CO105-13 cont'd

East Tennessee, and Transco pipeline systems.[88] In rejecting further consideration of these alternatives, FERC generally stated that because they would involve construction similar to or greater than what is proposed by MVP, they were not considered in greater detail. This rationale, however, does not at all take into consideration the relative values of the areas and resources being impacted.

For example, FERC said that "construction of the additional facilities for the East Tennessee pipeline system alternatives would be nearly equal to the construction of the MVP."[89] Instead of analyzing the alternative in further detail, however, FERC simply stated that "the East Tennessee pipeline system would not provide a significant environmental advantage to the MVP, and so that alternative is not studied further in this EIS."[90] FERC made this assertion without any comparative analysis of the resource impacts between the MVP and the East Tennessee system alternative. It could be that the East Tennessee system alternative would impact fewer resources of concern than MVP, which will impact numerous resources of concern including karst resources, steep slopes, sensitive waterbodies, public lands (including the Jefferson National Forest), and endangered species. Considering the "nearly equal" size of the East Tennessee system alternative, FERC should have considered it in greater detail.

CO105-14

FERC's consideration of alternatives involving the Atlantic Coast Pipeline (ACP) were also flawed. FERC considered two alternatives associated with the ACP. First, FERC considered the ACP-single pipeline ("one pipe-one route") alternative, which would combine the

[88] *See* DEIS at 3-10 – 3-11.

[89] *Id.* at 3-11.

[90] *Id.*

CO105-14 We stand by our analyses in the EIS. Alternatives including ACP Project were examined in section 3.3.2 of the EIS.

CO105-14 cont'd

MVP volumes with the ACP volumes in a single pipeline following the proposed ACP route.[91] Second, FERC considered the Northern Pipeline – ACP Collocation (two pipes – one route) alternative, which would involve installation of MVP adjacent to the ACP.[92]

The central flaw in FERC's consideration of these alternatives is the fact that FERC simply assumed that all of the gas proposed for transport on these pipelines is actually needed. Without looking behind the precedent agreements supporting both the MVP and ACP pipelines, FERC cannot determine whether the shipper commitments represent genuine growth in market demand as to warrant to construction of both projects.

CO105-15

As demonstrated above, FERC's failure to establish the true market need for the proposed projects completely undermines its analysis of reasonable alternatives. Without knowing how much, if any, new infrastructure is needed to satisfy public demand —not just applicants' desires for profits—FERC cannot reasonably determine what alternative actions, including the no action alternative, would satisfy the underlying need. FERC's purpose and need statement and resulting alternatives analysis thus fails to comply with the requirements of NEPA.

CO105-16

II. The DEIS Fails to Include Critical Environmental Information Necessary to Determine Impacts to Numerous Environmental Resources.[93]

NEPA's EIS requirement "guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and

[91] *Id.* at 3-13 – 3-15.

[92] *Id.* at 3-25 – 3-28.

[93] Other sections of these comments address the significance of the missing information in certain particularly critical contexts, such as evidence of need for the MVP, impacts associated with karst areas, impacts to threatened and endangered species, impacts to aquatic life, and impacts associated with greenhouse gas emissions. This section more generally highlights FERC's consistent failure to include information necessary to determine impacts of the MVP and FERC's practice of allowing applicants to submit critical information after the release of the DEIS to the public.

CO105-15 See the response to FA11-12 regarding need.

CO105-16 See the response to comments LA5-1 and FA11-2 regarding pending information in the EIS. See the response to comment IND196-2 regarding "prior to construction" recommendations. See also the response to comment IND147-1 regarding recommendations. Courts have found that final plans are not required at the NEPA stage, as long as they are completed prior to construction. The final EIS has been updated to include the following: consultations with FS and stakeholders about crossing the ANST (section 4.8): Mountain Valley's adoption of the Mount Tabor Variation; revised table 3.5.3-1; waterbodies that would be paralleled (section 4.3); wetlands at WB Interconnect (section 4.3); wetlands where more than 75 feet would be used (section 4.3); revised *Migratory Bird Conservation Plans* (section 4.5); easements were acquired by Equitrans for the Redhook Compressor Station (section 2); Equitrans' adoption of the New Cline Variation (section 3); revised *Landslide Mitigation Plan* (section 4.1); analysis of debris flows within the Jefferson National Forest (section 4.1); results of the fracture trace study (section 4.1); impacts on wells and springs (section 4.2); culverts and fill in waterbodies and wetlands (section 4.3); Mountain Valley's proposal for crossing the Elk, Gauley, and Greenbrier Rivers with dry ditch methods; our recommendation that Mountain Valley cross the Pigg River with an HDD (section 4.3); our recommendation that Mountain Valley provide a contingency plan to reduce impacts on public water supplies (section 4.3); results of environmental surveys at cathodic protection beds; the FWS is not requiring surveys for the Elliott Valley millipede because the MVP pipeline would avoid caves (sections 4.1 and 4.7); surveys for bog turtle and buffalo clover (section 4.7); the avoidance of the Mill Creek Natural Area and consultations with TNC and VADCR (sections 3 and 4.8); and cultural resources surveys (section 4.10). Constitution, Atlantic Sunrise, Sabal Trail, and PennEast are separate projects and have nothing to do with the MVP and EEP.

CO105-16 cont'd

the implementation of that decision."[94] Information must be provided in a timely manner to ensure that the public can meaningfully participate in the decisionmaking process.[95] An agency must "not act on incomplete information, only to regret its decision after it is too late to correct."[96]

When an agency publishes a draft EIS, it "must fulfill and satisfy to the fullest extent possible the requirements established for final statements in section 102(2)(C) of the Act."[97] "If a draft statement is so inadequate as to preclude meaningful analysis, the agency *shall* prepare and circulate a revised draft of the appropriate portion."[98] "The agency shall make every effort to disclose and discuss at appropriate points in the draft statement all major points of view on the environmental impacts of the alternatives including the proposed action."[99]

Courts have explained that, when performing an EIS, an agency "should take to the public the full facts in its draft EIS and not change them after the comment period unless, of course, the project itself is changed."[100] NEPA "expressly places the burden of compiling information on the agency" so that the public and other governmental bodies can evaluate and

---

94 *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

95 *League of Wilderness Defenders/Blue Mountain Biodiversity Project v. Connaughton*, 752 F.3d 755, 761 (9th Cir. 2014) ("Informed public participation in reviewing environmental impacts is essential to the proper functioning of NEPA.").

96 *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 371 (1989).

97 40 C.F.R. § 1502.9(a).

98 *Id.* (emphasis added).

99 *Id.*

100 *Burkey v. Ellis*, 483 F. Supp. 897, 915 (N.D. Ala. 1979).

CO105-16 cont'd

critique the agency's action.[101] "The now traditional avenue of independent comment on decision-making by public interest organizations would be narrowed if interested parties did not have presented in the EIS the analysis and data supporting an agency's decision."[102] Such information must be included in the draft EIS, as opposed to supplied in the final EIS following public comments because "*the purpose of the final EIS is to respond to comments rather than to complete the environmental analysis (which should have been completed before the draft was released).*"[103]

As the CEQ's regulations and case law make clear, a draft EIS that fails to provide the public a meaningful opportunity to review and understand the agency's proposal, methodology, and analysis of potential environmental impacts violates NEPA.[104]

Here, the DEIS lacks sufficient information about the MVP and its potential environmental impacts on a wide variety of resources. The DEIS recommends that some of this missing information be supplied by the applicants either by the end of the DEIS comment period or before construction begins. *See* DEIS at 5-20 – 5-24. That means the public will not have an opportunity to meaningfully review and comment on this information, which should have been included in the DEIS. The information regarding environmental impacts that is missing from the DEIS and will not be provided by the applicants in a manner that facilitates meaningful public

[101] *Grazing Fields Farm v. Goldschmidt*, 626 F.2d 1068, 1073 (1st Cir. 1980).

[102] *Id.*

[103] *Habitat Educ. Ctr. v. U.S. Forest Servs.*, 680 F. Supp. 2d 996, 1005 (E.D. Wis. 2010) (emphasis added), *aff'd sub nom. Habitat Educ. Ctr., Inc. v. U.S. Forest Serv.*, 673 F.3d 518 (7th Cir. 2012).

[104] *See e.g.*, *California ex rel. Lockyer v. U.S. Forest Service*, 465 F. Supp. 2d 942, 948-50 (N.D. Cal. 2006); *see also Idaho ex rel. Kempthorne v. U.S. Forest Service*, 142 F. Supp. 2d 1248, 1261 (D. Idaho 2001) ("NEPA requires full disclosure of all relevant information before there is meaningful public debate and oversight.").

CO105-16 cont'd

disclosure and participation includes the following information, which the applicants will not provide until the end of the DEIS comment period:

- Documentation of continued coordination with the Forest Service and other Appalachian Trail stakeholders regarding the newly adopted pipeline crossing, including visual simulations modeling both "leaf-on" and "leaf-off" scenarios at the crossing;
- Results of on-site surveys for the Mount Tabor Route Alternative to assess constructability and identify karst features that shall be adopted if the alternative is adopted into the proposed pipeline route;
- Additional information on the proposed route variations involving the tracts identified in table 3.5.3-1 of the DEIS;
- A complete list of any locations not already found acceptable by FERC staff where the pipeline route or access road parallels a waterbody within 15 feet or travels linearly within the waterbody channel;
- Plans and maps that illustrate how permanent impacts on wetlands would be avoided at the WB Interconnect;
- Site-specific justifications for each of the wetlands for which MVP requests a right-of-way greater than 75 feet;
- A plan that describes how long-term and permanent impacts on migratory bird habitat would be minimized, with an emphasis on high quality and/or larger intact core interior forest areas;
- The current status of easement negotiations for the Redhook Compressor Station and alternative sites and analysis if those negotiations have been unsuccessful; and
- Information regarding the potential construction feasibility of the Cline Route Alternative, including more detailed analysis of potential issues associated with either an open-cut or road crossing at Raccoon Creek and Raccoon Run Road.[105]

All of that information is necessary for FERC to take the necessary hard look at the environmental impacts of the proposed projects and to allow the public to evaluate and meaningfully participate in the NEPA process.

[105] DEIS at 5-20 – 5-24.

CO105-16 cont'd

FERC not only allows the applicants to submit crucial information during the pendency of the DEIS comment period, but indeed after the conclusion of the entire NEPA process. The critical information that FERC allows Mountain Valley to submit after the issuance of the Final EIS includes:

- A plan for the avoidance of active mines, or copies of agreements with coal companies regarding compensation for loss of coal resources;
- A revised Landslide Mitigation Plan that includes:
  - An analysis of the potential landslide hazards at the GCSZ, Peters Mountain, Sinking Creek Mountain, and Brush Mountain based on the results of investigations conducted by Schultz and Southworth (1989), and further identified and discussed in USGS Bulletin 1839-E;
  - An identification of landslide hazards where the pipeline routes through areas comprised of both steep slopes and red shale bedrock of the Conemaugh, Monongahela, Dunkard, and Mauch Chunk Groups;
  - An analysis of a potential debris flow zone within the Jefferson National Forest from MP 195.5 along the Kimballton Branch to the junction of Stoney Creek; and
  - Minor route adjustments as a method to avoid areas of potential slides and debris flows;
- Results of MVP's fracture trace/lineament analysis;
- Site-specific plans, including details regarding materials to be used and installation methods, for the use of permanent culverts and permanent fill in waterbodies and wetlands for access roads, including a detailed analysis of all reasonable alternatives to the use of culverts and permanent fill;
- Results of quantitative modeling for turbidity and sedimentation associated with wet open-cut crossings of the Elk River, Gauley River, and Greenbrier River addressing the duration, extent, and magnitude of turbidity levels and assess the potential impacts on resident biota and including a discussion on the physical and chemical characteristics of the sediments, the estimated area affected by the transport and redistribution of the sediments, and the effect of the suspension and resettlement on water quality as well as an assessment of the effectiveness of the proposed turbidity curtains;
- HDD feasibility and geotechnical studies for the alternative alignments identified for the Pigg River crossing at MP 286.8 and the Blackwater River crossing at MP 262.8;
- Contingency plans outlining measures that would be taken to minimize and mitigate potential impacts on public surface water supplies with intakes within 3 miles

CO105-16 cont'd

downstream of the crossing of the MVP pipeline, and ZCC within 0.25-mile of the pipeline;

- Results of all remaining environmental surveys (water resources, wetlands, cultural resources, and threatened and endangered species) for all cathodic protection groundbeds;
- Evidence of landowner concurrence with the site-specific residential construction plans for all locations where construction work areas would be within 10 feet of a residence, as indicated in bold in table 4.8.2-1;
- Documentation of further coordination with TNC and VDCR of regarding the Mill Creek Springs Natural Area Preserve, including any impact avoidance, minimization, or mitigation measures developed;
- HDD noise mitigation plan to reduce the projected noise level increase attributable to the proposed drilling operations at the NSAs;
- The location of all water wells, springs, swallets, and other drinking water sources within 150 feet (500 feet in karst terrain) of the pipeline and aboveground facilities;
- All outstanding biological surveys for federally listed species (*i.e.*, Ellett Valley millipede, bog turtle, and running buffalo clover); and
- Remaining cultural resources survey reports, site evaluation reports, avoidance plans, or treatment plans.[106]

The information described above should have been included in the DEIS; without this information, FERC cannot perform a fully informed evaluation of potential impacts and routing decisions. FERC's failure to require such voluminous and significant information to be evaluated and included in the DEIS for public review and comment clearly demonstrates that the agency has not "ma[d]e every effort to disclose and discuss at appropriate points *in the draft statement* all major points of view on the environmental impacts of the alternatives including the proposed action."[107] By publishing the DEIS without this information, FERC failed to

[106] DEIS at 5-20 – 5-24.

[107] 40 C.F.R. § 1502.9(a) (emphasis added).

CO105-16 cont'd

"guarantee[ ] that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision."[108]

FERC's failure to include significant amounts of critical environmental information in the DEIS seems to be part of a recent trend in draft statements prepared by FERC for major greenfield pipelines. For example, in comments on the DEIS for the Constitution Pipeline, EPA stated that a substantial amount of information was omitted from the DEIS, including information regarding impacts to geology and soils, waterbodies, wetlands, wildlife and vegetation, air emissions, and cumulative impacts.[109] EPA repeatedly explained that the lack of information prevented other agencies and the public from meaningfully participating in the NEPA process.[110]

In comments on the Atlantic Sunrise Pipeline DEIS, EPA stated it was "concerned about the amount of detailed information that has yet to be filed and is not evaluated in the DEIS."[111] This missing information includes

> surveys for land, rare, species, historic resources, water supplies, air modeling, mitigation measures to manage and dispose of contaminated groundwater, proposed mitigation measures for source water protection areas, geotechnical feasibility studies for HDD crossing locations and mitigation measures to minimize drilling risks, and a detailed aquatic resource compensatory mitigation plan.[112]

---

[108] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

[109] EPA, *Comments on the Constitution Pipeline DEIS* at 3-9 (Apr. 9, 2014) (Docket No. CP13-499-000, Accession No. 20140409-5120).

[110] *See, e.g.*, *id.* at 3 (The lack of information "negates the ability of agency specialists and the public to review the analysis and comment on it.").

[111] EPA Atlantic Sunrise Comments at 2.

[112] *Id.*

CO105-16 cont'd

EPA explained that this information is both "relevant and critical to evaluation of potential impacts" and that "a fully informed decision may not be made without this information."[113] EPA also stressed that this missing information needs to be "disseminated and appropriately evaluated with the resource agencies and public stakeholder participation prior to the issuance of any certificates by FERC."[114] EPA specifically recommends that FERC do this "through the use of a revised DEIS."[115]

Likewise, in comments on the DEIS for the Sabal Pipeline, EPA said that it had "very significant concerns over the FERC's process and full and objective compliance with the NEPA regulations at 40 CFR Part 1500."[116] EPA even suggested that FERC "appear[ed] to be justifying decisions made prior to implementing the NEPA process."[117]

In comments on the DEIS for the PennEast Pipeline, EPA said it had "significant concerns regarding the alternatives analysis, a number of important topics for which *information is incomplete*, and the direct, indirect and cumulative impacts of the proposed action on the environment and public health, including impacts to terrestrial resources, including interior forests, aquatic resources, and rare, threatened and endangered species."[118] EPA emphasized that "[a] significant amount of information is omitted from the DEIS and is proposed to be filed by

---

[113] *Id.*

[114] *Id.*

[115] *Id.*

[116] EPA, *Comments on the Southeast Market Pipeline Project DEIS* at 1 (Oct. 26, 2015) (Docket No. CP15-17-000, Accession No. 20151102-0219).

[117] *Id.* at 9.

[118] EPA, *Comments on the PennEast Pipeline DEIS*, at 1 (Sept. 16, 2016) (Docket No. CP15-558-000, Accession No. 20160916-0013) (emphasis added).

CO105-16 cont'd

the project proponent at a future date."[119] EPA stressed that "[f]ailing to consider this information in the DEIS leads to gaps in the data and lack of potentially important information for the decision maker."[120] As it did in comments on the Atlantic Sunrise DEIS, EPA specifically requested that FERC prepare a "revised DEIS" for the PennEast Pipeline to account for these significant deficiencies.

In order to cure the glaring deficiencies in the DEIS and allow the public to review and meaningfully comment on the impacts of the proposed project, FERC must wait until it has gathered the information described above (and the other missing information identified elsewhere in these comments and in the numerous other similar comments submitted to FERC) and then issue a Revised DEIS with a new public comment period. "If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion."[121] Only the issuance of a revised DEIS that thoroughly analyzes this missing information will satisfy NEPA's public comment procedures, which "[encourage] public participation in the development of information during the decision making process."[122] Simply adding this missing information to the final EIS is insufficient, as it does not allow the same degree of meaningful public participation.[123]

---

[119] *Id.* at 3.

[120] *Id.*

[121] 40 C.F.R. § 1502.9(a).

[122] *Half Moon Bay Fishermans' Mktg. Ass'n v. Carlucci*, 857 F.2d 505, 508 (9th Cir. 1988).

[123] *Id.* (*citing California v. Block*, 690 F.2d 753, 770-71 (9th Cir. 1982)) ("It is only at the stage when the draft EIS is circulated that the public and outside agencies have the opportunity to evaluate and comment on the proposal…No such right exists upon issuance of a final EIS."); 40 C.F.R. § 1500.1(b). Issuance of a Final EIS with a comment period, in lieu of a Revised DEIS, would not satisfy the requirements and purpose of NEPA. NEPA was enacted to "insure that environmental information is available to public officials and citizens before

CO105-17

III. The DEIS Fails to Adequately Assess the Impacts of Erosion, Sedimentation, and Turbidity on Aquatic Life

Construction of the proposed projects would cross 1,021 waterbodies, including 376 perennial waterbodies, and would disturb over 4,100 acres of soils that are classified as having the potential for severe water erosion.[124] The vast majority of those waterbodies provide habitat for aquatic life and support fisheries.[125] The MVP would clear a 150 foot wide corridor along the length of the pipeline route during construction, which would "remove[] the protective cover and expose[] the soil to the effects of wind and rain, which increases the potential for soil erosion and sedimentation."[126] Additionally, the project would convert a significant amount of forested land to herbaceous cover in the 75-foot wide permanent right-of-way, much of which follows steep slopes with highly erodible soils.

FERC acknowledges that "[i]mpacts on waterbodies could occur as a result of construction activities in stream channels and on adjacent banks."[127] Those impacts include

---

decisions are made and before actions are taken." 40 CFR § 1500.1(b). It is essential that that environmental information is high quality and based upon "accurate scientific analysis, expert agency comments and public scrutiny." *Id.* Furthermore, part of the NEPA process includes the public's opportunity to understand the agency's response to these comments. Even with a comment period, a Final EIS will not allow informed public scrutiny of and input into the decisionmaking process before a "decision is made and before actions are taken." *Id. See also Half Moon Bay Fishermans' Mktg. Ass'n v. Carlucci*, 857 F.2d 505, 508 (9th Cir. 1988).

[124] DEIS at 4-59, 4-171.

[125] *Id.* at 4-171.

[126] *Id.* at 4-64.

[127] DEIS at 4-108.

CO105-17 See the responses to comments CO95-3 and CO99-49 regarding impacts to aquatic life and habitats from erosion, sedimentation, and turbidity. See also the response to comment FA11-15 regarding sedimentation and turbidity modeling. Water resources are discussed in section 4.3 of the EIS; soils in section 4.2.

CO105-17 cont'd

"local modifications of aquatic habitat involving sedimentation, increased turbidity, and decreased dissolved oxygen concentrations."[128] Additionally, FERC states that the

> clearing and grading of stream banks could expose soil to erosional forces and would reduce riparian vegetation along the cleared section of the waterbody. The use of heavy equipment for construction could cause compaction of near-surface soils, an effect that could result in increased runoff into surface waters in the immediate vicinity of the proposed construction right-of-way. Increased surface runoff could transport sediment into surface waters, resulting in increased turbidity levels and increased sedimentation rates in the receiving waterbody. Disturbances to stream channels and stream banks could also increase the likelihood of scour after construction.[129]

Those impacts would harm the aquatic organisms that rely on the affected streams for their survival. As FERC states,

> [i]ncreased sedimentation and turbidity resulting from in-stream and adjacent construction activities would displace and impact fisheries and aquatic resources. Sedimentation could smother fish eggs and other benthic biota and alter stream bottom characteristics, such as converting sand, gravel, or rock substrate to silt or mud. These habitat alterations could reduce juvenile fish survival, spawning habitat, and benthic community diversity and health. Increased turbidity could also temporarily reduce dissolved oxygen levels in the water column and reduce respiratory functions in stream biota. Turbid conditions could also reduce the ability for biota to find food sources or avoid prey.[130]

Despite generally acknowledging these impacts, FERC nonetheless concludes that "[n]o long-term or significant impacts on surface waters are anticipated as a result of the projects" and that "[t]emporary impacts would be avoided or minimized" primarily because the applicants will use dry open-cut crossing methods at all but three major crossings and will adhere to Best Management Practices when performing clearing and grading in riparian areas.[131] Following

---

[128] *Id.*

[129] *Id.*

[130] *Id.* at 4-176

[131] *Id.* at 4-116, 4-176.

CO105-17 cont'd

from that conclusion, FERC finds that "constructing and operating the MVP and the EEP would not significantly impact fisheries and aquatic resources."[132]

The DEIS's conclusion that the projects would not have significant adverse impacts on fisheries and aquatic resources is flawed for several reasons. First, FERC lacks adequate information to determine the impacts that would be associated with the use of wet open-cut crossing methods at three of the major rivers that would be crossed by the MVP. Without that information, FERC cannot reasonably conclude that the project would not significantly impact the aquatic ecosystems in those waterbodies. Second, FERC unjustifiably relies on the use of

CO105-18

Best Management Practices to conclude that clearing and trenching within the relevant watersheds during pipeline construction will not significantly contribute to sedimentation and related impacts of turbidity. FERC provides no evidence to justify its conclusion that those measures would successfully minimize sedimentation impacts, and past experience with similar projects in steep terrain like that which would be traversed by the MVP demonstrates that they would be inadequate. Finally, FERC completely fails to account for the increased sedimentation

CO105-19

that would result from the conversion of mature forest to herbaceous cover within the 75-foot wide permanent right-of-way along much of the pipeline route. As expert analysis performed by the consulting firm Downstream Strategies, LLC confirms, that land use change would cause significant increases in sedimentation.[133] FERC's failure to analyze those impacts renders its conclusion that the projects would not significantly impact aquatic resources unsupportable. Because of those shortcomings, FERC's DEIS does not comply with NEPA.

---

[132] DEIS at 4-181.

[133] *See* Mountain Valley Pipeline Sediment Modeling Methodology, Prepared for Appalachian Mountain Advocates by Jason Clingerman and Evan Hansen of Downstream Strategies, LLC, (hereinafter "Downstream Strategies Report"), attached as Exhibit D.

CO105-18 The FERC Plan and Procedures contains a series of erosion and sedimentation control measures as discussed in sections 2.4, 4.2, and 4.3 of the EIS. Mountain Valley has adopted the Plan and the Procedures (with a few modifications). The FERC staff has decades of extensive experience observing and assessing pipeline construction, waterbody crossings, and restoration using the BMPs and mitigation measures outlined in our Plan and Procedures.

CO105-19 See the response to IND70-1 regarding erosion and sedimentation.

CO105-20

A. The DEIS Lacks Information Necessary to Determine Impacts to Aquatic Life in the Three Major Rivers That Would Be Crossed Using Wet Open-Cut Methods

The MVP would cross three major rivers using the "wet open-cut" method: the Elk River at milepost 87.4, the Gauley River at milepost 118.6, and the Greenbrier River at milepost 170.6.[134] All of those rivers are ecologically, economically, and recreationally important to West Virginia. According to Mountain Valley's modeling analysis included in the DEIS, the crossings would significantly increase the sediment loads in those rivers. Specifically, "[s]ediment loads downstream of the crossings were estimated to increase by 49 to 81 percent, 15 to 26 percent, and 19 to 52 percent for the Elk River, Gauley River, and Greenbrier Rivers[135], respectively, over monthly baseline loads based on a crossing duration of 2 days."[136]

FERC acknowledges, however, that those sedimentation-loading calculations by themselves are not sufficient to assess impacts to aquatic life. In order to determine the impacts to aquatic organisms, it is necessary to calculate the duration, extent, and magnitude of in-stream turbidity levels that would result from additional sediment loads. As FERC explains, "while sediment loads and downstream turbidity and sedimentation are related, they are different

[134] FERC notes that Mountain Valley is currently evaluating using the wet open-cut method at the crossing of the Pigg River at milepost 286.3. Obviously, FERC (and the public) cannot know what the impacts to the Pigg River will be until the method of crossing is determined. This is yet another example of FERC rushing to release the DEIS before obtaining adequate information to take the required "hard look" at the impacts of the projects.

[135] In addition to the sedimentation impacts discussed in these comments, the crossing of the Greenbrier River poses additional risks to water quality and aquatic life in part due to the bedrock exposes in the river bed that will likely require blasting during pipeline construction. Those risks are outlined in the comments submitted on behalf of the Indian Creek Watershed Association by Thomas Bouldin and Pamela C. Dodds, Ph.D., Licensed Professional Geologist. Commenters hereby adopt and incorporate those comments by reference.

[136] DEIS at 4-176. The DEIS notes that Mountain Valley would "attempt" to minimize those impacts using "turbidity curtains" and timing restrictions but includes no analysis of the effectiveness of the minimization measures that would be used.

CO105-20 Mountain Valley now proposes to cross the Elk, Gauley, and Greenbrier Rivers using dry crossing methods, and final EIS has been updated accordingly.

CO105-20 cont'd

measurements with distinct values."[137] The density, downstream extent, and persistence of a turbidity plume at a given crossing depends on stream velocity, turbidity, bank composition, sediment particle size, and duration of the disturbance.[138] According to the DEIS, "Mountain Valley's analysis does not quantify the duration, extent, or magnitude of estimated turbidity levels. Therefore, based on these estimates, *conclusions cannot be drawn regarding the effects of sedimentation and turbidity on fisheries and aquatic resources due to the wet open-cut crossings.*"[139]

Despite admitting that it cannot determine impacts from sedimentation and turbidity on aquatic life at the three major river crossings, FERC remarkably goes on to conclude that those impacts would not be significant. Its conclusion appears to be based in part on its requirement that Mountain Valley submit a turbidity analysis that "address[es] the duration, extent, and magnitude of turbidity levels," "assess[es] the potential impacts on resident biota," "include[s] a discussion on the physical and chemical characteristics of the sediments, the estimated area affected by the transport and redistribution of the sediments, and the effect of the suspension and resettlement on water quality," and includes "an assessment of the effectiveness of the proposed turbidity curtains" that are proposed as mitigation measures.[140] FERC, however, does not require that analysis to be submitted during the NEPA process or, indeed, even prior to the issuance of a

[137] DEIS at 4-110.

[138] *Id.* at 4-108, 4-176.

[139] *Id.* at 4-176 (emphasis added).

[140] *Id.* at 4-110.

CO105-20 cont'd

certificate. Rather, FERC permits Mountain valley to submit its analysis at any time prior to the beginning of construction.[141]

As explained in detail above, NEPA does not permit agencies to defer analysis that is critical to determining the environmental impacts of a proposed project until after the issuance of a DEIS or, even less so, after the conclusion of the NEPA process. Rather, FERC must "take to the public the full facts in its draft EIS."[142] Here, FERC expressly acknowledges that it cannot determine impacts to aquatic life at the three major rivers that would be crossed using the wet open-cut method based on the information before it. Nonetheless, FERC concludes that those impacts would not be significant because they would be studied at some future date along with the effectiveness of the proposed mitigation measures. FERC's conclusion defies logic and plainly renders the DEIS deficient, thus violating NEPA.

CO105-21

B. The DEIS's Reliance on BMPs to Minimize Construction Sedimentation Impacts is Unsupported

The proposed projects would impact aquatic life due to increased sedimentation not just from the stream crossings themselves, but also from the runoff from the significant land disturbance that would occur in the watersheds upstream from the crossings during construction. As mentioned above, construction of the MVP would disturb over 4,100 acres of soils that are classified as having the potential for severe water erosion.[143] Moreover, much of the proposed pipeline route follows very steep slopes, with the MVP crossing 18.5 miles of slopes between 15 and 30 percent grade and 72.6 miles of slopes greater than 30 percent.[144] Through the course of

[141] *Id.*

[142] *Burkey v. Ellis*, 483 F. Supp. 897, 915 (N.D. Ala. 1979).

[143] DEIS at 4-59.

[144] *Id.* at 2-49.

CO105-21 See response to comment CO105-18 regarding the use of BMPs to control sedimentation impacts. Landslides and steep slopes are addressed in section 4.1 of the EIS. See the response to comment IND 70-1 regarding erosion. See the response to comment LA1-4 regarding existing pipelines in mountainous terrain.

