD as appendices, which must be approved by the Forest Service and BLM. MVP must submit a final POD prior to BLM issuing its ROD. If approved, the BLM would incorporate the final POD into the ROD and would attach it to the ROW grant and TUP as a comprehensive compliance document for the approved use of the authorization. No relocation, additional construction, or use that is not in accordance with the approved POD can be initiated without the BLM's prior written approval (see Section 1.4.2).

Mitigation measures incorporated into the proposed amendment are designed to minimize the potential for soil movement and ensure adequate restoration and revegetation. The mitigation measures are outlined in the Erosion and Sediment Control Plan (POD, Appendix C), Landslide Mitigation Plan (POD, Appendix F), the Site-Specific Design of Stabilization Measures in High Hazard Portions of the Route (POD, Appendix G), the Restoration Plan (POD, Appendix H), and the Winter Construction Plan (POD, Appendix M). In addition, the project would be compliant with the FERC Upland Erosion Control, Revegetation, and Maintenance Plan and the FERC Waterbody and Wetland Construction and Mitigation Procedures; and it would follow Best Management Practices (BMPs) for the states of West Virginia and Virginia. During initial construction activities, monitoring identified instances where ECDs needed repair or replacement due to excessive precipitation or other factors. Enhanced ECDs were added to these

areas to reinforce protection of resources and to minimize the risk of future damage or ECD failure.

The Forest Service will continue to monitor implementation of the mitigation measures on NFS lands to assure that the terms and conditions of the ROW grant issued by BLM are carried out (40 CFR 1505.3) and that negative impacts from construction and operation of the pipeline on federal lands are minimized to the extent possible. As during initial construction activities, compliance monitors would be present on a full-time basis to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues to FERC, the Forest Service, and the BLM. Objectives of the compliance monitoring program are to facilitate the timely resolution of compliance issues in the field; provide continuous information to FERC regarding noncompliance issues and their resolution; and review, process, and track construction-related variance requests. The Agencies would issue a stop work order if the project does not comply with terms and plans in the POD.

Changes to approved mitigation measures, construction procedures, and construction work areas due to unforeseen or unavoidable site conditions would require regulatory approval from the applicable land management agencies. FERC's authorized representatives would have the authority to stop any activity that violates an environmental condition of the FERC authorization issued to Mountain Valley.

Conventional Bore Stream Crossings

If the four streams on NFS lands are crossed using a conventional bore method, the procedures in the Water Crossing Plans (POD Appendix K; MVP 2020v) and the stream crossing method variance request (MVP 2020u) would be implemented, as summarized below:

- All earth disturbance necessary to complete the crossings and spoil stockpile will remain within the previously permitted LOD.
- Reinforced filtration devices will be used, which may include priority 1 silt fence, triple stacked compost filter sock, or super silt fence.
- Bore pits and construction activities will be located outside of the ordinary high water mark of streams.
- Bore pits will be monitored and dewatered when necessary by utilizing a standard water pump. The pumps will discharge into dewatering structures that will be built in compliance with both FERC and Virginia Department of Environmental Quality requirements.
- No drilling fluids will be employed.

Dry-Ditch Open Cut Stream Crossings

If the four streams on NFS lands are crossed using a dry-ditch open cut method, the following procedures would be utilized to minimize adverse impacts:

- Any open-cut stream crossings will not be started unless the weather forecast reflects limited or no upcoming rain events.
- Any open-cut stream crossings will be attempted during low flow.

- Environmental monitors will be on-site during stream crossing activities to evaluate any changing conditions.
- Stream crossing crews will be required to have additional sandbags and erosion and sedimentation control devices, back-up pumps, and spill kits on-site prior to starting the stream crossing.
- Additional erosion and sedimentation control devices, including turbidity curtains, will be deployed downstream if necessary.
- All fuel supplies and pumps will be required to be in secondary containment.
- The stream crossings will be completed as quickly as possible to eliminate the duration in the stream.
- Any temporary impacts to the stream banks and any adjacent areas from the crossing activity will be restored directly following the stream crossing.

Requirements in the 2020 Biological Opinion

The ROW grant and TUP would incorporate reasonably prudent measures, terms and conditions, and monitoring and compliance reporting requirements in the 2020 BO that apply to actions on NFS lands. These requirements are summarized below.

Indiana Bat

- Provide information to individuals involved in project construction on how to avoid and minimize potential effects to the Indiana bat.
- Finalize the Memorandum of Understanding regarding federally listed bat mitigation prior to the completion of project construction.
- Prior to initiation of on-site work, notify all prospective employees, operators, and contractors about the presence and biology of the Indiana bat, special provisions necessary to protect the Indiana bat, activities that may affect the Indiana bat, and ways to avoid and minimize these effects. This information can be obtained by reading Indiana bat-related information in the 2020 BO or a fact sheet containing this information can be created and provided by FERC or the applicant.
- FERC or the applicant shall notify the FWS regarding the projected and actual re-start dates, progress, and completion of the project and verify that all conservation measures were followed. Provide a report containing this information by December 31 of each year until construction is complete.

Northern Long-Eared Bat

- Finalize the Memorandum of Understanding regarding federally listed bat mitigation prior to the completion of project construction.
- FERC or the applicant shall notify the FWS regarding the projected and actual re-start dates, progress, and completion of the project and verify that all applicable conservation measures were followed. Provide a report containing this information by December 31 of each year until construction is complete.

2.3 Alternatives Considered but Eliminated from Detailed Study

The Forest Service is adopting the FERC FEIS and augmenting it based on additional analysis. In addition to adopting the alternatives considered but eliminated from detailed study in Section 3.2 of the FERC FEIS (pp. 3-4 to 3-119), this section discloses how the Forest Service is meeting its obligation to analyze off-NFS alternatives.

Section 3 of the FERC FEIS documents how public comments, which provided suggestions for alternative methods for achieving the purpose and need, were addressed. Section 3, which is incorporated by reference into this DSEIS, describes alternative development and the alternatives that were carried forward into detailed analysis. The FERC used key criteria to evaluate the identified alternatives, which included whether the alternative would:

- be technically and economically feasible and practical;
- offer a significant environmental advantage over the proposed action; and
- meet the project's purpose, as described in the FEIS, Section 1.1.

The identification of alternative routes for the MVP as a whole, and for specific segments for crossings the JNF, began with a detailed routing analysis performed during the pre-filing stage. The MVP adopted at least 11 route revisions and incorporated at least 571 minor route variations (FERC FEIS, Sec. 3.4 pp. 3-17 to 3-32).

Since 2017, the identification and evaluation of alternative routes has continued as issues were raised by stakeholders or located in the field. Two alternatives evaluated (Alternative 1 and Northern Alternative-ACP Collocation Alternative) included alternative crossing locations of the JNF. A third major alternative was identified that would avoid crossing FS-managed lands entirely: the Forest Service Avoidance Alternative.

2.3.1 Evaluation of Off-NFS Lands Alternatives

The Forest Service evaluated whether the MVP could be reasonably accommodated off-NFS lands for consistency with Forest Service Manual and the Forest Plan as a consideration in whether to concur with issuance of a ROW grant for the MVP project. The following are factors that weigh on this consideration:

Forest Service Manual 2703.2(2) states:

> In applying the second-level screening criterion regarding the public interest (36 CFR 251.54(e)(5)(ii)), consider the following: … Authorize use of NFS lands other than noncommercial group uses only if … the proposed use cannot reasonably be accommodated off of NFS lands.

The JNF Forest Plan standard FW-244 states:

> Evaluate new special use authorizations using the criteria outlined in 36 CFR 251.54 and according to Forest Service policy. Limit to needs that cannot be reasonably met on non-NFS lands or that enhance programs and activities.

In response to Issue 2, the Agencies organized a team of resource specialists to review the alternatives that would avoid NFS lands and to determine if other non-NFS options existed. The evaluation considered whether there were new options for using existing ROWs. The evaluation responds to Issue 2.

For this analysis, three criteria were selected to guide the evaluation: (1) Whether all reasonable alternatives that would avoid NFS lands had been reviewed; (2) How special use screening requirements found at 36 CFR 251.54(d)(e) supported a review of alternatives; and (3) Whether the JNF Forest Plan standard FW-244 had been adequately addressed.

2.3.1.1 Evaluation Criteria 1

Table 3 addresses evaluation criteria 1 and displays a re-evaluation of the 2017 FERC alternatives and the BLM Practicality Analysis (see Appendix A). The table also includes the 2020 MVP "Forest Service Avoidance" alternative (part of screening criteria review performed by the Forest Service in 2016).

Table 3. MVP Alternative Route Evaluation

MVP Alternatives	Source	Description Summary	Review Comments	Summary of Findings
Summary of Alternative Routes reviewed	Updated 2020 MVP SF 299	"The identification of alternative routes for the Project as a whole, and for specific Project segments for crossings of the Weston and Gauley Bridge Turnpike Trail and JNF, began with a detailed routing analysis performed in May 2014 that analyzed 94 corridor segments including 2,362 miles of potential pipeline routes that would move gas from Northern West Virginia to Transco Station 165 in Pittsylvania County, Virginia."	The identification of 94 corridor segments and 2,362 miles of potential routes are in the FERC FEIS and/or docket.	--
Summary of Alternatives Considered in addition to the Proposed Action	Updated 2020 MVP SF 299	Mountain Valley continued to identify and evaluate alternatives as issues were raised by stakeholders or located in the field. Two alternatives evaluated (Alternative 1 and Northern Alternative-ACP Collocation Alternative) would avoid crossing the Weston and Gauley Bridge Turnpike Trail and would include alternative crossing locations of the JNF.	Notes alternative crossing locations on the JNF not entire avoidance of NFS lands.	--
Alternative 1	Updated 2020 MVP SF 299	Alternative 1 would maximize collocation; would be collocated primarily with existing electric transmission lines for approximately 101 miles, or about 31% of its total length.	Reduces crossing NFS from 3.5 to 1.6 miles; Reduces acres of old growth crossed from 1,710 feet to 0; Reduces designated old growth affected from 4.9 acre to zero.	Does not eliminate routes on NFS lands.

Table 3 (continued). MVP Alternative Route Evaluation

MVP Alternatives	Source	Description Summary	Review Comments	Summary of Findings
FS Avoidance Route	Updated 2020 MVP SF 299	This route would entirely avoid NFS lands and locate the pipeline on private lands.	See evaluation and review of this alternative.	Eliminates routes on NFS so does meet intent of Court issue. See evaluation.
Northern Pipeline-ACP Collocation	FERC FEIS; updated 2020 MVP SF 299, BLM Practicality Analysis	Collocated entirely on federal lands with two parallel 42" pipelines with two 125' ROWs.	Still crosses NFS, but in conjunction with ACP. 22 miles more of side slope routes; issue with collocating two pipelines along ridges. MP37 to MP303.5.	Does not eliminate routes on NFS so does not meet intent of Court issue. See BLM practicality analysis for additional analysis. Since the ACP has been proposed to be cancelled, this is no longer a viable alternative.
Highway Collocation	FERC FEIS, BLM Practicality Analysis	Alongside of Interstate 77.	Still crosses NFS but in conjunction with the highway ROW. Two versions analyzed: one within highway ROW and one adjacent to highway ROW.	See BLM practicality analysis for additional analysis.
Alt 1-Hybrid 1A	FERC FEIS, BLM Practicality Analysis	Alt 1 maximizes collocation with an existing electric transmission line with Hybrid 1A follows approved route to MP 135, then follow Alt 1, re-converging at MP 303.5.	Collocates with electric transmission lines.	Does not eliminate routes on NFS lands so it does not meet intent of Court issue. However, it does reduce the pipeline length on NFS lands to 1.6 miles.
Variations 110, 110R, and 110J	FERC FEIS, BLM Practicality Analysis	Developed to avoid sensitive resources in the general vicinity of the JNF crossing between MPs 175-235.	Crosses more federal lands than the approved route	Does not eliminate routes on NFS lands.
SR-635-ANST Variation	FERC FEIS, BLM Practicality Analysis	Developed to reduce effects to AT hikers by crossing the AT at an existing state road. MPs 191.7 to 207.8.	Crosses 2.9 miles more of federal land.	Does not eliminate routes on NFS lands.

Table 3 (continued). MVP Alternative Route Evaluation

MVP Alternatives	Source	Description Summary	Review Comments	Summary of Findings
Columbia Gas of Virginia (CGV) Variation	FERC FEIS, BLM Practicality Analysis	Collocates MVP with CGV for about 1.6 miles. MPs 195 to 200.	Reduces un-collocated crossing on federal lands but increase total pipeline by about 9 miles with 4.1 miles on steep slope and 4.6 miles of side slope. Increases total disturbance by 136.3 acres with 60.8 more acres on forested land.	Does not eliminate routes on NFS lands.
AEP-ANST Variation	FERC FEIS, BLM Practicality Analysis	Developed to reduce effects to AT hikers by crossing the AT at an existing electric transmission line. MPs 195.4 to 200.	Increases crossing of federal lands by about 0.9 miles.	Does not eliminate routes on NFS lands.
Brush Mountain Alternatives 1 and 2	BLM Practicality Analysis	Developed to reduce effects to the Craig Creek watershed. MP 219.5 to 220.7.	Crosses same amount of federal land.	Does not eliminate routes on NFS lands.
Slussers Chapel Variations	BLM Practicality Analysis	Two route alternatives between MPs 220.7 and 223.7 to reduce effects on the Slussers Chapel Conservation Site.	Modified Variation 250 entirely on non-federal lands but still has about 2.3 miles on federal land. Other alternative crosses more federal lands.	Does not eliminate routes on NFS lands.
Burnsville Lake WMA	Updated 2020 MVP SF 299	Alternative crossing location of the Weston and Gauley Bridge Turnpike Trail. Variation between MP 65.3 and 69.6.	Does not change the route on NFS as it rejoins the primary route.	Does not eliminate routes on NFS lands.
Alternative Modes of Natural Gas Transportation	FERC FEIS, Sec. 3.2	Natural gas would be transported by transporting by LNG vessels.	The alternative was determined to be not technically feasible and practicable by the FERC.	Would avoid NFS lands, but the proposal is outside the scope and jurisdiction of the JNF. FERC found this alternative to not be feasible.

Table 3 (continued). MVP Alternative Route Evaluation

MVP Alternatives	Source	Description Summary	Review Comments	Summary of Findings
Alternative Modes of Natural Gas Transportation	FERC FEIS, Sec. 3.2.2.	Natural gas would be trucked on existing roadways.	The alternative was determined to not have significant advantages by the FERC.	Would avoid NFS lands, but the proposal is outside the scope and jurisdiction of the JNF. FERC found this alternative to not be feasible.
Alternative Modes of Natural Gas Transportation	FERC FEIS, Sec. 3.2.3.	Natural gas would be transported via railroad.	The alternative was determined by FERC to need years to design, permit, and build and would come with its own set of environmental effects with no significant environmental advantages. See additional information in narrative form, below.	Would avoid NFS lands, but the proposal is outside the scope and jurisdiction of the JNF. FERC found this alternative to not be feasible.
System Alternatives	FERC FEIS Sec.3.3	The FERC identified multiple alternatives for using other natural gas pipelines.	FERC considered the Texas Eastern, Columbia, East Tennessee, and Transco pipeline systems. Proposed natural gas transmission systems considered include the Supply Header, Atlantic Coast, and WB Xpress pipeline systems. See additional information in narrative form, below.	Would avoid NFS lands, but the proposal is outside the scope and jurisdiction of the JNF. FERC found this alternative to not be feasible.

Alternatives that Avoid NFS Lands

The May 2020 Standard Form 299 (SF-299) and 2017 FERC FEIS includes multiple alternatives that avoid NFS lands (DOI 2020a).

Forest Service Avoidance Alternative

One alternative that would fully avoid NFS lands was developed by the MVP in their SF-299 application but was not included in the 2017 FERC FEIS. Mountain Valley submitted this alternative to the Forest Service on April 8, 2016. This route would entirely avoid NFS lands by being placed on private lands in both West Virginia and Virginia but north of the JNF (MVP 2020s). This alternative encompasses a broad array of route deviations and, therefore, impacts. Although the Court stated that the Forest Service must consider alternatives that avoid NFS lands, a majority of the MVP has already been constructed, including crossings of the Blue Ridge Parkway and U.S. Army Corps of Engineers lands. In addition, the Forest Service does not have jurisdiction over an alternative that avoids NFS lands, and the No Action Alternative effectively addresses avoidance of NFS lands.

In effect, all actions that would have occurred on NFS would be transferred to other lands. This alternative would increase the length of the pipeline from approximately 303 miles to 351 miles and the acres of land that are disturbed from the ROW during construction increases by 745 acres. The number of populated areas that are within ½ mile of the pipeline increase from 8 to 31, and the number of private lands crossed would increase by about 248 parcels. Relatedly, the number of residences that are in close proximity (within 50 feet) to the ROW would increase from 63 to 168. The ANST and the Blue Ridge Parkway, important features on this landscape, would still be crossed but not on NFS lands.

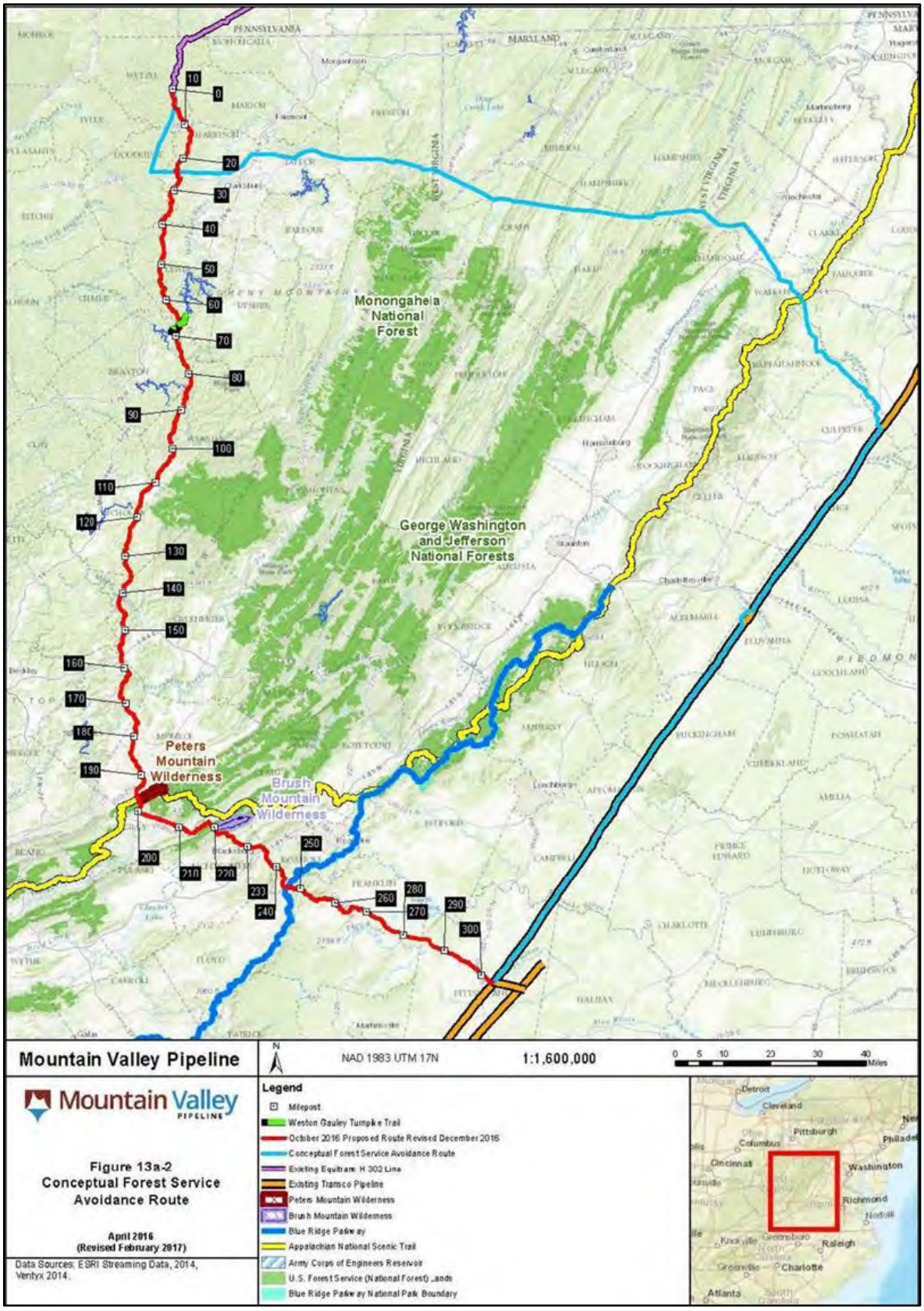

Figure 2. MVP NFS Lands Avoidance Route

Jefferson National Forest

In terms of sensitive resources, the route would include approximately 11 additional large waterbody crossings, and perennial waters affected by the route would increase by over 50%. There would be an increase of about 15,000 feet of wetland crossings, including approximately 6,000 feet of forested wetlands. The area affected by the route would increase over 50% for perennial waters. Table 4 compares the proposed action alternative to this alternative.

Table 4. Comparison of Proposed Action and NFS Lands Avoidance Route

Feature	Forest Service Avoidance Route	Proposed Action Alternative
General		
Total length (miles)	351	303.5
Length adjacent to existing ROW (miles)	332	22
Land disturbed within construction ROW (acres)	5,301	4,556
Land Use		
Populated areas within ½ mile (number)	31	8
National Forest System lands crossed (miles)	0	3.4
National Forest Wilderness crossed (miles)	0	0
ANST crossings (number)	1	1
Blue Ridge Parkway crossings (number)	0	1
NRHP designated or eligible historic districts crossed (miles)	0.1	10.1
Landowner parcels crossed (number)	1,743	1,495
Residences within 50 feet of construction workspace (number)	168	63
Resources		
Forested land crossed (miles)	206.0	245.2
Forested land affected during construction (acres)	3,121.2	3,720.0
Forested land affected during operation (acres)	1,248.5	1,486.0
Interior forest crossed (miles)	41.1	129.8
Wetlands (National Wetlands Inventory) crossed (feet)	18,918	3,299
Forested wetlands crossed (feet)	7,761	1,721
Forested wetlands affected by construction (acres)	13.4	3.0
Forested wetlands affected by operation (acres)	8.9	2.0
Perennial waterbody crossings (number)	206	97

Alternative Modes of Transporting Natural Gas

Liquefied natural gas (LNG) delivery via ships, trucks, and railroads was considered in the 2017 FERC FEIS but dismissed from detailed analysis because it was found to not provide significant environmental advantage and/or not technically feasible and practical.

Ship Delivery

Delivery via ships would have to utilize existing import/export shipping terminals because construction of a new shipping terminal would be impractical. Therefore, the utilization of Dominion Cove Point terminal in Maryland and the Elba Island Terminal in Georgia were considered for a shipping alternative. Utilization of either of these terminals would still require construction of a pipeline of about 310 miles for Dominion Cove Point and more than 350 miles for Elba Island Terminal. Therefore, the shipping alternative was not developed for detailed analysis because it does not provide a significant environmental advantage and is impractical.

Truck Delivery

Delivery via trucks would require the construction of liquefaction facilities at the natural gas production area in West Virginia and Pennsylvania, and new regasification facilities would need to be constructed at the delivery points. The environmental effects associated with the construction and operation of new liquefaction and regasification facilities would be substantial. An estimated 2,201 trucks would be required to transport the volume of LNG per day to replace the proposed MVP. For these reasons, the trucking alternative was not developed for detailed analysis because it does not provide a significant environmental advantage and is impractical.

Railroad Delivery

Delivery via railroad would require the construction of liquefaction facilities at the natural gas production area in West Virginia and Pennsylvania, and new regasification facilities would need to be constructed at the delivery points. The environmental effects associated with the construction and operation of new liquefaction and regasification facilities would be substantial. An estimated 779 rail cars would be required to transport the volume of LNG per day to replace the proposed MVP. In addition, railway extensions would be needed to proposed delivery points. For these reasons, the railroad alternative was not developed for detailed analysis because it does not provide a significant environmental advantage and is impractical.

System Alternatives

Alternatives utilizing existing or other proposed natural gas transmission system/facilities were considered in the updated 2020 SF-299 and 2017 FERC FEIS. Existing natural gas transmission systems considered include the Texas Eastern, Columbia, East Tennessee, and Transco pipeline systems. Proposed natural gas transmission systems considered include the Supply Header, Atlantic Coast, and WB Xpress pipeline systems. Many of these existing and proposed pipelines cross NFS lands. However, all the system alternatives considered were not developed for detailed analysis because construction of additional facilities and pipelines to connect and utilize these systems would be similar or greater environmental effect than the proposed MVP project, and/or the existing system does not have the capacity to transport MVP's natural gas.

Route Alternatives

The FERC FEIS analyzed four major route alternatives to the proposed action in detail: Alternative 1, Hybrid 1A, Hybrid 1B, and the Northern Pipeline-Atlantic Coast Pipeline Collocation. All four of these alternatives analyzed in detail cross NFS lands for some portion of the overall project. In addition, the FERC FEIS considered 15 route variations to address site-specific issues, some of which reduced the overall project length crossing NFS lands but did not eliminate crossing NFS lands. Therefore, these route alternatives are not pertinent in determining whether the proposal can reasonably be accommodated off of NFS lands.

Re-Evaluation Conclusion

The evaluation of effects is only specific to NFS lands; the Avoidance Alternative as well as the other alternative modes of transporting natural gas would reduce or eliminate additional effects to NFS lands. However, the conclusion from the Agencies, when considering all aspects of the MVP proposal, was that it could not be reasonably accommodated off NFS lands in its entirety. To determine and compare the environmental effects associated with the avoidance alternatives as well as the alternative modes is not within the jurisdiction of the Forest Service. For these reasons, the Forest Service Avoidance Alternative was considered but eliminated from detailed study and the analysis on other route alternatives displayed in the FERC FEIS remains valid.

2.3.1.2 Evaluation Criteria 2

How the 2016 and 2020 Forest Service special uses initial and second-level screening checklist for the MVP proposal initially addressed alternatives was reviewed. In both cases, the Forest Service complied with special use screening requirements per 36 CFR 251.54 and Forest Service policy (FSH 2709.11, Sec. 12.2; 12.4).

As noted above in the "Background" section, the 2016 screening included initial evaluations of, among other things, the location of the proposed use; collocation opportunities; route alternatives and variations; if the proposed use could be reasonably accommodated on non-NFS lands; and if the proposed use would be consistent with the mission of the Forest Service to manage NFS lands and resources in a manner that will best meet the present and future needs of the American people. The screening served to help inform whether a Plan Amendment was needed for the project (251.54(e)(1)(ii) and whether the project would be in the public interest 251.54(e)(5)(ii) (i.e., can be accommodated off of NFS lands). The application process stopped at the application processing and response stage (36 CFR 251.54 (2)(g)) because only the BLM had the authority to approve Mountain Valley's ROW application and the authority to issue a decision on whether to approve, approve with modifications, or deny the application (30 U.S.C. § 185 et seq and 43 CFR Part 2880.).

2.3.1.3 Evaluation Criteria 3

The JNF FW-244 standard states, "Evaluate new special use authorizations using the criteria outlined in 36 CFR 251.54 and according to Forest Service policy. Limit to needs that cannot be reasonably met on non-NFS lands or that enhance programs and activities."

In 2016, the JNF applied this standard by evaluating the MVP application for a special use permit (for the purposes of conducting location surveys) by following the requirements as outlined in 36 CFR 251.54 and FSH 2709.11, Sec. 12.2 and 12.4. In 2020, the screening criteria were again applied as a consideration in whether the Forest Service should concur on the BLM's issuance of a ROW. A re-evaluation of the alternative routes concludes the proposed use cannot be reasonably accommodated on non-NFS lands (see Evaluation Criteria 1).

FW-244 also includes language that addresses needs that enhance programs and activities. There are a number of complementary laws, Executive Orders, and policy documents that recognize the importance of domestic energy production and transmission to the American people and have established federal policy to support projects that will increase the production, transmission, or conservation of energy. Also, the USDA was one of ten Federal departments or agencies that is a signatory to a May 2002 Interagency Agreement for processing interstate natural gas pipeline proposals. The Interagency Agreement establishes a framework for cooperation and participation among the signatories to statutory responsibilities are met in connection with the authorizations that are required to construct and operate interstate natural gas pipeline projects certificated by FERC. FERC is responsible for authorizing the construction and operation of interstate natural gas pipelines. FERC decides whether a proposed project is in the public interest and whether to issue a certificate of public convenience and necessity for such pipeline under section 7 of the Natural Gas Act.

After considering all of the varied interests, issues, and effects for the entirety of the 303.5-mile pipeline route, FERC determined that construction and operation of the MVP was in the public interest and issued a Certificate of Public Convenience and Necessity. In deference to FERC's decision and the agency's commitment to the Interagency Agreement, the Forest Service

determined the portion of the MVP route on the JNF enhances programs and activities of the federal government and therefore is consistent with Forest Plan standard FW-244.

2.4 Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in Table 5 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. Effects from implementing the amended Forest Plan standards (see Section 3.4.4) would be the same as the effects from implementing the Proposed Action.

Table 5. Comparison of Alternatives

	Alternative 1 – No Action	Alternative 2 – Proposed Action
Soils	With continued implementation and monitoring of ECDs, adverse effects on soil resources would be minor and would occur over the short term. Given consideration of these factors, effects under the No Action Alternative would be consistent with those analyzed in the FERC FEIS. To facilitate restoration activities, soil amendments will be used to increase soil quality of stockpiles and help restore soil productivity to pre-project conditions over the long-term.	Short-term effects would be associated with construction and would be minor to moderate, which is consistent with the conclusions in the FERC FEIS. Long-term impacts would be associated with post-construction restoration and operation and would be minor in intensity, which is consistent with the conclusions in the FERC FEIS. Mitigation measures in the POD and Project Design requirements would minimize construction-related effects to soils, such as clearing, grading, trench excavation, backfilling, contouring, and the movement of construction equipment. To facilitate restoration activities, soil amendments will be used to increase the soil quality of stockpiles and help restore soil productivity to pre-project conditions over the long-term.
Water Resources	With continued implementation and monitoring of ECDs, adverse effects on water resources would be minor and would occur over the short term. Given consideration of these factors, effects would be consistent with those analyzed in the FERC FEIS and associated studies including the updated *Hydrologic Analysis*. Long-term water resource effects would be minor and are associated with restoring the project area to its pre-project condition.	Short-term impacts would be associated with construction and would be minor, which is consistent with the conclusions in the FERC FEIS. Construction activities are not likely to significantly affect groundwater resources because the majority of construction would involve shallow excavations. The project would prevent or adequately minimize accidental spills and leaks of hazardous materials into groundwater resources during construction and operation by adhering to its spill prevention, control, and countermeasure plan in the POD. To reduce effects on waterbodies, the POD identifies measures to minimize effects, such as BMPs and ECDs. Long-term impacts would be associated with post-construction restoration and operation and would be minor in intensity, which is consistent with the conclusions in the FERC FEIS.

Table 5 (continued). Comparison of Alternatives.

	Alternative 1 – No Action	Alternative 2 – Proposed Action
Threatened, Endangered, and Sensitive Species	No detrimental effects to threatened and endangered species would occur as a result of the No Action Alternative beyond those which already occurred during the partial pipeline implementation. Long-term effects would be minor and beneficial as restoration activities would return the project area to its pre-project condition.	A total of 17 federally listed and 20 RFSS species could be affected by the MVP in the JNF. The Forest Service determined that the MVP may affect is likely to adversely affect the following species: candy darter, Indiana bat, northern long-eared bat, and Virginia spiraea. Formal consultation with the FWS determined appropriate mitigation measures for potential effects to federally listed species. The Forest Service determined that the project would be unlikely to cause a Trend Toward Federal Listing or Loss of Viability for Region Forester Sensitive Species. Implementation of required conservation measures in the POD will help reduce project effects to threatened, endangered, and sensitive species.
National Forest Management Act	No Effects.	Utility Corridors. Short- and long-term beneficial effect to the local and regional economy. Soil and Riparian. Modifications to six soils and riparian standards would result in greater adverse effects to erosion and sedimentation, soil compaction, soil porosity, runoff potential, soil fertility, revegetation potential, and soil carbon budget. Mitigation measures, erosion control devices, and best management plans included in the POD would ensure that a substantial lessening of protections to soils, riparian, and water resources do not occur (36 CFR 219). Old Growth Management Area. Amendments to Standard 6C-007 and 6C-026 would allow effects to old growth forest as well as create more forest edge habitat. However, the limited area (2 acres out of approximately 30,200 acres of JNF old growth or about 0.07% of the total old growth on JNF) of effect on old growth forests results in a minor effect that was adequately analyzed in the FERC FEIS. Appalachian National Scenic Trail. Temporary, minor adverse effects to trail users would occur from noise, dust, and visual intrusions from crossing underneath the ANST via a 600-foot-long bore. The long-term effects would be minor due to an approximate 300-foot buffer on either side of the trail and vegetative screening of the bore holes. Scenery Integrity Objectives (SIO). Degradation of scenic quality inconsistent with the JNF Forest Plan SIOs. Although this is an adverse effect to scenery, it is not a substantial adverse effect due to the limited extent of the project crossing the JNF (FERC FEIS p. 4-347), the project's proposed mitigation measures that would apply to temporary workspace, and the temporary and permanent ROW that are found in the updated POD (Section 7.9).

3 Affected Environment and Environmental Consequences

3.1 Introduction

This chapter combines the affected environment and environmental consequences discussions required by the NEPA implementing regulations (40 CFR 1500-1508). The discussions are combined so that the environmental consequences (effects) of the alternatives on forest resources and the background information needed to understand these consequences are discussed together for each resource.

Each resource is first described by its current condition, uses, supply and demand, or expected use, along with an explanation of how each resource is measured and evaluated. The descriptions are limited to providing the background information necessary for understanding how the SEIS alternatives may affect the resource from that which is displayed in the FERC FEIS. Methodology and scientific accuracy are discussed for most resources.

Existing conditions reflect the extensive changes brought about by long-term human occupancy and use of the forest and represent the present-day condition resulting from past and present actions. Effects include the short- and long-term effects that would result from each of the alternatives considered in this SEIS. Cumulative effects may result when the direct and indirect effects associated with the alternatives are added to the effects associated with other past, present, or reasonably foreseeable actions. Analysis of long-term cumulative effects extends 30 years into the future (i.e., the term of the ROW grant/temporary use permit) in many cases.

Many of the relationships established and discussed in the FERC FEIS and 2004 JNF Forest Plan FEIS are still valid, and therefore, are incorporated by reference in this SEIS. However, this SEIS updates some of this information to better reflect current conditions and focuses on the potential effects most relevant to the potential changes that could occur from this proposed action and the alternatives.

In support of the FWS Endangered Species Act consultation process for the MVP project, a hydrologic analysis of sedimentation for streams was prepared by an independent contractor. This analysis was conducted at the watershed scale and included the JNF in its analysis area. The analysis was submitted to Federal Agencies – including the Forest Service – with jurisdiction for review (Forest Service, FERC, FWS, Natural Resource Conservation Service [NRCS], and BLM). The agencies' expert reviewers conducted a concurrent review and a series of discussions, phone calls, and teleconferences (questions and answers, comment, feedback) took place. A revised analysis was submitted to the FWS based on inter-Agency comments. This reviewed and updated *Hydrologic Analysis* (Geosyntec Consultants 2020) is incorporated into this SEIS.

3.1.1 Existing Conditions

A described in Section 1.2, construction on NFS lands has been partially completed. The ROW on NFS lands was cleared of trees between February and April 2018. On Sinking Creek and Brush Mountain NFS lands, the trees have been felled and removed, and the ROW has been graded. On Peters Mountain, the trees have been felled but not removed from the ROW (approximately 26.2 acres). Grading activities on Sinking Creek and Brush Mountain include the

stockpiling of topsoil. No trenching has occurred on NFS lands. ECDs have been installed along the entire ROW on NFS lands.

Stockpiled topsoil and disturbed areas of the ROW have been stabilized with temporary vegetation to decrease erosion and sedimentation. In 2018, annual grasses and native perennial forbs/grasses were planted. In 2019, the areas were reseeded with a mix that included annual grasses, two or more native, perennial grasses, and partridge pea (a perennial forb). Sections of pipe have been delivered to the ROW and are being stored aboveground.

ROW conditions, including ECDs, have been monitored daily. Review of monitoring reports continue to show that most areas along the ROW on NFS lands are stable and ECDs are functioning (Transcon 2018-2020). Additional enhanced ECDs have been incorporated where appropriate as part of the monitoring program. Since construction commenced in 2018, enhanced measures implemented beyond the original approved erosion and sedimentation control plans include the following: hydraulically applied or pelletized mulch/tackifier upgraded from a less protective stabilization measure, waterbar end treatments upgraded from single compost filter sock (CFS) to triple stack CFS, increased size of CFS, upgrade of standard silt fence to Priority 1 belted silt retention fence, erosion control blanket installed in flow path and at the outfall end treatments of waterbars (in areas with erosive soils), temporary slope drain pipes installed to convey waterbar discharge across fill slopes where the ROW is benched, among other enhancements (FWS 2020b). Not all enhanced BMPs are expected to perform the same and should not be considered identical in terms of their reduction in expected sediment loads. Since construction commenced in 2018, approximately 65 formal enhancements have been undertaken along the 303.5-mile pipeline corridor in response to changing site conditions (FWS 2020b).

3.2 Analyzing Effects

Following each resource description is a discussion of the potential effects (environmental consequences) on the resource associated with implementation of each alternative. All significant or potentially significant effects, including direct, indirect, and cumulative effects, are disclosed. Effects are quantified, where possible, although qualitative discussions are also included. Mitigation measures are also described, if relevant.

Environmental consequences are the effects of implementing an alternative on the physical, biological, social, and economic environment. Direct environmental effects are defined as those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity but could be significant in the foreseeable future.

Potential adverse environmental effects that cannot be avoided are disclosed. Unavoidable adverse effects are those resulting from managing the land for one resource, while recognizing effects on the use or condition of other resources. Some adverse effects can be reduced or mitigated by limiting the extent or duration of effects.

Short-term uses, and their effects, are those that occur during the anticipated 2-year-long construction period (Proposed Action) or restoration period (No Action Alternative). Long-term uses, and their effects, are those that occur during the 30-year term of the ROW grant/temporary use permit.

Unless stated otherwise for a particular resource or use, the effects analysis utilizes the following effect intensity definitions:

- Negligible – Effect that is at or near the lowest level of detection.
- Minor – Effect that is detectable, but localized, small, and of little consequence to a resource.
- Moderate – Effect that is readily detectable, localized, and has consequences to a resource.
- Significant – Effect that is obvious and causes substantial consequences to a resource.

3.3 Resources Not Brought Forward for Detailed Analysis

As part of the SEIS analysis, the FERC FEIS and supporting documentation, new data, changed conditions, and the amended Forest Plan standards were evaluated for potential effects and environmental consequences. The Forest Service and the BLM reviewed the FERC FEIS to identify if there are significant changed circumstances or new information related to the BLM and Forest Service decisions and relevant to environmental concerns and bearing on the proposed action or its effects that should be analyzed in this SEIS (40 CFR 1502.9). For the resources listed below, the analyses in the FERC FEIS are still applicable and relevant, and the stipulations (i.e., terms and conditions) incorporated into the FERC FEIS analyses remain adequate. As a result, they are not brought forward in this SEIS for detailed analysis.

Specifically, the following resource areas do not need further analysis:

- Air Quality, Climate, and Noise
- Public Health and Safety
- Heritage Resources
- Mineral Resources
- Socioeconomics
- Scenery
- Vegetation
- Silviculture
- Terrestrial Wildlife
- Aquatic Species
- Geology
- Land Use
- Recreation and Special Uses
- Transportation

3.3.1 Air Quality, Climate, and Noise

Since a portion of the construction has been completed, some of the short-term construction effects disclosed in the FEIS have already occurred, so only a portion of the mass emissions expected from construction in the project area would be anticipated to be released once construction recommences. Under the No Action Alternative, vehicle and equipment emissions would occur during restoration activities. These would be minor because there would be no equipment (and associated emissions) for activities such as trenching, stream crossings, welding the pipe, hydrostatic testing, or backfilling.

Under the Proposed Action, operation and end-use combustion emissions resulting from the project would be the same as described in the FERC FEIS (p. 4-514). Upon recommencement of the construction under the Proposed Action, the anticipated construction sequence would continue in the manner specified in the POD, which would result in emissions of the same character and similar—though potentially somewhat reduced—quantity as originally proposed in the FEIS (MVP 2020a).

