



June 16, 2015

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Norman C. Bay, Chairman
Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Re: Comments on FERC's Notice to Prepare an EIS for the Planned Mountain Valley Pipeline Project, FERC Docket No. PF15-3-000

Dear Chairman Bay and Secretary Bose:

Thank you for the opportunity to submit scoping comments on the proposed Mountain Valley Pipeline Project (FERC Docket No. PF15-3-000) ("Mountain Valley Pipeline" or "MVP"). Please accept the attached comments on behalf of Appalachian Mountain Advocates; the Southern Environmental Law Center; the Center for Biological Diversity; Ohio Valley Environmental Coalition; West Virginia Highlands Conservancy; Virginia Chapter of the Sierra Club; West Virginia Chapter of the Sierra Club; West Virginia Rivers Coalition; Natural Resource Defense Council; Allegheny Defense Project; Friends of Nelson; Wild Virginia; Preserve Craig County, VA; Preserve Montgomery County, VA; Preserve Giles County, VA; Friends of the Middle River; Shenandoah Valley Network; Greenbrier River Watershed Association; Friends of the Lower Greenbrier; Eight Rivers Council; Augusta County Alliance; Friends of Augusta; Dominion Pipeline Monitoring Coalition; Indian Creek Watershed Association; Chesapeake Climate Action Network; Summers County Residents Against the Pipeline; Alderson Community Food Hub; Preserve the New River Valley, and Highlanders for Responsible Development.

Our letter describes numerous issues that FERC must address in its EIS for these projects. Of these, we specifically draw your attention to four issues that we believe are critical to FERC's evaluation of the Mountain Valley Pipeline:

- FERC must prepare a single, regional EIS that incorporates all four interstate pipeline projects proposed for the central Blue Ridge and Appalachian Mountain region of Virginia and West Virginia—the Mountain Valley Pipeline, the Atlantic Coast Pipeline,

the Appalachian Connector Pipeline, and the WB Express Project. This programmatic EIS must be a comprehensive evaluation of the direct, indirect, and cumulative impacts of pipeline development in this region.

- In order to meaningfully evaluate the potential impacts of the Mountain Valley Pipeline and the three other proposed interstate pipeline projects, FERC must assess the market demand for the gas to be carried by each of these projects. We urge FERC be cognizant of its authority to reject unnecessary construction and avoid the harmful impacts to local communities and natural resources caused by unnecessary projects.
- FERC must evaluate alternatives to the Mountain Valley Pipeline that avoid or minimize the impacts to local communities and natural resources caused by this project. This analysis must include alternatives that use: existing pipeline capacity and infrastructure, upgrades to existing pipeline infrastructure, co-location in existing pipeline corridors, co-location in other existing utility or road corridors, and other alternative routes that lessen the impacts of the proposed project.
- Construction of the Mountain Valley Pipeline has the potential to jeopardize the continued existence of several federally protected species. FERC must evaluate the potential impacts to listed species through formal Endangered Species Act consultation, and incorporate that analysis into the EIS.

Thank you for your attention to these important matters.

Sincerely,



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COMMENTS

I. FERC must prepare a single, regional EIS to address the impacts of the MVP, the Atlantic Coast Pipeline, the Appalachian Connector Pipeline, and the WB Express Project.

1. NEPA requires a single, regionally-focused EIS for related projects with cumulative impacts pending or reasonably foreseeable in the same geographic area.

FERC must prepare a single, regionally-focused EIS—a programmatic EIS—that addresses the impacts of the MVP, as well as the Atlantic Coast Pipeline, the Appalachian Connector Pipeline, and the WB Express Project, and is a comprehensive examination of the impacts of pipeline development in the Blue Ridge and Appalachian Mountain region of Virginia and West Virginia. The MVP and the Atlantic Coast Pipeline have initiated pre-filing with FERC and will likely file their formal applications with the agency later this year.¹ Williams announced the Appalachian Connector Pipeline in the fall of 2014 but has not yet requested pre-filing with FERC.² And Columbia Gas requested pre-filing with FERC for a fourth project in this region, the WB Express Project, in April 2015.³

Under NEPA, a federal agency must evaluate the impacts of several related projects with cumulative impacts proposed or reasonably foreseeable in the same geographic region in a single, comprehensive, regional EIS.⁴ The purpose of this requirement is that such projects are likely to have cumulative impacts affecting the entire region that the agency would overlook in a more constrained analysis.⁵ FERC itself has recognized this obligation: “Proposed actions with

¹ See FERC Dockets PF15-3 & PF15-6.

² See Williams, Appalachian Connector, last viewed June 12, 2015, *available at* <http://co.williams.com/expansionprojects/appalachian-connector/>.

³ See FERC Docket PF15-21.

⁴ See *Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976) (“when several proposals for . . . actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.”); *Churchhill Cnty. v. Norton*, 276 F.3d 1060, 1077 (9th Cir. 2001) (“[A]n agency must prepare both a programmatic EIS and a site-specific EIS where there are large scale plans for regional development. At least when the projects in a particular geographical region are foreseeable and similar, NEPA calls for an examination of their impact in a single EIS.”); *Nat’l Wildlife Fed’n v. Appalachian Reg’l Comm’n*, 677 F.2d 883, 888 (D.C.Cir. 1981) (“the environmental consequences of proposed actions must all be considered together in a single, programmatic EIS when their impacts will have a compounded effect on a region.”).

⁵ See *LaFlamme v. FERC*, 852 F.2d 389, 401-02 (9th Cir. 1988) (rejecting an EIS that did not consider the effects of other projects in the same river basin).

potential cumulative impacts may mandate the preparation of a regional or comprehensive impact statement.”⁶

A comprehensive regional or programmatic EIS provides an important mechanism for the agency to assess the cumulative impacts of the proposed projects and to “evaluate different courses of action,” *i.e.* alternatives, to avoid or minimize those impacts.⁷ Without this broad-level analysis, the agency cannot identify and evaluate the full impacts of its actions runs the risk of overlooking or foreclosing important alternatives.

The requirement for a comprehensive, regional EIS is found throughout NEPA’s implementing regulations. Section 1502.4 (a) requires that “proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement.”⁸ Section 1508.18 defines “major federal action” requiring an EIS to include the “[a]doption of programs, such as the implementation of concerted actions to implement a specific policy or plan.”⁹ And § 1508.25 requires that agencies consider connected actions, cumulative actions, similar actions, and cumulative impacts in defining the scope of an EIS.¹⁰ In its guidance on these regulations, the CEQ provides the following examples that justify the preparation of a regional or programmatic EIS: “[s]everal similar actions or projects in a region or nationwide (e.g., a large scale utility corridor project),” and “[a] suite of ongoing, proposed or reasonably foreseeable actions that share a common geography or timing, such as multiple activities within a defined boundary (*i.e.*, Federal land or facility).”¹¹

It is well-established that FERC must evaluate the cumulative impacts of a natural gas pipeline before it issues a certificate of public convenience and necessity for the project.¹² NEPA’s implementing regulations define these impacts as the

impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.¹³

⁶ See *Columbia Gas Transmission, LLC*, 148 FERC ¶ 61,138, *6 (Aug. 22, 2014) (emphasis omitted) (citations and quotations omitted).

⁷ *Kleppe* at 410.

⁸ 40 C.F.R. § 1502.4(a).

⁹ *Id.* § 1508.18(b)(4).

¹⁰ See *id.* § 1508.25. See also *id.* at § 1508.27(7) (“Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.”)

¹¹ Michael Boots, CEQ, Memorandum: Effective Use of Programmatic NEPA Reviews at 14 Dec. 18, 2014).

¹² See *Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1320 (D.C.Cir. 2014).

¹³ 40 C.F.R. § 1508.7.

A cumulative impacts analysis provides the agency and the public “with a complete understanding” of the impacts that will result from the project.¹⁴ Importantly, an agency cannot defer this analysis “when meaningful consideration can be given now.”¹⁵ The agency must evaluate the cumulative impacts of related projects proposed or reasonably foreseeable in a geographic area in a single, comprehensive, regional EIS in order to fully understand the impacts of the proposed action in its proper context.¹⁶

For the Mountain Valley Pipeline, NEPA does not allow FERC to proceed with blinders on to the cumulative and synergistic impacts of the other interstate natural gas pipelines proposed across the mountains of Virginia and West Virginia.

2. *The MVP, the Atlantic Coast Pipeline, the Appalachian Connector Pipeline, and the WB Express are related projects with cumulative impacts for the central Blue Ridge and Appalachian Mountain region of Virginia and West Virginia.*

The MVP, the Atlantic Coast Pipeline, the Appalachian Connector Pipeline, and the WB Express Project are related projects with cumulative impacts for the central Blue Ridge and Appalachian Mountain region of Virginia and West Virginia. First, the projects would all impact the same geographic region on the same schedule.¹⁷ The MVP and the Atlantic Coast Pipeline would originate near Clarksburg, West Virginia, and then head southeast for an interconnection with the Transco interstate pipeline in Virginia. They would meet the Transco line approximately sixty miles apart in Buckingham County and Pittsylvania County respectively. Both companies plan to have their pipelines operational by 2018. The reasonably foreseeable Appalachian Connector Pipeline would originate farther north in Wetzel County, West Virginia, but then follow the same approximate route of the MVP to reach the Transco pipeline in Pittsylvania County, Virginia. Williams also expects to bring the Appalachian Connector online by 2018. Furthermore, these pipelines would all cross the defined boundaries of the federal lands in the Jefferson, George Washington, or Monongahela national forests, and the Forest Service must be able to rely on this EIS for its decisions on these projects. The WB Express Project involves upgrades to a pipeline network that also crosses the George Washington and Monongahela national forests with laterals connecting to the Transco line. As with the other proposed pipelines, Columbia Gas plans to make this project operational by 2018.

¹⁴ *N.C. Alliance for Transp. Reform, Inc. v. U.S. Dep’t of Transp.*, 151 F.Supp.2d 661, 698 (M.D.N.C. 2001).

¹⁵ *Kern v. BLM*, 284 F.3d 1062, 1075 (9th Cir. 2002)

¹⁶ *See LaFlamme* at 401-02 (“Considering that the Upper Mountain Project represents only the initial development of the remaining water resources in the South Fork of the American River basin, the foreseeability of future development underscores the importance of performing a comprehensive cumulative impact analysis of the project’s effects on the environment before any more development proceeds.”).

¹⁷ *See Pehlakai v. Duncan*, 476 F.Supp. 1247, 1258 (D.D.C. 1979) (recognizing that “time and space” are important considerations in evaluating a request for a regional EIS).

In addition to timing and geography, the MVP, the Atlantic Coast Pipeline, and the Appalachian Connector share a similar objective: all three pipelines intend to deliver natural gas from the Marcellus shale to the southeastern United States. According to the proponent of the Atlantic Coast Pipeline, it “would connect the growing demand areas in Virginia and North Carolina with growing supply areas in the mid-Atlantic region.”¹⁸ The MVP “would provide timely, cost-effective access to the growing demand for natural gas . . . in the Mid-Atlantic and southeastern markets, as well as potential markets in the Appalachian region.”¹⁹ According to Williams, the Appalachian Connector would “directly access Mid-Atlantic, Southeast, and Gulf Coast markets along the Transco system as far south as Louisiana.”²⁰

Moreover, the initial leg of the MVP, from its origin in West Virginia to the Transco interstate pipeline, has an objective that is almost identical to that of the Atlantic Coast Pipeline and the Appalachian Connector Pipeline: all three projects would deliver a similar quantity of natural gas from the well-fields of West Virginia to the Transco interstate pipeline. The Atlantic Coast Pipeline would have the capacity to deliver 1.4 bcf/d to Transco at the Buckingham Interconnect in Buckingham County, Virginia. The MVP would deliver 2.0 bcf/d to Transco sixty miles south at Transco Station 165 in Pittsylvania County, Virginia.²¹ And the Appalachian Connector would also deliver 2 bcf/d to Transco Station 165. Finally, the WB Express Project would raise the capacity of existing pipelines to 1.3 bcf/d for a route that has several interconnections with the Transco line in Green County, Virginia, and in Northern Virginia.

In light of their objectives, their location, and their timing, the MVP, the Atlantic Coast Pipeline, the Appalachian Connector Pipeline, and the WB Express Project have the potential for numerous cumulative impacts. These impacts are especially relevant as FERC develops and considers alternatives to the MVP that will overlap with alternatives for the Atlantic Coast Pipeline, the Appalachian Connector Pipeline, and the WB Express Project. For example, the potential cumulative impacts of these pipelines include the following:

- Changes in the rural character of the central Blue Ridge and Appalachian Mountain region of Virginia and West Virginia. These pipelines could attract industries that use natural gas and increase the industrial land uses in the Appalachians or the Blue Ridge. Moreover, the pipelines could attract more interstate and intrastate pipeline expansion through the region further promoting industrial development.

¹⁸ Atlantic Coast Pipeline, LLC, Resource Report 1 at 1-5 (Dec. 2014).

¹⁹ Mountain Valley Pipeline, Summary of Alternatives at 10-1 (Dec. 2014).

²⁰ Williams, Appalachian Connector, last viewed April 20, 2015, *available at* <http://co.williams.com/expansionprojects/appalachian-connector/>.

²¹ The Atlantic Coast Pipeline included a “western route alternative” in its Resource Report 10 that would have also delivered gas to Transco Station 165. Dominion apparently rejected the western route alternative because of its anticipated environmental impacts, but not because Transco Station 165 was not a suitable or feasible delivery point to bring gas to the Transco interstate pipeline.

- Encouraging the development of shale gas drilling throughout the region. The Marcellus shale extends as far east as western Virginia but the region has experienced no drilling development in recent years. However, an extensive investment in natural gas transmission infrastructure through the region, such as multiple interstate pipelines, could sufficiently lower the development costs for this resource and encourage its extraction.
- Clearing of forest habitat on public and private lands throughout the region, including habitat occupied by endangered and threatened species such as the Indiana bat or the northern long-eared bat.
- Increasing the region's greenhouse gas emissions, including emissions related to transmission, increased drilling, and increased industrial uses of natural gas.
- Adversely affecting the region's air quality.
- Impacts on the regional economy.
- Impacts on the national forest lands in the region, including the loss of forest habitat and the disruption of forest habitat connectivity.
- Harm to water quality and watersheds providing drinking water.
- Impacts to the national parks throughout the region including the Blue Ridge Parkway and the Appalachian National Scenic Trail examining fragmentation to intact forested areas, impacts to interior forest species, and disruption to viewsheds and visitor experience.

Even if FERC rejects the idea that its actions in evaluating the proposals for the MVP, the Atlantic Coast Pipeline, the WB Express Project, and the reasonably foreseeable Appalachian Connector Pipeline amount to a large-scale regional development plan in the central Appalachians, the agency cannot ignore the related character and cumulative impacts of the projects now under its consideration. These projects would cross the same geographic region at the same time to achieve similar objectives, and FERC must evaluate their impacts in a single, comprehensive, regional EIS.

3. *A regional EIS will allow FERC to develop and consider alternatives that will avoid or minimize cumulative impacts for the entire region.*

A key purpose of a cumulative impact analysis is to provide the federal agency with the information that it needs to identify and evaluate alternatives to lessen those impacts.²² Where multiple projects are slated for the same geographic area, the Supreme Court emphasized that “only through comprehensive consideration of pending proposals” in a single EIS can the agency sufficiently evaluate alternatives.²³ Because the MVP is accompanied by other, closely-related pipeline projects in the same area, FERC must use a regional EIS to identify those alternatives

²² See *Churchhill Cnty.* at 1080 (holding that the purpose of the cumulative impacts analysis is “to assist the decisionmaker in deciding whether, or how, to alter the program to lessen cumulative impacts”).

²³ *Kleppe* at 410.

that would avoid or minimize the cumulative impacts of pipeline development for the entire region, not just along the route of any single pipeline. Right now, two new interstate natural gas corridors are proposed across the central Blue Ridge and Appalachian Mountain region of Virginia and West Virginia and a third is likely. A fourth project will upgrade an existing pipeline that already crosses this region. A regional EIS provides the only suitable mechanism to determine how to avoid or minimize the impacts across the entire region.

Furthermore, because of the similarity in their objectives and their routes, the alternatives that FERC must evaluate for each of the four projects will significantly overlap. In this letter, we enumerate a suite of alternatives that would lessen the impacts of the MVP on the local communities and natural resources of the central Blue Ridge and Appalachian Mountain region in Virginia and West Virginia. These include the use of existing pipeline infrastructure, upgrades to existing pipeline infrastructure, collocation in existing pipeline corridors, collocation in other existing utility or road corridors, and other alternative routes. FERC should consider many, *if not all*, of the same alternatives for the Atlantic Coast Pipeline, the Appalachian Connector Pipeline, and the WB Express Project. Unless FERC undertakes its alternatives analysis in a single, regional EIS, it runs the risk of selecting an alternative for the MVP that has the unanticipated effect of compounding the environmental impact of the projects or forecloses an important alternative for the other three.

These concerns are not merely hypothetical. The companies themselves have demonstrated how intertwined the alternatives for the MVP and the Atlantic Coast Pipeline are in their filings with FERC. In its Resource Report 10, the proponent of the Atlantic Coast Pipeline described a “western route alternative” to the south and west of its preferred route. While not identical, the western route alternative follows the same approximate trajectory of the proposed route for the MVP and would interconnect with the Transco pipeline at the same place, Transco Station 165 in Pittsylvania County, Virginia. MVP similarly evaluated a “northern pipeline alternative” that would parallel the proposed route of Atlantic Coast Pipeline.

Both of these companies rejected the alternative similar to the project proposed by their competitor. Dominion claimed that its “western alternative route” would be longer, cross more miles of public lands, and cross more miles of forest lands. Mountain Valley claimed that its “northern pipeline alternative” would cross more federal lands, thirty-seven more perennial waterbodies, and would not be “environmentally preferable.” The anomalous outcome is that both the proponents of the MVP and the Atlantic Coast Pipeline have rejected an approximation of the others’ preferred route for environmental considerations. For FERC to meaningfully understand and evaluate the interaction between the alternatives for these projects will require a single, regional EIS.

4. *A regional EIS will allow FERC to assess the need for the proposed pipelines.*

An agency preparing an EIS must specify the underlying “purpose and need” for the proposed action.²⁴ The framing of the project’s “purpose and need” is crucial because it provides a context which defines the range of “reasonable alternatives” that must be evaluated in the EIS.²⁵ Here, the EIS should address a regional purpose and need rather than adopting the narrow, individual goals of Mountain Valley, Atlantic Coast, and other companies proposing to transport natural gas from the Marcellus region southeast to the Transco Line and beyond. While each applicant seeks to construct its own project, it would be wrong for the Commission to start with the premise that all of the proposed projects are necessary; to do so would undermine the alternatives analysis and treat the EIS as a “foreordained formality.”²⁶ An agency cannot “slip past the strictures of NEPA” by “contriv[ing] a purpose so slender as to define competing ‘reasonable alternatives’ out of consideration.”²⁷ Faced with several proposals that serve similar goals, the Commission should articulate a purpose with sufficient breadth to facilitate the serious consideration of regional alternatives.

This approach is not foreclosed by the Commission’s duty to respond to individual pipeline applications. Although an agency “should take into account the needs and goals” of a permit applicant,²⁸ those private goals do not end the analysis. As courts have noted, “[r]equiring agencies to consider private objectives . . . is a far cry from mandating that those private interests define the scope of the proposed project.”²⁹ An agency must also “look hard at the factors relevant to the definition of purpose” and “always consider the views of Congress, expressed, to

²⁴ 40 C.F.R. § 1502.13.