CO105-21 cont'd

construction, "clearing and grading would remove trees, shrubs, brush, roots, and large rocks from the construction work area" and heavy machinery would be used to dig a trench to a depth of 5.5 feet to 9 feet for the MVP and 5 feet to 6 feet for the EEP.[145] Such disturbance would undoubtedly lead to increased sedimentation in waterbodies downstream from the disturbed area.[146]

Despite the steep slopes and highly erodible soils that would be traversed by the MVP, FERC concludes that erosion and sedimentation from these areas would not result in significant impacts because the applicants would adhere to their Erosion and Sedimentation Plans.[147] The DEIS does not, however, in any way evaluate the effectiveness of, or even discuss in any detail, the measures included in those plans. Indeed, the plans are not included in the DEIS and it is not clear if those plans have been completed and reviewed by FERC. FERC appears to simply assume that the plans would successfully minimize sedimentation impacts. FERC's conclusion is thus unsupported and, indeed, conflicts with available evidence of the impacts of pipeline construction through areas of steep slopes and highly erodible soils.

Studies show that erosion and sedimentation controls for pipelines have been known to fail under heavy rain events and sedimentation risk is higher under steeper conditions and near bodies of water.[148] There are numerous examples of significant sedimentation impacts occurring

---

[145] DEIS at 2-38, 2-39.

[146] *See, e.g.,* Becker Report at 11-12.

[147] *See, e.g.,* DEIS at 5-2.

[148] *See, e.g.,* Johnson, Gagnolet, Ralls, and Stevens, The Nature Conservancy, *Natural Gas Pipelines* at 7 (2011), available at http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/pennsylvania/ng-pipelines.pdf.

CO105-21 cont'd

during pipeline construction despite the use of industry-standard erosion and sedimentation controls.[149]

A 42-inch diameter pipeline has never been constructed through the steep, rugged, highly erodible terrain of the region of the Appalachian Mountains that would be traversed by the MVP. However, construction of much smaller pipelines in the region has repeatedly resulted in extreme sedimentation impacts. For example, in 2006, during construction of a 20-inch East Tennessee Gas Pipeline in Tazewell and Smyth Counties, Virginia, slopes failed in two independent events in Indian Creek and North Fork Holston River, resulting in a kill of several hundreds of individuals and multiple species of endangered mussels.[150] The worst sediment problems originated not directly at the stream crossings, but high in the watershed where small streams transported sediment to the larger streams. Evidence of the sediment was detected as far as 2 kilometers downstream of the slips. These impacts occurred despite extreme care taken by FERC, USFWS, the Virginia Department of Conservation and Recreation, and the company to ensure that state-of-the-art erosion control measures were in place.[151]

Similarly, a 2014 Columbia Gas of Virginia project to add a 12-inch pipeline adjacent to an existing 6-inch pipeline along Peter's Mountain near a portion of the Jefferson National Forest in Giles County, Virginia, led to extreme sedimentation impacts.[152] This location involves

---

[149] *See, e.g.,* J. Tanfani & C.R. McCoy, *Environmentalists and sportsmen raise alarms over pipelines*, Philadelphia Inquirer (December 12, 2011), available at http://www.philly.com/philly/news/special_packages/inquirer/marcellus-shale/20111212_Environmentalists_and_sportsmen_raise_alarms_over_pipelines.html.

[150] *See* April 10, 2015 Comments of the Scientific and Technical Committee of Preserve Craig, Inc. to the USDA Forest Service, attached as Exhibit E.

[151] *Id.*

[152] *See* Dominion Pipeline Monitoring Coalition, *Case Study - Columbia Gas, Giles County, VA*, *available at* http://pipelineupdate.org/case-study-no-1.

CO105-21 cont'd

similar terrain and is very close to the proposed route of the MVP. Inspection reports by the US Forest Service describe sediment movement that "looked like a lava flow" and note that the inspector had "never seen that much sediment move off site before."[153] Much of the sediment became embedded in a nearby stream.[154] These impacts occurred despite the existence of comprehensive erosion control plans, implementation of Best Management Practices, and weekly inspections by the company to ensure proper implementation.[155] As demonstrated by the photo below showing massive amounts of sediment that has travel beyond the company's installed silt fence and bypassed a diversion channel, standard erosion and sediment control practices are simply not sufficient to protect against damage associated with pipeline construction on the steep slopes of this area.

The same story occurred in Pennsylvania with construction of Tennessee Gas Pipeline's (TGP) 300 Line Project, part of the Susquehenna West Project.[156] In May of 2010, FERC issued an environmental assessment for the 300 Line Project, finding there would be no significant impacts when TGP crossed streams in northeast and north-central Pennsylvania. FERC relied on TGP's plan to follow construction guidelines created by the Corps, USDA, NRCS, and FERC. In addition, FERC imposed its own conditions. However, despite what FERC believed to be adequate measures, TGP's construction violated Pennsylvania Clean Water Law multiple times. The majority of the project's compliance reports contained at least one violation of the project

[153] USFS Inspection Reports of Sept. 5, 2014 and September 15, 2014, *available at* http://pipelineupdate.org/national-forest-pipeline-inspection-reports/.

[154] *Id.*

[155] *Id.*

[156] *See* Comments of Allegheny Defense Project and Damascus Citizens for Sustainability on Susquehenna West Pipeline Environmental Assessment, FERC Docket CP15-148-000, filed April 18, 2016 (Accession No. 20160418-5264) pp. 13-17.

CO105-21 cont'd

plans, but the plan was never enforced.[157] Whether the plan was inadequate in its substance or inadequately enforced, the end result is the same; the pipeline's stream crossings, which FERC believed would cause no significant environmental impact, ended up costing TGP $800,000 in a settlement with the Pennsylvania DEP.[158] The harm to the streams and marine life, which could have been mitigated or avoided with proper procedure, is immeasurable. It is time FERC learn from its previous mistakes and scrutinize an applicant's proposal beyond the lofty assurances therein.

[157] *Id.* at 15-16.

[158] *Id.* at 13.

CO105-21 cont'd

Figure III.B: Sedimentation at Columbia Gas Site near Jefferson National Forest
Source: Dominion Pipeline Monitoring Coalition

Indeed, the portion of Mountain Valley's site specific erosion and sediment control plan that was available for public review does not inspire confidence. Professional Engineer Kirk Bowers reviewed sheets 18.01-18.04 and found that they failed to comply with basic erosion control requirements and lacked the measures that would be needed to limit sedimentation.[159] Even assuming that best management practices were to reduce sedimentation associated with construction by 75 percent, annual sedimentation would nonetheless increase by between 40 to 1,500 percent over baseline levels during construction, depending on slopes and soil erodibility.[160] FERC, however, cannot know the extent to which Mountain Valley's proposed measures would be successful because it has not performed the necessary analysis.

Despite the significant sedimentation impacts that have occurred on projects much smaller than the MVP, FERC concludes that the existence of erosion control plans and use of best management practices will adequately minimize impacts from construction of the larger 42-inch pipeline. The DEIS fails to offer any substantive support for that conclusion, which runs counter to the available evidence. FERC's unreasonable reliance on unproven best management practices to minimize any impacts to aquatic life from increased sedimentation from pipeline construction renders the DEIS deficient and in violation of NEPA.

CO105-22

C. The DEIS Fails to Account for Sedimentation Impacts from Land Cover Change in Sensitive Areas Within Steep and Erodible Segments of the Pipeline Right-Of-Way

[159] *See* Kirk Bowers, *Draft Environmental Impact Statement review comments on behalf of the Virginia Chapter of the Sierra Club* (hereinafter "Bowers Report") at 5–7, attached as Exhibit F.

[160] *See* Downstream Strategies Report.

CO105-22 Sedimentation is addressed in section 4.3 of the EIS.

CO105-22 cont'd

In addition to failing to assess impacts to aquatic life from wet open-cut crossings and unreasonably relying on unproven best management practices, FERC also entirely fails to account for the increase in sedimentation that would result from the conversion of upland forest to herbaceous cover within vulnerable segments of the pipeline right-of-way. Although FERC to some extent evaluates the temporary impacts from in-stream crossings and construction-related clearing of riparian vegetation at the site of crossings, it does not consider the permanent changes in runoff and sedimentation associated with land cover change.

"Fragmented forests have been directly linked to lower water quality and condition (Lee et al. 2009, Shandas and Alberti 2009) and infrastructure development including pipelines and access roads are known to increase fine sedimentation due to reduced vegetation and associated habitat fragmentation (Entrekin et al. 2011, Drohan et al. 2012, Wood et al. 2016)."[161] Consulting firm Downstream Strategies prepared an analysis of the sedimentation impacts associated with construction and with post-construction land use change utilizing the Generalized Watershed Loading Functions – Enhanced (GWLF-E) and Wikiwatershed computer modeling tools.[162] The authors used these models to predict the change in annual sedimentation post-construction that would result from conversion of land cover from forest to the herbaceous cover that would need to be maintained in the permanent pipeline right-of-way. Although the study found that streams in watersheds with low slopes and stable soils would not experience significant, long-term increases in sedimentation, the opposite was true for "high risk" areas, *i.e.*, those with steep slopes and highly erodible soils.[163] In the high risk modeling scenario,

[161] Becker Report at 11.

[162] Downstream Strategies Report at 1.

[163] As explained above, a significant portion of the proposed route of the MVP is characterized by the steep slopes and highly erodible soils that would contribute to such long-term impacts.

CO105-22 cont'd

sedimentation increased by 15 percent due to the permanent land use change associated with keeping the right-of-way clear.[164] Such an increase would threaten aquatic life in streams that are already experiencing stress from other activities such as mining, development, and oil and gas extraction.

Furthermore, that 15 percent figure likely underestimates the long-term increase in sedimentation in steep slope areas. Downstream Strategies' methodology assumes that the right-of-way would be converted to a land cover with equal sediment attenuating properties as "hay/pasture."[165] However, once steep slopes, particularly those with shallow soils, are disturbed, they are unlikely to regain plant cover equivalent to hay/pasture. Despite efforts to revegetate steep, mountainous slopes after construction, slopes between 33% and 50% have a poor chance of revegetating, and slopes over 50% have an improbable chance of revegetating.[166] The MVP would traverse 72.6 miles of slopes greater than 30 percent.[167] In order to satisfy NEPA's mandate that agencies take a "hard look" at the impacts of proposed actions, FERC must analyze the potential for long-term increases in sedimentation associated with the permanent maintenance of the pipeline right-of-way, particularly in sensitive areas with steep slopes and highly erodible soils.

[164] Downstream Strategies Report at 3.
[165] *Id.* at 2
[166] Bowers Report at 3.
[167] DEIS at 2-49.

CO105-23

IV. The DEIS Does Not Adequately Analyze Impacts Associated with Pipeline Construction and Operation of the MVP in Karst Terrain

The proposed route of the MVP traverses significant areas of karst terrain, which presents substantial risks to human and environmental resources.[168] FERC acknowledges that "[k]arst areas are susceptible to a greater range of environmental impact because of the highly developed subterranean network and associated fragile ecosystems. Surface water flowing through karst openings such as swallets has little opportunity to be naturally filtered by sediment as water rapidly flows through karst conduits."[169] Further, as FERC points out, karst features "could present a hazard to the pipeline due to cave or sinkhole collapse."[170] Additionally, "[b]lasting in areas of karst topography can create fractures in the rock, potentially changing groundwater flow, creating the potential for groundwater contamination, and temporarily affecting yield and increasing turbidity in nearby water wells and/or springs."[171]

Despite generally acknowledging these potential impacts, FERC fails to take the required "hard look" at how the MVP could affect and be affected by the significant karst resources along its route. FERC's failures include wrongfully limiting its analysis to only the most visible karst features, unjustifiably minimizing the risks of construction through the karst areas it does acknowledge, and relying on vague, unproven mitigation measures to determine that impacts associated with siting the MVP through karst terrain will not be significant. As a result, FERC vastly underestimates the environmental impacts associated with karst resources.

---

[168] See, generally, Chris Groves, Ph.D., *Karst Landscapes and Aquifers of the Central Appalachian Mountains and Implications for the Proposed Mountain Valley Pipeline* (hereinafter "Groves Report"), attached as Exhibit G.

[169] DEIS at 4-72.

[170] *Id.* at 4-34.

[171] *Id.* at 4-39.

CO105-23 Section 4.1 discusses karst terrain and section 4.3 of the EIS discusses groundwater, springs, and water supplies. See the response to comment IND62-1 regarding Dr. Kastning's report.

CO105-23 cont'd

A. The DEIS Fails to Adequately Identify the Karst Features That Would Be Affected by and Pose Risks to the MVP

The proposed corridor of the MVP passes through a significant area of karst as it crosses the mountainous Valley and Ridge Province in Southern West Virginia and Southwestern Virginia (the Appalachian Fold Belt).[172] In this valley and ridge area, the landscape is formed within heterogeneous, highly folded sedimentary rocks that create the characteristic valleys, where less resistant rock types such as limestone and shale have eroded relatively quickly, and ridges underlain by highly resistant rocks such as sandstone.[173]

FERC relies upon the applicant's desktop review of publicly available data to identify 94 instances of karst features within Summers and Monroe Counties, West Virginia and Giles, Craig, and Montgomery Counties, Virginia.[174] That review is limited to areas within ¼ mile of the MVP Filing Alignment.[175] FERC describes these features as "sinkholes, caves, and caverns."[176] That level of review is far too narrow and fails to account for portions of the karst system beyond mapped caves and the most obvious surface features. Because the DEIS fails to identify and assess impacts to the broader karst system, it does not comply with NEPA.

---

[172] *See* Ernst Kastning, Ph.D., *An Expert Report on Geologic Hazards in the Karst Regions of Virginia and West Virginia: Investigations and Analysis Concerning the Proposed Mountain Valley Gas Pipeline* at 1 (hereinafter "Kastning Report") (Accession No. 20160713-5029); Groves Report at 22.

[173] *See* Groves Report at 4, 22.

[174] DEIS at 4-34, 4-35; Karst Hazards Assessment (Desktop Review and Field Reconnaissance) Prepared for Mountain Valley Pipeline, Attachment DR2 RR2-12 (hereinafter "Karst Hazards Assessment").

[175] Karst Hazards Assessment at 3.

[176] DEIS at 4-34.

CO105-23 cont'd

As Professor Ernst Kastning explains, "Karstic features on the surface can range from the extremely obvious (e.g., large sinkholes, sinking streams, swallets and/or springs), often overlooked features (e.g., small sinkholes or dry valleys), subtle features (e.g., swales), and very small features (e.g., solutional sculpting of rock surfaces such as karren features)."[177] In addition to the more obvious "sinkholes, caves, and caverns" identified by FERC, karst landforms of any size on the surface can sometimes be hidden from the casual observer. "Large, dry valleys and solution valleys can inadvertently go unrecognized as karst – proverbially a 'one can't see the forest for the trees' symptom. . . . Other karstic features are too small to be discovered by aerial photography or illustrated on a topographic map."[178] The end result is that "[i]n areas underlain by soluble rock, the absence of sinkholes on the surface cannot be categorically interpreted as the absence of karst."[179]

Likewise, Professor Chris Groves explains that "explored and mapped caves within a particular area offer only a fragmented and incomplete picture" of the karst landscape.[180] A distinction must be made between mapped caves and the more complete, integrated networks known as "karst flow networks."[181] Cave maps such as those relied upon by FERC in the DEIS show only the extent of passages that can be explored and mapped by humans and do not represent the entirety of the karst flow network. When karst systems are viewed on the environmentally-relevant scale of passages large enough to transmit water and air contaminants,

---

[177] Kastning Report at 12.

[178] *Id.* at 12–13.

[179] *Id.* at 15.

[180] Groves Report at 9.

[181] Id.

CO105-23 cont'd

"separate caves can get connected, and caves that didn't exist at all because the larger explorers couldn't fit into them now come into existence. It is reasonable that at some point in the progression that more and more caves within a given region of a rock body, maybe all at some point, converge to form a single integrated system of interconnected spaces ranging from the relatively large passages shown on cave maps down to fine fractures."[182]

This distinction is important because the contaminants that could potentially be introduced by construction and operation of the MVP, such as sediment, hydrocarbons, and methane, can travel throughout the karst flow network. Thus, any impacts to one area of the karst flow network may be felt broadly throughout the larger network as contaminants travel unimpeded through the small spaces within the bedrock. As the Groves Report explains,

> a significant emphasis in [the DEIS] is on caves, meaning the larger places within the karst aquifers into which human-sized cave mappers can fit. However, water carrying sediment or other contaminants can flow through a wide range of spaces. This includes much smaller spaces than explorable caves, whose locations are not in general measurable. . . . [T]he notion of larger "karst features" being the focus is to some degree, especially anthropomorphic. For this reason indeed, while decisions in the Karst Mitigation Plan are called for to determine whether a karst feature has "connectivity to the subsurface environment and risk for impacting groundwater quality," there are karst areas where the entire landscape—not just sinkholes and swallets —has "connectivity to the subsurface environment and risk for impacting groundwater quality."[183]

Once those contaminants reach the karst flow network, can also travel long distances over relatively short periods . . . where they may emerge at a spring that in some cases may serve as a water supply contaminated by a source that may be miles or tens of miles away."[184] Thus, although there may be no apparent karst surface features, construction may still significantly contaminate the karst network and affecting resources many miles away. By relying primarily on

[182] *Id.*
[183] *Id.* at 25.
[184] *Id.* at 11.

CO105-23 cont'd

mapped caves and more obvious surface features to identify karst resources, limiting the assessment of karst features to within ¼ mile of the pipeline corridor, and limiting assessment of springs/swallets and pre-construction water quality surveys to within 500 feet of the MVP, FERC fails to account for potential significant impacts to the larger karst flow network.

In order to adequately identify the karst resources that could be affected by the MVP, FERC must require "ground truthing" in all areas with soluble bedrock that could contain karst features. As professor Kastning explains,

> [s]ite visits are mandatory to research a potentially karstic area; one cannot rely solely on sinkholes depicted on a topographic map or mapped with aerial photography. This is an especially important point for environmental assessments where karst is a factor of risk (Hubbard, 1984, 1991). Performing ground truth is the only proven way to detect the presence and abundance of small sinkholes.[185]

Likewise, comments submitted by the Cave Conservancy of Virginia emphasize the importance of "rigorous, site-specific evaluation of karst areas within the MVP project footprint before decisions regarding construction are made. This type of evaluation, including methods such as dye tracer studies, subsurface mapping, geophysical studies, and other on-site field investigations is critical to ensuring the safe construction and operation of the pipeline, as well as the protection of water resources and the ecological habitats of the area."[186]

By relying on relying primarily on cave maps and desktop analysis of obvious surface karst features, FERC significantly underestimates the extent of karst landscapes that would be impacted by the MVP. Indeed, numerous members of the public have written comments to FERC identifying karst features within the impact zone of the MVP that are not considered in the

[185] Ernst Kastning, Kastning Response to DEIS: A Critical Analysis of Interpretation in the Draft Environmental Impact Statement Regarding the Proposed Mountain Valley Gas Pipeline at 5 (hereinafter "Kastning Response") (Accession No. 20161212-5032).

[186] Comments submitted by the Cave Conservancy of Virginia to FERC Docket No. CP16-10 on December 22, 2016.

CO105-23 cont'd

DIES.[187] These comments further illustrate the inadequacy of the DEIS's assessments of impacts to and risks posed by karst terrain in the area of the proposed MVP route.

Those inadequacies are not remedied by FERC's request in the DEIS that Mountain Valley collect additional information on karst impacts in certain areas,[188] because the public must have an opportunity to evaluate and comment on that information prior to finalization of the DEIS. Rather, the substantial missing information and ongoing data collection only further demonstrate that the DEIS was prematurely issued and should be revised so that it contains sufficient information for the public to analyze whether FERC has taken the requisite hard look at and adequately minimized the impacts associated with construction through karst areas.

CO105-24

B. The DEIS ignores the serious risks posed by leakage of gas from the MVP into the karst flow network

The DIES's analysis of risks posed by the crossing of karst landscapes does not discuss the potential for methane leakage from the pipeline to contaminate and spread through the karst flow network. There have been, however, numerous documented cases where toxic and/or explosive gasses have contaminated the unsaturated zone of a karst flow system in ways that have created concerns for public health, significant financial impacts, and in at least two cases, injury and death.[189]

The Bureau of Land Management (BLM) conducted a study on the potential for methane leakage from natural gas development activities to contaminate the karst network outside of but

[187] *See, e.g.,* November 27, 2016 Comments of Pamela L. Ferrante at 1-2 (Accession No. 20161128-5050); November 13, 2016 Comments of Pamela L. Ferrante at 1-2 (Accession No. 20161114-5110); November 1, 2016 Comments of Robert K. and Roberta C. Johnson (Accession No. 20161116-5038).

[188] S*ee, e.g.,* DEIS at 4-35, 4-49.

[189] Groves Report at 14–22.

CO105-24 In the very unlikely case of a pipeline leak, natural gas is lighter than air, and would dissipate into the atmosphere and would not contaminate groundwater. These projects include welded steel transportation underground pipelines; and methane leakage from exploration and development activities is not relevant. Read section 4.12 of the EIS.

CO105-24 cont'd

connected to Carlsbad Caverns National Park (CCNP), which was published as part of the Final Dark Canyon Environmental Impact Statement (EIS).[190] BLM's analysis found that

> If natural gas were to flow through an open hole or through casing/cement that either failed or was inadvertently perforated, the gas would follow passage or other routes, such as small fractures or faults, and eventually contaminate a cave or cave system. Some of the effects of such contamination may be irreversible. The risk to humans from the migration of hydrogen sulfide and/or methane could be substantial. Explosions could result when the gas and the oxygen in the cave mix and are ignited by carbide lights often used by cavers.
> . . .
> Cave values would be damaged by explosion. The presence of hydrogen sulfide and/or methane gas, even in small amounts, could change the delicate balance of the cave atmosphere, causing the rapid deterioration of cave formations and the disruption or death cave life.
> …
> Buildup of toxic or combustible fumes in caves and cave entrances from leaking or ruptured pipelines may harm wildlife and cave visitors and, in extreme cases, lead to asphyxiation or rapid ignition in the rare event that the fumes are ignited by visitors.[191]

The DEIS entirely fails to address the substantial ecological and safety risks posed by pipeline leakage into karst systems. Such methane leakage is a common occurrence in underground pipelines.[192] Indeed, the risk of leaks or catastrophic failures are greatly

[190] *Id.* at 15.

[191] *Id.* at 15-17.

[192] EPA Natural Gas Star, Basic Information, http://www.epa.gov/methane/gasstar/basicinformation/index.html; Exhibit H [Scoping comments] at 19; Conservation Law Foundation, *Into Thin Air: How Leaking Natural Gas Infrastructure is Harming Our Environment and Wasting a Valuable Resource*, *available at* http://www.naturalgaswatch.org/wp-content/uploads/2012/11/CSF_fugitive_emissions_report.pdf; House Natural Resources Committee Democratic staff, *America Pays for Gas Leaks: Natural Gas Pipeline Leaks Cost Consumers Billions*, *available at* http://www.clf.org/wp-content/uploads/2013/08/Markey-Gas-Leaks-Report-2.pdf.

CO105-24 cont'd

increased when a pipeline is cited through karst terrain.[193] FERC's failure to address these risks renders the DEIS inadequate.

CO105-25

C. The DEIS Unjustifiably Minimizes the Risks of Construction Through Karst by Relying on Vague, Unproven Mitigation Measures

Despite acknowledging some, but by no means all, of the risks posed by construction through karst terrain, FERC concludes that the impacts will not be significant.[194] In order to reach that conclusion, FERC relies on Mountain Valley's implementation of Best Management Practices in its *Karst Mitigation Plan* and use of a karst specialist to "assist in limiting potential negative impacts on karst features."[195] FERC does not, however, evaluate the effectiveness of those measures but rather assumes that they would be sufficient to minimize impacts to karst. As the Groves and Kastning reports make clear, those measures would not be adequate to avoid the significant impacts associated with construction through karst.

Professor Groves concludes that "Considering the nature of the karst systems of the Appalachian Mountains across which this proposed pipeline would cross, the environmental challenges presented, and the karst-related environmental planning described in the DEIS, karst hazard assessments, and the Karst Mitigation Plan, . . . there are still significant environmental and safety risks if the MVP is constructed."[196] Groves cites numerous flaws with the mitigation plan that demonstrate it will not minimize impacts as FERC asserts. For example,

> the Karst Mitigation Plan (3.9.2.e) recommends that "Hazardous chemicals, fuels, lubricating oils and petroleum products will not be stored within 100 feet of any karst feature." This suggests that if a spill of such hazardous material occurs, that

[193] Groves Report at 9–10; Kastning Report at 28–29; DEIS at 4-34.

[194] DEIS at 4-78–4-79.

[195] *Id.*

[196] Groves Report at 25.

CO105-25 See response to comment CO99-21 regarding Mountain Valley's *Karst Mitigation Plan*.

CO105-25 cont'd

> it will flow overland to the karst feature and then sink there to potentially contaminate groundwater. A characteristic of many karst areas, however, especially sinkhole plains such as occur in SW Virginia and eastern West Virginia, is that surface drainage is almost wholly lacking, and this is because water can infiltrate essentially everywhere. While sinkholes, swallets and related karst features can certainly be preferred routes for water and contaminants to enter the subsurface, they are often not required for water to infiltrate into the karst aquifer.[197]

FERC is thus wrong to rely on Mountain Valley's identification of "karst features" to minimize impacts.

In addition to failing to adequately identify karst areas that pose risks, the mitigation measures that FERC relies on lack sufficient detail to determine their effectiveness. "Mitigation plans dictate stabilization of karst features but little detail on the actual measures are provided in the Karst Mitigation Plan."[198]

Moreover, FERC's assurance that Mountain Valley will be able to not only identify but avoid impacts to karst by minor route adjustments ignores the reality of the karst systems described above. As Kasting explains,

> For the DEIS discussion of hazrds and mitigation to merely dance around and past individual sinkholes and other karst features ignores the interconnectivity of surficial and subsurficial paths of water flow. By analogy, if an army were to encounter a mine field in battle, it would be prudent for it to skirt the area completely rather than tip-toe through it in the hopes that a catastrophic event would not be triggered. A pipeline that zigs and zags through a plain of sinkholes may easily encounter karst features that are subtle of not recognizable from surface recognizance.[199]

Because of the complex, interconnected nature of karst landscapes, both Groves and Kastning that the impacts of construction of a 42-inch buried pipeline through this terrain "cannot simply

---

[197] *Id.*

[198] *Id.* at 26.

[199] Kastning Response at 7.

CO105-25 cont'd

be engineered away. These are often simply poor locations for the construction and operation of such facilities. . . . The only way to wholly avoid these significant potential problems is to avoid well-developed karst areas altogether."[200] FERC's unreasonable reliance on Mountain Valley's proposed mitigation measures to minimize the impacts of construction in karst thus renders the DEIS deficient.

CO105-26

V. The DEIS Fails to Adequately Consider Impacts to Birds and Wildlife That Would Result from Forest Fragmentation

The DEIS acknowledges that impacts to forests associated with clearing and construction of the proposed projects will be significant. Despite that acknowledgement, FERC fails to adequately analyze and disclose the impacts on birds and wildlife, including the impacts associated with forest fragmentation. Additionally, the DEIS wrongly relies on inadequate mitigation measures to conclude that impacts will be sufficiently minimized. As detailed in the studies and comments from Carl Zipper and Douglas Becker, referenced below, those impacts would be substantial. Such deficiencies need to be addressed and a revised analysis must be provided for public comment to comply with the requirements of NEPA.

A. The DEIS Fails to Quantify the Edge Effects Associated with Forest Fragmentation

The DEIS concludes that disturbing the forest vegetation is the most significant impact from construction of the pipeline.[201] The DEIS, however, reaches this conclusion without taking into account the full effects of the deforestation. Most glaringly, the DEIS's measurements of affected acres exclude the full effect of forest edging. Though the DEIS acknowledges the detrimental edge-effect, it fails to take it into consideration when calculating the ultimate impact

[200] Groves report at 25; *see also* Kastning Report at 54–56.

[201] DEIS at 4-150.

CO105-26 Forest fragmentation, including impacts on wildlife, is addressed in section 4.4 and 4.5 of the EIS. Mountain Valley has filed a revised *Migratory Bird Conservation Plan* that addresses forest fragmentation. The final EIS has been updated to quantify impacts to forest edges.

CO105-26 cont'd

of disturbing the forest vegetation. FERC must quantify and disclose these impacts in order to comply with NEPA.

The DEIS estimates that 4,960.6 acres will be affected by pipeline construction (69.9% of Project-specific impacts), and 1,755.7 acres will be permanently converted to grass/scrub shrub in the operation corridor.[202] However, FERC significantly underestimates the affected acreage because it does not calculate acres affected by edge effects. Such quantification is possible using established scientific methods and should have been included in the DEIS. Professor Douglas Becker estimates that over 22,000 acres of core forest would suffer from edge effects as a result on the construction of the MVP.[203] Becker notes that this is a very conservative estimate based on the use of an edge effect distance of 100 meters into the core forest. The DEIS in its analysis of edge effects uses the more standard measure of 300 meters, which would result in a much larger area suffering from edge effects. Even assuming the much more conservative 100-meter figure for edge effects, the DEIS underestimates forest impacts by more than a factor of five.

Assessing the acreage that will be impacted by edge effects is necessary to understand the full scope of adverse effects of pipeline construction. Edge effects deplete the habitat of species most in need of protection due to the dwindling of deep core habitat. The DEIS recognizes that the FWS and FERC must support the conservation intent of their memorandum of understanding by avoiding fragmentation of large, continuous tracts of wildlife habitat.[204] Yet 90% of the core

[202] DEIS, Table 4.4.2-1.

[203] Douglas Becker, "Potential Effects of Forest Fragmentation from the Proposed Mountain Valley Pipeline on Forest Birds," at 16 (Hereinafter "Becker Report").

[204] DEIS at 4-154.

CO105-26 cont'd

forest loss is in the largest forest patches, which undermines the MOU between FERC and FWS.[205]

Once the previously forested construction corridors have been reforested, the total number of forest fragments will be 467. Approximately 27.41% of the fragments will be larger than 250 acres, 22.70% between 25 and 250 acres, 16.70% between 2.5 and 25 acres, and 33.19% smaller than 2.5 acres.[206] Note the large increase in small forest fragments, which are most problematic for area sensitive birds. The impact will be even greater until the temporary construction areas are fully reforested, which may take decades. The DEIS fails to meaningfully address these impacts.