The effects of construction on air quality in the project area were analyzed in the FERC FEIS, as summarized in Table 4.11.1-5 of the FEIS. The magnitude of emissions in the project area

between the originally proposed project analyzed in the FERC FEIS and the new Proposed Action would be similar in quantity and character. This analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of air effects is needed.

The FERC FEIS addressed noise conditions and effects on the JNF (pp. 4-532, 4-539, and 4-551). In summary, no compressor stations or other aboveground facilities would be located within the JNF. Noise effects would be limited to use of mechanized construction equipment and vegetation removal on Peters Mountain. Installation of the pipeline via conventional bore beneath the ANST would result in noise that may be audible to hikers, but these effects would vary based on the presence of hikers at the time of construction. In addition, the undisturbed forest on either side of the trail and location of the bore pits 70 to 90 feet below the trail would minimize noise effects. Most pipeline construction noise would be localized and short-term (lasting for a few days to several weeks at any given location), and no noise sensitive area would be expected to be exposed to significant noise levels for an extended period of time. Noise effects during operation and maintenance of the MVP would not be expected within the JNF.

Noise effects on NFS lands under either alternative in this SEIS would be similar, or less than, those described in the FERC FEIS. The extent and intensity of adverse effects would be lower because it has been determined that the ROW can be accessed using only off-NFS roads. The FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of noise effects is needed.

3.3.2 Public Health and Safety

Effects on public health and safety within the project area would be similar to those analyzed in the FERC FEIS (Section 4.12, pp. 4-567, 4-568, and 4-571 to 4-574). As stated in the FERC FEIS, the pipeline and aboveground facilities associated with the project must be designed, constructed, operated, and maintained in accordance with the U.S. DOT's Minimum Federal Safety Standards (49 CFR 192). The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The DOT regulations specify material requirements and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion (FERC 2017a). Similarly, MVP would construct and maintain the Proposed Action in accordance with DOT regulations following the construction procedures and mitigation measures applicable to the project area contained in the November 2017 version of the POD and in the updated 2020 POD.

As described in the FERC FEIS, public health and safety risks would be minimized through the use of compliance monitors who would be present in the project area on a full-time basis during construction to inspect construction procedures and mitigation measures and provide regular feedback on compliance issues, including on matters of public safety to FERC, the Forest Service, and the BLM. There would generally be fewer risks to public health and safety under the No Action Alternative because restoration would involve fewer activities and less use of heavy equipment than the construction activities in the Proposed Action.

Because the MVP has been partially constructed on NFS lands, the potential effects on public health and safety under either alternative would be similar to those described in the FERC FEIS but would occur over a shorter period of time and in fewer locations. The FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action

in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of public health and safety effects is needed.

3.3.3 Heritage Resources

Phase II archaeological evaluations of all archaeological sites at least partially within the Area of Potential Effect (APE) have been completed, determining that site 44GS0241 is eligible for the National Register of Historic Places (NRHP) (Clement and Freedman 2017; Clement et al. 2017) and cannot be avoided. FERC, as the lead agency for NHPA, developed a PA (FERC 2017b), under 36 CFR § 800.14(b)(3), in consultation with the cooperating agencies, West Virginia and Virginia SHPOs, and other consulting parties, which sets forth the alternative steps for compliance with the requirements of Section 106 of the NHPA. The PA contains stipulations to satisfy all responsibilities under Section 106 of the NHPA for the involved regulatory agencies, including consideration of effects of the undertaking on historic properties, and resolution of adverse effects of the undertaking on NRHP eligible historic properties, including a Treatment Plan for the mitigation of adverse effects to site 44GS0241. The Treatment Plan for site 44GS0241 stipulated by the PA has been developed by third-party contractor, SEARCH, Inc., and received Virginia Department of Historic Resources concurrence (Clement and Freedman 2017; Clement et al. 2017).

As stipulated in the PA and the Forest Service concurrence letter to the BLM, implementation of the proposed action cannot occur until the archaeological excavations for site 44GS0241, as outlined in the Treatment Plan and including a separate agreement on the use of Tribal monitors, have been completed. No pipeline construction, other than tree clearing, has been conducted in the APE associated with site 44GS0241. All PA stipulations with regard to historic properties in the JNF have been completed with the exception of the implementation of the Treatment Plan with regard to data recovery excavations at site 44GS0241.

Consideration of potential effects on heritage resources under NEPA are consistent with the analysis in the FERC FEIS (pp. 4-468 to 4-469). The FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of heritage resources effects is needed.

3.3.4 Mineral Resources

The partial implementation of the project on NFS lands has not resulted in changes to minerals resources. In addition, there have been no changes to minerals data in the project area. As a result, effects to minerals under the No Action Alternative and Proposed Action would be captured in the FERC FEIS effects analysis (pp. 4-65 to 4-66), the effect determination would remain the same, and no additional mines would be affected in the project area. As stated in the FERC FEIS, the MVP project would come within 0.25 miles of oil and gas wells; no additional oil and gas wells in the project area would be encountered or affected under the Proposed Action. The MVP was sited to avoid known existing oil and gas wells to the extent possible, and the FERC FEIS concluded that the MVP would not affect future oil and gas exploration production, as the use of unconventional (directional) drilling techniques would allow for oil and gas wells to be drilled outside the pipeline ROW. A review of the Forest Service Schedule of Proposed Actions for the George Washington and Jefferson National Forest revealed no reasonably foreseeable future oil and gas wells within the MVP ROW (Forest Service 2020). The FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and

Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of mineral resources effects is needed.

3.3.5 Socioeconomics

The FERC FEIS (p. 4-380) described socioeconomic conditions on the JNF, including local county unemployment rates, primary industries, per capita income, Payment in Lieu of Taxes for local counties, and income-generating activities on NFS lands. The description of these conditions remains accurate, as there has been relatively little change since 2017. The FERC FEIS (pp. 4-400 to 4-402) also disclosed the effects of constructing the pipeline across NFS lands. In summary, the FERC FEIS anticipated benefits from construction jobs and the sale of timber cleared in the ROW and concluded that there would not be significant adverse effects on tourism or other revenue-generating activities on NFS lands. There would be fewer benefits under the No Action Alternative because restoration would not require as many employees. Overall though, the FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of socioeconomic effects is needed.

3.3.6 Scenery

Because of the partial implementation of the project on NFS lands, the visual character has changed since publication of the FERC FEIS in 2017. However, the clearing of the ROW and other project-related disturbances were analyzed in the FEIS. Under the Proposed Action, though the timeline of ROW clearing has been accelerated in these changed areas, from a scenery perspective, no changes in circumstances have occurred that would suggest conformance with Scenic Integrity Objectives (SIOs) within a 5-year timeframe following construction could not be achieved. Further, since the FEIS and ROD were issued, there have been no new recreation sites or trails developed on the JNF nor any new public parks, trails, or other outdoor recreation areas identified off the national forest (Forest Service 1995) that would require additional scenery analysis. Because no additional scenery effects have occurred outside those contemplated in the FEIS, SIOs are still anticipated to be met within five years. Under the No Action Alternative, the ROW would be restored to its pre-project condition and long-term effects on scenery would be negligible. The FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of scenery effects is needed.

3.3.7 Vegetation

Since publication of the FERC FEIS, several changes to vegetation conditions have occurred. The primary changed condition is that the ROW was cleared of trees between February and April 2018. On Sinking Creek and Brush Mountain NFS lands, the trees have been felled and removed and the ROW has been graded. On Peters Mountain, the trees have been felled but not removed from the ROW (approximately 26.2 acres) due to the stop work order issued by the FERC. Stockpiled soil has been seeded on Brush Mountain and Sinking Creek Mountain to prevent erosion. Vegetation maintenance within the 50-foot operation/maintenance ROW would be conducted in accordance with FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (FERC 2013a). In accordance with the Plan (FERC 2013a), vegetation maintenance/removal would not be done more frequently than every 3 years. Any ground disturbance would be restored to pre-existing topographic contours, and restoration would use native vegetation (where possible), as specified in the POD.

Four exotic invasive species have been observed scattered throughout the ROW: multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), garlic mustard (*Alliaria petiolata*), and mile-a-minute vine (*Persicaria perfoliata*) (Transcon 2018-2020). These species have been treated, and would be treated, in accordance with the Exotic and Invasive Species Control Plan (POD, Appendix S). Stockpiled topsoil in the ROW has been seeded and soil amendments would be added as needed as part of either alternative to ensure successful revegetation. Under the No Action Alternative, vegetation would be restored to its pre-construction condition across the permanent and temporary ROWs.

Prior to clearing of the ROW, this area was previously forested. Under the Proposed Action, it would be replaced with a grass/shrub condition, which is a changed vegetative community, but the FERC FEIS analyzed conversion of the permanent ROW from forest to herbaceous cover, the natural regeneration of temporary workspace from mature forest to an early successional condition, and the potential for treating exotic invasive species in accordance with the POD. The FERC FEIS analysis (pp. 4-186 to 4-189) remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of vegetation effects is needed.

Discussion of effects on federally listed and RFSS plant species is provided in Section 3.4.3.

3.3.8 Silviculture

All tree felling on NFS lands has already occurred and timber has been removed from the ROW except in the Peters Mountain area. The silvicultural effects related to timber removal were addressed in the FERC FEIS (pp. 4-186 to 4-189). After publication of the FERC FEIS, Mountain Valley applied for and was granted a variance to use ground-based harvesting methods as opposed to advanced logging techniques as described in the FERC FEIS. The effects of ground-based harvesting methods are consistent with the FERC FEIS because ground disturbance was confined to the Limit of Disturbance (LOD) where other construction activities have disturbed the ground and the temporary ROW would be allowed to regenerate to a forested condition. This effect would be minor because it is localized and because regeneration of the temporary workspaces would be guided by BMPs and the POD. Disturbance and regeneration of the temporary ROW were previously analyzed in the FERC FEIS.

The felled trees that have been left on Peters Mountain may not be merchantable at this time. This represents a reduced benefit to silviculture and the local economy, though the reduction is minor due to the relatively small area (26.2 acres) where merchantable timber has not been removed. Because the value of the timber has been paid to the Forest Service and the felled trees would be either removed from the ROW or windrowed within the ROW, the area of disturbance would not change and no supplemental analysis is needed. Under the No Action Alternative, regeneration and restoration would occur on both the temporary and permanent ROWs, resulting in a minor long-term benefit to silviculture. The FERC FEIS evaluated effects to forest habitat and the POD included restoration measures for vegetation and forest habitat.

The Forest Service's procedure for surveying old growth forests has changed since 2017; however, because the project route remains unchanged and no additional areas are to be cleared, no additional analysis is needed (see Section 3.4.4.3 for additional information). The FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of silviculture effects is needed.

3.3.9 Terrestrial Wildlife

Since publication of the FERC FEIS, forested habitat that comprised the MVP ROW has been cleared. Restoration activities were initiated on Brush Mountain and Mystery Ridge, but the stop work order resulted in restoration activities being delayed in the Peters Mountain area. Effects under the No Action Alternative include benefits associated with restoration of the temporary ROW to its pre-project condition, which is consistent with the FERC FEIS analysis. Effects under the Proposed Action include completion of construction and the long-term conversion of the permanent ROW from forest to herbaceous cover and the natural regeneration of temporary workspace from mature forest to an early successional condition. The FERC FEIS analysis (pp. 4-210 to 4-211) remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of terrestrial wildlife effects is needed.

Discussion of effects on federally listed and RFSS species is provided in Section 3.4.3.

3.3.10 Aquatic Species

Under the No Action Alternative, the greatest potential for effects on aquatic species except for threatened, endangered, or sensitive species is through erosion and sedimentation from the partially implemented MVP. Review of Transcon Environmental, Inc. (Transcon) weekly monitoring reports since the advent of construction activities show that most areas along the ROW are stable and ECDs are functioning. Additional ECDs have been incorporated where appropriate as part of the monitoring program. Since the FERC FEIS was published, an updated sedimentation model (Revised Universal Soil Loss Equation [RUSLE2]) has been completed which incorporates access road utilization, time elapsed since construction, and new construction timeline (Geosyntec Consultants 2020). The Forest Service has conducted an independent agency review of this analysis and incorporated it into this SEIS. Using this modeling, the *Hydrologic Analysis* report concluded that construction of the MVP would result in a slight increase in delivered sediment loads above the Baseline (pre-project) scenario to each of the streams analyzed (Geosyntec Consultants 2020). The supplemental analysis, which included Craig Creek, found a lower temporary percent in delivered sediment load compared to the Baseline scenario (Geosyntec Consultants 2020). Since publication of the FERC FEIS, it has been determined that the ROW can be accessed using only off-NFS roads and that stream crossing construction methods could be performed either with a dry-ditch open cut or conventional boring for all four unnamed tributary stream crossings on NFS lands. Avoiding use of NFS roads would lead to a lower predicted sedimentation load for streams than identified in the FERC FEIS under the Proposed Action because there would be less disturbance in and adjacent to water features. A similar reduction in impacts would be expected if the streams are crossed using a conventional bore because there would be no work performed in the streams. The FERC FEIS analysis (pp. 4-139 and 4-220 to 4-223) remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of aquatic species effects is needed.

Discussion of effects on federally listed and RFSS species is provided in Section 3.4.3.

3.3.11 Geology

The FERC FEIS (Section 4.1.1.7, pp. 4-45 to 4-46) described geology conditions on the JNF, including geologic setting, bedrock geology, surface geology, mineral resources, geological hazards, and paleontological resources. The description of these conditions remains accurate, as

there has been relatively little change since 2017. The partial implementation of the project on NFS lands has resulted in vegetation and soil/overburden removal. (No blasting or trenching has occurred on NFS lands.) Although these activities have altered surface flow patterns, ECDs have been installed and are monitored daily. Restoration under the No Action Alternative would result in negligible adverse effects on geology because there would be no trenching, stream crossings, or other in-ground activities. The ROW would be restored to its pre-project condition and ECDs would be removed after restoration is completed.

While geological units known to be associated with karst formation exist within the JNF proclamation boundary, none of them actually underlie NFS lands administered by the JNF, and those that do are unlikely to have karst features.

The pipeline would cross streams on NFS lands using either a dry-ditch open cut or conventional bore method. Use of horizontal directional drilling as a boring method was analyzed for some waterways in the FERC FEIS. To further minimize the risk of landslides from boring, the FERC FEIS recommended adoption of additional industry BMPs. The revised POD incorporates both of these requests. As a result, effects on geology under the Proposed Action were captured in the FERC FEIS effects analysis, the effect determination would remain the same, and no additional resources would be affected in the project area.

Various potential landslide or slip[10] risks along the proposed pipeline ROW on the JNF were recognized and analyzed in the FERC FEIS and 2020 BO and addressed in plans for pipeline construction. Landslides and slips can be caused by a variety of factors, such as long duration or high intensity rain events, rapid snowmelt, freeze/thaw conditions, slope height and steepness, vegetation, and underlying geology. The 2020 BO analyzes impacts along the entire MVP, including 296.45 acres associated with expected disturbance for future variances including slip repairs. These future variances could occur anywhere along the pipeline route, but in general, landslide susceptibility is higher in the northern and mountainous portions of the MVP due to regional geology and topography. In June 2018, the JNF provided a guidance document on identification and mitigation of landslide risks (Turner and Collins 2018) to its contractor (Transcon) tasked with monitoring pipeline construction on the Forest. The information provided in this document was recognized in the FERC FEIS, and the document was created to further implementation of the construction monitoring process on JNF NFS lands. In addition, the POD Appendix G identified six high hazard portions of the route on NFS lands (four on Peters Mountain, one on Brush Mountain, and one on Sinking Creek Mountain) and developed site-specific stabilization measures to mitigate for potential geohazards from pipeline construction.

Two outside documents related to landslide risk and the pipeline were released following release of the FERC FEIS. One document is a draft topographic quadrangle map released by the Virginia Division of Geology and Mineral Resources (Prince 2019). While this map is focused on showing bedrock geology of that quadrangle it also includes mapping of certain types of deposits associated with landslides along and near the pipeline route where it crosses the JNF on the southeast side of Sinking Creek Mountain. However, the information provided in this map is a less detailed version of the same type of information provided in earlier reference sources cited in the FEIS. Therefore, while the document is new, it does not provide any new information requiring further analysis in the SEIS.

[10] A landslide is the downslope movement of soil, rock, and organic materials under the effects of gravity (USGS 2008). Slips are a type of slope failure that result in a downward falling or sliding of a mass of soil, rock, trees, and other debris from a steep slope onto an area below (FWS 2020b).

The second document is an advisory bulletin concerning landslide risks to pipelines issued by the Pipeline and Hazardous Materials Safety Administration on May 1, 2019, in the FR (FR Doc. 2019–08984). This advisory bulletin was released to remind pipeline operators of their obligations to address landslide risks to pipelines under existing Federal regulations and to suggest a set of activities that operators should consider performing for identifying, monitoring, and mitigating these types of risks. As noted in the FERC FEIS, these are the types of ongoing regulatory agency actions that Mountain Valley would be required to comply with as part of pipeline construction, operation, and maintenance. Therefore, while the document is new, it does not provide any new information requiring further analysis in the SEIS.

There are no known paleontological collection sites along the proposed route within the JNF and therefore no need to analyze paleontological resources in the SEIS.

In conclusion, the FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of geology effects is needed.

3.3.12 Land Uses

Existing land use conditions described in the FERC FEIS include the presence of NFS administrative roads and forested landscape. Since publication of the FERC FEIS, the pipeline has been partially constructed. Adjacent to the project area, there has been a change in ownership of a 25.75-acre parcel at the intersection of Clendennin Road and Pocahontas Road, which is crossed by the ANST through a road easement. This parcel was purchased by Mountain Valley in 2019; however, there have been no changes to land use or resource conditions within this parcel.

Construction in the ROW was analyzed in the FERC FEIS and the current conditions are consistent with that analysis. There are no changes to project-related land uses beyond those described in the FERC FEIS.

The project area would be reclaimed under the No Action Alternative. The effects of restoration on land use in the project area were included in the FERC FEIS. The partial construction of the MVP on NFS lands has not resulted in changes to land use beyond those described in the FERC FEIS, and effects on land use from restoration would be the same, although to a lesser degree, as those described in the FERC FEIS. Implementation of the No Action Alternative would allow the ROW to be available for other future uses consistent with the Forest Plan. In conclusion, the FERC FEIS analysis (p. 4-325) remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of land uses effects is needed.

3.3.13 Recreation and Special Interest Areas

The partial implementation of the project on NFS lands has not resulted in changes to recreation or special interest areas. In addition, there have been no changes to recreation or special interest area data in the project area. As a result, effects on recreation and special interest areas under the Proposed Action is captured in the FERC FEIS effects analysis (pp. 4-311 to 4-315), the effect determination would remain the same, and no additional resources would be affected in the project area.

One of the many partnerships that the Forest Service participates in for the management of certain NFS lands is the unique cooperative management system partnership for the ANST. The ANST, first envisioned in 1921 and first completed as a footpath through 14 states in 1937,

became the first National Scenic Trail in the United States with the passage of the National Trails System Act in 1968. This federal law designates the entire 2,190-mile-long ANST as a National Scenic Trail; designates the Secretary of the Interior as the lead federal agency, in consultation with the Secretary of Agriculture, for the administration of the entire ANST (which the Secretary of Interior subsequently delegated to the National Park Service); recognizes the jurisdiction of the other federal and state public land managers whose lands are crossed by the ANST; and requires the consistent cooperative management of the unique ANST resource by the National Park Service, working formally with the non-profit Appalachian Trail Conservancy, local Appalachian Trail Conservancy–affiliated trail clubs and all the land managing agencies that the ANST traverses—notably and specifically, the Forest Service. More of the ANST is on NFS lands than any of more than 75 other public land ownerships trail-wide.

The MVP would cross underneath the ANST via a 600-foot-long bore so there would be an approximate 300-foot forested buffer on either side of the trail and there would be no need for vegetation removal within 300 feet of the trail. As stated in the FERC FEIS, use of the bore would minimize effects on recreational users on the trail (FERC FEIS, 3-52). The ANST would remain open during construction and would not require rerouting of trail traffic. Visual effects would be minor due to the forested buffer and vegetative screening of the bore holes. While ANST users on NFS lands would be affected by the noise and dust of the construction activities, impacts would be minor because they would be occurring 300 feet from the users and effects would be limited only to the time when boring is occurring. Installation of the pipeline via a bore beneath the ANST would result in noise that may be audible to hikers, but these effects would vary based on the presence of hikers at the time of construction. In addition, the undisturbed forest on either side of the trail and location of the bore pits 70 to 90 feet in elevation below the trail would minimize noise effects.

The MVP would cross streams within the JNF either by open cut or boring methods. Both crossing methods are described for waterways in the FERC FEIS. Effects on recreational fishing would be minimized by adhering to time-of-year restrictions as applicable (if open cut methods are used) or eliminated (if boring is used). As a result, adverse effects on recreational fishing would be as described in the FERC FEIS or avoided all together. As disclosed and analyzed in the FERC FEIS, the MVP would continue to cross a portion of the Brush Mountain Inventoried Roadless Area. In conclusion, the FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of recreation and special interest areas effects is needed.

3.3.14 Transportation

The FERC FEIS identified the proposed crossing of Mystery Ridge and Brush Mountain roads within the boundaries of the JNF. The proposed location and effects associated with these crossings have not substantively changed since publication of the document. The FERC FEIS also identified and analyzed the use of Pocahontas and Mystery Ridge roads. Pocahontas Road is open to the public up to milepost 1.3 and designated for administrative use only beyond that point. This road has been used since 2017 for construction of the MVP. More recently, it is in use for accessing a nearby timber sale not related to the MVP. It is scheduled for maintenance in 2020.

Since publication of the FERC FEIS, it has been determined that the ROW can be accessed using only off-NFS roads that intersect with the ROW off of NFS lands. This changed condition would significantly reduce any conflict that would potentially have existed with other use along those

NFS roads. The amended proposal would have fewer adverse effects than that which were previously analyzed and disclosed in the FERC FEIS. Effects on transportation would be the same under the No Action Alternative because NFS roads would not be utilized. Since no additional effects to NFS roads beyond what was analyzed in the FERC FEIS are proposed, the FERC FEIS analysis remains accurate and the effects of implementing the No Action Alternative and Proposed Action in the SEIS are consistent with those described in the FERC FEIS. As a result, no supplemental analysis of transportation effects is needed.

3.4 Resources Analyzed in Detail

3.4.1 Soils

This section responds to Issue 1 (Forest Plan Amendment – Purpose and Effect and Consistency with the Planning Rule and the NFMA) and Issue 3 (Erosion and Sediment Effects).

3.4.1.1 Affected Environment

The project area for soils is the 3.5-mile section of the MVP on NFS lands, including the pipeline ROW (temporary and permanent), access roads that have been used for construction (i.e., Pocahontas and Mystery Ridge roads), and any temporary workspace utilized during construction.

Existing conditions in the project area are described in the FERC FEIS, which is incorporated into this SEIS by reference. In summary, the project crosses 15 different soil map units in the JNF, all of which are sandy loams, well drained and many with high percentages of coarse fragments, and located on steep slopes. Soil mapping by the NRCS for the JNF was completed by review of aerial imagery and was validated via on-site surveys.

Soil limitations along the pipeline ROW within the project area include Prime Farmland, Rock/Stony Soils, Water Erosion Potential, Revegetation Potential, Potential for Topsoil, Soil Cohesion (strength), Corrosion to Concrete/Steel, Piping, Hydric Inclusions, etc. Hydric soil limitations in the project area were not identified in the FERC FEIS. An increased analysis of soil limitations in the project area using an Order 2 Soil Survey is recommended for the SEIS to further determine the extent and effect of these limitations.

Since publication of the FERC FEIS, pipeline construction activities were initiated, but project construction was halted prior to completion on the JNF. Segregated and salvaged topsoil on JNF lands has been stabilized with vegetation to prevent erosion and sedimentation where trees have been felled and grubbed. On Peters Mountain, stabilization efforts have been implemented, but felled trees have been left in place. Since construction of the project was stopped, the working surface has been stabilized with temporary vegetation to decrease erosion and sedimentation, and continuous monitoring of conditions and ECDs has occurred (Transcon 2018-2020). There has been documented erosion and sedimentation on both Pocahontas and Mystery Ridge roads which served as access and maintenance roads to the project area (Transcon 2018-2020). Monitoring reports have documented the status of ECDs along the project ROW in the JNF as being adequate and functioning as designed.

The stoppage of the project has led to an extension of the project timeline. This has resulted in the project ROW on the project area being left both exposed and in a partially constructed state for an extended period of time. Because of this delay in construction, temporary vegetation has been used to stabilize the windrowed topsoil stockpiles, the working surface of the project ROW,

and areas with erosion potential. The temporary vegetative cover provides a longer-term BMP, which has served to decrease erosion and sedimentation, stabilize steep slopes with loose soil resources, and help maintain the ecological function of soil resources. These BMPs would maintain and stabilize soil resources and their ecological function while the decision is made to proceed with either the No Action Alternative or Proposed Action. However, the ability of this mix of perennial and annual grasses/forbs to control erosion is limited because the soil has lost some productivity after being stockpiled for more than two years. Under either alternative, soil amendments would be applied before the topsoil is reseeded for final restoration.

The initial grading, stripping, and stockpiling of topsoil on Brush Mountain have already contributed to temporary losses of soil quality. Disrupting, moving, and stockpiling soil for any amount of time degrades soil quality through loss of nutrient cycling and microbial activity, homogenization of soil layers, and loss of overall organic matter and organic carbon (Fink and Drohan 2015; Bradshaw et al. 2017). Stockpiling of soil resources was originally planned to occur for short periods of time during construction. The stoppage of project construction has resulted in stockpiling of soils for extended periods of time (approximately two years).

In an attempt to stabilize the topsoil stockpiles and exposed soil surfaces, temporary seed mixes were used to expedite vegetation growth on sensitive soil resources. The species in the temporary mixes are generally shallow rooted, with minimal benefit to soil-building processes and soil health. Proliferation of these annual species increases competition with more desirable native species that are beneficial in reforming soil structure, reducing compaction, minimizing erosion, and increasing soil porosity. Whenever possible, loss of soil quality in these stockpiled soils would be tested and analyzed for agronomical and biological properties. If deficiencies are determined from these tests, soil amendments may be incorporated to increase the soil quality and to promote healthier final restoration efforts. In the absence of soil chemistry tests, the POD, Appendix H, contains guidelines for fertilizer and liming rates.

Mystery Ridge and Pocahontas roads were part of the FERC FEIS and have been used to access and maintain the pipeline ROW on Peters Mountain ever since. Recent (i.e., 2020) Transcon monitoring reports have indicated that Pocahontas Road has erosion and sedimentation issues. This road has also been used for Forest Service and MVP administrative uses and as access for a nearby timber sale not associated with the MVP. Independent of the MVP, the Forest Service is planning to conduct maintenance and repair of Pocahontas Road in 2020 to address erosion and sedimentation issues that were occurring prior to and during the MVP project. As a result, current erosion and sedimentation issues would be mitigated, and traffic related to construction of the MVP has ceased, limiting future erosional events to pre-project levels. Other Forest Service administrative and permitted uses would continue to utilize this road.

Much of the direct and indirect effects to soil resources associated with construction activities occurred during the initial clearing and grading phases of pipeline construction, as analyzed and outlined in the FERC FEIS (pp. 4-87 to 4-88). Direct and indirect effects to soil resources are due to the disruption of soil structure by means of removing vegetation and root mass, as well as the physical crushing of aggregates through topsoil salvage, grading, and compaction by heavy equipment activities. Given the amount and extent of construction activities that have taken place in the project area, effects on the soil have likely occurred. Studies indicate that 70% to 80% of soil compaction occurs during the first pass of disturbed ground (McNabb et al. 2001; Wolkowski and Lowery 2008; Ampoorter et al. 2010). Multiple passes by equipment used in the initial phases (i.e., tree clearing, vegetation removal, topsoil stripping, and pipe stringing) contributed a substantial portion of the overall effects on soil resources.

3.4.1.2 Environmental Consequences

Methodology

The project soil specialists have formed professional judgments on probable effects on the soil resources related to soil quality, erosion and sediment potential, and landslide risks under the No Action Alternative and the Proposed Action to determine whether these potential effects would be the same as those described in the FERC FEIS. Professional judgements were based on a review of existing information to identify changed circumstances in the affected environment for soil resources. Sources of existing information include the FERC FEIS, the specialist reports for soils supporting the FERC FEIS, the RUSLE and RUSLE2 erosion modeling conducted by an independent third-party contractor (Geosyntec Consultants 2020), Transcon monitoring reports, NRCS soil survey information (Soil Survey Staff 2020), and the MVP May 15, 2020 POD including the Timber Removal Plan appendix (MVP 2020a).

The updated erosion modeling conducted by an independent third-party contractor was submitted to Federal Agencies – including the Forest Service – with jurisdiction for review (Forest Service, FERC, FWS, NRCS, and BLM). A concurrent review was conducted and a series of discussions, phone calls, and teleconferences (questions and answers, comment, feedback) took place. This reviewed and updated *Hydrologic Analysis* (Geosyntec Consultants 2020) is incorporated into this SEIS.

Spatial and Temporal Boundaries

The spatial boundary for this analysis is the project area and associated access roads. (Downstream effects are described in Section 3.4.2, Water Resources.) The temporal boundary for this analysis is the 30-year term of the ROW grant/temporary use permit.

Alternative 1 – No Action

Under the No Action Alternative, construction of the MVP project would not continue, and ongoing operation and maintenance of the pipeline within the project area would not occur. Restoration activities would commence on all working surfaces. Once restoration activities in the project area are complete, areas disturbed by construction activities would be returned as close as possible to pre-project conditions. Native vegetation would be planted. Changes in soil resource conditions that have occurred since the FERC FEIS evaluation include stockpiled soil resources, erosion and sedimentation issues on Pocahontas and Mystery Ridge roads, waterbar construction, and the disruption to soil quality and functions through initial construction processes.

The soil disturbance from trenching and pipe installation activities would not occur. By not trenching and installing pipe, the subsoil structure would not be exposed and subjected to fragmentation. There would be short-term effects from the use of equipment to spread stockpiled soils back into their original locations within the ROW. Amending topsoil as part of the restoration process would result in a long-term benefit as it would restore soil productivity to pre-project conditions (POD, Appendix H).

The No Action Alternative also negates the need for long-term pipeline maintenance activities, which can affect soils by means of disturbance through compaction or rutting by maintenance vehicles. Vegetation maintenance during restoration would require vehicle traffic and road use, though, which would result in continued adverse effects along the ROW until restoration is completed. Since a maintained pipeline corridor would not be needed, revegetation and natural succession of forest species across the ROW would take place, reducing overall surface erosion

and compaction potential over the long term. Compared to the Proposed Action, native, permanent vegetation would be established sooner, and the process of establishing pre-construction natural conditions would begin at an earlier time. The permanent stabilization of the pipeline ROW, provided by established native vegetation, would increase the integrity of the area and surrounding environmental resources by limiting the effects on water resources, vegetation, wildlife, recreational areas, and special interest areas.

Subsequent passes of heavy equipment activities on soil resources that have already been subject to increased traffic contribute additional effects on soil structure. The FERC FEIS outlines methods and practices to address these effects throughout the construction process. Compacted soils have reduced pore space and may become prone to runoff and difficult to revegetate. To address these concerns, the POD identifies use of topsoil replenishment and adding ground cover protection and plantings.

Stockpiling of soil resources was originally planned to occur for short periods of time during construction. The stoppage of project construction has resulted in stockpiling of soils for extended periods of time (approximately 2 years). Stockpiling soil resources for extended periods of time could affect soil nutrient cycling and microbial activity (Fink and Drohan 2015; Bradshaw et al. 2017). Without application of soil amendments, these potential effects on soil resources change the outcome of final restoration activities and result in decreased restoration success, thereby increasing the potential for soil erosion throughout the project area. While a poorer quality soil may hinder restoration success and lead to more exposed surfaces susceptible to erosion and sedimentation, the lack of surface vegetation from restoration efforts may lead to the inability to wick soil moisture from the soil profile through evapotranspiration. Higher moisture content in the soil profile has the potential for increasing pore pressure, shear force, and saturated soils, among others, that can lead to slope failure and mass movement. Regardless of Action Alternative selected, soil amendments would be used to minimize these effects.

Under the No Action Alternative, Mountain Valley would remove stored pipe and construction debris and implement the restoration techniques outlined in the FERC FEIS and POD. Restoration practices, such as grading subsoil as close as possible to original contour, returning the salvaged topsoil, incorporating soil amendments, and bringing in additional soil material where needed, could expose soil resources to erosion and sedimentation and could introduce excessive rock to the soil surface, thereby hindering restoration efforts. Successful restoration is required as described in Appendix H of the POD, but successful restoration would be more difficult to attain if felled trees on Peters Mountain are left in place, due to the inability to effectively seed the working surfaces through the downed trees. If the felled trees in the Peters Mountain area are, in fact, windrowed and placed on the side of the ROW or removed from the ROW entirely, successful final restoration activities on Peters Mountain would occur as described in the FERC FEIS. However, there is still an associated potential of erosion and sedimentation, along with landslide risks, within the windrowed tree line where insufficient surface vegetation would establish and decrease the potential of those processes. If the felled trees in the Peters Mountain area are left in place, it is likely that additional treatments would be required to facilitate successful revegetation under these felled trees and minimize landslide risk and reduce the long-term potential for adverse effects associated with erosion sedimentation.

Various potential landslide risks along the pipeline route on the JNF were recognized and analyzed in the FEIS and addressed in plans for pipeline construction. In June 2018, the JNF provided a guidance document on identification and mitigation of landslide risks (Turner and Collins 2018) to its contractor (Transcon) tasked with monitoring pipeline construction on the

forest. The information provided in this document was recognized in the FERC FEIS, and the document was created to further implement the construction monitoring process on JNF NFS lands.

Once restoration is successful, vegetative cover of deep-rooting species on soil resources would minimize the risk of soil mass movement (landslides) by increasing the root mass holding the soil in place and increasing evapotranspiration, which would reduce the overall soil moisture water content. The reduced soil moisture content would decrease the potential for a slip plane (landslide) to develop from excessive water and minimize overall mass movement potential.

Since tree clearing and vegetative removal have already occurred, temporary vegetative seeding and an increased amount of maintenance and monitoring have been occurring to identify and address erosion concerns. Tree clearing and vegetative removal have contributed to soil erosion and sedimentation. Additional effects on soil resources are anticipated when construction crews using heavy equipment remove pipe from the project ROW in order to initiate final restoration efforts. Activity pertaining to pipe removal and the cessation of construction operations further disturbs the soil by increasing soil compaction and exposing bare soil to erosion and sedimentation. These processes often entail re-disturbance of stabilized, vegetated areas to restore the pipeline ROW back to its pre-construction condition. The disturbance of vegetated areas along the ROW corridor would expose soil resources to potential erosion and sedimentation, which could ultimately be deposited into the ROW corridor's water resources. Analysis of the sedimentation effects on water resources is provided in Section 3.4.2.

Overall, the effects associated with restoration would be similar to those during construction because the same ECDs used during construction would remain in place and would minimize erosion until revegetation is successful.

In conclusion, with continued implementation and monitoring of ECDs, adverse effects on soil resources under the No Action Alternative would be minor and would occur over the short term. Given consideration of these factors, effects under the No Action Alternative would be consistent with those analyzed in the FERC FEIS.

Alternative 2 – Proposed Action

Under the Proposed Action, the remaining construction activities necessary to complete the project would be completed as specified in the POD (MVP 2020a). Effects on soil resources from operation and maintenance of the project would be the same as analyzed in the FERC FEIS. The soil resources on Peters Mountain have not fundamentally changed since the original FERC FEIS evaluation. The changed conditions that have occurred since the FERC FEIS evaluation include stockpiled soil resources, excavation, waterbar construction, Pocahontas and Mystery Ridge road erosion and sedimentation issues, and soil quality and function. As noted in the Affected Environment, Transcon monitoring reports have documented the status of ECDs along the project ROW in the JNF as being adequate and functioning as designed in most cases and where necessary, ECDs have been modified or increased to reduce erosion.

Restoration after construction would minimize the long-term potential for landslides as described in the No Action Alternative. As discussed in the No Action Alternative, various potential landslide risks along the pipeline route on the JNF were recognized and analyzed in the FERC FEIS and addressed in plans for pipeline construction.

Stockpiling of soil resources was originally planned to occur for short periods during construction. The delay in the project has resulted in stockpiling of soils for extended periods of

time (approximately 2 years). Stockpiling soil resources for extended periods of time could affect soil nutrient cycling and microbial activity. Application of soil amendments to the topsoil would assist with successful revegetation and minimize soil erosion during the restoration process. The Restoration Plan (POD, Appendix H) contains detailed information on seed mixes and application methods for restoration. Species that can establish roots into the stockpile can increase moisture and gaseous transfer within the stockpile and help keep microbial populations active and healthy. Loss of soil quality in these stockpiled soils would be offset by application of soil amendments that would increase the soil quality and promote healthier final restoration conditions. With application of soil amendments, long-term impacts on soil resources would be minor.

Since publication of the FERC FEIS, it has been determined that the ROW can be accessed using only off-NFS roads. As a result, implementation of the Proposed Action would not result in greater erosion or sedimentation along Pocahontas or Mystery Ridge roads than what is described in the Affected Environment.

Overall, the Proposed Action of completing MVP construction on NFS lands has resulted in minor changes to soil resources beyond those described in the FERC FEIS. Incorporating soil amendments, based on soil test results or following POD guidance, to increase the soil quality of stockpiles would facilitate restoration as described in the FERC FEIS. Completing final restoration on the ROW surface, after topsoil replacement, would also increase surface stabilization and decrease the potential of slope failure and landslide risks. Erosion and sedimentation issues on Pocahontas Road are scheduled to be repaired in 2020 and would minimize further effects to soil resources along the access road and project area.

In conclusion, effects on soil resources from implementation of the Proposed Action would occur over the short and long term. Short-term impacts would be associated with construction and would be minor to moderate, which is consistent with the conclusions in the FERC FEIS. Long-term impacts would be associated with post-construction restoration and operation and maintenance and would be minor in intensity, which is consistent with the conclusions in the FERC FEIS.

Effects of Forest Plan Amendment

The Proposed Action would amend 11 Forest Plan standards. Of those 11 standards, six pertain to soil and riparian resources. The effects from those amended standards on the MVP ROW, as well as those on alternative ROWs, relate to the Fourth Circuit's opinions regarding decision-making authority under the ROW collocation practicality (U.S. Court of Appeals 2018a). Those six standards are listed below with each being assessed for their direct and indirect effects on the soil and riparian resources from the adoption of these amended standards. The use of the RUSLE2 model relies on Soil Survey Geographic Database data that is publicly available and readily accessible. The following analysis relies on detailed information regarding the available soil resources used for the RUSLE2 model.

The amended Standard FW-5 states, "On all soils dedicated to growing vegetation, the organic layers, topsoil and root mat will be left in place over at least 85% of the activity area and revegetation is accomplished within 5 years, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which the applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*."

Segregating the pipeline ROW's organic layers, topsoil, and root mass for the restoration phase of the project has occurred. Soil amendments would be applied as needed so that critical components of soil resources in the project area would be successfully used for promoting healthy vegetation. Application of measures to limit erosion and sedimentation have been addressed in the POD and the updated *Hydrologic Analysis of Sedimentation*. Determinations of the ROW's organic layers, topsoil, and root mass have already been made and would be used for the final restoration efforts. To ensure healthy vegetation of introduced grass and forb species in areas that were once forested, soil amendments may be needed to promote successful germination and proliferation of seeded species. Over the short term, there would be minor to moderate effects on soil resources because of some lost productivity in stockpiled topsoil. Over the long term, adverse effects would be minimized by application of soil amendments as needed to ensure successful restoration and long-term preservation of soil stability and productivity.

The amended Standard FW-8 states, "To limit soil compaction, no heavy equipment is used on plastic soils when the water tables is within 12 inches of the surface, or when soil moisture exceeds the plastic limit, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which applicable measures identified in the approved POD and MVP Project design requirements must be implemented*."

With a mitigation measure that avoids construction activities on soil resources in the project area within at least 24 hours of precipitation events, soil compaction from heavy equipment would be limited when handling potentially plastic soils. A means of preventing soil compaction on the soil surface during pipeline construction is to prevent construction activities for at least 24 hours following a precipitation event. The amended standard would allow MVP construction activities on soil surfaces to occur when either the water table is within 12 inches of the surface or when soil moisture exceeds the plastic limit, resulting in site-specific adverse effects associated where compaction occurs from heavy equipment or vehicle use. These effects would be mitigated by the POD's requirement that compacted soils be ripped to a depth of at least 6 to 8 inches.