²⁵ *City of Carmel-by-the-Sea v. Dep’t of Transportation.*, 123 F.3d 1142, 1155 (9th Cir. 1995) (citing *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 192 (D.C. Cir. 1991)).

²⁶ *Citizens Against Burlington*, 938 F.2d at 196 (citing *City of New York v. Dep’t of Transp.*, 715 F.2d 732, 743 (2d Cir. 1983)) (“[A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency’s power would accomplish the goals of the agency’s action, and the EIS would become a foreordained formality.”).

²⁷ *Simmons v. U.S. Army Corps of Eng’rs*, 120 F.3d 664, 666 (7th Cir. 1997). *See also Tex. E. Transmission L.P.*, 146 FERC ¶ 61,086, P 91 (2014) (citing cases) (use of applicants’ identified purpose and need “is subject to the admonition that a project’s purpose and need may not be so narrowly defined as to preclude consideration of what may actually be reasonable choices”); *Nat’l Parks & Conservation Ass’n v. Bureau of Land Mgmt.*, 606 F.3d 1058, 1072 (9th Cir. 2010) (if agency uncritically adopts project proponent’s goals as the purpose and need, it violates NEPA because it “necessarily consider[s] an unreasonably narrow range of alternatives.”).

²⁸ *Citizens Against Burlington*, 938 F.2d at 196.

²⁹ *Nat’l Parks Conservation Ass’n v. Bureau of Land Mgmt.*, 606 F.3d at 1070.

the extent that the agency can determine them, in the agency's statutory authorization to act, as well as in other congressional directives."³⁰

The Natural Gas Act ("NGA") gives the Commission powerful tools to regulate the development of pipeline infrastructure, directing the Commission to deny any application not "required by the present or future public convenience and necessity" and allowing it to impose "such reasonable terms and conditions as the public convenience and necessity may require."³¹ In addition, FERC's Certificate Policy requires the Commission to balance the alleged need for a project against the adverse impacts on affected landowners and the surrounding communities.³² Thus, when identifying a purpose and need, the Commission should consider its authority to shape pipeline certificates and reject unnecessary construction. More generally, the Commission should recognize that the main purpose of the NGA is "to encourage the *orderly* development of plentiful supplies of . . . natural gas at reasonable prices."³³ The goals of promoting order and economy would be frustrated by a piecemeal analysis that ignores the potential for haphazard and redundant pipeline development. Likewise, the subsidiary goals of the NGA—including "conservation" and "environmental" considerations³⁴—would be poorly served if the Commission failed to consider a regional perspective.

FERC may not uncritically accept the project proponents' stated need for the pipelines. Rather, the agency must consider whether expected gas demand can be met by existing pipeline capacity. If not, FERC must consider how much additional capacity is needed to meet demand and to what extent that capacity can be provided by alternatives to the proposal that upgrade existing gas pipelines and/or building new pipelines on existing rights-of way. In so doing, FERC should also look at the potential for significant decline in production from the Marcellus and Utica formations that would supply the gas for the pipelines and the ability of increasingly price-competitive renewable energy sources and energy efficiency to meet electric demand over the life of the proposed pipelines.³⁵ FERC should project electric-sector natural gas use in the region using detailed data on specific generating units, estimating gas demand both on an annual basis and for the hour of peak demand in each year. FERC must critically analyze and document

³⁰ *Citizens Against Burlington*, 938 F.2d at 196 (citing *City of New York*, 715 F.2d at 743-45.

³¹ 15 U.S.C. 717f(e).

³² Statement of Policy for Certification of New Interstate Natural Gas Pipeline Facilities, 88 FERC ¶ 61,227 (1999), *clarified*, 90 FERC ¶ 61,128 (2000), *further clarified*, 92 FERC ¶ 61,094 (2000) ("Certificate Policy Statement").

³³ *NAACP v. Fed. Power Comm'n*, 425 U.S. 662, 669–70 (1976) (emphasis added). *See also* 15 U.S.C. § 717(a) ("Federal regulation in matters relating to the transportation of natural gas and the sale thereof in interstate and foreign commerce is necessary in the public interest.").

³⁴ *Id.* at 670 & n.6.

³⁵ Detailed comments on these subjects were submitted to FERC as part of the NEPA scoping process for the Atlantic Coast Pipeline (FERC Docket Nos. PF15-5-000 and PF15-6-000) by the Virginia Chapter of the Sierra Club. Those comments are incorporated by reference.

any assumptions regarding: 1) market rules and topology, 2) hourly load profiles, 3) forecasted annual peak demand and total energy, 4) thermal-unit characteristics, 5) conventional hydro and pumped storage unit characteristics, 6) fuel prices, 7) renewable unit characteristics, 8) transmission system paths and upgrades, 9) generation retirements, additions, and uprates, 10) outages, 11) environmental regulations, and 12) demand response resources. Only by analyzing all of those factors can FERC determine the need for the proposed pipeline projects.

Finally, the purpose and need statement should meet the needs of other agencies planning to rely on the EIS. For instance, the U.S. Forest Service and National Park Service must decide whether to permit the pipeline to pass through lands that they administer. The EIS's purpose and need statement must reflect the purpose and need of those specific agencies in permitting the pipeline, not merely the purpose and need of the project applicant.³⁶ The EIS's purpose and need statement should thus facilitate the activities of all agencies responsible for evaluating the current pipeline proposals.

II. FERC Must Consider the Impacts of the Pipeline on Property Owners and Community Character

1. FERC must consider the pipeline's impacts in light of the rural character and cultural connections to the landscapes of the impacted communities

NEPA requires consideration of a project's impacts on the "human environment."³⁷ CEQ regulations mandate that the term human environment "shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment."³⁸ The impacts to the human environment that must be considered include "aesthetic, historic, cultural, economic, [and] social" effects.³⁹ The proposed route of the Mountain Valley Pipeline will cross primarily rural landscapes where agriculture and forestry are the dominant land uses. The communities that would be affected by the MVP have deep roots in and strong cultural identification with the land and its rural character.⁴⁰ In addition to impacts from reduced property values, FERC must consider the effects of pipeline construction and right of way maintenance on the character of these currently non-industrialized areas.

³⁶ See Bureau of Land Management, National Environmental Policy Act Handbook, H-1790-1, at 35 (Jan. 2008) ("The purpose and need statement for an externally generated action must describe the [agency's] purpose and need, not an applicant's or external proponent's purpose and need (40 CFR 1502.13). The applicant's purpose and need may provide useful background information, but this description must not be confused with the [agency] purpose and need for action.").

³⁷ 42 U.S.C. § 4332(2)(C).

³⁸ 40 C.F.R. § 1508.14.

³⁹ *Id.* § 1508.8.

⁴⁰ See Heidi Lockhart Utz, *Collective Identity In Appalachia: Place, Protest And The AEP Power Line* (2001) at 21–25, available at <http://scholar.lib.vt.edu/theses/available/etd-04262001-120307/unrestricted/FD425.pdf>.

a. Cultural and social impacts

The impacts of the taking and alteration of private property for construction of the Mountain Valley Pipeline must be assessed in light of the affected communities' "cultural attachment" to the land. Cultural attachment is the "cumulative effect over time of a collection of traditions, attitudes, practices, and stories that ties a person to the land, to physical place, and kinship patterns."⁴¹ Much of the land that would be affected by the MVP has been held in families for generations and people's reliance on the land for survival and prosperity has resulted in high levels of cultural attachment.

Rural Appalachian communities have historically suffered from significant intrusions, such as railroad highway construction, that have "undercut the cultural patterns that had developed through people's relation to the land, physical place, and kin."⁴² As the U.S. Forest Service recognized in a Draft Environmental Impacts Statement for a major utility corridor project in rural West Virginia and Virginia,

Substantial outside-generated intrusions (such as highways, railroads, and transmission lines) that breach the boundary of a high cultural attachment area may have significant adverse impacts to the sustainability of the local culture. One important characteristic of these intrusions is their permanency — the cement and steel of these projects have a life span far greater than that of man, so the intrusions will also be felt by future generations. The permanence of the intrusions is a symbol of the imposed dominance of commerce and economic interests.

. . . [Additionally,] [p]ermanent and elongated linear intrusions tend to bifurcate previously existing cultural units into new units. This tends to fracture informal support systems and create new boundary areas. Boundary areas created by intrusion are often abandoned by area residents from cultural management, thereby increasing the likelihood of additional intrusions.⁴³

Those cultural impacts are difficult if not impossible to mitigate.⁴⁴

In addition to the intrusion of the pipeline itself, FERC must also consider the potential for the character of these communities to be disrupted by gas drilling activities that would not be economical absent their close proximity to a pipeline to move the gas to market, as discussed in Section IV of these comments. In order to properly assess the cultural impacts of the MVP,

⁴¹ Unites States Forest Service, Draft Environmental Impact Statement for APCO 765 kV Transmission Line, June 1996 at 4.15-2, attached as Exhibit A.

⁴² Id. at 4.15-1.

⁴³ Id. at 4.15-1 – 4.15-2.

⁴⁴ Id. at 4.15-6.

FERC must conduct a study similar to that performed for the U.S. Forest Service's DEIS for the APCo 765 kV Transmission Line in West Virginia and Virginia.⁴⁵

b. Impacts to Property Values

FERC may not limit its assessment of the economic impacts of the Mountain Valley Pipeline on property owners to the value of acreage lost to the pipeline right of way. Rather, FERC must determine the portion of the existing value that is attributable to the largely undisturbed, rural character of the properties and how that value would be affected by construction and maintenance of the MVP.

Special consideration must be given to impacts on farms, both during construction and permanently. During pipeline construction, access to large portions of a property by equipment needed for farming could be restricted, leading to significant lost revenues. Restrictions on the size and type of equipment that can cross the permanent pipeline right of way could also limit future use of properties that are bisected by the Mountain Valley Pipeline. Additionally, pesticide spraying to control invasive species on the pipeline corridor could constrain adjacent agricultural uses, particularly for property owners who farm organically.

FERC must also consider the impact on property values and social well-being associated with pipeline safety hazards. Last year, more than 700 pipeline failures killed 19 people, injured 97 and caused more than \$300 million in damage.⁴⁶ Just this month, the rupture and explosion of a 24-inch pipeline in Lycoming County, Pennsylvania required the evacuation of more than 130 nearby residents.⁴⁷ A recent investigation into the Pipeline and Hazardous Materials Safety Administration (PHMSA), which is responsible for ensuring the safety of oil and gas pipelines, found that the agency “lacks the manpower to inspect the nation’s 2.6 million miles of oil and gas lines,” “grants the industry it regulates significant power to influence the rule-making process,” and “has stubbornly failed to take a more aggressive regulatory role, even when ordered by Congress to do so.” In public testimony before the House Transportation and Infrastructure Committee’s Subcommittee on Railroads, Pipelines, and Hazardous Materials, Congresswoman Jackie Speier recently stated that “Even when [PHMSA] has crystal-clear authority, it still refuses to act. PHMSA is not only a toothless tiger, but one that has overdosed

⁴⁵ See JKA Associates, Cultural Attachment: Assessment of Impacts to Living Culture, Appendix M to USFS DEIS for APCo 765 kV Transmission Line, attached as Exhibit B.

⁴⁶ Elana Schor and Andrew Restuccia, “Pipelines blow up and people die,” Politico, April 21, 2015, <http://www.politico.com/story/2015/04/the-little-pipeline-agency-that-couldnt-117147.html#ixzz3Y2zoJ0g9>.

⁴⁷ Ad Crable, “Gas line explosion in Lycoming County involves pipeline owned by same company that wants to build in Lancaster County,” LancasterOnline, June 10, 2015, http://lancasteronline.com/news/local/gas-line-explosion-in-lycoming-county-involves-pipeline-owned-by/article_1e1f7fcc-0f76-11e5-a35e-db7d39c8e3fa.html.

on Quaaludes and is passed out on the job.”⁴⁸ Those criticisms have been echoed in reports from the National Transportation Safety Board (NTSB) and the Department of Transportation Inspector General.⁴⁹ The significant number of highly publicized dangerous pipeline failures and the many public statements that the agency tasked with ensuring pipeline safety is not up to the task lead to the rational perception that natural gas pipelines are not safe neighbors. That perception not only impacts the well-being of communities that have to live everyday with fears of a fatal accident, but also significantly lowers property values by dissuading others from wanting to buy property near the pipeline.

c. Historic resources

Moreover, FERC must consider the impacts of the Mountain Valley Pipeline to historic places and structures. The CEQ regulations explicitly require consideration of impacts to “districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places” as well as any other significant cultural or historical resources.⁵⁰ FERC may not rely entirely on existing or officially proposed listings in the National Register to determine whether the pipeline will affect significant cultural or historical resources. FERC must consult with local residents and historic preservation organizations that have valuable knowledge of the significance of particular resources to local communities. Consideration of impacts to those resources should not be limited to physical alterations from pipeline construction and operation. Rather, FERC must also assess impacts from the altered character of the rural landscapes that provide the context for the cultural and historical significance of those resources.

2. *Special consideration is warranted because the property will be transformed as a result of FERC’s grant of the extraordinary power of eminent domain*

If FERC approves MVP’s application, the company will be vested with the power of eminent domain. FERC must consider the effects of granting that power to MVP in its analysis of the Mountain Valley Pipeline.⁵¹ That obligation to consider eminent domain arises under both the NGA and NEPA.⁵² It is an oft-cited principle that, “since the power to condemn private

⁴⁸ Press Release: Congresswoman Speier Calls for Improved Pipeline Safety, April 14, 2014, http://speier.house.gov/index.php?option=com_content&view=article&id=1652:congresswoman-speier-calls-for-improved-pipeline-safety-phmsa-is-a-toothless-tiger&catid=20&Itemid=14.

⁴⁹ Id.

⁵⁰ 40 C.F.R. § 1508.27(b)(8).

⁵¹ See California Wilderness Coalition v. U.S. Dept. of Energy, 631 F.3d 1072, 1101 (9th Cir. 2011) (finding that action constituted major federal action subject to NEPA in part because it granted power of eminent domain).

⁵² 88 FERC ¶ 61,227, 1999 WL 718975 at * 1 (stating FERC’s goal to avoid the unneeded exercise of eminent domain in making public necessity and convenience determinations); 18 C.F.R. § 380.15(e)(1) (requiring the consideration of the use of existing rights-of-way in NEPA analysis).

property against the will of the owner is a stringent and extraordinary one, based upon public necessity or an urgent public policy, the rule requiring the power to be strictly construed, and the prescribed mode for its exercise strictly followed, is a just one, and should, within all reasonable limits, be inflexibly adhered to and applied.”⁵³

For that reason, FERC has acknowledged that “[o]ne goal of [its] Certificate Policy Statement was to protect the interests of landowners whose land might be condemned for right-of-way under the eminent domain rights conferred by the Commission’s certificates from unnecessary construction.”⁵⁴ FERC’s Certificate Policy Statement acknowledges that the use of eminent domain has an adverse effect on landowners and communities, and must be offset by public benefits before a Certificate of Public Necessity and Convenience can be awarded.⁵⁵ Indeed, FERC has stated that it will demand a stronger showing of the public benefit when the use of eminent domain is required because “[t]he strength of the benefit showing will need to be proportional to the applicant’s proposed exercise of eminent domain procedures.”⁵⁶ FERC has an obligation to consider the impacts of the use of eminent domain on property owners pursuant to NEPA.

Based on present landowner opposition to the Mountain Valley Pipeline, MVP will have to rely extensively on the power of eminent domain. For example, MVP has sued over 100 West Virginia landowners in federal court seeking access for pipeline surveys over the landowners’ objections. Several landowners have brought their own suits in state court seeking a declaration of their rights to exclude MVP’s surveyors from their property. With that kind of landowner and community opposition, it is clear that MVP will have to rely heavily on eminent domain to build its proposed pipeline. FERC must consider whether the effects on the environment and landowners of that use of the extraordinary power of eminent domain outweighs whatever public benefit the Mountain Valley Pipeline is purported to have.

III. FERC Must Consider the Climate Change Impacts of the Pipeline Resulting From Increased Greenhouse Gas Emissions

1. NEPA requires consideration of a project’s contributions to global climate change

NEPA requires federal agencies to consider not only a project’s direct effects, which “are caused by the action and occur at the same time and place,” but also its indirect effects, which “are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”⁵⁷ A project’s indirect effects include “effects related to induced

⁵³ Schneider v. City of Rochester, 160 N.Y. 165, 172, 54 N.E. 721, 722 (N.Y. 1899) (internal quotation marks omitted).

⁵⁴ Tennessee Gas Pipeline Co., LLC, 142 FERC ¶ 61,025, 2013 WL 240878 at *26, n. 113 (FERC Jan. 11, 2013).

⁵⁵ 88 FERC ¶ 61,227, 1999 WL 718975 at *20.

⁵⁶ Id.

⁵⁷ 40 C.F.R. § 1508.8.

changes in the pattern of land use . . . and related effects on air and water and other natural systems, including ecosystems.”⁵⁸ Direct and indirect effects include “ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, [and] economical” impacts.⁵⁹

In order to assess the significance of the Mountain Valley Pipeline’s potential direct, indirect, and cumulative impacts, FERC must consider both the “context and intensity” of those impacts.⁶⁰ To consider the context of the FERC must assess the impacts of the Mountain Valley Pipeline within a range of contexts that are relevant to a project, including short-term local impacts, regional impacts, and impacts on society as a whole.⁶¹ Intensity “refers to the severity of the impact” and requires consideration of at least ten listed factors, including:

- The degree to which the proposed action affects public health or safety.
- The degree to which the effects on the quality of the human environment are likely to be highly controversial.
- The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.⁶²

Impacts from greenhouse gas (GHG) emissions associated with the Mountain Valley Pipeline are clearly within the scope of effects NEPA mandates federal agencies to consider. GHG pollution is a potent threat to public welfare on local, regional, and national scales, as the Environmental Protection Agency (“EPA”) and the scientific community have acknowledged. GHG emissions will increase global warming, harming both the local and global environments. The impacts of global warming include “increased air and ocean temperatures, changes in precipitation patterns, melting and thawing of global glaciers and ice, increasingly severe weather events, such as hurricanes of greater intensity, and sea level rise.”⁶³ Other impacts that have already occurred and are expected to increase in the future include “more severe wildfires, degraded air quality, more heavy downpours and flooding, increased drought, . . . harm to water

⁵⁸ Id.

⁵⁹ Id.

⁶⁰ Id. § 1508.27.

⁶¹ 40 C.F.R. § 1508.27(a); The Mountaineers v. U.S. Forest Serv., 445 F. Supp. 2d 1235, 1245 (W.D. Wash. 2006) (noting the mandate to consider both local and regional impacts).

⁶² 40 C.F.R. § 1508.27(b).