CO105-27

B. The DEIS Fails to Adequately Assess Impacts to Song Birds and Other Forest Wildlife

The DEIS considers briefly the effects of the proposed pipeline on wildlife in the surrounding area. Its analysis is inadequate to satisfy the requirements of NEPA because it ignores the serious effect of the pipeline on the declining passerine populations, does not present certain crucial alternatives for public comment, and dismisses the effect of deforestation and fragmentation on the native wildlife without supporting evidence.

Astonishingly, the DEIS makes no mention of the pipeline's inevitable effect on passerine populations. Sixty-seven species of mature-forest breeding passerines, which are forest-dwelling songbirds, live in the Appalachian Mountains region; 39% of the species are declining due, in part, to habitat loss, habitat degradation, and forest fragmentation.[207] However, the DEIS does not account for the decline of this habitat-sensitive species when considering

[205] Becker Report, 16.

[206] *See, e.g.*, Becker Report at 6, 28.

[207] Becker Report at 3.

CO105-27 Forest interior and birds are discussed in section 4.5 of the EIS. See response to comment IND511-1 regarding bird mitigation plans. Mountain Valley has filed a revised *Migratory Bird Conservation Plan* that addresses forest fragmentation. The final EIS has been updated to quantify impacts to forest edges.

CO105-27 cont'd

forest fragmentation or wildlife. FERC cannot issue a FEIS without first analyzing and seeking comments on the effect of pipeline construction on passerine populations.

Likewise, the DEIS fail to consider the pipeline's effect on bird species as a whole. This is particularly concerning, considering the significant effect the pipelines will have on the native bird population:

> [t]he proposed pipeline will potentially impact at least 64 forest songbird species and 7 raptor species of which 25 species (35%) have declining trends since 1966 in the Appalachian Mountains (Sauer et al. 2014; Table 2). As a conservative estimate, I predict that construction of the pipeline would result in a loss of approximately 30,000 adult birds (15,004-39,980), an annual decrease of approximately 32,000 successful nests (19,607-41,820), and an annual loss of almost 100,000 fledglings (76,894-112,130; Table 3).[208]

Again, the estimation Becker provided is conservative; it is based on a modest 100-meter edge-effect, rather than the standard 300-meter edge effect FERC uses in the DEIS. FERC may not ignore these significant impacts to the already declining song bird populations.

In addition to failing to analyze impacts to songbird populations, FERC also fails to adequately assess impacts to other wildlife populations from deforestation. For example, the proposed route goes through Mill Creek Springs Natural Area Preserve in Montgomery County- a habitat for several rare invertebrate species.[209] Although FERC states that alternatives avoiding this sensitive area are now being considered, those alternatives must be evaluated and that analysis provided to the public for comment a revised DEIS in order to comply with NEPA.[210]

Additionally, the DEIS says temporary construction in forest habitats will restore in 30 or more years. In the meantime, "species that require large tracts of unbroken forest land would

[208] Becker Report at 21.
[209] DEIS 4-158.
[210] *Id.*

CO105-27 cont'd

need to seek suitable habitat elsewhere."[211] This statement unreasonably assumes that core forest habitat is readily available. That conclusion is particularly unsupportable in light of the large number of major greenfield pipelines that FERC is considering authorizing in the region.

Indeed, the DEIS fails to consider the broader impacts of the proposed pipelines, including the cumulative impacts of the natural gas extraction system; well pads, more pipelines, and access roads are all an inevitable result of this project.[212] All of these consequences compound the effects briefly discussed in the DEIS:

> Rapid expansion of shale gas development will increase impacts of forest loss and fragmentation on breeding birds in the Marcellus-Utica region, particularly in previously intact forests, across an even broader landscape and greater scale than the proposed pipeline alone. Other threats to wildlife have been identified including surface, groundwater, and soil contamination; large-scale freshwater consumption (3–5 million gallons per well); increased impervious surfaces; soil erosion; diminished stream flow and higher siltation; localized air, noise, and light pollution; increased human access/presence; changes in biotic communities, and cumulative impacts with other regional development.[213]

FERC must analyze the impacts to birds and other wildlife that rely on the forests that would be fragmented by the MVP in the context of these large-scale impacts that have occurred and are likely to continue to occur.

CO105-28

C. The DEIS Wrongly Concludes That Forest Impacts Will Be Adequately Mitigated

The reforestation measures included in FERC's DEIS are inadequate because they do not include plans for active revegetation of natural plant species. In addition, the proposed action to

CO105-29

revegetate temporary work sites is vague and unsupported by evidence. FERC asserts that "Revegetation of cleared areas would be considered successful when cover and density of

[211] DEIS, 4-161.

[212] Becker Report at 32.

[213] Becker Report at 32-33 (citations omitted).

CO105-28 Actually, the EIS concludes that the projects would have significant impacts on forest; and mitigation measures are not included. See the response to comment FA15-5 regarding forest impacts.

CO105-29 See the response to comment LA14-5. Revegation is discussed in section 4.4 of the EIS.

CO105-29 cont'd | vegetation within the construction right-of-way is similar to the adjacent undisturbed land."[214] In addition, the DEIS calls for "natural regeneration" in the temporary construction work zones.

CO105-30 | However, the plan does not specify the type of vegetation that would "naturally regenerate," and the risks associated with natural revegetation of a cleared area, especially in core forest area, are too great to be unmanaged.[215]

CO105-31 | FERC has not adequately evaluated active reforestation as a mitigation measure for long term impacts associated with deforestation within the pipeline corridor. In order to properly minimize impacts from deforestation, an active revegetation plan is necessary for all cleared areas, including the temporary right of ways. Specifically, forest regeneration will require mitigation of soil conditions left by the construction process.[216] Also, the DEIS proposes seeding

CO105-32 | temporary construction right-of-ways to revegetate. However, certain herbaceous vegetation actually hinders forest regeneration.[217] The DEIS should take this into account and specify what kind of seeding the pipelines plan to undertake and why Mountain Valley should use this kind of seeding. Without this information, FERC cannot determine the long-term impacts of the project.

CO105-33 | Active reforestation with natural species would restore forest cover more rapidly than natural regeneration.[218] Rapid reforestation is important for several reasons. First, rapid reforestation of natural species creates competition for exotic invasive plant species. Exotic

[214] DEIS at 4-144.

[215] Becker Report at 14.

[216] See Carl E. Zipper, Letter to FERC Re: Mountain Valley Pipeline proposal, Dec. 1, 2016, p. 3 (Hereinafter "Zipper Comments").

[217] Zipper Comments at 3.

[218] Zipper Comments at 5.

CO105-30 Early successional forest habitat would result from natural regeneration of tree saplings within the restored temporary right-of-way in formerly forested areas. Section 4.4.2.2 provides a discussion of the special construction techniques, restoration measures, and post-construction monitoring that would be utilized.

CO105-31 See response to comment PS2B2-6 regarding active revegetation of workspaces.

CO105-32 Seed mixes are provided in appendix N of the EIS.

CO105-33 Invasive species are addressed in section 4.4 of the EIS. See also the response to comment IND343-1 regarding invasive species. The FERC would monitor Mountain Valley's invasive species program as part of its third-party monitoring program discussed in section 2.4 of the EIS and in the response to comment IND152-1.

CO105-33 cont'd

invasive species are known to be in the area surrounding the proposed pipeline route[219] and they spread easily through cleared paths because of increased animal travel.[220] Therefore, the likelihood of exotic invasive species proliferating through the cleared right of ways in the proposed area is high. Rapid and effective revegetation with native forest species will mitigate the effect of exotic invasive species better than the hands-off approach called for by the DEIS.

> Given the nature of invasive exotic plant species that are common in the project area, the preference of many invasive exotic plant species for open canopies and forest edges such as are planned for disturbance areas, the capability of invasive exotic plants to disperse over landscapes via mechanisms that include wind, wildlife, and human traffic, and the intense deer browse pressure that occurs in at least one portion of the project area[,] Reliance on natural regeneration cannot ensure restoration of native forest plant communities in all disturbed areas.[221]

In addition to providing competition for exotic invasive plant species, rapid reforestation would reduce the extent of edge effects by protecting non-cleared forest vegetation from the solar, thermal, and humidity conditions at the forest edge.[222] Therefore, active reforestation of natural species is the best way to mitigate the significant environmental effects of deforestation in the temporary construction corridors.

CO105-34

Full reforestation of temporary access roads needs to be considered as a mitigation measure to reduce the impacts to forests. This measure could reduce fragmentation by nearly 1/3.[223] In addition, the DEIS must consider the types of access permissible on the roads remaining after construction, such as the access roads, and present the permissible uses for public

---

[219] *Id.*

[220] *See* DEIS at 4-162.

[221] Zipper Comments at 3; *see also*, Becker Report, 14.

[222] Zipper Comments at 5.

[223] Zipper Comments at 4.

CO105-34 See response to comment PS2B2-6 regarding active revegetation of workspaces.

CO105-34 cont'd

comment. For example, active reforestation in temporary corridors, as opposed to creation of shrub/scrub area, would reduce adverse effects to the habitat of 16 migratory bird species of concern.[224] Reforestation of temporary access roads and work areas would be especially beneficial to the 9 migratory bird species of concern that depend on large expanses of contiguous forest.[225] Without evaluating these potential measures, FERC cannot reasonably conclude that the impacts of the proposed projects have been minimized.

CO105-35

Despite acknowledging the significant impacts that pipeline construction would have on forest, FERC nonetheless concludes that impacts to the wildlife that relies on these forests, including migratory birds, would not be significant. FERC relies in large part on Mountain Valley's Migratory Birds Conservation Plan (MBC Plan) to reach this conclusion. The Plan, however, is insufficient because it does not consider active reforestation, does not sufficiently detail reforestation plans, inappropriately dismisses the likely effects of noise on nearby nests, and overestimates the ability of a two-man team to identify all live nests in the pipeline construction area.

The MBC Plan states that "impacts due to construction to more than two-thirds of the area (1,717.52 hectares) are temporary and the area will recover to forested conditions if left undisturbed."[226] In reality, those acres will be overrun by invasive plant species if left undisturbed. As stated above, the exotic invasive species, known to be in the area, need to be accounted for, and an active revegetation plan needs to be implemented.[227]

[224] Zipper Comments at 4-5.

[225] *Id.*

[226] MBC Plan at 15.

[227] *See generally* Zipper Comments.

CO105-35 See response to comment IND511-1 regarding the *Migratory Bird Conservation Plan*.

CO105-35 cont'd

Sixteen of the 25 migratory bird species in the area rely on productive native forest vegetation.[228] Thus, it is imperative that the MBC Plan include an active reforestation plan for temporary workspaces in forested areas in order to re-establish the productive native forest vegetation that these migratory species rely on. As stated above, an active reforestation plan would include de-compaction of compacted soils, such as those on roadways; replacement of topsoil where possible; active planting of native forest trees; active and effective control of invasive exotic species; protection of native, planted trees from deer browse; active monitoring and follow-up. Instead, the MBC Plan fails to describe the nativity of the plant communities that would develop in temporary workspaces if un-managed after construction and fails to provide for active follow-up. Because FERC has not considered the use of a deliberate and active native reforestation, it cannot reasonably conclude that impacts effect on migratory species will be adequately mitigated.

CO105-36

The MBC Plan claims that, "while a small number of Core Forest Areas are reduced, approximately 92.69 percent of these Core Forest Areas continue to provide large expanses of habitat for even the most area-sensitive forest birds."[229] However, the previous fragmentation analysis in the DEIS where only 27.4% of the resulting forest fragments are greater than 101.17 hectares and 33.19% are less than 10.12 hectares, counters this claim. The effects of forest fragmentation on the various native species is detailed in the Becker Report, page 27-29. The fact that there is a large expanse of core forest should not detract from the overall reduction in the amount of core forest area. To understand the total impact of the proposed project, the analysis should focus on the net change of core forest area and how many birds this might affect.

[228] Zipper Comments at 4.
[229] MBC Plan at 23.

CO105-36 The EIS analyzes impacts to forest, including old growth and core/interior forest in detail in sections 4.4 and 4.5.

CO105-36 cont'd | Without conducting this analysis, FERC cannot reasonably conclude that these impacts have been adequately minimized.

CO105-37 | The MBC Plan also claims that, "while construction noise can be a nuisance to nesting forest bird species, these activities should not result in mortality for individuals nor eggs."[230] This ignores the potential for loss of eggs if, as is likely, the construction noise causes mother birds to abandon active nests. Furthermore, predators and parasites will threaten the mothers and nests more due to clearing of forest vegetation.[231]

CO105-38 | To minimize destruction of migratory bird nests, MVP plans to use one avian survey crew per construction spread in a forested area to search for nests before trees are cleared. Also, [w]hile construction activities are completed, MVP commits to assigning one avian survey crew per construction spread in grassland/herbaceous and [forested and] shrub/scrub habitats to search for nests within the Project LOD ahead of construction crews from April 1 to August 31."[232] This method is minimally helpful to avoid the loss of any bird or nest. A single biologist with a single technician in a small timeframe will miss a majority of the nests if searching for nests of every possible migratory bird. Even highly trained specialists would never find every single nest. A more effective approach would be to use detected nests and parental behaviors, such as nest building or defensive chipping, as an indicator of ongoing nesting activities. Without such measures, FERC cannot reasonably conclude that the MBC Plan will adequately minimize impacts to migratory birds.

[230] MBC Plan at 25.

[231] Becker Report at 5.

[232] MBC Plan at 26.

CO105-37 The EIS analyzes noise impacts on wildlife in sections 4.5 and 4.11.

CO105-38 See response to comment IND511-1 regarding the *Migratory Bird Conservation Plan*.

CO105-38 cont'd

In conclusion, FERC's analysis of the effects of forest fragmentation on birds is inadequate to comply with the hard look required by NEPA. FERC must take the comments provided into consideration and republish a DEIS with proper analysis of the effects of forest fragmentation on migratory birds and passerines.

CO105-39

VI. The DEIS Fails to Adequately Consider the MVP's Effect on Threatened and Endangered Species

In the scoping comments for this NEPA process, Commenters submitted that it was not possible to assess the full range of potential impacts of the Project on listed species, since specific information on those impacts and proposed mitigation was not provided. The DEIS fails to remedy this shortfall, as it provides scant information on the actual impacts to listed species. While Commenters agree that formal consultation is warranted with respect to several species - such as the Roanoke logperch and Indiana and northern long-eared bats – FERC has not provided sufficient information in the DEIS for Commenters to assess the actual impacts to these species. Therefore, FERC has failed to provide the "hard look" required in an EIS, and has thereby precluded the public from having sufficient information on which to base comments on the impacts that the Project will have on these species, which is essential to the NEPA process.

FERC may not gloss over the impacts to listed species simply by declaring that it has (or will sometime in the future) initiated formal consultation with the U.S. Fish and Wildlife Service. This is in direct violation of 40 C.F.R. § 1502.25(a), which states that, "To the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analysis and related surveys and studies required by the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), the National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.), the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), and other environmental review laws and executive orders." The

CO105-39 Threatened, endangered, and other special status species are discussed in section 4.7 of the EIS and in more detail in our BA.

CO105-39 cont'd

concurrency requirement for the NEPA and ESA process is essential for public involvement; since there is no opportunity for public comment on the development of a Biological Assessment or Biological Opinion, it is only through the NEPA process that the public may comment on the impacts to listed species. Furthermore, in order to fully assess the cumulative impacts of the proposal, as NEPA requires, all impacts must be fully vetted in the NEPA documents, and FERC may not undermine that analysis by segmenting the impacts to listed species and ignoring them in the DEIS.

CO105-40

While FERC contends that the Threatened and Endangered Species section of the DEIS "essentially summarizes our BA," this is insufficient to overcome the failure to provide sufficient information on impacts to listed species in the DEIS. Further, the information provided in the DEIS does not even come close to fulfilling the requirements of a BA, which must not only identify the species that may be impacted, but for each species must describe the current habitat conditions and status trends, and how the action may affect those species. The FWS Guidance for the development of BAs further states that this must be supported with documentation that indicates "what, when and how the protected resource will be exposed to and how such individuals or habitats are likely to respond to this exposure." None of this information has been provided in the DEIS. Moreover, if FERC is able to "summarize" its BA, it is entirely unclear why the actual BA was not provided along with the DEIS, as required by 40 C.F.R. § 1502.25(a), so that the public could provide comment.

CO105-41

Commenters further note that the DEIS admits that the process for identifying impacts to imperiled species is not complete. It states that "Mountain Valley must still conduct field surveys for an assortment of federal special status species and/or provide complete reports on the

CO105-40 See the response to comment CO105-39.

CO105-41 See the response to FA11-2 regarding incomplete surveys.

CO105-41 cont'd

surveys that have been conducted."[233] This suggests that FERC has failed to provide complete information on the impacts of the proposal, and therefore has not fulfilled its NEPA requirements. Commenters therefore insist that FERC require Mountain Valley to complete the required field surveys, and then provide a supplemental DEIS along with a complete BA, and reopen the DEIS comment period so that the public may properly participate in analyzing the cumulative environmental impacts of this proposal.

CO105-42

A. Bats

Commenters agree with FERC's conclusion that the Project is likely to adversely affect Indiana and northern long-eared bats, and support the decision to initiate formal consultation on these species. As discussed above, however, the complete lack of analysis of impacts to these species in the DEIS renders it incomplete, and FERC has failed to properly include impacts to these species in its assessment of the cumulative impacts of the proposal. Moreover, it is Commenters position that the proposed Project will jeopardize the continued existence of these species and, therefore, would violate the ESA.[234]

In recent years, populations of North American bats, particularly in the Eastern and Southern U.S., have suffered steep declines. Millions of bat fatalities have been attributed to white-nose Syndrome ("WNS"), a deadly fungal disease first identified in 2006. WNS is a fatal disease affecting hibernating bats that is named for a white fungus that appears on the muzzle and other parts of bats. The disease has spread rapidly across the eastern half of the United States, and is estimated to have killed more than 6 million bats in the Northeast and Canada.[235]

[233] DEIS at 4-191.

[234] 16 U.S.C. § 1536(a)(2).

[235] USFWS, White-nose syndrome: The devastating disease of hibernating bats in North America (May 2016), *available at*

CO105-42 As stated in section 4.7 of the EIS, we have determined that the MVP *is not likely to adversely affect* the gray bat and Virginia big-eared bat and we are requesting formal Section 7 consultation with the FWS for the Indiana bat and the northern long-eared bat as they relate to the MVP.

CO105-42 cont'd

According to the FWS, WNS is the cause of "the most precipitous decline in North American wildlife in our history."[236] Recent studies have estimated an 88% decrease in the total number of hibernating bats – with 98% and 72% declines in hibernating northern long-eared and Indiana bats, respectively[237] – and have concluded that these perilous population declines are exacerbated by the additive nature of both WNS and numerous human-induced environmental stressors.[238]

Indeed, the FWS recently determined that the listing of the northern long-eared bat was warranted, primarily due to the species' catastrophic decline caused by WNS.[239] There is no evidence the impact of the disease will lessen as it continues to spread across the rest of the species' range. The federally-listed Indiana bat has also suffered population declines attributable to the spread of WNS, and the species' range now is nearly entirely coincident with the area affected by WNS. A recent study by U.S. Geological Survey and FWS scientists projected the

---

https://www.whitenosesyndrome.org/sites/default/files/resource/white-nose_fact_sheet_5-2016_2.pdf.

[236] Consensus Statement of the Second WNS Emergency Science Strategy Meeting, Austin, Texas, May 27-28, 2009, *available at* http://www.batcon.org/pdfs/whitenose/ConsensusStatement2009.pdf

[237] Bat Conservation Int'l, Impacts of Shale Gas Development on Bat Populations in the Northeastern United States 7 (June 2012), *available at* http://www.delawareriverkeeper.org/resources/Reports/Impacts_of_Shale_Gas_Development_on_Bats.pdf.

[238] *Id.*

[239] U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Eastern Small-Footed Bat and the Northern Long-Eared Bat as Endangered or Threatened Species; Listing of the Northern Long-Eared Bat as an Endangered Species, 78 Fed. Reg. 61,046 (Oct. 2, 2013) (hereinafter "Northern Long-Eared Bat Proposed Listing").

CO105-42 cont'd

Indiana bat population will fall to just 14% of its pre-WNS numbers range-wide by 2022.[240] A 2013 study determined that WNS threatens the Indiana bat with a high risk of extirpation throughout large parts of its range.[241]

The FWS has assessed the summer habitat needs of both the Indiana bat[242] and the northern long-eared bat.[243] In addition, the Center for Biological Diversity's petition for listing the northern long-eared bat summarized available scientific literature regarding the species' summer habitat needs.[244] While specific geographic location, sex, and reproductive status all appear to influence the selection of habitat by both species, the overarching conclusions of applicable research are that both the Indiana bat and the northern long-eared bat appear moderately to strongly dependent on the availability of larger, older trees and snags for roosting, and on larger patches of relatively undisturbed forest, preferably near bodies of water, for foraging. Large, older trees that are located in areas of forest with lower canopy cover are of

---

[240] Thogmartin, W.E., C.A. Sanders-Reed, J.A. Szymanski, P.C. McKann, L. Pruitt, R.A. King, M.C. Runge, and R.E. Russell. 2013. White-nose syndrome is likely to extirpate the endangered Indiana bat over large parts of its range. Biological Conservation 160: 162-172.

[241] Thogmartin, Wayne E. et al. White-nose syndrome is likely to extirpate the endangered Indiana bat over large parts of its range, Biological Conservation, Vol. 160, pp. 162-172 (April 2013), *available at* http://www.sciencedirect.com/science/article/pii/S0006320713000207.

[242] FWS, Indiana Bat Draft Recovery Plan, First revision (2007), http://www.fws.gov/midwest/Endangered/mammals/inba/inba_drftrecpln16ap07.html; *see also* Luensmann, Peggy S. 2005. *Myotis sodalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), *available at* http://www.fs.fed.us/database/feis/ [2013, December 5].

[243] Pp. 40-43, Northern Long-Eared Bat Proposed Listing.

[244] Center for Biological Diversity, Petition to List the Eastern-Small Footed Bat *Myotis leibii* and Northern Long-Eared Bat *Myotis septentrionalis* as Threatened or Endangered Under the Endangered Species Act (2010), *available at* http://www.biologicaldiversity.org/species/mammals/eastern_small-footed_bat/pdfs/petition-Myotisleibii-Myotisseptentrionalis.pdf

CO105-42 cont'd

particular importance because they serve as the location of Indiana bat maternity colonies. Thus, the removal of trees from forested lands, either by clearcutting or other techniques, and the fragmentation of habitat, whether by logging, road-building, or construction and maintenance of pipeline corridors, creates a real threat to the recovery and survival of these vulnerable species.

The northern long-eared bat, in particular, appears highly sensitive to forest fragmentation and reduction in canopy cover.[245] Given the threat of WNS to northern long-eared bats, the FWS has recognized that "[o]ther sources of mortality could further diminish the species' ability to persist as it experiences ongoing dramatic declines," since WNS has "reduced these populations to the extent that they may be increasingly vulnerable to other stressors that they may have previously had the ability to withstand."[246]

Although concerns about impacts from oil and gas development have focused a great deal on well pads, drill pits, and hazardous fracking fluids as sources of harm, pipelines associated with increased gas production are particularly powerful drivers of habitat harm and fragmentation. Increasingly, as pipelines have proliferated across the eastern U.S., they have become a major environmental concern in their own right.

---

[245] Caceres, M.C., and R. Barclay. 2000. *Myotis septentrionalis*. Mammalian Species 634: 1-4; Caceres, M. C., and M. J. Pybus. 1997. Status of the Northern Long-eared Bat (*Myotis septentrionalis*) in Alberta. Alberta Environmental Protection, Wildlife Management Division, Wildlife Status Report No. 3, Edmonton, AB; Ford, W.M., Menzel, M.A., Rodrigue, J.L., Menzel, J.M., and Johnson, J.B. 2005. Relating bat species presence to simple habitat measures in a central Appalachian forest. Biological Conservation 126: 528-539; Forest Service Manual 2600 – Wildlife, Fish, and Sensitive Plant Habitat Management. Chapter 2670 – Threatened, endangered, and sensitive plants and animals. September 2005; Veilluex, J.P. and S. Reynolds. 2006. Northern Myotis. Pp. A317-A323 in New Hampshire Wildlife Action Plan. *Available at* http://extension.unh.edu/resources/files/Resource001071_Rep1315.pdf

[246] *See* U.S. Fish and Wildlife Service, Northern Long-Eared Bat Interim Conference and Planning Guidance, USFWS Regions 2, 3, 4, 5 & 6 (2014).

CO105-42 cont'd

Fragmentation of forests causes "irreversible alterations to the forest ecosystem" that "result in increased predation, brood parasitism, altered light, wind, and noise intensity, and spread of invasive species."[247] Further, pipeline companies continue to keep pipeline rights-of-way areas cleared, causing sustained forest fragmentation.[248] This results in less forest cover for wildlife habitats, leaving wildlife more vulnerable and with fewer trees for bats to perch upon.[249] For forest-dependent species like the Indiana and northern long-eared bat, the escalation of forest fragmentation and ongoing decline of interior forest area indicates a landscape less and less suited to match the species' needs for suitable roosting sites, security from predators, competitive advantage over other nocturnal insectivores, or appropriate foraging habitat. In parts of the East already intensively developed for shale gas and other petroleum and natural gas products, biologists are increasingly painting a picture of a radically transformed landscape, from one that used to be dominated by continuous, mature forest to one in which forest habitat is segmented into smaller and smaller parcels, and invasive plants and animals become more common as the disturbed habitats that favor them become proportionally more abundant.[250]

---

[247] Abrahams, L.S., Griffin, W.M., and Matthews, H.S. 2015. Assessment of policies to reduce core forest fragmentation from Marcellus shale development in Pennsylvania. Ecological Indicators, Vol. 52, Pp. 153-160. Available at http://www.sciencedirect.com/science/article/pii/S1470160X14005664.

[248] *See* Food & Water Watch. [Fact sheet]. "Fracking Infrastructure Is Carving Up Pennsylvania." December 2013; Messersmith, Dave. Penn State Extension. "Negotiating pipeline rights-of-way in Pennsylvania." Available at http://extension.psu.edu/natural-resources/natural-gas/publications/negotiating-pipeline-rights-of-way-in-pennsylvania. Accessed November 15, 2013.

[249] Food & Water Watch "Fracking Infrastructure Is Carving Up Pennsylvania." (December 2013).

[250] Sadasivam, N. 2013. Gas pipeline boom fragmenting Pennsylvania's forests. Inside Climate News, Dec. 10, 2013; FracTracker Alliance. 2013. U.S. Shale Viewer. Accessed on Dec. 19, 2013. http://maps.fractracker.org/3.0/?appid=ad67d1d697104a4bbc1c238319f03eeb

CO105-42 cont'd

The DEIS fails to include an analysis of the combined impact of physical forest disturbance and WNS on bat populations. The fragmentation effects of the recent boom in shale gas extraction and pipeline construction have been particularly profound on both public and private land, and scientists are deeply concerned about the long-term consequences of such significant landscape alteration on wildlife.[251] Given the unprecedented collapse of WNS-affected bat populations, any other adverse impacts to the species are likely to be significant; they must be assessed in tandem with the proposed activities and must be evaluated as part of FERC's determination.

The DEIS fails to consider the significance of habitat loss and fragmentation from the proposed pipeline construction activities in the context of the ongoing threats from WNS and climate change, as well as private surface development. Moreover, FERC must consider how the

CO105-43

proposed activities could fragment the bats' remaining habitat for spring staging/fall swarming and foraging, disrupt breeding and foraging patterns, and pollute and degrade the bat's drinking water sources.

[251] Slonecker, E.T., Milheim, L.E., Roig-Silva, C.M., and Malizia, A.R. 2013. Landscape consequences of natural gas extraction in Allegheny and Susquehanna Counties, Pennsylvania, 2004-2010. USGS Open-File Report 2013-1025, 34pp. *Available at* http://pubs.usgs.gov/of/2013/1025/OFR2013_1025.pdf; Begos, K. 2013. Northeast gas drilling boom threatens forest wildlife, scientists say. Huffington Post, April 2, 2013. http://www.huffingtonpost.com/2013/04/02/northeast-gas-drilling-boom_n_3000449.html; Sadasivam, N. 2013. Gas pipeline boom fragmenting Pennsylvania's forests. Inside Climate News, Dec. 10, 2013. *Available at* http://insideclimatenews.org/news/20131210/gas-pipeline-boom-fragmenting-pennsylvanias-forests?page=show; Drohan, P. J., M. Brittingham, J. Bishop, and K. Yoder. 2012. Early trends in landcover change and forest fragmentation due to shale-gas development in Pennsylvania: a potential outcome for the Northcentral Appalachians. Environmental Management 49:1061-1075; Drohan, P. J., J. C. Finley, P. Roth, T. M. Schuler, S.L. Stout, M. C. Brittingham, N.C. Johnson. 2012. Oil and Gas Impacts on Forest Ecosystems: findings gleaned from the 2012 Goddard Forum at Penn State University. Environmental Practice 14:394-399.

CO105-43 Mitigation for impacted bat species is included in section 4.7 of the EIS, and in our BA.

CO105-43 cont'd

The only mitigation that is apparent on the DEIS is time restrictions on tree clearing; however, while the Applicants may limit tree removal to the winter months, individuals that could have been expected to emerge from hibernation and then readily tolerate the disappearance of traditional roosting areas that were logged during the hibernation period may now have lower margins of survival. Bats that survive a winter of WNS infection are likely to be in a weakened state that could predispose them to higher rates of mortality or reproductive failure from a variety of other causes. With the additional factor of WNS, the increased energy expenditure compelled by the loss of spring, summer, or fall habitat may be the difference between survival and death.

It is therefore clear that this Project has the potential to jeopardize the continued existence of these vulnerable species. FERC's failure to address this renders the DEIS deficient.