The ROW and soil conditions are evaluated daily, including after precipitation events (POD Appendix C-2). Prior to resuming construction activities after precipitation, an assessment of soil moisture and plasticity must be made to determine if construction activities and equipment traffic would result in soil compaction (POD, Appendix C-2). Overall, adoption of this amended standard would result in adverse short-term effects on soil resources over the short and long term because soil compaction could occur from use of heavy equipment and vehicles on the ROW. The spatial extent of effects would be limited to those areas where heavy equipment or vehicles were used. Long-term effects would be minimized by ripping compacted soil as described above.

The amended Standard FW-9 states, "Heavy equipment is operated so that soil indentations, ruts, or furrows are aligned on the contour and the slope of such indentations is 5 % or less, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which the applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*."

Typical pipeline construction involves operating equipment in a manner that is safe for the operator and the surrounding crews. This often involves creating soil indentations, ruts, and/or furrows that run parallel and perpendicular to the slope's contour. The POD includes BMPs and ECDs that address the effects of these soil indentations, ruts, and furrows along the contour during pipeline construction in the project area to and would minimize the effects of erosion and sedimentation of soil resources. Adoption of the amended standard would result in effects on soil stability and erosion as described above for the Proposed Action. Adverse effects would occur

over the short term and, with successful restoration, would not be expected to occur over the long term.

The amended Standard FW-13 states, "Management activities expose no more than 10% mineral soil in the channeled ephemeral zone, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which the applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*."

Pipeline construction activities typically involve earth-disturbance practices, which can expose 10% or more mineral soil while using heavy equipment. The POD requires BMPs that prevent the movement and deposition of the mineral soil into channeled ephemeral zones, which is the purpose of Standard FW-13. A means for preventing mineral soil from being deposited into channeled ephemeral zones is to design, implement, and monitor ECDs that appropriately manage and divert water to designated areas that prevent sediment deposition.

The amended Standard FW-14 states, "In channeled ephemeral zones, up to 50% of the basal areas may be removed down to a minimum basal area of 50 square feet per acre. Removal of additional basal area is allowed on a case-by-case when needed to benefit riparian-dependent resources, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which the applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*."

Basal areas support slope stability by anchoring the soil resources to the surface with the species' rooting systems. By stabilizing slopes and soil resources, these basal areas have the potential to prevent erosion and sedimentation into channeled ephemeral zones. The POD requires BMPs and ECDs that address the potential erosion and sedimentation from the removal of basal areas in channeled ephemeral zones, which is the purpose of Standard FW-14. A means for appropriately managing basal areas is to study their effect on a site-by-site basis and monitor erosion and sedimentation BMPs to limit their exposure to channeled ephemeral zones.

The amended Standard 11-003 states, "Management activities expose no more than 10 percent mineral soil within the project area riparian corridor, *with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which the applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*."

Riparian corridors are critical portions of pipeline ROWs because of their ability to stabilize stream banks, filter surface water, and support wildlife habitat, among others. By managing the exposure of mineral soils in proximity to these riparian corridors, the soil and riparian resources can be protected from earth-disturbing activities and erosion and sedimentation potential. BMPs and ECDs have been implemented in riparian corridors to limit any possible exposure of mineral soils and their deposition into riparian resources, which is the purpose of Standard 11-003. A means for preventing the exposure of more than 10% mineral soils within riparian corridors is to appropriately identify riparian corridors, design and implement the appropriate BMPs and ECDs, and maintain those throughout construction and restoration stages of pipeline construction. This would minimize adverse effects over the short term. Long-term effects would not occur because successful restoration would not expose mineral soil.

3.4.2 Water Resources

This section responds to Issue 1 (Forest Plan Amendment – Purpose and Effect and Consistency with the Planning Rule and the NFMA) and Issue 3 (Erosion and Sediment Effects).

3.4.2.1 Affected Environment

Existing condition for water resources (i.e., hydrology) were discussed and analyzed in the FERC FEIS (pp. 4-102 to 4-103, p. 4-114, pp. 4-135 to 4-136), which is incorporated by reference. In summary, the section of the MVP that would be located on NFS lands crosses the Valley and Ridge Regional Aquifer system which has dominant lithology consisting of sandstone, shale, limestone, and dolomite and well yields of less than 120 gallons per minute. No springs or swallets were identified within 500 feet of the MVP pipeline route crossing the JNF. No mine pools identified within the vicinity of the project, or the sites with potential groundwater contamination, would be located along the pipeline route across the JNF. There are no public groundwater supplies or source water protection areas for groundwater resources crossed by the MVP within the JNF boundaries. No hydrostatic test water would be obtained from groundwater sources within the JNF (MVP 2020a).

Since publication of the FERC FEIS, the following new information or changed circumstances have occurred:

- The Fourth Circuit identified NFMA issues on the MVP project. Specifically, the Court identified NFMA issues regarding Forest Service Planning Rule requirements for soil, water, and threatened and endangered species as they applied to the Forest Plan amendment.
- The Fourth Circuit also identified NEPA deficiencies which include the need for the Forest Service to evaluate erosion, sedimentation, and water quality effects in relation to anticipated mitigation effectiveness.
- 92% of the entire MVP project has been implemented; disturbance on NFS lands has occurred and stabilization efforts are ongoing. On the Peters Mountain area, trees have been felled but not removed within the ROW. On Sinking Creek and Brush Mountain NFS lands, trees have been felled and removed and the ROW has been graded.
- NFS roads would no longer be used for construction, operation, or maintenance purposes.
- Enhanced ECDs have been installed to further limit and reduce erosion and sedimentation. These enhanced ECDs were in addition to devices identified in the original approved Erosion and Sediment Control Plan (ESCP). Enhanced ECDs include increasing the size of sediment traps, bolstering downslope perimeter controls with additional layers (e.g., adding new silt fences or compost socks), and increasing the use of soil stabilization products on exposed soil slopes (FWS 2020b). These measures provide additional protections to aquatic habitats and associated species by minimizing the potential for sediment to leave the project area and impact waterways during precipitation events.
- A revised and more in-depth *Hydrologic Analysis* was conducted that responded to Forest Service and other federal agency comments regarding the previous analysis.

A variance has been proposed that addresses the use of conventional bores as an optional crossing method of the four unnamed tributary streams on NFS lands (see Figure 3 for the location of each proposed stream crossing). If this process is used, it would reduce effects to Waters of the United States and potential sedimentation effects in the JNF (MVP 2020u). All earth disturbance (e.g., bore entry and exit pits) necessary to complete the crossings and spoil stockpile would remain within the previously permitted LOD. Reinforced Filtration Devices, which may include Priority 1 Silt Fence, Triple Stacked Compost Filter Sock, or Super Silt Fence would be used at each crossing. A bore pit is approximately 15 - 25 feet wide and the length varies from approximately 20 - 60 feet. In comparison, the pipeline trench is approximately 10 feet wide with bell hole areas, where pipe sections are welded, being approximately 20 feet wide. Bore pits and construction activities would be located outside of the Ordinary High Water Mark of streams. The bore methodology for these crossings would be a conventional unguided track-style auger bore employing a Robbins style rock bit if and when hard rock is encountered. No drilling fluids or additives would be employed for this endeavor.

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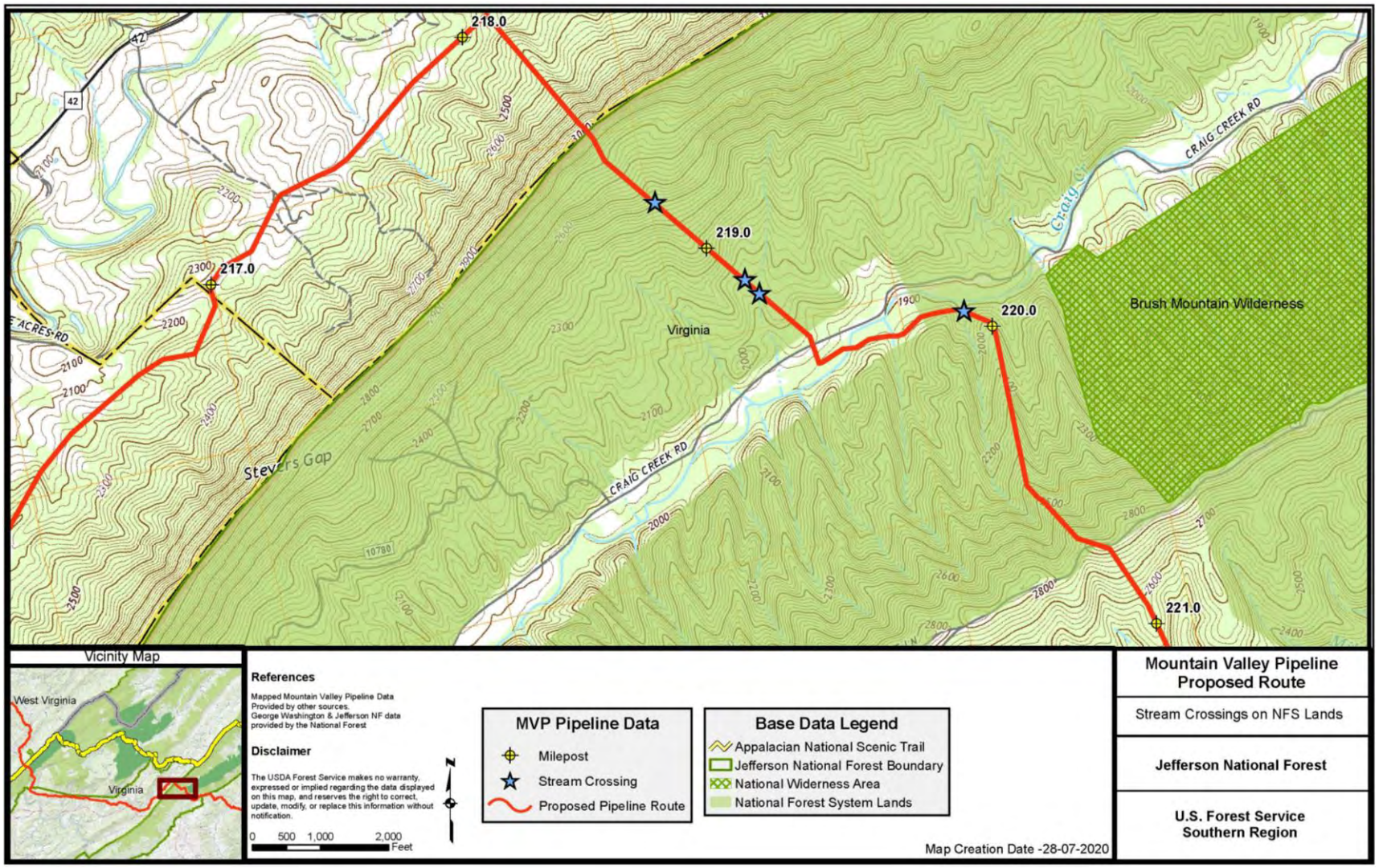

Figure 3. Location of Proposed Stream Crossings on NFS Lands

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Groundwater may be encountered within the conventional bore pits. Any groundwater would be pumped and filtered to maintain a safe working environment during the crossings. Bore pits would be monitored and dewatered when necessary by utilizing a standard water pump. Pumping may need to occur 24 hours a day. The pumps would discharge into dewatering structures that would be built in compliance with both FERC and Virginia Department of Environmental Quality (VDEQ) requirements. All disturbance and structures would be located within the ROW. The project's standard dewatering structure has been enhanced for sensitive crossings like those on NFS lands. After discharging through a sediment filter bag, the water is then filtered through an interior cell that is comprised of double-stacked straw bales and geotextile fabric, reinforced with cattle fencing to help maintain the structural integrity. After filtering through these devices, the water is then filtered through another row of double-stacked straw bales, geotextile fabric, and cattle fencing. The structure would be in a well-vegetated area to increase the retention and filtration of the water. The pumping rates would be monitored and modified to ensure that the structure does not overtop and water is properly filtered. Using this structure greatly reduces the amount of turbid water discharging from the work area and potentially mixing with nearby resources. The dewatering structure would be located within the already approved LOD. However, if at any time a temporary dewatering structure is required off LOD, Mountain Valley would obtain permission from the landowner prior to building the structure.

The FERC FEIS considered the effects of dewatering of the pipeline trench and any dewatering of the bore pits would have similar effects. Water removed from the bore pits would be reintroduced in the immediate vicinity of excavation and therefore, potential dewatering effects would be localized, occur over the short-term, and would not affect surface waters.

The U.S. Army Corps of Engineers confirmed that boring under small non-navigable streams can be performed in a manner that would not constitute a discharge of dredged or fill material (MVP Variance Request Form G-16. July 1, 2020).

3.4.2.2 Environmental Consequences

Methodology

The project hydrology specialists have formed professional judgments on probable effects. Professional judgments are based on the FERC FEIS; the *Hydrologic Analysis of Sedimentation for the Jefferson National Forest, Virginia and West Virginia* published May 8, 2020 (Geosyntec Consultants 2020), herein referred to as the *Hydrologic Analysis*; approved erosion and sediment control plans; monitoring reports; personal observation (including observation in similar areas); scientific literature; and professional contacts.

Spatial and Temporal Boundaries

The spatial boundary for this analysis includes the 3.5-mile ROW in the JNF and nine 12-digit Hydrologic Unit Code (HUC) subwatersheds that underlay the ROW on NFS lands (Table 6). This boundary was chosen for consistency with the spatial boundary in the *Hydrologic Analysis*. The LOD includes a 125-foot-wide temporary ROW and a 50-foot-wide permanent ROW. The short-term temporal boundary for this analysis is the construction period, or two years. The long-term temporal boundary for this analysis is 30 years.

Table 6. HUC-12 Subwatersheds Within or Draining to NFS lands.

HUC-12	Subwatershed Name
020802011001	Trout Creek - Craig Creek
020802011003	Broad Run - Craig Creek
030101010201	Dry Run - North Fork Roanoke River
050500020302	Upper Sinking Creek
050500020303	Lower Sinking Creek
050500020304	Little Stony Creek - New River
050500020305	Stony Creek
050500020601	Brush Creek - Rich Creek
050500020602	Clendennin Creek - Bluestone Lake

Alternative 1 – No Action

Under the No Action Alternative, no permit would be issued for the construction, operation, and maintenance of the MVP within the JNF. The current Forest Plan would continue to guide management of the project area. The MVP would have to utilize other lands for the pipeline in order to satisfy demand for natural gas and energy, or end users would have to seek alternate energy from other sources such as other natural gas transporters, fossil fuels, or renewable energy (FERC 2017a).

Some resource effects described in the FERC FEIS have already occurred since the project has been partially constructed. Specifically, timber felling has already occurred along the entire 3.5 miles within the JNF. The *Hydrologic Analysis* shows that timber felling would have a negligible increase (0.0%-0.4%) in sediment load over pre-project conditions at a HUC-12 subwatershed scale. Grading and soil stockpiling activities have also occurred within portions of NFS lands, and stockpiled soil has been revegetated. Effects associated with restoration would occur over the short term as the ROW is restored to its pre-project condition. Restoration activities would include replacing topsoil to its original location within the ROW and revegetating the permanent ROW with herbaceous cover (forest would be allowed to regenerate in the temporary ROW). The effects associated with restoration would be similar to those during construction because the same ECDs used during construction would remain in place and would minimize sedimentation until restoration is successful.

In conclusion, with continued implementation and monitoring of ECDs, adverse effects on water resources under the No Action Alternative would be minor and would occur over the short term. Given consideration of these factors, effects under the No Action Alternative would be consistent with those analyzed in the FERC FEIS and associated studies including the *Hydrologic Analysis*.

Alternative 2 – Proposed Action

As described in the FERC FEIS, potential effects on groundwater would be limited to those associated with clearing, grading, trenching, and trench dewatering during construction. These effects would occur over the short-term. Trenching is unlikely to be deep enough (5.5 to 9.0 feet) to significantly affect an aquifer. No springs were identified within 500 feet of the pipeline crossing of JNF. No wetlands are proposed to be crossed by the pipeline. Therefore, no wetlands in the JNF would be affected by the pipeline.

The Proposed Action includes four proposed amended Forest Plan standards that would affect hydrologic function and water quality (amended text is in italics). Because the amended

standards are specific to the MVP, their effects would be the same as the effects of implementing the Proposed Action, and thus they are discussed in this section.

- Amended Standard FW-8: To limit soil compaction, no heavy equipment is used on plastic soils when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limit*, with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented*. Soil moisture exceeds the plastic limit when soil can be rolled to pencil size without breaking or crumbling.

- Amended Standard FW-9: Heavy equipment is operated so that soil indentations, ruts, or furrows are aligned on the contour and the slope of such indentations is 5 percent or less*, with the exception of the operational rights-of-way and the construction zone for the MVP, for which applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*

- Amended Standard FW-13: Management activities expose no more than 10% mineral soil in the channeled ephemeral zone*, with the exception of the operational ROW and the construction zone for the MVP, for which the responsible official must ensure applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*

- Amended Standard 11-003: Management activities expose no more than 10 percent mineral soil within the project area riparian corridor*, with the exception of the operational ROW and the construction zone for the MVP for which applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*

The FERC FEIS did not discuss the effect of these four amended standards on hydrologic function and water quality.

The proposed amendment for FW-8 would result in negligible adverse effects on hydrology. All soil types listed in the FERC FEIS as being crossed in the JNF have a depth to water table of >80 inches (Table 7) (USDA NRCS 2020a). This is considerably different from a water table within 12 inches of the soil surface that is typically a characteristic of a wetland (USACE 2012), and no wetlands would be impacted by the pipeline on NFS lands. Five soil types within the ROW have a plasticity index over 15%, indicating these soil types have a possibility of soil moisture exceeding the plastic limit and are easily compactable (Table 7) (USDA NRCS 2020b). Soil compaction due to heavy equipment can have a significant adverse effect on hydrology. Hydrological changes can include alterations in soil water holding capacity, reduced infiltration rates, increase peak flows, and increased runoff volume (Skousen et al. 2009; Olson and Doherty 2012). The POD Restoration Plan would minimize adverse effects on hydrology by prohibiting heavy equipment from use in wetland habitats and requiring Mountain Valley to rip compacted soils to a depth of at least 6 to 8 inches if those compacted soils are identified within areas targeted for restoration (POD, Appendix H). Because there are no soils in the ROW where the water table is anticipated to be within 12 inches of the surface, and because the POD includes measures to limit effects on plastic soils, there would be negligible adverse effects on hydrology.

Table 7. Soil Types Within the LOD

Soil Type	Depth to Water Table (inches)	Plasticity Index (%)
Bailegap sandy loam, 35 to 60% slopes	>80	5.9
Berks and Weikert soils, 25 to 65% slopes	>80	9
Berks and Weikert very stony soils, 15 to 35% slopes	>80	9
Berks-Rock outcrop complex, 25 to 70% slopes	>80	9
Berks-Weikert complex, 15 to 25% slopes	>80	9
Calvin-Rough complex, 35 to 70% slopes, very stony	>80	7.2
Craigsville soils	>80	5
Dekalb channery loam, 55 to 70% slopes, very stony	>80	7.1
Jefferson extremely stony soils, 7 to 25% slopes	>80	15.6
Jefferson very stony soils, 7 to 15% slopes	>80	15.6
Lehew and Wallen soils, very stony, 35 to 65% slopes	>80	7.6
Lily-Bailegap complex, very stony, 15 to 35% slopes	>80	15.5
Lily-Bailegap complex, very stony, 35 to 65% slopes	>80	15.5
Nolichucky very stony sandy loam, 15 to 30% slopes	>80	21.7

The proposed amendment for FW-9 would result in short-term, minor adverse effects on hydrology. The POD requires tracking to occur perpendicular to the slope, which would create soil indentations that are aligned on the contour (POD, Appendix C). Tracking would include roughening and scarifying of the slopes, which would reduce runoff velocity, increase infiltration, reduce erosion, and assist in establishing vegetative cover (Michigan 2019). The POD requires ECDs when management activities cause bare mineral soil on slopes greater than 5%, which is consistent with Forest Plan Standard FW-10. Project-specific grading activities, such as tracking and ECDs, were modeled into RUSLE2 in the *Hydrologic Analysis*. This report concludes that the delivered sediment yields during construction is projected to increase over pre-project conditions ranging from 0.001 to 0.011 tons/acre/year (0.1% to 2.6% increase) at a HUC-12 subwatershed scale. The report estimates that during the restoration phase (one year post-construction) delivered sediment yield would have an increase of <0.001 to 0.002 tons/acre/year (0.01% to 0.5% increase) over pre-project conditions. This projects that delivered sediment yields would decrease post-construction and likely reach an equilibrium close to pre-project conditions after restoration is complete. Therefore, operating heavy equipment so that the slope of indentations is 5% or more would result in short-term, minor adverse effects on hydrology.

The proposed amendments for FW-13 and 11-003 would result in short-term, minor adverse effects on hydrology. Exposure of 10% or more of mineral soil in the channeled ephemeral zone or riparian corridor can adversely affect hydrology because channeled ephemeral zones and riparian corridors are vital buffers for reducing runoff velocity, removing sediment during runoff events, and improving stream water quality (Lowrance et al. 1997; Sheridan et al. 1999). The pipeline on NFS lands would cross four unnamed tributaries of Craig Creek. If a dry-ditch open cut method is used, channeled ephemeral zones and riparian corridors in the ROW would not be fully functional during the construction phase of MVP due to temporary soil and vegetation disturbance. The *Hydrologic Analysis* analyzed disturbances during the construction phase and concluded that adverse effects would occur over the short-term, since soils would be separated and replaced during construction and the ROW would revegetate.

On July 1, 2020, Mountain Valley applied for a FERC variance to bore under the four unnamed tributary streams on NFS lands instead of the dry-ditch open cut method (MVP Variance Request Form G-16. July 1, 2020). If the stream crossings are bored instead of open-cut, a 10-foot buffer

around the top of bank extending into the riparian buffer would be undisturbed from trenching activities. Therefore, potential effects of exposing 10% or more of mineral soil in the channel ephemeral zone or riparian corridor are anticipated to be less for the boring method than the open cut method. Exposing 10% or more of mineral soil in the channeled ephemeral zone or riparian corridor would have minor short-term adverse effects on hydrology. As described in the Affected Environment, dewatering structures and pumps would be used if groundwater is encountered during the boring process. Adverse effects from any discharged water would be minimized by the use of measures including sediment filter bags and two rows of double-stacked straw bales and geotextile fabric. As a result, effects would be similar to those from enhanced ECDs that are in place to control runoff. Effects would occur over the short-term as the boring procedure occurs and any discharged water completes its passage through the sediment filters. Compared to the dry-ditch open cut method, avoidance of the streams via a boring crossing method would result in less sediment delivery because the streams would not be disturbed during the crossing process. Effects would also be less than those disclosed in the *Hydrologic Analysis*, which assumed a dry-ditch open cut stream crossing method.

The *Hydrologic Analysis* incorporates the MVP-approved ESCPs, site conditions, and construction timing into its RUSLE2 modeling. RUSLE2 is a commonly used model in the US and internationally for estimating soil loss and is adaptable to unique site-specific conditions. This is an improvement compared to the original RUSLE model effort used in the FERC FEIS, which evaluated potential sedimentation effects based only on generalized and preliminary assumptions about the erosion and sediment controls that would be utilized for the Project. The RUSLE2 modeling results at a catchment scale were then incorporated into the watershed-based RUSLE modeling. This improved the *Hydrological Analysis*, since more detailed, site-specific data were modeled. It also allows for evaluation of the effect of BMPs for the pipeline ROW according to approved ESCPs for Virginia and West Virginia and restoration activities within the construction workspace.

The *Hydrologic Analysis* provides results as sediment yield (tons/acre/year) and sediment delivery ratio (SDR). While RUSLE models watersheds on an annual timeframe and RUSLE2 allows for some further customization of timeframes, neither model adequately captures turbidity or total suspended solids (TSS), which are instantaneous measurements representing one specific point in time. At minimum, multiple turbidity or TSS measurements would likely need to be field collected at each proposed stream crossing to establish pre-project conditions before a model could be developed for turbidity or TSS. While the SDR might be able to be used to estimate and extrapolate (e.g., at a 1:1 ratio) turbidity or TSS values, we are not aware of literature that specifies this is a valid approach. The *Hydrologic Analysis* model is thorough and conservative in its approach (i.e., likely overestimating sediment loads). Therefore, conducting additional modeling to obtain turbidity or TSS estimates is not considered necessary for this assessment.

The rainfall runoff erosivity factor (*R*) of the baseline RUSLE model was calculated based on average annual precipitation from 1980 to 2010, a 30-year timeframe that includes years with excessive precipitation or prolonged drought conditions. Specific fire, flood, or short-term drought events are not able to be incorporated into RUSLE modeling, due to the short time frame (e.g., days or weeks) of the events and that RUSLE modeling is on an annual scale. The Felled scenario accounted for trees that have already been felled within the LOD, including on Peters Mountain where trees were felled but not removed. Therefore, expanding the baseline parameters is not considered necessary.

As described above, the *Hydrologic Analysis* modeled the approved Project-specific BMPs. These include management and support practice BMPs modeled based on the alignment of the pipeline and topography for either a Transverse Profile or Perpendicular Profile. This configuration represents a conservative approach (i.e., estimates higher than expected soil loss) to modeling the effect of BMPs for most areas of the Project because few areas of the Project ROW are exactly perpendicular or parallel to the predominant slope. Most areas of the pipeline would employ both BMP types. To quantify the efficiency of the BMPs modeled by RUSLE2, sediment loss from the During Construction scenarios with no BMPs were compared to sediment loss when BMPs were implemented. In the Perpendicular Profile category where BMPs included sediment traps and bonded fiber matrix, the BMP effectiveness ranged from 45% to 70%. In the Transverse Profile, the modeled BMP efficiency for porous barriers and bonded fiber matrix was approximately 83%. The cover BMPs account for about a 30% reduction in soil loss and the porous barrier accounted for about 50% reduction in soil loss. As discussed in the *Hydrologic Analysis*, the effectiveness of the BMPs is consistent with documented studies of BMP effectiveness (Geosyntec Consultants 2020).

The FERC FEIS identified the proposed use of Pocahontas and Mystery Ridge roads. These roads are no longer part of the proposed action, which represents a changed condition. (However, existing roads and the use of these roads was incorporated into the RUSLE2 model.) Access for construction, operation, and/or maintenance of the pipeline within JNF would be conducted using the MVP ROW. The ROW would be accessed from locations outside of JNF. Removing Pocahontas and Mystery Ridge roads from the proposed action is a reduction of 12 stream crossings compared to the FERC FEIS (FERC FEIS Table 4.3.2-9). This changed condition would eliminate project-related effects on water resources from the use of NFS roads and result in a reduction of hydrological effects compared to those identified and analyzed within the FERC FEIS. Therefore, further assessment of project access roads is not considered to be necessary.

Transcon was contracted to conduct routine environmental monitoring inspections along the pipeline and document the effectiveness of the ECDs that were stipulated in the POD. Transcon's reports have shown that ECDs have been effective at controlling erosion, runoff, and sedimentation. They have also documented timely repair and adjustment of ECDs that were not properly functioning. Repair and reconstruction of ECDs are an essential part of proper maintenance during the construction phase and ECDs require maintenance to ensure effectiveness. Redesign and installation of additional ECDs and/or enhanced ECDs is a common practice within the pipeline industry.

Enhanced ECDs may include increasing the capacity of sediment traps and installing additional perimeter controls (e.g., compost filter sock, silt fence, super silt fence). These additional measures are often constructed once field conditions have been observed during intense precipitation events and the responsible parties understand that field conditions do not necessarily align with desktop design conditions. The enhanced ECDs that exceed approved ESCPs reduces the potential for extreme precipitation events to contribute sediment loads that exceed the model's predictions, as well as decrease the expected sediment loads during typical precipitation events. The additional measures are often necessary to ensure compliance with National Pollutant Discharge Elimination System permitting (e.g., sediment laden water not permitted to leave the LOD). The additional ECDs constitute a changed circumstance since they were not analyzed in the FERC FEIS. (Enhanced ECDs are reflected as redline changes to the approved Erosion and Sediment Control Plan which is Appendix C to the POD). The *Hydrologic Analysis* states that enhanced ECDs were not accounted for in the sediment

modeling. Therefore, installation of enhanced ECDs designed to further minimize erosion, runoff, and sedimentation would likely result in a reduction in adverse effects on hydrology compared to the conclusions in the *Hydrologic Analysis*. Therefore, further assessment of ECDs is not considered necessary.

In conclusion, effects on water resources from implementation of the Proposed Action would occur over the short and long term. Short-term impacts would be associated with construction and would be minor, which is consistent with the conclusions in the FERC FEIS. Long-term impacts would be associated with post-construction restoration and operation and maintenance and would be minor in intensity, which is consistent with the conclusions in the FERC FEIS

Effects of Forest Plan Amendment

There are 11 project-specific Forest Plan standards that would be amended in the proposed action. Four amended standards are related to hydrology, which include Standards FW-8, FW-9, FW-13, and 11-003. The Proposed Action includes mitigation to reduce erosion, sedimentation, runoff, and runoff velocity to reduce the adverse effects of the amended standards.

The POD Restoration Plan would minimize adverse effects on soil compaction by requiring Mountain Valley to rip compacted soils to a depth of at least 6 to 8 inches if those compacted soils are identified within areas targeted for restoration (POD, Appendix H). With application of this measure, adverse effects on soil compaction would be short-term and minor, and the proposed action would comply with FW-8 as amended. Adherence to FW-9, as amended, would result in short-term, minor adverse effects on hydrology. The POD requires tracking to occur perpendicular to the slope, which would create soil indentations that are aligned on the contour. FW-13 and 11-003, as amended, would result in short-term, minor adverse effects on hydrology. Amendments to FW-9, FW-13, and 11-003 were analyzed in the *Hydrological Analysis*; therefore, the effects associated with adopting these amended standards as the same as the effects associated with implementing the Proposed Action. As discussed in the analysis of the Proposed Action above, adoption of these amended standards would result in minor, short-term adverse effects on hydrology.

3.4.3 Threatened, Endangered, and Sensitive Species

This section responds to Issue 1 (Forest Plan Amendment – Purpose and Effect and Consistency with the Planning Rule and the NFMA) and Issue 3 (Erosion and Sediment Effects).

Threatened, endangered, and sensitive species are afforded protection by law, regulation, or policy by federal and/or state agencies. These species include federally listed species that are protected under the Endangered Species Act (ESA), or are under review as candidates for such listing by the FWS, and species on the RFSS list. Potential effects that could affect the conservation needs of a species or decrease the viability of a population include habitat fragmentation, loss, or degradation; decreased breeding or nesting success; increased predation or decreased food sources; and injury or mortality.

Federal agencies are required by the ESA Section 7(a)(2) to ensure that any action authorized, funded, or carried out by the agency would not jeopardize the continued existence of a federally listed threatened or endangered species (TES) or species proposed for listing, or result in the destruction or adverse modification of designated and proposed critical habitat. As the lead federal agency, the Forest Service is responsible for determining whether any federally listed TES or any of their designated critical habitats are near the proposed action and to determine the proposed action's potential effects on those species or critical habitats.

To satisfy requirements of the ESA, FERC initiated formal Section 7 consultation with the FWS in 2017. FERC submitted a Biological Assessment (BA) on July 10, 2017, which resulted in FWS issuing a BO and Incidental Take Statement on November 21, 2017. The BO for MVP is currently under litigation with the Fourth Circuit but has not ever been vacated/remanded back to the agency by the Court. A Supplemental BA (SBA) was submitted to FWS in April 2020 and revised on May 28, 2020. FWS issued a new BO and Incidental Take Statement for the project on September 4, 2020 (FWS 2020b).

Appendix B provides a summary table of the federally listed species and RFSS addressed in the SEIS.

3.4.3.1 Affected Environment

Aquatic Species

The project area analyzed in the FERC FEIS totaled 82.7 acres of NFS lands including 50.9 acres of ROW corridor, 33.7 acres of NFS access roads, and 0.8 acres of temporary workspace. Since publication of the FERC FEIS, 92% of the project has been implemented including disturbance within the JNF. Construction was halted upon issuance of the FERC's stop work order, leaving disturbance along a partially constructed pipeline. Subsequent stabilization of disturbed areas within the JNF is ongoing. Since publication of the FERC FEIS, it has been determined that the ROW can be accessed using only off-NFS roads.

The affected environment for aquatic species includes four waterbody crossings and affected areas downstream. These waterbodies support warmwater and coldwater fisheries as well as federally listed aquatic species and RFSS.

Terrestrial Species

Existing conditions in the project area are described in the FERC FEIS (pp. 4-250 to 4-256), which is incorporated by reference (FERC 2017a). In summary, the affected environment in the FERC FEIS includes 82.7 acres within the JNF that consists of six major forest community types, including mixed mesophytic forest; dry-mesic oak forest; dry and dry-mesic oak-pine forest; dry and xeric oak forest, woodland, and savanna; conifer-northern hardwood; xeric pine and pine-oak forest and woodland (FERC 2017a). Forest within the 50-foot-wide operational pipeline easement (about 24.5 ac) would be permanently converted to herbaceous grasslands. The remaining areas would be allowed to naturally regenerate, converting mature forest to an early successional condition.

Preliminary federally listed TES surveys were conducted across the project area between 2015 and 2016. No TES were located. Two RFSS species were located on or adjacent to the ROW. American Barberry (*Berberis canadensis*) was located adjacent to the ROW and a determination of **No Impacts** was made for this species. Rock Skullcap (*Scutellaria saxatilis*) was located on and around the ROW. One population of approximately 10,000 individuals occurs over 3.58 acres with approximately 1.94 acres occurring within the ROW. Efforts to minimize and mitigate effects to this species along with the presence of additional populations and habitat in the vicinity of the ROW led to a determination of **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** (MVP 2017).

A Supplemental Biological Evaluation is being finalized and will incorporate the results of additional surveys for the following RFSS species:

- Liverwort (*Plagiochila virginica*)
- Liverwort (*Radula tenax*)
- Addison's leatherflower (*Clematis addisonii*)
- Virginia white haired leatherflower (*Clematis coactilis*)
- Tall larkspur (*Delphinium exaltatum*)
- Quill Fameflower (*Phemeranthus teretifolius*)

Surveys for these six species were conducted in summer 2020 and no individuals were found (MVP 2020t). Therefore, a **No Impacts** determination for these species will be made in the Supplemental Biological Evaluation.

Four exotic invasive species have been observed scattered throughout the ROW: multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), garlic mustard (*Alliaria petiolata*), and mile-a-minute vine (*Persicaria perfoliata*) (Transcon 2018-2020).

Since publication of the FERC FEIS, several changes have occurred. Three species have become federally listed, 19 species have been added to the RFSS, and 13 species have been dropped from the RFSS list. Another changed condition is that the ROW was cleared of trees between February and April 2018. On Sinking Creek and Brush Mountain NFS lands, the trees have been felled and removed and the ROW has been graded. On the Peters Mountain area, the trees have been felled but not removed from the ROW due to the stop work order issued by the FERC. Exotic invasive occurrences within the ROW may expand due to the open canopy and exposed soils from the ROW clearing.

Additionally, seed from the impacted population of Rock Skullcap were collected and plants excavated for transplantation. Plants intended for transplantation did not survive. Seed was sown at two locations with seedlings observed at one location the following season (MVP 2020t).

3.4.3.2 Environmental Consequences

Methodology

Existing information was reviewed, including the FERC FEIS, the SBA (MVP 2020b), the 2017 BO (FWS 2017), the 2017 BE (MVP 2017), and the POD and appendices (MVP 2020a). Aquatic, terrestrial, and plant species evaluated include federal TES as well as RFSS.

Since publication of the FERC FEIS, the designation of several species as federally listed or RFSS has changed. These changed designations and the anticipated effects on these species are discussed in the analysis below. A Supplemental Biological Evaluation is being finalized using data from surveys completed in summer 2020 and the Forest Service's updated RFSS list for Region 8.

Alternative 1 – No Action

Aquatic Species

The greatest potential for the No Action alternative to affect TES and RFSS aquatic species within the JNF is through erosion and sedimentation from the partially implemented MVP. Review of Transcon weekly monitoring reports shows that most areas within the JNF are stable and erosion and sedimentation controls are functioning. Erosion and sedimentation issues are continuing to occur along Pocahontas Road, however, contributing factors likely include the pre-existing condition of the roadway and an independent timber sale. The JNF is implementing a separate maintenance action to improve sedimentation problems associated with Pocahontas and Mystery Ridge roads. Under the No Action Alternative, the JNF project area would be restored to its pre-project condition and minor, short-term adverse effects to aquatic TES from use of equipment and vehicles during restoration activities. This is consistent with the conclusions in the FERC FEIS.

Terrestrial and Plant Species

The greatest potential for the No Action alternative to affect TES and RFSS terrestrial wildlife and plant species within the JNF is through habitat loss from the partially implemented MVP. Direct effects have already occurred during partial construction of the pipeline and were analyzed in the FERC FEIS. Indirect effects associated with habitat loss would occur over the long term because restoration of the affected JNF lands to their pre-project condition under the No Action would take many years. Because the pre-project condition was forest, this area would be regenerating trees, whether planted or volunteer species, for decades, existing in successional habitat stages. Under the No Action Alternative, the JNF project area would be restored to its pre-project condition and minor, short-term adverse effects to terrestrial TES from use of equipment and vehicles during restoration activities. This is consistent with the conclusions in the FERC FEIS.

Alternative 2 – Proposed Action

Aquatic Species – Federally Listed

FWS completed the 2020 BO on September 4, 2020. It contains mitigation measures to reduce potential effects to threatened and endangered species. These mitigation measures are mandatory nondiscretionary items that Mountain Valley must implement. The Forest Service will require the mandatory measures from the 2020 BO applicable to species and habitat on NFS land be implemented as a condition of approving the Plan amendment and Special Use Authorization. Therefore, the project would be compliant with the ESA.

<u>Aquatic Species Action Area</u>

In addition to assessing impacts in the geographic area covered in the *Hydrologic Analysis*, the 2020 BO also looked at impacts that could occur in a mixing zone in stream segments where sediment from tributaries (i.e., tributaries crossed or receiving sediment from construction activities in the upland area) is delivered to streams/rivers where listed aquatic species and/or proposed critical habitat are potentially present. The upstream extent of the Action Area for aquatic species considered in the 2020 BO is defined as “the most upstream point at which measurable sediment attributed to the project may enter a National Hydrography Dataset stream segment via sediment from direct impacts where the project crosses the stream or sediment from upland workspaces delivered via overland flow to streams” (FWS 2020b). The downstream extent is the point at which “the stream becomes impounded to an extent that water velocity

slows and sediment settles out or the downstream point at which the project's estimated maximum increase in delivered sediment concentration to the stream is attenuated to the point where an increase in measurable sediment concentration (for example, TSS or suspended sediment concentration) from the project could not be discerned from background sediment concentrations (i.e., the concentration attenuation threshold)" (FWS 2020b).

Table 8 provides a summary of each federally listed aquatic species and their effects determination.

Table 8. Determination of Effects for Aquatic ESA Listed Species in the 2017 BA, the 2020 SBA, and 2020 FWS Consultation Letter.

Species	Scientific Name	2017 BA Determination	April 2020 SBA Determination	July 9, 2020 FWS Consultation Letter
Clubshell	*Pleurobema clava*	May Affect, Not Likely to Adversely Affect	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
James spinymussel	*Parvaspina collina*	May Affect, Not Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Snuffbox	*Epioblasma triquetra*	May Affect, Not Likely to Adversely Affect	May Affect, Likely to Adversely Affect	May Affect, Not Likely to Adversely Affect
Candy darter	*Etheostoma osburni*	May Affect, Action not likely to jeopardize the species*	May Affect, Not Likely to Adversely Affect	May Affect, Likely to Adversely Affect; May Affect; Likely to Adversely Affect Proposed Critical Habitat
Roanoke logperch	*Percina rex*	May Affect, Likely to Adversely Affect	May Affect, Likely to Adversely Affect	May Affect, Likely to Adversely Affect

* January 5, 2018 FWS Letter to FERC on Formal Conferencing for the Candy Darter

Candy Darter (*Etheostoma osburni*)

The July 9, 2020, coordination letter from FWS to FERC included a **May Affect, Likely to Adversely Affect** determination for the project (FWS 2020a). The FWS concurred with this determination for the candy darter in the 2020 BO (FWS 2020b). At the time of the 2017 FERC FEIS and BA, the candy darter was not federally listed but was proposed for ESA listing. Formal Conferencing was requested, and it was determined that the action was not likely to jeopardize the species. Since that time, the species has been listed as federally endangered with proposed Critical Habitat. The candy darter has been added to project Formal Consultation between FERC and FWS. The SBA recommended this species for a determination of May Affect, Not Likely to Adversely Affect; however, July 2020 coordination between FERC and FWS led to a revised determination of May Affect, Likely to Adversely Affect (FWS 2020a). No direct effects are anticipated for the candy darter on the JNF since the pipeline does not cross any waterbodies in

the JNF known to harbor the species. Indeed, none of the stream crossings on NFS lands are for streams that contain federally listed species. Therefore, these crossings are outside the scope of the 2020 BO and are not mentioned in that document. The FERC FEIS considered indirect sedimentation effects resulting from the use of Pocahontas Road and Mystery Ridge roads. Because these access roads would no longer be utilized for the project, indirect effects to the species are expected to be less than those considered in the FERC FEIS and 2020 SBA.