⁶³ Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous

Air Pollutants Reviews, 76 Fed. Reg. 52,738, 52,791-92 (citing EPA, 2011 U.S. Greenhouse Gas Inventory Report Executive Summary (2011)).

resources, harm to agriculture, and harm to wildlife and ecosystems.”⁶⁴ Climate change fueled by GHG emissions will also lead to loss of coastal land in densely populated areas, shrinking snowpack in Western states, increased wildfires, and reduced crop yields.⁶⁵ More frequent heat waves as a result of global warming already have affected public health, leading to premature deaths, and threats to public health are only expected to increase as global warming intensifies. For example, a warming climate will lead to increased incidence of respiratory and infectious disease, greater air and water pollution, increased malnutrition, and greater casualties from fire, storms, and floods.⁶⁶ Vulnerable populations—such as children, the elderly, the poor and those with existing health problems—are the most at risk from these threats.⁶⁷

The Council on Environmental Quality (CEQ) has released draft guidance that reinforces NEPA’s mandate to consider a proposed project’s climate change impacts. The CEQ Guidance plainly states that “Climate change is a fundamental environmental issue, and the relation of Federal actions to it falls squarely within NEPA’s focus.”⁶⁸ The potential severity of climate change impacts dictates that contributions to climate change in the form of GHG emissions be given thorough, meaningful consideration and not be brushed aside with a boilerplate dismissal. As the CEQ guidance explains, “providing a paragraph that simply asserts, without qualitative or quantitative assessment, that the emissions from a particular proposed action represent only a small fraction of local, national, or international emissions or are otherwise immaterial is not helpful to the decision maker or public,” and does not satisfy NEPA.⁶⁹

2. *The Mountain Valley Pipeline would result in GHG emissions from a wide range of sources*

FERC must consider in detail the potential for the Mountain Valley Pipeline to contribute to climate change both directly from the pipeline itself as well as from indirect contributions from other sources. Every link in the chain of natural gas production, transmission, and use that will be facilitated by the Mountain Valley Pipeline will contribute significant GHG emissions.

- a. Emissions from fossil fuels burned to provide energy for construction and operation

⁶⁴ CEQ, *Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts* (CEQ Guidance) at 7-8, available at <https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance>.

⁶⁵ US EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,532–33.

⁶⁶ EPA, Climate Change, Health and Environmental Effects, <http://epa.gov/climatechange/effects/health.html>.

⁶⁷ CEQ Guidance at 28.

⁶⁸ CEQ Guidance at 2.

⁶⁹ *Id.* at 6 note 11 (citing 40 CFR §§ 1500.2, 1502.2).

Construction and operation of the Mountain Valley Pipeline and associated facilities would directly emit GHGs as a result of the fossil fuels that would power construction equipment and compressor stations. According to US EPA, the construction sector has the third highest GHG emissions among all industrial sectors.⁷⁰ EPA estimates that construction of oil and gas pipelines and related structures contributed nearly one million metric tons of CO₂ equivalents in 2002 alone.⁷¹ Construction of the Mountain Valley Pipeline through the rugged mountainous terrain of the proposed route is likely to require increased energy use beyond what is required for construction in flatter terrain. Additionally, operation of the pipeline's four compressor stations with a combined output of approximately 217,000 horsepower will require significant energy use with attendant GHG emissions.⁷²

b. Emissions from leakages in the transmission system

Fugitive emissions from the pipeline and compressor stations will contain high levels of GHGs, most notably methane, which the Intergovernmental Panel on Climate Change ("IPCC") estimates to have 34 times the global warming potential ("GWP") of carbon dioxide over a 100-year period.⁷³ EPA estimates that 23 percent of annual US methane emissions come from natural gas systems and that 34 percent of all methane emissions from the natural gas industry come from the transmission and storage sector, with emissions totaling 54.4 million metric tons in 2013.⁷⁴ Recent studies suggest that EPA may be underestimating the methane emissions from all sources by as much as 75 percent.⁷⁵ According to EPA, "methane losses can occur from leaks (also referred to as fugitive emissions) in all parts of the infrastructure, from connections between pipes and vessels, to valves and equipment."⁷⁶

c. Emissions from end use of the natural gas carried by the Mountain Valley Pipeline

⁷⁰ US EPA, Potential for Reducing Greenhouse Gas Emissions in the Construction Sector (2009) at 3, available at www.epa.gov/sectors/pdf/construction-sector-report.pdf.

⁷¹ *Id.* at 31.

⁷² Draft Resource Report 1 at 1-2, March 2015.

⁷³ Working Group I Contribution to the IPCC Fifth Assessment Report, Climate Change 2013: The Physical Science Basis 8-58 (June 7, 2013), available at http://www.climatechange2013.org/images/uploads/WGIAR5_WGI-12Doc2b_FinalDraft_All.pdf.

⁷⁴ U.S. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2013 (April 2015)* at 3-69 – 3-70, available at <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html#fullreport>.

⁷⁵ Subramanian, *et al.*, Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol, *Environ. Science & Technology*, 49, 3252–61 (2015) at 3252, available at <http://pubs.acs.org/doi/abs/10.1021/es5060258>.

⁷⁶ EPA Natural Gas Star, Basic Information, <http://www.epa.gov/methane/gasstar/basic-information/index.html>.

The Mountain Valley Pipeline has the capacity to carry 2.0 billion cubic feet per day of natural gas per day from production areas to end users. The burning of that gas would result in substantial GHG emissions. According to the U.S. Energy Information Administration, on average burning one thousand cubic feet of natural gas produces 119.9 pounds of CO₂ emissions.⁷⁷ Thus if the Mountain Valley Pipeline operates at full capacity, combustion of the gas it carries will result in 239,800,000 pounds (108,771.4 metric tons) of CO₂ emissions every day that it is in operation.

When assessing the impacts of burning the gas carried by the Mountain Valley Pipeline, the proper comparison is not with the emissions from the burning of coal required to produce an equivalent amount of energy. Rather, the appropriate baseline is the GHG emissions from renewable sources that can provide the same amount of energy. CEQ's Guidance counsels agencies to consider the use of renewable energy and energy efficiency when analyzing the impacts of and alternatives to a proposed project.⁷⁸ Increased implementation of renewables represents a viable alternative to the construction of the Mountain Valley Pipeline. The costs of renewables have dropped drastically in recent years and are expected to continue to drop as growing global demand translates into manufacturing and supply chain efficiencies. For example, the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) found that distributed solar photovoltaic (PV) system prices dropped by 12–19 percent nationwide in 2013 and forecasted another reduction of 3–12 percent in 2014,⁷⁹ depending on system location and market segment. These price drops are even greater than expected, such that utility-scale solar photovoltaic systems prices per watt are 59 percent less than were projected as recently as 2010.⁸⁰ Another estimate predicted an additional 40 percent drop in costs of solar power over the next three to four years.⁸¹ The International Renewable Energy Agency (IRENA) recently released a report finding that renewables such as biomass, hydropower, geothermal and onshore wind are all competitive with or cheaper than coal, oil and gas-fired power stations, even without financial support and despite falling oil prices.⁸² That report found that the cost of solar PV equipment fell by 75 percent and the cost of wind generation by almost a third since the end of 2009, while utility scale solar PV system costs fell by about 50 percent on

⁷⁷ Carbon Dioxide Emissions Coefficients, http://www.eia.gov/environment/emissions/co2_vol_mass.cfm.

⁷⁸ CEQ Guidance at 19–20.

⁷⁹ NREL, Solar Energy Prices See Double-digit Declines in 2013; Trend Expected to Continue, <http://www.nrel.gov/news/press/2014/15405.html>.

⁸⁰ Id.

⁸¹ Clean Technica, “Deutsche Bank Predicts Solar Grid Parity In 80% Of Global Market By 2017,” January 14th, 2015, <http://cleantechnica.com/2015/01/14/deutsche-bank-predicts-solar-grid-parity-80-global-market-2017/>.

⁸² International Renewable Energy Agency (IRENA), *Renewable Power Generation Costs in 2014*, available at http://www.irena.org/DocumentDownloads/Publications/IRENA_RE_Power_Costs_2014_report.pdf.

average since 2010.⁸³ Integration of those renewables into the grid on a large scale is possible with very little disruption. As IRENA explained:

There are no technical barriers to the increased integration of variable renewable resources, such as solar and wind energy. At low levels of penetration, the grid integration costs will be negative or modest, but can rise as penetration increases. Even so, when the local and global environmental costs of fossil fuels are taken into account, grid integration costs look considerably less daunting, even with variable renewable sources providing 40% of the power supply. In other words, with a level playing field and all externalities considered, renewables remain fundamentally competitive.⁸⁴

Those renewable energy sources result in little to no GHG emissions. Conversely, investing billions of dollars in natural gas infrastructure such as the Mountain Valley Pipeline commits the country to many years of fossil fuel combustion and attendant GHG emissions. Investing such great deal of money in fossil fuel infrastructure at this time will hinder the region's ability to take advantage of drastically reduced costs of renewables in the future. FERC must thus consider the GHG emissions of the Mountain Valley Pipeline in the light of the positive future outlook for renewables expansion, not the historic emissions from coal burning power plants.

d. Emissions from induced natural gas drilling

FERC must also assess the GHG contributions from the natural gas drilling that is a predicate for pipeline construction. As explained below, construction of the pipeline will induce further gas drilling in the Marcellus and Utica formations near the origin point and along the pipeline route. Those drilling activities constitute indirect effects of the Mountain Valley Pipeline under NEPA.⁸⁵ The CEQ Guidance explains that “emissions from activities that have a reasonably close causal relationship to the Federal action, such as those that may occur as a predicate for the agency action (often referred to as upstream emissions) and as a consequence of the agency action (often referred to as downstream emissions) should be accounted for in the NEPA analysis.”⁸⁶ The drilling activities that are necessary to supply the Mountain Valley Pipeline with gas will emit high levels of GHGs, distinct from the downstream emissions of the pipeline, compressors stations, and end use of the gas. Science shows that when the entire lifecycle of shale gas is accounted for, its use as an energy source actually results in greater GHG emissions than the use of coal or oil.⁸⁷ A major reason for that is the “upstream” GHG emissions

⁸³ *Id.* at 12.

⁸⁴ *Id.* at 14.

⁸⁵ 40 C.F.R. § 1508.8.

⁸⁶ CEQ Guidance at 11 (citing 40 C.F.R. § 1508.8).

⁸⁷ Robert W. Howarth, “A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas,” *Energy Science & Engineering* 2014, [available at](http://www.eeb.cornell.edu/howarth/index.php) <http://www.eeb.cornell.edu/howarth/index.php>.

associated with shale gas drilling operations, which through leaks and flaring cause anywhere from 2.2 to 4.3 percent of the total gas produced to be emitted directly to the atmosphere.⁸⁸ The high global warming potential of those methane emissions must be considered as an indirect effect of the proposed Mountain Valley Pipeline.

e. Emissions from loss of carbon sinks

Finally, FERC must assess the contributions to climate change as a result of the loss of carbon sinks due to construction of the Mountain Valley Pipeline and permanent maintenance of the pipeline right of way. CEQ's guidance explains that, for the purposes of NEPA, the concept of GHG emissions includes "release of stored GHGs as a result of destruction of natural GHG sinks such as forests and coastal wetlands, as well as future sequestration capability."⁸⁹ Much of the proposed route of the Mountain Valley Pipeline is now forested and would be replaced by mowed grassland for the life of pipeline. FERC must take into account the net loss of stored carbon and future carbon storage capacity represented by that change in vegetation.

3. *FERC must provide a quantitative assessment of GHG emissions*

The potential GHG emissions from the lifecycle of the Mountain Valley Pipeline are sufficiently large that NEPA's rule of reason mandates that they be given a quantitative, as opposed to merely qualitative, analysis. The CEQ recommends that any project that will result in emissions of over 25,000 metric tons of CO₂ equivalents annually should generally be subject to a quantitative analysis.⁹⁰ As demonstrated above, the GHG emissions from the Mountain Valley Pipeline would far exceed that threshold. For such projects, the CEQ explains in its Guidance that "If tools or methodologies are available to provide the public and the decision-making process with information that is useful to distinguishing between the no-action and proposed alternatives and mitigations, then agencies should conduct and disclose quantitative estimates of GHG emissions and sequestration."⁹¹ The tools necessary to conduct such an analysis for the Mountain Valley Pipeline are readily available.⁹² Only by calculating the Mountain Valley Pipeline's total lifetime GHG emissions and attendant contributions to climate change can the impacts of the project be meaningfully compared against the realistic scenario wherein the pipeline is not constructed and the region's energy demands are met with increased renewables.

⁸⁸ *Id.* at 3.

⁸⁹ CEQ Guidance at 1 note 1.

⁹⁰ *Id.* at 18.

⁹¹ *Id.* at 15.

⁹² See, e.g., Interstate Natural Gas Association of America, Greenhouse Gas Emission Estimation Guidelines for Natural Gas Transmission and Storage, Volume 1 – GHG Emission Estimation Methodologies and Procedures (GHG Guidelines), [available at](http://www.ingaa.org/cms/33/1060/6435/5485.aspx) <http://www.ingaa.org/cms/33/1060/6435/5485.aspx>.

IV. FERC Must Consider the Impacts of the Mountain Valley Pipeline Resulting From Increased Shale Gas Drilling

In addition to the local impacts described in the preceding sections, further, and likely greater, environmental impacts would result from increased gas production induced by construction of the Mountain Valley Pipeline. NEPA mandates that FERC give detailed consideration to the environmental effects of induced gas drilling. As noted above, NEPA requires consideration of “indirect effects” of the proposed action, which include “growth inducing effects and other effects related to induced changes in the pattern of land use ... and related effects on air and water and other natural systems,” and “reasonably foreseeable” effects “removed in distance” from the site of the proposed action.⁹³ “An impact is ‘reasonably foreseeable’ if it is ‘sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision.’”⁹⁴ NEPA requires “[r]easonable forecasting and speculation,” and courts “must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as ‘crystal ball inquiry.’”⁹⁵

Here, MVP’s stated purpose for constructing the pipeline is to meet demand for natural gas markets in the Mid-Atlantic and southeastern United States for electric power generation and other industrial and domestic uses.⁹⁶ Dominion proposes to meet that demand with gas produced in the Marcellus and Utica shale formations. Dominion explicitly recognizes that the growing demand for natural gas is expected to lead to a significant increase in production from 2012 to 2040. The Mountain Valley Pipeline would bring “natural gas supplies from the prolific Marcellus and Utica shale regions and supply it to the demand markets in order to support the growing demand for clean-burning natural gas,” allowing for the production of 2.0 billion cubic feet of gas per day that would not otherwise have a direct route to market.⁹⁷ The MVP would not only carry Marcellus and Utica gas to supply existing markets, but could also create new markets by “support[ing] additional uses of natural gas in south central West Virginia and southwest Virginia by providing an open access pipeline that can facilitate interconnects and subsequent economic development associated with having access to affordable gas supplies, as these areas currently have limited interstate pipeline capacity.”⁹⁸ Without the pipeline to move the gas from the production areas, the drilling would not likely be economical and would not occur. Likewise, without the ongoing production from the shale gas sources, there would be no need for the

⁹³ 40 C.F.R. § 1508.8(b).

⁹⁴ City of Shoreacres v. Waterworth, 420 F.3d 440, 453 (5th Cir. 2005) (quoting *Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992)).

⁹⁵ Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm’n, 481 F.2d 1079, 1092 (D.C. Cir. 1973).

⁹⁶ Resource Report 1 at 1-2.

⁹⁷ Id.

⁹⁸ Id.

pipeline. Such development is therefore plainly a “reasonably foreseeable” effect that must be analyzed in NEPA.

That conclusion is supported by several federal court decisions holding that natural resource production and other analogous upstream impacts induced by new infrastructure development must be considered under NEPA. For example, the Ninth Circuit recently held that, where the Surface Transportation Board was considering a proposal to expand a railway line which would enable increased coal production at several mines, NEPA required that the Board consider the impacts of increased mining.⁹⁹ The court pointed to the agency’s reliance on the induced coal mine development “to justify the financial soundness of the proposal.”¹⁰⁰ Because the agency anticipated induced coal production in justifying its proposal, such production was reasonably foreseeable, and NEPA analysis of its impacts was required.¹⁰¹ Likewise, here the entire justification for the Mountain Valley Pipeline is to move gas produced by shale gas drilling in the Marcellus and Utica formations to market, and even to create new markets that will require additional gas. The impacts of that drilling are thus reasonable foreseeable effects of pipeline development.

Border Power Plant Working Group v. DOE also required consideration of upstream environmental impacts induced by the construction of new energy infrastructure.¹⁰² That case involved applications to construct and operate transmission lines across the U.S.-Mexico border. The court held that the Department of Energy was required to consider the environmental effects of upstream electricity generation induced by the new infrastructure, rejecting DOE’s decision to exclude these upstream impacts from analysis.¹⁰³ Consideration of induced impacts was required even though the upstream electricity generation would occur in Mexico, outside the jurisdiction of DOE or any other U.S. agency.¹⁰⁴ Here, too, FERC is required to consider the impacts of natural gas production induced by the Mountain Valley Pipeline, regardless of FERC’s regulatory authority over that production.

EPA also has argued, in scoping comments it submitted on two other natural gas infrastructure proposals, that induced production should be included in NEPA review. In scoping comments for the Jordan Cove LNG project, EPA opined that, in light of the regulatory definition of indirect effects and the predictions of the project’s induced production, “it is appropriate to consider available information about the extent to which drilling activity might be stimulated by the construction of an LNG export facility on the west coast, and any potential

⁹⁹ Northern Plains Resource Council, Inc. v. Surface Transp. Bd., 668 F.3d 1067, 1081-82 (9th Cir. 2011).

¹⁰⁰ Id. at 1082.

¹⁰¹ Accord Mid States Coalition for Progress v. Surface Transp. Bd., 345 F.3d 520, 548-50 (8th Cir. 2003).

¹⁰² 260 F. Supp. 2d 997 (S.D. Cal. 2003).

¹⁰³ Id. at 1017.

¹⁰⁴ Id. at 1016- 17.

environmental effects associated with that drilling expansion.”¹⁰⁵ EPA’s scoping comments for the Cove Point facility in Maryland also recommended analyzing “indirect effects related to gas drilling and combustion” and stressed that, in addition to reviewing the economic impacts of induced drilling, the DOE should “thoroughly consider the indirect and cumulative environmental impacts” of export.¹⁰⁶ It is thus clear that FERC must consider the impacts of the shale gas drilling that would be required to supply the Mountain Valley Pipeline.

That drilling would result in significant environmental impacts. Natural gas production—particularly from “unconventional” sources such as the shale gas formations that would supply the Mountain Valley Pipeline—is a significant air pollution source, can disrupt ecosystems and watersheds, leads to industrialization of entire landscapes, disrupts communities, and presents challenging waste disposal issues. A subcommittee of the DOE’s Secretary of Energy’s Advisory Board recently highlighted “a real risk of serious environmental consequences” resulting from continued expansion of shale gas production.¹⁰⁷ Shale gas production requires employing the controversial practice of hydraulic fracturing or “fracking,” which imposes a large number of environmental harms.

For instance, fracking operations are a significant source of air pollution beyond the GHG emissions discussed above. EPA acknowledges that “[t]here have been well-documented air quality impacts in areas with active natural gas development, with increases in emissions of methane, volatile organic compounds (VOCs) and hazardous air pollutants (HAPs).”¹⁰⁸ Exposure to this pollution can cause eye, nose, and throat irritation, respiratory illnesses, central nervous system damage, birth defects, cancer, or premature death.¹⁰⁹ In Colorado, for example, an evaluation of birth defects in areas with high concentrations of oil and gas activity found that mothers who lived near many oil and gas wells were 30 percent more likely to have babies with heart defects.¹¹⁰ Similarly, preliminary results from a study in Pennsylvania show impacts

¹⁰⁵ EPA, Scoping Comments – The Jordan Cove Energy Project LP, FERC Dkts. PF12-7 and PF12-17, 14 (Oct. 29, 2012); *see also* EPA, Scoping Comments – The Oregon LNG Export Project and Washington Expansion Project, FERC Dkts. PF12-18 and PF12-20 (Dec. 26, 2012).