CO105-44

B. Mussels

Commenters are very concerned by FERC's failure to properly analyze the potential impacts to freshwater mussels. The DEIS notes that "in addition to supporting fisheries, crossed waterbodies support other aquatic species including mussels and other invertebrates,"[252] however FERC concludes that, "Based on the absence of federally listed and sensitive mussels and Mountain Valley's commitment to implement its Procedures during the crossings, we have determined that the MVP *is not likely to adversely affect* the clubshell, James spineymussel, and snuffbox."[253]

The presence or absence of listed mussels at the proposed water crossings is not dispositive of the impacts this Project would have on these highly imperiled species. FERC admits that, "Benthic invertebrates and freshwater mussels could also be affected by elevated

[252] DEIS at 4-171 (emphasis added).
[253] DEIS at 4-187.

CO105-44 Potential impacts to aquatic habitats, mussels, and fish are discussed in sections 4.3, 4.6, and 4.7 of the EIS as well as our BA. As stated in section 4.6.2.7 of the EIS, Mountain Valley would reduce impacts on freshwater mussels by relocating mussels in the construction zone in accordance with both West Virginia and Virginia mussel protocol documents.

CO105-44 cont'd

turbidity and suspended sediments," and that "downstream sessile species could be affected,"[254] yet FERC provides no analysis as to the potential for the project to impacts listed mussel species downstream of the water crossing points. As discussed in Section III of these comments, impacts to aquatic resources from sedimentation would be significant.

CO105-45

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. frac fluids), with associated impacts to downstream species and communities. FERC even admits that "[t]he HDD method, proposed by Equitrans only, could result in a release of drilling fluid into a waterbody. An inadvertent release of drilling fluid would result in sedimentation and turbidity, affecting aquatic biota…."[255] Though Equitrans has a *HDD Contingency Plan* to handle failures and frac-outs, no analysis of the potential impacts to downstream mussels is provided.

CO105-46

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."[256] Species in the Project area -- such as the James spinymussel, 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

[254] DEIS at 4-177.

[255] DEIS at 4-177.

[256] 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).

CO105-45 See the response to comment CO105-44.

CO105-46 See the response to comment FA11-15 regarding waterbody crossings and sediment and turbidity modeling.

CO105-46 cont'd

susceptible to water quality impacts, since they are limited to areas of unpolluted water with clean sand and cobble bottom sediments.[257]

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. The absence of mussels at the proposed stream crossing locations does not suggest that downstream mussels would not be impacted by these activities. As set forth above, FERC has failed to consider the downstream impacts of the proposed activities, which have the potential to increase sediment loads not only from stream crossing construction activities, but also from the loss of riparian vegetation, upland exposure of highly erodible soils, and conversion of mature forest to scrub/shrub cover, all of which will lead to increased erosion and sedimentation.

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,[258] thereby reducing interstitial flow rates. Silt and clay particles can clog the gills of mussels,[259] interfere with filter feeding,[260] or affect

[257] USFWS, James Spinymussel Recovery Plan at 3 (1990) (available at http://www.fws.gov/northeast/fisheries/pdf/jamesspinymusselplan.pdf)

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

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

[260] 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).

CO105-46 cont'd

mussels indirectly by reducing the light available for photosynthesis and the production of food items.[261]

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.

FERC's determination that the proposed actions are not likely to affect listed mussel species is therefore entirely without merit. Commenters note that the threshold for triggering the formal consultation requirement is "very low;" indeed, "any possible effect ... triggers formal consultation requirements."[262] The proposed actions pose significant risk of harm to mussels, which must be fully analyzed in the DEIS and through formal ESA consultation.

CO105-47

C. Roanoke Logperch[263]

Commenters support FERC's determination that the Project is likely to adversely affect the Roanoke logperch, and the decision to pursue formal consultation. However, as with the bat species discussed above, the DEIS fails entirely to assess the impacts to this species, and

[261] 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).

[262] *See* 51 Fed. Reg. at 19,926.

[263] In addition to the following comments, Commenters also adopt and incorporate by reference the analysis of impacts to the Roanoke Logperch submitted to FERC Dockets No. CP16-10 and CP16-13 by Steven Powers on Dec. 20, 2016 (Accession No. 20161220-5120).

CO105-47 The Roanoke logperch is addressed in section 4.7 of the EIS and in more detail in our BA. All waterbodies would be crossed via dry crossing methods, which would limit impacts, particularly for turbidity and sedimentation.

CO105-47 cont'd

provides insufficient information on which to provide comments. FERC has therefore not fulfilled its NEPA obligations to take a hard look at the impacts, and to provide an opportunity for public participation.

The FWS Recovery Plan for Roanoke logperch specifically identifies a need to "reduce erosion and excessive stream sedimentation. Highest priority should be placed on reducing the quantity of silt entering the North Fork Roanoke." However, the MVP would cross the Roanoke River and tributaries 35 times with open cut crossing methods and will denude 75 linear feet of stream bank on each side of these streams during construction. After construction, 50 feet on each bank will be permanently maintained as grassy and/or shrub vegetation. This will equate to 3,500 feet of riparian forest permanently eliminated from the upper Roanoke River drainage. During construction, an additional 1750 feet of stream bank will be denuded. The MVP will also parallel tributaries to the Roanoke River for approximately another 12,000 feet in narrow valleys with varying impacts on the riparian vegetation of these tributaries. The DEIS identifies slopes of up to 60% grade that will be denuded during construction and maintained as right-of-way indefinitely. As explained above, sediment loads are therefore certain to increase dramatically in runoff from the right of way. Elimination of riparian buffers along the MVP route will further reduce the already insufficient riparian filtration of sediments increasing sediment loads in the Roanoke River.

The lack of any meaningful discussion of the impacts to Roanoke logperch from this sedimentation and the potential means of mitigating those impacts renders the DEIS incomplete. It remains unclear how the Project proponents will avoid such impacts, and what that might mean for the overall impacts of the project on the environment. For example, it may be that alternative routes or stream crossing methods are necessary to mitigate impacts, yet since the

CO105-47 cont'd

DEIS does not discuss these matters, there is no opportunity to provide comment. FERC must supplement the DEIS with a full discussion of the impacts to this species, and provide an opportunity for meaningful public participation.

CO105-48

D. Big Sandy Crayfish

In Commenters scoping comments, it was noted that the Big Sandy crayfish (listed as Threatened on May 9, 2016) is found within waters that the Project would affect. Commenters further noted that 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 and 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, however, makes no mention of this species in the DEIS. The complete failure to even consider impacts to this species renders the DEIS incomplete and violates Section 7 of the ESA.

CO105-49

VII. The DEIS Fails to Consider Significant Adverse Socioeconomic Impacts, Including Disproportionate Impacts to the Elderly

Comprehensive comments on FERC's failure to adequately address the socioeconomic impacts of the MVP were submitted to Dockets No. CP16-10 and CP16-13 on behalf of the Virginia Chapter of the Sierra Club by Spencer Phillips, Ph.D., of Key-Log Economics on December 20, 2016. Those comments are attached as Exhibit L and are hereby incorporated by reference. Commenters likewise attach as Exhibit M and fully incorporate by reference the report Economic Costs of the Mountain Valley Pipeline: Effects on Property Value, Ecosystem

CO105-48 Scientific evidence indicates that the Big Sandy crayfish once occurred in streams throughout the upper Big Sandy River basin in Kentucky, Virginia and West Virginia. However, currently the FWS identifies the Big Sandy crayfish as known to be found in six isolated populations across Floyd and Pike counties, Kentucky; Buchanan, Dickenson, and Wise counties, Virginia; and McDowell and Mingo counties, West Virginia. None of these counties are crossed by the MVP.

CO105-49 Socioeconomics impacts and our analysis of environmental justice impacts are discussed in section 4.9 of the EIS. This analysis indicates which counties along the pipeline route contain concentrations of vulnerable populations, including the elderly. See the response to comment CO100.

CO105-49 cont'd

Services, and economic Development in Virginia and West Virginia, also prepared by Key-Log Economics and submitted on behalf as the Virginia Chapter of the Sierra Club on May 30, 2016.

The Key-Log reports demonstrate that the DEIS's assessment of socioeconomics is flawed because, among other things, FERC fails to critically evaluate applicant-provided assessments of potential economic benefit when those assessments use flawed research methods, apply the methods inappropriately, and base estimates on unrealistic assumptions. FERC also fails to critically evaluate flawed research into gas-industry-sponsored and/or promoted research, which concludes, falsely, that pipelines do not diminish property value. FERC fails to consider external costs due to lost ecosystem service value, carbon and other greenhouse gas emissions, and impacts on regional recreation, tourism, and other amenity-dependent economic development. Finally, FERC unreasonably dismisses independent research into the likely economic impacts of the proposed Mountain Valley Pipeline. The Key-Log analyses undermine FERC's conclusion that the proposed projects would not have a significant adverse effect on the socioeconomic conditions of the project area.

CO105-50

The adverse socioeconomic impacts outlined in the Key-Log reports would fall disproportionately on elderly populations along the pipeline route. As FERC acknowledges, "Nine of the eleven affected counties in West Virginia and five of the six counties in Virginia have more elderly than the state average. Only Montgomery County, Virginia has fewer elderly than the Commonwealth average. The census block data revealed that people over 65 years old were over-represented in all the affected blocks in comparison to the county averages." Because FERC has wrongly concluded that adverse socioeconomic impacts would not be significant, the DEIS fails to consider to consider the disproportionate effects of those impacts on elderly populations along the pipeline route. The DEIS must be revised to account

CO105-50 See the response to comment CO105-49.

CO105-50 cont'd

for those impacts and include full consideration of mitigation for disparate negative effects to the elderly.

CO105-51

VIII. The DEIS Fails to Take a Adequately Assess Greenhouse Gas Emissions and Climate Change Impacts[264]

The DEIS does not adequately evaluate the potential impacts of, alternatives to, and mitigation measures for the proposed projects on Greenhouse Gas (GHG) emissions and the impacts of climate change. As discussed in detail below, the DEIS must be revised to properly evaluate the lifecycle GHG emissions of the MVP project, including:

- Using the most recent values for methane global warming potential (GWP);
- Disclosing methodologies used to calculate GHG emissions;
- Quantifying projected upstream and downstream direct and indirect GHG emissions where possible and conducting a strong qualitative assessment if quantitative analysis may not be warranted; and
- Fully analyzing all of the direct, indirect, and cumulative GHG emissions resulting from the MVP project and using this analysis to compare alternatives and develop mitigation measures to address such emissions;
- Assessing the impacts of the quantified direct, indirect, and cumulative GHG emissions resulting from the full lifecycle of the MVP and EEP projects.

A. FERC Utilizes an Outdated Methane GWP in the MVP DEIS

The MVP DEIS uses an outdated global warming potential (GWP) value for methane. The authors state that "the 100-year GWP of...CH_4 is 25."[265] This is the 100-year methane (CH_4) GWP from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report

[264] In additional to the following comments, Commenters also adopt and incorporate by reference the comments filed to FERC Docket Nos. CP16-10 and CP16-13 by oil Change International on December 22, 2016.
[265] DEIS at 4-390.

CO105-51 GHG emissions are discussed in section 4.11 and 4.13 of the EIS. Climate change is also discussed in section 4.13.

CO105-51 cont'd

(AR4),[266] but the IPCC has since released a newer version, the Fifth Assessment Report (AR5).[267] Methane GWPs were updated in AR5, as shown in the table below.

Table 8.7 | GWP and GTP with and without inclusion of climate–carbon feedbacks (cc fb) in response to emissions of the indicated non-CO_2 gases (climate-carbon feedbacks in response to the reference gas CO_2 are always included).

	Lifetime (years)		GWP_{20}	GWP_{100}	GTP_{20}	GTP_{100}
CH_4[b]	12.4[a]	No cc fb	84	28	67	4
		With cc fb	86	34	70	11
HFC-134a	13.4	No cc fb	3710	1300	3050	201
		With cc fb	3790	1550	3170	530
CFC-11	45.0	No cc fb	6900	4660	6890	2340
		With cc fb	7020	5350	7080	3490
N_2O	121.0[a]	No cc fb	264	265	277	234
		With cc fb	268	298	284	297
CF_4	50,000.0	No cc fb	4880	6630	5270	8040
		With cc fb	4950	7350	5400	9560

Notes:
Uncertainties related to the climate–carbon feedback are large, comparable in magnitude to the strength of the feedback for a single gas.
[a] Perturbation lifetime is used in the calculation of metrics.
[b] These values do not include CO_2 from methane oxidation. Values for fossil methane are higher by 1 and 2 for the 20 and 100 year metrics, respectively (Table 8.A.1).

Figure VII.A: Table 8.7 from the IPCC Fifth Assessment Report[268]

Using the most up-to-date-science, the correct 100-year GWP for fossil methane with carbon climate feedback is 36.[269] The DEIS must be updated to use the most current value for methane GWP.

GHG emissions should also be calculated using the 20-year GWP of 87. FERC should analyze both because methane has greater radiative forcing, but a shorter atmospheric lifetime,

---

[266] Intergovernmental Panel on Climate Change (hereafter referred to as IPCC) (2007), Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (S. Solomon, et al. eds., Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA) available at: https://www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html.

[267] IPCC (2013). Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change 1535 pp (T.F. Stocker, et al. eds., Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA) available at: http://www.ipcc.ch/report/ar5/wg1/.

[268] *Id.* at 714.

[269] As shown in the table, the 100-year GWP for methane with carbon climate feedback is 34, and as stated in footnote b of the table, the value is higher by 2 for fossil methane due to CO_2 from methane oxidation.

CO105-51 cont'd

than carbon dioxide.[270] Thus, relative to carbon dioxide, methane has much greater climate impacts in the near term than in the long term. A short-term measure of climate impacts is most effective when considering policies that can avoid significant warming within the time horizon of the United States' international commitment to reduce GHG emissions or, independently, the time horizon within which swift action must be taken to avoid catastrophic impacts of climate change.

CO105-52

B. FERC Fails to Adequately Assess the Emissions and Impacts Resulting from the MVP Project

As acknowledged in the DEIS, on August 1, 2016, the White House Council on Environmental Quality (CEQ) issued its Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews, which outlines the analyses and documentation of GHG emissions and climate change impacts that agencies should include to facilitate compliance with existing NEPA requirements.[271] FERC states in the MVP DEIS that "[a]s recommended in this new guidance, to the extent practicable, the FERC staff has presented the direct and indirect GHG emissions associated with construction and operation of the projects and the potential

[270] Gunnar Nyhre & Drew Shindell et al., *Antropogenic and Natural Radiative Forcing in* IPCC, Climate Change 2013: The Physical Science Basis, Contribution of Working Group 1 to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (T.F. Stocker et al., eds., 2013), *available at* http://www.climatechange2013.org/images/report/WG1AR5_Chapter08_FINAL.pdf.

[271] The White House Council on Environmental Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (2016) (hereinafter, "CEQ final guidance"), *available at* https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf.

CO105-52 See the response to comment IND313-3 regarding emissions.

CO105-52 cont'd

impacts of GHG emissions in relation to climate change."[272] However, FERC's GHG analysis in the DEIS falls short of the requirements of NEPA as explained in the CEQ final guidance.

FERC summarily concludes in the DEIS that "[c]urrently, there is no standard methodology to determine how the proposed projects' relatively small incremental contribution to GHGs would translate into physical effects of the global environment. The GHG emissions from the construction and operation of the MVP and the EEP would be negligible compared to the global GHG emission inventory."[273]

However, the CEQ final guidance, which, again, addresses compliance with existing NEPA obligation, explicitly states that this purported reasoning – that a particular project has a small contribution to emissions relative to global emissions – is not an appropriate excuse to avoid fully assessing the GHG impacts of a project, as follows:

> Climate change results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale. CEQ recognizes that the totality of climate change impacts is not attributable to any single action, but are exacerbated by a series of actions including actions taken pursuant to decisions of the Federal Government. Therefore, a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact.[274]

[272] DEIS at 4-516.

[273] *Id.*

[274] CEQ final guidance at 10-11.

CO105-52 cont'd

The CEQ final guidance also lists various appropriate methodologies for analyzing the greenhouse gas emissions of a project, stating that "[q]uantification tools are widely available, and are already in broad use in the Federal and private sectors, by state and local governments, and globally."[275] In fact, CEQ provides a compilation of GHG accounting tools, methodologies, and reports.[276]

Additionally, even if "no standard methodology" is available, as FERC claims, the CEQ final guidance states that this is not a valid excuse for failing to assess impacts and that, at a minimum, a qualitative analysis must be performed. It states as follows:

> When an agency determines that quantifying GHG emissions would not be warranted because tools, methodologies, or data inputs are not reasonably available, the agency should provide a qualitative analysis and its rationale for determining that the quantitative analysis is not warranted.[277]

The CEQ final guidance also states that agencies should quantify a proposed agency action's projected direct *and indirect* GHG emissions. The final guidance explains how the scope of the proposed action should be considered:

> In order to assess effects, agencies should take account of the proposed action – including "connected" actions – subject to reasonable limits based on feasibility and practicality. (Actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements; (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously, or; (iii) Are interdependent parts of a larger action and depend on the larger action for their justification). Activities that have a reasonably close causal relationship to the Federal action, such as those that may occur as a predicate for a proposed agency action or as a consequence of a proposed agency action, should be accounted for in the NEPA analysis.[278]

[275] *Id.* at 12.

[276] *See* Executive Office of the President of the U.S., Greenhouse Gas Accounting Tools (last visited December 20, 2016), https://ceq.doe.gov/current_developments/GHG-accounting-tools.html.

[277] CEQ final guidance at 13.

[278] *Id.*

CO105-52 cont'd

In the MVP DEIS, FERC fails to follow the requirements of NEPA as explained in the directives of the CEQ final guidance. FERC states that "induced or additional natural gas production is not a 'reasonably foreseeable' indirect effect resulting from the proposed MVP and the EEP, and this topic need not be addressed in this EIS," and that "the environmental effects resulting from natural gas production are not linked to or caused by a proposed pipeline project."[279] This reasoning directly contradicts the requirements of NEPA, given that, as explained in great detail in Section IX of these comments, producing, processing, and distributing natural gas are clearly actions that "occur as a predicate for a proposed agency action or as a consequence of a proposed agency action," and therefore must be accounted for in the NEPA analysis. In fact, the CEQ final guidance provides an example of the types of impacts that should be considered specifically for resource extraction projects:

> For example, NEPA reviews for proposed resource extraction and development projects typically include the reasonably foreseeable effects of various phases in the process, such as clearing land for the project, building access roads, extraction, transport, refining, processing, using the resource, disassembly, disposal, and reclamation.[280]

Here, FERC only includes estimates of GHG emissions from (1) pipeline construction, (2) compressor stations, and (3) "Total annual emissions." FERC fails to provide reasoning or methodology for its GHG emissions estimates for the MVP pipeline construction, compressor stations, and total annual emissions, making it impossible for the public to independently evaluate the adequacy of these calculations. "Total annual emissions" for the MVP is estimated

[279] DEIS at 1-22 – 1-23.

[280] CEQ final guidance at 14.

CO105-52 cont'd

as 40 million tons per year (TPY) carbon dioxide equivalents (CO_2-eq)[281], and the DEIS states that this is "based on the total capacity for each project."[282] Although FERC failed to provide the reasoning or methodology for this calculation, it appears that this number may represent an attempt to quantify the CO_2 emissions[283] that would result from combusting[284] the total yearly capacity of the MVP, which is listed as 2 billion cubic feet per day (Bcf/d).[285] If this is the methodology that FERC used to calculate the total annual emissions, this analysis omits a significant number of potential emissions sources. The direct emissions sources that FERC should have considered in the MVP DEIS include but are not limited to CH_4 and CO_2 emissions from

- Pipeline leaks;
- Meter and Regulation (M&R) Stations;
- Dehydrator vents;
- Pneumatic devices; and
- Malfunctions and upsets, e.g. blowdowns/venting.

---

[281] As stated in the MVP DEIS, "[e]missions of GHGs are typically estimated as carbon dioxide equivalents (CO_2-eq), where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of the heating potential of CO_2 over a specific timeframe, or its global warming potential (GWP)." The MVP DEIS lists emissions as "CO TPY" but it is assumed that this is a typo. However, we request that this be clarified. The MVP DEIS does not clarify whether this measure is short tons or metric tons.

[282] DEIS at 1-22 – 1-23.

[283] Again, Commenters cannot determine what methodology was used to calculate annual emission because no such methodology was included in the DEIS.

[284] The MVP DEIS also fails to disclose the end-use of the gas, which has implications for GHG emissions (i.e. combustion vs. non-combustion uses).

[285] 2,000,000 Mcf/d x 365 days x 0.054717 metric tons CO_2/Mcf = 39,943,147 tons CO_2 (performing the calculation may not return the exact result shown due to rounding).

CO105-52 cont'd

Indirect emissions sources that FERC should have included in the MVP DEIS – such as from the wells supplying the gas to equipment and processes used to prepare the gas for transport and deliver it to customers – include but are not limited to CH_4 and CO_2 emissions from

- Drilling;
- Completion, including hydraulic fracturing;
- Wells;
- Wellsite equipment, e.g. heaters, separators, dehydrators, etc.;
- Gathering and boosting stations;
- Pipeline leaks;
- Pneumatic devices;
- Tanks;
- Malfunctions and upsets;
- Processing plants; and
- Distribution pipeline and M&R station leaks.

As justification for not including these upstream and downstream activities that can cause indirect impacts, FERC states in the DEIS that "[w]hile we know generally that natural gas is produced in the Appalachian Basin, there is no reasonable way to determine the exact wells providing gas transported in the MVP and the EEP pipelines, nor is there a reasonable way to identify the well-specific exploration and production methods used to obtain those gas supplies."[286]

However, it is not necessary to know the exact locations of all of the wells that will supply gas to the pipelines, or the methods used to obtain that gas, in order to analyze the potential impacts. FERC supplies the total capacity of the pipelines in the MVP DEIS. The region from which gas will be supplied can be estimated based on the location of the pipeline. Average production rates and production methods from wells in that potential supply region can

[286] DEIS at 1-22.

CO105-52 cont'd

be obtained from state databases,[287] and can then be used to estimate the number of wells and the type of equipment and production methods necessary to supply the full pipeline capacity. Information can also be requested from producers and marketers who have contracts to supply gas or have expressed interest in supplying gas to the pipeline.[288] FERC itself acknowledges in the DEIS that such producers should already be known.[289] The results of this analysis can and should have been used to analyze the potential GHG impacts and to develop alternatives and mitigation strategies to offset the emissions.

CO105-53

C. FERC's Proposed Mitigation to Offset the GHG Emissions is Inadequate

The mitigation proposed for the limited GHG emissions sources that FERC analyzed in the DEIS (construction, operation of compressors, and "total yearly emissions") is insufficient. Aside from a statement that "[a]dhering to good operating and maintenance practices would help minimize fugitive GHG and VOC leaks," and providing a list of "feasible mitigation measures, based on review of EPA's voluntary Natural Gas Star program for potential emission reduction measures," the DEIS does not contain any detailed or specific mitigation plans to reduce the lifecycle GHG emissions from the MVP project.

---

[287] *See* The Pennsylvania Department of Environmental Protection, Office of Oil and Gas Management Oil & Gas Reporting Website, *available at:* <https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Welcome.aspx>

[288] Indeed, as explained in Section I, significant information is available concerning the specific locations of the gas holdings of the drilling companies and their affiliates who have contracted to ship gas on the MVP.

[289] DEIS at 1-22. In its discussion of considering impacts from additional drilling, FERC suggests that gas supplies will already be identified before pipeline development begins, stating, "…once production begins in an area, shippers or end users will support the development of a pipeline to move the natural gas to markets."

CO105-53

Section 4.11 outlines the air impacts from direct and indirect emissions (including GHG emissions) related to the MVP and EEP (considered interrelated and connected actions), and outlines applicable mitigation measures for both construction and operations. Section 4.13 lists the cumulative impacts of as a result of other past, present, and reasonably foreseeable future actions. In section 1.3.3 of the EIS we discuss out-of-scope issues, such as upstream and downstream emission, and explain why it is impractical to include a lifecycle analysis in the EIS.

CO105-53 cont'd

A full suite of mitigation measures should have been fully analyzed to determine the ultimate impact of the project. FERC must therefore revise the DEIS to include specific actions that will be taken to reduce or prevent GHG emissions and develop detailed plans for carrying out those actions, including proposed timelines, and the ultimate impacts. As stated above, the DEIS must also consider a much broader range of direct, indirect, and cumulative impacts resulting from the MVP project to fully comply with NEPA, and it must use this information to develop alternatives and implement mitigation strategies for those impacts.

CO105-54

D. FERC Failed to Fully Evaluate Lifecycle GHG Emissions

More broadly, FERC must analyze the possibility that additional natural gas infrastructure will lock-in fossil fuel use for decades to come and discourage or prevent the construction of carbon-free energy sources, which has significant implications for the climate. Because the construction and operation of new interstate natural gas infrastructure approved by FERC ultimately contributes to, or facilitates, increased lifecycle GHG emissions into the atmosphere, FERC must fully evaluate these impacts and to compare alternatives and develop mitigation measures to address such emissions.[290] FERC's duty under NEPA to analyze the lifecycle GHG emissions and the climate change implications of such emissions is required by NEPA, and is supported recent case law interpreting NEPA in the context of climate change and CEQ's recently issued final guidance.[291]

CO105-55

E. FERC Failed to meaningfully evaluate the impacts of GHG emissions

[290] Katherine Lee, CEQ's Draft Guidance on NEPA Climate Analyses: Potential Impacts on Climate Litigation, 45 Envtl. L. Rep. News & Analysis 10925 (2015).

[291] See generally CEQ final guidance; see, e.g., *High Country Conservation Advocates v. United States Forest Service*, 52 F.Supp.3d 1174 (D.Colo. 2014); *Ctr. for Biological Diversity v. Nat'l Hwy. Traffic Safety Admin.*, 538 F.3d 1172, 1216 (9th Cir. 2008) (cumulative impacts analysis inadequate where agency failed to "discuss the *actual* environmental effects resulting from [greenhouse gas] emissions" (emphasis in original)).

CO105-54 Section 4.13.2.7 has been revised to clarify the estimated total GHG emissions from end use of the natural gas. As stated in section 4.13.1, the Commission's practice is to conduct an environmental review for each proposed project or a number of projects that are interrelated or connected. Actions are 'connected' if they: trigger other actions that may require EISs, will not proceed unless other actions are taken, or are interdependent parts of a larger action (depending on the larger action for their justification)[40 CFR 1508.25(a)(1)]. NEPA does not require speculative analyses that will not meaningfully inform the decision-making process. If we were able to identify a sufficient connection between the proposed Projects and specific upstream development (or downstream end-use), it would be difficult if not impossible to meaningfully consider these impacts as any emission estimates would be based primarily on broad or conflicting assumptions. As such, lifecycle emissions are not addressed in the EIS.

CO105-55 See the response to comment CO105-54.

CO105-55 cont'd

Another major flaw in FERC's climate change analysis is FERC's comparison of the total annual GHG emissions of the MVP Project to "the global GHG emission inventory."[292] This comparison serves only to minimize the MVP Project's GHG emissions and does not provide any meaningful information.[293] EPA recently criticized FERC for comparing the estimated emissions of another major interstate gas pipeline, the Leach Xpress Project, "to state GHG emission levels."[294] EPA explained that "[c]omparing one project's direct and indirect emissions to aggregated totals is not an appropriate way to consider the impact of emissions" and is inconsistent with the CEQ GHG Guidance's explanation of existing NEPA requirements.[295] In order to assess those impacts, FRC should have utilized available tools such as the "social cost of carbon," developed by EPA and other federal agencies.[296]. Because FERC failed to in any way analyze the impacts of the GHG emissions associated with the proposed projects, the DEIS does not satisfy NEPA.

CO105-56

IX. The DEIS Fails to Consider the Indirect Impacts of the Reasonably Foreseeable Shale Gas Drilling That Would Be Induced by the MVP

In analyzing the potential impacts of its approval of the MVP, FERC must consider the indirect effects of shale gas development. Indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."[297] "Indirect effects are defined broadly, to 'include growth inducing effects and other effects related to induced

[292] DEIS at 4-516.
[293] *Id.* (noting that GHG emissions from MVP Project would be "negligible" compared to the global GHG inventory).
[294] EPA, *Comments on the Leach Xpress Pipeline DEIS*, at 7 (June 6, 2016) (Docket No. CP15-514-000, Accession No. 20160613-5177).
[295] *Id.*
[296] *See* EPA, The Social Cost of Carbon, https://www.epa.gov/climatechange/social-cost-carbon.
[297] 40 C.F.R. § 1508.8(b).

CO105-56 See the response to comment IND241-1 regarding induced development.

CO105-56 cont'd

changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.'"[298]

For several years, however, FERC has categorically refused to consider induced gas development as an indirect effect of pipeline projects such as MVP. FERC's argument is usually two-fold. First, FERC claims that gas drilling and pipeline projects are not "sufficiently causally related" to warrant a detailed analysis.[299] Second, FERC claims that even if gas drilling and pipeline projects are "sufficiently causally related," the potential environmental impacts of the gas development are not "reasonably foreseeable" as contemplated by CEQ's NEPA regulations.[300]

The DEIS continues this head-in-the-sand approach, failing to consider at all the indirect effects of shale gas development. FERC claims that "it is not likely that [MVP] would lead to additional drilling and production" of natural gas.[301] "In fact," FERC continues, "the opposite causal relationship is more likely, i.e., once production begins in an area, shippers or end users will support the development of a pipeline to move the natural gas to markets."[302]

FERC's certificate approvals could plausibly induce new natural gas production since new pipelines will be made available to transport fracked gas. Therefore, it seems reasonable for FERC to conduct NEPA analyses of the upstream development that would likely occur due to its certificate approvals. Arguments have been made that current levels of natural gas production are

---

[298] *Natural Res. Def. Council v. U.S. Army Corps of Eng'rs*, 339 F. Supp. 2d 386, 404 (S.D.N.Y. 2005) (quoting 40 C.F.R. § 1508.8(b)).

[299] *See e.g., Nat'l Fuel Gas Supply Corp.*, 150 FERC ¶ 61,162, at P 44 (2015).

[300] *Id.*

[301] DEIS at 1-22.

[302] *Id.*

CO105-56 cont'd

adequate to supply any new natural gas infrastructure,[303] and so the construction of new pipelines does not induce new natural gas production. However, it is unlikely that current production would be sufficient to supply natural gas for the life of a pipeline, which could be up to fifty years,[304] meaning that new production could be induced to continually supply a pipeline throughout its lifespan.[305] Therefore, the indirect effects of FERC's certificate approvals, including induced production must be included in its NEPA analysis of the MVP project.