As summarized in Section 2.2.2.2, the project would implement nondiscretionary measures in the 2020 BO to avoid, minimize, and mitigate potential effects on the candy darter.

Roanoke Logperch (*Percina rex*)

While the overall project **May Affect and Is Likely to Adversely Affect** the Roanoke logperch, no suitable habitat was found within the JNF. Roanoke logperch are known to occur downstream of the MVP waterbody crossings within the North Fork Roanoke River; however, the occurrences are outside of the project area and are beyond the extent of increased sedimentation modeled for the waterbody crossings within the JNF. Although construction of the MVP as a whole is determined to be May Affect, Likely to Adversely Affect the species, no effects from project activities within the JNF are expected, which is consistent with the 2020 BO.

James Spinymussel (*Pleurobema collina*)

A **May Affect, Not Likely to Adversely Affect** determination has been made for the James spinymussel (FWS 2020a), and this determination has not changed throughout the consultation process. It was initially proposed in the 2017 FERC BA and the FWS concurred in the 2017 FWS BO. Justification for the determination in the 2017 FERC BA stated, “Based on the location of known and presumed populations of this species relative to the crossings at Craig Creek, the lack of mussels or suitable habitat within the Action Area, and MVP’s commitment to not cross Craig Creek from May 15 to July 31, no individuals are expected to be directly or indirectly harmed or harassed and no James spinymussel designated critical habitat would be affected by the project” (FERC 2017c). To supplement information about the James spinymussel, Environmental DNA (eDNA) sampling was undertaken to assist during the reinitiated consultation. eDNA sampling of water from Craig Creek did not identify the presence of James spinymussel genetic material. While not considered conclusive, eDNA sampling was used to help support the determination and that the James spinymussel is not likely to occur near the JNF. Based on the *Hydrologic Analysis* in Appendix B of the SBA, it is predicted that the dry-ditch open cut stream crossing method would have less effects to the unnamed tributaries of Craig Creek in the JNF than those described in the FERC FEIS. In addition, the optional method using a conventional bore is expected to result in further reduced effects because no work would occur in the streams (FERC FEIS p. 4-139). Therefore, the indirect effects to Craig Creek would also be predicted to be less than what was described in the FERC FEIS. The effects determination for the James spinymussel has not been altered by the revised sedimentation analysis, eDNA analysis, embeddedness analysis, or the option to bore under the four unnamed tributaries of Craig Creek located in the JNF. Because the determination for the James spinymussel is May Affect, Not Likely to Adversely Affect, this species was not addressed in the 2020 BO.

Yellow Lance (*Elliptio lanceolata*)

A **No Effec**t determination has been made for the yellow lance. Although effects to the federally threatened yellow lance were considered in the 2017 FERC BE and FEIS (when it was an RFSS

and also proposed by the FWS for listing under the ESA), the species is not evaluated in the SEIS because FWS has approved range changes for the species based on erroneous records in the project area. As a result, the MVP is considered to have **No Effect** to the species by FWS and FERC (FWS 2020a).

Clubshell (*Pleurobema clava*) and Snuffbox (*Epioblasma triquetra*)

May Affect, Not Likely to Adversely Affect determinations have been made for the clubshell and snuffbox (FWS 2020). These species were reported to potentially occur in Meathouse Fork, Leading Creek, and Little Kanawha River in West Virginia. These locations are outside the possibility of effect for actions taken within JNF. Thus, while the overall project may affect these species, actions within the JNF do not drain into waters where they potentially occur. No effects are expected to the clubshell and snuffbox from project activities within the JNF. Because the determination for the clubshell and snuffbox is May Affect, Not Likely to Adversely Affect, these species were not addressed in the July 9, 2020, FWS letter to FERC (FWS 2020a).

Supplemental Biological Assessment

An SBA was submitted to FWS in April 2020 and revised in May 2020. The SBA changes the determination of effects for several federally listed aquatic species and eliminated some species from consideration. None of the identified species have designated Critical Habitat in the MVP area. The SBA included a letter from FWS to Sierra Club dated May 22, 2019, stating that further consultation on the yellow lance is not required because the latest information shows yellow lance does not occur in any waters in the vicinity of the project.

The SBA offered the following determinations for federally listed aquatic species:

- Candy darter - May Affect, Not Likely to Adversely Affect
- Roanoke logperch - May Affect, Is Likely to Adversely Affect
- James spinymussel - May Affect, Not Likely to Adversely Affect
- Yellow lance - No Effect (due to presumed lack of occurrence in project area)

The SBA also made effects determinations for the clubshell and snuffbox mussels; as discussed above, these species were reported to potentially occur in Meathouse Fork, Leading Creek, and Little Kanawha River in West Virginia. These locations are outside the possibility of effect for actions taken within or draining into or from the JNF.

Detailed descriptions, figures, and tables of the previously identified construction methodology are contained in the SBA and 2020 BO. The SBA describes the surveys conducted, and the POD identifies measures that will be implemented to minimize adverse effects to aquatic species from the construction and operation and maintenance of the MVP.

Environmental DNA Analysis

To supplement information about aquatic species, eDNA sampling was undertaken to assist during the reinitiated consultation. Aquatic organisms shed DNA into their environment that can be collected via water samples. eDNA sampling can provide a screening tool to help identify the presence of a species' genetic material in the environment. Forty-one locations were sampled for the James spinymussel within Craig Creek just outside the JNF. All Craig Creek samples resulted

in negative test results which indicates the absence of James spinymussel DNA in the samples. While not considered conclusive, eDNA sampling was used to help support the determination and that the James spinymussel is not likely to occur near the JNF.

Hydrologic Analysis of Sedimentation

The updated *Hydrologic Analysis* incorporates project-specific BMPs, access road utilization, time elapsed since construction, and a new construction timeline using an updated erosion model (RUSLE2) while applying more conservative predicted values (Geosyntec Consultants 2020). The FWS determined that the *Hydrologic Analysis* constituted an appropriate geographic scope of analysis for defining the Action Area and assessing impacts on federally listed aquatic species (FWS 2020b). Comparisons of estimated sediment yield in the hydrologic study area including JNF lands for Baseline (pre-project conditions), Felled (Baseline through trees felled and left in place before clearing), During Construction (during project construction from the time of clearing through seeding to the end of a year), and Restoration (after project completion for a one year duration starting at seeding) scenarios indicate that project construction would contribute to a slight increase in delivered sediment above the Baseline scenario at the watershed level.

During construction, none of the nine HUC-12 watersheds in this analysis would experience sediment yields in excess of 2.6% above the Baseline scenario. During restoration, sediment yield increases would be 0.5% or less at a watershed scale (Geosyntec Consultants 2020). As vegetation within the restored portion of the project LOD matures, sediment yields are expected to continue trending towards Baseline conditions across all watersheds, resulting in negligible to minor long-term adverse impacts.

Sediment yield was also modeled for individual stream segments. The localized temporary effect of construction within stream segments near the ROW corridor was modeled to lead to an increase in sediment delivery ranging from 0.1% to 31.3% (median: 2.8%) over the Baseline scenario. The modeling predicted the maximum 31.3% temporary increase to occur in a 1.16-mile-long stream segment that is located off NFS lands within the Brush Creek-Rich Creek watershed (Geosyntec Consultants 2020). This stream segment is not identified as containing suitable habitat for TES (Appendix B of the SBA). Sediment yield on this stream segment would be 13.6% above the Baseline scenario during restoration. Overall, compared to the Baseline scenario, sediment yield for all modeled stream segments would increase 0.01% to 13.6% (median: 0.6%) for the Restoration scenario (Geosyntec Consultants 2020). These predicted sedimentation values are lower than what was identified in the FEIS.

Since the completion of this sedimentation analysis, the use of Pocahontas Road and Mystery Ridge roads for access will no longer occur. This change is anticipated to lower the predicted sedimentation load in the JNF. There is also an option to use conventional boring for the four stream crossings on NFS lands. If used, boring would also be anticipated to reduce sediment load because there would be no in-stream work (FERC FEIS 4-139).

Mixing Zones

Two mixing zones (i.e., upstream and downstream reaches as defined in the Aquatic Species Action Area section above) were identified within the JNF and analyzed in the 2020 BO. One mixing zone was predicted to have TSS concentrations below the TSS/suspended sediment concentration threshold for adverse impacts while the other mixing zone, at the confluence of Kimballton Branch and Stony Creek, was identified as an anticipated impact area for the candy

darter. This second mixing zone was already identified as an impact area in the *Hydrologic Analysis* due to crossings in both Kimballton Branch (within JNF) and Stony Creek (outside JNF). Due to periodical drying up of Stony Creek below Kimballton Branch, no candy darters likely occupy this mixing zone. Consistent with the 2020 SBA, FWS determined in the 2020 BO that "the effects from this specific project are not anticipated to reduce appreciably the suitable habitat available for recovery or the recovery potential for the species" (FWS 2020b).

Baseline Embeddedness Analysis

Embeddedness surveys were conducted in the Upper Roanoke River basin to assess potential sedimentation effects to the Roanoke logperch (Geosyntec Consultants 2020). The streams assessed were the reaches of Bradshaw Creek, North Fork Roanoke River, Roanoke River, North Fork Blackwater River, Teels Creek, Little Creek, and Blackwater River. Baseline field embeddedness information was not obtained from the Roanoke River because of restricted land access at the time of the field work. However, baseline embeddedness measurements in the North Fork Roanoke River serve as a surrogate for the Roanoke River due to proximity, relatively similar hydrological and/or basin characteristics, and longitudinal connection. Craig Creek in Virginia was also assessed due to the potential presence of James spinymussel. Baseline conditions in the field were taken immediately above the most upstream point of sediment input from the project within each stream reach evaluated. A preliminary examination of potential alternate reference reaches was conducted on data collected from VDEQ. Most embeddedness data found were based on a qualitative 0 - 20 scale, and data were lacking for streams in the region. This embeddedness analysis does not affect the sedimentation conclusion, therefore does not provide information that constitutes changed conditions.

New Aquatic Species Listing

In the period since the 2017 FERC FEIS, BA, and BO, the candy darter has been listed as endangered under the ESA with proposed Critical Habitat. The candy darter was not considered in the 2017 BA as it was not yet listed under the ESA. Formal Conferencing with FWS was requested for the species which at the time was proposed for ESA listing. Formal Conference initially resulted in the FWS/FERC opinion that the action would not jeopardize the species. Post listing of the candy darter, the 2020 SBA offered an effects determination of May Affect, Not Likely to Adversely Affect the candy darter. The listing of the candy darter as federally endangered combined with a May Affect, Likely to Adversely Affect determination constitutes a substantial change in the regulatory requirements for the MVP. The candy darter, however, does not occur on JNF lands but may occur downstream in watersheds that overlap with the JNF.

Possible Change in Construction in Methods for Unnamed Tributaries of Craig Creek from Dry-ditch Open Cut to Conventional Bore

There are four unnamed tributary stream crossings on NFS lands, all of which are unnamed tributaries of Craig Creek. They may be crossed using a dry-ditch open cut method or a conventional bore method. The dry-ditch open cut method was analyzed for these streams in the FERC FEIS and a horizonal directional drilling method was analyzed for other waterways (FERC FEIS pp. 4-139 to 4-140). The impacts of a conventional bore method would be similar to those of horizonal directional drilling and, in comparison to dry-ditch open cut, would be expected to decrease expected erosion and sedimentation by keeping the stream bed intact (FERC FEIS p. 4-139). As part of the POD, a contingency plan would be developed for the potential boring activities. This method would decrease the potential for increased embeddedness

as well as generally decrease adverse effects to the quality of the aquatic environment in the Craig Creek basin. This would reduce potential effects to James spinymussel.

Utilization of Mystery Ridge and Pocahontas Roads as Access Roads

Alternative 2 requires no further utilization of Mystery Ridge and Pocahontas roads as access roads. While Pocahontas Road included several stream crossings and was in close proximity to several RFSS, post-construction improvements to the roads required under the previous plan would have improved long term erosion and sedimentation, leaving a net neutral result. As a result of implementing post-construction improvements that were analyzed in the FERC FEIS, the effects of Alternative 2 are consistent with those analyzed in the FERC FEIS.

Aquatic Species - RFSS

The list of aquatic RFSS considered in the 2020 Supplemental Biological Evaluation will be different from that in the 2017 BE and FERC FEIS because the Region 8 RFSS list has been updated since those two documents were written. For example, the candy darter is now federally listed, the project has been determined to be outside the range of the now federally listed yellow lance, and the Allegheny snaketail (*Ophiogomphus incurvatus alleganiensis*) is no longer on the RFSS list. As of September 6, 2020, a total of six aquatic RFSS are being assessed for their potential to be affected by the project, including 3 fishes, 1 dragonfly, and 2 mussels (see Table 9). Preliminary determinations are provided in this SEIS. This differs from the 2017 BE (MVP 2017) that addressed nine aquatic species: 5 fishes, 2 mussels, and 2 dragonflies.

Table 9. RFSS Aquatic Species Analyzed in the 2020 SEIS

Group	Latin Name	Common Name	2017 BE	2020 SEIS
Fish	*Notropis semperasper*	Roughhead shiner	X	X
Fish	*Noturus gilberti*	Orangefin madtom	X	X
Fish	*Phenacobius teretulus*	Kanawha minnow	X	X
Dragonfly	*Gomphus viridifrons*	Green-faced clubtail	X	X
Mussel	*Fusconaia masoni*	Atlantic pigtoe*	X	X
Mussel	*Lasmigona subviridis*	Green floater	X	X

*Proposed for listing under the ESA

The four unnamed tributary stream crossings on NFS lands would be performed either with a dry-ditch open cut method or a conventional bore. The dry-ditch open cut method was evaluated in the FERC FEIS. Alternatively, use of a conventional bore method would reduce potential direct and indirect effects to sensitive aquatic environments and species because it would avoid disturbance to the stream bed. As described above for federally listed aquatic species, if a conventional bore method is used it would reduce potential effects to RFSS aquatic species compared to the dry-ditch open cut method.

The following mitigation measures were addressed in the FERC FEIS to avoid or minimize effects to RFSS aquatic species: fuel and chemical spills, hydrostatic testing, blasting, pesticide and/or herbicide use, and fisheries of special concern. Because the effects from implementing these measures were already analyzed in the FERC FEIS, they are not analyzed in detail in this SEIS.

To minimize or avoid adverse effects on aquatic habitat that support RFSS, the project would adhere to conservation measures established in the POD. Other measures that would contribute to minimizing effects to RFSS are included in the FERC Plan and Procedures, the Erosion and Sediment Control Plan, and the Spill Prevention, Control, and Countermeasure plan.

Roughhead Shiner (*Notropis semperasper)*

The roughhead shiner is a medium-sized minnow with an elongated body and pointed dorsal and anal fins with falcate margins (MVP 2020t). This species is endemic to the Ridge and Valley Province of the upper James River watershed (Stauffer et al. 1995). Habitat for the roughhead shiner includes clear rocky pools and backwaters of small to large rivers (Page et al. 2011) as well as cool to warm clear pristine streams with moderate gradient, hard bottom, and little siltation. This species prefers moderate currents of runs but can occasionally be found in swifter water (Jenkins and Burkhead 1994).

The roughhead shiner was considered in the 2017 BE resulting in a **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination. Craig Creek is known to support populations of the roughhead shiner; however, all known occurrence records are 16.9 miles downstream of the Project crossing. Given the results of the updated sedimentation analysis, all occurrence records fall outside the zone of measurable suspended sediment effects (Geosyntec Consultants 2020); thus, no change to the 2017 BE determination is necessary based on new analysis.

Orangefin Madtom (*Noturus gilberti)*

The orangefin madtom has a long, slender body and a flattened head ranging in length from 2 to 3 inches (MVP 2020t). It is olive to brown in color on the dorsal side and yellow to white on the ventral side, with yellow to white edges on its fins. The species occurs in rocky riffles in small swift-moving rivers and streams. The species typically spawns in 50 to 68 degree Fahrenheit water from April through May. The orangefin madtom is currently under review for federal listing under the ESA and is considered a state-threatened species in Virginia.

The orangefin madtom was considered in the 2017 BE resulting in a **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination. While the species is known to occupy the Upper James River and Upper Roanoke River subbasins, no collection records for the species exist in the Trout Creek-Craig Creek or Dry Run-North Fork Roanoke River subwatersheds. Based on the results of the updated sedimentation analysis, all species collections fall outside the zone of discernible suspended sediment effects (Geosyntec Consultants 2020); thus, no change to the 2017 BE determination is necessary.

Kanawha minnow (*Phenacobius teretulus)*

The Kanawha minnow is an elongate, slender minnow with a dark dorsal, greenish sides, a pale silvery underside, and orange-tinged fins and tail (MVP 2020t). The species is endemic to the New River system of North Carolina, Virginia, and West Virginia. This species prefers the riffles and runs over bedrock or boulder substrates in medium-sized rivers (Stauffer et al. 1995). The species is known to occupy the Middle New River (HUC 05050002) subbasin; however, according the Virginia Department of Game and Inland Fisheries (VDGIF) Wildlife Environmental Review Map Service (WERMS) database, the species was captured only in a few localities within the subbasin.

The Kanawha minnow was considered in the 2017 BE resulting in a **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination. The closest known population occurs within Little River drainage, a tributary to the New River. Based on results of the updated sedimentation analysis, all known species populations fall outside the zone of discernible suspended sediment effects (Geosyntec Consultants 2020); thus, no change to the 2017 BE determination is necessary.

Green-faced clubtail (*Gomphus viridifrons)*

The green-faced clubtail is a small, primarily black dragonfly with a clear gray-green face (MVP 2020t). It prefers clean, small to large, highly oxygenated streams with a moderate current. The larval (i.e., nymph) stages of the species prefers substrates that consist of gravel-sand and lightly silted rocks. This species has an extremely local distribution, slightly under 50 counties across approximately 15 states (Dunkle 2000).

The green-faced clubtail was considered in the 2017 BE resulting in a **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination. The proposed alignment traverses streams within the known range of the green-faced clubtail and some streams may support populations of the species. Populations of the species (nymph stages) may occur at project stream crossing locations where a direct take of individuals could occur, and downstream of construction activities, nymphs (if present) may be subject to sedimentation issues. Adults are highly mobile and are likely able to avoid direct mortality by construction activities within the Project area. Green-faced clubtail exhibits a broad geographic distribution across numerous regions and states, and any potential indirect effects due to temporary sedimentation are not likely to cause a trend toward federal listing or a loss of viability for this species.

Atlantic Pigtoe (*Fusconaia masoni)*

The Atlantic pigtoe is currently under review for federal listing under the ESA (MVP 2020t). This species, a freshwater unionid mussel, is typically found in swift, clean, and well-oxygenated streams, larger in size (e.g., large creek to medium-sized river) with gravel and sand substrates (Terwilliger 1991). This species was designated as state threatened in Virginia in January 1987. Atlantic pigtoe is one of the Atlantic slope unionids that prefers to inhabit the upper parts of rivers, usually above the geological boundary, typically denoted by rapids or a waterfall, between an upland region and a plain (i.e., fall line).

The Atlantic pigtoe was considered in the 2017 BE resulting in a **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination . Populations of this species were not identified at any of the Project stream crossings, and the closest known population (according to the VDGIF WERMS database) occurs in Craig Creek downstream of the confluence with Johns Creek approximately 30.2 miles downstream of the project area. However, given the known presence of the species within the Upper Johns Creek Subwatershed (HUC 020802011101), a similarly sized watershed adjacent to the Trout Creek-Craig Creek Subwatershed, the species may exist closer to the project area. The species is known to occupy the Upper James River (HUC 02080201) subbasin; however, it typically inhabits relatively large creeks and small rivers. The project may result in temporary sedimentation increases within stream habitat downstream of the project area. Acute siltation events and chronic turbidity have been documented to reduce growth rates and survivability in other mussel species. According to the *Hydrologic Analysis of Sedimentation* conducted in support of this SEIS (Geosyntec Consultants 2020), increased sedimentation rates are not expected to occur

outside of the Trout Creek-Craig Creek Subwatershed, and the cumulative impact area (i.e., areas with a 10 percent increase or more in sediment load) does not extend beyond the negative survey area. According to the VDGIF WERMS database, more than 20 mussel survey events occurred in the Trout Creek-Craig Creek Subwatershed (including past records upstream and downstream of the Project crossing and mussel surveys associated with the project); however, no Atlantic pigtoe have been collected.

Green Floater (*Lasmigona subviridis*)

The green floater is currently under review for federal listing under the ESA (MVP 2020t). This species, state-threatened in Virginia, is a small freshwater mussel, typically less than 2 inches long. It has a trapezoidal to subovate shape and is yellow-green in color. This species primarily occurs in stagnant pools and other calm-water pockets 1 to 4 feet in depth. It is native to many drainage basins in the U.S., including the New River and James River basins. The species is typically found in clear pool habitats of streams of varying sizes with substrates of gravel and sand. The species is known to occupy the Middle New River (HUC 05050002) and Upper James River (HUC 02080201) subbasins.

The green floater was considered in the 2017 BE resulting in a **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination. The closest known occurrence of green floater within the Upper James River occurs outside of the Craig Creek drainage. Relic shells were collected in relative proximity to the project between Little Stony Creek and Stony Creek. Given the results of the updated sedimentation analysis, all known species populations fall outside the zone of discernible suspended sediment effects (Geosyntec Consultants 2020); thus, no change to the 2017 BE determination is warranted.

Terrestrial Species – Federally Listed

The effects analyses remain the same for federally listed terrestrial species identified. FWS concurred in their 2020 BO that the determinations for the species analyzed are unchanged from the 2017 BO (FWS 2020b).

Terrestrial Species Action Area

The Action Area is defined by a combination of effects related to movement of dust, light levels, noise, and water quality. Specifically, the Action Area for federally listed terrestrial species considered up to 350 feet for dust effects, up to 1,200 feet for light effects, up to two miles for noise effects, and the geographic scope of the *Hydrologic Analysis* (Geosyntec Consultants 2020) for water quality effects (FWS 2020b).

Indiana bat (*Myotis sodalis*)

Indiana bats are a nocturnal, medium-sized, brown-colored bats ranging in size from 1.6 to 1.9 inches and weigh about as much as a nickel (<0.3 ounces) (MVP 2020b). They eat insects in flight. The geographic range of Indiana bats includes much of the eastern, southeastern, and north central United States, including all of Virginia. Indiana bats migrate seasonally between caves (hibernacula), where they hibernate during winter months, and their summer range where they roost in dead, dying, or live trees with cracks, crevices, or exfoliating bark.

The project **May Affect, Is Likely to Adversely Affect** the Indiana bat. Indiana bats were not captured during 2015 and 2016 mist-net surveys, but it is assumed the species occupies potentially suitable summer habitat, spring staging/fall swarming habitat, and winter hibernacula

in the Action Area where presence/probable absence surveys were not conducted. Additional mist net surveys have not been required since trees were removed within LOD. Based on coordination with VDGIF, no new capture or roost records have been reported with the Action Area (MVP 2020b). Some Indiana bat individuals would likely be impacted during construction and operation and maintenance of the project. As summarized in Section 2.2.2.2, the FWS 2020 BO would require implementation of measures to avoid, minimize, and mitigate adverse impacts on the Indiana bat.

Northern long-eared bat (*Myotis septentrionalis*)

Northern long-eared bats are medium-sized bats characterized by their long ears relative to other bats in the genus (MVP 2020b). They weigh about the size of a nickel (0.17 to 0.28 ounces) at maturity with average body lengths of about 3.0 to 3.7 inches. Females average slightly larger than males. The geographic range includes much of the eastern and northeastern United States, including all of Virginia. Northern long-eared bats hibernate in caves and roost underneath bark or in cavities or crevices of both live and dead trees in the summer during their reproductive season.

The project **May Affect, Is Likely to Adversely Affect** the northern long-eared bat. Results of summer mist-net and harp trap surveys confirmed presence of northern long-eared bats within the LOD. The Action Area for northern long-eared bat is the same as described above for the Indiana bat (FWS 2020b). The project has avoided and would avoid take of adults and non-volant young by suspending tree-clearing activities during June 1 through July 31[11]. However, individuals present during spring staging and autumn swarming may be impacted during project development. As summarized in Section 2.2.2.2, the FWS 2020 BO would require implementation of measures to avoid, minimize, and mitigate adverse impacts on the northern long-eared bat.

Gray bat (*Myotis grisescens*)

Gray bats are one of the largest species in the genus *Myotis* in eastern North America with a wingspan of about 10 to 12 inches (MVP 2020b) and body length of 3.1 to 4.1 inches. Gray bats are also distinguished from other *Myotis* species by their uniformly dark gray dorsal fur, their wing membrane that attaches at the ankle as opposed to the base of the toes in other species, and by a notch in the claws of their hind feet. The primary range of gray bats is concentrated in the cave regions of Alabama, Arkansas, Kentucky, Missouri, and Tennessee, with smaller populations found in adjacent states, including a growing population in a quarry in Clark County, Indiana. Gray bats require caves for winter hibernation and summer roosting.

There are no hibernacula or roosting habitat (i.e., caves), or records of gray bat captures within the Action Area. The project would not affect any caves within the range of the species in the Action Area. Based on the lack of summer captures during field surveys and absence of suitable, occupied roosting or hibernating habitat for the gray bat within the Action Area, no adverse effects are expected on roosting or hibernating habitat. Thus, the determination for gray bat is **May Affect, Not Likely to Adversely Affect** gray bats due to the potential for foraging habitat, which is the same determination in the 2017 BA (MVP 2017) and the 2020 SBA (MVP 2020b).

[11] Mountain Valley sought and obtained relief from this time-of-year restriction from FERC and FWS under emergency Section 7 consultation initiated by FERC to conduct limited tree-clearing activities on 0.81 acre during June 2018 required to remediate the imminent risk to safety or the environment.

Because the determination for the gray bat is May Affect, Not Likely to Adversely Affect, this species was not addressed in the 2020 BO.

Virginia big-eared bat (*Corynorhinus townsendii virginianus*)

Virginia big-eared bats are medium-sized bats, averaging 3.9 inches in length. They are distinguished by their long ears, greater than 1 inch in length, and two mitten-shaped glandular masses on each side of its nose (FWS 2011). Virginia big-eared bats are distributed in isolated populations in the Appalachian Mountains in Kentucky, North Carolina, Virginia, and West Virginia (MVP 2020b). Virginia big-eared bats use caves for winter hibernation and summer roosting.

There are no records of this species within the Action Area, the project would not affect any caves within the range of the species in the Action Area, and there are no hibernacula known in the Action Area. Based on the lack of summer captures during field surveys and absence of occupied roosting or hibernating cave habitat for the species within the Action Area, a **May Affect, Not Likely to Adversely Affect** determination is made for Virginia big-eared bats. This is the same determination as in the 2017 BA (MVP 2017) and the 2020 SBA (MVP 2020b). Because the determination for the Virginia big-eared bat is May Affect, Not Likely to Adversely Affect, this species was not addressed in the 2020 BO.

Rusty patched bumble bee (*Bombus affinis*)

Rusty patched bumble bees appear similar to other bumble bees, having large, round bodies with black and yellow coloration. All rusty patched bumble bees have entirely black heads and the workers and males have a rusty reddish patch centrally located on the abdomen (MVP 2020b). Since 2000, the rusty patched bumble bee has been documented in just 13 states in the eastern and Midwest U.S., including Virginia, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Minnesota, North Carolina, Ohio, Pennsylvania, Tennessee, and Wisconsin. The rusty patched bumble bee has been documented inhabiting woodlands, marshes, agricultural landscapes, and residential parks and gardens. The species requires areas that support sufficient food (nectar and pollen from diverse and abundant flowers), undisturbed nesting sites in proximity to floral resources, and overwintering sites for hibernating queens. Nests are typically in abandoned rodent nests or other similar cavities and colonies may consist of up to 1,000 individual workers in a season.

A **No Effect** determination was made for this species. Surveys for the species were conducted in 2018 and 2019 by the West Virginia DNR and Virginia Department of Conservation and Recreation within and without a 10-km buffer of the MVP project boundary. All surveys within the JNF boundaries were negative for individuals (FERC 2017a; WEST 2020; MVP 2020b). The Virginia Department of Conservation and Recreation (VDCR 2020; Orcutt 2019) documented the presence of the rusty patched bumble bee in Bath, Highland, and Rockingham counties in Virginia over 50 miles from MVP, which is well outside of the dispersal distance of the species. The surveys conducted by VDCR included Giles and Montgomery counties, each of which is crossed by a portion of the project within the JNF. No rusty patched bumble bees were found in Giles or Montgomery counties during these surveys, including in the vicinity of the project. According to the FERC BA for MVP (FERC 2017a), historical populations of the rusty patched bumble bee were last observed in Giles County in 1987 and in Montgomery County in 1997. The species requires grasslands and a mixed forest cover. Creating a path through the heavily wooded JNF would not negatively affect this species, but it could create habitat once the project is completed and pollinator plants are established in the ROW. Based upon the MVP survey results,

as well as available scientific and commercial data, the project area is outside of the rusty patched bumble bee's current range. Therefore, the FWS determined in its July 9, 2020, consultation letter to the FERC that the project should have a **No Effect** determination (FWS 2020a).

Terrestrial Species – RFSS

The list of terrestrial RFSS considered in the 2020 Supplemental Biological Evaluation will be different from that in the 2017 BE and FERC FEIS because the Region 8 RFSS list has been updated since those two documents were written. As of September 6, 2020, a total of nine terrestrial RFSS are being assessed for their potential to be affected by the project, including seven butterflies and two mammals (both bats; see Table 10). Preliminary determinations are provided in this SEIS. This differs from the 2017 BE (MVP 2017) that addressed four terrestrial species: two butterflies, one beetle (the Maureen's shale stream beetle [*Hydraena maureenae*] that is no longer on the RFSS list), and one mammal (bat).

Table 10. RFSS Terrestrial Species Analyzed in the 2020 SEIS

Group	Latin Name	Common Name	2017 BE	2020 SEIS
Butterfly	*Atrytone arogos*	Arogos skipper		X
Butterfly	*Calephelis borealis*	Northern metalmark		X
Butterfly	*Danaus plexippus*	Monarch		X
Butterfly	*Erora laeta*	Early hairstreak		X
Butterfly	*Erynnis martialis*	Mottled duskywing		X
Butterfly	*Speyeria Idalia*	Regal fritillary	X	X
Butterfly	*Speyeria diana*	Diana fritillary	X	X
Mammal	*Myotis leibii*	Eastern small-footed bat	X	X
Mammal	*Perimyotis subflavus*	Tricolored Bat		X

Butterflies (7 species; see Table 10)

Arogos Skipper (*Atrytone arogos*)

The arogos skipper has yellow orange upperside wings with a black border (MVP 2020t). The female's wings tend to be wider than the males. Arogos skippers inhabit relatively undisturbed prairies or grasslands throughout the majority of its range. Adults feed on nectar from the flowers of dogbane, stiff coreopsis (*Coreopsis palmata*), purple coneflower (*Echinacea purpurea*), and green milkweed (*Asclepias viridis*). Females lay eggs singly under caterpillar host plant leaves, including big bluestem (*Andropogon gerardii*) and other native grasses (NatureServe 2020).

Northern Metalmark (*Calephelis borealis*)

The northern metalmark is a small butterfly with a wingspan of 1.13 to 1.25 inches found in Virginia, West Virginia, and other parts of the eastern U.S. (MVP 2020t). In male butterflies, the forewing is more rounded than the female; the upperside of both wings is brown with wide orange borders and a dark median band. Habitat for the northern metalmark are forested openings, such as natural outcrops, shale or limestone barrens, and glades or powerline rights of way. Larvae feed solely on roundleaf ragwort (*Senecio obovatus*). Important nectar flowers for

adults include orange milkweed (*Asclepias tuberosa*), black-eyed Susan (*Rudbeckia hirta*), daisy (*Bellis perennis*), and fleabane (*Erigeron annuus*) flowers (NatureServe 2020).

Monarch (*Danaus plexippus*)

The monarch butterfly is identified by distinct orange, black, and white wing patterns (MVP 2020t). Female adults tend to have brown-orange coloration and blurred black veins, while the male is bright orange and wide black borders with scent scales on the hindwing. Monarch habitat is complex, but generally includes virtually all patches of milkweed in North America. Overwintering habitats including high altitude Mexican conifer forests or coastal California conifer and Eucalyptus groves are critical for the species (NatureServe 2020). Adults feed on nectar from a wide variety of flowers including dogbane (*Apocynum cannabinum*), lilac (*Syringa* sp.), thistles (*Cirsium* sp.), and milkweeds (*Asclepias* sp.). Monarch reproduction is entirely dependent on milkweeds including common milkweed (*Asclepias syriaca*), swamp milkweed *(A. incarnata*), and showy milkweed (*A. speciosa*). Females lay eggs singly on host plants; caterpillars eat the leaves and flowers. Monarch's migrate to Mexico from August to October. Throughout its range, the monarch is found in open habitats, including fields, meadows, weedy areas, marshes, and roadsides.

Early Hairstreak (*Erora laeta*)

The early hairstreak butterfly can be identified by its lack of tail, blue and black wing uppersides, and light turquoise wing undersides with two irregular bands of small orange spots (MVP 2020t). The butterfly is found primarily in deciduous and mixed woods, particularly along open ridgetops and along dirt roads. Although like most hairstreaks a few adults sometimes are found on flowers away from the woods, at least southward. Beech-maple forests seem most typical, but more mixed types can also house populations. Most habitats contain a lot of beech, but collections have been reported where beech was not present in the immediate area (Sullivan 1971, Allen 1997), often single individuals on flowers. Nearly all records are from hilly or mountainous regions.

Mottled Duskywing (*Erynnis martialis*)

Mottled duskywing butterflies are identified by their upperside bands and the mottled appearance of both front and back wings. Mottled duskywing are found in habitat that includes open woodland, barrens, prairie hills, open brushy fields, and chaparral, especially where the eastern species of *Ceanothus* (lilacs) are common, or at least well distributed over dozens of hectares or more, usually in hilly country. At least from Texas and Wisconsin eastward, this species is strongly associated with various sorts of oak (black, post, etc.) or pine (jack, pitch, longleaf) savannas or open woodlands, non-coastal pine barrens, or grassy openings within these communities (Schweitzer et al. 2011), also probably embankments along rivers. Adults prefer the nectar of the flowers of bush houstonia (*Houstonia* sp.), gromwell (*Lithospermum* sp.), hoary vervain (*Verbena stricta*), and other species. Females lay eggs singly on the host plants of wild lilacs, particularly New Jersey tea (*Ceanothus americanus*) and red root (*Caenothus herbaceus* var. *pubescens*).

Regal Fritillary (*Speyeria idalia*)

A petition to list the regal fritillary was submitted to the USFWS in April 2013 (WildEarth Guardians 2013); listing status is currently under review. The regal fritillary is a relatively large butterfly that uses a variety of habitats such as herbaceous wetlands, riparian areas, grasslands,

old fields, and savannas; however, it prefers high-quality remnant tallgrass prairies. Nectar sources for the entire flight season are very important, and the regal fritillary prefers areas with wet patches or streams (Wagner et al. 1997; Wells and Smith 2013). The species primarily deposits eggs in close proximity to violets (especially birdfoot violet [*Viola pedata*] and prairie violet [*V. pedatifida*]), which are the sole sources of food for larvae (Allen 1997).

Diana Fritillary (*Speyeria diana*)

The Diana fritillary feeds on a variety of flowering plant species while occupying deciduous or mixed forests with moist rich soil (Wells and Smith 2013). The species may also occupy adjacent fields, pastures, shrublands, and grasslands during various stages of its life. The Diana fritillary is known from Monroe County, West Virginia and Giles and Montgomery counties, Virginia.

A **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination is made for all butterfly species above. Potentially suitable habitat was identified during field habitat assessments. The biggest threat from construction, operation, and maintenance would be removal of potentially suitable habitat from the project area; however, most butterflies are known to benefit from the presence of woodland clearings, including ROWs, as they increase the amount of nectar forage available. Construction of the ROW would increase the amount of potentially suitable habitat for these species. Revegetation of the ROW would follow a two-step process as recommended by the Forest Service. This includes stabilization of soils immediately following tree removal and construction activities with appropriate seed mixes and techniques, as well as revegetation of the ROW corridor as needed with native seed mixes recommended in consultation with the Forest Service.

Eastern small-footed bat (*Myotis leibii*)

The eastern small-footed bat roosts in vertical cracks of cliff faces and horizontal cracks on talus slopes near deciduous or coniferous forest. It may also use man-made structures such as rip-rap and bridges. This bat hibernates in caves during the winter. The eastern small-footed bat forages widely in forested and open habitat types of mountainous habitat. It is known to occur in Montgomery County, Virginia (MVP 2017).

A **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination is made for the eastern small-footed bat. Potential summer habitat, typically rocky outcrops, for the eastern small-footed bat was limited along the proposed alignment and Pocahontas Road on JNF during field surveys (mist netting and portal searches). The closest captured individual was approximately ½ mi from the western boundary of the construction ROW. No suitable cave openings or portals were observed along the proposed alignment or Pocahontas Road on JNF. There are no known winter hibernacula along the proposed alignment; however, it is likely that suitable winter habitat for the species is present on or within the vicinity of JNF as summer and winter habitats are often close together. The Karst Mitigation Plan (MVP 2020b) covers roosting habitat used by this species. Therefore, additional analysis is not needed.

Tricolored bat (*Perimyotis subflavus*)

Tricolored bat is a small bat weighing between 0.2 and 0.3 ounces found in the eastern U.S. with a wingspan of 8 to 10 inches. The coat of the tricolored bat is dark brown at the root and tip and yellow in the middle of each strand. Identifying characteristics of the species include pink-hued skin on the radius bone and relatively large feet. The bat is found in early successional open

woods over water and adjacent water edges. Tricolored bats most commonly roost in the dead or live tree foliage during summer. In winter, tricolored bat hibernate in caves. They may also utilize man-made structures such as buildings, bridges, and culverts.

A **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination is made for the tricolored bat. Bat surveys were conducted in 2015 and 2016, but no tricolored bats were captured within the JNF ROW. Potential summer habitat for tricolored bats is present within the JNF in the form of trees. However, roosts are not limiting for this species and the removal of trees has already occurred. No suitable cave openings or portals were observed along the proposed alignment on the JNF. There are no known winter hibernacula within 0.25 mile along the proposed alignment. The closest known hibernaculum is approximately 3 miles from the ROW crossing JNF lands (VDGIF 2020). Therefore, no additional effects would occur for this species that have not been covered by other mitigation measures (i.e., noise, hydrology, and karst features).

Conclusion

To minimize or avoid adverse effects on terrestrial habitat that support RFSS, the POD includes conservation measures and the BE includes mitigation measures. Other measures that would contribute to minimizing effects to RFSS are included in the FERC Plan and Procedures, the Erosion and Sediment Control Plan, and the Spill Prevention, Control, and Countermeasure Plan. The BE determined that MVP would not cause a trend toward federal listing or loss of viability for any of these terrestrial species.

Plant Species – Federally Listed

Smooth coneflower (*Echinacea laevigata*)

The smooth coneflower grows up to 59 inches tall from a vertical root stock; stems are smooth, with few leaves. The largest leaves are the basal leaves, which reach 7.8 inches in length and 2.9 inches in width. Flower heads are usually solitary. The ray flowers (petal-like structures on the composite flower heads) are light pink to purplish, usually drooping, and 1.9 to 3.1 inches long. It has disk flowers that are about 0.2-inch-long with tubular purple corollas and mostly erect short triangular teeth. Smooth coneflower historically occurred from Pennsylvania to Georgia. In Virginia, it is known or believed to occur in Montgomery County (MVP 2017). In Virginia, smooth coneflower occurs in woodlands or glades that are generally open and dry. It has also been found in open woods, cedar barrens, roadsides, clear-cuts, utility line rights-of-way, and dry limestone bluffs.