¹⁰⁶ EPA Region III, Scoping Comments -- The Dominion Cove Point LNG, LP, FERC Dkt. CP13-133, 2-3 (Nov. 15, 2012).

¹⁰⁷ DOE, Secretary of Energy’s Advisory Board, Shale Gas Production Subcommittee Second 90-Day Report 10 (Nov. 18, 2011); *see also* DOE, Shale Gas Production Subcommittee, First 90-Day Report (Aug. 18, 2011) (hereinafter “First 90-Day Report”).

¹⁰⁸ US EPA, Natural Gas Extraction - Hydraulic Fracturing, <http://www2.epa.gov/hydraulicfracturing#air>.

¹⁰⁹ John L. Adgate et al., “Potential Public Health Hazards, Exposures and Health Effects from Unconventional Natural Gas Development,” *Environmental Science and Technology* (2014), [available at http://pubs.acs.org/doi/abs/10.1021/es404621d](http://pubs.acs.org/doi/abs/10.1021/es404621d).

¹¹⁰ Lisa M. McKenzie et al., “Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado,” *Environmental Health Perspectives*, (2014) at 12, [available at http://ehp.niehs.nih.gov/1306722/](http://ehp.niehs.nih.gov/1306722/).

among newborns that could be linked to air pollution such as increases in low birth weight.¹¹¹ In many rural areas, the boom in oil and gas activity has been linked to unhealthy spikes in ozone concentrations.¹¹² In 2008 and 2011, increased ozone concentrations in Wyoming's Sublette County were associated with subsequent increases in outpatient clinic visits for respiratory problems.¹¹³ Researchers who looked at air pollution levels near fracking sites in Colorado also found an increased risk of chronic and sub-chronic effects mainly stemming from oil and gas related pollutants, which can harm the respiratory and neurological systems and lead to symptoms like shortness of breath, nosebleeds, headaches, dizziness, and chest tightness.¹¹⁴ FERC must consider those air quality impacts that would result from the shale gas drilling necessary to supply the Mountain Valley Pipeline.

FERC must also consider the water quality impacts associated with induced drilling. The chemicals injected into the ground to aid in the hydraulic fracturing process pose a serious risk to groundwater supplies, many of which are used for drinking water. EPA's Acting Assistant Administrator for Water testified before Congress about the dangers posed by these injected chemicals, particularly the use of diesel fuel. She explained that:

Diesel fuels in hydraulic fracturing fluids are a concern because they often contain benzene, toluene, ethylbenzene, and xylene compounds (BTEX). BTEX compounds are highly mobile in ground water and are regulated under national primary drinking water regulations because of the risks they pose to human health. People who consume drinking water containing any of these compounds in excess of the EPA's drinking water standard over many years may experience health complications such as increased cancer risk, anemia, and problems with the nervous system, kidneys, or liver.¹¹⁵

The human health and environmental impacts of many other chemicals injected in the fracking process are not completely understood, in large part because operators are not required to disclose what they are injecting.

¹¹¹ Adgate et al.

¹¹² Detlev Helmig et al., "Highly Elevated Atmospheric Levels of Volatile Organic Compounds in the Uintah Basin, Utah." *Environmental Science & Technology*, March 27, 2014, [available at http://www.ncbi.nlm.nih.gov/pubmed/24624890](http://www.ncbi.nlm.nih.gov/pubmed/24624890).

¹¹³ State of Wyoming Department of Health, "*Associations of Short-Term Exposure to Ozone and Respiratory Outpatient Clinic Visits — Sublette County, Wyoming, 2008–2011*," 2013, [available at health.wyo.gov/Media.aspx?mediaId=16318](http://health.wyo.gov/Media.aspx?mediaId=16318).

¹¹⁴ McKenzie et al.

¹¹⁵ Testimony of Nancy K. Stoner Before the Subcommittee on Technology, Information Policy, Intergovernmental Relations and Procurement Reform Committee on Oversight and Government Reform, United States House of Representatives, May 31, 2012, at 3 [available at http://www.epa.gov/ocir/hearings/testimony/112_2011_2012/n_stoner_testimony.pdf](http://www.epa.gov/ocir/hearings/testimony/112_2011_2012/n_stoner_testimony.pdf)

In addition to the chemicals injected, fracking also impacts water quality by releasing contaminants into the groundwater that were formerly bound within rock formations. A study from Duke University found methane concentrations 17 times higher in drinking water wells within 1 kilometer of active hydrofracking sites.¹¹⁶ Additionally, much of the brine brought closer to the surface by fracking operations contains very high levels of radioactive materials.¹¹⁷

Not only does shale gas drilling contaminate groundwater *in situ*, it also uses and contaminates an incredible amount surface water that, once injected and then returned to the surface, must be disposed of. A recent report by the consulting firm Earthworks showed that it requires between two and five millions of gallons of water to hydraulically fracture a shale well.¹¹⁸ The disposal of the produced water and flowback of surface water once well pressure is released have serious water quality impacts. Samples of flowback from the Marcellus Shale have shown consistently high levels of sodium, chloride, strontium, barium, and bromide. In addition, flowback can contain substances originating from the fractured formation, such as hydrogen sulfide and various volatile organic compounds.¹¹⁹ In 2008, improper disposal of shale gas wastewater in the Monongahela caused a surge in levels of Total Dissolved Solids (TDS) leading to a bottled water advisory for Pittsburgh residents.¹²⁰ In 2013, there were nearly 600 spills of wastewater, fracturing fluids, and other substances at oil and gas well sites in Pennsylvania, a 70% increase since 2011.¹²¹ Those represent just a couple of the many examples of water quality impacts that result from the challenges associated with disposing of massive quantities of wastewater from fracking operations. In its EIS, FERC must consider all of those impacts as indirect effects of the Mountain Valley Pipeline.

V. FERC Must Consider the Environmental Justice Implications of Authorizing the Mountain Valley Pipeline

FERC has an obligation under NEPA and Executive Order No. 12898¹²² to identify and consider in-depth any disproportionately high and adverse human or environmental effects on

¹¹⁶ See “Hydrofracking Changes Water Wells: New method of extracting shale gas may force methane into the water supply,” <http://today.duke.edu/2011/05/hydrofracking>.

¹¹⁷ “Radionuclides in Fracking Wastewater: Managing a Toxic Blend,” *Environmental Health Perspectives* 122:A50–A55 (2014), [available at](http://dx.doi.org/10.1289/ehp.122-A50) <http://dx.doi.org/10.1289/ehp.122-A50>.

¹¹⁸ Earthworks, “Wasting Away: Four states’ failure to manage gas and oil field waste from the Marcellus and Utica Shale,” April 2015, at 7, [available at](http://www.earthworkSACTION.org/library/detail/wasting_away_full_report#.VTRgofC9Qb4) www.earthworkSACTION.org/library/detail/wasting_away_full_report#.VTRgofC9Qb4.

¹¹⁹ *Id.*

¹²⁰ *Id.* at 6.

¹²¹ *Id.* at 7.

¹²² Although FERC may not be explicitly bound by E.O. 12898 pursuant to Section 6-604, that Order nonetheless requests compliance by “independent” agencies such as FERC. Regardless, because cooperating agencies explicitly covered by the E.O., such as the U.S. Forest Service, intend to rely on FERC’s EIS to satisfy their obligations under NEPA, the EIS will need to fully comply with E.O. 12898.

minority populations and low-income populations that would result from approval of the Mountain Valley Pipeline. Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” directs every Federal agency, “[t]o the greatest extent practicable and permitted by law” to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions.”¹²³ The Council on Environmental Quality has explained that the attainment of environmental justice is “wholly consistent” with the goals and requirements of NEPA.¹²⁴

Pursuant to NEPA and E.O. 12898, agencies must determine if an area potentially affected by a proposed action may include low-income or minority populations. Many of the communities that could be affected by the Mountain Valley Pipeline include a significant portion of low-income residents. For instance, Braxton, Fayette, Nicholas, Summers, and Wetzel Counties in West Virginia have all been identified by the Appalachian Regional Commission as “at-risk” areas, meaning that they are between the lowest ten and twenty-fifth percent of all U.S. counties economically.¹²⁵ Webster County, WV has been identified as “distressed,” meaning that it is the lowest ten percent of all U.S. counties economically.¹²⁶ “In general, the Appalachian region has lagged economically from other parts of the U.S. Relatively high levels of unemployment, low regional incomes, and educational deficits continue to contribute to a lower standard of living than enjoyed in many areas of the U.S.”¹²⁷ FERC must actively determine where low-income areas exist along the route of the Mountain Valley Pipeline so that it can assess environmental justice impacts.

FERC must pay particular attention to the environmental justice implications of the pipeline’s four compressor stations. Compressor stations operate around the clock and are a significant source of nuisance noise and air pollution. A compressor station in North Carolina with similar horsepower to the MVP’s three smaller proposed stations (less than one-third of the hp of the larger Bradshaw Station) was permitted to emit the following levels of harmful air pollutants per year: 25,000 pounds of Particulates (2.5, 10 and total); 1,400 pounds of sulfur dioxide; 360,000 pounds of nitrogen oxides; 70,000 pounds of volatile organic compounds; 44,000 pounds of carbon monoxide; 25,000 pounds of hazardous air pollutants, 17,000 pounds of

¹²³ Executive Order 12898, Section 1-101 (February 1994).

¹²⁴ Council on Environmental Quality, *Environmental Justice: Guidance Under the National Environmental Policy Act* (Dec. 10, 1997) (“CEQ EJ Guidance”) at 7.

¹²⁵ Appalachian Regional Commission, County Economic Status, Fiscal Year 2016: Appalachian West Virginia, http://www.arc.gov/reports/region_report.asp?FIPS=54999&REPORT_ID=58.

¹²⁶ *Id.*

¹²⁷ Halverson, J.A., L. Ma, E.J. Harner, An Analysis of Disparities in Health Status and Access to Health Care in the Appalachian Region, report prepared for the Appalachian Regional Commission, Sept. 2004 at xiv.

formaldehyde; and 407,000,000 pounds of carbon dioxide equivalent.¹²⁸ Those air pollutants can be carcinogenic or neurotoxic, aggravate asthma and COPD, and contribute to other negative impacts on public health such as respiratory problems, early mortality, and childhood learning defects.¹²⁹ Compressor stations are also significant sources of low-frequency noise pollution that can cause adverse physical and mental effects.¹³⁰ Those impacts must be considered as part of FERC’s environmental justice review.

Not only must FERC identify areas that could suffer environmental justice impacts, it must also seek to avoid those impacts. Identification of an environmental justice impact “should heighten agency attention to alternatives (including alternative sites), mitigation strategies, monitoring needs, and preferences expressed by the affected community or population.”¹³¹ When an agency identifies a disproportionately high and adverse human health or environmental effect on low-income or minority populations, it should consider both the distribution and the magnitude of that impact when determining its environmentally preferable alternative.¹³² Additionally, mitigation measures identified in the EIS should reflect the needs and preferences of affected low-income or minority populations. FERC thus consider alternatives and mitigation measures for the Mountain Valley Pipeline that minimize impacts on those populations.

VI. FERC must assess the impact of the Mountain Valley Pipeline on karst systems, surface waters, and fauna.

FERC must assess the impact of the Mountain Valley Pipeline on karst systems, surface waters, and fauna. Numerous parties have submitted comments to FERC on the Atlantic Coast Pipeline (FERC Docket Nos. PF15-5-000 and PF15-6-000) addressing potential impacts on water resources, karst systems, and ecosystems. The terrain that would be crossed by the ACP is very similar to the terrain proposed to be crossed by the Mountain Valley Pipeline such that the concerns raised in those comments are applicable here and we thus incorporate those comments by reference. In particular, we wish to highlight comments submitted by the Dominion Pipeline Monitoring Coalition (“DPMC”), Richard Lambert of the Highland County Cave Survey, the Augusta County Board of Supervisors (“Augusta BOS”), and Trout Unlimited.

The DPMC has submitted comments discussing several concerns relating to water resources and ecosystem protection, including but not limited to: issues and standards related to water quality and water quantity, karst-related issues, forests, plant and animal species,

¹²⁸ Blue Ridge Environmental Defense League, Natural Gas Compressor Stations: Air Pollution, Explosions and Fires at 2, available at www.bredl.org/pdf5/Factsheet_compressor_stations.pdf.

¹²⁹ Id.

¹³⁰ Earthworks, Oil and Gas Noise, http://www.earthworksaction.org/issues/detail/oil_and_gas_noise#.VT_gpvC9Qb4.

¹³¹ CEQ EJ Guidance at10.

¹³² Id. at 15.

biodiversity, and several other ecological issues. DPMC also highlights the need for public access to fundamental information regarding the alternate routes under consideration.

Richard Lambert of the Highland County Cave Survey has submitted detailed comments regarding the ACP's potential effects on karst systems, surface waters, and fauna in Highland County. As Mr. Lambert explains, karst landscapes are characterized by features such as underground drainage, caves, sinkholes, and sinking or losing streams. Aquatic and terrestrial organisms may have a high degree of specific adaptation to the features within karst systems, making those organisms extremely susceptible to environmental degradation. In this environment, sedimentation and hydrostatic testing raise serious concerns. Sediment releases could change habitat, block recharge sites, or alter flows, and contaminated water and sediments could have serious effects on cave life and water quality. In light of these concerns, Mr. Lambert offers a number of specific recommendations, which we urge FERC to consider for the entire route of the MVP, which also proposes to cross substantial karst systems.

In light of the fact that approximately 43 miles of the proposed ACP would run through Augusta County, Virginia, the Augusta BOS initiated an extensive study process to evaluate potential impacts of the pipeline. The Augusta BOS submitted comments on March 30, 2015, that incorporated comments (oral and written) from a multitude of state and county agencies and staff (including the Virginia Department of Health, the Virginia Department of Transportation, the Augusta County Service Authority, and various county departments), citizens, and experts. The Augusta BOS identified a number of areas of concern related to the proposed ACP, including: risks to the County's water supply and associated infrastructure posed by a proposed pipeline through karst geology; risks to adjoining counties that rely on Augusta County's groundwater flow and streamwater flow; and negative impacts of blasting on water quality, yield of wells and springs, and integrity of flood control structures. Those comments are likewise applicable to the karst areas that would be crossed by the Mountain Valley Pipeline.

Trout Unlimited has submitted comments identifying potential impacts on coldwater resources, as well as mitigation measures to limit or eliminate those impacts. The comments include recommendations relating to the pipeline's route, stream crossing methods, construction activities, and hydrostatic testing. Impacts from erosion and sedimentation are also discussed. These comments, as well as many others, provide valuable information that should be considered as part of FERC's scoping process for the Mountain Valley Pipeline.

VII. The EIS must thoroughly analyze the environmental impacts, including cumulative impacts, of forest fragmentation and related issues caused by the proposed Mountain Valley Pipeline and alternative routes.

The central Appalachian mountains, including the Jefferson National Forest, are rich in biodiversity and contain some of the most contiguously forested areas along the East Coast.¹³³ These large, contiguous patches of forest are particularly valuable.¹³⁴ For example, they sustain wide-ranging forest species, are more resistant to the spread of invasive species, suffer less tree damage from wind and ice storms, and provide important ecosystem services like carbon storage and water filtration.¹³⁵ Large linear corridors created by buried pipelines like the proposed Mountain Valley Pipeline, however, would permanently fragment these areas of continuous high-quality forest, decrease critical interior forest, and increase forest edge. Fragmentation of such large, continuous blocks of habitat has been recognized as “one of the most pervasive threats to native ecosystems”—indeed, roads and pipelines like the Mountain Valley Pipeline have a greater impact on fragmentation than well pads themselves.¹³⁶ As a result, the U.S. Geological Survey has acknowledged that “[f]ragmentation of forest and habitat is a primary concern resulting from current gas development.”¹³⁷

1. Habitat Fragmentation

¹³³ See, e.g., The Nature Conservancy, The Central Appalachians Critical Habitats Assessment, available at http://s3.amazonaws.com/DevByDesign-Web/MappingApps/CentralApps/critical_habitat/CritHabitat.html (depicting “Forest cores,” which are interior forest habitat areas greater than 5,000 acres that have been identified as conservation priorities for The Nature Conservancy); see also M. Dougherty and E. Byers, W.V. Div. of Natural Res., *Preliminary Calculation of Landscape Integrity in West Virginia Based on Distance from Weighted Disturbances*, (2008), available at http://wvgis.wvu.edu/data/otherdocs/Dougherty_and_Byers_LandscapeIntegrity_2008.pdf; E.A. Byers, et al., W.V. Div. of Natural Res., *Classification and Conservation Assessment of Upland Red Spruce Communities in West Virginia*, (2010), available at <http://www.wvdnr.gov/publications/PDFFiles/RedSpruceUplands-web.pdf>.

¹³⁴ Nels Johnson, The Nature Conservancy, *Pennsylvania Energy Impacts Assessment Report 1: Marcellus Shale Natural Gas and Wind*, 19 (Nov. 15, 2010).

¹³⁵ *Pennsylvania Energy Impacts Assessment Report 1: Marcellus Shale Natural Gas and Wind* at 19.

¹³⁶ Brittingham, M.C., et al., *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats*, Environmental Science & Technology, 11037 (Sept. 4, 2014) (citing E.T. Slonecket, et al., U.S. Geological Survey, *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pa., 2004-2010*, 9 (2012) (in Bradford and Washington counties, “forests became more fragmented primarily as a result of the new roads and pipelines associated with shale development, and development resulted in more and smaller forest patches with loss of core forest ... at twice the rate of overall forest loss.”)); see also *Pennsylvania Energy Impacts Assessment Report 1: Marcellus Shale Natural Gas and Wind*; E.T. Slonecket, et al., U.S. Geological Survey, *Landscape Consequences of Natural Gas Extraction in Fayette and Lycoming Counties, Pennsylvania, 2004-2010* (2013).

¹³⁷ *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 9.

Habitat fragmentation occurs when large areas of natural landscapes are intersected and subdivided by other land uses, leaving smaller patches to serve as habitat for various species.¹³⁸ Forest fragmentation and habitat loss “are closely intertwined, with loss of habitat frequently associated with fragmentation of the remaining habitat, and fragmentation often associated with additional losses of interior or core habitats.”¹³⁹ Fragmentation is also associated with various ecological changes—including “changes in patch size and isolation, light, moisture, and temperature”—that directly and indirectly affect populations and communities.¹⁴⁰ The resulting smaller patches have a decreased ability to support viable populations of individual species.¹⁴¹ As a result, habitat loss and forest fragmentation can be major threats to biodiversity.¹⁴²

Gas exploration and development activities can have an extreme effect on the surrounding landscape.¹⁴³ Associated infrastructure, including pipelines, “alters the landscape by creating a mosaic of spatially distinct habitats from originally contiguous habitat, resulting in smaller patch size, greater number of patches, and decreased interior or edge ratio” through habitat loss, fragmentation, and edge effects.¹⁴⁴ This in turn alters the flora and fauna that depend on that habitat.¹⁴⁵ In studying gas development in two Pennsylvania counties, the U.S. Geological Survey concluded that “[p]ipeline construction was the source of most of the increase in forest patch number.”¹⁴⁶

Constructing the proposed Mountain Valley Pipeline and related infrastructure would likely involve clearing and bulldozing a 125-foot-wide construction corridor and permanent maintenance of a cleared right of way. It will also involve construction of access roads for

¹³⁸ *Id.*

¹³⁹ *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037.