CO105-57

A. There is a Clear Causal Connection Between the Proposed MVP and Shale Gas Development

Courts have said that an agency must consider something as an indirect effect if the agency action and the effect are "two links of a single chain."[306] It cannot be disputed that gas development and infrastructure that transports that gas are "two links of a single chain." The gas industry certainly considers them to be so; for example, in a 2014 report, the Interstate Natural Gas Association of America ("INGAA") stated that

> midstream infrastructure development is crucial for efficient delivery of growing supplies to markets. Sufficient infrastructure goes hand in hand with well-functioning markets. *Insufficient infrastructure can constrain market growth* and strand supplies. . . . New infrastructure will be required to move hydrocarbons from regions where production is expected to grow to locations where the hydrocarbons are used. Not all areas will require significant new pipeline infrastructure, but many areas (even those that have a large amount of existing pipeline capacity) may require investment in new capacity to connect new supplies to markets. In analogous cases to date, oil and gas producers and

[303] Opening Brief of Petitioners Catskill Mountainkeeper, Inc., et al. at 22-23, *Catskill Mountainkeeper, Inc., et al. v. FERC*, No. 16-345-L (2d Cir. July 12, 2016).
[304] Interstate Natural Gas Association of America, *The Interstate Natural Gas Transmission System: Scale, Physical Complexity and Business Model, Executive Summary* (2010), http://www.ingaa.org/file.aspx?id=10751.
[305] Roger Howard, *Is the Fracking Boom a Bubble?* Newsweek, July 11, 2014, http://www.newsweek.com/2014/07/18/how-long-will-americas-shale-gas-boom-last-260823.html; *see also* IEEFA Study, *supra* note 50 at 11 (finding that the pipeline capacity being proposed in the Atlantic Coast and Mountain Valley pipelines exceeds the amount of natural gas likely to be produced from the Marcellus and Utica formations over the lifetime of the pipelines).
[306] *Sylvester v. U.S. Army Corps of Eng'rs*, 884 F.2d 394, 400 (9th Cir. 1989).

CO105-57 See section 1.3.3 of the EIS.

CO105-57 cont'd

> marketers have been the principal shippers on new pipelines. These "anchor shippers" have been willing to commit to long-term contracts for transportation services that provide the financial basis for pipeline companies to pursue projects. Going forward, producers will likely continue to be motivated to ensure that the capacity exists to move supplies via pipelines. *Producers have learned from past experience that the consequences of insufficient infrastructure for gas transport are severe, and that the cost of pipeline transport is a relatively small cost compared with the revenues lost as a result of price reductions or well shut-ins that occur when transport from producing areas to liquid pricing points is constrained.*[307]

In other words, according to INGAA, gas producers rely on there being sufficient infrastructure capacity to continue, if not expand, production activities. If new infrastructure is not built, prices drop, new production slows, well shut-ins occur, and the attendant environmental and social impacts of drilling are reduced or eliminated.

As stated above, FERC attempts to avoid its duty to consider induced gas drilling by claiming that "it is not likely that [MVP] would lead to additional gas drilling" because, according to FERC, "the opposite causal relationship is more likely."[308] According to the Energy Information Administration ("EIA"), however, pipeline projects do facilitate an increase in gas production. In a recent report on natural gas liquids (NGL) market trends, EIA stated that "[e]thane production is increasing as midstream infrastructure projects become operational and ethane recovery and transport capacities grow."[309] In other words, an increase in infrastructure to transport a product results in an increase in production of that product.

Indeed, Mountain Valley claims that the MVP would "provide opportunities to expand the use of natural gas and economic growth along the Project route in West Virginia and

---

[307] INGAA, *North American Midstream Infrastructure through 2035: Capitalizing on Our Energy Abundance, Executive Summary*, p. 1, 8-9 (Mar. 18, 2014) (emphasis added), *available at* http://www.ingaa.org/file.aspx?id=21498.

[308] DEIS at 1-22.

[309] EIA, *Hydrocarbon Gas Liquids (HGL): Recent Market Trends and Issues*, p. 6 (Nov. 2014), *available at* http://www.eia.gov/analysis/hgl/pdf/hgl.pdf.

CO105-57 cont'd

southwestern Virginia." MVP Application at 12 (emphasis added). As the West Virginia Oil and Gas Association stated in its motion to intervene in the Certificate Application proceeding for the Atlantic Coast Pipeline, the construction of a pipeline from the Appalachian Basin to the Southeast and Mid-Atlantic markets would lead to an "increase in production" and shale gas producers would "greatly benefit from these new end-use consumption markets created by the . . . pipeline."[310] Without the pipeline to move the gas from the production areas, the drilling would simply not be economical and would not occur.

Recent statements from other oil and gas industry officials corroborate this. For example, in May 2015, Dennis Xander, president of Denex Petroleum spoke about the recent downturn in gas drilling, stating that "[d]rilling is hard to justify" due, in part, "to lack of infrastructure[.]"[311] According to Mr. Xander, "there are several infrastructure projects in progress that will change all that," including the Mountain Valley Pipeline.[312] Mr. Xander continued that "[b]y 2017 and 2018, things will be very busy – count on it."[313]

According to Corky DeMarco, executive director of the West Virginia Oil and Natural Gas Association, "when drilling slows down, that is when you build pipelines" because "[i]t's

[310] Motion to Intervene of the West Virginia Oil and Gas Association (October 22, 2105) in FERC docket No. CP15-554 at 2.

[311] Casey Junkins, *Number of Drilling Rigs on the Decline*, The Intelligencer/Wheeling News-Register (May 19, 2015), *available at* http://www.theintelligencer.net/page/content.detail/id/633293/Number-of-Drilling-Rigs-on-the-Decline.html?nav=526.

[312] *Id.*

[313] *Id.* The MVP "facilities from the Mobley area to the WB Interconnect [were] scheduled to be placed in service no later than December 2017" with the "remainder of the Project from the WB Interconnect to the Transco Interconnect [ ] scheduled to be placed in service no later than December 2018." MVP Application at 9.

CO105-57 cont'd

just the way the industry works."[314] According to Tim Greene, owner of Mineral Management of Appalachia, "more pipelines will lead to more drilling all across [West Virginia]."[315] Indeed, according to Mr. DeMarco, "[o]nly 5 percent of the potential Marcellus wells have even been permitted[.]"[316] These industry statements make clear that major pipeline projects such as MVP are planned not only to transport current production but in anticipation of and to facilitate long-term increases in production.

In addition to the industry and government statements above, EQT itself understands the close causal relationship between the midstream infrastructure and increased shale gas drilling. Indeed, EQT has an integrated business in which its two segments, EQT Production and EQT Midstream, coordinate the build-out of gas infrastructure to facilitate gas production and transport.[317]

EQT Production is "one of the largest natural gas producers in the Appalachian Basin with 10.0 Tcfe of proved natural gas, NGL and crude oil services across approximately 3.4 million gross acres, including approximately 630,000 gross acres in the Marcellus play."[318] "The Company's Marcellus assets constitute approximately 7.8 Tcfe of the Company's total proved reserves."[319]

---

[314] *Id.*

[315] *Supra*, n. 213.

[316] *Id.*

[317] *See* EQT, 2015 Annual Report (Form 10-K) at 7 (Feb. 11, 2016) ("2015 Annual Report"), *available at* http://ir.eqt.com/sites/eqt.investorhq.businesswire.com/files/doc_library/file/2015_Annual_Report_on_Form_10-K.pdf.

[318] *Id.* at 8.

[319] *Id.*

CO105-57 cont'd

EQT Midstream "provides gathering, transmission and storage services for the Company's produced gas, as well as for independent third parties across the Appalachian Basin, primarily through its ownership and control of EQT Midstream Partners, LP (EQM)[.]"[320] EQM is "a publicly traded limited partnership formed by EQT to own, operate, acquire and develop midstream assets in the Appalachian Basin."[321] EQT's "midstream assets are hoover signs – spanning a large, prolific area of southwestern Pennsylvania and northern West Virginia – providing a competitive advantage that uniquely positions the Company for continued growth."[322]

In 2014, "EQT Production recognized higher recoveries compared to 2013 primarily by using its contracted transportation capacity to sell gas in higher priced markets[.]"[323] "Much of these higher revenues resulted from sales of the Company's Texas Eastern Transmission (TETCO) and Tennessee Gas Pipeline capacity, including additional TETCO capacity that came online in 2014."[324] Thus, additional pipeline capacity provides EQT Production more opportunities to reach higher priced markets and "recognize[ ] higher recoveries." It is likely then that construction of MVP, which is "designed to transport natural gas production from the Marcellus and Utica shale regions to the growing demand markets in the southeast region of the United States[,]"[325] will lead to further production and revenue increases for EQT.

---

[320] *Id.* at 7.

[321] *Id.*

[322] *Id.* at 13.

[323] *Id.* at 40.

[324] *Id.*

[325] *Id.* at 13.

CO105-57 cont'd

A recent EQT presentation supports this. According to EQT, it is "strategically focused" on its "Marcellus Core Development Area."[326] EQT says it has 400,000 acres in this "core development area" and has "719 wells online."[327] However, EQT has identified at least "4,200 locations" indicating that most of this acreage has not been developed.[328] This is supported in EQT's most recent annual report where it states that 72% of its total gross acreage (3.4 million acres) is considered "undeveloped."[329]

EQT also has acreage in the Upper Devonian and Utica formations, both of which fall within the boundaries of its broader "Marcellus Core Development Area."[330] EQT has "85,000 core near-term development acres" in the Upper Devonian formation that it "develop[s] in conjunction with Core Marcellus" development.[331] EQT has identified "730 core locations" in the Upper Devonian formation with 83 wells currently online.[332] In the Utica formation, EQT has identified 3,700 locations on 490,000 acres.[333] To date, EQT has only 5 Utica wells online.

The presentation further emphasizes the fact that EQT Midstream's "[a]ssets overlay [EQT Production's] Core Marcellus and Utica" acreages.[334] As EQT notes, its current interstate

---

[326] EQT, Analyst Presentation at 10 (Nov. 2016) ("Analyst Presentation"), *available at* http://ir.eqt.com/sites/eqt.investorhq.businesswire.com/files/doc_library/file/Analyst_Presentation_November_2016_PRINT.pdf.

[327] *Id.*

[328] *Id.*

[329] *See* 2015 Annual Report at 24.

[330] *See* Analyst Presentation at 10, 13, and 28.

[331] *Id.* at 28.

[332] *Id.*

[333] *Id.* at 13.

[334] *Id.* at 14.

CO105-57 cont'd

transmission and storage capacity is 4.4 Bcf/d. If MVP is constructed and placed into service, it will add an additional 2 Bcf/d, a 45% increase in EQT's interstate transmission capacity.[335] This will almost certainly induce additional shale gas production in southwestern Pennsylvania and northern West Virginia.

Indeed, EQT appears to be preparing for that scenario. In October 2016, EQT announced that it was acquiring "additional core Marcellus acreage" totaling 59,600 net acres.[336] Of this total net acreage, 55,800 acres (94%) are considered undeveloped. The additional Marcellus acreage is located in Marion, Wetzel, and Marshall counties in West Virginia, and Washington, Westmoreland, and Greene Counties in Pennsylvania.[337] These acquisitions are in close proximity to MVP and EQT's infrastructure in Pennsylvania (some of which will be expanded by the related Equitrans Expansion Project).[338]

The statements above from industry and government representatives and EQT itself demonstrate the direct causal link between increased gas transmission capacity and increased gas drilling. FERC, however, has previously claimed that it need not consider the indirect effects of shale gas development because "such development will likely continue regardless of whether the proposed projects are approved because multiple existing and proposed transportation alternatives for production from the region are available."[339]

---

[335] *Id.* at 18.

[336] EQT, *EQT Increases Its Core Marcellus Acreage Position* (Oct. 25, 2016), *available at* http://media.eqt.com/print/node/484.

[337] *Id*; *see also* Analyst Presentation at 12.

[338] *See* Analyst Presentation at 12 and 18.

[339] *Nat'l Fuel Gas Supply Corp.*, 150 FERC ¶ 61,162, at P 45 (2015).

CO105-57 cont'd

As the statements above indicate, that does not appear to be the case. The corollary to "more pipelines will lead to more drilling" is that fewer pipelines may lead to less drilling. Moreover, when FERC says shale gas development will continue because there are other "proposed transportation alternatives," those other "proposed transportation alternatives" are almost certainly interstate natural gas pipelines subject to FERC's jurisdiction. To say in one proceeding that shale gas development will continue regardless of whether that particular project is approved because there are other similar projects that will likely be authorized by FERC itself only proves the causal connection between FERC's decision to approve pipeline projects and shale gas development.

CO105-58

B. The Impacts of Shale Gas Development Are Reasonably Foreseeable

Shale gas development is not only causally related to construction of the MVP, but is also reasonably foreseeable. An indirect effect 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."[340] "[W]hen the *nature* of the effect is reasonably foreseeable but its *extent* is not, [an] agency may not simply ignore the effect."[341] "Agencies need not have perfect foresight when considering indirect effects, effects which by definition are later in time or farther removed in distance than direct ones."[342] Here, additional shale gas drilling is sufficiently likely to occur that a person of ordinary prudence would take it into account when assessing the impact of the Project on the

[340] *Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992).

[341] *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003) (emphasis in original); *see also Habitat Educ. Ctr. v. U.S. Forest Serv.*, 609 F.3d 897, 902 (7th Cir. 2010).

[342] *WildEarth Guardians v. U.S. Office of Surface Mining*, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015).

CO105-58 See the response to comment CO105-57.

CO105-58 cont'd

environment. Moreover, FERC is well aware of the nature of the effects of shale gas development and, therefore, may not ignore those effects.

FERC, however, has consistently and stubbornly claimed that even if there is a sufficient causal relationship between projects such as the one under review here and induced gas production, "such production is not reasonably foreseeable as contemplated by CEQ's regulations and case law."[343] There, FERC said that it "need not address remote and highly speculative consequences."[344] FERC also said that it is not required "to engage in speculative analysis" or "to do the impractical, if not enough information is available to permit meaningful consideration."[345] Finally, FERC said that even if it knew the "identity of a supplier of gas . . . and even the general area where the producer's existing wells are located," it does not mean that FERC can engage in forecasting future development.[346] The DEIS for the MVP adopts this flawed interpretation of "reasonably foreseeable."[347]

FERC's claim that if it does not know the *exact* timing and location of future shale gas development, it may "simply ignore the effect" cannot be squared with the requirements of NEPA.[348] FERC's practice "would require the public, rather than the agency, to ascertain the

[343] *See, e.g., Nat'l Fuel Gas Supply Corp.*, 150 FERC ¶ 61,162, at P 46 (2015).

[344] *Id.* (*citing Hammond v. Norton*, 370 F. Supp. 2d 226, 245-46 (D.D.C. 2005).

[345] *Id.* (*citing N. Plains Res. Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1078 (9th Cir. 2011).

[346] *Id.*

[347] *See* DEIS at 1-23.

[348] *See Mid States Coal.*, 345 F.3d at 549.

CO105-58 cont'd

environment. Moreover, FERC is well aware of the nature of the effects of shale gas development and, therefore, may not ignore those effects.

FERC, however, has consistently and stubbornly claimed that even if there is a sufficient causal relationship between projects such as the one under review here and induced gas production, "such production is not reasonably foreseeable as contemplated by CEQ's regulations and case law."[343] There, FERC said that it "need not address remote and highly speculative consequences."[344] FERC also said that it is not required "to engage in speculative analysis" or "to do the impractical, if not enough information is available to permit meaningful consideration."[345] Finally, FERC said that even if it knew the "identity of a supplier of gas . . . and even the general area where the producer's existing wells are located," it does not mean that FERC can engage in forecasting future development.[346] The DEIS for the MVP adopts this flawed interpretation of "reasonably foreseeable."[347]

FERC's claim that if it does not know the *exact* timing and location of future shale gas development, it may "simply ignore the effect" cannot be squared with the requirements of NEPA.[348] FERC's practice "would require the public, rather than the agency, to ascertain the

[343] *See, e.g., Nat'l Fuel Gas Supply Corp.*, 150 FERC ¶ 61,162, at P 46 (2015).

[344] *Id.* (*citing Hammond v. Norton*, 370 F. Supp. 2d 226, 245-46 (D.D.C. 2005).

[345] *Id.* (*citing N. Plains Res. Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1078 (9th Cir. 2011).

[346] *Id.*

[347] *See* DEIS at 1-23.

[348] *See Mid States Coal.*, 345 F.3d at 549.

CO105-58 cont'd

environment. Moreover, FERC is well aware of the nature of the effects of shale gas development and, therefore, may not ignore those effects.

FERC, however, has consistently and stubbornly claimed that even if there is a sufficient causal relationship between projects such as the one under review here and induced gas production, "such production is not reasonably foreseeable as contemplated by CEQ's regulations and case law."[343] There, FERC said that it "need not address remote and highly speculative consequences."[344] FERC also said that it is not required "to engage in speculative analysis" or "to do the impractical, if not enough information is available to permit meaningful consideration."[345] Finally, FERC said that even if it knew the "identity of a supplier of gas . . . and even the general area where the producer's existing wells are located," it does not mean that FERC can engage in forecasting future development.[346] The DEIS for the MVP adopts this flawed interpretation of "reasonably foreseeable."[347]

FERC's claim that if it does not know the *exact* timing and location of future shale gas development, it may "simply ignore the effect" cannot be squared with the requirements of NEPA.[348] FERC's practice "would require the public, rather than the agency, to ascertain the

[343] *See, e.g., Nat'l Fuel Gas Supply Corp.*, 150 FERC ¶ 61,162, at P 46 (2015).

[344] *Id.* (*citing Hammond v. Norton*, 370 F. Supp. 2d 226, 245-46 (D.D.C. 2005).

[345] *Id.* (*citing N. Plains Res. Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1078 (9th Cir. 2011).

[346] *Id.*

[347] *See* DEIS at 1-23.

[348] *See Mid States Coal.*, 345 F.3d at 549.

CO105-58 contd

cumulative effects of a proposed action."[349] "Such a requirement would thwart one of the 'twin aims' of NEPA – to 'ensure[ ] that the agency will inform the public that it has indeed considered environmental concerns in its decision making process.'"[350] Compliance with NEPA "is a primary duty of every federal agency; fulfillment of this vital responsibility should not depend on the vigilance and limited resources of environmental plaintiffs."[351] Thus, FERC's insistence that it is incumbent upon others to produce the kind of information it claims to need is wholly inconsistent with its obligations under NEPA.

As the D.C. Circuit has explained, "[r]easonable forecasting and speculation is … implicit in NEPA, and we 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.'"[352] Here, FERC has attempted to "shirk [its] responsibilities" by characterizing the future environmental effects of induced shale gas drilling as "crystal ball inquiry" despite

---

[349] *Te-Moak Tribe of Western Shoshone of Nevada v. U.S. Dep't of the Interior*, 608 F.3d 592, 605 (9th Cir. 2010). While this case was about cumulative impacts, the same rationale holds true for indirect effects in terms of effects being "reasonably foreseeable."

[350] *Id.* (quoting *Balt. Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 97, 103 S.Ct. 2246, 76 L.Ed.2d 437 (1983)) (emphasis added by Ninth Circuit).

[351] *City of Carmel-by-the-Sea v. U.S. Dep't of Transp.*, 123 F.3d 1142, 1161 (9th Cir. 1997) (quoting *City of Davis v. Coleman*, 521 F.2d 661, 671 (9th Cir. 1975); *see also Ctr. for Biological Diversity v. U.S. Forest Serv.*, 349 F.3d 1157, 1166 (9th Cir. 2003) ("The procedures prescribed both in NEPA and the implementing regulations are to be strictly interpreted 'to the fullest extent possible' in accord with the policies embodied in the Act….'[g]rudging, pro forma compliance will not do.'") (citations omitted)).

[352] *Delaware Riverkeeper Network v. F.E.R.C.*, 753 F.3d 1304, 1310 (quoting *Scientists' Inst. For Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973)); *see also N. Plains Res. Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1078-79 (9th Cir. 2011).

CO105-58 cont'd

abundant available information regarding the impacts of the gas drilling that would be facilitated by construction of the MVP, thus violating NEPA.[353]

Contrary to FERC's assertions, there is ample information about existing and projected shale gas development for FERC to engage in reasonable forecasting. According to a report by the research investment firm Morningstar, several companies, including EQT, have "identified between *10 and 30 years of drilling locations* across the Marcellus, which should fuel several more years of production growth at relatively low cost."[354] EQT's Analyst Presentation identifies its core development areas in which it is "strategically focused."[355] Thus, FERC should be able to work with EQT in identifying reasonably foreseeable gas wells within this area.

This is important since, according to EQT, it assumes that the estimated ultimate recovery ("EUR") of a Marcellus well is 13.6 Bcfe.[356] EQT's Type Curve for Marcellus wells indicates that nearly 25% of recoverable shale gas is produced in the first year and nearly 50% in the first five years.[357] That means that projects like MVP, which will transport 2 Bcf/d, are simply unable to rely solely on existing production over the projected lifetime of the pipeline, which about 50 years for the MVP, or even through the length of the subscription contracts.[358] New, additional production is thus absolutely necessary to supply the MVP.

---

[353] *See Delaware Riverkeeper*, 753 F.3d at 1310.

[354] Morningstar Energy Observer, *Shale Shock: How the Marcellus Shale Transformed the Domestic Natural Gas Landscape and What It Means for Supply in the Years Ahead*, p. 17 (Feb. 2014) (emphasis added), *available at* http://marcelluscoalition.org/wp-content/uploads/2014/03/Morning-Star_EnergyObserverFebruary2014.pdf.

[355] *See* Analyst Presentation at 10, 12, 13, and 28.

[356] *See* Analyst Presentation at 11.

[357] *Id.*

[358] *See* DEIS at 2-58.

CO105-58 cont'd

Reasonable forecasting of the impacts of the type of future drilling that would be necessary to supply the MVP is being performed in other federal regulatory contexts. For example, on November 25, 2016, the U.S. Fish & Wildlife Service ("FWS") announced its intent to prepare an EIS for the proposed issuance of a 50-year incidental take permit under the Endangered Species Act ("ESA") for the draft "Oil & Gas Coalition Multi-State Oil and Gas Habitat Conservation Plan ("O&G HCP").[359] The O&G HCP would "streamline environmental permitting and compliance with the ESA for nine companies in conjunction with their respective midstream and upstream" operations in Ohio, Pennsylvania, and West Virginia.[360] The companies are seeking incidental take coverage for five species of bat: Indiana bat, northern long-eared bat, little brown bat, eastern small-footed bat, and tri-colored bat.[361] One of the companies seeking incidental take coverage is EQT Corporation.[362]

According to FWS, the covered activities would include upstream well development, production, decommissioning, and reclamation as well as construction of midstream gathering, transmission, and distribution pipelines.[363] Importantly, FWS explains that "[a] model of the proposed covered activities will be used to estimate potential impacts to the covered species by overlaying the predicted covered activity implementation (including the type and location of infrastructure build-out) on the covered species' habitats."[364] If FWS can use a model to predict how EQT's oil and gas development activities will impact five threatened and endangered bat

[359] *See* 81 Fed. Reg. 85,250 (Nov. 25, 2016).

[360] *Id.* at 85,251.

[361] *Id.* at 85,252.

[362] *See id.* at 85,251.

[363] *Id.* at 85,252.

[364] *Id.* (emphasis added).

CO105-58 cont'd

species over the next half-century, then FERC cannot claim such modeling is infeasible for EQT's Mountain Valley Pipeline.[365]

Nor may FERC claim that the environmental impacts of those activities cannot be reasonably predicted. FERC is well aware of the nature of the impacts of shale gas drilling. In the FEIS for the Constitution Pipeline, for example, FERC relied on multiple agency reports and statistics to describe the nature of the impacts caused by Marcellus shale development activities.[366] FERC stated that "an average well requires approximately 4.8 acres during construction and 0.5 acre during operation[.]"[367] FERC determined 13,402 acres of earth disturbance could result to supply the Constitution Pipeline.[368] Thus, FERC is clearly aware of the nature of shale gas drilling.

Despite FERC's awareness of these impacts, it likely underestimated them in the Constitution Pipeline FEIS.[369] For example, according to a 2012 U.S. Geological Survey ("USGS") report,

> [a] recent analysis of Marcellus well permit locations in Pennsylvania found that well pads and associated infrastructure (roads, water impoundments, and pipelines) required nearly 3.6 hectares (9 acres) per well pad with an additional 8.5 hectare (21 acres) of indirect edge effects (Johnson, 2010). This type of extensive and long-term habitat conversion has a greater impact on natural ecosystems than activities such as logging or agriculture, given the great

[365] Commenters discuss the EIS for the 50-year incidental take permit for the O&G HCP only to demonstrate the feasibility of future forecasting of shale gas development, not to express any support for the issuance of such a permit.

[366] *See* Constitution Pipeline FEIS at 4-232 – 4-235 (Docket No. CP13-499-000, Accession No. 20141024-4001).

[367] *Id.* at 4-233.

[368] *Id.*

[369] Commenters cannot determine if FERC underestimated these impacts in the MVP DEIS because it made no such estimations.

CO105-58 cont'd

> dissimilarity between gas-well pad infrastructure and adjacent natural areas and the low probability that the disturbed land will revert back to a natural state in the near future (high persistence) (Marzluff and Ewing, 2001).[370]

The USGS figures on surface disturbance are substantially higher than the figures FERC relied on in the Constitution Pipeline FEIS. According to the West Virginia Department of Commerce ("WVDOC"), approximately 2,700 Marcellus shale wells have been drilled in West Virginia.[371] Using the USGS figures, it is reasonable to assume that approximately 24,300 acres of West Virginia's landscape have been converted to shale gas infrastructure with 56,700 acres of additional indirect edge effects.[372]

These are enormous impacts to our landscapes, watersheds, wildlife habitat, and recreation opportunities that FERC routinely fails to fully evaluate under NEPA. FERC has the information required to assess the impacts of the shale gas drilling that would be induced by its approval of the MVP. FERC may not shirk its responsibilities under NEPA by dismissing the environmental impacts of that future shale gas extraction in the Marcellus and Utica shale formations as too speculative.[373] FERC has failed to analyze the reasonably foreseeable impacts of the MVP in the DEIS in violation of NEPA.

---

[370] Slonecker, E.T., et al., *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010: USGS Open-File Report 2012-1154*, p. 8 (2012), *available at* https://pubs.usgs.gov/of/2012/1154/of2012-1154.pdf ("USGS Report").

[371] *See* WVDOC, Fossil Energy – Marcellus Shale, *available at* http://www.wvcommerce.org/energy/fossil_energy/marcellusshale.aspx.

[372] Commenters previously submitted detailed information regarding the impacts of the type of shale gas drilling that would be induced by the MVP to the FERC docket and hereby incorporate those comments by reference. *See* Motion to Intervene and protest of Appalachian Mountain Advocates *et al.* at 37–42, FERC Docket Nos. CP16-10, CP16-13; Comments of Appalachian Mountain Advocates *et al.* on FERC's Notice to Prepare an EIS for the Planned Mountain Valley Pipeline Project at 21–27, FERC Docket No. PF15-3-000.

[373] *Delaware Riverkeeper*, 753 F.3d 1304, 1310.

CO105-59

X. The DEIS Fails to Adequately Consider Cumulative Impacts, Including Those Impacts Associated with Gas Development

In addition to considering the direct and indirect effects of the project, FERC must also consider cumulative impacts. A cumulative impact is 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.[374]

Cumulative impact analyses that contain "cursory statements" and "conclusory terms" are insufficient.[375] FERC's cumulative impact analysis for the MVP is insufficient because it is needlessly and impermissibly restrictive both in terms of time and geography and relies on cursory statements and conclusory terms that seek to minimize impacts to an array of environmental resources.

A. FERC's Analysis of Cumulative Impacts Is Impermissibly Restrictive and Not Based on Natural Ecological Boundaries.

FERC's cumulative impacts analysis is fatally flawed because it substantially limited the analysis area to "the vicinity of the MVP and EEP facilities[.]"[376] For example, FERC used HUC10 sub-watersheds as the analysis area for water resources and wetlands, vegetation, land use, and wildlife.[377] While it may make sense to consider impacts on water resources at the HUC10 sub-watershed level, FERC fails to explain why this geographic scope is appropriate for

[374] 40 C.F.R. § 1508.7.

[375] *See Delaware Riverkeeper Network v. F.E.R.C.*, 753 F.3d 1304, 1319-20 (D.C. Cir. 2014); *see also Natural Resources Defense Council v. Hodel*, 865 F.2d 288, 298 (D.C. Cir. 1988) (although "FEIS contains sections headed 'Cumulative Impacts,' in truth, nothing in the FEIS provides the requisite analysis," which, at best, contained only "conclusory remarks").

[376] DEIS at 4-474.

[377] *See* DEIS at 4-476.

CO105-59 Cumulative impacts are addressed in section 4.13 of the EIS. Projects within our resource-specific geographic scopes, including oil and gas well development, were included in that analysis.

CO105-59 cont'd

vegetation, land use, and wildlife. Moreover, consideration of cumulative impacts on water resources at the HUC10 sub-watershed level may be necessary but not sufficient. FERC should have broadened the scope to consider cumulative impacts on water resources and wetlands. FERC also should have selected analysis areas for vegetation, land use, and wildlife that were rationally connected to those particular resource areas.

CEQ's guidance on cumulative impacts recommends significantly expanding the cumulative impacts analysis area beyond the "immediate area of the proposed action" that is often used for the "project-specific analysis" related to direct and indirect effects:

> For a project-specific analysis, it is often sufficient to analyze effects within the immediate area of the proposed action. When analyzing the contribution of this proposed action to cumulative effects, however, the geographic boundaries of the analysis *almost always should be expanded.* These expanded boundaries can be thought of as differences in hierarchy or scale. Project-specific analyses are usually conducted on the scale of counties, forest management units, or installation boundaries, *whereas cumulative effects analysis should be conducted on the scale of human communities, landscapes, watersheds, or airsheds.*[378]

CEQ further says that it may be necessary to look at cumulative effects at the "ecosystem" level for vegetative resources and resident wildlife, the "total range of affected population units" for migratory wildlife, and an entire "state" or "region" for land use.[379]

EPA guidance on cumulative impacts states that "[s]patial and temporal boundaries should not be overly restrictive in cumulative impact analysis."[380] EPA specifically cautions agencies to not "limit the scope of their analyses to those areas over which they have direct

[378] CEQ, Considering Cumulative Effects under the National Environmental Policy Act, p. 12 (1997) (emphasis added).
[379] *Id.* at 15.