Prior to the 2017 BA, no individual smooth coneflower was observed during survey, but potential habitat was determined to be present within the Action Area in Montgomery County (MVP 2017). No additional smooth coneflower suitable habitat has been documented in the project area since the issuance of the 2017 BA, so there are no updates to occurrence of this species. The MVP would not directly or indirectly impact known-occupied habitats of smooth coneflower. The species and the nearest known populations occur outside of the Action Area in Montgomery County, Virginia, and individuals were not found in the project area during FWS-approved plant surveys. Therefore, the smooth coneflower has a **May Affect, Not Likely to Adversely Affect** determination and it is not addressed in the 2020 BO (FWS 2020a and 2020b).

Small whorled pogonia (*Isotria medeoloides*)

The small whorled pogonia is a member of the orchid family and is characterized by a single gray-green stem up to 11.8 inches tall and the whorl of five to six leaves at the top of the stem (MVP 2017). The leaves are gray-green, oblong, and reach 1.6 to 3.1 inches in length. A single or pair of green-yellow flowers appears in May or June. The small whorled pogonia occurs on upland sites in mixed-deciduous or mixed deciduous/coniferous forests that are generally in second- or third-growth successional stages. Characteristics common to most small whorled pogonia sites include sparse to moderate ground cover in the species' microhabitat, a relatively open understory below the canopy, and proximity to features that create long persisting breaks in the forest canopy. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams. Small whorled pogonia is known or believed to occur in Virginia and West Virginia.

There is suitable habitat within the Action Area, but no individuals were found in field surveys. Therefore, the determination is **May Affect, Not Likely to Adversely Affect**. Because Section 7 has been concluded informally for this species, it is not addressed in the 2020 BO (FWS 2020a; FWS 2020b).

Virginia spiraea (*Spiraea virginiana*)

Virginia spiraea is a perennial shrub with many branches (MVP 2017). It grows 3 to 10 feet tall. Its alternate leaves are single-tooth serrated and grow to 1 to 6 inches long and 1 to 2 inches wide. The leaves are darker green above than below, occasionally curved, and have a narrow, moderately tapered base. The plant produces flowers that are yellowish green to pale white, with stamens twice the length of the sepal. It blooms from late May to late July, but flower production is sparse and does not begin until after the first year of establishment. The Virginia spiraea is a Southern Appalachian species found in the Appalachian Plateaus or the southern Blue Ridge Mountains in Alabama, Ohio, West Virginia, Virginia, Tennessee, North Carolina, Kentucky, and Georgia. Virginia spiraea occurs along scoured banks of second and third order streams, or on meander scrolls, point bars, natural levees, and other braided features of lower reaches of streams. In Virginia, these plants are often located along flood scour zones in crevices of sandstone cobbles, boulders, and massive rock outcrop, and quartzite/feldspar boulders. It occurs in soils that are sandy, silty, or clay at elevations ranging between 1,000 and 2,400 feet.

Known populations of this species occur in West Virginia and surveys conducted before and after the 2017 BA and BO did not locate individuals in the Action Area. Although the 2020 BA made a May Affect, Not Likely to Adversely Affect determination, FWS concurred with FERC's determination of **Likely to Adversely Affect** in the July 9, 2020, consultation letter that addressed the entire 303.5-mile-long project (FWS 2020a). The 2020 BO concurred that the Virginia spiraea does not occur on NFS lands and would not be affected by the proposed action in this SEIS (FWS 2020b).

Running buffalo clover (*Trifolium stoloniferum*)

Running buffalo clover is a stoloniferous, perennial herb. It is characterized by and differentiated from white clover (*Trifolium repens*) by having erect peduncles (flowering stalks) that have two large trifoliate leaves at their summit. White clover lacks these leaves. Running buffalo clover's erect flowering stems are typically 3.0 to 6.0 inches tall. The round flowering heads occur in mid-April to June with wilted flowering heads persisting for a short time thereafter. Running buffalo clover grows in relatively moist, fertile soils in regions with limestone or other

calcareous bedrock. It is often found in semi-shaded, moist openings, and edge habitats maintained by some form of long-term disturbance. Running buffalo clover currently grows in limited portions of Arkansas, Indiana, Kentucky, Missouri, Ohio, and West Virginia (MVP 2017). It is not known to occur in Virginia.

After the 2017 FEIS, additional surveys for running buffalo clover were conducted in 2018 and 2019 due to pipeline route changes and variance requests. No running buffalo clover individuals were observed within the LOD even though potentially suitable habitat was present. Therefore, a **May Affect, Not Likely to Adversely Affect** determination is made for this species and it is not addressed in the 2020 BO (FWS 2020a; FWS 2020b).

Shale barren rock cress (*Arabis serotina*)

The shale barren rock cress is a biennial plant species within the mustard family (MVP 2017). Young, non-reproductive individuals have leaves in a basal rosette that range in size from 0.6 to 1.4 inches in diameter. Potentially reproductive individuals are erect (16.1 to 38.2 in) and are flowering plants that lack the basal rosette. The flowering stalks are highly branched with three to 41 branches measuring 7.9 to 15.7 inches wide with many flowers. The flowers are small and white with calyxes (0.08 to 0.13 in long) that bear silique fruits ranging from 1.7 to 3.1 inches long. It flowers from mid-July to September. It is only known to occur in West Virginia and Virginia at low densities on mid-Appalachian shale barrens of the Ridge and Valley Province of the Appalachian Mountains.

This species was previously determined to be likely affected by the project. However, additional surveys and the statement by FWS that unsurveyed locations were not identified known habitat or likely suitable habitat for shale barren rock cress, the determination is now that there would be **No Effect** on this species by the project.

Plant Species – RFSS

The list of RFSS plants considered in the 2020 Supplemental Biological Evaluation may be different from that in the 2017 BE and FERC FEIS because the Region 8 RFSS list has been updated since those two documents were written. As of September 6, 2020, a total of eight RFSS plants are being assessed for their potential to be affected by the project, including two liverworts and six vascular plants (see Table 11). Preliminary determinations are provided in this SEIS. This differs from the 2017 BE (MVP 2017) that addressed three RFSS plants.

Table 11. RFSS Plant Species Analyzed in the 2020 SEIS

Group	Latin Name	Common Name	2017 BE	2020 SEIS
Liverwort	*Plagiochila virginica*	A liverwort		X
Liverwort	*Radula tenax*	A liverwort		X
Vascular Plant	*Berberis canadensis*	American barberry	X	X
Vascular Plant	*Clematis coactilis*	Virginia white haired leatherflower		X
Vascular Plant	*Delphinium exaltatum*	Tall larkspur		X
Vascular Plant	*Hypericum mitchellianum*	Blue Ridge St. John's-wort*		X
Vascular Plant	*Rudbeckia triloba var. triloba*	Pinnate-lobed coneflower*		X
Vascular Plant	*Monotropsis odorata*	Sweet pinesap	X	X
Vascular Plant	*Scutellaria saxatilis*	Rock skullcap	X	X
Vascular Plant	*Talinum teretifolium*	Quill fameflower		X

*Not on RFSS list; these species were surveyed for at the request of the Forest Service.

A liverwort (*Plagiochila virginica*)

Plagiochila virginica is a Southern Appalachian endemic occurring from West Virginia and Virginia south to Georgia and Mississippi. Habitat is described as damp to intermittently dry calcareous or sandstone ledges or cliffs in partially exposed sites. Reportedly over half of specimens were collected on calcareous rock (NatureServe 2020)

A **No Impacts** determination is made for *Plagiochila virginica*. Potential habitat for this species within the ROW on the JNF is limited to two rock outcrops, both of which have been thoroughly surveyed with no target species located (ESI 2017; MVP 2020t).

A liverwort (*Radula tenax*)

Radula tenax is a species of liverwort indigenous to the Appalachians from Maine to Georgia. Typical habitat includes moist rocks or trees in mountains below the spruce-fir zone along with depressed, dense mats on moist rocks. This species is described as having two discrete modes of occurrence: on shaded, damp rocks and on tree bark in deep, moist forests. Does not tolerate submersion (NatureServe 2020).

A **No Impacts** determination is made for *Radula tenax*. Although low quality habitat for this species is present, surveys identified no species occurrences in the JNF project ROW (ESI 2017; MVP 2020t). Construction, operation, and maintenance would likely impact potentially suitable habitat, however, no direct effects to the species are anticipated due to its probable absence in the project area.

Virginia white-haired leatherflower (*Clematis coactilis*)

Virginia white-haired leatherflower occurs on shale, calcareous sandstone, dolomite, and limestone outcrops and barrens. This is a bushy herbaceous perennial growing to 0.8 to 1.8 inches with solitary, terminal colorful flowers that have purplish outer parts of the flowers (sepals) that appear white because they are densely covered with white to pale-yellow hairs. The sepals form a bell-shaped floral structure (Weakley et al. 2012).

A **No Impacts** determination is made for the Virginia white-haired leatherflower. The Forest Service reevaluated this plant due to changes in the landscape since the 2017 FERC FEIS. Based on surveys in 2020, no suitable habitat was identified in the project area and the Virginia white-haired leatherflower was eliminated from further consideration.

Tall larkspur (*Delphinium exaltatum*)

Tall larkspur is an herbaceous perennial member of the buttercup family (*Ranunculaceae*). Larkspurs have distinctive flowers with four blue petals and one sepal elongated into a slender spur, which gives the plant its name. The leaves are deeply lobed into irregular segments. It blooms from July to September. Tall larkspur grows on dry, open southwest-facing slopes with limestone soils.

A **No Impacts** determination is made for the tall larkspur. The Forest Service reevaluated this plant due to changes in the landscape since the 2017 FERC FEIS. While potential habitat was found, no individuals were found during a 2020 field survey. Therefore, the tall larkspur was eliminated from further consideration.

Blue Ridge St. John's-wort (*Hypericum mitchellianum)*

Blue Ridge St. John's-wort is a perennial herb that generally grows up to 2 feet in height. It blooms in July and August and its blooms are orange and yellow. The Blue Ridge St. John's-wort can be found in grassy openings, forests, and seepages. The Blue Ridge St. Johns-wort's range extends from western Virginia, eastern West Virginia, and northeastern Tennessee south to southwestern North Carolina (NatureServe 2020).

Although this species is not on the RFSS list, the Forest Service requested surveys for Blue Ridge St. John's-wort. While potential habitat was found, no individuals were found during a 2020 field survey. Therefore, the project would not adversely affect Blue Ridge St. John's-Wort.

Pinnate-lobed coneflower (*Rudbeckia triloba var. triloba*)

Pinnate-lobbed coneflower is a native herbaceous perennial in the sunflower family (*Asteraceae*). The pinnate-lobed coneflower occurs on limestone outcrops, on cedar glades, in pastures, and on roadsides. It is a short-lived perennial with a rhizome. Stems are 1 to 3 feet in height, branched, reddish-purple or green in color, and pubescent with long white hairs. Flowers are produced in heads. Each head has 8 to 15 yellow or orange ray flowers and 150 to 300 purple-black disc flowers. It can be found in Virginia, North Carolina, Kentucky, Tennessee, and Alabama.

Although this species is not on the RFSS list, the Forest Service requested surveys for pinnate-lobed coneflower. While potential habitat was found, no individuals were found during a 2020 field survey. Therefore, the project would not adversely affect pinnate-lobed coneflower.

American barberry (*Berberis canadensis*)

American barberry is a deciduous shrub that occurs from Ohio south to Georgia and extends west to Missouri (NatureServe 2020). It is often located in rocky woods, open woods, and glades, typically with mafic or calcareous substrate. Occasionally found along fencerows (Weakley 2015).

A **No Impacts** determination is made for American barberry. This species was found at four locations during plant surveys on pipeline routes on JNF land in Craig County, Virginia that are not part of the proposed route. Although potentially suitable habitat is present within the Project area, the species is likely absent based on the negative survey results (MVP 2017). It is unlikely to be directly impacted by project construction, operation, and maintenance; however, this species may benefit from an increase of potentially suitable habitat (woodland clearings and exposed hillsides).

Sweet pinesap (*Monotropsis odorata*)

Sweet pinesap is a diminutive (1 - 4 in) heteromycotropic herb with a range from Maryland south to Georgia and west to Kentucky and Alabama with most occurrences located in the Appalachian highlands (NatureServe 2020; Weakley 2015). Known habitat includes dry to mesic oak-pine-heath woodlands, often on upper slopes and bluffs with abundant ericaceous shrub cover (Weakley 2015).

A **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** determination is made for sweet pinesap. Due to its diminutive size and coloration, sweet pinesap is easily overlooked and often hidden or only partially emergent from the forest leaf litter and is likely more common than documented. Although surveys did not locate any occurrence of this species, potentially suitable habitat is located along the ROW on the JNF, therefore its absence cannot be confirmed. Project activities could remove potentially suitable habitat (along with individuals not located during surveys). However, the abundance of potentially suitable habitat for this species on the JNF indicates that project activities would not lead to a trend toward federal listing or loss of viability.

Rock skullcap (*Scutellaria saxatilis*)

Rock skullcap is an herbaceous perennial distributed from Pennsylvania south to Georgia and west to Indiana primarily restricted to the Appalachian highlands. This species typically occurs in rich, rocky dry to mesic deciduous woods often on hillsides, moist cliffs, talus slopes, ravines, stream sides, and occasionally roadsides (NatureServe 2020).

A **May Impact Individuals – Is Not Likely to Cause a Trend Toward Federal Listing or Loss of Viability** with **Minor effects** determination is made for rock skullcap. A single occurrence was located on the ROW consisting of approximately 10,000 individuals. The proposed alignment was shifted and reduced to a width of 75 feet to partially avoid the occurrence so that 1.94 acres out of the total 3.58-acre occurrence is impacted by project activities. Additional occurrences were located on alternative alignments and habitat is apparently not uncommon on the JNF which supports a conclusion that project activities are unlikely to lead to a trend toward federal listing or reduced viability (MVP 2017).

Seed from the impacted population of Rock Skullcap were collected and plants excavated for transplantation. Plants intended for transplantation did not survive. Seed was sown at two locations with seedlings observed at one location the following season (MVP 2020t).

Quill fameflower (*Phemeranthus teretifolius*)

Quill fameflower is a diminutive herbaceous perennial that is restricted to habitats including calcareous sandstone glades, metabasalt barrens and rock outcrops typically in depressions that collect rain or seepage and often co-occurring with *Grimmia* species (Weakley 2015). Although

occurring throughout a wide range in the east from Pennsylvania south to Georgia and west to Alabama and Kentucky, it is not common across its range (NatureServe 2020).

A **No Impacts** determination is made for quill fameflower. Low-quality potential habitat for this species within the ROW on the JNF is limited to two rock outcrops, both of which have been thoroughly surveyed with no target species previously located (ESI 2017; MVP 2020t).

Conclusion

To minimize or avoid adverse effects on vegetation habitat that support RFSS, the POD includes conservation measures and the 2017 BE includes mitigation measures. The 2017 BE determined that MVP would have negligible to moderate effects and would not cause a trend toward federal listing or loss of viability for any of these vegetation species.

Effects of Forest Plan Amendment

There are 11 Forest Plan standards that would be amended under the proposed action. These amended standards are required to make the construction, operation, and maintenance of the MVP through the JNF a conforming use under the Forest Plan. Direct and indirect effects to fisheries and aquatic species from adoption of the amended standards would be limited to the construction and operation/maintenance of the MVP. For terrestrial species, amended standards that facilitate tree removal may directly negatively affect Indiana bats and northern long-eared bats. These amended standards include Standard FW-14 (exposed soil and residual basal area within the channeled ephemeral zone) and Standard 6C-007 and 6C-026 (tree clearing and utility corridors in the old growth management area). A summary of potential effects to fisheries, aquatic species, and terrestrial species from the amended standards is provided in Table 12.

Table 12. Effects of Proposed Forest Plan Amendment on Aquatic and Terrestrial Species

JNF Forest Plan Standards (Modifications in Italics)	Effects on Fisheries and Aquatic Species	Effects on Terrestrial Species
Utility Corridors		
Standard FW 248: Following evaluation of the above criteria, decisions for new authorizations outside of existing corridors and designated communication sites will include an amendment to the Forest Plan designating them as Prescription Area 5B or 5C. *However, this requirement does not apply to the operational ROW for the MVP Project.*	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD
Soils and Riparian		
Standard FW-5: On all soils dedicated to growing vegetation, the organic layers, topsoil and root mat will be left in place over at least 85% of the activity area and revegetation is accomplished within 5 years*, with the exception of the operational ROW and the construction zone for the MVP, for which the applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD

Table 12 (continued). Effects of Proposed Forest Plan Amendment on Aquatic and Terrestrial Species.

JNF Forest Plan Standards (Modifications in Italics)	Effects on Fisheries and Aquatic Species	Effects on Terrestrial Species
Standard FW-8: To limit soil compaction, no heavy equipment is used on plastic soils when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limit*, with the exception of the operational right-of-way and the construction zone for the Mountain Valley Pipeline, for which applicable mitigation measures identified in the approved POD and MVP Project design requirements must be implemented.* Soil moisture exceeds the plastic limit when soil can be rolled to pencil size without breaking or crumbling.	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD
Standard FW-9: Heavy equipment is operated so that soil indentations, ruts, or furrows are aligned on the contour and the slope of such indentations is 5 percent or less*, with the exception of the operational rights-of-way and the construction zone for the MVP, for which applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD
Standard FW-13: Management activities expose no more than 10% mineral soil in the channeled ephemeral zone*, with the exception of the operational ROW and the construction zone for the MVP, for which the responsible official must ensure applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD. POD Appendix H details waterbody construction mitigation, as well upland erosion control, revegetation, and maintenance, and topsoil and spoil treatment.	Soil exposure mitigated in FEIS. Already addressed in FEIS and POD
Standard FW-14: In channeled ephemeral zones, up to 50% of the basal area may be removed down to a minimum basal area of 50 square feet per acre. Removal of additional basal area is allowed on a case-by-case basis when needed to benefit riparian-dependent resources*, with the exception of the operational ROW and the construction zone for the MVP, for which applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD. POD Appendix H details waterbody construction mitigation, as well upland erosion control, revegetation, and maintenance, and topsoil and spoil treatment.	Soil exposure mitigated in FEIS. Already addressed in FEIS and POD. The effects of implementing mitigation measures and design requirements would be consistent with the wildlife, threatened and endangered species, and sensitive species analysis in the FERC FEIS and would not result in any additional effects beyond those disclosed in the FERC FEIS.

Table 12 (continued). Effects of Proposed Forest Plan Amendment on Aquatic and Terrestrial Species.

JNF Forest Plan Standards (Modifications in Italics)	Effects on Fisheries and Aquatic Species	Effects on Terrestrial Species
Standard 11-003: Management activities expose no more than 10 percent mineral soil within the project area riparian corridor*, with the exception of the operational ROW and the construction zone for the MVP for which applicable mitigation measures identified in the approved POD and MVP design requirements must be implemented.*	Does not change conditions apart from those required to construct and maintain pipeline which is already addressed in FEIS and POD. POD Appendix H details waterbody construction mitigation, as well upland erosion control, revegetation, and maintenance, and topsoil and spoil treatment.	Soil exposure mitigated in FEIS. Already addressed in FEIS and POD
Old Growth Management Area		
Standard 6C-007: Allow vegetation management activities to: maintain and restore dry-mesic oak forest, dry and xeric oak forest, dry and dry-mesic oak-pine old growth forest communities; restore, enhance, or mimic historic fire regimes; reduce fuel buildups; maintain rare communities and species dependent on disturbance; provide for public health and safety; improve threatened, endangered, sensitive, and locally rare species habitat; control non-native invasive vegetation*, and clear the trees within the construction zone associated with the MVP*	Does not change analysis and conclusions of the FEIS, BA, or BE, which address these issues	Will increase edge habitat that will promote some plant and animal species. Will increase fragmentation which could have adverse effects on interior forest species. However, this amendment does not change analysis and conclusions of the FEIS, BA, or BE, which address these issues
Standard 6C-026: These areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites*, with the exception of the MVP ROW.* Existing uses are allowed to continue.	Does not change analysis and conclusions of the FEIS, BA, or BE, which address these issues	Will increase edge habitat that will promote some plant and animal species. Will increase fragmentation which could have adverse effects on interior forest species. However, this amendment does not change analysis and conclusions of the FEIS, BA, or BE, which address these issues

Table 12 (continued). Effects of Proposed Forest Plan Amendment on Aquatic and Terrestrial Species.

JNF Forest Plan Standards (Modifications in Italics)	Effects on Fisheries and Aquatic Species	Effects on Terrestrial Species
Appalachian National Scenic Trail		
Standard 4A-028: Locate new public utilities and rights-of-way in areas of this management prescription area where major impacts already exist*, with the exception of the MVP ROW.* Limit linear utilities and rights-of-way to a single crossing of the prescription area, per project.	Viewshed concerns evaluated and addressed in FEIS and POD	Viewshed concerns evaluated and addressed in FEIS and POD
Scenic Integrity Objectives		
Standard FW-184: The Forest Scenic Integrity Objectives (SIOs) Maps govern all new projects (including special uses), *with the exception of the MVP ROW. MVP shall attain the existing SIOs within five years after completion of the construction phase of the project, to allow for vegetation growth.* Assigned SIOs are consistent with Recreation Opportunity Spectrum management direction. Existing conditions may not currently meet the assigned SIO.	No effect on fisheries and aquatic species	No effect on terrestrial species

3.4.4 National Forest Management Act

This section responds to Issue 1 (Forest Plan Amendment – Purpose and Effect and Consistency with the Planning Rule and the NFMA) and Issue 3 (Erosion and Sediment Effects).

Forest Service regulations at 36 CFR 219.13(b)(5) require the agency to determine which substantive requirement(s) within 219.8 through 219.11 are directly related to the proposed amendment. Whether a substantive requirement is directly related to an amendment is determined by any one of the following: The purpose for the amendment, a beneficial effect of the amendment, a substantial adverse effect of the amendment, or a substantial lessening of plan protections by the amendment (36 CFR 219.13(b)(5)). Based on these criteria and the analyses below, the substantive requirements that are directly related to the proposed amendment include:

- 219.8(a)(2)(ii) – Soils and soil productivity
- 219.8(a)(3)(i) – Ecological integrity of riparian areas
- 219.8(b)(3) – Multiple uses that contribute to local, regional, and national economies
- 219.9(a)(2) – Ecosystem diversity of terrestrial and aquatic ecosystems
- 219.10(a)(3) – Utility Corridor
- 219.10(b)(i) – Sustainable recreation, including recreation setting, opportunities, access, and scenic character
- 219.10(b)(vi) – Other designated areas or recommended designated areas
- 219.11(c) – Timber harvest for purposes other than timber production

The above directly related substantive requirements varies slightly from those identified in the NOI (July 30, 2020) based on subsequent analysis and addressing of the substantive requirements based on 36 CFR 219.10. Forest Service regulations at 36 CFR 219.13(b)(5) requires the agency to apply the directly related substantive requirement(s) within the scope and scale of the amendment.

3.4.4.1 Utility Corridors

The JNF Forest Plan standard FW-248 directs that if a new utility corridor is created outside an existing corridor, the new route would be reallocated as Management Prescription 5C, a designated utility corridor. The use of designated corridors is intended to reduce fragmentation and minimize visual effects by encouraging collocation of any future utility corridors. Many public comments on the FERC Draft EIS expressed concern that a utility corridor designation could adversely impact private landowners that are interspersed and/or adjacent to the National Forest. Other comments pointed out the analysis did not address the effects of prospective utilities that may be constructed in a 500-foot management area. After consideration of public comments and further review of the proposed designation of the MVP corridor to Management Prescription 5C, the Forest Service determined that collocation of future utilities (which is the purpose of the designation) is too speculative and may not be logistically feasible or environmentally preferable. Therefore, the proposed management area designation was dropped from the FERC FEIS and a forest plan amendment was proposed.

Relationship to the Substantive Requirements

The purpose of the proposed amendment for standard FW-248 is to allow the project to move forward while exempting the MVP project from the JNF Forest Plan approach of managing for future utility corridors. Therefore, the proposed exemption of the MVP project from standard FW-248 is directly related to 219.10(a) – integrated resources management to provide for ecosystem services and multiple uses, and more specifically 219.10(a)(3) – infrastructure, which includes utility corridors, due to the purpose of the amendment.

There are no direct environmental effects of not designating the MVP corridor as Management Prescription 5C. In addition, there is no indirect or cumulative effects of not changing the land allocation because it is too speculative to assume a future utility line would be collocated within the MVP corridor and may not be logistically feasible or environmentally preferable, and there are no reasonably foreseeable future utility corridors proposed or known that will be proposed in the vicinity of MVP on the JNF. Therefore, there are no substantive requirements directly related to the modification of FW-248 based on effects of not changing the land allocation.

However, one effect of the proposed amendment is the short and long term beneficial impact to the local and regional economy (FERC FEIS, Sec. 5.1.9, p. 5-11). Therefore, the proposed amendment is directly related by the effects to 219.8(b)(3) – multiple uses that contribute to local, regional, and national economies. This is not specifically related to the utility corridor, but applies for the amendment as a whole and will be addressed in the Utility Corridor section only and not repeated in the discussion for the other parts of the amendment. This beneficial effect is the same as the effect of the Proposed Action.

Application of the Substantive Requirement(s)

The only substantive requirement directly related to the modification of FW-248 is 219.10(a)(3) – infrastructure, based on the purpose of the amendment. The scope and scale of the amendment

of FW-248 is limited to the MVP project which is a 3.5-mile corridor (83 acres) across the JNF, which accounts for about 0.01% of the entire JNF.

The overarching goal of the substantive requirements related to 219.10 is to provide for ecosystem services and multiple uses within Forest Service authority and the inherent capability of the plan area. In this case the plan area is the JNF which is approximately 723,300 acres. The substantive requirement specific to utility corridors is consideration of appropriate placement and sustainable management of infrastructure, including utility corridors. The JNF Forest Plan includes forest-wide goals, objectives, and standards for lands and special uses, which include utility corridors. In addition, specific utility corridor standards associated with individual management prescriptions are provided in many of the individual prescriptions. The amended JNF Forest Plan direction achieves the overarching goal of the substantive requirements related to 219.10.

The FERC FEIS and this DSEIS assess the placement and sustainable management of the MVP corridor across the JNF, including the collocation with existing utilities. The proposed amendment would not preclude future collocation of utilities in the MVP corridor or any other utility corridor nor a future allocation change of the MVP corridor to Management Prescription 5C, though as stated, any future collocations would be speculative at this time.

The substantive requirement related to the amendment as a whole is 219.8(b)(3) – multiple uses that contribute to local, regional, and national economies. The overarching goal of the substantive requirements related to 219.8 is to provide for social, economic, and ecological sustainability within Forest Service authority and the inherent capability of the plan area. The substantive requirement specific to local and regional contribution to the economy is to include plan components to guide the plan area's contribution to social economic sustainability. The JNF Forest Plan includes goals, objectives, desired conditions, and standards to ensure the JNF contributes to social and economic sustainability. The JNF Forest Plan includes plan components addressing timber, recreation, range, mineral, infrastructure, access, land uses, and special uses. All these contribute to the social and economic sustainability of the area influenced by the JNF, as summarized in the FERC FEIS, pages 5-11.

3.4.4.2 Soil and Riparian

Six JNF Forest Plan standards associated with soil productivity and riparian habitat are proposed to be modified in this amendment (FW-5, FW-8, FW-9, FW-13, FW-14 and 11-003). These six standards preclude standard industry pipeline construction methods like those proposed with the MVP. FW-5 requires that at least 85% of the organic layers, topsoil, and root mat be left in place over an activity area. FW-8 limits the use of heavy equipment on plastic soils when the water table is within 12 inches of the surface or when soil moisture exceeds the plastic limit. FW-13 limits management activities from exposing no more than 10% mineral soils in the channeled ephemeral zone. FW-14 limits basal area removal to a minimum of 50 square feet per acre in channeled ephemeral zones. Standard 11-003 limits management activities from exposing more than 10% mineral soils within the project area riparian corridor. It is not possible or practical to modify the MVP construction methods and achieve consistency with these six standards. Therefore, the Forest Service proposes to amend these six standards for the construction of the MVP.

Relationship to the Substantive Requirements

The purpose of the proposed amendment for standards FW-5, FW-8, FW-9, FW-13, and 11-003 is to allow the project to move forward by exempting construction of the MVP project from the

application of these standards for soils and water protection and instead applying mitigation measures from the POD to protect soil and water. Therefore, the modification of these five soils standards is directly related to 219.8(a)(2)(ii) – soils and soil productivity, due to the purpose of the amendment. The purpose of the proposed amendment for standard FW-14 is to allow the project to move forward by reducing measures for riparian protection, specifically level of timber removal within riparian areas, for the construction of the MVP. Therefore, the modification of this riparian standard is directly related to 219.8(a)(3)(i) – ecological integrity of riparian areas and 219.11(c) – timber harvesting for purposes other than timber production.

The effect of the modification of the six soils and riparian standards includes minor and temporary adverse effects to erosion and sedimentation, soil compaction, soil porosity, runoff potential, soil fertility, revegetation potential, and soil carbon budget (FERC FEIS, Sec 4.2.2.5, p. 4-88). Although the reduction of soil and riparian protection measures constitutes an adverse impact, effects would not be expected to be substantial because mitigation measures designed to minimize soil and riparian effects have been incorporated into the POD (FERC FEIS, Sec. 4.2.3, p. 4-88; Sec 5.1.2, p. 5-3; Sec. 4.3.2.2., p. 137; Sec. 4.4.2.6, p. 4-187; Sec. 4.6.2.2). Specifically, an Erosion and Sediment Control Plan (POD, Appendix C), Landslide Mitigation Plan (POD, Appendix F), Site-Specific Design of Stabilization Measures in High Hazard Portions of the Route (POD, Appendix G), Restoration Plan (POD, Appendix H), and Winter Construction Plan (POD, Appendix M) would ensure effects to soils, riparian, and water are minimized and would occur over the short term. The mitigation measures incorporated into the POD would ensure that a substantial lessening of protections to soils, riparian, and water resources does not occur. Therefore, the MVP project is not directly related to the substantive requirements, which are related to soil, riparian, or water based on effects of the amendment. However, since these substantive requirements are related to the amendment due to the purpose of the amendment, they are applied for this proposed amendment.

Application of the Substantive Requirement(s)

The substantive requirements directly related to the modification of the six soils and riparian standards include 219.8(a)(2)(ii) – soils and soil productivity, 219.8(a)(3)(i) – ecological integrity of riparian areas, and 219.11(c) – timber harvesting for purposes other than timber production. The scope and scale of the modification of the six soils and riparian standards is limited to the MVP project which is a 3.5-mile corridor (83 acres) across the JNF, which accounts for about 0.01% of the entire JNF.

The overarching goal of the substantive requirements related to 219.8 is to provide for social, economic, and ecological sustainability within Forest Service authority and the inherent capability of the plan area. The substantive requirement specific for soils and soil productivity is to include plan components to maintain or restore soils and soil productivity including guidance to reduce soil erosion and sedimentation. The substantive requirement specific to riparian is to include plan components to maintain or restore the ecological integrity of riparian areas in the plan area. The JNF Forest Plan includes numerous forest-wide goals, objectives, and standards for water and soils that are not subject to modification as part of this proposed amendment (JNF Forest Plan, Chapter 2, pp. 2-5 to 2-9). For example, although this project would amend three water and soil quality standards, the JNF has seven additional standards that would continue to protect the water and soil resource; and the riparian resource is protected by two other standards (JNF Forest Plan, Chapter 3, pp. 3-181 to 3-182). In addition, specific water and soils standards associated with individual management prescriptions are provided in many of the individual prescriptions.

Although the proposed amendment reduces protection for soils, soil productivity, and riparian areas, application of BMPs and other appropriate mitigation are required in the modified standards. The design requirements and mitigation measures identified in the POD will be required by the modified standards and incorporated into BLM's ROW grant if the project is authorized. Therefore, the amended JNF Forest Plan would meet the overarching goal of the substantive requirements related to 219.8.

The overarching goal of the substantive requirements related to 219.11 is to provide for timber management within Forest Service authority and the inherent capability of the plan area. The substantive requirement specific to timber harvesting for purposes other than timber production states that the plan may include plan components to allow for timber harvest for purposes other than timber production throughout the plan area or portions of the plan area, as a tool to assist in achieving or maintaining one or more applicable desired conditions or objectives of the plan in order to protect other multiple-use values, and for salvage, sanitation, or public health or safety. The JNF Forest Plan recognizes timber harvesting for purposes other than timber production but does not explicitly include goals, objectives, or standards as forest-wide direction. Some management prescriptions also recognize timber harvest for purposes other than timber production. However, the substantive requirement for timber harvesting for purposes other than timber production is optional (because the requirement is described as "may include") and the overarching goal of providing for timber management direction is clearly provided for in the JNF Forest Plan.

3.4.4.3 Old Growth Management Area

Two JNF Forest Plan standards associated with old growth management are proposed to be modified in this amendment (6C-007 and 6C-026). These two standards apply to NFS lands allocated to Management Prescription 6C: Old-Growth Forest Communities Associated with Disturbance. Standard 6C-007 would not allow clearing of trees where the MVP corridor and areas designated under Management Prescription 6C coincide. Standard 6C-026 states areas designated as 6C are not suitable for designation for a new utility corridor. These two standards would preclude the construction and designation of the MVP project if not modified. Originally, the ROW corridor was proposed in the FERC DEIS to be reallocated to Management Prescription 5C-Utility Corridor but that part of the proposal was reconsidered in the FERC FEIS (see Section 3.4.4.1 of this SEIS). Therefore, the Forest Service proposes to amend these two standards for the construction of the MVP.

Relationship to the Substantive Requirements

The purpose of the proposed amendment for standards 6C-007 and 6C-026 is to allow the project to move forward by reducing measures for the protection of old growth for the construction of the MVP. Therefore, the modification of these two old growth standards is directly related to 219.9(a)(2) – ecosystem diversity of terrestrial and aquatic ecosystems, due to the purpose of the amendment. In addition, since Standard 6C-007 restricts timber harvesting, this standard is also directly related to 219.11(c) – timber harvesting for purposes other than timber production.

The effect of the modification of these two old growth standards is the clearing of about 2 acres of old growth within areas designated as 6C (FERC FEIS, Sec. 5.1.8, p. 5-9). Although this is an adverse impact to old growth ecosystems, it is not a substantial adverse impact due to the limited extent of the impact.

Application of the Substantive Requirement(s)

The substantive requirements directly related to the modification of the two old growth standards include 219.9(a)(2) – ecosystem diversity of terrestrial and aquatic ecosystems and 219.11(c) – timber harvesting for purposes other than timber production. The scope and scale of the modification of the two old growth standards is limited to the MVP project which is a 3.5-mile corridor (83 acres) across the JNF, which accounts for about 0.01% of the entire JNF. More specifically, this modification would adversely impact two acres of old growth of the approximately 30,200 acres of old growth across the JNF or about 0.07% of the total old growth on the JNF.

The overarching goal of the substantive requirements related to 219.11 is to provide for the ecological conditions to both maintain the diversity of plant and animal communities and support the persistence of most native species in the plan area. The substantive requirement specific to ecosystem diversity is to include plan components to maintain or restore the diversity of ecosystems and habitat types throughout the plan area. The JNF Forest Plan includes numerous goals, objectives, standards for old growth, rare communities, wildlife, and listed species, both at the forest-wide level as well as for lands designated as 6C, that are not subject to modification from this proposed amendment (JNF Forest Plan, Chapter 2, p. 2-23 to 2-26). The amended JNF Forest Plan direction, which includes an old growth management strategy (Appendix B of the JNF Forest Plan) would meet the overarching goal of the substantive requirements related to 219.11. The effect of amending the two old growth management standards is the same as the effect of implementing the Proposed Action.

The application of the substantive requirements related to 219.11 is discussed above in the Soil and Riparian section.

3.4.4.4 Appalachian National Scenic Trail

The JNF Forest Plan standard 4A-028 requires the Forest Service to locate new public utilities and ROWs along the ANST in areas where major effects already exist. The FERC FEIS evaluated pipeline routes crossing the ANST along existing ROWs and at an existing road crossing (State Route 635). However, concerns regarding longer routes, and greater effects to old growth, inventoried roadless areas, wetlands, other recreational effects, and increased risks from landslide prone areas are associated with the alternative routes. This proposed amendment would allow for a pipeline route to cross the ANST at a location where no other major effects already exist.

Relationship to the Substantive Requirements

The purpose of the proposed amendment for standard 4A-028 is to allow the project to move forward by reducing measures for the protection of the ANST for the MVP project near milepost 196.3. Therefore, the modification of the 4A-028 standard is directly related by the purpose of the amendment to 219.10(b)(i) – sustainable recreation, including recreation setting, opportunities, access, and scenic character, and 219.10(b)(vi) – other designated areas.

The effect of the modification of the 4A-028 standard is the allowance of a new utility corridor to cross the ANST at a location other than where major effects already exist. Although this is an adverse impact to ANST, it is not a substantial adverse impact due to the construction method proposed for crossing the trail. The MVP would cross by boring under the trail so there would be an approximate 300-foot forested buffer on either side of the trail and there would be no need for vegetation removal within 300 feet of the trail.

Minor temporary adverse effects to trail users would occur from noise, dust, and visual intrusions from crossing underneath the ANST via the 600-foot-long bore. These impacts would be limited only to the time when boring is occurring (FERC FEIS, p. 3-52) (POD, Sec. 1.3) and the POD includes mitigation to control fugitive dust (Sec 7.5.2). Long-term effects would be minor because there would be an approximate 300-foot buffer on either side of the trail, which would provide vegetative screening of the bore holes.

Application of the Substantive Requirement(s)

The substantive requirement directly related to the modification of the 4A-028 standard is 219.10(b)(i) – sustainable recreation, including recreation setting, opportunities, access, and scenic character and 219.10(b)(vi) – other designated areas. The scope and scale of the modification of the 4A-028 standard is limited to the MVP project which is a 3.5-mile corridor (83 acres) across the JNF, which accounts for about 0.01% of the entire JNF. The ANST is approximately 2,190 miles and the MVP project would cross the ANST once near MP 196.3 along the proposed pipeline route through a 600-foot-long bore underneath the trail.

The overarching goal of the substantive requirements related to 219.10 is to provide for ecosystem services and multiples uses within Forest Service authority and the inherent capability of the plan area. The substantive requirement specific to sustainable recreation is to include plan components to provide for recreation settings, opportunities, and access. The substantive requirement specific to other designated areas is to include plan components to provide for protection of other designated areas, such as the ANST. The JNF Forest Plan includes numerous forest-wide goals, objectives, and standards for recreation, including the ANST, which are not subject to modification from this proposed amendment. In addition, specific recreational standards associated with individual management prescriptions are provided in many of the individual prescriptions, and there is a specific management prescription for the ANST. The amended JNF Forest Plan direction would meet the overarching goal of the substantive requirements related to 219.10.

3.4.4.5 Scenery Integrity Objectives

The JNF Forest Plan standard FW-184 requires all new projects to meet specific scenery conditions as outlined in the Forest SIOs maps. The MVP proposed action would cross two areas on NFS lands assigned a high SIO, four areas with a moderate SIO, and one area with a low SIO (FERC FEIS, pp. 4-295 to 4-296). Scenery analysis in the FERC FEIS (pp. 4-334 to 4-347 and Appendix S) indicates the standard pipeline construction methods would not meet high and moderate SIOs. High SIO areas should appear unaltered to the casual observer, while moderate SIO may appear slightly altered but should borrow from elements of form, line, color, texture, and scale found in the characteristic landscape. It is not possible or practical to modify the MVP construction methods and achieve consistency with high and moderate SIOs. Therefore, the Forest Service proposes to amend FW-184 for the MVP project.

Relationship to the Substantive Requirements

The purpose of the proposed amendment for standard FW-184 is to allow the project to move forward by reducing scenery protection measures for the MVP project. Therefore, the modification of the FW-184 standard is directly related to 219.10(b)(i) – sustainable recreation, including recreation setting, opportunities, access, and scenic character – due to the purpose of the amendment.

The effect of the modification of the FW-184 standards is the degradation of scenic quality inconsistent with the JNF Forest Plan SIOs. Although this is an adverse impact to scenery, it is not a substantial adverse impact due to the limited extent of the project crossing the JNF (FERC FEIS p. 4-347), the project's proposed mitigation measures that would apply to temporary workspace, and the temporary and permanent ROW that are found in the updated POD (Section 7.9).