¹⁴⁰ *Id.* (citing K. Harper, *et al.*, *Edge influence on forest structure and composition in fragmented landscapes*, *Conserv. Biol.* 2005, 19 (3), 768-82; S.K. Collinge, *Ecology of Fragmented Landscapes*, p. 340, The Johns Hopkins University Press: Baltimore, Md. (2009)).

¹⁴¹ *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 9.

¹⁴² *Id.* (citations omitted).

¹⁴³ *Id.*

¹⁴⁴ *See Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 9-10 (citing L.F. Lehmkuhl and L.F. Ruggier, *Forest fragmentation in the Pacific Northwest and its potential effects on wildlife* (1991), in L.F. Ruggiero, *et al.*, USDA Forest Service, Pacific Northwest Research Station, *Wildlife and vegetation of unmanaged Douglas-fir forests*, GTR-PNW-285, 34-36; V.H. Dale, *et al.*, *Ecological principles and guidelines for managing the use of land: Ecological Society of America report*, *Ecological Applications*, v. 10, no. 3, 639-670 (2000)).

¹⁴⁵ *Id.* at 10.

¹⁴⁶ *Id.* at 26; *see also Landscape Consequences of Natural Gas Extraction in Fayette and Lycoming Counties, Pennsylvania, 2004-2010* at 26 (reporting 40 percent increase in forest patches in one county and majority of new forest patches in other county attributable to pipeline construction).

pipeline construction and maintenance and clearing and excavation of staging areas somewhere within or in proximity to the proposed study corridors. There will be unavoidable, but thus far unstudied and unquantified, impacts to forested areas.

Because the specific impacts of habitat loss and fragmentation depend on the needs and attributes of specific species and communities, FERC must fully evaluate the significant, long-term impacts that fragmentation from the proposed pipeline corridor and alternatives may have on each species and community, both within and adjacent to the proposed pipeline corridor.¹⁴⁷ Avoidance, minimization, or mitigation of these impacts is critical to ecological sustainability. Moreover, the EIS must assess whether mitigation measures fully account for and address the impacts that constructing and maintaining the pipeline and related infrastructure will have with respect to these ecological disruptions. The EIS must disclose and assess all direct, indirect, and cumulative impacts of this disturbance and fragmentation of forests.

2. *Interior and edge forest*

Forest and habitat fragmentation is closely tied to a loss of interior forest and an increase in edge forest habitat. Large interior blocks of core forest (forest habitat that is at least 100 meters from an anthropogenic edge) provide an important and unique habitat for an array of plant and animal species.¹⁴⁸ The environmental conditions within an interior forest, including light, wind, humidity, and exposure to and protection from predators, differ greatly from those areas close to the forest edge.¹⁴⁹ A linear land use like the proposed Mountain Valley Pipeline, however, can dramatically affect the amount of interior forest, which is among those most at risk for suffering from long-term impacts of gas development, as are the area-sensitive species that live there.¹⁵⁰ Following a study of gas development in two Pennsylvania counties, the U.S. Geological Survey reported that both counties experienced a loss of interior forest and a gain in edge forest, concluding that “pipeline construction was the major contributor to forest loss” and the largest amount of increase in forest edge was attributable to pipeline construction.¹⁵¹

The proposed Mountain Valley Pipeline will also increase forest edge—the amount of edges between the forest and other land uses in the area— and “edge effect—the influence of the

¹⁴⁷ See *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 10.

¹⁴⁸ See *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11040; see also *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 10.

¹⁴⁹ See *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 10.

¹⁵⁰ *Id.*; *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11039-40.

¹⁵¹ *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 24, 29; see also *Landscape Consequences of Natural Gas Extraction in Fayette and Lycoming Counties, Pennsylvania, 2004-2010* at 29 (same).

two bordering communities on each other—along the proposed and alternative routes.¹⁵² Edge habitat differs from interior forest habitat in several ways, including but not limited to increased light reaching the forest floor, decreased moisture and organic matter levels, increased spread of non-native invasive species, and different soil chemistry and associated micro biota. In addition, the decomposition community in edge forest may be predominantly fungal instead of bacterial. This may impact nutrient recycling and plant growth.

Increasing forest edge can have a variety of negative impacts and can affect the natural ecosystem for some distance in from the edge.¹⁵³ Indeed, research indicates that measurable impacts often extend at least 100 meters (approximately 330 feet) into forest adjacent to an edge.¹⁵⁴ Plots with two or more neighboring edges have greater tree mortality and biomass loss.¹⁵⁵ And over time, proliferating vines and underbrush growth can partially seal the forest edge, which can make it more difficult for smaller tree seedlings to survive.¹⁵⁶ Abrupt, artificial boundaries like those created by the Mountain Valley Pipeline corridor are also vulnerable to windstorms, snow, ice, and convectional thunderstorms.¹⁵⁷ These can weaken and destroy exposed edge.¹⁵⁸ In addition, forest edge exposed to dry wind conditions and increased rates of evaporation—as occurs with periodic droughts—may suffer more pronounced effects.¹⁵⁹ Moreover, as discussed below, increasing forest edge has many effects on interior forest and edge forest species.

The EIS must consider these many potential impacts of increasing forest edge, including but not limited to potential impacts on terrestrial and avian species, as well as vegetation and soil dynamics (including loss of native soil integrity) associated with an increase in forest edge. In order to assess fully the potential impacts of the edge effect, the EIS must properly account for the geographic extent and temporal frame of forest edge impacts. The EIS must evaluate any beneficial impacts of edge creation for certain species in conjunction with the negative impacts on other species.

The EIS must also disclose and analyze the geographic extent, including total acreage of interior forest habitat that would be impacted, by edge effect. Because expanding edges into

¹⁵² See *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 11.

¹⁵³ *Id.* (citation omitted).

¹⁵⁴ Nels Johnson, The Nature Conservancy, *Pennsylvania Energy Impacts Assessment Report 1: Marcellus Shale Natural Gas and Wind*, 11 (Nov. 15, 2010);

¹⁵⁵ *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 11.

¹⁵⁶ See *id.*.

¹⁵⁷ See *id.*

¹⁵⁸ *Id.*

¹⁵⁹ See *id.*

natural ecosystems can affect the natural ecosystem for some distance in from the edge, the EIS must evaluate an impact area that extends at least 300 feet into adjacent forest; examining only the pipeline corridor and other areas in which soil may be moved or vegetation may be cleared would grossly underestimate the area of impact. This analysis should include spatial data detailing interior forest resources along the proposed route and alternatives, as well as forest connectivity and riparian corridors. In addition, the EIS must acknowledge the current declining levels of interior forest habitat and the increase of forest edge conditions. The EIS must also acknowledge and deal with the reality that while interior forest requires decades to create, edge forest can be created overnight.

3. *Wildlife*

The EIS must also examine impacts that fragmentation from a long, linear pipeline corridor could have on native wildlife populations and communities—directly by habitat loss or indirectly through changes on adjacent habitats and land uses associated with them.¹⁶⁰

Populations of forest interior species decline as forest patches are fragmented into smaller patches.¹⁶¹ While fragmented forests can provide habitat for edge species, they are poor for interior species.¹⁶² Interior forest species avoid edge areas for a variety of reasons, including increased risk of predation, as well as changes in canopy cover, humidity, and light levels.¹⁶³ Other species, particularly common species such as whitetail deer, are attracted to forest edge, which can result in increased competition, predation, parasitism, and herbivory.¹⁶⁴ Invasive species, which “often thrive on forest edges,” can displace native species.¹⁶⁵

Fragmentation can lead to increased mortality of individuals moving between patches, decreased recolonization rates, and reduced population sizes.¹⁶⁶ In addition, depending on whether the corridor is perceived as a barrier or boundary or used for invasion into habitats that were previously not accessible, the Mountain Valley Pipeline could alter movement patterns, species interactions, and abundance.¹⁶⁷ For example, the brown-headed cowbird, and many other

¹⁶⁰ See *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037.

¹⁶¹ *Pennsylvania Energy Impacts Assessment Report 1: Marcellus Shale Natural Gas and Wind* at 11.

¹⁶² See *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 26 (“Fragmented forests provide habitat for edge species, but are poor for interior species, and are unlikely to provide migration corridors.”).

¹⁶³ *Pennsylvania Energy Impacts Assessment Report 1: Marcellus Shale Natural Gas and Wind* at 11.

¹⁶⁴ *Id.*

¹⁶⁵ *Id.*

¹⁶⁶ *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010* at 10.

¹⁶⁷ *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037; see also Bureau of Land Mgmt., *FEIS for Ruby Pipeline Project*, 25 (Nov. 2013) (artificial structures can increase the abundance, diversity, or hunting efficiency of predators) (citations omitted).

species use linear corridors like the proposed Mountain Valley Pipeline “for movement and hunting, potentially resulting in increased levels of predation and parasitism.”¹⁶⁸ “Studies have shown that fragmentation of the landscape, which can result from the development of large-scale energy projects, particularly influences predation and nest success by providing predators with beneficial features, such as better visibility.”¹⁶⁹

The large blocks of intact forest that the proposed pipeline would fragment include essential habitat for area-sensitive or forest-interior species, including songbirds—primarily neotropical migrants.¹⁷⁰ For example, the proposed pipeline corridor appears to cut through breeding habitat for many species of migratory and resident birds,¹⁷¹ and would affect designated Important Bird Areas, which provide essential habitat for migratory and other bird species.¹⁷² Neotropical migrants, which play an important role in forest ecosystems have declined in numbers as a result of forest fragmentation.¹⁷³ Numerous research studies have documented the

¹⁶⁸ *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037.

¹⁶⁹ *FEIS for Ruby Pipeline Project* at 25 (citations omitted); see also K.V. Rosenberg, et al., *A land manager’s guide to improving habitat for scarlet tanagers and other forest-interior birds*, The Cornell Lab of Ornithology (1999), available at <http://www.birds.cornell.edu/bbimages/clo/pdf/tanager.pdf> (“As mature forests become fragmented, less habitat is available for breeding birds, and a variety of factors, such as increased brood parasitism and nest predation, result in lower reproductive success in the habitat that remains.”); A.C. Rich, et al., *Defining Forest Fragmentation by Corridor Width: The Influence of Narrow Forest-Dividing Corridors on Forest-Nesting Birds in Southern New Jersey*, *Conservation Biology*, 8: 1109–1121 (Dec. 1994), available at <http://onlinelibrary.wiley.com/doi/10.1046/j.1523-1739.1994.08041109.x/abstract>; American Bird Conservancy, *The United States Watch List of Birds of Conservation Concern*, available at <http://www.abcbirds.org/abcprograms/science/watchlist/index.html>.

¹⁷⁰ See *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11040; see also P.B. Wood, et al., American Bird Conservancy, *Management guidelines for enhancing Cerulean Warbler breeding habitat in Appalachian hardwood forests*, 3-7 (2013), available at http://amjv.org/documents/cerulean_guide_1-pg_layout.pdf.

¹⁷¹ See, e.g., J.R. Sauer, et al., [USGS Patuxent Wildlife Research Center](http://www.mbr-pwrc.usgs.gov/bbs/), *The North American Breeding Bird Survey, Results and Analysis 1966 – 2013, Version 01.30.2015* (2014), available at <http://www.mbr-pwrc.usgs.gov/bbs/>; USGS Patuxent Wildlife Research Center, *Virginia North American Breeding Bird Survey Trend Results*, available at <http://www.mbr-pwrc.usgs.gov/cgi-bin/atlasa12.pl?VA&2&12&csrfmiddlewaretoken=3YKakk7LxT2ki6NSpl4mstudYCqdw02C>; USGS Patuxent Wildlife Research Center, *West Virginia North American Breeding Bird Survey Trend Results*, available at <http://www.mbr-pwrc.usgs.gov/cgi-bin/atlasa13.pl?WV&2&13&csrfmiddlewaretoken=3YKakk7LxT2ki6NSpl4mstudYCqdw02C>.

¹⁷² See, e.g., Bird Life International, *Important Bird and Biodiversity Areas*, available at <http://www.birdlife.org/worldwide/programme-additional-info/important-bird-and-biodiversity-areas>; Audubon, *Audubon Important Bird Areas: Greenbrier River Drainage and Adjacent Mts.*, available at <http://netapp.audubon.org/IBA/Reports/3563>; Audubon, *Audubon Important Bird Areas: Lewis Wetzel WMA*, available at <http://netapp.audubon.org/IBA/Reports/3447>; Audubon, *Audubon Important Bird Areas: New River Gorge - Garden Ground Mt. IBA*, available at <http://netapp.audubon.org/IBA/Reports/3445>.

¹⁷³ *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11040 (citing J. Faaborg, et al., *Habitat fragmentation in the temperate zone*, *Ecology* and

negative effects of fragmentation on the abundance and productivity of these area-sensitive birds, which have the highest breeding success and abundance in large blocks of continuous forest.¹⁷⁴ There are also many other bird species of conservation concern in the area of the proposed pipeline. For example, Partners in Flight, a cooperative effort of federal, state, and local government agencies, foundations, professional organizations, academic communities, and individuals interested in the conservation of birds has conducted a comprehensive analysis of the regional and continental status of bird species and established a ranking of priority bird species.¹⁷⁵

Conservation of migratory birds and their habitat is a priority for the regions that the proposed Mountain Valley Pipeline and alternatives cross. For example, the FEIS for the recently revised George Washington Forest Plan acknowledges that migratory birds are a “focus of conservation concern due to evidence of declining population trends of many species.”¹⁷⁶ The Forest Service thus worked with partnerships to protect migratory birds and their habitats.¹⁷⁷ In addition, FERC and the FWS entered into a Memorandum of Understanding in 2011 to further the purposes of the migratory bird conventions, the Migratory Bird Treaty Act, the Endangered Species Act, NEPA, and other statutes.¹⁷⁸ FERC and FWS agreed that “conservation of migratory birds and their habitat will help sustain ecological integrity” and “contribute to public conservation education[.]”¹⁷⁹ Accordingly, FERC agreed to (among other things): avoid or minimize the take of migratory birds and adverse effects on their habitat, and improve conditions for migratory birds on lands affected by energy projects like the proposed Mountain Valley

Management of Neotropical Migrant Birds, 357-80 (Oxford University Press 1995); S. Robinson *et al.*, *Regional forest fragmentation and the nesting success of migratory birds*, *Science*, 267 (5206) (1995); R.A. Askins, *Hostile landscapes and the decline of migratory songbirds*, *Science*, 267 (5206) (1995)); see also *The North American Breeding Bird Survey, Results and Analysis 1966 – 2013, Version 01.30.2015*, available at <http://www.mbr-pwrc.usgs.gov/bbs/>; *Virginia North American Breeding Bird Survey Trend Results*, available at <http://www.mbr-pwrc.usgs.gov/cgi-bin/atlasa12.pl?VA&2&12&csrfmiddlewaretoken=3YKakk7LxT2ki6NSpl4mstudYCqdW02C>; *The State of the Birds 2014: 1968-2012 Trend Estimates: Eastern Forests*, available at http://www.stateofthebirds.org/maps_species#1966-2012-trend-estimates-2.

¹⁷⁴ *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11040.

¹⁷⁵ Partners in Flight Science Committee, *Species Assessment Database*, (2012), available at <http://rmbo.org/pifassessment>; see also North American Bird Conservation Initiative, *Bird Conservation Region 28: Appalachian Mountains*, available at <http://www.nabci-us.org/bcr28.htm>.

¹⁷⁶ GW Revised Land and Resource Management Plan at 3-211.

¹⁷⁷ *Id.* at 3-211 to 3-212.

¹⁷⁸ See Memorandum of Understanding Between the Federal Energy Regulatory Commission and the U.S. Department of Interior United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds,” 1 (Mar. 2011).

¹⁷⁹ See *id.* at 3.

Pipeline.¹⁸⁰ FERC also agreed to address migratory birds and their habitat in any environmental review to include, as necessary:

- a. Direct, indirect, and cumulative effects, of the proposed action on migratory birds, including take, and detrimental alteration of important habitats such as breeding, migrating, roosting, or over-wintering habitats using best available demographic, population, or habitat association data. Where the potential for impacts on raptors or other species of concern is likely, require applicant to conduct pre-application surveys to facilitate the evaluation of effects to migratory birds and their habitats.
- b. Reasonable modifications and alternatives to the proposed action that avoid or minimize take.
- c. Bird conservation measures and best management practices to avoid or minimize adverse effects and mitigation.
- d. Migratory bird species of concern in the proposed project area by reviewing the *Birds of Conservation Concern*, published and updated periodically by FWS, and other lists of priority migratory bird species[.]¹⁸¹

Accordingly, the EIS must disclose and evaluate all potential impacts on migratory birds.

In addition, researchers have hypothesized that habitat fragmentation will negatively impact forest-dwelling amphibians such as the Peaks of Otter salamander in the Jefferson National Forest.¹⁸² Negative impacts on amphibians from development is due in part to amphibians' poor ability to disperse and microclimatic drying.¹⁸³ The risk "is particularly high for species that have large portions of their native range underlain by shale basins."¹⁸⁴

In light of the above, the EIS must thoroughly examine all potential impacts the proposed Mountain Valley Pipeline could have on wildlife. This should include analysis of the abundance and nesting success of forest birds, increased predation, increased parasitism, and increases in non-native species. The EIS must also examine potential impacts on salamanders and all other species that rely on the quality and quantity of forest and understory that would be degraded if forest habitat were fragmented by the proposed pipeline. FERC must also examine how the

¹⁸⁰ See *id.* at 3-4.

¹⁸¹ See *id.* at 5-6.

¹⁸² See *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11040.

¹⁸³ *Id.*

¹⁸⁴ *Id.* (citing J.L. Kiviat, *Hydraulic fracturing threats to species with restricted geographic ranges in the eastern United States*, 320-31 *Environ. Pract.* (2012)).

fragmentation caused by the pipeline corridor would affect the movement patterns and interaction of species in the area.

4. Proliferation of Invasive species

The EIS must also consider the impacts of fragmentation and increased edge forest on the spread of invasive species, “many of which are associated with disturbance and can degrade native habitat quality.”¹⁸⁵ Following habitat loss and degradation, non-native invasive species are considered the second most important threat to biodiversity.¹⁸⁶ Indeed, about 42 percent of the species listed as endangered or threatened over the Endangered Species Act “are at risk because of competition with or predation by exotic species.”¹⁸⁷ The 2011 MOU between FERC and FWS requires FERC to address the potential introduction, establishment, and spread of non-native plants and animals that could result from actions that FERC is considering.¹⁸⁸

Invasion by exotic species as a result of the proposed Mountain Valley Pipeline may “displace native animals and plants, disrupt nutrient and fire cycles, and change the patterns of plant succession.”¹⁸⁹ “Ecological harm caused by invasive species can include near extirpation of native species, as in the cases of chestnut blight and hemlock wooly adelgid, and alteration of natural ecological communities, as with snakehead fish [and] zebra mussel[.]”¹⁹⁰ In addition, invasive species can disrupt forest regeneration, soil chemistry, habitat, hydrology, and land value. Many of the affected areas, including parks, preserves, and wildlife refuges, are significant for maintaining indigenous plants and animals.¹⁹¹ Consequently, the responsible land

¹⁸⁵ *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037 (citing D. Mortenson, *et al.*, *Forest roads facilitate the spread of invasive plants*, *Invasive Plan Sci. Manage.* 191-99, (2009), 2(3); J. Allen, *et al.*, *Socioeconomics drive woody invasive plant richness in New England, USA through forest fragmentation*, *Landscape Ecol.* 28(9), 1671-86 (2013)).