[380] EPA, Consideration of Cumulative Impacts in EPA Review of NEPA Documents, p. 8 (1999).

CO105-59 cont'd

authority or to the boundary of the relevant management area or project area."[381] Rather, agencies "should delineate appropriate geographic areas including *natural ecological boundaries*" such as ecoregions or watersheds.[382]

FERC did not cite to either the 1997 CEQ guidance or the 1999 EPA guidance in the cumulative impacts section.[383] This is a notable departure from previous EISs.[384] Simply put, there is no rational relationship between HUC10 sub-watersheds and vegetation, land use, or wildlife. Nor are HUC10 sub-watersheds sufficient to capture the cumulative impacts of other past, present, and reasonably foreseeable actions on water resources and wetlands. Therefore, FERC should include a compliant cumulative impacts analysis in a revised DEIS with these considerations in mind.

CO105-60

B. The Temporal Scope of the Cumulative Impacts Analysis Is Too Restrictive.

The temporal boundary of FERC's cumulative impacts analysis is also too restrictive. FERC considered other projects that were constructed within the last 3 years.[385] In its comments on the DEIS, the EPA explained that "[t]hough some construction impacts can be short-termed, there are prolonged impacts, which cannot be adequately captured within the three-year timeframe given[.]"[386] For example, "impacts associated with forest fragmentation, invasive

[381] *Id.*

[382] *Id.* (emphasis added).

[383] *See* DEIS, Sec. 4.13 and App. V.

[384] *See e.g.*, Draft Environmental Impact Statement for the Atlantic Sunrise Project at 4-258 (Docket No. CP14-138-000, Accession No. 20160505-4005).

[385] *See* DEIS at 4-480.

[386] EPA, Dec. 20, 2016 DEIS Comments at 28 (Accession No. 20161221-5087) ("EPA Comments").

CO105-60 Cumulative impacts are discussed in section 4.13 of the EIS. We conclude that our temporal scope is appropriate for the analysis of cumulative impacts.

CO105-60 cont'd

species, as well as the temporal loss of forested habitat which can take decades to reach maturity."[387] Thus, EPA "recommends that FERC include additional time for the temporal scope of the cumulative [impacts] analysis to account for the time beyond three years for forest growth back to maturity."[388] Commenters agree and request that FERC prepare a revised or supplemental DEIS that addresses these deficiencies.

CO105-61

C. Water Resources and Wetlands

FERC claims that "[c]onstruction of the projects would result in temporary or short-term impacts on surface water resources (see section 4.3.3), as well as some minor long-term impacts such as loss of forested cover in the watershed and partial loss of riparian vegetation."[389] FERC then claims that because other projects within watersheds crossed by MVP and EEP "would likely be required to install and maintain BMPs similar to those proposed by the MVP and the EEP . . . most of the [cumulative] impacts on waterbodies are expected to also be of short duration."[390] "Consequently," says FERC, "the cumulative effect on surface waterbody resources would be temporary and minor."[391] Such vague assertions do not satisfy the "hard look" requirement for considering the cumulative impacts of the projects on watersheds.

The analysis is further flawed by the fact that FERC failed to take a hard look at the cumulative impacts of shale gas development at an appropriate watershed level. To begin with,

[387] *Id.*

[388] *Id.*

[389] DEIS at 4-502.

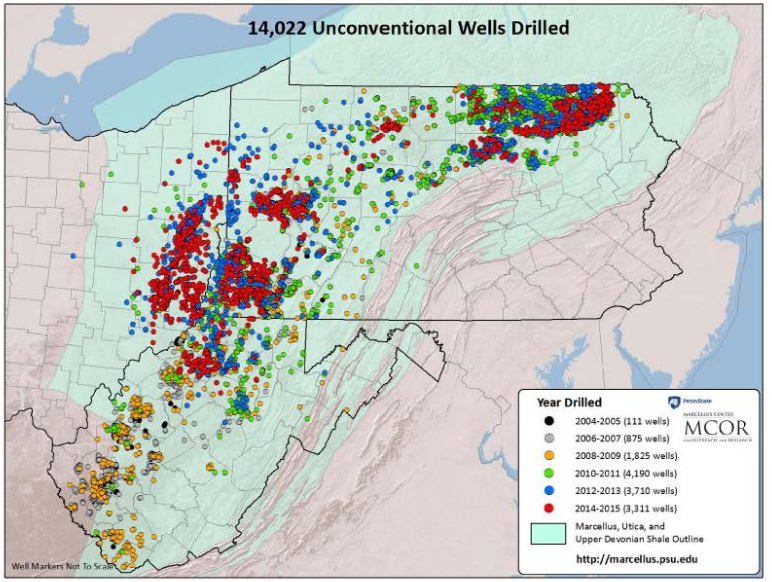
[390] *Id.*

[391] *Id.*

CO105-61 Cumulative impacts are addressed in section 4.13 of the EIS. Resource specific effects, such as water resources, are addressed in section 4.13.2 of the EIS. We conclude that our geographic scope is appropriate for the analysis of cumulative impacts.

CO105-61 cont'd

FERC cited statewide well and drilling permit figures in Pennsylvania and West Virginia.[392] FERC never puts these statewide figures into a rational context with the projects. This is important because a large portion of the shale gas development that has occurred over the last decade has been in northern West Virginia and southwestern Pennsylvania, an area that substantially overlaps with the projects.[393]



[392] *See* DEIS at 4-493. The Pennsylvania is outdated. For example, as of March 31, 2015, at least 9,031 unconventional wells have been drilled in Pennsylvania. *See* Penn State-Marcellus Center for Outreach and Research, http://www.marcellus.psu.edu/images/PA%20Spud%20Map%202014-15%2020150331.jpg.

[393] *See* Figure X.C.

CO105-61 cont'd

Figure X.C: Unconventional Wells Drilled in Ohio, Pennsylvania, and West Virginia (2004-2015).

While Appendix V indicates that FERC did consider at least some oil and gas wells in the cumulative impacts analysis, this was only done at the restrictive HUC10 sub-watershed level. According to FERC, "the purpose of the MVP pipeline" is to "extend to the natural gas production areas of West Virginia."[394] As Figure X.C shows, the "natural gas production areas of West Virginia" to which the MVP is extending is a large area, well beyond the HUC10 sub-watershed boundary that FERC used in the cumulative impacts analysis. Moreover, this production area extends well into Pennsylvania where the related EEP is located. FERC, however, did not include *any* oil and gas wells in the two HUC 10 sub-watersheds used in the DEIS.[395] As Figure X.C shows, this is a significant omission in light of the large number of unconventional wells that have been drilled in this part of Pennsylvania in recent years.

Commenters suggest that FERC expand the analysis area to include, at a minimum, EQT's upstream and midstream footprint. That footprint substantially overlaps with the project areas for MVP and EEP.[396] Within this area, FERC should consider the cumulative impacts of oil and gas development and other projects at multiple watershed levels, rather than just a restrictive HUC10 sub-watershed level.

CO105-62

D. Vegetation and Wildlife

FERC failed to take a hard look at the cumulative effects of shale gas development on vegetation and wildlife. FERC acknowledges that oil and gas development contributes to

[394] DEIS at 3-11.

[395] *See* DEIS, App. U at 27-33.

[396] *Compare* DEIS at 1-3 – 1-4 *with* EQT, 2015 Annual Report (Form 10-K) at 9, 12 (Feb. 11, 2016).

CO105-62 See the response to comment CO105-61.

CO105-62 cont'd

cumulative impacts on vegetation and wildlife impacts.[397] With regard to vegetation, FERC concluded that cumulative impacts "are expected to be minor, considering the limited area affected within the geographic scope, the large amount of undisturbed vegetation, including forests, remaining in each watershed . . . and because the other projects are expected to take the required precautions and mitigation measures[.]"[398] There are a couple problems with this.

As EPA stated, FERC "seems to trivialize forest impacts" and fails to properly distinguish between "forests" and "interior forests."[399] Simply stating that there is allegedly a large amount of "undisturbed vegetation, including forests, remaining in each watershed" does not provide useful information by which to assess qualitatively the resource impacts. Moreover, the notion that there are large amounts of undisturbed forests is specious in light of how much shale gas well and pipeline infrastructure development has already occurred and is reasonably foreseeable in West Virginia and Pennsylvania.[400]

CO105-63

These inadequacies continue into the cumulative impacts analysis on wildlife.[401] Regarding forest-dwelling wildlife, FERC acknowledges that these species would be impacted more than open-habitat species.[402] FERC continues, however, that "[g]iven the large amount of wildlife habitat that would remain undisturbed within the geographic scope," and the mitigation measures utilized by MVP, EEP, and other project proponents, "the MVP and EEP, combined

[397] *See* DEIS at 4-504 – 4-507.

[398] *Id.*, at 4-504.

[399] *See* EPA Comments at 31.

[400] *See* Figure X.C.

[401] *See* DEIS at 4-504 (noting that FERC used vegetation as a "generalized proxy for wildlife habitat").

[402] *Id.* at 4-505.

CO105-63 See the response to comment CO105-61.

CO105-63 cont'd

with the other identified projects, would not have a significant impact on wildlife."[403] FERC makes similar conclusory statements regarding aquatic species and threatened and endangered species.[404]

FERC's dismissive conclusions ignore the landscape level effects that have occurred and are likely to continue to occur from rampant shale gas well and pipeline infrastructure development. As the Supreme Court of Pennsylvania explained,

> By any responsible account, the exploitation of the Marcellus Shale Formation will produce a detrimental effect on the environment, on the people, their children, and future generations, and potentially on the public purse, perhaps rivaling the environmental effects of coal extraction.[405]

It is critical that FERC consider the detrimental effects of shale gas well and pipeline infrastructure developments on a much broader level than it used in the DEIS.

According to recent research published in Environmental Science & Technology,

> Potential effects [of shale gas drilling] on terrestrial and aquatic ecosystems can result from many activities associated with the extraction process and the rate of development, such as road and pipeline construction, well pad development, well drilling and fracturing, water removal from surface and ground waters, establishment of compressor stations, and by unintended accidents such as spills or well casing failures . . . The cumulative effect of these potential stressors will depend in large part on the rate of development in a region. Depending on extent of development, oil and gas extraction has the potential to have a large effect on associated wildlife, habitat and aquatic life.[406]

Shale gas development "changes the landscape" as "[l]and is cleared for pad development and associated infrastructure, including pipelines, new and expanded roads, impoundments, and

---

[403] *Id.*

[404] *Id.* at 4-505 – 4-507.

[405] Robinson Twp. v. Commonwealth of Pennsylvania, 83 A.3d 901, 976 (Pa. 2013).

[406] Brittingham, M.C., et al., Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats, Environmental Science & Technology, pp. 11035-11037 (Sept. 4, 2014) (citations omitted) (Exhibit I).

CO105-63 cont'd

compressor stations[.]"[407] "Seismic testing, roads, and pipelines bisect habitats and create linear corridors that fragment the landscape."[408]

"Habitat fragmentation is one of the most pervasive threats to native ecosystems and occurs when large contiguous blocks of habitat are broken up into smaller patches by other land uses or bisected by roads, transmission lines, pipelines or other types of corridors."[409] "Habitat fragmentation is a direct result of shale development with roads and pipelines having a larger impact than the pads."[410] In Bradford County, PA "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 (forest > 100 m from an edge) at twice the rate of overall forest loss."[411] "Pipelines and roads not only resulted in loss of habitat but also created new edges."[412] "Fragmentation from linear corridors such as pipelines, seismic lines, and roads can alter movement patterns, species interactions and ultimately abundance depending on whether the corridor is perceived as a barrier or territory boundary or used as an avenue for travel and invasion into habitats previously inaccessible."[413]

---

[407] *Id.* at 11037 (citations omitted).

[408] *Id.*

[409] *Id.*

[410] *Id.* (citations omitted).

[411] *Id.* (citation omitted).

[412] *Id.*

[413] *Id.* (citations omitted).

CO105-63 cont'd

According to the New York Department of Environmental Conservation, "development of one horizontal [shale] well requires over 3300 one-way truck trips."[414] "This is a concern because roads of all types have a negative effect on wildlife through direct mortality, changes in animal behavior, and increased human access to areas, and these negative effects are usually correlated with the level of vehicular activity."[415] "Even after a well is drilled and completed, new roads and pipelines provide access for more people, which results in increased disturbance."[416] "In Wyoming, Sawyer et al. found that mule deer migratory behavior was influenced by disturbance associated with coal bed gas development and observed an increase in movement rates, increased detouring from established routes, and overall decreased use of habitat along migration routes with increasing density of well pads and roads.[417]

CO105-64

Shale gas development "is associated with both short-term and long-term increases in noise."[418] "In the short term, site clearing and well drilling, [high volume hydraulic fracturing], and construction of roads, pipelines and other infrastructure are a limited time disturbance similar to disturbance and sound associated with clearing land and home construction."[419] "Depending on number of wells drilled, construction and drilling can take anywhere from a few months to multiple years."[420]

---

[414] *Id.* at 11038 (citation omitted).

[415] *Id.* (citations omitted).

[416] *Id.*

[417] *Id.* (citation omitted).

[418] *Id.*

[419] *Id.* (citation omitted)

[420] *Id.*

CO105-64 See the response to comment CO105-61.

CO105-65

"Compressor stations, which are located along pipelines and are used to compress gas to facilitate movement through the pipelines, are a long-term source of noise and continuous disturbance."[421] "Because chronic noise has been shown to have numerous costs to wildlife, compressors have potential to have long-term effects on habitat quality.[422] "For many species of wildlife, sound is important for communication, and noise from compressors can affect this process through acoustical masking and reduced transmission distances."[423] "Studies on effects of noise from compressors on songbirds have found a range of effects including individual avoidance and reduced abundance, reduced pairing success, changes in reproductive behavior and success, altered predator-prey interactions, and altered avian communities . . . Greater sage-grouse (*Centrocercus urophasianus*) gather at leks where males display in order to attract females."[424] "Lek attendance declined in areas with chronic natural gas-associated noise and, experimentally, sage-grouse were shown to experience higher levels of stress when exposed to noise."[425]

CO105-66

"Because of the large overlap between the Appalachian shale play and core forest habitat in the East, many forest species are vulnerable to development."[426] "Area-sensitive forest songbirds are primarily insect-eating Neotropical migrants, are an important component of forest ecosystems, and, as a group, many have declined in numbers in response to forest

---

[421] *Id.* (citation omitted).

[422] *Id.* (citation omitted).

[423] *Id.*

[424] *Id.*

[425] *Id.* (citations omitted).

[426] *Id.* at 11040.

CO105-65 See the response to comment IND375-4 regarding noise impacts from construction and operation of the projects.

CO105-66 See the response to comment CO105-61.

CO105-66 cont'd

fragmentation."[427] "These birds are area-sensitive because breeding success and abundance are highest in large blocks of contiguous forest, and numerous research studies have documented negative effects of fragmentation on abundance and productivity[.]"[428] "The impact that shale development has on this group of species will depend on the scale and extent of development."[429] "*By some estimates, less than 10% of potential shale gas development has occurred in the Appalachian basin [and] [i]f this is the case, there is the potential for a 10-fold increase in the amount of shale gas development which would likely have negative impacts on area-sensitive forest songbirds and other forest specialists.*"[430]

CO105-67

"Development of shale resources, which clears land for well pads and roads, is occurring across a large portion of the native range of brook trout, *especially in Pennsylvania.*"[431] "If remaining high-quality stream reaches become unsuitable to brook trout, there may be further fragmentation of the larger meta-population."[432]

CO105-68

"Rare species with limited ranges are always a concern when development occurs" and "any type of disturbance can be very detrimental to them."[433] "Freshwater mussels are an additional taxonomic group of interest because of already high numbers of listed species and

[427] *Id.* (citations omitted).

[428] *Id.*

[429] *Id.*

[430] *Id.* (emphasis added) (citation omitted).

[431] *Id.* (emphasis added) (citation omitted).

[432] *Id.*

[433] *Id.*

CO105-67 See the response to comment CO105-61.

CO105-68 See the response to comment CO105-61.

CO105-68 cont'd

relative sensitivity to toxicants."[434] "The endangered Indiana Bat, (*Myotis sodalis*), is another example of a species where a large portion of its native range is within areas of shale development."[435] "Gillen and Kiviat 2012 reviewed 15 species that were rare and whose ranges overlapped with the Marcellus and Utica shale by at least 35%."[436] "The list included the West Virginia spring salamander (*Gyrinophilus subterraneus*), a species that is on the IUCN Red List as endangered and whose range overlaps 100% with the shale layers."[437] This salamander "requires high quality water and is sensitive to fragmentation suggesting that this species is at great risk to oil and gas development."[438] "The list also included eight Plethodontid salamanders, a group that tends to be vulnerable because of the overlap between their range and shale layers, their dependence on moist environments and sensitivity to disturbance."[439]

CO105-69

"Habitat fragmentation, effects on water quality and quantity, and cumulative effects on habitats and species of concern have already been identified as problems and are expected to increase in magnitude as shale resource development continues to expand."[440] Brittingham et al. (2014) "suggests that species and habitats most at risk are ones where there is an extensive overlap between a species range or habitat type and one of the shale plays (leading to high vulnerability) coupled with intrinsic characteristics such as limited range, small population size,

[434] *Id.* (citation omitted).

[435] *Id.* (citation omitted).

[436] *Id.*

[437] *Id.*

[438] *Id.*

[439] *Id.* at 11040-11041.

[440] *Id.* at 11043.

CO105-69 See the response to comment CO105-61.

CO105-69 cont'd

specialized habitat requirements, and high sensitivity to disturbance."[441] "Examples include core forest habitat and forest specialists, sagebrush habitat and specialists, vernal pond inhabitants, and stream biota."[442]

Brittingham et al. (2014) demonstrates the substantial impact that shale gas drilling is having and will continue to have on wildlife throughout the Marcellus and Utica shale region. Such impacts will only worsen if FERC continues facilitating such drilling by authorizing infrastructure projects such as the one proposed here without analyzing the cumulative impacts on wildlife, disclosing that information to the public, and incorporating it into FERC's decisionmaking process.

According to Souther et al. (2014):

> The few studies that consider cumulative impacts suggest that shale-gas development will affect ecosystems on a broad scale . . . As cumulative impacts' methodology and knowledge improve, research should move toward detecting synergies between shale development and other likely drivers of extinction, such as climate change, as site-specific or single variable risk assessments likely underestimate threats to ecological health.[443]

These researchers further state that:

> Using criteria related to the environmental risks and current understanding of these impacts, we suggest that top research priorities are related to probabilistic events that lead to contamination of fresh water, such as equipment failure, illegal activities, accidents, chemical migration, and wastewater escape, *as well as cumulative ecological impacts of shale development.*[444]

---

[441] *Id.*

[442] *Id.*

[443] Souther et al. (2014), *Biotic impacts of energy development from shale: research priorities and knowledge gaps.* Frontiers in Ecology and the Environment 12(6): 334 (Exhibit J).

[444] *Id.* at 337 (emphasis added).

CO105-70

The U.S. Fish and Wildlife Service recently expressed concerns about the potential noise impacts of National Fuel's Tuscarora Lateral Project on wildlife:

> Since the project involves the increase of horsepower at one compressor station and the construction of a new station, we recommend the FERC request data on operating noise levels at the compressor stations, and an analysis be completed of how the project noise levels will affect wildlife. Noise levels over background levels can adversely affect wildlife, particularly songbirds, that rely on call identification for successful breeding. If noise levels will exceed background levels, the environmental document should identify mitigation measures that will be employed to reduce noise impacts on wildlife such as vegetation screening or barriers.[445]

While these comments were specific to the Tuscarora Lateral Project, the same rationale applies for other projects as well, such as the ones at issue here where MVP is constructing three new compressor stations and EEP is constructing one new compressor station.[446]

FERC acknowledges that the proposed "compressor stations would generate noise on a continuous basis once in operation."[447] FERC also acknowledges that that declines in bird populations and reproductive success have been documented near oil and gas infrastructure.[448] Nevertheless, FERC concludes that after construction of the projects is complete, "birds and other wildlife would either become habituated to the operational noise associated with compressor station facilities or move into similar available habitat farther from the noise source."[449] There are a couple problems with this conclusion.

---

[445] U.S. Fish and Wildlife Service January 27, 2015 Letter to FERC (Docket CP14-112-000, Accession No. 20150202-0104).

[446] *See* DEIS at 2-2.

[447] DEIS at 4-163.

[448] *Id.* (citations omitted).

[449] *Id.* at 4-164.

CO105-70 See the response to comment CO105-65. The EIS analyzes noise impacts to wildlife in sections 4.5 and 4.11.

CO105-70 cont'd

First, FERC does not identify where the "similar available habitat" is if species are unable to habituate to the operational noise. As Figure X.C above shows, the landscape is West Virginia and Pennsylvania is becoming increasingly fragmented from shale gas development. The noise associated with that development in conjunction with more compressor stations means that the "similar habitat" that FERC refers to may not be as available as it assumes.

Second, FERC only discussed noise impacts on birds in any detail.[450] There is no discussion in this section regarding noise impacts on "other wildlife." Thus, it was inappropriate for FERC to extend its conclusion about "birds" to "other wildlife."

The failure to look at noise impacts on other wildlife species is problematic because it is likely that the dramatic increase in shale gas well and pipeline infrastructure development has already disrupted wildlife populations. For example, in 2012, the New York Department of Environmental Conservation ("NYDEC") revised its "Bobcat Management Plan" because:

> Observations by hunters and trappers, and reports from the general public suggest that bobcat populations are increasing and expanding throughout New York State outside of their historic core range in the Taconic, Catskill, and Adirondack mountains and into central and western New York. *In addition, emigration of bobcats from Pennsylvania has likely fostered growth of the bobcat population in the southern tier of the state* (Matt Lovallo, Pennsylvania Game Commission, personal communication).[451]

The plan further stated:

> The presence of bobcat in New York's Southern Tier has *increased dramatically* over the past decade. What began as occasional sightings along the New York/Pennsylvania border has progressed to large numbers of observations, trail camera photos, and incidental captures and releases by trappers. *Over the past*

[450] *See* DEIS at 4-163 – 4-164.

[451] New York Department of Environmental Conservation. Management Plan for Bobcat in New York State 2012-2017. p. 8. 2012 (emphasis added). *available at:* http://www.dec.ny.gov/docs/wildlife_pdf/finalbmp2012.pdf.

CO105-70 cont'd

five years there have been 332 bobcat observations documented in the harvest expansion area[.][452]

The following figure, showing the number confirmed bobcat observations in New York from 2006-2011, reveals a concentration of observations along the Pennsylvania border:

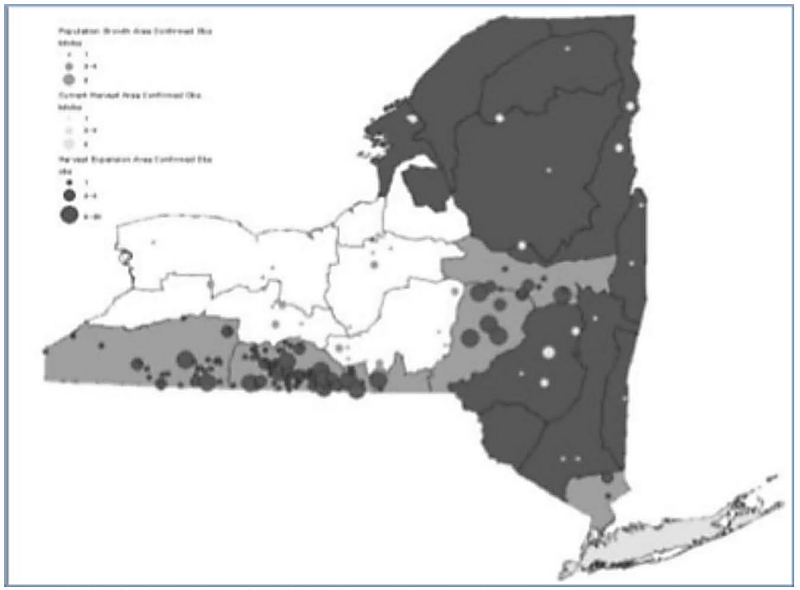


Figure X.D: Total Confirmed Bobcat Observations, 2006-2011
Source: NYDEC Bobcat Management Plan, p. 17.

While NYDEC was documenting an increase in bobcat observations in the southern tier of New York between 2006-2011, hundreds and then thousands of shale gas wells were being drilled in the northern tier of Pennsylvania. As Figure X.C indicates, between 2006-2011, gas companies

[452] *Id.* at 17 (emphasis added).

CO105-70 cont'd

drilled at least 4,858 shale gas wells in Pennsylvania. Many of these wells were drilled in Pennsylvania's northern tier. Thus, at the same time the gas industry began and then rapidly escalated gas drilling across the northern tier of Pennsylvania, the bobcat population in the southern tier of New York "increased dramatically." Since there has been no shale gas development in New York throughout this time period due to a moratorium (and now ban)[453] on shale gas development, this suggests that the rapid increase in shale gas development in Pennsylvania may be causing "emigration of bobcats from Pennsylvania" into southern New York.

National Fuel Gas Company's 2013 Annual Report suggests why this could be happening. According to National Fuel, the drilling operations of its exploration and production subsidiary, Seneca Resources, occur 24-hours a day.[454] If shale gas drilling companies are operating in remote, forested areas 24-hours a day, and compressor stations operate 24-hours a day in remote, forested areas, then the "similar available habitat" crutch that FERC relies on may, in fact, be illusory as more gas infrastructure spreads across the landscape.

CO105-71

E. Land Use, Recreation, Special Interest Areas, and Visual Resources

FERC failed to take a hard look at cumulative impacts on land use, recreation, special interest areas, and visual resources. First, although FERC stated at the outset that it considered cumulative impacts on these resources at the HUC10 sub-watershed level,[455] FERC subsequently stated that it "focused [its] analysis of potential cumulative land use impacts on projects located

[453] *See* New York State Department of Conservation and Natural Resources, High-Volume Hydraulic Fracturing in NYS, *available at* http://www.dec.ny.gov/energy/75370.html.

[454] *See* National Fuel 2013 Annual Report, p. 3, *available at* http://s2.q4cdn.com/766046337/files/doc_financials/2013/NFG_SAR_13_Final.pdf (emphasis added).

[455] DEIS at 4-476.

CO105-71 See the response to comment CO105-61.

CO105-71 cont'd

close by or immediately adjacent to the proposed MVP and EEP construction workspaces."[456] This seems to be a smaller geographic area than HUC10 sup-watersheds, which itself is too narrow and bears no ecological relationship to these resource areas.

CO105-72

Second, FERC used different standards in assessing cumulative impacts on these resources areas. For example, for impacts to prime farmland, FERC used specific acreages to describe the impacts of MVP, EEP, and the projects in Appendix U.[457] For recreation and special-interest lands, however, FERC provided no acreages. Instead, FERC simply stated that there could be cumulative impacts on recreation and special-interest areas "if other projects affect the same areas or feature at the same time" that MVP and EEP are constructed.[458] FERC should have determined the acreage of recreation and special-interest lands impacted by both the MVP and EEP as well as other projects, including shale gas well and infrastructure development projects.

CO105-73

To satisfy NEPA, FERC must take a much broader view of cumulative impacts of shale gas development and on land use, recreation, special interest areas, and visual resources because such development is encroaching upon, currently impacting and substantially altering such areas, including public lands that provide outstanding opportunities for remote recreation. For example, according to the Pennsylvania Department of Conservation and Natural Resources (DCNR),

> The majority of [shale gas] development [on state forests] has occurred in the Devonian-aged Marcellus Shale. Approximately 1.5 million acres of state forest lands lie within the prospective limits of the Marcellus Shale. Assuming a drainage area of 120 acres per well, the [DCNR's Bureau of Forestry (Bureau)]

[456] DEIS at 4-507.

[457] DEIS at 4-508.

[458] *Id.*

CO105-72 See the response to CO105-61.

CO105-73 We conclude that our geographic scope is appropriate for the analysis of cumulative impacts.

CO105-73 cont'd

> expects that approximately *3,000 wells may be drilled* to fully develop the lands it currently has leased . . . In recent years, there has been a marked increase in the development of the Ordovician-aged Utica Shale in western Pennsylvania and eastern Ohio . . . As development moves eastward from the Pennsylvania-Ohio border, the [Bureau] has seen an increased interest in the Utica Shale on state forest lands. Development of the Utica has become increasingly prevalent adjacent to state forest lands, primarily in Tioga County and the northwestern section of the state forest system.[459]

Thus, these remote, forested area of Pennsylvania, which contains outstanding biological and recreational features, are seriously threatened by rapidly encroaching shale gas development. As DCNR explains,

> Unconventional shale-gas development can cause short-term or *long-term conversion of existing natural habitats to gas infrastructure.* The footprint of shale-gas infrastructure is a byproduct of shale-gas development. The use of existing transportation infrastructure on state forest lands, such as roads and bridges, increase considerably due to gas development . . . Shale-gas development requires *extensive truck traffic by large vehicles*, which may require upgrades to existing roads to support this use. These upgrades may affect the wild character of roads, a value that is enjoyed by state forest visitors . . . Compressor stations commonly are used in association with gas production and pipelines. Compressor stations increase the gas pressure at the well bore or within pipelines to overcome friction or production volume decreases. *Noise from compressors can dramatically affect a state forest user's recreational experience and generate conflict.* Unlike compressors, most sources of potential noise on state forest land are temporary in nature . . . The development of oil and gas resources requires pipelines for delivering the product to market. When compared to other aspects of gas development, *pipeline construction has the greatest potential to cause forest conversion and fragmentation* due to the length and quantity of pipelines required.[460]

The U.S. Forest Service ("USFS") has also explained how oil and gas development has "industrialized" the Allegheny National Forest in Pennsylvania:

> The value of the land to provide recreation opportunities is diminished in intensively developed oil fields. The land area is *crisscrossed with roads*, which are confusing to navigate and usually not open to public travel. The *sounds of*

[459] DCNR, 2015 Draft State Forest Management Plan, 134-35 (emphasis added), *available at* http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_20031287.pdf.