Application of the Substantive Requirement(s)

The substantive requirement directly related to the modification of the FW-184 standard is 219.10(b)(i) – sustainable recreation, including recreation setting, opportunities, access, and scenic character. The scope and scale of the modification of the FW-184 standard is limited to the MVP project which is a 3.5-mile corridor (83 acres) across the JNF, which accounts for about 0.01% of the entire JNF. More specifically as related to scenery, the MVP would be inconsistent with the areas assigned high and moderate SIO, which account for nearly all (3.4 of 3.5 miles) of the MVP project.

The overarching goal of the substantive requirements related to 219.10 is to provide for ecosystem services and multiple uses within Forest Service authority and the inherent capability of the plan area. The substantive requirement specific to scenery is to include plan components to provide for scenic character. The JNF Forest Plan includes numerous forest-wide goals, objectives, and nineteen additional standards for scenery not subject to modification from this proposed amendment (JNF Forest Plan, pp. 2-47 to 2-48), including a forest-wide assignment of SIOs by management prescriptions.

MVP mitigation measures to reduce effects to scenery include reducing the long-term operational ROW appearance from 50 feet wide to 10 feet wide on the JNF through the restoration and revegetation plan contained in Appendix H of the POD. Application of this mitigation measure in the approved ROW on the JNF would substantially reduce the visibility of the ROW on the JNF, especially when viewed in the far middle-ground and background distance zones and at an angle. Along the edge the linear corridor shrubs, small trees, and shallow rooted trees would be planted and maintained along a slightly undulating line to break up the straight edge effect of the utility corridor. These mitigation measures should allow the MVP project to obtain consistency with the applicable SIO within five years of construction. Therefore, the amended JNF Forest Plan direction would meet the overarching goal of the substantive requirements related to 219.10.

3.5 Cumulative Effects

This analysis augments the FERC FEIS cumulative effects analysis. It has been updated as needed to reflect new activities or a change in status of actions disclosed in the FERC FEIS. The cumulative effects information from the FERC FEIS Section 4.13 to 5.16 and Appendix W was reviewed to determine if an activity should be added or updated. New information was gathered by reviewing the George Washington and Jefferson National Forests Schedule of Proposed Actions and by reviewing actions that have occurred, or may occur, on other non-NFS lands that are adjacent to the project area.

There are three 10-digit HUC watersheds that overlap the 3.5-mile-long portion of the MVP that crosses NFS lands. These HUC-10 watersheds, including all lands regardless of ownership, are the spatial boundary for evaluating cumulative effects relative to actions on NFS lands (Figure 4). This boundary was chosen for consistency with the FERC FEIS cumulative analysis; the

FERC FEIS used HUC-10 watersheds for the cumulative effects analysis area. Table 13 displays these watersheds and their acreage. Combined, the acreage of the three HUC-10 watersheds comprising the cumulative effects analysis area represent 8.6% of the 31 HUC-10 watersheds crossed by the entire 303.5-mile-long MVP.

Table 13. Cumulative Effects Analysis Area

HUC-10 Watershed	HUC-10 Code	Acres
East River – New River	0505000206	107,883
Upper Craig Creek	0208020110	71,468
Sinking Creek – New River	0505000203	126,574
Total	-	305,925

The temporal timeframe for the short-term is two years and encompasses the construction phase (Proposed Action) and restoration activities (No Action Alternative). The long-term timeline for both alternatives is 30 years and encompasses the operation and maintenance phase under the Proposed Action. Resource specialists reviewed this information and based on their specific resource they may have added or deleted activities or adjusted the cumulative effects boundary.

Those projects or actions that could cumulatively contribute effects to soil productivity, erosion, and sedimentation; water quality; threatened and endangered species and their habitat; Forest Service RFSS; vegetation; and scenery were reviewed and included or dismissed with rationale (see project record). Resources not brought forward for detailed analysis in the SEIS are not discussed in Cumulative Effects because the Agencies did not identify direct or indirect effects that were not previously addressed in the FERC FEIS.

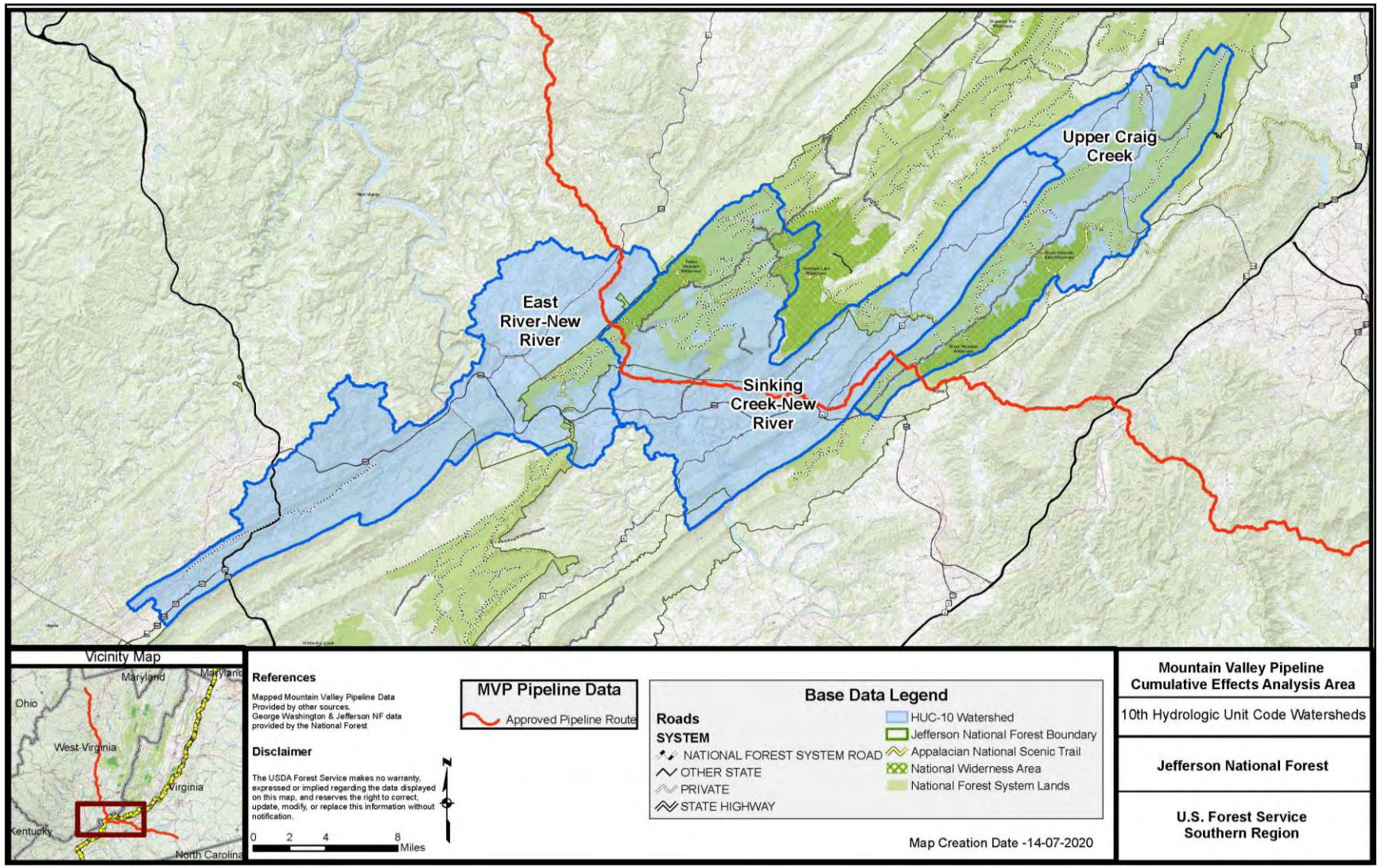

Figure 4. Cumulative Effects Analysis Area

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3.5.1 Past, Present, and Reasonably Foreseeable Future Actions

3.5.1.1 FERC-jurisdictional Natural Gas Interstate Transportation Projects

The FERC FEIS (Sec. 4.13.1-11) identified seven FERC-regulated natural gas projects within proximity to the MVP. In 2017 several of those had filed applications with FERC, were in the environmental review process, or were already operational. These projects include the Columbia WB XPress (CP16-38), Supply Header (CP15-555), Atlantic Coast Pipeline (CP15-554), Rover Pipeline (CP15-93), Mountaineer Xpress Project (CP16-357), Columbia Smithfield III (CP13-477), and Virginia Southside Expansion projects (CP13-30).

Each of these projects was reviewed and determined to be located outside of the cumulative effects spatial boundary. For this reason, they are not included in the list of past, ongoing, or reasonably foreseeable actions.

Since publication of the FERC FEIS, two additional FERC-regulated natural gas projects have been identified. These projects are summarized in the following paragraphs:

- Virginia Southside Expansion II – This project was not in the FERC FEIS and it is currently considered a present, ongoing project. This project was considered but eliminated from cumulative effects because its location does not overlap any HUC-10 watersheds that comprise the MVP cumulative effects spatial boundary.
- Mt. Storm to Valley Transmission Line Replacement – A reasonably foreseeable project (fourth quarter, 2020): The line proposed for replacement runs for about 64.5 miles from Dominion's existing Mt. Storm substation in Grant County, West Virginia to the existing valley transmission line. Reference milepost is 69.8 to 92.5. This project was considered but eliminated from cumulative effects because it is located approximately 77 miles east of the MVP.

The Columbia Gas Pipeline Replacement Project is a reasonably foreseeable project (2021) that is not a FERC-regulated project because it is not an interstate pipeline. Columbia Gas of Virginia (CGV) is proposing to replace a segment of natural gas distribution pipeline in an existing authorized ROW on the Glenwood & Pedlar Ranger District around milepost 285.1. It does not overlap any HUC-10 watersheds that comprise the MVP cumulative effects spatial boundary. The proposal entails upgrading nine miles of an aging 6-inch pipe with a 12-inch pipe. This project was considered but eliminated from inclusion in cumulative effects because it is not located within the cumulative effects boundary; it is approximately 45 miles north of the MVP.

These three projects are not located within the cumulative effects spatial boundary and are not included in this cumulative effects analysis.

3.5.1.2 Non-Federal Projects Identified in the FWS 2020 Biological Opinion

In the 2020 BO, the FWS identified six non-federal projects, including three in West Virginia and three in Virginia. The Forest Service reviewed these projects and determined that none are located within the geographic scope of analysis for cumulative effects in this SEIS.

3.5.1.3 Change in Past, Present, and Reasonably Foreseeable Transportation Projects

Table 14 summarizes change in the transportation system actions as it relates to the MVP. Emergency road repairs funded through the Emergency Relief for Federally Owned Roads

Program (ERFO) is an ongoing action that will continue to occur on 15 miles of road within the George Washington and Jefferson (GWJ) National Forests as a result of past severe weather events.

There are three reasonably foreseeable road maintenance actions that are planned to occur in 2020 and future years. Pocahontas and Mystery Ridge roads (33.7 acres; East River - New River Watershed) will receive heavy maintenance and reconstruction to repair damaged waterbars and culverts. The roads could not be adequately restored by the MVP due to limitations on the work allowed after the Forest Service ROD and BLM ROW was vacated in 2018. Approximately 59,000 acres of road corridors and 6,500 acres of existing gas and power line utility ROWs within the JNF are proposed for maintenance in the near future. Roads associated with vegetation management projects are encompassed within the total acres of each project.

3.5.1.4 Changes in Past, Present, and Reasonably Foreseeable Vegetation and Prescribed Fire Projects

Table 15 summarizes vegetation (including restoration) projects that have been completed (now part of the existing condition), are ongoing, or reasonably foreseeable. Road actions are included in the overall project acres:

- Completed Project: The 317-acre White Rocks Timber Sale located in the Sinking Creek/New River watershed and about 8.5 miles north of the MVP was completed in 2018.
- Ongoing Projects: There are three on-going vegetation management projects, totaling 1,605 acres, that are occurring within the temporal and spatial cumulative effects boundary of the MVP project.
- Reasonably Foreseeable: There are four reasonably foreseeable vegetation projects, totaling 555 acres and one prescribed fire project (Table 15) that could overlap within the temporal (2 years) and spatial boundary of the MVP cumulative effects analysis. Two projects that are technically out of the affected watersheds were included as they are located close to the watershed boundary: Middle Tub Run (foreseeable; 183 acres Johns Creek watershed) and Tub Run East (ongoing; 93 acres; Johns Creek watershed).
- Considered but Eliminated: Two reasonably foreseeable (1,283 acres) and three ongoing vegetation management projects (469 acres) were considered but eliminated from the analysis due to not being within the cumulative effects analysis watersheds: Phase II Vegetation Management (foreseeable; 1,100 acres), No Business (ongoing; 265 acres; Kimberling Creek-Walker Creek watershed), and Dings Branch (ongoing; 111 acres; Kimberling Creek-Walker Creek watershed).

At least one project was too conceptual to provide information that would be meaningful to the cumulative effects analysis: the forthcoming Eastern Divide landscape restoration project is not reasonably foreseeable as it is in the conceptual development phase and has not been entered into the Schedule of Proposed Actions.

Table 14. Change in Past, Present, and Reasonably Foreseeable Transportation Projects[12]

Project Name	Proponent (if relevant)	Description	Nearest approx. milepost or facility	Approx. Distance & Direction from the MVP	Status: (Past; Present & Ongoing/ Reasonably Foreseeable	Change since 2017 FERC FEIS?	Comments
ERFO road repairs	Forest	Road repairs that could include 15.5 miles of the GWJ NFs.	Varies by project	Varies by project	Present & Ongoing	Yes	All counties within the GWJ NFs.
Routine maintenance of road corridors and utility ROWs	Forest	59,000 acres of road corridors, and 6,500 acres of existing gas and power line utility ROWs across the entire Forest	Varies by project	Varies by project	Reasonably Foreseeable	Yes	Highland, Bath, Augusta County East River - New River Watershed, North Fork Roanoke Watershed, Sinking Creek - New River Watershed, Upper Craig Creek Watershed, within watershed from FEIS.
Pocahontas Road	Forest	Repair of waterbars, culvert replacement		Less than 1 mile	Foreseeable – fall 2020	Yes – in 2017 the road was proposed and approved for use. In 2020, the road has been removed from the MVP proposal.	The road has erosion and sedimentation issues as a result of failing waterbars and culverts. Road will be repaired once a timber sale which is occurring has ended.
Mystery Ridge Road	Forest	Repair of waterbars, culvert replacement		Road parallels the MVP and some of the road is within the ROW (although not used)	Foreseeable -fall 2020	Yes – in 2017 the road was proposed and approved for use. In 2020, the road has been removed from the MVP proposal.	The road has erosion and sedimentation issues as a result of failing waterbars and culverts. Road will be repaired once a timber sale which is occurring has ended.

[12] Road actions associated with vegetation projects are not included.

Table 15. Past, Present, and Reasonably Foreseeable Vegetation Projects

Project Name	Proponent (if relevant)	Description	Nearest approx. milepost or facility	Approx. Distance & Direction from the MVP	Status: (Past; Present & Ongoing/ Reasonably Foreseeable	Change since 2017 FERC FEIS?	Comments
White Rocks Timber Sale (TS)	Forest	317 acres of vegetation management including temporary roads	204.9	8.5 miles north of the MVP	Past	Yes, implementation was completed in 2018	The TS Is approximately 8.5 miles north of the MVP and within the Sinking Creek/New River watershed.
MVP Settlement TS	Forest	82 acres of tree clearing for pipeline activities	N/A	Occurring along the pipeline ROW	Ongoing	Yes (this action was reasonably foreseeable in the FERC FEIS and is now an action being implemented)	The TS will be completed by the fall of 2020.
Barton Road TS	Forest	1,331 acres of veg treatments including roads	191.5	8.5 miles east of the MVP	Ongoing	Yes – there is no indication this was included in the FERC FEIS	Project is in the Sinking Creek / New River Watershed and was part of the Fork Mtn Vegetation Management EA
Salt Sulphur TS	Forest	69 acres of veg treatments including roads	191.7	6 miles east of the MVP	Ongoing	Yes – there is no indication this was included in the FERC FEIS	Project is in the Sinking Creek / New River Watershed
Warren Road TS	Forest	146 acres of veg treatments including roads	191.5	8.5 miles east of the MVP	Reasonably Foreseeable and will be advertised in 2020	Yes – there is no indication this was included in the FERC FEIS	Project is in the Sinking Creek / New River Watershed
Johnson Flats TS	Forest	133 acres of veg treatments including roads	191.5	8.5 miles east of the MVP	Reasonably Foreseeable and will be advertised in 2020	Yes – there is no indication this was included in the FERC FEIS	Project is in the Sinking Creek / New River Watershed

Table 15 (continued). Past, Present, and Reasonably Foreseeable Vegetation Projects

Project Name	Proponent (if relevant)	Description	Nearest approx. milepost or facility	Approx. Distance & Direction from the MVP	Status: (Past; Present & Ongoing/ Reasonably Foreseeable	Change since 2017 FERC FEIS?	Comments
Eastern Divide Highlands Prescribed Fire	Forest	60,628 acres total with 15,000 planned annually on 3 to 5-year rotation basis	196.2 - 197.7 and 219.6 - 220.8	Intersects with the MVP	Reasonably Foreseeable with implementation starting in 2020	Yes, new project with decision signed on 9/19/2019	East River/New River Watershed, North Fork Roanoke Watershed, Sinking Creek/New River Watershed, Upper Craig Creek Watershed

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3.5.2 Soils

Past, present, and reasonably foreseeable future actions in the analysis area are described in Section 4.13.1 of the FERC FEIS (pp. 4-581 to 4-600), which is incorporated by reference. In summary, those actions include oil and gas exploration and production, natural gas pipelines, and mining operations, as well as other non-mineral resource development actions. Since publication of the FERC FEIS, reasonably foreseeable road maintenance and vegetation management projects have been identified within the cumulative effects analysis area. Road maintenance and reconstruction would have a long-term benefit to soil resources by minimizing erosion. Vegetation management activities can result in short-term adverse effects (e.g., erosion) from increased travel on roads and ground disturbance where harvesting or other management activities occur. These adverse effects are minor because vegetation management projects would comply with Forest standards and guidelines to minimize erosion, runoff, and sedimentation.

The MVP project would continue to encounter various soil resources and conditions as construction (Proposed Action) and/or restoration (both alternatives) progresses. Under the Proposed Action, construction activities, such as grading, trenching, and backfilling, could affect soil resources due to erosion, sedimentation, and the introduction of excessive rock to the soil surface, which could hinder restoration efforts. In areas that have already been cleared and graded during initial construction, soil compaction would not be exacerbated by further construction activities. Studies indicate that 70% to 80% of soil compaction occurs during the first pass of disturbed ground (Ampoorter et al. 2010; Wolkowski and Lowery 2008). In the Peters Mountain area, clearing, grubbing, and grading would increase the erosion potential. The Restoration Plan (POD, Appendix H) explains in detail the required preventative measures that would be used during the restoration process, including the stabilization of soil resources with temporary and permanent vegetation. Adoption of the 11 amended Forest Plan standards under the Proposed Action would address and lessen these potential effects with an approved allowance of certain disturbances, as long as those activities are managed appropriately and are compliant with the Forest Plan ROD. When added to the effects from implementation of reasonably foreseeable road and vegetation management actions, there would be moderate adverse cumulative effects where multiple actions occur within the same watershed. These effects would occur over the short term; long-term adverse cumulative effects would be minor to moderate as restoration efforts are completed.

Under either alternative, implementation of reasonably foreseeable road maintenance projects would reduce erosion and land used for vegetation management projects would revegetate, which would minimize long-term potential for erosion. Combined with the beneficial effects of restoring the MVP ROW corridor, long-term adverse cumulative effects on soil resources would be minor to moderate. The intensity would be greater in watersheds where multiple projects have been implemented in close proximity.

Under both the Proposed and No Action alternatives, soil quality would be improved by successful restoration. As stipulated in the POD, soil amendments would be applied as needed to ensure restoration success after prolonged periods of temporary stabilization and soil stockpiling. Proper use of soil amendments (lime, fertilizer, carbon-source organic matter, and biotic soil additives, such as mycorrhizae inoculations) would facilitate root growth and improve soil quality by increasing soil microbial activity, nutrient cycling, and soil aggregate stability.

3.5.3 Water Resources

Past, present, and reasonably foreseeable future actions in the analysis area are described in Section 4.13.1 of the FERC FEIS (pp. 4-581 to 4-600), which is incorporated by reference. In summary, those actions include oil and gas exploration and production, natural gas pipelines, and mining operations, as well as other non-mineral resource development actions. Since publication of the FERC FEIS, reasonably foreseeable road maintenance and vegetation management projects have been identified within the cumulative effects analysis area. Road maintenance and reconstruction would have a long-term benefit to hydrology by allowing the roads to more efficiently control runoff, resulting in an improved hydrologic connection that would benefit watershed hydrology. Vegetation management activities can result in short-term adverse effects from increased travel on roads and ground disturbance where harvesting or other management activities occur. These adverse effects are minor because vegetation management projects would comply with Forest standards and guidelines to minimize erosion, runoff, and sedimentation.

Under the No Action Alternative, direct and indirect adverse effects would be minor and short-term. When combined with the effects associated with road maintenance projects and approximately 2,080 acres of timber sales (Table 14 and Table 15), there would be minor adverse cumulative effects within the 305,925-acre analysis area. The Eastern Divide Highlands Prescribed Fire project would impact a much larger area (60,628 acres, or approximately 15,000 acres annually over 3 to 5 years). In stream segments or other water features where this project overlaps with other projects, cumulative effects would be moderate in intensity. Effects would be minimized by adherence to Forest standards and guidelines. Overall, these effects would occur over both the short term (i.e., during restoration) and long term if any reasonably foreseeable projects (e.g., Eastern Divide Highlands Prescribed Fire project) extend beyond the restoration timeframe for the MVP ROW.

Cumulative effects under the Proposed Action would be greater than those under the No Action Alternative. Although effects from construction of the MVP would be minimized by the same ECDs that are in place for the No Action Alternative, because the Proposed Action includes additional surface disturbing actions (e.g., trenching, stream crossings) there would be a greater potential for adverse effects. Combined with the road and vegetation projects listed in Table 14 and Table 15, cumulative effects on water resources would be moderate where multiple projects impact the same water feature. Where a water feature is impacted by only one project, cumulative effects would be minor. As under the No Action Alternative, these effects would occur over the short term (i.e., during restoration) and long term if any reasonably foreseeable projects extend beyond the restoration timeframe for the MVP ROW.

3.5.4 Threatened, Endangered, and Sensitive Species

3.5.4.1 Aquatic Species

Past, present, and reasonably foreseeable future actions in the analysis area are described in Section 4.13.1 of the FERC FEIS (pp. 4-581 to 4-600), which is incorporated by reference. In summary, those actions include oil and gas exploration and production, natural gas pipelines, and mining operations, as well as other non-mineral resource development actions. Since publication of the FERC FEIS, reasonably foreseeable road maintenance and vegetation management projects have been identified within the cumulative effects analysis area. Road maintenance and reconstruction would have a long-term benefit to aquatic species by allowing the roads to more efficiently control runoff, resulting reduced sediment load and associated habitat degradation. Vegetation management activities can result in short-term adverse effects on water quality and

aquatic species habitat from increased travel on roads and ground disturbance where harvesting or other management activities occur.

The FERC FEIS did not identify any contribution to cumulative effects from implementation of the No Action Alternative. Since then, the project has been partially constructed and the SEIS No Action Alternative would result in restoration of the ROW on NFS lands to its pre-project condition. This would result in short-term adverse contributions to cumulative effects of an intensity similar to that described in the analysis of direct and indirect effects. Effects on aquatic species would be short-term, minor and would be noticeable in habitat that is affected by multiple concurrent projects. Over the long-term, restoration would not contribute to cumulative effects from the MVP.

Under the Proposed Action, cumulative effects on aquatic species would be similar those described in the FERC FEIS. These effects are summarized below.

Cumulative effects on aquatic species could occur if other projects occur within the same segment of a waterbody and have similar construction timeframes as the proposed MVP or that could result in permanent or long-term impact on the same or similar habitat types. Implementation of the actions identified in Appendix W of the FERC FEIS, those in Table 14 and Table 15 of this SEIS, and the MVP could result in cumulative effects on waterbodies and fisheries from sedimentation and turbidity, habitat alteration, streambank erosion, fuel and chemical spills, water depletions, entrainment or entrapment due to water withdrawals or construction crossing operations, and blasting if constructed on the same waterbody in a similar timeframe. Based on known project schedules, there would be some overlap in project implementation in the analysis area, but other project schedules would be staggered. Staggered implementation would minimize effects on aquatic resources by limiting the amount of disturbance at a given time. Transportation and timber sale projects in the analysis area would be designed to minimize effects on waterbodies, and thus on aquatic species, as much as possible.

Effects on waterbodies (and therefore aquatic species) would be minor, short-term and mostly limited to construction activities associated with construction of the MVP and other reasonably foreseeable actions, including road repairs and timber sales, that would be conducted in accordance with BMPs and Forest standards. As such, none of these effects would be cumulatively significant because of their temporary nature. The ensuing operation and maintenance of the proposed MVP would not contribute to cumulative effects unless maintenance activities occur in or near streams at the same time/location as other actions (FERC 2017a pp.4-620 to 4-621). As a result, long-term cumulative effects would be minor at a watershed scale.

3.5.4.2 Terrestrial Species

Past, present, and reasonably foreseeable future actions in the analysis area are described in Section 4.13.1 of the FERC FEIS (pp. 4-581 to 4-600), which is incorporated by reference, and in Table 14 and Table 15 of this SEIS. In summary, implementation of the MVP and many of those actions (e.g., timber harvest) would result in long-term loss of habitat types important to wildlife, which is consistent with the analysis in the FERC FEIS. The actions listed in Table 14 and Table 15 were not reasonably foreseeable when the FERC FEIS was published, but they are representative of typical actions ongoing and planned on NFS lands in the JNF; they would also contribute to cumulative effects on terrestrial species where habitat is fragmented or converted. While there have been changes to the list of federally listed species and RFSS, the cumulative effects on these newly listed species would not differ substantially from those analyzed in the

FERC FEIS. Cumulative effects from timber sales would be minor because the Proposed Action and reasonably foreseeable timber sales account for approximately 2,160 acres of the 305,925-acre analysis area. In conjunction with implementation of either alternative, reasonably foreseeable road maintenance projects would contribute to minor cumulative effects because disturbance associated with equipment and vehicles may alter the movement or behavior of terrestrial species while work is occurring. For species sensitive to fragmentation, however, the adverse cumulative effects would be greater than just the acreage lost to herbaceous cover; these species would experience moderate cumulative effects within the analysis area because the reduced movement of individuals could affect local populations.

Under the No Action Alternative, restoration of the ROW to its pre-project condition would offset some of the long-term adverse cumulative effects associated with timber sales and prescribed fire. However, short-term effects would be similar to those under the Proposed Action because the ROW would not fully revegetate within the next two years.

Cumulative effects on plant species would be similar to those for terrestrial species and are influenced by changes in vegetative cover, light, and dust. Both alternatives would contribute to short-term adverse cumulative effects that would be minor due to the small portion of each HUC-10 watershed that would be impacted. The Proposed Action would result in similar short-term effects but would also contribute to the long-term conversion of habitat, especially in the 50-foot-wide permanent ROW. Long-term adverse effects from the ROW would be offset by long-term improvements in habitat from implementation of the Eastern Divide Highlands Prescribed Fire project. In combination with reasonably foreseeable vegetation management actions, long-term cumulative effects would be minor because of the small portion of the analysis area (approximately 2,160 acres of the 305,925-acre analysis area) that would be impacted and because surveys in the permanent ROW did not identify suitable habitat for listed or RFSS plant species.

3.6 Short-term Uses and Long-term Productivity

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

“Short-term” is defined as anticipated to occur during construction of the MVP. “Long-term” is defined as the 30-year term of the ROW grant/temporary use permit. Surface-disturbing activities, including vegetation clearing, trenching, and installing the pipeline, would result in the greatest potential for effects on long-term productivity. Management prescriptions and BMPs are intended to minimize the effect of short-term commitments and reverse change over the long term.

Short-term use of the ROW for construction would result in the long-term loss of forested habitat within the permanent ROW and the fragmentation of this habitat type within the HUC-10 watersheds that the pipeline intersects.

3.7 Unavoidable Adverse Effects

Section 102(C) of NEPA requires disclosure of any adverse environmental effects that cannot be avoided should the proposed action be implemented. Unavoidable adverse effects are those that remain following the implementation of mitigation measures or effects for which there are no mitigation measures.

Construction of the MVP on NFS lands would temporarily increase air emissions, noise, erosion, and sedimentation in a localized area. Over the long-term, it would change the relative abundance of species within plant communities, the relative distribution of plant communities, and the relative occurrence of seral stages of those communities in the MVP ROW. Construction, operation, and maintenance would also introduce intrusions, which would affect the visual landscape on NFS lands.

3.8 Irreversible and Irretrievable Commitments of Resources

Section 102(2)(C) of NEPA requires a discussion of any irreversible or irretrievable commitments of resources that are involved in the proposed action should it be implemented. Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a powerline ROW or road.

For the construction, operation, and maintenance of the MVP on NFS lands, some of the resource commitments would be irreversible and irretrievable. The ROW on NFS lands would be cleared and graded as needed to accommodate pipeline construction. Although portions of the pipeline would cross existing access roads, and the land areas and their associated resources could be reclaimed at some point in the future, it is unlikely that they would be restored to original conditions and functionality across the entire ROW. Maintaining herbaceous cover on the permanent ROW would result in an irretrievable loss of forested wildlife habitat.

Raw materials needed for construction of the pipeline and associated facilities would include crushed stone and sand, water, diesel fuel, gasoline, and steel, for example. Construction would consume these materials, which would constitute an irreversible commitment. The construction, operation, and maintenance of the pipeline would require the irreversible commitments of human resources that would not be available for other activities during the period of their commitment, but these commitments would not be irretrievable.

Finally, the implementation of the Proposed Action would require the commitment of financial resources for construction, operation, and maintenance on NFS lands. This commitment, however, would be consistent with the Project's purpose of and need for the Proposed Action as described in Chapter 1.

3.9 Incomplete or Unavailable Information

An effort was made to obtain and use the best available information to evaluate and compare the effects of alternatives. NEPA implementing regulations (40 CFR 1502.22) state that when "there is incomplete or unavailable information, the agency shall always make clear that such information is lacking." This was done where appropriate. The regulation requirement goes on to say that if the incomplete information "is essential to a reasoned choice among alternatives" then

considerations, such as the cost of obtaining it, apply. This SEIS, in conjunction with the analyses presented in the 2017 FERC FEIS and 2004 JNF Forest Plan FEIS, along with their planning records, will provide the responsible official with the "essential" information needed to make a reasoned choice among alternatives.

4 Consultation and Coordination

The Forest Service consulted the following individuals, federal, state, and local agencies, tribes and other organization and individuals during the development of this SEIS:

4.1 Federal, State, and Local Agencies

Bureau of Land Management

Federal Energy Regulatory Commission

National Park Service

Natural Resource Conservation Service

US Fish and Wildlife Service

4.2 Tribes

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M.S., Geology, University of Utah, 1988

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B.S., Geology, Iowa State University, 2004
M.S., Soil Science, New Mexico State University, 2007

Ginny Williams, Natural Resources Specialist
B.L.A., Landscape Architecture, 1990

4.3.2 Copperhead Environmental Consulting, Inc. Team

Marty Marchaterre, Project Manager
J.D., College of William and Mary, 1988
B.A., History and Political Science, Williams College, 1985

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M.S., Environmental Policy and Planning, University of Michigan, 2006
B.Ph., Urban and Environmental Planning, Miami University, 2003

Kelsie Eshler, Socioeconomics
B.A., Environmental Earth Science and Sustainability, Miami University, 2015

Taylor Fagin, Fisheries
M.S., Biology, Biological Sciences, Eastern Illinois University, 2020
B.A., Biology, Field and Organismal Studies, Berea College, 2014

Chris McNees, GIS
B.S. Environmental Studies, Eastern Kentucky University, 2014
A.S./A.A. Environmental Science Technology, Bluegrass Community and Technical College, 2005

Logan Nutt, Silviculture
B.S., Forestry, University of Kentucky, 2014

Austin Prater, Vegetation
M.S., Environmental Science, University of Tennessee at Chattanooga, 2015
B.S., Biology, East Tennessee State University, 2004

Piper Roby, Threatened, Endangered, and Sensitive Species
Ph.D., Animal Sciences, University of Kentucky, 2019
M.S., Biology, University of Louisville, 2006
B.A., Biology, Hanover College, 1999

Price Sewell, Aquatic Biology
B.A., Environmental Science, Rollins College, 1997

Michael Tincher, Water Resources
M.S., Wildlife and Fisheries Resources, West Virginia University, 2013
B.S., Wildlife and Fisheries Resources, West Virginia University, 2010

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J.D., University of Utah, 2004
B.A., Political Science, University of Utah, 1999

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M.S., Park & Natural Resources Management, University of Illinois at Urbana-Champaign, 1998
M.L.A., Landscape Architecture, University of Illinois at Urbana-Champaign, 1995
B.L.A., Landscape Architecture / Environmental Planning, Utah State University, 1990

Laura Klewicki, Land Uses (SWCA)
M.E.S., Environmental Science, Yale University, 2013
B.S. Environmental Technology & Management, North Carolina State University, 2011

Daren Pait, Water Resources (SWCA)
B.S., Environmental Engineering, North Carolina State University, 2000

Michele Rowe, Air Quality and Climate (SWCA)
B.S., Environmental Geoscience, Texas A&M University, 2012

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M.L.A., Landscape Architecture, Virginia Polytechnic Institute & State University, 2012
B.B.A., Marketing, Radford University, 1998

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M.P.P., Environmental Policy Concentration; George Washington University, 2014
B.A., Political Science, University of Michigan, 2011

Aaron DeJoia, Soils (Duraroot)
M.S., Soil Science, Kansas State University, 2001
B.S., Agronomy, Kansas State University, 1997

James Hartsig, Soils (Duraroot)
M.S., Soil Science, University of Tennessee, 2011
B.S., Soil Science, University of Tennessee, 2009

John Galbraith, Soils Advisor (Virginia Polytechnic Institute and State University)
Ph.D., Soil Science, Agronomy, Geomorphology, Cornell University, 1997
M.S., Range Science, Texas Tech University, 1983
B.S., Range and Wildlife Management, Texas Tech University, 1978

Stevan Pullins, Heritage Resources (Cultural Resource Analysts, Inc.)
M.A., Anthropology, Pennsylvania State University, 1995
B.A., Anthropology, Indiana University, 1986

David Waldner, Transportation (Palmer Engineering)
B.S., Civil Engineering, University of Kentucky, 1983

4.4 Distribution of the Environmental Impact Statement

A postcard announcing the availability of the DSEIS has been distributed to 3,326 individuals who were on the mailing list for the FERC FEIS. In addition, postcards have been sent to the following federal agencies, federally recognized tribes, state and local governments, and organizations representing a wide range of views.