¹⁸⁶ David Wear and John Greis, USDA Forest Service, Southern Research Station, *Southern Forest Resource Assessment*, 67 (Sept. 2002), available at http://www.srs.fs.usda.gov/pubs/gtr/gtr_srs053.pdf.

¹⁸⁷ *Id.* (citing D.S. Wilcove, *et al.*, *Quantifying threats to imperiled species in the United States*, *Bioscience* 48(8), 607-15 (1998)); *see also* Virginia Invasive Species Advisory Committee, *Virginia Invasive Species Management Plan 2012*, 4 (2012), available at http://www.dcr.virginia.gov/natural_heritage/vaisc/documents/2012_VISMP.pdf.

¹⁸⁸ *See* Memorandum of Understanding Between the Federal Energy Regulatory Commission and the U.S. Department of Interior United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds” at 7.

¹⁸⁹ *Southern Forest Resource Assessment* at 66-67 (citing R. Westbrooks, *Invasive plants changing the landscape of America: fact book*, 109 (Fed. Interagency Committee for the Mgmt, of Noxious and Exotic Weeds 1998)).

¹⁹⁰ Virginia Invasive Species Advisory Committee, *Virginia Invasive Species Management Plan 2012*, 4 (2012), available at http://www.dcr.virginia.gov/natural_heritage/vaisc/documents/2012_VISMP.pdf.

¹⁹¹ *Southern Forest Resource Assessment* at 67 (citing U.S. Congress, Office of Tech. Assessment, *Harmful non-indigenous species in the United State*, OTA-F-565 (GPO 1993)).

management agencies must spend increasing resources to control the most problematic invasive species.¹⁹²

The EIS must thoroughly analyze the potential impacts of the proposed pipeline on the spread of invasive species.

5. *Watersheds and drinking water*

FERC must also consider the impacts on watersheds as habitat fragmentation can also affect aquatic ecosystems.¹⁹³ Forests “provide a number of ecosystem services that are essential to water quality and overall watershed health” and “protect and enhance our water supplies.”¹⁹⁴ Among other things, forests absorb rainfall and snow melt, helping to minimize floods; slow storm runoff, reducing soil erosion and improving water infiltration rates and recharge to aquifers; filter pollutants from runoff; and provide fish and wildlife habitat to maintain aquatic diversity.¹⁹⁵ Forests also moderate stream temperatures. Moreover, because many riverine species use streams as corridors for dispersal, the process of constructing the Mountain Valley Pipeline across water could create a barrier to dispersal.¹⁹⁶ Such barriers can isolate populations—particularly of fish, which are restricted to stream corridors for dispersal—by separating upstream and downstream populations during pipeline construction.¹⁹⁷ Moreover, these and other negative impacts can result in cascading degradations that harm downstream ecological quality as well.

Consequently, the reduction in forest cover, including riparian tree cover, and stream shading could have negative impacts on water temperature, water chemistry—such as reduced dissolved oxygen levels and increased nitrogen, phosphorous, sodium, chlorides, and sulfate levels—and decreased stream macroinvertebrate diversity.¹⁹⁸ And since grassland or developed soils cannot absorb precipitation as readily as forested land with native soil integrity, the proposed pipeline corridor would likely result in reduced groundwater recharge. The EIS must

¹⁹² *Id.*

¹⁹³ *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037.

¹⁹⁴ See, e.g., USDA Forest Service, *Watershed Services: The important links between forests and water* (Aug. 2007), available at http://www.fs.fed.us/ecosystemservices/pdf/Watershed_Services.pdf.

¹⁹⁵ *Id.* at 1.

¹⁹⁶ See *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037 (citations omitted); Resource Report 1 at 1-31 to 1-37 (construction procedures for waterbody crossings).

¹⁹⁷ See *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats* at 11037-38 (citation omitted).

¹⁹⁸ See J.K. Jackson and B.W. Sweeney, Stroud Water Research Center, *Expert Report on the Relationship Between Land Use and Stream Condition (as Measured by Water Chemistry and Aquatic Macroinvertebrates) in the Delaware River Basin*, DRBC Contribution Number 2010011 (2010).

disclose and consider all such potential impacts of fragmentation and forest loss on water quantity levels, water quality issues, and species.

VIII. FERC Must Consider the Harm To Species, Including Federally Protected Species, That Could Be Caused by the Mountain Valley Pipeline

The EIS must address the Project's potential impacts to mammals, reptiles, birds, invertebrates, and fish, their habitats, and the ecological systems that link them throughout the entire Project area or other areas affected by the Project. This must include an evaluation of the direct and indirect impacts from the Project, including those from construction, operation, and decommissioning. Impacts to terrestrial and freshwater biology from combustion of the natural gas must also be analyzed in the EIS, including impacts from the Project's contribution to climate change on terrestrial and freshwater biological resources. The EIS should further describe effects on specific areas of plant communities and sensitive species' habitats.¹⁹⁹ In addition, erosion, sedimentation, down-slope and downstream water quality impacts, habitat fragmentation, and invasion by non-native plant species should be addressed. Alternatives to address and avoid these impacts must also be considered.

Furthermore, the EIS must identify all federal and state-listed endangered, threatened and rare species that are known to reside within, or migrate through, areas that will be affected by the Project, as well as any other species subject to special protections, such as golden and bald eagles (protected under the Bald and Golden Eagle Protection Act - "BGEPA") and migratory birds (protected by the Migratory Bird Treaty Act - "MBTA"). A detailed habitat assessment should be conducted and thorough surveys undertaken to identify the presence of suitable habitat and to establish the presence of federally protected species in the Project area. The Applicant should provide survey reports that include the following information, to be used by FERC in analyzing the potential impacts of the Project on these species:

- (1) name(s) and qualifications of person(s) conducting the survey;
- (2) methods(s) used to conduct the survey;
- (3) date(s) of the survey;
- (4) area surveyed (include mileposts if applicable);
- (5) areas where species or potential habitats occur (including mileposts if applicable);
- (6) potential impacts, both beneficial and negative, that could result from the construction of the proposed project; and
- (7) proposed mitigation that would substantially minimize or eliminate the potential negative impacts.

¹⁹⁹ The EIS should describe and identify by milepost and length of crossing (in feet) any unique, sensitive, or protected vegetation types, plant communities, or habitat areas that would be affected by Project activities, including all construction workspaces. Additionally, it should describe any proposed mitigation measures and any measures proposed to avoid or minimize impacts on sensitive vegetation or habitat types.

1. Federally Protected Species

Congress enacted the Endangered Species Act (“ESA” or “Act”) in 1973 to provide for the conservation of endangered and threatened fish, wildlife, plants and their natural habitats.²⁰⁰ Under section 9(a)(1)(B) of the Act, it is illegal to engage in any activity that “takes” an endangered species.²⁰¹ The ESA further imposes substantive and procedural obligations on all federal agencies and persons with regard to listed species and their critical habitats.²⁰² Each federal agency has a duty to consult with the Services to ensure that “any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species”²⁰³

Congress intended the term “take” to be defined in the “broadest possible manner to include every conceivable way” in which a person could harm or kill wildlife.²⁰⁴ The term “take” is defined in the statute to include “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”²⁰⁵ The implementing regulations for the Act define “harm” to include “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”²⁰⁶

According to the FWS ESA database,²⁰⁷ there are several federally protected species that may be impacted by the proposed Project, including the following:

- Clubshell mussel (E)
- Pink mucket mussel (E)
- Northern riffleshell mussel (E)
- Rayed bean mussel (E)
- Snuffbox mussel (E)
- Fanshell mussel (E)
- Pink mucket mussel (E)
- Sheepnose mussel (E)
- Spectaclecase mussel (E)
- Tubercled-blossom pearly mussel (E)
- James spiny mussel (E)
- Big Sandy crayfish (PE)
- Roanoke logperch (E)

²⁰⁰ 16 U.S.C. §§ 1531, 1532.

²⁰¹ 16 U.S.C. § 1538(a)(1)(B).

²⁰² *See Id.* §§ 1536(a)(1), (a)(2) and 1538(a); 50 C.F.R. § 402.10.

²⁰³ 16 U.S.C. § 1536(a)(2).

²⁰⁴ S. Rep. No. 93-307, 93d Cong., 1st Sess. 1, reprinted in 1973 USCAAN 2989, 2995.

²⁰⁵ 16 U.S.C. § 1532(18).

²⁰⁶ 50 C.F.R. § 17.3.

²⁰⁷ *See* <http://www.fws.gov/northeast/EcologicalServices/endangeredspecies.html> (searched by county).

Running buffalo clover (E)
Virginia spiraea (T)
Shale barren rock cress (E)
Small whorled pogonia (T)
Smooth coneflower (E)
Indiana Bat (E)
Virginia big-eared bat (E)
Northern long-eared bat (T)
Bald eagle (BGEPA)
Golden eagle (BGEPA)
Migratory Birds (MBTA)

Several of our concerns regarding the Project's impacts on these species are discussed below, though more information on the Project is needed to assess the full range of potential impacts -- such as more specific information on construction methods and affected areas (i.e. water body crossing methods and locations), and proposed mitigation.

It is readily apparent, however, that the proposed Project has the potential to harm listed species. Building the proposed 300-mile pipeline would require clearing a 125-foot-wide swath of land, digging a deep trench, and leaving a 75-foot permanent right-of-way.²⁰⁸ Construction of the planned facilities would disturb about 5,458 acres of land for the pipeline and aboveground facilities, not including temporary access roads. This will cause habitat loss and fragmentation of the landscape, directly impacting many of the above-mentioned species and the habitats they rely on. The environmental harms associated with constructing the Project, as well as the potentially devastating impacts from a spill of natural gas and the ecological effects of climate disruption associated with the Project, have the very real potential to result in take of federally protected species, which must be fully considered in the EIS as well as through the ESA consultation process.

Furthermore, both NEPA and the ESA require a thorough review of the direct, indirect and cumulative impacts of the Project, which includes related and connected actions as well.²⁰⁹ This requires a full analysis of the potential impacts to these protected species from the construction and maintenance of this proposed pipeline, as well as the Atlantic Coast Pipeline and Appalachian Connector Pipeline, since these are closely-related actions (as discussed above). Further, this requires that the EIS address the impacts to imperiled species associated with the mining of the natural gas, transportation of the product to and through the pipeline and associated spills, refinement of the product, and consumption/use of the natural gas for energy, as well as climate change impacts associated with those actions.

²⁰⁸ It is not yet clear how the ROW would be maintained; however, if pesticides or herbicides will be used, then this is an additional concern regarding harm to species that must be included in FERC's analysis.

²⁰⁹ 40 C.F.R. §1502, 1508.

In addition, the EIS must consider potential alternatives, including alternative routes, construction methods and mitigation measures, to ensure that the Project will not result in take of listed species, or jeopardize their continued existence. As set forth below, this should include completing formal consultation with the US Fish and Wildlife Service, and incorporating the results of that process into the NEPA analysis.

a. Freshwater Mussels

The proposed Project would result in direct impacts to streams and wetlands from runoff and erosion, and potential contamination of waterbodies through construction activities and spills of natural gas or other substances (i.e. fuels), with associated impacts to downstream species and communities. This includes the potential for significant adverse impacts to the several species of imperiled freshwater mussels that are known to reside in the Project area.

Freshwater mussels are incredibly susceptible to sediment loading. Studies have shown that “One of the most ubiquitous factors that may adversely affect mussel populations is excessive sedimentation caused, in part, by poor land-use practices. Excessive sedimentation has been suspected as a cause of unionid mussel declines since the late 1800s.”²¹⁰ Species in the Project area -- such as the James spiny mussel, which has been extirpated from 90% of its historic range -- have experienced a precipitous decline over the past several decades due to development of the region. These species have a very restricted distribution, and are therefore incredibly susceptible to water quality impacts, since they are limited to areas of unpolluted water with clean sand and cobble bottom sediments.²¹¹

The proposed Project route would go through prime freshwater mussel habitat, and the proposed Project route would require many stream crossings through waters that support endangered freshwater mussels. In addition, the Applicant’s proposed alternative route would place the Project directly within essential habitat for the James spiny mussel, further endangering this imperiled species, and potentially jeopardizing its continued existence. The potential impacts on these freshwater mussel species must be analyzed in the EIS as well as through formal consultation with FWS.

Excessive amounts of sediments, especially fine particles, that wash into streams can potentially affect mussels through multiple mechanisms. Fine sediments can lodge between coarse grains of the substrate to form a hardpan layer,²¹² thereby reducing interstitial flow rates. Silt and clay particles can clog the gills of mussels,²¹³ interfere with filter feeding,²¹⁴ or affect

²¹⁰ Box, J.B., Mossa, J., *Sediment, land use, and freshwater mussels: prospects and problems*, J. N. Am. Benthol. Soc. at 100, 18(1):99-117 (1999).

²¹¹ USFWS, James Spiny mussel Recovery Plan at 3 (1990) (available at <http://www.fws.gov/northeast/fisheries/pdf/jamesspiny mussel plan.pdf>)

²¹² Gordon, N. D., T. A. McMahon, and B. L. Finlay-Son. 1992. *Stream hydrology: an introduction for ecologists*. John Wiley and Sons, New York.

²¹³ Ellis, M. M., *Erosion silt as a factor in aquatic environments*, Ecology 17:29-42 (1936).

mussels indirectly by reducing the light available for photosynthesis and the production of food items.²¹⁵

Much of the region contains ecological communities characterized by thin soils and exposed parent material that result in localized complexes of bare soils and rock, herbaceous and/or shrubby vegetation, and thin, often stunted woods and sparse woodlands with shallow, drought-prone soils. Other areas are characterized by rugged, mountainous terrain with steep hills and ridges dissected by a network of deeply incised valleys. These communities are susceptible to erosion from activities that remove vegetation and disturb soil. Construction activities therefore have the potential to cause substantial sediment discharge into receiving waters that provide habitat for endangered mussels. This poses a risk of harm to mussels that must be fully analyzed in the EIS.

In sum, since endangered freshwater mussels are known to reside in areas affected by the Project, a full and complete assessment of the potential impacts the Project may have on these species is warranted. This should include thorough surveys of not only the waters that will be directly impacted by the proposed Project activities, but surveys and an analysis of the downstream effects of the planned activities as well as possible spills along the pipeline route, which have the potential to be far-reaching.

b. Endangered Bats

Much of the proposed pipeline route is through geologically karst terrain, which is characterized by underground drainage systems with sinkholes and caves, formed from the dissolution of limestone over hundreds of thousands of years. As water moves underground, from hilltops toward streams through tiny fractures in the limestone bedrock, the rock is slowly dissolved away by weak acids found naturally in rainwater and in the soil. These areas are well known for caves and sinkholes that can provide habitat for endangered bats. The proposed Project areas should therefore be fully surveyed for caves and mine portals. Mist net surveys should further be conducted to establish the presence of these species, and to ensure that the Project will not result in take, or jeopardize the continued existence of, protected bats.

Listed bats are known to forage and roost in areas along the proposed pipeline path. The Project has the potential to harm endangered bats through loss of roost and forage habitat, fragmentation of the landscape, poisoning of surface water resources from construction activities or spills, and associated impacts on food sources. Allowing activities that may harm these

²¹⁴ Aldridge, D. W. *et al.*, *The effects of intermittent exposure to suspended solids and turbulence on three species of fresh-water mussels*, *Environmental Pollution*, 45:17-28 (1987).

²¹⁵ Davies-Colley, R. J., C. W. Hickey, J. M. Quinn, and P. A. Ryan., *Effects of clay discharges on streams: 1. Optical properties and epilithon*, *Hydrobiologia*, 248:215-234 (1992).

species opens up both the agency and private actors to ESA take liability,²¹⁶ and these impacts must be analyzed in the EIS as well as through formal ESA consultation.

Many bats, such as Indiana bats, hibernate in caves and mines in the winter and migrate over varying distances to summer habitat in a variety of habitat types — most often forests, but also wetlands, parklands, and agricultural areas. Reproductive females may migrate great distances to form maternity colonies. Bats feed primarily on flying insects over rivers and lakes. Indiana bats are nocturnal insectivores, eating flying insects during the nighttime hours. A single bat can eat thousands of insects in one night, and if those insects have been exposed to the toxins associated with natural gas mining or leaks from the proposed pipeline, then it could cause a trophic effect up the food chain, poisoning bats and therefore further harming a species whose rapid decline from habitat loss and white nose syndrome has left it on the brink of extinction.

Bats need access to clean surface water for both direct consumption and for its association with aquatic insects that serve as important prey species. Access to drinking water is especially important for lactating bats, which need far more.²¹⁷ Surface water habitat produces higher concentrations of nocturnal insects that bats rely on.²¹⁸ Aquatic insects are especially important to Indiana bats.²¹⁹ Ready access to water and the insects it helps produce is even more critical during times of increasing drought. Environmental contaminants may be a major factor specifically in Indiana bat decline.²²⁰ Heavy metals and other toxins can reduce aquatic insect populations on which bats rely.²²¹

The proposed Project would result in the fragmentation and loss of areas that endangered bats utilize for feeding, along with sedimentation of wetlands and streams they rely on for drinking water, and where the species they feed on breed. The EIS must therefore assess the potential harm to bats, including harm to caves that are relied on as hibernacula, and the habitat areas in which the bats feed. This must include an analysis of the potential for construction-

²¹⁶ 16 U.S.C. § 1538(a)(1)(B).

²¹⁷ Adams, R., and M. Hayes, *Water availability and successful lactation by bats as related to climate change in the arid regions of western North America*, *Journal of Animal Ecology*, 77:1115–1121 (2008); Kurta, A., G. P. Bell, K. A. Nagy, and T. H. Kunz, *Water balance of free-ranging little brown bats (*Myotis lucifugus*) during pregnancy and lactation*, *Canadian Journal of Zoology*, 67:2468–2472 (1998); Johnson, J. S., J. D. Kiser, K. S. Watrous, and T. S. Peterson, *Day-roosts of *Myotis leibii* in the Appalachian ridge and valley of West Virginia*, *Northeastern Naturalist*, 18:95–106 (2011).

²¹⁸ MacGregor, J. and J. Kiser, *Recent reproductive records of eastern small-footed bat, *Myotis leibii* in Kentucky with notes on a maternity colony located in a concrete bridge*, *Bat Research News*, Abstract (1998).

²¹⁹ Murray, S. W. and A. Kurta, *Nocturnal activity of the endangered Indiana bat (*Myotis sodalis*)*, *Journal of Zoology*, 262:197–206 (2004).

²²⁰ “Agency draft Indiana bat (*Myotis sodalis*) revised recovery plan,” US Fish and Wildlife Service, (1999) Fort Snelling, Minnesota.