[460] *Id.* at 136-38 (emphasis added).

CO105-73 cont'd

> *vehicles, pump engines and heavy equipment are common and pervasive.* Trail systems that traverse these fields are interrupted by *frequent road crossings*. Some trails may be converted to roads when the trail is located in an appropriate location for road building. Mineral owners may continue to expand the oil field to the extent of its geologic limit. Some of the developed oil fields cover thousands of acres. *The inherent character of the landscape is converted to an industrial atmosphere in the midst of the forest.*[461]

In the 2007 Forest Plan FEIS, the USFS cautioned that, because of the amount of oil and gas drilling in the Allegheny National Forest, "those seeking a more remote and less developed recreation experience *could be displaced to other State or National Forests where remote, semi-primitive settings and experiences are more readily available.*"[462] Now, pipeline projects like MVP and shale gas development are combining to rapidly fragment these other state and national forest lands. These are long-term land use changes from a rural, forested setting to an increasingly industrialized setting.

In addition to encroaching shale gas impacts on Pennsylvania's state forests, the Bureau of Land Management ("BLM") recently announced that it leased over 700 acres of the Wayne National Forest in Ohio.[463] An additional 38,000 acres could be auctioned in 2017.[464] With EQT's infrastructure footprint, as well as other companies pipeline infrastructure in the region, it

[461] USFS, Allegheny National Forest Roads Analysis Report, 44 (2003) (emphasis added), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5048405.pdf.

[462] USFS, Allegheny National Forest Land and Resource Management Plan FEIS, 3-327 (2007) (emphasis added), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5044089.pdf.

[463] *See* James F. McCarty, The Plain Dealer, Gas companies spend $1.7 million for exploration rights to Wayne National Forest in SE Ohio (Dec. 14, 2016), *available at* http://www.cleveland.com/metro/index.ssf/2016/12/gas_companies_spend_17_million.html.

[464] *Id.*

CO105-73 cont'd

is possible that once MVP is constructed, gas from the Wayne National Forest could be flowing on MVP.[465]

In addition to shale gas development, new pipeline infrastructure is impacting public lands in the region. MVP will cut 3.4 miles of new right-of-way through the Jefferson National Forest in West Virginia and Virginia.[466] The proposed Atlantic Coast Pipeline would cut through the Monongahela National Forest in West Virginia and the George Washington National Forest in Virginia.[467] In Ohio, the proposed Leach Xpress Pipeline Project would be located within a half-mile of the Wayne National Forest in Ohio.[468] In Pennsylvania, the Atlantic Sunrise Pipeline and Susquehanna West Project would impact public lands in Sproul State Forest and Tioga State Forest, respectively.[469]

As pipeline construction and shale gas development proliferate in Appalachia, remote recreation opportunities are rapidly diminishing. As noted above, the USFS has already told the public that oil and gas development has so impacted Pennsylvania's Allegheny National Forest that "those seeking a more remote and less developed recreation experience *could be displaced to other State or National Forests where remote, semi-primitive settings and experiences are*

---

[465] *See* EQT Midstream Partners, Customer Portal – Interstate Pipeline Overview, available at https://customers.eqtmidstreampartners.com/Interstate (see map showing multiple pipelines with access to southeast Ohio).

[466] *See* DEIS at ES-8.

[467] *See* FERC, Supplemental Notice of Intent to Prepare an EIS for the Atlantic Coast Pipeline Project (Docket CP15-554-000; Accession No. 20160503-3002).

[468] *See* Columbia Gas Transmission, LLC, Leach Xpress Pipeline Project, Resource Report 8 at 8-19 (Docket No. CP15-514-000, Accession No. 20150608-5049).

[469] *See* Draft Environmental Impact Statement for the Atlantic Sunrise Project at 4-88 (CP15-138-000); Susquehanna West Project Environmental Assessment at 2 (CP15-148-000, Accession No. 20160317-4001).

CO105-73 cont'd

more readily available."[470] But as pipeline construction and shale gas development continues expanding, these "other State or National Forests" might themselves become just as impacted as the Allegheny National Forest. This is a regional degradation of our public lands and it is imperative that FERC greatly expand the scale at which it considers cumulative impacts on public lands. FERC did not do this and, therefore, the DEIS is legally deficient.

CO105-74

F. Air Quality

FERC failed to take a hard look at the cumulative impacts of the Project and past, present and reasonably foreseeable future shale gas development on air quality. As Figure X.C shows, there has been substantial shale gas development in the vicinity of the project areas for MVP and EEP. Instead of trying to quantify the emissions impacts of existing and reasonably foreseeable wells, FERC simply states that "oil and gas drilling activities . . . would need to comply with federal, state, and local air regulations[.]"[471] Therefore, FERC "conclude[d] that operation of the MVP and the EEP in combination with other projects would not result in significant cumulative impacts on air quality."[472] Such conclusory statements are insufficient.[473]

The fact that gas wells "would need to comply with federal, state, and local air regulations" does not excuse FERC from its obligation of analyzing these cumulative impacts. FERC has an independent duty to review the environmental and human health impacts of the Project and cannot simply rely on the regulatory efforts by the EPA and DEP.[474] Moreover, the

[470] USFS, Allegheny National Forest Land and Resource Management Plan FEIS, 3-327.

[471] DEIS at 4-513.

[472] *Id.*

[473] *Delaware Riverkeeper*, 753 F.3d at 1319-20.

[474] *See, e.g., Idaho v. Interstate Commerce Comm'n*, 35 F.3d 585, 595-96 (D.C. Cir. 1994) (agency fails to take a "hard look" when it "defers to the scrutiny of others"); *North Carolina*

CO105-74 Air quality including cumulative effects are discussed in sections 4.11.1 and 4.13 of the EIS.

CO105-74 cont'd

issuance of a permit simply means that a polluting source has met a "minimum condition"; it does not establish that a project will have no significant impact under NEPA.[475]

Because FERC unreasonably restricted the extent of its cumulative impacts analysis, failed to quantify many of the effects that it does acknowledge, and repeatedly relied on conclusory statements to dismiss significant impacts, the DEIS's cumulative impacts analysis does not meet the requirements of NEPA. FERC must remedy those defects in a revised DEIS and provide that analysis for public comment.

CO105-75

XI. The DEIS Fails to Provide Adequate Information to Justify Amendments to the Land Resource Management Plan for the Jefferson National Forest

In order to accommodate construction and operation of the MVP across the Jefferson National Forest, the U.S. Forest Service ("USFS") has proposed four significant amendments to the forest's Land Resource Management Plan (hereinafter, "LRMP" or "Forest Plan"). The LRMP for the Jefferson National Forest ("JNF") was first developed in 1985, and revised in 2004. All projects or activities within a National Forest must be consistent with the governing Forest Plan, pursuant to 36 C.F.R. § 219.15.

National Forest System ("NFS") lands are managed for multiple uses and provide suitable habitat for many common and special status wildlife species. The Jefferson National Forest Revised LRMP (USDA, 2004) provides guidelines to ensure coordination of the multiple

v. Fed. Aviation Admin., 957 F.2d 1125, 1129-30 (4th Cir. 1992) ("[NEPA] precludes an agency from avoiding the Act's requirements by simply relying on another agency's conclusions about a federal action's impact on the environment.")

[475] *Calvert Cliff's Coordinating Comm. v. U.S. Atomic Energy Comm'n*, 449 F.2d 1109, 1123 (D.C. Cir. 1971); *WildEarth Guardians v. U.S. Office of Surface Mining, Reclamation & Enforcement*, 104 F. Supp. 3d 1208, 1227-28 (D. Colo. 2015) (rejecting argument that coal mine's compliance with the Clean Air Act exempts mine from review for significant impacts to the environment under NEPA because "[i]t is the duty of OSM [Office of Surface Mining] to determine where a mining plan modification would contribute to such an effect, whether or not the mine is otherwise in compliance with the Clean Air Act's emissions standards.").

CO105-75 See the responses to comments FA8-1 and FA10-1.

CO105-75 cont'd

components of land use. This includes management prescriptions for different management areas within the National Forest ("NF") to provide specific direction regarding how to manage different ecological regions, watershed boundaries, or other biological or social divisions of land.[476]

Consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. §§ 528-531), the USFS manages the national forest system to sustain the multiple use of its renewable resources in perpetuity while maintaining the long-term health and productivity of the land. Resources are managed through a combination of approaches and concepts for the benefit of human communities and natural resources. Land management plans guide sustainable, integrated resource management of the resources within the plan area in the context of the broader landscape, giving due consideration to the relative values of the various resources in particular areas.[477]

A plan amendment must be performed according to the requirements of the 2012 U.S. Forest Service rule pertaining to National Forest System Land Management Planning.[478] Therefore, the responsible official's discretion is not unbounded; an amendment cannot be tailored so that the amendment fails to meet directly related substantive requirements of the rule. Rather, the responsible official must determine which substantive requirements within §§ 219.8 through 219.11 of the 2012 rule (pertaining to sustainability, plant and animal diversity, multiple uses, and timber requirements based on NFMA) are directly related to the plan direction being added, modified, or removed by the amendment and apply those requirements to the

[476] DEIS at 4-159.

[477] 36 C.F.R. § 219.1(b).

[478] *See* 36 C.F.R. § 219.17(b)(2)(2012).

CO105-75 cont'd

amendment.[479] The decision document for an amendment must include a rationale for the responsible official's determination of the scope and scale of the amendment, which requirements within §§ 219.8 through 219.11 are directly related, and how they were applied.[480]

Here, the MVP is proposed to cross a 3.4-mile portion of the JNF in Giles, Craig, and Montgomery Counties, Virginia. Construction of the pipeline would impact at least 81 acres in the JNF, including the pipeline right-of-way and access roads. Operation of the pipeline would affect a total of about 38 acres in the JNF, including the permanent right-of-way easement and permanent access roads. To address proposed impacts on the JNF, the LRMP would need to be amended, as required, such as in relation to the Appalachian National Scenic Trail (ANST), to make provisions for the MVP. The MVP Plan of Development (POD) would identify mitigation measures that are deemed necessary by the USFS to accomplish goals and objectives of the LRMP.[481] FERC relies, in part, on best management practices (BMPs) or mitigation measures to conclude that it does not anticipate any adverse impacts on sensitive resources within the JNF.[482]

The proposed mitigation measures that FERC relies upon here are vague and unenforceable. Additionally, neither FERC nor the USFS have enough information to fully evaluate the impacts on the sensitive resources within the JNF, particularly impacts to visual resources. Therefore, the proposed LRMP amendments are not in compliance with the 2012 regulations in 36 C.F.R. § 219.15 and the Forest Plan for Jefferson National Forest.

---

[479] U.S. Department of Agriculture, U.S. Forest Service, Final Rule on National Forest System Land Management Planning, 36 CFR Part 219, December 15, 2016, *available at*: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd527447.pdf.

[480] *Id.* at 15.

[481] DEIS at 4-516.

[482] DEIS at 4-517.

CO105-76

A. Standards for Forest Plan Amendments

Land management plans guide management of NFS lands so that they are ecologically sustainable and contribute to social and economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future. These benefits include clean air and water; habitat for fish, wildlife, and plant communities; and opportunities for recreational, spiritual, educational, and cultural benefits.[483] Projects and activities must be consistent with the plan.[484]

The process for developing or revising a forest plan includes assessment, preliminary identification of the need to change the plan based on the assessment, development of a proposed plan, consideration of the environmental effects of the proposal, providing an opportunity to comment on the proposed plan, providing an opportunity to object before the proposal is approved, and, finally, approval of the plan or plan revision. A new plan or plan revision requires preparation of an environmental impact statement.[485]

Forest Plan amendments are guided by direction in the NFMA and USFS planning regulations.[486] The process for amending a plan includes: preliminary identification of the need to change the plan, development of a proposed amendment, *consideration of the environmental effects of the proposal*, providing an opportunity to comment on the proposed amendment,

[483] 36 C.F.R. §219.1(c).

[484] *Id.* §219.15.

[485] *Id.* §219.5(2)(i).

[486] *Id.* §§ 219.5 and 219.13.

CO105-76 See the response to comments FA8-1 and FA10-1.

CO105-76 cont'd

providing an opportunity to object before the proposal is approved, and, finally, approval of the plan amendment.[487] The appropriate NEPA documentation for an amendment may be an environmental impact statement, an environmental assessment, or a categorical exclusion, depending upon the scope and scale of the amendment and its likely effects. Here, Mountain Valley has not provided adequate information to permit FERC and the USFS to fully consider the environmental effects of the MVP proposal.

The National Forest Management Act (NFMA) requires that proposed projects, including third-party proposals subject to permits or rights-of-way, be consistent with the Forest Plan of the administrative unit where the project would occur. When a project would not be consistent with the Forest Plan where the project would occur, the FS has the following options: (1) modify the proposed project to make it consistent with the Forest Plan; (2) reject the proposal; (3) amend the Forest Plan so that the project would be consistent with the plan as amended; or (4) amend the Forest Plan contemporaneously with the approval of the project so the project would be consistent with the plan as amended. The fourth option may be limited to apply only to the project.[488]

As further described below, the USFS has the authority, which it should use in this case, to reject the MVP proposal until Mountain Valley provides adequate information to fully consider its environmental effects. FERC itself acknowledges that the linear nature of the pipeline corridor and the topography of the JNF make it difficult to avoid every circumstance that would be inconsistent with the management direction and standards in the Forest Plan. FERC states that Mountain Valley has cooperated with the USFS to make its proposal consistent

[487] *Id.* §219.5(2)(ii) (emphasis added).

[488] 36 C.F.R. §219.15(c); MVP DEIS at 4-260.

CO105-76 cont'd

with the Forest Plan *where feasible* (meaning, not in all cases) and has proposed additional mitigation measures.[489] However, many of the proposed mitigation measures are vague and unenforceable.

CO105-77

B. Proposed Impacts to the Jefferson National Forest

About 3.4 miles of the MVP pipeline route would cross the JNF. The construction of the MVP would impact at least 81 acres. Impacts on National Forest resources that are proposed to be minimized or mitigated must be approved by the USFS and Bureau of Land Management (BLM). The proposed route of the MVP would cross five separate management prescriptions outlined in the Jefferson National Forest Plan: ANST Corridor (Rx4A); Mix of Successional Habitats in Forested Landscapes (Rx8A1); Old Growth Forest Communities-Disturbance Associated (Rx6C); Urban/Suburban Interface (Rx4J); and Riparian Corridors (Rx11). Construction of the MVP would result in a long-term impact on about 14.1 acres within Rx4J and 52.4 acres within Rx8A1. Operation of the MVP would result in a permanent loss of timber of about 31.1 acres, including 5.7 acres of Rx4J and 25.4 acres of Rx8A1. In the DEIS, the USFS analyzed amendments to its LRMP to allow for the MVP within the JNF. This includes one plan-level amendment to reallocate management prescription areas, and three project-specific amendments that apply to the MVP only.[490]

Some of the impacts to JNF resources are as follows:

- The pipeline would cross the Appalachian National Scenic Trail (ANST) and the Brush Mountain Inventoried Roadless Area.[491]

[489] DEIS at 4-260 (emphasis added).

[490] DEIS at ES-8.

[491] DEIS at ES-8.

CO105-77 Impacts on the Jefferson National Forest, BRP, and ANST are discussed in section 4.8 of the EIS.

CO105-77 cont'd

- Potential impacts on groundwater along the MVP pipeline route across the Jefferson National Forest associated with clearing, grading, and trenching during construction.[492]
- The MVP would cross two watersheds (HUC-8): the Upper James and the Middle New. The project would conduct 27 waterbody crossings within the JNF. All waterbodies would be crossed using dry open-cut methods (dam and pump or flume crossing). One waterbody that would be crossed, Craig Creek, is an NRI-listed waterbody and also contains habitat for threatened and endangered species.[493]
- Construction of the MVP would affect about 81 acres of forest spanning three major forest community types, mixed mesophytic and western mesophytic forest, dry mesic oak forest, and dry and dry-mesic oak-pine forest.[494]
- Impacts on game species and hunting may occur during construction. As with other portions of the MVP right-of-way, game species would be temporarily displaced during construction. Permanent impacts on game species would occur where herbaceous vegetation is maintained in place of forested habitat.[495]
- U.S. Forest Service-designated old growth forest will be affected by construction of the MVP. Sections old growth forests (dry mesic oak forest) would be cleared in order to install and maintain the pipeline.[496]

CO105-78

C. Proposed LRMP Amendments[497]

1. Proposed Amendment 1 – Changed Land Allocations

The first type of proposed Forest Plan amendment is a "plan-level amendment" that would change land allocations. A "plan-level amendment" is needed because there would be a

[492] DEIS at 4-84.

[493] DEIS at 4-106

[494] DEIS at 4-137.

[495] DEIS at 4-170.

[496] DEIS at 3-27 and 4-137.

[497] On December 19, 2016, Thomas Bouldin submitted comments on the proposed LRMP amendments to the FERC Docket for the MVP (Accession No. 20161219-5143). Commenters hereby incorporate those comments by reference.

CO105-78 See the response to comment FA8-1 regarding Amendment 1.

CO105-78 cont'd

change in the future management direction for the lands reallocated to the new management prescription (Rx), as required by LRMP Standard FW–248.

Pursuant to Proposed Amendment 1, the LRMP would be amended to reallocate 186 acres to the Management Prescription 5C–Designated Utility Corridors. Rx 5C–Designated Utility Corridors contain special uses which serve a public benefit by providing a reliable supply of electricity, natural gas, or water essential to local, regional, and national economies. However, Mountain Valley fails to demonstrate that the MVP would serve a public benefit to local, regional, or national economies. The DEIS could not form the basis for such a determination because it fails to evaluate whether the pipeline is necessary to serve the public's need for natural gas or, more broadly, electric generation.[498]

The new Rx 5C land allocation would be 500 feet wide (250 feet wide on each side of the pipeline), with two exceptions: (1) the area where the pipeline crosses Rx 4A– Appalachian National Scenic Trail Corridor would remain in Rx 4A; and (2) the new 5C area would not cross into Peters Mountain Wilderness, so the Rx 5C area would be less than 500 feet wide along the boundary of the Wilderness. However, land will be removed from the following Rxs and added to Rx 5C for the MVP:

- Rx 4J – Urban/Suburban Interface (56 acres); 6C–Old Growth Forest Communities-Disturbance Associated (19 ac); and 8A1–Mix of Successional Habitats in Forested Landscapes (111 acres).[499]
- Rx 4J – Urban/Suburban Interface is north of the city of Blacksburg, Virginia, and this area is designed to be a buffer between urban/suburban developments and forest lands,

[498] DEIS at 1-9 (acknowledging that the EIS "does not address in detail the need or public benefits of either the MVP or the EEP").

[499] DEIS at 4-237.

CO105-78 cont'd

reducing the risk of wildland fire. The Rx 4J allows active management and new utility corridors. This includes the Brush Mountain Inventoried Roadless Area (IRA).[500]

- Rx 6C – Old Growth Forest Communities Associated with Disturbance areas are managed to emphasize protection, restoration, and management of old growth forests and their associated wildlife, botanical, recreational, scientific, educational, cultural, and spiritual values. Most of the areas contain forest communities where no forest management activities occur. These areas are unsuitable for new utility corridors.[501]

The Forest Plan states that "utility corridors designated as Prescription Area 5C are linear areas 50-1,000 feet wide to accommodate access for maintenance, to *facilitate co-location of new utilities*, and include all existing utility rights-of-way 50 feet wide and larger under special use permit." Forest Plan at 2-59 (emphasis added). The Forest Plan also notes that "[u]tility corridors and communication sites on NFS lands minimize negative environmental, social, or visual impacts; minimize acres of land affected; are designed using good engineering and technological practices; and clearly benefit society."[502] FW-247 in the Forest Plan suggests to "[d]evelop and use existing corridors and sites to their greatest potential in order to reduce the need for additional commitment of lands for these uses. When feasible, expansion of existing corridors and sites is preferable to designating new sites."[503] Decisions for new authorizations outside of existing corridors and designated communication sites will include an amendment to the Forest

[500] DEIS at 4-237 and 4-238. The Roadless Area Conservation Rule (RACR) applies within the Brush Mountain IRA. The RACR prohibits timber removal and road construction and reconstruction in IRAs except under specific circumstances. 36 C.F.R. 294. The RACR does not prohibit special use permits for the construction of utility corridors. The FEIS for the RACR specifically states that "under these alternatives, all or part of the more common types of uses [non-recreation special uses] could occur without road construction, but most likely, at a higher cost than if road construction was allowed to occur." It also allows incidental timber harvest in the implementation of a management activity not otherwise prohibited by the rule.

[501] DEIS at 4-237.

[502] *Id.*

[503] *Id.* at 2-60.

CO105-78 cont'd

Plan designating them as Prescription Area 5B or 5C.[504] Standard 4A-028 in the Forest Plan also instructs to "[l]ocate new public utilities and rights-of-way in areas of this management prescription area where major impacts already exist. Limit linear utilities and rights-of-way to a single crossing of the prescription area, per project."[505]

We recognize that MVP's proposed route utilizes co-location to some extent. However, the DEIS fails to demonstrate why full co-location within existing corridors is infeasible. Before amending the Forest Plan to create additional 5C designations, Mountain Valley must be required to fully survey existing 5C areas for suitability. The Forest Plan's maps show multiple routes that could fully traverse the National Forest using existing 5C Designated Corridors.[506] Without an explanation of why the use of existing corridors is not feasible, the USFS cannot determine whether the MVP project is in compliance with the 2012 rules or the Forest Plan, and does not have adequate information to determine whether a Forest Plan amendment is appropriate. Additionally, the DEIS does not analyze the environmental, resource, or cultural impacts of these re-designations. The DEIS specifies the areas and amount of acreage that will require re-designation of lands from one prescription to another, but fails to provide an adequate analysis of the associated environmental impacts. Therefore, the DEIS cannot form the basis for the plan-level amendment decision.

CO105-79

2. Proposed Amendment 2 – Exceedances on Soil Restrictions and Riparian Corridor Conditions

Amendments 2-4 are all ''project-specific amendments'' that apply only to the construction and operation of the MVP. FERC asserts in the DEIS that the intent of many Forest

[504] *Id.* at 2-60.

[505] Forest Plan at 3-23.

[506] *See* Feb. 13, 2015 Comments of Wild Virginia to the USFS, at 6-7, attached as Exhibit K.

CO105-79 See the response to comment FA10-1 regarding Amendment 2.

CO105-79 cont'd

Plan standards is that they could be met with additional mitigation measures and monitoring activities that are agreed upon by the USFS and identified in the POD and Environmental Protection Plans.[507] However, as further described below, many of the proposed mitigation measures are vague and unenforceable.

Pursuant to Proposed Amendment 2, the Forest Plan would be amended to allow construction of the MVP pipeline to exceed restrictions on soil conditions and riparian corridor conditions as described in FW-5, FW-9, FW-13, FW-14 and 11-017 standards, provided that mitigation measures or project requirements agreed upon by the USFS are implemented as needed.[508] Riparian Corridors include the riparian habitat along streams, lakes, wetlands, and floodplains. These corridors are managed to retain, restore and/or enhance the inherent ecological processes and functions of the associated aquatic, riparian, and upland components within the corridor. These areas are not specifically mapped on the Rx area map but are embedded within other Rxs. Ground disturbing activities are allowed within this Rx if necessary; however, resource effects are proposed to be minimized by applicable standards and mitigation measures.[509]

i. FW-5

FW-5 states that on all soils dedicated to growing vegetation, the organic layers, topsoil and root mat will be left in place over at least 85% of the activity area and revegetation is accomplished within 5 years.[510]

---

[507] DEIS at 4-262.

[508] DEIS at 4-262.

[509] DEIS at 4-237.

[510] Forest Plan at 2-7.

CO105-79 cont'd

Here, it appears that the mitigation measure proposed in the DEIS for FW-5 is that topsoil removed during construction would be stored separately of other material and replaced as directed by the Forest.[511] This proposed mitigation measure is vague in that it does not specify where and how topsoil will be removed, stored, or replaced, which would make this mitigation measure unenforceable if FWS were to dispute the methodology of removal, storage, or replacement, utilized by Mountain Valley. There is also no evaluation of the potential environmental impacts of this standard, either with or without the implementation of the proposed mitigation measures.

CO105-80

ii. FW-9

FW-9 states that heavy equipment is operated so that soil indentations, ruts, or furrows are aligned on the contour and the slope of such indentations is 5 percent or less.[512]

Here, FERC acknowledges that because of the linear nature of the MVP and requirements for pipeline installation, heavy equipment operating within the construction right-of-way would not meet this standard. It instead proposes a mitigation measure consisting of temporary erosion and sediment controls used during construction to control and confine overland surface water flow. Following construction, ground contours and surface flow outlets would be restored to pre-construction conditions.[513]

FERC fails to explain why this project should go forward if Mountain Valley cannot meet standard FW-9 due to the nature and requirements for pipeline installation. FERC also fails to quantify or explain the amount and extent of the soil damage anticipated. Without a projection

[511] DEIS at 4-262.

[512] Forest Plan at 2-7.

[513] DEIS at 4-263.

CO105-80 The Restoration Plan (POD, Appendix H) states "all disturbed areas will be regraded and re-contoured to reestablish drainage patterns, except at those locations where permanent changes in drainage will be required to prevent erosion, scour, and possible exposure to the pipeline. The emphasis during re-contouring will be to return the entire right-of-way to its approximate original contours, stabilize slopes, control surface drainage, and aesthetically blend the area with the contours of adjacent lands." The FS would have its own inspectors on site during construction and during restoration to ensure that the intent of standard FW-9 for the protection of the soil resource is met.

CO105-80 cont'd

of soil damage, it is not possible for the public or the agencies involved to make informed decisions about whether the proposed soil damage can be mitigated. The proposed mitigation measure is vague in that it does not specify how soils will be restored and fails to provide a definition of "pre-construction conditions" so that the public or the agencies involved can fully understand the type and extent of restoration that will be necessary. Without a pre-defined restoration standard, it will be difficult for the USFS to enforce this mitigation measure in the field once work has begun.

CO105-81

iii. FW-13

FW-13 states that management activities expose no more than 10% mineral soil in the channeled ephemeral zone (required on 25 feet on each side of a channeled ephemeral stream and 25 feet upstream for the point at which the scoured channel begins (the "nick point")).[514]

Here, FERC summarily concludes that the linear nature of the MVP and the topography of the JNF would require exposure of mineral soil above the 10% standard in channeled ephemeral zones, without providing any information to support this conclusion.[515] FERC fails to explain why this project should go forward if Mountain Valley cannot meet this standard due to the nature of the project and existing topography. FERC also fails to quantify or explain the amount and extent of the soil exposure damage anticipated. Without a projection of soil damage, it is not possible for the public or the agencies involved to make informed decisions about whether the proposed soil damage can be mitigated. Further, there is no mitigation measure identified to mitigate any impacts resulting from soil exposure.

CO105-82

iv. FW-14

[514] Forest Plan at 2-8.

[515] DEIS at 4-263.

CO105-81 The Restoration Plan (POD, Appendix H) requires the segregation of topsoil so that it can be replaced after construction. The FS would have its own inspectors on site during construction and during restoration to ensure that the intent of standard FW-13 for the protection of the soil resource is met.

CO105-82 Mountain Valley has worked with the FS in the avoidance of routing the pipeline parallel to streams as much as possible to avoid impacting riparian habitat. Mountain Valley has committed to restoring the riparian area along the tributary to Craig Creek with hand planted trees and shrubs.

CO105-82 cont'd

FW-14 states that up to 50% of the basal area may be removed down to a minimum basal area of 50 square feet per acre. Removal of additional basal area is allowed on a case-by-case basis when needed to benefit riparian-dependent resources.[516]

Here, FERC again summarily concludes that the linear nature of the MVP and the topography of the JNF require removal below this basal area in channeled ephemeral zones, without providing any information to support this conclusion.[517] FERC fails to explain why this project should go forward if Mountain Valley cannot meet this standard due to the nature of the project and existing topography. FERC also fails to quantify or explain the amount and extent of the basal area removal anticipated. Without a projection of the damage, it is not possible for the public or the agencies involved to make informed decisions on whether the proposed damage can be mitigated. Further, there is no mitigation measure identified to mitigate any impacts resulting from removal below this basal area.

CO105-83

v. 11-017

11-017 states that tree removals from the core of the riparian corridor may only take place if needed in order to[518]

- Enhance the recovery of the diversity and complexity of vegetation native to the site;
- Rehabilitate both natural and human-caused disturbances;
- Provide habitat improvements for aquatic or riparian species, or threatened, endangered, sensitive, and locally rare species;
- Reduce fuel buildup;
- Provide for public safety;

[516] Forest Plan at 2-8.

[517] DEIS at 4-263.

[518] *See* Forest Plan at 3-183

CO105-83 Standard 11-017 allows tree removals from the core of the riparian corridor for approved facility construction/renovation. If the BLM decides to authorize the use of NFS for the MVP, this would be an approved construction project and this standard would allow for the removal of trees.

CO105-83 cont'd

- For approved facility construction/renovation; or
- As allowed in standards 11-012 (up to 2 percent early successional forest habitat may be created when the riparian corridor falls within the Ruffed Grouse/Woodcock Habitat Management Prescription 8E1 (measured within riparian corridor across geographically contiguous prescription block)) and 11-022 (Corridors for cable logging in areas adjacent to the riparian corridor may cross the riparian corridor. Crossing will be at as near a right angle as possible, with full suspension preferred).

Here, FERC merely restates these standards, but provides no analysis or explanation of why tree removals from the core of the riparian corridor are necessary, pursuant to the standards identified above.[519] It also fails to provide any proposed mitigation measures to offset any impacts of such tree removals. Therefore, neither the public nor the agencies involved have adequate information to determine whether the proposed tree removals from the core of the riparian corridor are consistent with the 2012 rules or the Forest Plan for the JNF.