4.4.1 Agencies and State and Local Governments

Advisory Council on Historic Preservation
Braxton County
Bureau of Land Management
City of Bridgeport
City of Clarksburg
City of Hinton
City of Richwood
City of Weston
Craig County
Fayette County
Federal Aviation Administration
Federal Energy Regulatory Commission
Federal Highway Administration
Franklin County
Giles County
Greenbriar County
Greene County
Harrison County
Lewis County
Monroe County
Montgomery County
National Park Service
Natural Resources Conservation Service
Nicholas County
NOAA Fisheries
Office of Environmental Policy and Compliance
Office of Federal Programs, Advisory Council on Historic Preservation
Office of the Secretary of Defense
Pittsylvania County
Pulaski County
Roanoke County
Summers County
Town of Addison
Town of Blacksburg
Town of Boones Mill
Town of Camden On Gauley
Town of Cowen
Town of Flatwoods
Town of Meadow Bridge
Town of Peterstown
Town of Quinwood
Town of Rainelle
Town of Rainesel
Town of Rupert
Town of Summersville
Town of Sutton
Town of Union
Town of West Union
U.S. Air Force
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Department of Agriculture, Animal and Plant Health Inspection Service
U.S. Department of Energy
U.S. Department of Transportation
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. Navy
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Game and Inland Fisheries
Virginia Department of Historic Resources
Virginia Department of Mines Minerals and Energy
Webster County
West Virginia Department of Agriculture
West Virginia Department of Commerce
West Virginia Department of Environmental Protection
West Virginia Department of Highways
West Virginia Department of Transportation
West Virginia Division of Culture and History, Historic Preservation Office
West Virginia Division of Energy
West Virginia Division of Forestry
West Virginia Division of Natural Resources
Wetzel County

4.4.2 Tribes

Cherokee Nation Tribal Historic Preservation Office
Eastern Band of Cherokee Indians
Monacan Indian Tribe
Nansemond Indian Tribal Association
Rappahannock Tribe
United Keetoowah Band of Cherokee Indians in Oklahoma
Wyandotte Nation

4.4.3 Organizations

500-Year Forest Foundation
3 Pond Valley, LLC
AAA Adventures, Outdoors LLC
Advent Christian Church
Advisory Council on Historic Preservation
AED, LLC
Alice K. Mills Revocable Trust
Alleghany Country Farms, Inc.
Allegheny Defense Project
Allegheny Energy Supply Co., LLC and Tax Dept Supply
Allegheny Land Trust
Alpha Natural Resource Services, LLC
American Chemistry Council
American Electric Power
American Electric Power Service Corporation
American Hiking Society
American Mountaineer Energy, Inc. c/o Murray Energy Corp
American Petroleum Institute
APG Lime Corporation
Appalachian Mountain Advocates
Appalachian Mountain Club
Appalachian National Scenic Trail Office
Appalachian Power Company
Appalachian Trail Conservancy
Appalachian Voices
Ashcraft Trust
Associated Builders and Contractors
Associated General Contractors of Virginia
Attorney General of Virginia
Audubon Society
B and W Land Company
B L Farm
B.A. Mullican Lumber and Manufacturing Company, L.P.
Bailey and Glasser LLP
Ballengee Farm
Barbara A. Nickum Trust
Basalt Trap Rock, LLC
Bat Conservation International
BDJ, LLC
Beckley Register-Herald
Beckwith Lumber Company, Inc, a West Virginia Corporation
Bee Berry Farms
Bellwood Corporation
Bent Mountain Farms, LLC
BETS, Inc.
Betty B. Kulp Personal Residence Trust
Beverly O. Cooper Living Trust
Big Chief Drilling and Production Co. Inc.
Black Diamond Property Owners Association
Blackrock Enterprises LLC
Blacks Chapel Cemetery, Inc.
Blue Eagle Partnership, LLC
Blue Ridge Environmental Defense League
Blue Ridge Land Conservancy
Blue Ridge Parkway Association
Blue Ridge Parkway Foundation
Boones Mill Christian Church
Branch Banking and Trust Co.
Braxton Citizen's News
Braxton Industries
Braxton Oil and Gas Corp.
Briarwood Development, LLC
Bridgeport Public Library
Bristol Methodist Church
Brown Mist Fuel Company
Buck Ridge Farm
Buckland Law Firm, P.L.L.C
Bunola Volunteer Fire Company Station #156
Bureau of Land Management, SE States District Office
Burnsville Public Library
Bush Family Living Trust
Butterfly Evolution Trust
C. L. Draughn Ditching Contractor, Inc.
Cadle Family Trust
Cahas Mountain Rural Historic District
Calloway Level Primitive Baptist Church
Canaan Properties, LLC
Canestrale Environmental Control Co.
Carl C. Bosley Family Trust, David Bosley, et al
Catherine R. Beckner Irrevocable Trust
Cave Conservancy of the Virginias
Cave Hill Farm

Celanese Acetate LLC
Center for Applied Behavior Systems
Center for Biological Diversity
Center Point Outpost Library
CFX, Inc.
Charleroi Area School District
Charleston Regional Chamber of Commerce
Chatham High School
Chemical Lime Company of Virginia
Chesapeake Bay Foundation
Chesapeake Bay Program
Chesapeake Climate Action Network
Chestnut Mill Ranch, LLC
Ciras Inc
City of Salem Public Library
Clarksburg Exponent-Telegram
Clarksburg-Harrison Public Library
Clarksville Volunteer Fire Company
Cloeter Living Trust
CNG Transmission Corp.
CNX Gas Company LLC
Coal Bank Ridge Homeowners Association
Coastal Forest Resources Company
Coastal Timberlands Company
Columbia Forest Products
Columbia Plywood Corp.
Columbia West Virginia Corp.
Comfort Inn
Commonwealth Forest Investments Inc.
Consolidated Edison Company of New York, Inc.
Consolidation Coal Company
Countryside Land Company LC
County Commissioners Association of Pennsylvania
County of Craig
Cowen Public Library
Craig Botetourt Electric Cooperative
Craig County Board of Supervisors
Craig County Public Library
Craig-Botetourt Electric Cooperative
Craigsville Public Library
Cross Family Trust
CSX Railroad PGH and Lake Erie RR Co
CSX Transportation Inc
Cummings Properties, an Ohio LLC
Dallison Lumber, Inc.
Danbury Ltd.
Danville Institute for Advanced Learning and Research
Danville Pittsylvania County Chamber of Commerce
Danville Regional Foundation
David B. Sprenkle Living Trust
DB Mining Services, Estate of James Humphrey, Estate of Vorheis Buskirk MacNab, Martha Buskirk and Barbara Buskirk
Dillon Living Trust
Dinsmore and Shohl, LLP
DJR Holdings, Inc.
Doddridge County
Doddridge County Library
Doddridge Independent
Doe Creek Farm, Inc.
Dominion
Dominion Hope
Dominion Transmission Inc.
Doughboy LLC, (Millehan, Joseph and Vicky)
Dowdy Farm LLC
Ducks Unlimited, Pennsylvania
Ducks Unlimited, Virginia
Ducks Unlimited, West Virginia
Duke Energy Progress, LLC
Dyer Family Trust
Eagles Nest Ministries, Inc.
Eastern Montgomery High School
Economic Development Authority of Montgomergy County
Ed Broome, Inc.
Edward R. Kuhl Revocable Trust
Edwards Properties, Ltd.
Elisabeth A. Vogel Trust
Elmer W. Boyle, Et Al / Thelma Boyle, Et Al
Elrama McGuirk, LLC and Liberty USA, Inc.
Elrama Volunteer Fire Company
Emax Gas
EMAX Gas Company
Environmental Defence Fund
Environmental Fund for Pennsylvania
EQT Corporation
EQT Gathering, LLC
Equitrans, LP
Ernestine Trent Estate
Estate of Alma B. Cherry
Estate of Andrew Martin
Estate of Charles J. Via, Jr.
Estate of Charles S. Shriver, et al
Estate of David L. and Delberta Cunningham
Estate of Eugene A. McKenzie
Estate of Evelyn Teresa Nicholas
Estate of Granville Parks et al
Estate of Madeline Callison
Estate of Malcolm E. Goodrich
Estate of Martha C. Jones
Estate of Mary S. Randolph-Hetzel
Estate of Mary S. Randolph-Hetzel
Estate of P. I. Apgar
Estate of R. L. Ensiminger
Estate of Robert J. Haught
Estate of Robert Martin
Estate of Syble Ann Richmond

Evelyn Teresa Nicholas Estate
Evergreen Conservancy
Family Limited Beinlich Partnership
Fayette County Public Library
Fayette Tribune
Fayetteville Public Library
Field Family Trust
Finleyville Volunteer Fire Department
First American Real Tax Service, Escrow Report DRW 4-3
First Piedmont Corporation
Forks of John's Creek Christian Church
Forward Township
Forward Township Volunteer Fire Company EMS, Station #155
Foundation for Pennsylvania Watersheds
Fox Brothers Properties
Franklin Center for Advanced Learning and Enterprise
Franklin Community Bank, N.A.
Franklin County Historical Society
Franklin County Library
Franklin Real Estate Company
Franklin Township
Franklin Township Board of Supervisors
Franklin Township EMA
Franklin Township Planning Commission
Freshwater Mollusk Conservation Society
Friends of Blackwater
Friends of Claytor Lake
Friends of Lower Greenbrier River and Greenbrier River Watershed Association
Friends of Nelson
Friends of Nelson, Heartwood, and Wild Virginia
Friends of the Blue Ridge Parkway
Friends of the Central Shenandoah
Friends of the Lower Greenbrier River
Friends of the Rivers of Virginia
Friends of the Second Creek, Inc.
Frontier Communications as Successor to C and P Telephone Company
Gallatin-Sunnyside Volunteer Fire Department, Station #154
Garden Club of Virginia
Garnett A. Gum Trust
GFWC Blue Ridge District Public Policy Chair
Giles County Chamber of Commerce
Giles County Farm Bureau
Giles County Historical Society
Giles Cousel
Glade Hill Farm LLC
Global Partisan, Inc.
Goldsboro Milling Company
Greater Bluefield Chamber of Commerce
Greater Greenbrier Chamber of Commerce
Greater Newport Rural Historic District Committee
Green County Library System
Green Valley Coal Co.
Greenbrier County Public Library
Greenbrier River Trial Association
Greenbrier River Watershed Association
Greene Tech II, LP
Harrison County Chamber of Commerce
Haught Family Trust
Hazeltine A. Clark Estate
Heartwood Forestland Fund III, Limited Partnership, a North Carolina Limited Partnership
Heartwood Forestland Fund IV
Heartwood Forestland Fund VII, Limited Partnership
Heatherwood Properties, Inc
Heirs of Delphia Garrett
Heritage Trust Company
High Mountain Timber, LLC
High Top Properties LLC
Highlanders for Responsible Development Inc
Hilary Heights Ltd.
Hill Top Investments
Hinman Revocable Trust
Hinton News
Hollow Hill Farm
Holt Properties, LLC
HRW Properties LLC
HS Tejas, Ltd.
Huffman Family Living Trust
Hurd IIP LLC
Indian Creek Watershed Association
Industrial Energy Consumers of America
J and J Energy, Inc,. a Virginia corporation
J and M Grants, Inc.
J. Maurice Payne Estate
J. Pitt Trust
J.C. Baker and Sons, Inc.
Jack Chapman Revocable Trust
Jack E. and Dorcas M. Eanes, James Cabel Law
Jacksonburg Volunteer Fire Department
James Monroe High School
Janum Management, LLC
Jefferson Volunteer Fire Company
Jenkins Family Revoc Trust
Jennings, Strouss, & Salmon, P.L.C.
Joan Rowles Shelhorse Trust
Joanna Mullins Life Estate
John A. Marshok, Jr. Revocable Living Trust dated June 3, 2011
Jorge N. Fernandez Trust
Joyce Ann Richards Revocable Trust
Katherine M. Hanbury Revocable Trust
KDKA-TV

Lafon Living Trust
Lake Anna Investments LC
Lake Floyd Club Inc.
Land Trust of Virginia
Lands Apart, LLC
LaPaix Herb Farm
Laurel Creek Hardwoods Inc.
Law Offices of Carolyn Elefant PLLC
League of Women Voters of Montgomery County
League of Women Voters of Virginia
League of Women Voters of West Virginia
Leatha Faye Cales Allen Life Estate
Lenoir-Rhyne University
Lewis and Clark Trust, Inc.
Lewis County Chamber
LHOIST North America
Liberi, LLC
Lick Creek Valley Farm
Life Estate Tenants
Lighthouse Deliverance Center
Linside United Methodist Church Trustees
LMS Enterprises, Inc.
Lock 3 Oil Coal & Dock Company
Lock 3 Oil Coal and Dock Company
Longview Holsteins Inc.
Lorraine Sanders Snider - Dower Life Estate
Louis Bennett Public Library
M. Farrell Properties LLC
M3 Appalachia Gathering, LLC
Mad Dog Property Management, LLC
Margaret McGraw Slayton Living Trust
Margaret Mullooly Trust and Thomas B. Mullooly Trust
Markwest Liberty Midstream and Resources, LLC
Marshall County Chamber of Commerce
Marshall Living Trust
Martin, Hopkins and Lemon, P. C.
McClellan, Life Estate
McKenzie and McKenzie LLC
Meadow Creek Coal Corporation
Meadowbrook Public Library
Media General Operations, Isel
Mike Ross Inc
Mike Ross, Inc. and Waco Oil and Gas
Mill Mountain Conservation Committee
Mining Company Consol, LLC
Mon Valley Regional Chamber of Commerce
Monongahela Railway Company
Monroe County Administration Building
Monroe County Historical Society
Monroe County Organic District
Monroe County Planning Commission
Monroe County Public Library
Monroe County Schools
Monte Vista Brethren Church
Montgomery County Board of Supervisors
Montgomery County Chamber of Commerce
Montgomery-Floyd Regional Library
Morgantown Area Chamber of Commerce
Morris Fork Missionary Baptist Church
Motley Family Rev. Trust
Mount Tabor Ruritan Club
Mountain Branch Farm
Mountain Conservatory LLC
Mountain Creek Land Co., LLC
Mountain Lair LLC
Mountain Lakes Preservation Alliance
Mountain Messager
Mountain Way Realty
Mule Tracts, LLC
National Agricultural Library
National Committee for the New River
National Federation of Independent Businesses - Virginia Chapter
National Parks Conservation Association, Mid-Atlantic Region
National Trust for Historic Preservation
National Trust for Historic Preservation
National Wildlife Federation
Natural Resource Partners
Natural Resources Defense Council
New Martinsville
New Martinsville Chamber of Commerce
New Martinsville City Council
New Martinsville Police Department
New Martinsville Public Library
New Martinsville Volunteer Fire Department
New River Community College
New River Economic Development Alliance
New River Gorge Development Authority
New River Land Trust
Newport Community Action Committee
Newport Development Company, LLC
NextEra Energy Power Marketing, LLC
NGHD Lands, Inc.
Nicholas County High School
Norfolk Southern Corporation
North Marion High School
Northwest Power Planning Council
Novelty Land Holdings LLC
Oak Lawn Farm LLC
Observer Reporter
Occanneechi, Inc
Offutt Investments Limited Partnership 1
Ohio Valley Environmental Coalition
Oil Change International
Old Brick Manor Farm
Open Space Institute
Orion Power Midwest, LP Property Tax Dept
Orr Living Trust

Owen Anderson, LLC
P and D Holdings, Inc.
Pacific Crest Trail Association
Pacific Northwest Trail Association
Paco Land, Inc.
PAP, Inc.
Pardee and Curtin Realty, LLC
Pascarosa
Patricia M. Frizzell Revocable Trust
Paugh Family Trust II
Paulette A. Sears Revocable Trust
Pearisburg Public Library
Peerless Minerals, LLC
Penhook UM Church
PennEnvironment
Pennsylvania Association of Conservation Districts, Inc.
Pennsylvania Holdings Co.
Pennsylvania Lines, LLC
Pennzoil Exploration and Production Co.
Peoples Natural Gas Company LLC
Peters Township Public Library
Piala Living Trust
Piedmont Natural Gas Company, Inc.
Pine Grove Public Library
Pine Grove Volunteer Fire Department
Pipeline & Hazardous Materials Safety Administration, Office of Pipeline Safety, USDOT
Pittsburgh Post-Gazette
Pittsburgh Tribune-Review
Pittsylvania County Farm Bureau
Pittsylvania County Library
Pittsylvania Cousel
Pittsylvania Historical Society
Plum Creek Timberlands, LP
Polino Enterprises, Inc.
Poole, Revocable Trust
Potomac Appalachian Trail Club
Potts Creek Ranch LLC
Preservation Alliance of West Virginia
Preservation Virginia
Preserve Bent Mountain
Preserve Craig and Save Monroe
Preserve Craig Inc.
Preserve Giles County
Preserve Greenbriar County
Preserve Monroe
Preserve Montgomery County Virginia
Preserve the New River Valley
Preston Forest Homeowners Association
Price, Life Estate
Princeton-Mercer County Chamber of Commerce
Protect Our Water, Heritage and Rights (POWHR)
Quince Farm LLC
R.L. Ensiminger Estate
RaGln Koger Farm
Rainelle Community Development Corporation
Rainelle Public Library
Reader Volunteer Fire Department
Red Sulphur Public Service District
Reese Family Ltd. Partnership
Region IV Planning and Development Council
Rex Coal Land Company
RGC Resources, Inc.
Richwood Area Chamber of Commerce
Roanoke Appalachian Trail Club
Roanoke Blacksburg Technology Council
Roanoke County Library
Roanoke Gas Company
Roanoke Regional Chamber of Commerce
Roanoke Regional Partnership
Roanoke River Basin Association
Roanoke Valley 4 Wheelers Assoc
Roanoke Valley Resource Authority
Rockydale Quarries Corporation
Salem-Roanoke Chamber of Commerce
Sands Anderson
Sandy P. Simmons Estate
Save Monroe Inc.
Scenic Virginia
Second Star Farm
Sentra Resources, LLC
Shenandoah Valley Battlefields Foundation
Shenandoah Valley Network
Shirley Titus Estate
Sierra Club
Simons Living Trust
Sisson and Ryan Inc.
Sizemore, Inc.
Skidmore and Woodward Farm Development
Skidmore/Woodward Farm Develop DBA Little General Store Inc.
Smith and Associates
Smith Mountain Lake Association
Smith Mountain Lake Chamber of Commerce
Smithview Management Corporation
SMMM LC
Soil Works, Inc.
South County Library
Southern Country Farms, Inc.
Southern Environmental Law Center
Southern Virginia Regional Alliance
Southway Farm LLC
Southwest Pennsylvania Office
Southwest Regional Police
Sparvin Energy LLC
Sperry Hardwoods, Inc.
Springdale, L.L.C.
St. Bernard's Church Parsonage and Cemetery

Steele Acres, LLC
Stockbridge Munsee Community
Straus Troy Co. LPA
Sullivan's Haven
Summers County Public Library
Summersville Area Chamber of Commerce
Summersville Public Library
Sun Lumber Co.
Sunrise Pipeline, LLC
Sunshine Valley School Inc.
Susquehanna Appalachian Trail Club
Susquehanna River Basins Commission
Sustainable Living for West Virginia
Sustainable Pittsburgh
Sutton Public Library
Sweet Springs Water Company
T. C. Lands Inc.
Tall Timber, Inc.
Tall Trees and Land, Inc.
Talty Clinical Biomechanics and Orthopedic Medicine
TAS Greenbrier Properties, LLC
Tetra Tech
Texas Eastern Transmission, Corp.
The Border Conservancy
The Catherine R. Beckner Trust
The Conservation Fund
The Danville Register and Bee
The Development Authority of Mercer County / Mercer County Economic Development Authority
The Emmadale Strader Revocable Living Trust
The Estate of Edith Naomi Stewart
The Estate of Ernest L. and Blondena Floyd
The Estate of Rebecca Richards
The Estate of Robert E. Dunbar
The Estate of Zola Lucille Devericks
The Franklin News-Post
The Hope Gas Inc., d/b/a Dominion Hope
The Huntington National Bank
The Mark Czaja 2015 Revocable Trust
The Maryella D. Hitt Trust
The Mitchell Law Firm
The Nature Conservancy
The Newcastle Record
The Roanoke Times
The State Journal
The Weston Democrat
The Wilderness Society
Thomas L. Woodward, Jr. Trust
Thomas Ltd.
Three Rivers Avian Center
Timberlands III, LLC
TractorWorks Building
Transcontinental Gas Pipeline Corporation
Triangle Sportsman Club, LLC
Trout Unlimited
Trust for Public Land
Trust Fund B under the Last Will and Testament of Woodrow Trent
Trustees of the Wallace Church of Christ
Twilight Hills, Inc.
Upper Monongahela River Association
Virginia Cave Board - Commonwealth of Virginia Department of Conservation and Recreation
Virginia Center for Coal and Energy Research
Virginia Chapter of the American Fisheries Society
Virginia Clean Cities
Virginia Conservation Network
Virginia Department of Transportation
Virginia Farm Bureau Federation
Virginia Forest Products Association
Virginia Forestry Association
Virginia Lakes and Watersheds Alliance
Virginia League of Conservation Voters
Virginia Manufacturers Association
Virginia Native Plant Society
Virginia Oil and Gas Association
Virginia Outdoors Foundation
Virginia Petroleum Council
Virginia Polytechnic Institute and State University
Virginia Wilderness Committee
Waco Oil and Gas
Wallace Volunteer Fire Department. Inc.
Walnut Hill Farm
Walnut Hills Holdings, LLC
Washington Gas
Washington Gas Light Company
Water and Power Law Group PC
Watershed Strategies, LLC
Waynesburg Chamber of Commerce
Waynesburg-Franklin Township Volunteer Fire Company
WBOY-TV
Webster Co. EDA
Webster County Lumber Co. Inc.
Webster Echo
Webster-Addison Public Library
West Virginia AFL-CIO
West Virginia Business and Industry Council
West Virginia Chamber of Commerce
West Virginia Citizens Action Group
West Virginia Contractors Association
West Virginia Daily News/Greenbrier Valley Ranger
West Virginia Division of Tourism
West Virginia Environmental Council
West Virginia Farm Bureau
West Virginia Highlands Conservancy

West Virginia Hospitality and Travel Association
West Virginia Independent Oil and Gas Association
West Virginia Land Trust
West Virginia Manufacturers Association
West Virginia Native Plant Society
West Virginia Oil and Natural Gas Association
West Virginia Public Broadcast
West Virginia Rivers Coalition
West Virginia Roundtable

West Virginia State University - Extension Service in Partnership with New River Gorge Regional Development Authority
West Virginia Tourism Commission
West Virginia University Jackson's Mill
West Virgnia Affiliated Construction Trades Foundation
Western Pennsylvania Conservancy
Western Pocahontas Properties Limited Partnership
Western Virginia Water Authority
Westgate Holdings, LLC
Wetlands Watch
Wetzel Chronicle
Wetzel Cousel
WGL Midstream Inc
Wheeling Area Chamber of Commerce
White Pine, Inc., a West Virginia corporation
Whitehorn Creek Buffalo Ranch
Wilbur Parker Trust
Wild Virginia
Wildlife Foundation of Virginia
Wildlife Habitat Council
Willard Construction of Smith Mountain Lake LLC
William H. Foster Trust / Franklin Grocery and Grain Corp.
William P. Crosier Trust
Wimmer Family, LLC
Wimmer, E. V. Revocable Trust
Windstream Communications
Wingo Living Trust
Wiseman Living Trust
WMS WVMinerals Trust
Wolf Creek Realty Mortgage
Woody Lumber Company, Inc.
WPW Properties, LLC
WPXI-TV
WTAE-TV
WV Association of County Commissioners
WV Land and Mineral Owners
WV Univ. Board of Governors
WVFX-TV
Zenith Farms LLC
Ziegler and Ziegler, L.C. Attorneys at Law

5 Index

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Appendix A – BLM Practicality Analysis

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August 24, 2018

IN REPLY REFER TO:
2880 (ESJ020) VMC

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: Mountain Valley Pipeline, LLC
Docket No. CP16-10-000
Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Ms. Bose:

Enclosed for your docket please find the Bureau of Land Management's analysis of the Mountain Valley Pipeline project under section 28(p) of the Mineral Leasing Act of 1920. Please note that this analysis in itself does not constitute a record of decision or right-of-way grant.

Sincerely,

Victoria (Vicki) Craft
Project Manager

Enclosure (1)
-Practicality Analysis

CC: Public File, Docket No. CP16-10-000

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AUG 2 3 2018

Mr. Joseph R. Balash
Assistant Secretary – Land and Minerals Management
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240

Re: Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Mr. Balash:

Section 28(p) of the Mineral Leasing Act of 1920 provides that "[i]n order to minimize adverse environmental impacts and the proliferation of separate rights-of-way across Federal lands, the utilization of rights-of-way in common shall be required to the extent practical."[1] On July 27, 2018, the U.S. Court of Appeals for the Fourth Circuit vacated the record of decision and right-of-way (ROW) grant for the Mountain Valley Pipeline (MVP). The court found that the record of decision did not address whether "the utilization of an existing right of way would be *impractical*," and specified that the BLM on remand must "favor[] routes utilizing existing rights of way unless those alternatives [are] impractical."[2]

The Bureau of Land Management (BLM) has prepared this supplemental analysis to address the court's instructions on remand. As explained below, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

I. Background

In order to implement the court's instructions, we have analyzed whether any route alternative exists that would result in greater collocation with other ROWs on federal lands than the route that was previously approved by the BLM, and that would be practical. Each of these two criteria is explained in greater detail below.

A. Collocation on Federal Lands

The first criterion that a route alternative must satisfy is that it must result in greater collocation with other ROWs on federal lands – that is, it must cross fewer miles of federal lands without

[1] 30 U.S.C. § 185(p).
[2] *See Sierra Club, Inc. v. U.S. Forest Serv.*, – F.3d –, 2018 WL 3595760, at *16 (4th Cir. July 27, 2018) (emphasis in the original).

collocation than the previously approved alternative. We limit our comparison of collocation to federal lands because section 28(p) aims to minimize "the proliferation of separate rights-of-way across Federal lands," and because the BLM has no authority over the MVP route except to the extent that the route involves the use of federal lands.[3]

In order to determine the extent of collocation on federal lands, we rely on two independent assessments: one conducted by staff of the Federal Energy Regulatory Commission (FERC), and one conducted by MVP.[4] Although the results of these two independent assessments are generally consistent, they occasionally provide different estimates of the extent of collocation on federal lands, because of the technical challenges inherent in measuring the lengths of potential pipeline routes. Where the two assessments provide conflicting results on the question of whether a given route alternative would result in greater collocation on federal lands than the previously approved route, we have assumed conservatively that the route alternative would satisfy this criterion, and proceeded to examine whether the route alternative would be practical.

B. Practicality

The second criterion that a route alternative must satisfy is that it must be practical. In interpreting the term "practical" for purposes of this analysis, we have taken into consideration the term's common usage, as well as relevant administrative and judicial interpretations. Black's Law Dictionary defines "practical" as meaning "[l]ikely to succeed or be effective," and "[u]seful or suitable for a particular purpose or situation."[5] The BLM's regulations note that one of the objectives of the BLM's pipeline ROW program is to "[p]romote[] the use of rights-of-way in common considering engineering and technological compatibility," and that the use of ROWs in common may be required "where safety and other considerations allow."[6] In the only judicial or administrative decision addressing section 28(p), the Interior Board of Land Appeals determined that this standard includes consideration of a route's cost and land-disturbance footprint, affirming that a route alternative was not "practical" when it would have "require[d]

[3] *See* § 185(c)(2),(p). We define federal lands, consistently with section 28, to exclude "lands in the National Park System." *See* 30 U.S.C. § 185(b)(1).

[4] *See* Email from Rich McGuire, FERC, to Victoria Craft, BLM (Aug. 16, 2018) (McGuire August 16, 2018 Email); Email from Megan Neylon, MVP, to Victoria Craft, BLM (Aug. 17, 2018) (Neylon August 17, 2018 Email). Unlike the figures reported in the FEIS for "[l]ength adjacent to existing right-of-way," these assessments included collocation with both major ROWs such as pipelines or electric transmission lines and smaller ROWs such as roads. *See* FEIS at 3-20. *Cf.* 70 Fed. Reg. 20,970, 20,970 (April 22, 2005) ("Some examples of land uses which require a right-of-way grant include: transmission lines, communication sites, roads, highways, trails, telephone lines, canals, flumes, pipelines, and reservoirs."). For this reason, along with the fact that the FEIS's figures do not distinguish between miles of collocation on federal and non-federal lands, we do not generally rely on the FEIS's figures for "[l]ength adjacent to existing right-of-way" for this analysis.

[5] *See* "Practical," Black's Law Dictionary (10th ed. 2014).

[6] See 43 C.F.R. §§ 2881.2(c), 2882.10(b). *See also* 70 Fed. Reg. at 21,033 (noting that "there may be situations where for technical or safety reasons it is not practical" to make use of an existing ROW).

construction of an additional 39 miles of pipeline at an estimated additional cost of $37.5 million," as well as "installation of an additional compressor station and ... the temporary disturbance of a substantially greater acreage of lands during construction."[7] Similarly, in interpreting a parallel standard in another statute, the Board affirmed that a route was not "practical" where it would have "require[d] construction of up to an additional 60 miles of 345 kV power line and ha[d] an adverse impact on an additional 60 miles of public and private land," while "preclud[ing] the opportunity to improve" service to one of the project's proposed customers.[8] Finally, a regulation issued to implement section 404 of the Clean Water Act prohibits the issuance of a dredge or fill discharge permit "if there is a practicable alternative to the proposed discharge" that is environmentally preferable, and defines "practicable" as including "consideration [of] cost, existing technology, and logistics in light of overall project purposes."[9] In reviewing decisions made under this regulation by the U.S. Army Corps of Engineers (USACE), courts have deferred to the agency's practicability determinations, and upheld its consideration of factors including cost, construction delays, logistical feasibility, and "the objectives of the applicant's project."[10]

Accordingly, we interpret the term "practical," for purposes of this analysis, as referring to the suitability of a route alternative for achieving its purpose, and to the likelihood that attempting to utilize that route would succeed in achieving that purpose.[11] The purpose of any route alternative is to construct a pipeline to deliver natural gas from the MVP's beginning point to its endpoint, via its mid-route delivery points, in a safe, environmentally responsible, and cost-effective manner.[12] In certain cases, however, as discussed below, a particular route alternative may also have a more specific purpose, such as mitigating the impact of the MVP on certain resources. Therefore, the determination of whether a route alternative is practical includes consideration of the construction challenges and potential safety hazards that would arise from constructing or operating the pipeline along the route;[13] the environmental consequences of constructing the

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[7] *Wyo. Indep. Producers Ass'n*, 133 IBLA 65, 82 (1995).
[8] *Paul Herman*, 146 IBLA 80, 105 (1998) (interpreting 43 U.S.C. § 1763).
[9] *See* 40 C.F.R. §§ 230.3(*l*), 230.10(a).
[10] *See Friends of Santa Clara River v. U.S. Army Corps of Eng'rs*, 887 F.3d 906, 912, 921-922 (9th Cir. 2018) (quotation marks omitted); *Friends of the Earth v. Hintz*, 800 F.2d 822, 833-834 (9th Cir. 1986); *Nat'l Parks Cons. Ass'n v. Semonite*, 311 F. Supp. 3d 350, 377-378 (D.D.C. 2018).
[11] *See* "Practical," Black's Law Dictionary.
[12] *See* MVP Final Environmental Impact Statement at 1-8 (June 23, 2017) (FEIS). While the section 28(p) analysis described here is distinct from the National Environmental Policy Act analysis contained in the FEIS, the information and analysis presented in the FEIS is in many instances relevant to the section 28(p) analysis.
[13] *See* 43 C.F.R. §§ 2881.2(c), 2882.10(b); 70 Fed. Reg. at 21,033.

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[10] *See Friends of Santa Clara River v. U.S. Army Corps of Eng'rs*, 887 F.3d 906, 912, 921-922 (9th Cir. 2018) (quotation marks omitted); *Friends of the Earth v. Hintz*, 800 F.2d 822, 833-834 (9th Cir. 1986); *Nat'l Parks Cons. Ass'n v. Semonite*, 311 F. Supp. 3d 350, 377-378 (D.D.C. 2018).
[11] *See* "Practical," Black's Law Dictionary.
[12] *See* MVP Final Environmental Impact Statement at 1-8 (June 23, 2017) (FEIS). While the section 28(p) analysis described here is distinct from the National Environmental Policy Act analysis contained in the FEIS, the information and analysis presented in the FEIS is in many instances relevant to the section 28(p) analysis.
[13] *See* 43 C.F.R. §§ 2881.2(c), 2882.10(b); 70 Fed. Reg. at 21,033.

pipeline along the route;[14] any resulting increase in the pipeline's length and footprint;[15] the ability of the route to serve the MVP's mid-route delivery points;[16] the additional costs associated with the alternative;[17] and the likelihood that the route would achieve any specific purpose identified for that route alternative.[18]

Although our comparison of the extent of collocation is limited to federal lands, determining the practicality of a route requires consideration of the route as a whole. A route alternative may increase the extent of collocation on federal lands, but prove impractical because of technical or other considerations relating to the route as a whole.

II. The MVP and the Previously Approved Route

The MVP is intended "to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States."[19] Specifically, the project is

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[14] We note that section 28(p) can be read as requiring "the utilization of rights-of-way-in common" only where such collocation would "minimize adverse environmental impacts" as compared to an alternative with less collocation. *See* 30 U.S.C. § 185(p). Had we applied a separate requirement that any route alternative must "minimize adverse environmental impacts" compared to the previously approved alternative, we would have concluded on this basis alone that none of the route alternatives would satisfy the criteria of section 28(p). *See* FEIS at 3-20, 3-22, 3-25, 3-32, 3-47 to 3-48, 3-51, 3-55, 3-62, 3-65, 3-70 (concluding that none of the route alternatives considered in this analysis would "provide a significant environmental advantage" over the previously approved route). In this case, however, we have not excluded any route alternatives based solely on their environmental impacts.

[15] *See Wyo. Indep. Producers*, 133 IBLA at 82; *see also Paul Herman*, 146 IBLA at 105.

[16] *See, e.g., Paul Herman*, 146 IBLA at 105. *See also Friends of Santa Clara River*, 887 F.3d at 912, 921 (requiring consideration of "the objectives of the applicant's project," so long as "those project objectives are not so narrowly defined as to preclude alternatives" (quotation marks omitted)). Each of the route alternatives would serve the MVP's beginning and endpoint.

[17] *See Friends of Santa Clara River*, 887 F.3d at 921-923; *Wyo. Indep. Producers*, 133 IBLA at 82. In this case, the cost of each route alternative would be driven primarily by differences in length and in the extent of steep slopes, side slopes, and other challenging construction conditions. *See* INGAA Foundation, Inc., Final Report No. 2015-03, *Mitigation of Land Movement in Steep and Rugged Terrain for Pipeline Projects: Lessons Learned from Constructing Pipelines in West Virginia* at 6 (2016) (INGAA Rugged Terrain Report), *available at* http://www.ingaa.org/File.aspx?id=28629 (noting that "the planning process must weigh the costs of longer alignments to avoid hazards versus cost of mitigation of the hazard"). Therefore, the information presented below about length and construction challenges serves, and was considered by the BLM, as a proxy for such cost information.

[18] *See Friends of Santa Clara River*, 887 F.3d at 921. We note that this definition of practicality is broader than mere technical feasibility – a standard that some, but not all, of the route alternatives considered here would satisfy. *See, e.g.*, FEIS at 3-32 (concluding that the Northern Pipeline – ACP Collocation Alternative is "likely ... technically infeasible"); *id.* at 3-119 (concluding that some of the remaining route alternatives "appear to be technically feasible").

[19] FEIS at 1-8.

intended to transport natural gas from an existing interconnect in West Virginia to an existing natural gas pooling point and gas trading hub located along a major existing natural gas pipeline in Virginia.[20]

The previously approved route connecting these locations would be 303.5 miles long, and would cross 3.5 miles of federal lands managed by the U.S. Forest Service within the Jefferson National Forest (JNF), in three discontinuous portions located at mileposts (MPs) 196.2 to 197.8, MPs 218.5 to 219.4, and MPs 219.8 to 220.8.[21] The route would also cross 60 feet of federal lands managed by the USACE, at MP 66.8.[22] The route would be collocated with an existing ROW for 1.0 miles of its crossing of the JNF, following a forest road known as Mystery Ridge Road at MPs 196.8 to 197.8.[23] The previously approved route would not be collocated with another ROW for any portion of its crossing of USACE lands.

In addition to its beginning and endpoints, the MVP is also intended to serve three mid-route delivery points that are relevant to this analysis: the WB Interconnect, located at MP 77.6 of the previously approved route; the Roanoke Gas Lafayette Tap, located at MP 235.7; and the Roanoke Franklin Tap, located at MP 261.3.[24] The location of the WB Interconnect is determined by existing natural gas infrastructure, while the locations of the two Roanoke Gas taps are determined by the service area of the utility purchaser that will operate those taps and by existing agreements with that purchaser.[25] The existence of these three mid-route delivery points was an important factor in the selection of the previously approved route, and in the approval of the MVP project by FERC.[26] Therefore, to the extent that any of the route alternatives would bypass these mid-route delivery points, that fact is relevant to the BLM's consideration of the practicality of that route alternative.

III. Route Alternatives

The BLM has analyzed nine route alternatives or families of route alternatives that would affect the MVP project's crossing of the JNF.[27] These route alternatives are analyzed in the order of the milepost at which each route alternative first diverges from the previously approved route.

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[20] FEIS at 1-8, 3-3.
[21] FEIS at 1-1, 1-14.
[22] FEIS at 1-16, 4-277.
[23] FEIS App'x P at P-6; MVP Plan of Development at 1-7 (Nov. 30, 2017) (POD).
[24] FEIS at 2-14 to 2-15; FERC Order Issuing Certificates and Granting Abandonment Authority at 4 (Oct. 13, 2017) (FERC Certificate). Two additional mid-route facilities are located at points along the previously approved route that would not be affected by any of the route alternatives considered here. *See* FEIS at 2-14 to 2-15.
[25] *See* FEIS at 1-8, 2-14; MVP Resource Report 10 and Appendices at 10-2 to 10-3 (Oct. 23, 2015) (Resource Report 10).
[26] *See* FEIS at 1-8 to 1-9, 3-15; FERC Certificate at 3-5.
[27] Several of the route alternatives addressed in this analysis would also affect the location of, or necessity for, the crossing of USACE lands. Because the USACE crossing is so short compared with the JNF crossing, however, any differences in the length or location of the USACE crossing

A. Northern Pipeline – ACP Collocation Alternative

The Northern Pipeline – ACP Collocation Alternative would involve collocating the 42-inch-diameter MVP with the planned 42-inch-diameter Atlantic Coast Pipeline (ACP), along the ACP's proposed route.[28] This route alternative would diverge from the previously approved route at MP 37, and re-converge at the MVP's endpoint at MP 303.5.[29]

For purposes of this analysis, the BLM assumes that the ACP would be constructed as proposed, and therefore that this route alternative would collocate the MVP with another ROW for the MVP's entire crossing of federal lands. Accordingly, this route alternative would provide greater collocation on federal lands than the previously approved route.

Constructing the two pipelines in parallel would raise serious constructability challenges:

> [A] major disadvantage of the Northern Pipeline – ACP Collocation Alternative route is the necessity to construct two parallel pipelines along approximately 205 miles of the ACP route, much of which presents significant constructability issues related to topography and space. … Based on [FERC's] review of aerial photography and topographic maps, … in many areas, such as in Lewis and Upshur Counties, West Virginia and Augusta and Nelson Counties, Virginia,[30] there is insufficient space along the narrow ridgelines to accommodate two parallel 42-inch-diameter … pipelines. This would result in side slope (i.e., side-hill) or two-tone construction techniques, with additional acres of disturbance required for [temporary workspaces], given the space needed to safely accommodate equipment and personnel, as well as spoil storage. The constructability issues alone are likely to render this alternative technically infeasible.[31]

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would not affect the outcome of the BLM's analysis for these route alternatives. As to alternatives apart from those addressed in this analysis, no route alternatives exist that would result in collocation of the USACE crossing and that are practical. A private landowner whose parcel is located approximately 2.5 miles from the USACE crossing proposed collocating the MVP with an existing pipeline near her property, but this proposal (which may not have resulted in collocation at the USACE crossing itself) would be impractical due to constructability and safety concerns. *See* FEIS at 3-112. No other route alternative has been identified that would involve collocation with that existing pipeline. *See* McGuire August 16, 2018 Email.

[28] FEIS at 3-29.

[29] FEIS at 3-29 to 3-30.

[30] These counties include much of the ACP's crossing of federal lands. *See* FEIS at 3-30.

[31] FEIS at 3-32. *See also* FERC Order on Rehearing at 73, 163 FERC ¶ 61,197 (June 15, 2018) ("The area's steep slopes and narrow ridgeways make construction of two adjacent pipelines technically infeasible."). FERC's assessment is supported by information submitted by MVP. *See* MVP Responses to FERC Environmental Information Request at 177 (Mar. 31, 2016) (March 31, 2016 Responses) ("Significant mountaintop removal and material excavation would be required to obtain a proper level construction surface to work on during the pipeline

Moreover, the Northern Pipeline – ACP Collocation Alternative would cross at least 19.1 miles of federal lands – more than five times as much as the previously approved MVP route.[32] Because a separate 125-foot-wide ROW may be required for each pipeline,[33] collocating the MVP with the ACP may result in a substantial increase in federal land disturbance compared with constructing each pipeline along its previously approved route.

Furthermore, the Northern Pipeline – ACP Collocation Alternative would include 22 more miles of side slope than the previously approved route, in addition to any side slope construction required by the need to fit two parallel pipelines on narrow ridgelines.[34] Construction along side slopes, where the gradient of the slope is perpendicular or oblique to the pipeline route, requires modified construction techniques and presents considerable safety and operational risks both during and after construction.[35] Although the terrain of the project area makes some degree of side slope construction unavoidable, and the project incorporates best management practices to mitigate the risks associated with side slopes, reducing side slopes is a key factor in comparing route alternatives for the MVP project.[36]

Finally, because the Northern Pipeline – ACP Collocation Alternative would diverge from the previously approved route at MP 37, and re-converge only at the MVP's endpoint at MP 303.5, this route alternative would bypass all three of the mid-route delivery points discussed above.[37] The two Roanoke Gas taps, in particular, could not be relocated so as to meet the ACP's route, meaning that an alternative that follows the ACP route would require either forfeiting the

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installation phase. … There is insufficient space along the tops of the ridgelines for two adjacent large diameter pipelines in these areas. Constructing two large diameter pipelines in the mountainous terrain would add significant construction personnel risk with the amount of equipment necessary to move and install both pipelines in the steep terrain. Sidebooms do not have enough weight capacity or levered distance to hold or move a second pipe over the first pipe trench. Erosion and sediment control risks significantly increase with the amount of soil and steep slope disturbance required for the two 42-inch pipelines ditch excavation and soil control."); Resource Report 10 at 10-16 (similar).

[32] *See* FEIS at 3-31. The version of the ACP route included in that project's final environmental impact statement may cross even more federal lands. *See* ACP Final Environmental Impact Statement at 4-423 (July 2017).

[33] FEIS at 3-29.

[34] *See* FEIS at 3-32.

[35] FEIS at 2-37, 3-4, 4-52 to 4-56; INGAA Rugged Terrain Report at 26-28, 40-41; McGuire August 16, 2018 Email.

[36] FEIS at 3-3. *See also* INGAA Rugged Terrain Report at 30 (recommending that side slope areas "should be identified early in the project design and planning processes, and minimized to the greatest extent possible"); *id.* at 61 ("Careful planning and routing is always preferred to avoid or minimize potential threats from landslide and erosion hazards, but mitigation is usually required when such hazards cannot be avoided.").

[37] *See* FEIS at 3-30.

purpose of serving this customer, or else building nearly 60 miles of additional pipeline in order to reach those taps.[38]

For these reasons, we conclude that the Northern Pipeline – ACP Collocation Alternative is not practical.

B. Highway Collocation Alternative

The Highway Collocation Alternative is a route alternative that would follow public roads for as much of its route as possible.[39] More specifically, this route alternative would mostly be collocated with interstate highways, intersecting the previously approved route in the vicinity of MP 60 and crossing the JNF alongside Interstate 77.[40] For purposes of this analysis, we assume that this route alternative would collocate the MVP with an interstate highway ROW for the MVP project's entire crossing of federal lands, and would therefore provide greater collocation on federal lands than the previously approved route.

The FEIS examined two versions of this collocated route alternative, one that would be located within the highway ROWs and one that would be located "adjacent to, but outside of," the highway ROWs.[41] The version that would be located outside the highway ROWs

> would likely present numerous and substantive construction challenges, including traversing roadway overpasses and underpasses, large interchanges, elevated sections of roadway including bridges, areas congested with development and homes, and narrow valleys where the most suitable terrain (i.e., flat) is already partially or fully encumbered by the roadway.[42]

The version of this route alternative that would be located within the highway ROWs, meanwhile, would likely be prohibited by state laws and policies.[43] In West Virginia, the state agency's utility placement policy "prohibits longitudinal occupancy inside the controlled access right of way, by any utility, on any type of [controlled] highway, ... except ... underground fiber

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[38] FEIS at 3-14. *See also* March 31, 2016 Responses at 177 ("[MVP] will also serve Roanoke Gas which is located along its Proposed Route in southwest Virginia; a market that cannot be served by moving to the Northern Pipeline Alternative route."); Resource Report 10 at 10-8, 10-16 (similar).

[39] FEIS at 3-18.

[40] FEIS at 3-18 to 3-19.

[41] FEIS at 3-18.

[42] FEIS at 3-18. This version of the Highway Collocation Alternative would not "utiliz[e a ROW] in common," and therefore does not satisfy section 28(p) for that reason, as well.