²²¹ Mason, C. F., *Biology of freshwater pollution*, 4th edition. Pearson Education Ltd., Harlow, Great Britain (1997); Jones, G., Jacobs, D., Kunz, T., Willig, M., and P. Racey, *Carpe noctem: the importance of bats as bioindicators*, *Endangered Species Research*, 8:93–115 (2009).

related activities and spills to adversely affect the water resources on which these bats depend. An Indiana Bat Conservation Plan must also be developed and shared with public for comment to ensure that the Project would not harm these bats, in violation of the ESA.

c. Roanoke logperch

The Roanoke logperch (*Percina rex*) was listed as an endangered species on August 18, 1989 (54 FR 34464). The proposed Project route goes directly through streams that are habitat for endangered Roanoke logperch, around the border of West Virginia and Virginia. Roanoke logperch are small, freshwater fish that can grow up to 5.5 inches in length. They are elongate and cylindrical in shape with a conical snout, and have prominent bar markings on their sides. They hunt for prey by flipping over small pebbles at the bottom of rivers and streams with their snouts to find tiny invertebrates to eat.

All of the existing populations of Roanoke logperch are threatened by road projects, water projects, catastrophic spills, and siltation from agricultural runoff. Recent studies of the distribution and habitat use of Roanoke logperch suggest that this species is subject to riverwide stochastic processes and has strict microhabitat requirements.²²²

Logperch tend to occupy medium to large warm-water streams and rivers of moderate gradient with relatively silt-free substrata that are free of pollution and sedimentation. These fish species require clear, unpolluted water in unaltered river systems to survive. Unfortunately, massive alterations of river systems throughout the eastern half of North America has resulted in many *Percidae* fish species becoming endangered. The Roanoke logperch is currently found only in five isolated river systems, and its distribution is fragmented by the presence of several large dams.

The proposed Project would pass through some of the last remaining Roanoke logperch habitat, and has the potential to harm this species by increasing runoff and sediment loading in nearby streams and rivers, and threatening their habitat with spills of natural gas or other substances. The EIS must consider the potential for harm to this species, and alternative routes to avoid impacts to the streams and rivers they rely on.

d. Big Sandy crayfish

The Big Sandy crayfish is a freshwater, tertiary burrowing crustaceans of the Cambaridae family. Tertiary burrowing crayfish do not exhibit complex burrowing behavior; instead, they shelter in shallow excavations under loose cobbles and boulders on the stream bottom. Crayfish -- also known as crawdads, crawfish, mudbugs, and freshwater lobsters -- are important aquatic species. They help clean the water by scavenging on dead matter.

²²² See USFWS (2007) An Update to the Roanoke Logperch Recovery Plan (available at https://www.sfos.uaf.edu/directory/faculty/rosenberger/LRP_RecoveryPlanUpdate.pdf)

This species requires clean, third order or larger (width of 13 to 66 feet), fast-flowing, permanent streams and rivers with unembedded slab boulders on a bedrock, cobble, or sand substrate. Suitable habitat for the Big Sandy crayfish appears to be limited to higher elevation, clean, medium-sized streams and rivers in the upper reaches of the Big Sandy basin. Importantly, the crayfish is intolerant of excessive sedimentation and other pollutants, and cannot survive in areas with impaired water quality

Within the historical range of the species, aquatic habitat has been severely degraded by past and ongoing human activities, such as coal mining, commercial timber harvesting, residential and commercial development, roads, and sewage discharges. Habitat degradation from these activities has caused severe soil erosion into the basin's streams, and resulted in the loss of riparian habitat and the continued direct discharge of sediments, chemical pollutants, sewage, and other refuse into the aquatic systems. This has led to the extirpation of the species from much of its historical range.

The Big Sandy crayfish population has declined by 70% over the past 40 years, largely due to water pollution from controversial mountaintop-removal coal mining. It is near extirpation in West Virginia, has lost half its range in Virginia, and has been extirpated from parts of its range in Kentucky. The remaining habitat of the Big Sandy crayfish is severely threatened by coal mining activities, interstate highway construction, and logging. Remaining populations are small and highly vulnerable to extirpation.

The proposed Project has the potential to further degrade the aquatic habitat in the region, primarily by increasing erosion and sedimentation, and perhaps contaminant loading, to local streams. FERC must ensure that the Project would not cause sedimentation and pollution of crayfish habitat in order to avoid jeopardizing the continued existence of this species.

e. Bald and Golden Eagles

Bald and golden eagles receive Federal protection under the BGEPA and the MBTA. They are listed by the FWS as Birds of Conservation Concern in the Appalachian Mountains Bird Conservation Region, within which the proposed Project occurs. These species are particularly susceptible to disturbance from construction-related activities and habitat loss.

The BGEPA provides for the protection of bald eagles and golden eagles by prohibiting the taking, possession, and commerce of such birds. BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald and golden eagles, including their parts, nests, or eggs. The BGEPA defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." This includes impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that injures an

eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes a loss of productivity or nest abandonment.

A variety of human activities can potentially interfere with eagles, affecting their ability to forage, nest, roost, breed, or raise young. If agitated by human activities, eagles may inadequately construct or repair their nest, may expend energy defending the nest rather than tending to their young, or may abandon the nest altogether. Activities that cause prolonged absences of adults from their nests can jeopardize eggs or young. If food delivery schedules are interrupted, the young may not develop healthy plumage, which can affect their survival. In addition, adults startled while incubating or brooding young may damage eggs or injure their young as they abruptly leave the nest. Older nestlings no longer require constant attention from the adults, but they may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves.²²³

Disruption, destruction, or obstruction of roosting and foraging areas can also negatively affect eagles. Disruptive activities in or near eagle foraging areas can interfere with feeding, reducing chances of survival. Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter, especially if there are not other undisturbed and productive feeding and roosting sites available. Activities that permanently alter communal roost sites and important foraging areas can altogether eliminate the elements that are essential for feeding and sheltering eagles.

Where a human activity, such as the construction of the proposed pipeline, agitates or bothers roosting or foraging bald eagles to the degree that causes injury or substantially interferes with breeding, feeding, or sheltering behavior and causes, or is likely to cause, a loss of productivity or nest abandonment, the conduct of the activity constitutes a violation of the Eagle Act's prohibition against disturbing eagles. The EIS must evaluate the Project for potential impacts to eagle habitat (i.e., bald eagle nests, bald and golden eagle roosts). The Project has the potential to harm these birds through habitat loss, fragmentation, climate disruption and construction related impacts (i.e. noise), which may directly harm eagles as well as the habitat areas they rely on for food sources.

To avoid disturbing nesting bald eagles, it is recommended that sufficient distance between the activity and the nest (distance buffers) are maintained, as well as forested (or natural) areas between the activity and around nest trees (landscape buffers), and avoiding certain activities during the breeding season.²²⁴ The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees. Proper

²²³ See the US Fish and Wildlife Service, National Bald Eagle Management Guidelines (May, 2007) (available at <http://digitalmedia.fws.gov/cdm/ref/collection/document/id/1982>).

²²⁴ *Id.*

surveys must be conducted, and the EIS must assess whether sufficient measures are being undertaken to protect these species from harm.

2. *Other Concerns Regarding Impacts to Habitat and Species*

a. Stream and River Crossings

One of the biggest concerns that this Project poses regarding potential harm to species are the various river crossings that would be required for the current proposed route. River crossings pose a risk of harm to bird species that may feed and breed along the rivers, which behaviors may be adversely impacted by construction activities and noise. River crossings may also impact aquatic species by contributing substantial sediment to the river during construction, which can have a drastic impact on freshwater mussels, which are susceptible to even small changes in sediment loading, as discussed above.

Construction of a pipeline across a river entails burying the line beneath the river, which can be done several ways, such as open trench cutting or horizontal directional drilling (HDD). Open trench cutting consists of digging an open trench in the stream bottom, laying the prefabricated length of pipe necessary to reach bank to bank and then backfilling. This method is incredibly invasive for the waterbody, resulting in drastically increased sediment loading and disruption of optimal flow regimes.

HDD, on the other hand, involves drilling below the stream or river, and therefore does not interrupt flow or cause as much damage to the streambed, with much less sedimentation of the waterway. Though this method still poses risks of harm to the river, and would still have the potential to harm aquatic species as well as birds in the construction area, it may provide much needed mitigation for the Project's impacts. We urge FERC to conduct a full analysis of the various alternative methods of stream crossings, to ensure that there is a complete understanding of the threats these activities pose to the aquatic and riparian habitats, and the alternatives available.

The EIS must analyze the full range of potential impacts of water crossings, and must consider alternative methods and locations, as well as temporal restrictions to avoid disrupting birds during certain seasons. To that end, FERC should require that the Applicant provide the following:

- a. Information regarding any impaired waterbodies that would be crossed by the new pipeline;
- b. State water quality classification (and definition of the classification) and known or potential pollutants in water or sediment;
- c. Bank width for each waterbody crossed;
- d. Flow type for each waterbody crossed;
- e. The length of each waterbody crossing;
- f. Crossing method or impact,

- g. The approximate mileposts for each crossing/impact;
- h. Fishery classifications and habitat assessments for each waterbody, including the presence of threatened or endangered species (i.e. freshwater mussels).

b. Habitat Fragmentation and Invasive Species from Roads and Pipeline Right-Of-Way

Construction of access roads and the pipeline right-of-way have the potential to produce myriad impacts to species and habitats through:

- Soil erosion, compaction, loss of forest productivity;
- Pollution: sedimentation, thermal loading;
- Rapid water runoff: peak flows;
- Impaired floodplain function;
- Barrier to movement of wood and spawning gravel;
- Fragmentation: wildlife dispersal barrier;
- Human disturbance, weed vector, hunting pressure, loss of snags, litter.

Roads have a particularly negative influence on aquatic and riparian ecosystems and organisms, and act as conveyor belts for delivering chronic sediment to streams.²²⁵

Over the last few decades, studies in a variety of terrestrial and aquatic ecosystems have demonstrated that road and cleared right-of-ways, like the proposed pipeline right-of-way, aggravate many of the most pervasive threats to biological diversity, including habitat destruction and fragmentation, edge effects, exotic species invasions, and pollution. These areas have been implicated as mortality sinks for animals ranging from snakes to wolves; as displacement factors affecting animal distribution and movement patterns; as population fragmenting factors; as sources of sediments that clog streams and destroy fisheries; as sources of deleterious edge effects; and as access corridors that encourage development, logging and poaching of rare plants and animals. Road building therefore threatens the existence of species in the Project area - especially those that are depend on connected habitat, or are susceptible to competition from invasive species.²²⁶

The EIS must consider the full range of impacts to habitats and species, including those protected by federal law, from the construction and maintenance of the roads necessary to construct and maintain the pipeline, as well as the pipeline right-of-way itself.

c. Buffers

²²⁵ Michael Derrig. Road Improvements for Watershed Restoration. Available at <http://www.fsl.orst.edu/geowater/PEP/calfed/derrig/index.html>.

²²⁶ Noss, Reed; The Ecological Effects of Roads. Available at <http://www.eco-action.org/dt/roads.html>.

The EIS must consider alternatives and mitigation measures to reduce the potential impacts to natural communities. One of the best ways to mitigate impacts, especially to aquatic and riparian species, is to use substantial buffer areas. Wide, mature riparian vegetation buffers filter sediment from upslope sources as well as stabilize stream banks from erosion. They further provide shade and habitat for many species.

The best available science shows that a larger buffer (i.e. 100 ft) provides more ecosystem services, such as sediment filtration and mitigation to protect and restore aquatic resources, than smaller buffers (i.e. 25 ft). The EIS must analyze the potential for the Project to include sufficiently large buffers to prevent and mitigate harm to riparian and aquatic communities.

d. Migratory Birds

The MBTA implements protection of all native migratory game and non-game birds with exceptions for the control of species that cause damage to agricultural or other interests. The MBTA prohibits the take of any migratory bird, part, nest, egg or product. Take, as defined in the MBTA, includes by any means or in any manner any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof. The MBTA does not allow for the issuance of a take permit.

The Project has the potential to take migratory birds through pipeline construction impacts to migratory bird feeding and breeding habitats (especially at river and stream crossings), loss of habitat and fragmentation of forested areas, and impacts associated with powerlines needed for the Project, including increased risk of collision as well as predation from the increase in raptor nesting and edge habitat.

The EIS must fully analyze these potential impacts to migratory birds, and FERC should consider potential alternatives for the minimization of land and vegetation disturbance during Project construction. FERC should require that the Applicant complete a migratory bird conservation plan, and consult with FWS regarding potential impacts to migratory birds.

e. Climate Change

As discussed in greater detail above, increased greenhouse gas emissions associated with the Project could exacerbate global climate change, leading to loss of sea ice and the species that depend on it,²²⁷ sea level rise,²²⁸ extreme weather events,²²⁹ ocean acidification,²³⁰ and loss of habitat and species.²³¹

²²⁷ A. Robinson, et al., *Multistability and critical thresholds of the Greenland ice sheet*, 2 NATURE CLIMATE CHANGE 429 (2012).

²²⁸ S. Rahmstorf et al., *Recent climate observations compared to projections*, 316 SCIENCE 709 (2007).

²²⁹ Intergovernmental Panel on Climate Change (IPCC), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)* (2012) (available at <http://ipcc-wg2.gov/SREX/>); U.S. Global Change Research Program, *Global Climate Change Impacts in the US:*

The EIS must disclose specific impacts to species and habitat areas resulting from climate change, including changes in precipitation, increased severity of storms, increase in heat waves, drought, ozone formation, and wildfires -- all of which have the potential to adversely impact species, including protected species.

3. *ESA Consultation*

Each federal agency has a duty to consult with the Services to ensure that agency action is not likely to jeopardize the continued existence of any threatened or endangered species.²³² The definition of agency “action” is broad and includes “all activities or programs of any kind authorized, funded, or carried out, in whole or in part” including “the granting of licenses, contracts, leases, easements, rights-of-way, [or] permits,” and any “actions directly or indirectly causing modifications to the land, water, or air.”²³³

Each federal agency must review its actions at “the earliest possible time” to determine whether any action “may affect” listed species or their critical habitat in the “action area.”²³⁴ The “action area” encompasses all areas that would be “affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.”²³⁵ The term “may affect” is broadly construed to include “[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character,” and thus is easily triggered.²³⁶ If a “may affect” determination is made, “consultation” is required.

The proposed Project would certainly affect listed species, as discussed above. Habitat fragmentation, construction-related contamination and noise, sedimentation of streams, loss of

Global Climate Change (2009); Dim Coumou & Stefan Rahmstorf, *A Decade of Weather Extremes*, 2 NATURE CLIMATE CHANGE 491 (2012); National Oceanic and Atmospheric Administration, *Extreme Weather 2011* (available at <http://www.noaa.gov/extreme2011/>).

²³⁰ See, e.g., O. Hoegh-Guldberg et al., *Coral reefs under rapid climate change and ocean acidification*, 318 SCIENCE 1737 (2007); K. Caldeira and M.E. Wickett, *Ocean model predictions of chemistry changes from carbon dioxide emissions to the atmosphere and ocean*, 110 J. GEOPHYS. RES. C09S04, doi:10.1029/2004JC002671 (2005).

²³¹ Camille Parmesan & Gary Yohe, *A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems*, 421 NATURE 37 (2003); Terry L. Root et al., *Fingerprints of Global Warming on Wild Animals and Plants*, 421 NATURE 57 (2003); Camille Parmesan, *Ecological and Evolutionary Responses to Recent Climate Change*, 37 ANNUAL REV. OF ECOLOGY EVOLUTION AND SYSTEMATICS 637 (2006); I-Ching Chen et al., *Rapid Range Shifts of Species Associated with High Levels of Climate Warming*, 333 SCIENCE 1024 (2011); Ilya M. D. Maclean & Robert J. Wilson, *Recent Ecological Responses to Climate Change Support Predictions of High Extinction Risk*, 108 PROC. OF THE NATL. ACAD. OF SCIENCES OF THE U.S. 12337 (2011); Rachel Warren et al., *Increasing Impacts of Climate Change upon Ecosystems with Increasing Global Mean Temperature rise*, 141 CLIMATIC CHANGE 106 (2011).

²³² 16 U.S.C. § 1536(a)(2).

²³³ 50 C.F.R. § 402.02.

²³⁴ 50 C.F.R. § 402.14(a).

²³⁵ 50 C.F.R. § 402.02.

²³⁶ *Interagency Cooperation – Endangered Species Act of 1973, As Amended*, 51 Fed. Reg. 19,926 (June 3, 1986).

habitat, and climate change impacts associated with this Project require FERC to undertake ESA consultation.

Therefore, a full and complete assessment of the potential impacts the Project may have on these imperiled species is warranted. Pursuant to the ESA, FERC must “use the best scientific and commercial data available” to determine whether listed species are likely to be adversely affected by the action.²³⁷ If the action agency concludes that the proposed action is “not likely to adversely affect” the species, then the Services must concur in writing with this determination in order to avoid formal consultation.²³⁸ If the Services concur in this determination, then consultation is complete.²³⁹ If the Services’ concurrence in a “not likely to adversely affect” finding is inconsistent with the best available science, however, any such concurrence must be set aside.²⁴⁰

If an action agency concludes that the action is “likely to adversely affect” listed species or critical habitat, as FERC must here, it must then enter into “formal consultation.”²⁴¹ The threshold for triggering the formal consultation requirement is “very low;” “any possible effect... triggers formal consultation requirements.”²⁴² “Formal consultation” commences with the action agency’s written request for consultation and concludes with the Services’ issuance of a “biological opinion.”²⁴³

It is readily apparent that the proposed Project is likely to adversely affect several listed species, as set forth in detail above. Endangered mussels, bats, birds, plants and fish are at great risk of harm from Project construction activities, which could result in pollution and sedimentation of waters and fragmentation of habitat.

The biological opinion issued at the conclusion of formal consultation states the opinion of the Services as to whether the effects of the action are “likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.”²⁴⁴ To “jeopardize the continued existence of” means “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.”²⁴⁵

The “effects of the action” include all direct and indirect effects of the proposed action, plus the effects of actions that are interrelated or interdependent, added to all existing

²³⁷ 16 U.S.C. § 1536(a)(2).

²³⁸ 50 C.F.R. §§ 402.13(a) and 402.14(b).

²³⁹ *Id.* § 402.13(a).

²⁴⁰ *See* 5 U.S.C. § 706(2).

²⁴¹ 50 C.F.R. §§ 402.12(k), 402.14(a).

²⁴² 51 Fed. Reg. 19,926.

²⁴³ 50 C.F.R. § 402.02.

²⁴⁴ *Id.* § 402.14(g)(4).

²⁴⁵ *Id.* § 402.02.

environmental conditions - that is, added to the environmental baseline. “The environmental baseline includes the past and present impacts of all Federal, state, and private actions and other human activities in the action area” “Interrelated actions are those that are part of a larger action and depend on the larger action for their justification.” The effects of the action must be considered together with “cumulative effects,” which are “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.”²⁴⁶

Therefore, the formal consultation on the Project’s impacts on listed species must include a full analysis of the potential impacts to protected species from the construction and maintenance of this proposed pipeline, as well as the Atlantic Coast Pipeline and Appalachian Connector Pipeline, since these are closely-related actions (as discussed above). Further, this requires that the EIS address the impacts to imperiled species associated with the mining of the natural gas, transportation of the product to and through the pipeline and associated spills, refinement of the product, and consumption/use of the natural gas for energy, as well as climate change impacts associated with those actions, which have the potential to jeopardize the continued existence of several listed species.

If jeopardy is likely to occur, the Services must prescribe in the biological opinion “reasonable and prudent alternatives” to avoid “take” of listed species.²⁴⁷ If either Service concludes that a project is not likely to jeopardize listed species, it must provide an “incidental take” statement with the biological opinion, specifying the amount or extent of incidental take, “reasonable and prudent measures” necessary or appropriate to minimize such take, and the “terms and conditions” that must be complied with by the action agency to implement any reasonable and prudent measures.²⁴⁸

After the issuance of a final biological opinion and “where discretionary Federal involvement or control over the action has been retained or is authorized by law,” the agency must reinitiate formal consultation if, *inter alia*:²⁴⁹

- the amount or extent of taking specified in the incidental take statement is exceeded;
- new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- the identified action is subsequently modified in a manner that causes an effect to the listed species ... that was not considered in the biological opinion; or
- a new species is listed or critical habitat designated that may be affected by the identified action.”

²⁴⁶ *Id.* § 402.02.

²⁴⁷ *Id.* § 402.14(g).

²⁴⁸ 16 U.S.C. § 1536(b)(4), 50 C.F.R. § 402.14(i).

²⁴⁹ 50 C.F.R. § 402.16.

FERC must therefore undertake formal consultation on the proposed Project. According to the FWS Endangered Species Consultation Handbook, the time required to conduct formal section 7 consultation may be longer than the time required to complete preparation of NEPA compliance documents, therefore “the action agency should be encouraged to initiate informal consultation prior to NEPA public scoping.”²⁵⁰ It does not appear that this recommendation has been complied with, and we urge FERC to begin the development of a Biological Assessment immediately, since “Early inclusion of section 7 in the NEPA process would allow action agencies to share project information earlier and would improve interagency coordination and efficiency.”²⁵¹ Furthermore, the Handbook makes it clear that “The Record of Decision for an EIS should address the results of section 7 consultation.” The consultation process must therefore commence prior to the issuance of a draft EIS, so that the results of consultation may be properly considered within the NEPA analysis.

IX. FERC Must Consider Alternatives to the Mountain Valley Pipeline That Use Existing Infrastructure and/or Rights of Way

1. FERC has an obligation to consider the potential for increased use of existing natural gas infrastructure and existing rights of way

FERC has obligations under both NEPA and the NGA to consider alternatives to the specific proposals presented by certificate applicants. The alternatives analysis required by NEPA is “the heart of the environmental impact statement.”²⁵² FERC must “[r]igorously explore and objectively evaluate all reasonable alternatives,” including a “no action” alternative, and “[d]evote substantial treatment to each . . . so that reviewers may evaluate their comparative merits.”²⁵³ The discussion of available alternatives should also include “reasonable alternatives not within the jurisdiction of the lead agency.”²⁵⁴ FERC regulations specifically require “[t]he use, widening, or extension of existing rights-of-way” to be considered in the siting of proposed pipelines.²⁵⁵

Further, the NGA does not constrain FERC solely to accept or reject the specific proposal presented by a certificate applicant. That is, FERC can issue a certificate that differs from the certificate requested.²⁵⁶ FERC and its predecessor agency have long recognized that,

²⁵⁰ at 4-11 (available at http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf)

²⁵¹ *Id.*

²⁵² 40 C.F.R. §1502.14.

²⁵³ *Id.* § 1502.14(a), (b).

²⁵⁴ *Id.* §1502.14(c).

²⁵⁵ 18 C.F.R. § 380.15(e)(1).

²⁵⁶ Sunray Mid-Con. Oil Co. v. Federal Power Com’n, 364 U.S. 137 (1960); 15 U.S.C. 717f(e) (“The Commission shall have the power to attach to the issuance of the certificate and to the exercise of the rights granted thereunder such reasonable terms and conditions as the public convenience and necessity may require.”).

in passing upon proposed certificate authorizations, it seems clear that we have the authority, if the application of the act's standards to the facts before us requires, to issue a certificate providing for such reasonable variations or departures from the parties' proposals as may be said to be fairly within their contemplation and are necessary or appropriate to carry out the provision of the Act. A contrary holding would exalt mere procedural incidents above substantial public interests.²⁵⁷

Even more importantly, the Supreme Court similarly recognized that Section 7(e) of the NGA provides "ample power" to FERC to attach appropriate conditions to certificates.²⁵⁸ Under the NGA, FERC must consider alternatives to a particular proposal to determine whether the application "would serve the public convenience and necessity."²⁵⁹ The NGA imposes a duty on FERC "to give proper consideration to logical alternatives which might serve the public interest better than any of the projects outlined in the applications."²⁶⁰ Indeed, FERC should reject proposals when alternative proposals would better serve public convenience and necessity, even when the agency lacks the authority to mandate the alternative.²⁶¹

In accordance with those principals, FERC must, at minimum, consider (1) relying on existing pipeline capacity, (2) collocating the proposed pipeline in existing pipeline rights-of-way, and (3) alternatives that would use expanded and improved existing pipelines, either through looping or pipeline replacement.

a. Using existing pipeline capacity

Because of FERC's broad authority to impose appropriate terms and conditions on certificates under the NGA, and because of FERC's duty under the NGA to consider logical alternatives that better serve the public interest, the scope of FERC's analysis must include consideration of using existing pipelines to transport the gas at issue in MVP's application.²⁶² FERC is authorized, under Section 7(a) of the NGA, to require existing pipelines to extend or improve.²⁶³

²⁵⁷ Re Natural Gas Pipeline Co. of Amer., 1957 WL 8339 at *3 (F.P.C. Jan. 31, 1957).

²⁵⁸ United Gas Imp. Co. v. Callery Properties, Inc., 382 U.S. 223 (1965).

²⁵⁹ City of Pittsburgh v. Federal Power Comm'n, 237 F.2d 741, 756 n. 28 (D.C. Cir. 1956).

²⁶⁰ Northern Natural Gas Co. v. Federal Power Comm'n, 399 F.2d 953, 973 (D.C. Cir. 1968).

²⁶¹ City of Pittsburgh, 237 F.2d at 756 n. 28.

²⁶² 40 C.F.R. § 1502.14; 15 U.S.C. § 717f(e); Northern Natural Gas Co., 399 F.2d at 973.

²⁶³ 15 U.S.C. § 717f(a). Panhandle Eastern Pipe Line Co. v. Federal Power Comm'n, 204 F.2d 675, 683 (3d Cir. 1953) (holding that 15 U.S.C. § 717f(a) authorizes the Commission to, "if necessary or desirable in the public interest, direct [a pipeline company] to improve its facilities by their rehabilitation and repair, or even reconstruction, to the extent necessary to restore them to their original designed and approved capacity or former actual capacity").

Accordingly, FERC must investigate alternatives to the construction of an entirely new pipeline for the entire proposed route. To the extent that existing pipelines can serve any perceived need for the Mountain Valley Pipeline, FERC must consider alternatives that include using available capacity in appropriate pipelines to transport the gas proposed by MVP to minimize or eliminate the need for new construction.

Under Section 7(e) of the NGA, FERC may condition approval of the Mountain Valley Pipeline on the use of existing pipelines where feasible. Moreover, under Section 7(a), FERC can order existing pipelines to extend or improve their facilities up to their original or former actual capacity to be able to transport gas. Because the use of existing pipelines would use existing rights-of-way and minimize adverse impacts on landowners through the use of eminent domain and would reduce or eliminate impacts to the environment, FERC must consider alternatives involving existing pipelines under NEPA and the NGA.²⁶⁴

b. Collocation

As noted above, FERC must consider “[t]he use, widening, or extension of existing rights-of-way . . . in locating proposed facilities.”²⁶⁵ Indeed, FERC has an admitted “general preference for utilizing ‘routing along existing road or utility rights-of-way, whenever possible, over creating a new greenfield pipeline right-of-way.’”²⁶⁶ The “use of existing utility corridors for pipeline construction is preferred over the creation of new utility corridors.”²⁶⁷ Collocation in existing rights-of-way is not only required under FERC’s NEPA regulations, but is also preferred under FERC’s interpretation of its mandate to issue certificates only on a demonstration of public convenience and necessity. In its 1999 Policy Statement, FERC made clear that it would seek to avoid the unneeded exercise of eminent domain.²⁶⁸ Such an exercise of that extraordinary power presents adverse impacts to landowners, and must be balanced against the public benefits of a proposed pipeline.²⁶⁹ Accordingly, to eliminate or minimize adverse impacts to landowners and the environment, and hence demonstrate public convenience and necessity under the NGA,²⁷⁰ an applicant must consider collocating its route with existing

²⁶⁴ 18 C.F.R. § 380.15(e)(1); 88 FERC ¶ 61,227, 1999 WL 718975 at *1, *14.

²⁶⁵ 18 C.F.R. § 380.15(e)(1).

²⁶⁶ Texas Eastern Transmission, LP, 131 FERC ¶ 61164, 2010 WL 2069842 at *14 (FERC May 20, 2010) (citing Islander East Pipeline Co., 102 FERC ¶ 61,054, at 133 (2003)).

²⁶⁷ Portland Natural Gas Transmission System Maritimes & Northeast Pipeline, LLC & Portland Natural Gas Trans. Sys., 83 FERC ¶ 61,080, 1998 WL 292787 at *11 (FERC Apr. 23, 1998).

²⁶⁸ 88 FERC ¶ 61,227, 1999 WL 718975 at *1.

²⁶⁹ Id. at *18–*20.

²⁷⁰ Id. at * 14.

rights-of-way.²⁷¹ Consequently, FERC will violate NEPA and the NGA if it fails to consider all possible collocation opportunities with existing utility corridors.

c. Enlarging existing pipeline

Although FERC may not have authority to order the enlargement of an existing pipeline under Section 7(a) of the NGA, that does not obviate FERC's obligation to consider alternatives that might involve the enlargement of an existing pipeline.²⁷² Because NEPA and the NGA require FERC to consider options that it would not necessarily be able to command, and because FERC must consider existing rights-of-way under NEPA, 18 C.F.R. § 380.15(e)(1), FERC must investigate and consider alternatives to the Mountain Valley Pipeline's proposed route that would enlarge existing pipelines to serve demand.

Existing natural gas pipelines that serve the same areas as the Mountain Valley Pipeline provide opportunities to minimize the environmental impact of the proposed pipeline and the effect on landowners and communities. Where those pipelines exist, FERC must consider alternatives that include looping existing pipelines or replacing older, smaller diameter pipelines with larger diameter pipelines to meet the combined need of the existing pipeline and the Mountain Valley Pipeline. Looping and/or replacing smaller pipelines could reduce the impact of the Mountain Valley Pipeline on the environment and landowners on the proposed project not only by taking advantage of existing infrastructure and reducing the disturbances to the environment and landowners, but also by replacing old and often leaking infrastructure, thereby reducing greenhouse gas emissions.²⁷³

2. *Any need for the Mountain Valley Pipeline can be met by practicable alternatives that use existing natural gas infrastructure or existing rights of way.*

Many pipelines have been altered or are being altered and/or upgraded to serve the same market demand as the proposed Mountain Valley Pipeline. Each such existing or planned project diminishes or eliminates the justification for the project proposed by Mountain Valley Pipeline. Such pipelines must be included in FERC's analysis of alternatives.

²⁷¹ See, e.g., National Fuel Gas Supply Corp., 150 FERC ¶ 61,162, 2015 WL 898840 at *4 (FERC Mar. 2, 2015) (concluding that the Certificate Policy Statement's requirement that pipeline companies seek to minimize the need to rely on eminent domain is satisfied where a company collocates on an existing pipeline right-of-way).

²⁷² 15 U.S.C. § 717f(a); 40 C.F.R. § 1502.14(c); City of Pittsburgh, 237 F.2d at 756 n. 28 ("The existence of a more desirable alternative is one of the factors which enters into a determination of whether a proposal would serve the public convenience and necessity. That the Commission has no authority to command the alternative does not mean that it cannot reject the proposal.").

²⁷³ See e.g., Conservation Law Foundation, Into Thin Air: How Leaking Natural Gas Infrastructure is Harming Our Environment and Wasting a Valuable Resource, available at www.clf.org/static/natural-gas-leaks/WhitePaper_Final.lowres.pdf, last visited April 20, 2015.

According to the U.S. Energy Information Administration, many companies are already increasing their pipelines' capacity to move bi-directionally, which will allow natural gas from the Northeast and West Virginia to reach Southeastern markets. Notably, the agency found that many existing pipelines are significantly underused. Many pipelines saw a decrease in usage of as much as 84% from 2008 to 2013.²⁷⁴ That EIA assessment describes at least six projects that are completed or underway that move Marcellus natural gas to Southeastern markets. The EIA further found that, in addition to costing less money to construct, these bidirectional projects produce fewer environmental impacts.

In addition to the new bidirectional projects discussed by the EIA, several existing rights of way provide access and potentially sufficient infrastructure to satisfy the market demand projected by Mountain Valley Pipeline. First, there are existing rights of way that run roughly due south from northern West Virginia. Those rights of way connect to an east-west right of way in Virginia, which in turns connects to existing lines in North Carolina. That route could potentially use the existing pipelines and could certainly use portions of existing rights of way to reach the Mountain Valley Pipeline market without the environmental impacts of a new route. FERC, therefore, must consider that potential route in its consideration of collocation.

Second, there is an existing pipeline that runs east-west through southern Pennsylvania and then connects to the Transco pipeline, which runs southward into North Carolina. According to the EIA, Pennsylvania and West Virginia are already so interconnected by pipelines that they function as a single unit. Thus, pipelines from Pennsylvania can carry gas from West Virginia as well. Those existing pipeline routes follow a trajectory from Northern West Virginia to the Tidewater area and southward to North Carolina. They would serve the same or nearly the same market areas as the proposed Mountain Valley Pipeline. Again, NEPA requires consideration of these rights of way and existing pipelines as an alternative to the Mountain Valley Pipeline.

Documents filed with FERC demonstrate that there are several other existing pipelines that connect West Virginia to southwest Virginia, including all or parts of the Transco, Columbia, and East Tennessee systems.²⁷⁵ Indeed, Columbia's system, like the proposed Mountain Valley Pipeline, "provides transportation services from supply areas in the Marcellus basin to demand areas in southern Virginia, including the City of Chesapeake."²⁷⁶ The EIS

²⁷⁴ U.S. Energy Information Administration, Dec. 2, 2014 news article, "32% of natural gas pipeline capacity into the Northeast could be bidirectional by 2017," available at <http://www.eia.gov/todayinenergy/detail.cfm?id=19011>.

²⁷⁵ See Filings for Atlantic Coast Pipeline and Supply Header Project, FERC Docket Nos. PF15-5-000 and PF15-6-000, Description of "System Alternatives", Resource Report 10, Section 10.4.1, "Existing Systems", submitted to FERC December 2014.

²⁷⁶ *Id.*, Preliminary Draft Resource Report 10, at 10-7.

should consider whether any portion of that right-of-way could be used to reduce the Mountain Valley Pipeline's impacts.²⁷⁷

The EIS should also consider non-pipeline corridors, such as electric transmission facilities and roads. For example, several 500 kV lines already connect areas that the Mountain Valley Pipeline proposes to serve.²⁷⁸ The EIS cannot simply accept MVP's assertion that "much of the route that followed existing overhead electric transmission line rights-of-way was along severe side slopes," such that collocation presents "insurmountable construction challenges."²⁷⁹ If minor deviations from MVP's proposed route do not allow for collocation, then more significant modifications must be considered. Moreover, MVP cannot seriously contend that collocation is infeasible all the way from the pipeline's origin to its terminus. At a minimum, the EIS must examine alternatives that make far greater use of existing corridors than MVP has proposed.

MVP rejects, with few facts and cursory analysis, the use of existing systems. However, those rights of way must be considered in detail in the NEPA analysis. MVP is incorrect that collocation or system upgrades on existing lines will entail similar or greater environmental impact when compared to the Mountain Valley Pipeline. On the contrary, using existing rights of way prevents the forest fragmentation of a new right of way. Further, upgrades to existing pipelines result in new infrastructure and therefore less risk of leakage and explosion in deteriorating pipelines.

3. FERC should consider alternatives with less severe impacts than the proposed Mountain Valley Pipeline.

Consistent with FERC's siting regulations, the EIS should examine alternatives that would "minimize[] effects on scenic, historic, wildlife, and recreational values."²⁸⁰ In particular, the EIS must carefully examine alternative corridors that would avoid or minimize harm to public lands. Although FERC requires project sponsors to avoid "officially designated parks; wetlands; and scenic, recreational, and wildlife lands,"²⁸¹ MVP's proposal would cross the Jefferson National Forest, the Blue Ridge Parkway, and the Appalachian Trail Scenic Corridor.²⁸² In analyzing alternatives, FERC should not merely aim to "thread-the-needle"

²⁷⁷ In Docket No. PF15-21, Columbia recently submitted a pre-filing request for its proposed WB Xpress Project, which involves upgrades to the WB pipeline system.

²⁷⁸ U.S. Department of Energy, Transmission Constraints and Congestion in the Western and Eastern Interconnections, 2009-2012, at 30 (Jan. 2014) (Figure 3-13: Map of PJM high voltage transmission Lines), available at <http://energy.gov/sites/prod/files/2014/02/f7/TransConstraintsCongestion-01-23-2014%20.pdf>.

²⁷⁹ MVP's Preliminary Draft Resource Report 10, at 10-8.

²⁸⁰ 18 C.F.R. § 380.15(a).

²⁸¹ 18 C.F.R. § 380.15(e)(2).

²⁸² Preliminary Draft Resource Report 1, at 1-3 to 1-4.

around the most special places in this sensitive region. Instead, it should recognize that the Mountain Valley Pipeline's proposed corridor is fundamentally unsuitable for a major pipeline project.

Other recent proposals demonstrate that the Mountain Valley Pipeline need not cause such severe harm to the region's national forests. For example, Spectra Energy recently proposed a pipeline that, like the Mountain Valley Pipeline, "would access gas from the Marcellus basin and provide delivery service to the same areas in southern Virginia and North Carolina."²⁸³ Despite raising serious concerns, Spectra's proposal, which is currently on hold, shows that it is not necessary to cross these important, sensitive areas in order to serve the southeast. To minimize the impacts of the Mountain Valley Pipeline and other proposed pipelines, the EIS should identify a comprehensive, regional alternative that makes the most efficient possible use of public lands. Additionally, FERC should reject MVP's summary assertions that other routes would cause impacts similar to or greater than those of the Mountain Valley Pipeline. In light of the Mountain Valley Pipeline's extraordinary impacts on forests, water resources, and public lands, it would be irrational for FERC to assume that any route of comparable length would do the same amount of harm.

Finally, the EIS should examine the use of renewable resources, energy efficiency, and conservation to meet any perceived demand for the Mountain Valley Pipeline. MVP's summary dismissal of such options is not supported by the facts, which, as explained above, demonstrate that renewables and conservation present a viable alternative to increased use of fossil fuels.²⁸⁴ To the extent that renewable resources and energy efficiency could reduce the pipeline's footprint or make a system alternative more viable, they should be considered together with other options.

²⁸³ Filings for Atlantic Coast Pipeline and Supply Header Project, FERC Docket Nos. PF15-5-000 and PF15-6-000, Preliminary Draft Resource Report 10, at 10-8.

²⁸⁴ See MVP's Draft Resource Report 10 at 10-3.