[43] Federal regulations permit state agencies to establish policies regarding utility installations in interstate highway ROWs. *See* 23 C.F.R. § 645.209(c)(1). *See also* 30 U.S.C. § 185(v) ("The Secretary or agency head shall take into consideration and to the extent practical comply with State standards for right-of-way construction, operation, and maintenance.").

optic facilities."[44] And in Virginia, where the JNF crossing is primarily located, state regulations provide that "[n]ew utilities will not be permitted to be installed parallel to the roadway longitudinally within the controlled or limited access right-of-way lines of any highway" except in "special cases," and even then only if such installation would not "involve tree removal or severe tree trimming."[45] This limitation on tree removal or trimming is likely incompatible with the placement of a natural gas pipeline.[46]

In addition, the Highway Collocation Alternative would be 142.5 miles (almost 47%) longer than the previously approved route, cross six times as many miles of federal lands, and cross more than twice as many perennial waterbodies, resulting in substantial additional costs and environmental impacts.[47] This route alternative would also cross an additional 51 miles of side slopes and an additional 125 miles of lands with landslide potential, amplifying the constructability concerns described above.[48] It would also bypass the three mid-route delivery points discussed above.[49]

For these reasons, we conclude that the Highway Collocation Alternative is not practical.[50]

C. Alternative 1/Hybrid Alternative 1A

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[44] *See* W. Va. Div. of Highways, *Accommodation of Utilities on Highway Right of Way and Adjustment and Relocation of Utility Facilities on Highway Projects*, at 2 (2007), *available at* https://transportation.wv.gov/highways/engineering/files/ACCOMMODATION_OF_UTILITIES.pdf.

[45] 24 Va. Admin. Code. § 30-151-301(2)(d). *See also* Va. Dep't of Trans., *Utility Manual of Instructions: Utility Relocation Policies & Procedures*, at 8-7 (2011), *available at* http://www.virginiadot.org/business/resources/right_of_way/utility_manual02132012_techrev.pdf. Such installations must also satisfy other requirements, including that "the installation will not adversely affect the safety, design, construction, operation, maintenance or stability of the highway," that "the accommodation will not interfere with or impair the present use or future expansion of the highway," and that "any alternative location would be contrary to the public interest," taking into account "the direct and indirect environmental and economic effects that would result from the disapproval of [such] use." *See* § 30-151-301(2)(a)-(c).

[46] *See* FEIS at 3-18.

[47] FEIS at 3-20.

[48] FEIS at 3-20.

[49] *See* FEIS at 3-19. Although such an alternative was not analyzed in the FEIS, it may be possible to construct a route alternative that generally follows the previously approved route, but deviates from that route between MPs 150 and 250 in order to cross the JNF along existing highways. *See* FEIS at 3-19. Such a hypothetical route alternative might avoid bypassing the three mid-route delivery points discussed above, but would otherwise be subject to most of the same practical concerns.

[50] *See also* FEIS at 3-17 ("This alternative concept is not evaluated in detail below due to the associated construction challenges, logistical constraints, and environmental impacts which we determined render it technically infeasible and/or as not providing a significant environmentally [sic] advantage compared to the proposed action.").

Alternative 1 was designed to maximize collocation with an existing electric transmission line.[51] Hybrid Alternative 1A is a variant that would follow the previously approved route through MP 135 and from there on follow the route of Alternative 1, re-converging with the previously approved route at its endpoint at MP 303.5.[52] These two route alternatives are considered together here, since they are identical at the JNF crossing.[53] Both route alternatives would result in greater collocation on federal lands than the previously approved route, crossing fewer miles of federal lands overall and being collocated with the existing transmission line for the entirety of that crossing.[54]

Collocating underground pipelines with electric transmission lines over long distances poses distinctive constructability and safety challenges that would be exacerbated in the circumstances of the MVP. Locating pipelines near transmission lines poses risks to pipeline workers from operating in close proximity to high voltage power lines, and increased risk of pipeline corrosion from interference with pipeline cathodic protection systems and from other forms of electrical interference.[55] These risks increase with parallel or near-parallel installation, especially at collocation lengths over a mile.[56] To mitigate these safety concerns, as well as concerns related to access for construction and operations, parallel installations typically involve adjacent or partially overlapping ROWs, rather than complete collocation.[57] Finally, because side slopes and

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[51] FEIS at 3-22. Alternative 1 was the original proposed alternative, but was supplanted by the previously approved route due to concerns regarding side slopes. *See* FEIS at 3-17; Resource Report 10 at 10-10 to 10-11.

[52] FEIS at 3-25.

[53] Another route alternative, known as Hybrid Alternative 1B, would follow Alternative 1 through MP 135 and from there on follow the previously approved route. *See* FEIS at 3-25 to 3-26. Hybrid Alternative 1B is not considered here, since it would be identical to the previously approved route at the JNF crossing.

[54] *See* FEIS at 3-24, 3-27; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

[55] *See generally* INGAA Foundation, Inc., Final Report No. 2015-04, *Criteria for Pipelines Co-Existing with Electric Power Lines* (2015) (INGAA Power Lines Report), *available at* http://www.ingaa.org/File.aspx?id=24732; McGuire August 16, 2018 Email.

[56] *See* INGAA Power Lines Report at 4, 45-49. The previously approved route would be collocated with electric transmission lines for numerous short stretches, but rarely for distances of a mile or more. *See* FEIS App'x P at P-1 to P-8.

[57] *See* McGuire August 16, 2018 Email (noting that in a typical configuration, the 50-foot-wide permanent pipeline ROW would be adjacent to the transmission line ROW, and the pipeline's temporary 100- to 125-foot-wide construction ROW would overlap with the transmission line ROW by 25 feet); FEIS at 3-22 ("The pipeline could be installed as close as 25 feet away from powerline infrastructure, with temporary workspace located even closer, but other configurations would also be required based on soil type and working conditions where the pipeline would be located much further away."). *See also* FEIS App'x P at P-1 to P-8 (listing offset distances between the centerline of the previously approved route and the edges of existing transmission line ROWs); INGAA Power Lines Report at 4, 46 (noting that interference risk is "Medium" for separation distances of 100 to 500 feet, and "High" for distances under 100 feet). MVP has also noted that constructing a major pipeline in the immediate vicinity of an electric transmission line poses "[c]onstructability and safety issues associated with ... the possibility of undermining

steep slopes[58] of the kind frequently encountered along the MVP's route pose a far greater challenge for pipelines than for electric transmission lines, which have a far smaller physical footprint and are capable of spanning stretches of challenging terrain, routes that are suitable for transmission line construction may be unsuitable for pipeline construction.[59] Therefore, while collocation with electric transmission lines can often be achieved, including in parts of the previously approved route of the MVP, the challenges of such collocation are highly relevant to the practicality analysis.

Alternative 1 would be over twenty miles longer than the previously approved route,[60] resulting in significant additional construction costs, and would pose significant technical challenges. In particular, Alternative 1 would cross 171.4 miles of steep slopes in excess of 20% grade – 42.8 miles more than the previously approved route, and over half the entire length of Alternative 1.[61] Alternative 1 would also cross more miles of side slope than the previously approved route, including over 100 miles of "severe side slopes,"[62] and would include two crossings of the New River, which the previously approved route avoids crossing.[63] These factors would pose substantial constructability and safety challenges.[64]

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power line towers." MVP Responses to Data Requests issued January 27, 2017, at 570 (Feb. 17, 2017) (February 17, 2017 Responses).

[58] Construction along steep slopes where the gradient of the slope is parallel to the pipeline route poses many of the same challenges as construction along side slopes, though such challenges are typically less severe than in side slope conditions. FEIS at 2-49, 3-25, 4-28, 4-45, 4-52 to 4-56; INGAA Rugged Terrain Report at 7, 24. *See also* MVP Responses to Data Requests issued December 24, 2015, at 238 (Jan. 15, 2016) (describing construction and safety challenges associated with steep slopes).

[59] *See* McGuire August 16, 2018 Email. *See also* Resource Report 10 at 10-10 to 10-11 ("While the overhead transmission lines span significant areas of slide [sic] slope, these areas would be required to be crossed directly by the pipeline."); February 17, 2017 Responses at 570 ("It is also important to recognize that the design requirements for a ROW for one type of infrastructure are not necessarily the same for other types of infrastructure.").

[60] FEIS at 3-24.

[61] *See* FEIS at 3-24.

[62] FEIS at 3-24; Resource Report 10 at 10-10, 10-14.

[63] FEIS at 3-24. As explained by FERC staff, crossing the New River poses both constructability challenges and environmental concerns. *See* McGuire August 16, 2018 Email ("The New River in the immediate vicinity of the proposed route ranges from about 300 to 350 feet wide (a major river crossing). It is not a complete obstacle, as it could be crossed (likely via [horizontal directional drilling], although with a risk of an inadvertent release of drilling mud into the River), however as a significant environmental resource, avoidance (which was accomplished with the proposed route) if possible was preferred."). Alternative 1 would also cross 38 more perennial waterbodies and 14.5 more miles of karst terrain. FEIS at 3-24.

[64] *See also* Resource Report 10 at 10-11 ("MVP determined that Route Alternative 1 represented insurmountable construction challenges, as well as a high risk of slope failure and pipeline slips, once the pipeline was to be in operation. … [M]uch of the existing right-of-way was ultimately found unsuitable for pipeline construction … .").

Hybrid Alternative 1A would pose many of the same challenges as Alternative 1. While this route alternative would be shorter than Alternative 1 and include fewer miles of steep slope, it would still be 6.3 miles longer than the previously approved route, and feature 140.8 miles of steep slope (almost 10% more than the previously approved route), as well as both crossings of the New River.[65] Hybrid Alternative 1A would also cross 177.2 miles of side slope (over 10% more than the previously approved route, exceeding even Alternative 1), and a significant portion of the "severe side slope" crossed by Alternative 1.[66] The additional miles of steep slope and side slope, compared with the previously approved route, would "present[] substantially more obstacles to safe construction, increas[e] extra workspace requirements, and potentially affect[] worksite stability during construction and after restoration."[67]

Both Alternative 1 and Hybrid Alternative 1A would also pose constructability challenges associated with the necessary crossing of the Blue Ridge Parkway. While the previously approved route would cross the Parkway in an open grassy area, allowing the pipeline to bore under the Parkway, Alternative 1 and Hybrid Alternative 1A would cross the Parkway in a location flanked on one side by a wetland and floodplain and on the other by a short, steep slope, which together would complicate the boring process.[68]

In addition, Alternative 1 would bypass the three mid-route delivery points discussed above, while Hybrid Alternative 1A would bypass two of the three.[69]

For these reasons, we conclude that Alternative 1 and Hybrid Alternative 1A are not practical.

D. Variations 110, 110R, and 110J

Variations 110, 110R, and 110J were developed in order to avoid a number of sensitive resources located in the general vicinity of the JNF crossing, between MPs 175 and 235.[70] Each of these variations would cross more miles of federal lands than the previously approved route but would be collocated for fewer of those miles.[71] Therefore, these route alternatives do not satisfy the criteria of section 28(p).[72]

E. SR 635-ANST Variation

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[65] FEIS at 3-25, 3-27 to 3-28. Hybrid Alternative 1A would also cross 22 more perennial waterbodies. FEIS at 3-27.
[66] FEIS at 3-24 to 3-25, 3-28; Resource Report 10 at 10-14.
[67] FEIS at 3-25.
[68] FEIS at 4-324 to 4-325; Resource Report 10 at 10-61.
[69] *See* FEIS at 3-26.
[70] FEIS at 3-44 to 3-45.
[71] *See* McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.
[72] Furthermore, we note that Variation 110 crosses a designated wilderness area within the JNF, which renders this route variation impractical. *See* FEIS at 3-44, 3-46. *See also* Letter from U.S. Forest Service to FERC (May 16, 2016) (noting lack of authority to approve a pipeline within a wilderness area).

The SR 635-ANST Variation, located between MPs 191.7 and 207.8, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the Appalachian National Scenic Trail (ANST) by crossing the ANST at the same location as an existing state road.[73] This route variation would cross 2.9 miles more federal lands than the previously approved route, and would not be collocated for any part of its crossing.[74] Therefore, the SR 635-ANST Variation does not satisfy the criteria of section 28(p).[75]

F. CGV Variation

The CGV Variation, located between MPs 195 and 200, was developed in order to examine the feasibility of collocating the MVP with two existing pipelines that cross the JNF.[76] This route alternative would provide increased collocation on federal lands, replacing a 1.7 mile crossing of federal lands of which 1 mile is collocated with a 1.6 mile crossing that is mostly or entirely

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[73] FEIS at 3-52.

[74] FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the SR 635-ANST Variation would cross the ANST at the same location as the state road, the route alternative would not continue alongside that existing road. *See* McGuire August 16, 2018 Email. To the contrary, due to the topography of the area, the SR 635-ANST Variation would be forced to parallel the ANST for one mile. *See* MVP Responses to Data Requests issued January 27, 2017 and Supplemental Materials (Mar. 2, 2017) (March 2, 2017 Responses) at 39; MVP Additional Responses to June 28, 2016 Data Request at 63 (July 18, 2016) (July 18, 2016 Responses). In light of the purpose of section 28(p), we do not consider the ANST, which is a congressionally designated national scenic trail, *see* 16 U.S.C. § 1244(a)(1), to be an existing ROW with which Congress intended to encourage collocation of pipelines.

[75] Moreover, even if the SR 635-ANST Variation provided greater collocation than the previously approved route, this route alternative would be impractical. The environmental, constructability, and safety effects of the SR 635-ANST Variation would be mixed: the variation would be 1.5 miles shorter and would affect 89.2 fewer acres of interior forest, but would cross 2.9 more miles of federal lands and cross more wetlands, perennial waterbodies, and miles of inventoried roadless areas; similarly, the variation would cross fewer miles of steep slope and side slope, but more miles of land with landslide potential. FEIS at 3-52. More importantly, however, the SR 635-ANST Variation would be unlikely to succeed at its purpose, to reduce the impact of the MVP on ANST users. Whereas the previously approved route would cross the ANST perpendicularly, and preserve a 300-foot forested buffer on either side of the ANST by boring under the trail, the SR 635-ANST Variation would be forced to parallel the trail for about a mile, as noted above, likely increasing visual impacts on the trail. See FEIS at 3-52 to 3-53; March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Moreover, the low topography of the trail crossing site would limit the length of the borehole, eliminating the forested buffer and further increasing the visual impacts. March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Furthermore, the SR 635-ANST Variation would bring the MVP ROW closer to the ANST's Wind Rock overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 39. For these reasons, the SR 635-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST, rendering the route impractical.

[76] FEIS at 3-48.

collocated.[77] The elimination of less than three-quarters of a mile of uncollocated crossing of federal lands would come at a cost of 9 more miles of total pipeline, however, including 4.1 more miles of steep slope and 4.6 more miles of side slope.[78] The CGV Variation would also result in 136.3 more acres of construction disturbance, including 60.8 more acres on forested land; increase the MVP's potential impacts on the watershed relied on by the Red Sulphur Public Service District, a public water supply utility; and bring the MVP ROW closer to the ANST's Angel's Rest overlook, increasing visual impacts on this overlook.[79] For these reasons, we conclude that the CGV Variation is not practical.

G. AEP-ANST Variation

The AEP-ANST Variation, located between MPs 195.4 and 200, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the ANST by crossing the ANST at the same location as an existing electric transmission line.[80] The AEP-ANST Variation would cross approximately 0.9 more miles of federal lands than the previously approved route, while providing, at best, no more than 0.8 miles of additional collocation on federal lands.[81] Because the AEP-ANST Variation involves at least 0.1 mile more uncollocated crossing of federal lands, this route alternative provides less net collocation on federal lands, and does not satisfy the criteria of section 28(p).[82]

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[77] FEIS at 3-50; *id.* App'x P at P-6; POD at 1-7; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the FEIS indicates that the relevant portion of the previously approved route contains zero miles "adjacent to existing right-of-way," this figure considers only major features such as transmission lines and pipelines, and excludes the previously approved route's collocation with a forest road, as noted above. See FEIS at 3-20, 3-50.

[78] FEIS at 3-50; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. Underscoring the constructability and safety concerns associated with the additional steep slopes and side slopes, the same pipeline ROW with which this route alternative would be collocated was previously the site of a slope failure related to side slopes. *See* FEIS at 4-45, 4-67, 4-69. *See also* INGAA Rugged Terrain Report at 7 (noting that "[l]andslide and erosion hazards are more commonly found, or created, ... where the proposed alignment intersects existing landslide[s]").

[79] FEIS at 3-50; March 2, 2017 Responses at 44.

[80] FEIS at 3-52, 3-55.

[81] *See* FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

[82] The AEP-ANST Variation would also pose constructability and safety concerns. The general concerns related to collocating the MVP with electric transmission lines are discussed above. In the specific context of the AEP-ANST Variation, these challenges include more miles of steep slope, side slope, shallow bedrock, and areas with landslide potential than the previously approved route. FEIS at 3-54. Moreover, this route alternative would be 3.2 miles longer, would cross more perennial waterbodies and forested land (but less inventoried roadless area, inventoried semi-primitive area, interior forest, and karst area), would result in an additional 48.9 acres of construction disturbance and a larger area of forested land disturbance during both construction and operation, and would increase the MVP's potential impacts on the Red Sulphur Public Service District watershed. FEIS at 3-54; March 2, 2017 Responses at 40.

H. Brush Mountain Alternatives 1 and 2

Brush Mountain Alternatives 1 and 2, located between MPs 219.5 and 220.7, were developed in order to reduce impacts to the Craig Creek watershed.[83] Brush Mountain Alternative 1 would feature the same amount of federal lands crossing and the same amount of collocation as the previously approved route, and therefore does not satisfy the criterion of providing greater collocation on federal lands.[84] Brush Mountain Alternative 2, meanwhile, may provide greater collocation, but by no more than 0.22 miles.[85] Any such increase in collocation, meanwhile, would come at the cost of a larger increase in the total mileage (0.3 additional miles), the mileage of side slope (0.4 additional miles), and the mileage of lands with landslide potential (0.3 additional miles).[86] Because Brush Mountain Alternative 2 would entail greater

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Furthermore, like the SR 635-ANST Variation, the AEP-ANST Variation would be unlikely to accomplish its purpose of reducing impacts on users of the ANST. Under either the AEP-ANST Variation or the previously approved route, hikers would experience a clearing at the location where the trail crosses the existing electric transmission line, and no clearing where the previously approved route crosses the trail (due to the 300-foot forested buffer). *See* FEIS at 3-52, 4-312; FEIS App'x S figs. 1a to 7b. The majority of new visual impacts on trail users would therefore occur, under either scenario, not due to near-field impacts at the location where the previously approved route crosses the trail, but rather due to more distant views of the MVP ROW from various points along the trail. *See* FEIS at 4-312; *see generally* FEIS App'x S. The AEP-ANST Variation would not reduce the overall visual footprint of the MVP ROW, and may in fact increase that overall footprint due to the larger area of forested land disturbance. *See also* March 2, 2017 Responses at 40 (noting that "the visual impact on ANST users would likely be greater because of the open view that trail users have when within the [transmission line] right-of-way"). Moreover, the AEP-ANST Variation would also bring the MVP ROW closer to the Angel's Rest overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 40. Therefore, the AEP-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST

For these reasons, we conclude that the AEP-ANST Variation is not practical.

[83] FEIS at 3-61 to 3-62.

[84] FEIS at 3-64; Neylon August 17, 2018 Email. Brush Mountain Alternative 1 also poses a significant constructability and safety concern related to an area of especially steep slope, over 43% grade. FEIS at 3-62 to 3-64; March 2, 2017 Responses at 47; MVP Responses to Data Requests issued January 27, 2017, at 139 (Feb. 23, 2017).

[85] One assessment estimated that Brush Mountain Alternative 2 would cross 1.3 miles of federal lands with no collocation, and therefore would offer no collocation advantage. *See* Neylon August 17, 2018 Email. The other assessment estimated that the route alternative would cross 1.18 miles of federal lands with 0.4 miles of collocation, for a net of 0.78 miles of federal lands without collocation. McGuire August 16, 2018 Email. By contrast, the corresponding segment of the previously approved route would cross 1.0 miles of federal lands, with between 0 and 0.2 miles of collocation, for a net of between 0.8 and 1.0 miles of federal lands without collocation. Neylon August 17, 2018 Email; FEIS at 3-64.

[86] FEIS at 3-64; MVP Responses to Data Requests issued January 27, 2017, at 140 (Feb. 23, 2017); March 2, 2017 Responses at 48. The FEIS also concluded that Brush Mountain Alternative 2 would not offer a significant environmental advantage compared to the previously

constructability and safety challenges than the previously approved route while providing at best a marginal increase in collocation on federal lands, we conclude that this route alternative is impractical.

I. Slussers Chapel Variations

The Slussers Chapel Variations consist of two route alternatives located between MPs 220.7 and 223.7 that were developed in order to reduce impacts on the Slussers Chapel Conservation Site.[87] One route alternative, Modified Variation 250, would replace a portion of the route located entirely on non-federal lands with a route that would cross 2.3 miles of federal lands, and therefore does not satisfy the criterion of increased collocation on federal lands.[88] The other route alternative, the VADCR Slussers Chapel Conservation Site Avoidance Variation, would replace a portion of the route that crosses 0.04 miles of federal lands with a route that would cross 2.54 miles of federal lands, and therefore does not appear to satisfy this criterion, either.[89] This route alternative would also traverse a narrow ridgetop with a designated wilderness area on one side, steep slopes on the other side, and an existing forest road along the ridge, posing significant constructability and safety concerns that the previously approved route avoids and that render this route alternative impractical.[90] For these reasons, we conclude that these route alternatives do not satisfy the criteria of section 28(p).

IV. Conclusion

As the analysis above demonstrates, none of the route alternatives would result in greater collocation on federal lands and be practical. Several of the route alternatives would not result in greater collocation on federal lands. Each of the remaining route alternatives would be impractical due to a combination of constructability and safety challenges, increased

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approved route. FEIS at 3-65. Because the purpose of Brush Mountain Alternative 2 is to reduce environmental impacts, *see* FEIS at 3-61 to 3-62, the failure to achieve a significant environmental advantage also renders this route alternative impractical.

[87] FEIS at 3-69 to 3-70. A third route alternative, Variation 250, would not affect the MVP's crossing of federal lands, and therefore is not relevant to this analysis. FEIS at 3-71. Moreover, Variation 250 was adopted by FERC and incorporated into the MVP route. FERC Certificate at 60; *id.* App'x C at 7.

[88] FEIS at 3-71, 3-74.

[89] FEIS at 3-72.

[90] FEIS at 3-69. *See also* February 17, 2017 Responses at 195-196 ("[The Slussers Chapel Variation] significantly increases the construction risks due to its placement along the ridgeline of Brush Mountain. There is an existing Forest Service Road (Forest Road 188/Brush Mountain Road) along the ridge top, with the boundary of Brush Mountain Wilderness north of and parallel to the road. Mountain Valley would need to maintain a 50-foot buffer between the Wilderness Boundary and the edge of construction work area, which would require that the 125-foot-wide construction right-of-way encompass Forest Road 188 as well as significant side slope areas along the south side of the road. In addition, during construction, this section of Forest Road 188 would be closed for an extensive period of time to regular vehicle or foot traffic.").

environmental impacts, increased length and footprint, increased cost,[91] and inability to serve the purposes of the MVP or the specific purpose of the route alternative in question. Therefore, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

Sincerely,

Mitchell Leverette

Mitchell Leverette
Acting State Director, Bureau of Land Management, Eastern States

X I concur _____ I do not concur

Joseph R. Balash
Assistant Secretary - Land and Minerals Management, U.S. Department of the Interior

[91] As noted above, the BLM has considered the information presented above about length and construction challenges as a proxy for cost information.

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Falls Church, Virginia 22041
https://www.blm.gov/eastern-states

September 2, 2020

IN REPLY REFER TO:
2800 (020) VMC
VAES-058143-02

Mountain Valley Pipeline Project – Revised Mineral Leasing Act Application
Addendum to the BLM's 2018 Practicality Analysis of Collocation Route Alternatives for the MVP Project Consistent with 30 U.S.C. § 185(p)
BLM, Eastern States Office

The Bureau of Land Management (BLM) has prepared this addendum to the supplemental analysis from August 23, 2018 (referred to hereinafter as "2018 Practicality Analysis") regarding the Mountain Valley Pipeline (MVP) Project.[1] *See* Attached. The purpose of this addendum is to update the 2018 Practicality Analysis based on Mountain Valley's revised Mineral Leasing Act (MLA) right-of-way (ROW) application. As discussed below, this addendum is consistent with the U.S. Court of Appeals for the Fourth Circuit's decision in *Sierra Club, Inc. v. U.S. Forest Serv.*, 897 F.3d 582 (4th Cir. 2018), *reh'g granted in part*, 739 Fed. App'x 185 (4th Cir. 2018), and the requirements of 30 U.S.C. § 185(p).

Background

In December 2017, the BLM issued a record of decision (ROD) approving Mountain Valley's application to cross federal land managed by the U.S. Forest Service (USFS) and the U.S. Army Corps of Engineers (USACE) pursuant to the MLA, 30 U.S.C. § 185, *et seq.* The BLM issued a ROW grant and temporary use permit to Mountain Valley for approximately 3.5 miles and 60 feet through USFS and USACE lands respectively. In issuing its decision, the BLM adopted and relied on the Federal Energy Regulatory Commission's (FERC) Final Environmental Impact Statement (FEIS) for purposes of compliance with the National Environmental Policy Act (NEPA).

Environmental organizations challenged the BLM's decision, as well as the USFS's decision relating to the MVP Project. On July 27, 2018, the U.S. Court of Appeals for the Fourth Circuit vacated the BLM's ROD and ROW grant through USFS lands.[2] The court rejected Plaintiffs' claims that the BLM's adoption and reliance on the FERC FEIS violated NEPA. Nevertheless, the court found that the BLM's ROD did not address whether "the utilization of an existing right

[1] In light of Mountain Valley's revised application, the BLM has reviewed the 2018 Practicality Analysis and determined that the analysis remains valid.
[2] The court also vacated and remanded the USFS's decision on NEPA and National Forest Management Act grounds.

of way would be *impractical*," and specified that the BLM on remand must "favor[] routes utilizing existing rights of way unless those alternatives [are] impractical."[3]

On August 23, 2018, as directed by the court, the BLM prepared an analysis of the route alternatives examined in the FERC FEIS to determine whether the alternatives provided for collocation of the proposed ROW on federal land to the extent practical. Section 28(p) of the MLA provides that "[i]n order to minimize adverse environmental impacts and the proliferation of separate rights-of-way across Federal lands, the utilization of rights-of-way in common shall be required to the extent practical."[4] The BLM's analysis set forth criteria to assess whether a route alternative is practical. Based on this analysis, the BLM concluded that "none of the route alternatives would result in greater collocation on federal lands" and therefore "the additional utilization of existing ROWs across federal land would be impractical."[5] The BLM submitted the 2018 Practicality Analysis to FERC for inclusion in the MVP Project docket.

On May 1, 2020, Mountain Valley submitted to the BLM a revised MLA ROW application. Mountain Valley's revised application seeks approval for the same proposal that BLM approved in 2017 and includes the previously examined route alternatives, which were analyzed in the FERC FEIS. The revised application also identifies two additional route alternatives not considered in the FERC FEIS. As a result, this addendum serves only to update the 2018 Practicality Analysis to consider the two additional route alternatives in the context of the practicality analysis.

Analysis

This analysis incorporates relevant information from Mountain Valley's revised application and the USFS's Draft Supplemental EIS (SEIS), which the BLM is serving as a cooperating agency. It also relies on the Section 28(p) criteria described in the 2018 Practicality Analysis - (1) whether the route alternative would result in greater collocation with other ROWs on federal lands than the route that was previously approved by the BLM, and (2) whether the route alternative would be practical.[6]

1. *Forest Service Avoidance Alternative*

As described in the revised application, this route alternative "would entirely avoid any crossing of National Forest System Lands."[7] The location of this route alternative would be in the northern portion in West Virginia around milepost 20, heading east across the lower tip of Western Maryland and through Northern Virginia, and then connect with the existing Transco Pipeline.[8] As examined in the Draft SEIS, this alternative would increase the pipeline length by approximately 48 miles, increase land disturbance by 745 acres, increase the pipeline in populated areas within ½ mile from 8 to 31, and increase use of private lands crossed by 248

[3] *See Sierra Club*, 897 F.3d at 604-05 (emphasis in the original).
[4] 30 U.S.C. § 185(p).
[5] 2018 Practicality Analysis at 16-17.
[6] *Id.* at 1-4.
[7] Mountain Valley Pipeline Revised SF 299 at Attachment A, p. 10 (May 1, 2020).
[8] *See id.* at Attachment A, Fig. 3-a2 p. 12; *see also* MVP Draft SEIS at Figure 2, p. 26.

parcels.[9] This route alternative would still cross the Appalachian National Scenic Trail and Blue Ridge Parkway.[10]

Under the Section 28(p) first criterion, this route alternative would not require the collocation of federal land within the BLM's jurisdiction under the MLA and thus does not offer a comparison between alternatives that provide for collocation on federal land. To the extent that the BLM must consider the second criterion – "practicality," the BLM finds this route alternative to be impractical. First, this route alternative is beyond the BLM's authority and essentially would represent the no action alternative; it would not require Mountain Valley to obtain an MLA ROW from the BLM.[11] Second, and beyond this jurisdictional problem, FERC, as the lead federal agency under the Natural Gas Act, has already issued the certificate of public convenience and necessity for the proposed route,[12] and Mountain Valley has constructed 256 miles of the 303.5 miles of pipe.[13] Third, this route alternative would significantly increase the use of private land, disruption of populated areas, and impacts to more natural resources, e.g., 11 additional large waterbody crossings and 15,000 feet of wetland crossings.[14] Fourth, it would significantly increase the total length of the pipeline by nearly 50 miles.[15] Such an increase in miles, particularly given that nearly 84 percent of the pipeline is already constructed, would represent a significant increase in costs. All of these factors taken together, especially for the stated purpose of avoiding 3.5 miles of National Forest Service lands, even if this route alternative may increase collocation on non-federal land, would be impractical. Therefore, this route alternative does not satisfy the criteria set forth in 30 U.S.C. § 185(p).

2. *Burnsville Weston Gauley Alternative*

The revised application describes an additional route alternative as deviating from the proposed alternative from approximately milepost 60 to 75 and traversing to the west around the Burnsville Lake WMA.[16] This route alternative would be 19.2 miles, roughly 3.7 miles longer than the proposed alternative, and parallel to an existing natural gas pipeline for 6 miles.[17] As

[9] MVP Draft SEIS at 25.
[10] *Id.*
[11] Under the MLA, the BLM has authority to grant rights-of-way through "federal land." 30 U.S.C. § 185(a). The MLA defines "federal lands" as "all lands owned by the United States except lands in the National Park System, lands held in trust for an Indian or Indian tribe, and lands on the Outer Continental Shelf." *Id.* § 185(b)(1). In this case, the BLM has authority under the MLA because the pipeline proposes to cross federal lands managed by two or more federal agencies. *Id.* § 185(c)(2).
[12] On October 13, 2017, FERC issued a Certificate of Public Convenience and Necessity, which approved the proposed route. Even though FERC serves as the lead agency for interstate natural gas pipelines, an applicant must obtain approval from other federal agencies to cross federal lands (or obtain other necessary permits or approvals associated with a pipeline). Importantly, as is the case here, the BLM only has authority under the MLA as it relates to the proposed use of federal lands associated with a proposed pipeline.
[13] MVP Draft SEIS at 3 (noting also that 155 miles of land along the pipeline ROW is in final restoration).
[14] Mountain Valley Pipeline Revised SF 299 at Attachment A, p. 10-12; *see also* MVP Draft SEIS at 24-26.
[15] *Id.* at 10; *see also* MVP Draft SEIS at 24.
[16] *Id.* at 16; Figure 13a-3.5.
[17] *Id.*

noted in the revised application, it "would cross more private landowners, be closer to three additional homes, impact more forested land, and cross steeper slope and landslide prone areas" and it was further identified as prohibitive "due to the steep terrain, previously existing utilities, other environmental concerns and proximity to residences and/or populated areas."[18] This route alternative would avoid the USACE lands (60 feet), which Mountain Valley already holds a valid MLA ROW, but otherwise would not change the proposed alternative crossing of 3.5 miles of the National Forest System lands.[19]

Under the Section 28(p) first criterion, this route alternative would not offer a different opportunity for greater collocation on federal land within the BLM's jurisdiction under the MLA, and thus does not offer a comparison between alternatives that provide for collocation on federal land. To the extent that the BLM must consider the second criterion – "practicality," the BLM finds this route alternative to be impractical. First, this route alternative is beyond the BLM's authority because, aside from the MLA ROW across USACE lands, it would not cross federal lands.[20] Second, as noted above, FERC, as the lead federal agency under the Natural Gas Act, has already issued the certificate of public convenience and necessity for the proposed route,[21] and Mountain Valley has constructed 256 miles of the 303.5 miles of pipe.[22] Third, the route alternative would increase environmental impacts, create constructability issues associated with steeper lands, and create potential safety issues associated with proximity to residences and/or populated areas.[23] These factors, plus the lack of change to the proposed alternative's use of National Forest System lands, make this route alternative impractical.

Conclusion

In conclusion, the BLM has evaluated the two additional route alternatives through the practicality analysis and determined that neither of these alternatives represents a practical alternative that provides for greater collocation on federal land. This analysis is intended only as an addendum to the 2018 Practicality Analysis. The 2018 Practicality Analysis remains valid.

[18] *Id.*
[19] *Id.*
[20] *See supra* note 11. Additionally, Mountain Valley has already completed construction of the pipeline across USACE via conventional boring. *See* Mountain Valley Pipeline Revised SF 299 at page 1.

[21] *See supra* note 12.
[22] *See supra* note 13.
[23] Mountain Valley Pipeline Revised SF 299 at Attachment A, p. at 16.

Appendix B – Federally Listed Species and Regional Forester Sensitive Species

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Table B-1. Federally Listed Species and Regional Forester Sensitive Species Addressed in the SEIS.

Group	Listing (2020)	Species Name	Common Name	Screening / Survey Result	Survey status	2017 BE	2018 RFSS	2020 SBA
Fish	Federal E	*Etheostoma osburni*	Candy darter	Suspected downstream of project/activity area. Within cumulative effects area	N/A	X		X
Fish	RFSS	*Notropis semperasper*	Roughhead shiner	Suspected downstream of project/activity area. Within cumulative effects area	N/A	X		
Fish	RFSS	*Noturus gilberti*	Orangefin madtom	Suspected downstream of project/activity area. Within cumulative effects area	N/A	X		
Fish	Federal E	*Percina rex*	Roanoke logperch	Suspected downstream of project/activity area. Outside cumulative effects area	N/A			X
Fish	RFSS	*Phenacobius teretulus*	Kanawha minnow	Suspected downstream of project/activity area. Within cumulative effects area	N/A	X		

Table B-1 (continued). Federally Listed Species and Regional Forester Sensitive Species Addressed in the SEIS.

Group	Listing (2020)	Species Name	Common Name	Screening / Survey Result	Survey status	2017 BE	2018 RFSS	2020 SBA
Mussel	Federal T	*Elliptio lanceolata*	Yellow lance	Suspected downstream of project/activity area. Outside cumulative effects area	N/A	X		X
Mussel	Federal E	*Epioblasma triquetra*	Snuffbox	N/A	N/A			X
Mussel	Proposed Federal T	*Fusconaia masoni*	Atlantic pigtoe	Suspected downstream of project/activity area. Outside cumulative effects area	N/A	X		X
Mussel	RFSS	*Lasmigona subviridis*	Green floater	Suspected downstream of project/activity area. Within cumulative effects area	N/A	X		
Mussel	Federal E	*Pleurobema clava*	Clubshell	No records on the JNF	N/A			X
Mussel	Federal E	*Parvaspina collina*	James spinymussel	Suspected downstream of project/activity area. Outside cumulative effects area	N/A			X
Dragonfly	RFSS	*Hylogomphus viridifrons*	Green-faced clubtail	New R, Craig Ck, Pound R, Locust Spring	N/A	X		
Dragonfly	-	*Ophiogomphus incurvatus alleghaniensis*	Allegheny snaketail	No longer on RFSS List	N/A	X		

Table B-1 (continued). Federally Listed Species and Regional Forester Sensitive Species Addressed in the SEIS.

Group	Listing (2020)	Species Name	Common Name	Screening / Survey Result	Survey status	2017 BE	2018 RFSS	2020 SBA
Butterfly	RFSS	*Atrytone arogos*	Arogos skipper	Historic records, Blacksburg area.	Assume presence		X	
Butterfly	RFSS	*Calephelis borealis*	Northern metalmark	Montgomery County and historical records from Giles County	Assume presence		X	
Butterfly	RFSS	*Danaus plexippus*	Monarch	Suitable habitat occurs	Assume presence		X	
Butterfly	RFSS	*Erora laeta*	Early hairstreak	Historical records from Giles, Montgomery Cos.	Assume presence		X	
Butterfly	RFSS	*Erynnis martialis*	Mottled duskywing	Historical records from Montgomery County	Assume presence		X	
Butterfly	-	*Speyeria diana*	Diana fritillary	No longer on RFSS List	N/A	X		
Butterfly	RFSS	*Speyeria idalia*	Regal fritillary	Habitat present	Assume presence	X		
Bee	Federal E	*Bombus affinis*	Rusty patched bumble bee	Habitat present outside of Action Area	N/A			X
Beetle	-	*Hydraena maureenae*	Maureen's shale stream beetle	No longer on RFSS List	N/A	X		
Liverwort	RFSS	*Plagiochila virginica*	A liverwort	Not observed	Survey completed; no individuals found		X	

Table B-1 (continued). Federally Listed Species and Regional Forester Sensitive Species Addressed in the SEIS.

Group	Listing (2020)	Species Name	Common Name	Screening / Survey Result	Survey status	2017 BE	2018 RFSS	2020 SBA
Liverwort	RFSS	*Radula tenax*	A liverwort	Not observed	Survey completed; no individuals found		X	
Mammal	Federal E	*Corynorhinus townsendii virginianus*	Virginia big-eared bat	No records on JNF	N/A			X
Mammal	Federal E	*Myotis grisescens*	Gray bat	No records on JNF	N/A			X
Mammal	RFSS	*Myotis leibii*	Small-footed bat	Species in project area, outside of activity area	Assume presence	X	X	
Mammal	Federal T	*Myotis septentrionalis*	Northern long eared bat	Habitat present, species not found previously	N/A			X
Mammal	Federal E	*Myotis sodalis*	Indiana bat	Habitat present, species not found previously	N/A			X
Mammal	RFSS	*Perimyotis subflavus*	Tricolored bat	Not captured on JNF	Assume presence		X	
Vascular Plant	Federal E	*Arabis serotina*	Shale barren rock cress	No records on JNF	N/A			X
Vascular Plant	RFSS	*Berberis canadensis*	American barberry	Species in project area, outside of activity area	N/A	X		
Vascular Plant	RFSS	*Clematis coactilis*	Virginia white haired leatherflower	Survey completed; no individuals found	Not observed		X	
Vascular Plant	RFSS	*Delphinium exaltatum*	Tall larkspur	Survey completed; no individuals found	Not observed		X	

Table B-1 (continued). Federally Listed Species and Regional Forester Sensitive Species Addressed in the SEIS.

Group	Listing (2020)	Species Name	Common Name	Screening / Survey Result	Survey status	2017 BE	2018 RFSS	2020 SBA
Vascular Plant	Federal E	*Echinacea laevigata*	Smooth coneflower	Lack of suitable habitat	Not observed			X
Vascular Plant	Federal T	*Isotria medeoloides*	Small whorled pogonia	Lack of suitable habitat	N/A			X
Vascular Plant	RFSS	*Monotropsis odorata*	Sweet pinesap	Habitat present	Assume presence	X		
Vascular Plant	RFSS	*Scutellaria saxatilis*	Rock skullcap	Species located in activity area	N/A	X		
Vascular Plant	Federal T	*Spiraea virginiana*	Virginia spiraea	Lack of suitable habitat	N/A			X
Vascular Plant	RFSS	*Talinum teretifolium*	Quill fameflower	Survey completed; no individuals found	Not observed		X	
Vascular Plant	Federal E	*Trifolium stoloniferum*	Running buffalo clover	No records on JNF	N/A			X

RFSS = Regional Forester Species, Federal E = federally endangered, Federal T = federally threatened, SBA = 2020 Supplemental Biological Assessment.

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