CO105-84

3. Proposed Amendment 3 – Removal of Old Growth Forest

Pursuant to Proposed Amendment 3, the LRMP would be amended to allow the removal of old growth trees within the construction corridor of the MVP.[520]

Standard FW-77 states that inventory stands for existing old growth conditions during project planning are performed using the criteria in Appendix D of the Forest Plan. The contribution of identified patches to the distribution and abundance of the old growth community type and to the desired condition of the appropriate prescription during project analysis must be considered. For purposes of project planning, the following forest types are considered well-represented in the current inventory of existing old growth for the JNF and may be cut through resource management activities: Dry and Xeric Oak Forest Woodland and Savanna; Dry and Dry-Mesic Oak-Pine Forest.

[519] DEIS at 4-263.

[520] DEIS at 4-263.

CO105-84 See the response to comment FA10-1 regarding Amendment 3.

CO105-84 cont'd

Generally speaking, "old growth" refers to forests containing trees that are often hundreds, sometimes thousands, of years old.[521] Protecting remaining old-growth is important for many reasons; these areas provide some of the cleanest drinking water in the world, critical wildlife habitat, world-class recreational opportunities, and critical carbon storage to offset climate change. Healthy forests in general and older forests in particular provide many useful ecological services to society—benefits to households, communities, and economies such as maintaining clean air and water and enriching soils.[522]

Forests play an important role in global climate change by absorbing atmospheric carbon dioxide and sequestering, or storing, carbon. Older forests contain large quantities of organic matter in living and dead trees, other vegetation, and soils and are thus larger reservoirs of sequestered carbon than younger forests. This is an ecological service that is a special attribute of older forests.[523] Older forests improve soil quality. As they decay, fallen trees slowly release nutrients that continually enrich soils, allowing them to support more diverse ecological communities. Some large, dead trees fall into streams, creating pools and cascades that provide favorable habitats for many aquatic plant and animal species. These logs also release nutrients into the water, help keep the stream water clean by capturing debris, and reduce the impacts of floods. Water that runs off from older forests is of high quality and is valuable for wildlife and human consumption.[524] To have old growth in the future, it's necessary to protect older forests

[521] Scientific American, Are Old-Growth Forests Protected in the U.S.?, *available at*: https://www.scientificamerican.com/article/are-old-growth-forests/.

[522] National Commission on Science For Sustainable Forestry, Beyond Old Growth: Older Forests in a Changing World: A synthesis of findings from five regional workshops (2008) at 11, *available at*: http://ncseonline.org/sites/default/files/BOG.pdf.

[523] *Id.*

[524] *Id.*

CO105-84 cont'd

that are nearing old-growth conditions and to sustain a resilient forest landscape by encouraging a wide range of forest types and ages.[525]

Despite all of the important benefits that old growth forests provide, the DEIS fails to fully evaluate the environmental impacts associated with removing old growth trees in the JNF. This would be a long-term impact because of the time it takes for trees to mature. Notably, the DEIS itself acknowledges that Rx 6C-Old Growth Forest Communities in the Forest are unsuitable for new utility corridors.[526] Yet FERC summarily concludes in the DEIS that "…small acreage of existing old growth would be removed. However, these project-specific amendments would not significantly change the future management of any resources or alter the level of output of any goods and services."[527] However, FERC fails to provide any information or analysis to support this conclusion, or to reconcile this statement with its prior statement that old growth forest communities are unsuitable for new utility corridors. To the contrary, as explained above, the scientific evidence makes clear that removal of old growth trees negatively "alter[s] the level of output of . . .goods and services" that the overall forest provides.

The DEIS states that existing old growth outside of the 125-foot-wide construction corridor out to the edge of the 500 feet wide Rx 5C corridor would remain; however, it could be available for removal if a new special use was authorized for collocation in the future.[528] Therefore, it appears likely that there would be a complete loss of old growth trees within the 125-foot-wide construction corridor. On the other hand, FERC states that area outside of the 50-foot-wide permanent right-of-way "would" be allowed to naturally revegetate; converting old

[525] *Id.* at 15.

[526] DEIS at 4-237.

[527] DEIS at 4-264.

[528] DEIS at 4-262.

CO105-84 cont'd

growth and mature forest to an early successional condition.[529] This means that old growth trees would be permanently removed from the pipeline right-of-way area itself, and trees removed outside of the right-of-way would be allowed to revegetate. However, the DEIS acknowledges that the revegetated area would be converted from old growth forest to early successional condition forest. Again, this statement does not comport with the prior statement that additional old growth areas could be available for removal if a new special use was authorized for collocation in the future.

FERC also fails to provide an environmental evaluation of the old growth removal and whether it is even possible to mitigate the loss of old growth and mature trees. For example, the DEIS contains no information or discussion on whether it could be feasible to transplant any old growth or mature trees out of the utility corridor to a different area within the forest, and whether long-term maintenance and monitoring could be required to ensure the success of the transplant.

CO105-85

4. Proposed Amendment 4 – Impacts to the Appalachian National Scenic Trail[530]

Pursuant to proposed Amendment 4, the LRMP would be amended to allow the MVP to cross the Appalachian National Scenic Trail (ANST) on Peters Mountain. The Scenic Integrity Objective for the Rx 4A area and the ANST will be changed from High to Moderate. This amendment also requires the Scenic Integrity Objective (SIO) of Moderate to be achieved within five to ten years following completion of the project to allow for vegetation growth.[531]

[529] DEIS at 4-138.

[530] The Appalachian Trail Conservancy submitted detailed comments on the DEIS's deficient analysis of the MVP's impacts to the ANST on December 8, 2016 (Accession No. 20161208-5043). Commenters hereby adopt and incorporate those comments by reference.

[531] DEIS at 4-264.

CO105-85 See the response to comment FA10-1 regarding Amendment 2.

CO105-85 cont'd

> Rx 4A-Appalachian National Scenic Trail Corridor lands are managed to protect the experience of users of the ANST and includes the footpath of the trail and the foreground area visible from the trail into the interior of the Forest. Roads, utility transmission corridors, communication facilities, or signs of mineral development activity exist or may be seen within the Rx area, *although the goal is to avoid these types of facilities and land uses to the greatest extent possible and blend facilities which cannot be avoided into the landscape so that they remain visually subordinate.*[532]
>
> FERC states that the following two existing standards apply specifically to the ANST:
>
> - Standard 4A-021: All management activities would meet or exceed a SIO of High. The proposed crossing of the ANST would not be able to meet the SIO of High. However, there should be design feature and vegetation plantings, to reduce the visual impacts as much as possible and achieve the highest possible SIO over time.[533]
>
> - Standard 4A-028: Locate new public utilities and rights-of-way in areas of this Rx area where major impacts already exist. Limit linear utilities and rights-of-way to a single crossing of the Rx area per project.[534]
> FERC states that there are no crossings of the ANST where major impacts already exist.

Mountain Valley intends to use horizontal conventional boring under the trail to minimize impacts on the extent possible.[535] However, FERC does not explain how any impacts that cannot be minimized will be avoided or mitigated.

CO105-86

The USFS has also expressed concerns about MVP crossing the ASNT. On May 16, 2016, the USFS filed a letter with the FERC objecting to Mountain Valley's ANST crossing plan. The USFS questioned the distance between the bore pits at the crossing. The USFS believed the bore holes and portions of the right-of-way would be visible to trail users during construction and operations. The pipeline crossing may also be visible to hikers at Angels Rest, a very popular nearby spot on the ANST. In addition, Mountain Valley's proposed ANST

[532] DEIS at 4-237 (emphasis added).

[533] Forest Plan at 3-23.

[534] Forest Plan at 3-23.

[535] DEIS at 4-264.

CO105-86 See the response to comment FA10-1.

CO105-86 cont'd

crossing would not be consistent with current JNF LRMP Standard FW-252, which specifies that a utility in the Forest must meet an SIO as high as practicable. The USFS sought alternative construction techniques or other mitigation measures to reduce visual impacts.[536]

A revised crossing plan for the ANST was filed by Mountain Valley on June 24, 2016. Mountain Valley intends to use a 600-foot-long bore to cross under the ANST, leaving a roughly 300-foot forested buffer on each side of the trail.[537] On July 22, 2016, representatives of FERC, the USFS, ATC, and RATC conducted a site visit to the alternative ANST crossing. Based on that visit, the USFS wrote a letter to FERC, dated August 5, 2016, stating that the USFS was satisfied that the bore pit location on the south side of the ANST could meet its High SIO. However, it is uncertain if the bore pit location on the north side of the ANST could meet USFS scenic objectives, and visual simulation modeling of a "leaf-off" scenario would be necessary. Crucially, this leaf-off visual impacts modeling is not included in the DEIS. FERC and the USFS thus have no basis to make conclusions regarding the visual impacts of the MVP to the ANST.

CO105-87

Even more egregious is that, although Mountain Valley states that it intends to bore under the ANST, it nonetheless "reserve[s] the idea of cutting an open trench over the [trail] if conventional boring is unsuccessful."[538] Despite seeking authority to dig an open trench through the ANST if boring is unsuccessful, neither the applicant nor FERC provides any analysis of the visual or other impacts that would be associated with such a drastic contingency plan. As the

[536] DEIS at 4-249.

[537] DEIS at 4-249.

[538] *See* Bureau of Land Management (BLM), Comments on the Federal Energy Regulatory Commission (FERC) Coordinated Project Plan and Permitting Timetable for the Mountain Valley Pipeline Project Docket No. CP16-10-000, December 1, 2016 at 6 (Accession No. 20161207-0057).

CO105-87 The ANST would be crossed by a bore as discussed in section 4.8 of the EIS. See the response to comment FA10-1.

CO105-87 cont'd

BLM notes, without this information other agencies and the public cannot meaningfully comment on those impacts or provide input on appropriate avoidance, minimization, or mitigation measures.[539]

CO105-88

Additionally, the Appalachian Trail Conservancy (ATC) also wrote a letter to the FERC, filed August 8, 2016, providing its comments on the July 22, 2016, field visit to the alternative ANST crossing. In the opinion of the ATC, the proposed MVP would be visible to users from multiple locations along the ANST. Visual simulations should be conducted to evaluate impacts. In the Alternatives section (3.5.1), FERC recommended that Mountain Valley continue coordination with the USFS and other ANST stakeholders, and file the results of visual simulations at the new trail crossing.[540] However, as the ATC made clear, visual simulations of the crossing alone are inadequate to determine visual impacts of the MVP to the ANST because the de-forested corridor would be visible from numerous locations along the trail, not just at the crossing. Without assessing the visual impacts of the MVP corridor on the experience of ANST users, the USFS cannot determine whether such impacts have been minimized.

CO105-89

In a comment letter on Final Resource Reports dated March 9, 2016, the Forest Supervisor commented that the description of management prescription 4A (Appalachian National Scenic Trail Corridor) in the 2004 FLRMP defines the corridor as the mapped visual foreground zone visible from the footpath, and lists an absolute minimum distance of 100 feet for protection from social, aural, and other impacts. The proponents should be responsible for mapping that location accurately in the area of their proposed activity. All activities within MRx4A should protect the ANST experience. The proponents do not show anywhere in the

[539] *Id.*

[540] DEIS at 4-249.

CO105-88

A revised visual analysis (including a leaf-off analysis) of the ANST can be found in section 4.8 of the final EIS. See the response to comment FA10-1.

CO105-89

See the response to comment FA11-6. See the response to comments FA8-1 and FA10-1.

CO105-89 cont'd

Resource Reports a need to conduct any surface disturbance within 4A, or why the proposed conventional bore cannot be significantly more distant from the ANST than shown, keeping it outside of the ANST management prescription, and eliminating the need for a Forest Plan amendment for the purpose of changing the ANST management prescription.

The segment of MVP's route that does not co-locate within an existing 5C Utility Corridor crosses the ANST Corridor, management area 4A, which is subject to its own management directives. That corridor is to be managed for, among other things, "the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the land through which the Trail passes," while adjacent areas should be managed "in a manner which will reasonably harmonize with and be complementary to the Appalachian Trail experience."[541]

The Forest Plan specifically addresses the relationship between utility corridors and the ANST corridor, stating a goal of avoiding the existence of utility corridors within the viewshed of the Appalachian Trail corridor "to the greatest extent possible."[542] Where utility crossings cannot be avoided, Standard 4A-028 requires the Forest Service to "[l]ocate new public utilities and rights-of-way in areas of this management prescription area where major impacts already exist."[543]

MVP's application fails to provide adequate information to determine compliance with the Forest Plan's management prescriptions for the ANST corridor. MVP has not demonstrated why avoidance of crossing the corridor is not feasible, nor has it even claimed that its proposed

[541] Forest Plan at 3-19.

[542] Forest Plan at 3-20.

[543] Forest Plan at 3-23.

CO105-89 cont'd

crossing is in an area where "major impacts already exist." Furthermore, FERC fails to explain the basis for its conclusion that there are no areas where major impacts already exist—despite the existence of an electric transmission line, road crossings, and a separate natural gas pipeline in nearby locations that could present opportunities for co-location. A major new pipeline right-of-way is not compatible with the "conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the land through which the Trail passes," nor would it "reasonably harmonize with and be complementary to the Appalachian Trail experience." Without information showing that MVP's proposed crossing location is located at an area where "major impacts already exist," the USFS cannot approve a Forest Plan amendment.

While the DEIS finds that the effects of Proposed Project-Specific Amendments would be restricted to the project area and would apply to a very small portion of the JNF, it acknowledges that there would be impacts on a small portion of the ANST where the SIO of High would not be met, and that a small acreage of existing old growth would be removed. After acknowledging these impacts, it summarily concludes that

> these project-specific amendments would not significantly change the future management of any resources or alter the level of output of any goods and services. They would not significantly affect the desired conditions, objectives, or suitable uses for long-term land and resource management in the Jefferson National Forest. The amendments would not change future management direction or apply to any other projects or activities on the Jefferson National Forest.[544]

However, there is no explanation on how FERC arrived at this conclusion based on the impacts described.

CO105-90

FERC summarily concludes that based on the provided visual simulations impacts would be minor, yet acknowledges that in June 2016, Mountain Valley filed an alternative crossing of the ANST, and both the USFS and ATC requested additional visual simulation modeling of the

[544] DEIS at 4-264.

CO105-90 Mountain Valley filed additional visual impact analysis for various KOPs along the ANST and within the Jefferson National Forest, and the results are included in the final EIS.

CO105-90 cont'd

new crossing location. FERC goes on to recommend in the Alternatives section (3.5.1) that Mountain Valley continue coordination with the USFS and other ANST stakeholders and file the results of visual simulations for the new ANST crossing.[545] FERC acknowledges that in selected areas such as at the ANST crossing in the JNF, the potential for visual impact is elevated and is still being assessed as of the time of this draft EIS and may be mitigated further.[546] FERC and the USFS, however, cannot put off this analysis until a later date. Rather, to comply with NEPA, this information must be included in the DEIS so that the public has an opportunity to meaningfully evaluate and provide input on the impacts of the proposed amendments.

Based on the foregoing, it is clear that FERC does not have adequate information at this time to study or determine the full impacts of the pipeline on the ANST and visitors' experiences. Additional modeling of the new ANST crossing and the visual impacts of the cleared right-of-way on the ANST must be conducted and incorporated into a revised DEIS so that FERC, the USFS, BLM, and the general public have adequate opportunities to evaluate and comment on the modeling results as part of the NEPA process.

In sum, the DEIS fails to fully analyze the impacts and proposed mitigation measures as required under NEPA. FERC fails to consider a reasonable range of alternatives as required by NEPA, and the need for the JNF Plan amendments is neither adequately supported nor analyzed. Additionally, the proposed amendments are not in compliance with the Forest Plan and the Forest Service's regulations for amendments to the LRMP. The objectives of the Forest Plan cannot be achieved if applicants such as Mountain Valley are not required to investigate and achieve full co-location or siting in alternative routes within an existing designated corridor or

[545] DEIS at 4-266 and 4-267.

[546] DEIS at 4-509.

CO105-90 cont'd

outside of a National Forest. Such investigation is the only way for the USFS to implement its own policies embodied in the Forest Plan and to determine whether Forest Plan amendments are warranted. The analysis in the DEIS is wholly insufficient to satisfy those important requirements. As the Forest Service highlighted in recent comments to FERC noting the inadequacy of information supplied by Mountain Valley, "[a]ctivities implemented on NFS lands must be disclosed to the public and discussed in the EIS or a supplemental analysis, sufficient to support a decision on the proposed project."[547] Because the DEIS fails to disclose sufficient information for FERC and the public to evaluate the impacts of the MVP Project on the Jefferson National Forest, it does not comply with NEPA.

Conclusion

For all or the reasons stated above, FERC's DEIS for the MVP and EEP projects does not comply with NEPA. In order to meet the requirements of that statute, FERC must remedy the flaws identified herein and reissue a revised DEIS for review and comment by the public.

Signatures follow

[547] Forest Service's Information Request for the Proposed Mountain Valley Pipeline Project, November 15, 2016 (Accession No. 20161116-5006).

CO105-90 cont'd

Sincerely,

Ben Luckett, Staff Attorney
Susan Waldie, Staff Attorney
Ryan Talbott, Staff Attorney
Appalachian Mountain Advocates
P.O. Box 507
Lewisburg, WV 24901
304.645.9006
bluckett@appalmad.org

Jared M. Margolis
Center for Biological Diversity
2852 Willamette Street, # 171
Eugene, OR 97405
971.717.6404
jmargolis@biologicaldiversity.org

Alison Kelly, Staff Attorney
Land and Wildlife Program
Natural Resources Defense Council
1152 15th Street NW, Suite 300
Washington, DC 20005
T 202.717.8297
F 202.289.1060
M 561.707.4404
AKELLY@NRDC.ORG

CO106-1

UNITED STATES OF AMERICA

BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

In the matter of
Mountain Valley Pipeline LLC
Docket No. CP16-10-000
and
Equitrans, LP
Docket No. CP16-13-000

December 22, 2016

MOTION TO INTERVENE
by THE WILDERNESS SOCIETY

Pursuant to Rule 214 of the Federal Energy Regulation Commission's (FERC) Rules of Practice and Procedure, 18 C.F.R § 385.214 and 18 CFR § 385.211,1 The Wilderness Society hereby moves for leave to intervene in, and become a party to, the above-captioned proceedings. In support of this motion, The Wilderness Society states the following:

I. Motion to Leave to Intervene

A. The Wilderness Society

The Wilderness Society is a non-profit (501(c)(3)) American public-lands conservation organization working to protect wilderness and inspire Americans to care for our wild places. Backed by more than 500,000 members and supporters, TWS has led the effort to permanently protect 110 million acres of wilderness. Since our founding in 1935, TWS has been at the forefront of nearly every major public lands victory and has profoundly improved the way our public lands are managed and enjoyed. The Wilderness Society has membership in all states and areas of the country including areas affected by the MVP proposal. TWS also has identified priority lands and values that would be affected by the MVP proposal.

The Wilderness Society has been actively engaged in studying the proposed Mountain Valley Pipeline (MVP) Project since we became aware of the proposal in 2016. We have been actively involved in gathering relevant information from Federal Agencies and other conservation groups, and conducting our own analysis of the implications of the proposed MVP Project. We have thoroughly reviewed and studied the Draft Environmental Impact Statement prepared by FERC for the proposal as well as additional information provided by the Forest Service and the Bureau of Land Management. The Wilderness Society desires to continue to stay current regarding

CO106-1 Non-environmental FERC staff will consider requests for late intervention.

CO106-1 cont'd

this proceeding and provide information about important conservation lands, the regional and conservation context, and the conservation values at stake in the affected project area.

B. Request to Be Added to Official Service List

All communications and services related to this motion should be directed to the following:

Hugh Irwin
Landscape Conservation Planner
The Wilderness Society
P.O. Box 817
Black Mountauin, NC 28711

(828)-357-5187
hugh_irwin@tws.org

CO106-2

B. Background

On October 23, 2015, Mountain Valley Pipeline, LLC requested that pursuant to Section 7(c) of the NGA, FERC issue a certificate of public convenience and necessity authorizing MVP to construct, own, and operate the MVP Pipeline Project. The proposed MVP Project would include approximately 300 miles of new interstate natural gas pipeline, three new compressor stations, and additional pipeline facilities located in West Virginia and Virginia. MVP's proposed pipeline route would pass and cross across lands which are located in Craig County and the surrounding watershed and region that Preserve Craig is committed to responsibly steward.

On October 23, 2015, Mountain Valley filed its formal application with the FERC in Docket No. CP16-10-000, pursuant to section 7(c) of the NGA. Mountain Valley is seeking a Certificate of Public Convenience and Necessity (Certificate) from the Commission authorizing the proposed Mountain Valley Project (MVP), with facilities located in the State of West Virginia and the Commonwealth of Virginia. The MVP would involve constructing and operating about 301 miles of 42-inch-diameter pipeline; 3 compressor stations totaling about 171,600 International Organization for Standardization (ISO) horsepower (hp); 4 meter and regulation (M&R) stations; 5 pig4 launchers and receivers; and 36 mainline block valves (MLV). Mountain Valley is currently proposing two taps for the MVP: one tap to serve the Roanoke Gas Company, LLC (Roanoke Gas) and one tap at the Webster Interconnect. The MVP includes four interconnections or tie-ins with facilities operated by Equitrans, Columbia Gas Transmission LLC (Columbia),5 and Transcontinental Gas Pipe Line Company LLC (Transco). The MVP facilities would be designed to transport about 2.0 million dekatherms per day (Dth/d, equivalent to about 2.0 billion cubic feet per day [Bcf/d]) of natural gas.

Mountain Valley also requested that the Commission issue it a Blanket Certificate to allow for the construction, operation, and abandonment of certain eligible unspecified future facilities and related services under the Commission's regulations at Subpart F of Title 18 Code of Federal Regulations (CFR) Part 157, and a Blanket Certificate to allow for open access transportation services and pre-granted abandonment approval under Subpart G of Part 284. Mountain Valley would have to document minor future actions performed under the Blanket Certificate program in either annual reports or as Prior Notice applications, subject to our environmental review in accordance with the FERC's regulations at Part 157.206.

CO106-2 Comment noted.

CO106-2 cont'd

On October 27, 2015, Equitrans filed its formal application with the FERC in Docket No. CP16-13-000, pursuant to Sections 7(b) and (c) of the NGA. Equitrans is seeking a Certificate authorizing the proposed Equitrans Expansion Project (EEP), with facilities located in the Commonwealth of Pennsylvania and the State of West Virginia. The EEP would involve construction and operation of a total of about 8 miles of various diameter pipelines; a new 31,300 nominal hp compressor station; and 4 pig launcher and receiver sites. There would be four tap locations and one interconnection. The EEP facilities would transport up to 400,000 Dth/d (about 0.4 Bcf/d) of contracted firm capacity of natural gas. In addition, Equitrans proposes as part of the EEP to abandon, by dismantlement and removal, the existing 4,800 hp Pratt Compressor Station. The EEP would connect with the MVP at the Webster Interconnect and Mobley Tap in Wetzel County, West Virginia. Therefore, we are conducting an environmental analysis of both projects combined in this single comprehensive EIS, as they are related and connected actions.

On September 16, 2016 the Federal Energy Regulatory Commission released a draft environmental impact statement (EIS) for the projects proposed by Mountain Valley Pipeline LLC (Mountain Valley) and Equitrans LP (Equitrans). The draft EIS assesses the potential environmental effects of the construction and operation of the MVP and EEP in accordance with the requirements of the National Environmental Policy Act (NEPA). The DEIS concludes that approval of the MVP and EEP would have some adverse environmental impacts; however, these impacts would be reduced with the implementation of Mountain Valley's and Equitrans' proposed mitigation measures, and the additional measures recommended by the FERC staff in the EIS.

C. The Wilderness Society's Interests

The Wilderness Society has a valid and substantial interest in this proceeding. Our Mission is to protect wilderness and inspire Americans to care for our wild places. The MVP proposal involves land that is designated wilderness, potential wilderness, important wild places, and lands and waters that comprise essential wildlife corridors and adaptation landscapes essential for climate adaptation and a healthy and ecologically sound future. The Wilderness Society is filing this motion to obtain intervenor status in order to retain all rights and privileges afforded to parties in a Commission proceeding.

The Wilderness Society learned about the proposal and realized its implications for important conservation lands along the proposed MVP route in May of 2016. TWS filed comments to the Forest Service on June 13, 2016 concerning aspects of the pipeline proposal on national forest lands that would affect our interests.

We learned about the Draft Environmental Impact study for the MVP proposal shortly after it was released on September 16, 2016 and have been reviewing the DEIS and related materials to better understand the issues as they relate to our interests and to understand the approach that FERC and other agencies are taking to address issues that affect TWS interests.

We have prepared detailed comments to the DEIS that we are submitting before the comment deadline. We are very concerned about the impacts of the proposed pipeline and the proposed route of the MVP to lands and values that TWS has a long-term interest in. In our comments, we point out information and data gaps, problems in the data and analysis, and adverse impacts that would result if the pipeline were built along the current route. We also point out alternative approaches and tools that would better inform the environmental analysis.

CO106-3

We also highlight the need for programmatic NEPA to address the multiple pipelines that have been proposed in the Appalachian Mountains. Any pipeline through the Appalachians with its high

CO106-3 The reasons the FERC did not prepare a programmatic NEPA document is explained in section 1.3.

CO106-3 cont'd

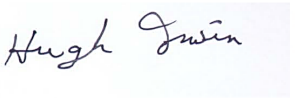
value for wilderness and wildlands, its high biodiversity value, and its challenging topography warrants a careful and considered examination of the overall demand for all proposed gas pipelines, the real needs, the expected lifecycle of pipelines to meet any needs, the impacts to critical conservation lands and resources in the region from all proposed pipelines, and the legacy of adverse environmental impacts these structures would leave on the landscape. The several pipelines proposed for the region pose a major threat to the conservation, environmental, and cultural values of the region that cannot be adequately addressed in separate planning processes that do not put the demands, needs, and impacts into an overall context that can be assessed and balanced. To adequately address these threats, a programmatic EIS is essential that examines energy supply from renewable sources as well as gas production, the current capacity as well as anticipated needs, and the tradeoffs between any economic and energy benefits with the inevitable impacts to conservation, environmental, and cultural values.

TWS has also informed our membership about the issues involved in the MVP proposal and the implications to TWS interests. With our comments we are submitting names and contact information for over 7,000 of our membership and interested public who are very concerned about the adverse impacts to important lands and conservation values and oppose moving forward with the current proposal that would impact these lands and values.

Conclusion

Therefore, for these reasons, The Wilderness Society respectfully requests that the FERC grant it intervenor status in these proceedings.

Respectfully submitted,



Hugh Irwin,
Landscape Conservation Planner
The Wilderness Society
P. O. Box 817
Black Mountain, NC 28711

828-357-5187
Hugh_irwin@tws.org

There are 600 pages of Names and Addresses that came in with this comment that have not been included in this document

THE WILDERNESS SOCIETY

Dec. 22, 2016

CO107-1

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

Re: Mountain Valley Pipeline Draft Environmental Impact Statement: Docket No. MVP CP16-10–000 and Docket No. CP16-13-000

Dear Secretary Bose:

Please accept this letter on behalf of The Wilderness Society and The Virginia Wilderness Committee as comment on the DEIS for the Mountain Valley Project and Equitrans Expansion Project.

I. Introduction; TWS and VWC missions and interest in the MVP proposal

The Wilderness Society is a non-profit (501(c)(3)) public-lands conservation organization working to protect wilderness and inspire Americans to care for our wild places. Backed by more than 500,000 members and supporters, TWS has led the effort to permanently protect 110 million acres of wilderness. Since our founding in 1935, TWS has been at the forefront of nearly every major public lands victory and has profoundly improved the way our public lands are managed and enjoyed. The Wilderness Society has membership in a states and areas of the country including areas affected by the MVP proposal. TWS also has also identified priority lands and values that would be affected by the MVP proposal.

The Virginia Wilderness Committee has had a long history of advocacy on the George Washington and Jefferson National Forest. Since 1969 our mission has been to protect

CO107-1 The reasons the FERC did not prepare a programmatic NEPA document is explained in section 1.3. The ACP Project was evaluated as a possible alternative to the MVP in section 3.3.2 of the EIS. The ACP Project was also evaluated in the cumulative impacts section of the EIS (4.13).

CO107-1 cont'd

permanently the best of Virginia's wild places for future generations; to foster understanding and appreciation of Wilderness; and to promote enjoyment and stewardship of our last remaining wildlands.

II. FERC should conduct programmatic NEPA to determine long term needs and best approaches region-wide

The emerging problems identified in the MVP and other pipelines routes such as ACP should have been a cautionary warning that such routes through the Appalachian Mountains are fraught with the potential for conservation and environmental impacts. Any pipeline through the mountains warrants a careful and considered examination of the overall demand for all proposed gas pipelines, the real needs, the expected lifecycle of pipelines to meet any needs, the impacts to critical conservation lands and resources in the region from all proposed pipelines, and the legacy of adverse environmental impacts these structures would leave on the landscape.

The several pipelines proposed for the region pose a major threat to the conservation, environmental, and cultural values of the region that cannot be adequately addressed in separate planning processes that do not put the demands, needs, and impacts into an overall context that can be assessed and balanced. To adequately address these threats a programmatic EIS is essential that examines energy supply from renewable sources as well as gas production, the current capacity as well as anticipated needs, and the tradeoffs between any economic and energy benefits with the inevitable impacts to conservation, environmental, and cultural values.

The proposed MVP route would adversely impact critical conservation lands on Jefferson National Forests and other forested areas, would fragment the landscape disrupting habitat and movement corridors for numerous wildlife species, would open the way for establishment of non-native invasive species, and would threaten water supplies and clean water. The pipeline would travel through karst topography which poses its own unique risks

CO107-1 cont'd

and impacts. And the current approach fails to examine the demand, need, and life of the pipeline in the context of other proposed pipelines.

CO107-2

Adverse impacts of the MVP are readily apparent even though the DEIS does not adequately document and analyze these adverse impacts. The discussion of Alternative 1 (maximizing locating MVP along existing rights-of-way) and the Northern Pipeline – ACP Colocation Alternative (the "two pipelines – one route" alternative) is inadequate but demonstrates the pressing need for a programmatic EIS. Mentioning these and other alternatives cannot be considered a replacement for programmatic NEPA to address all proposed pipelines in the region. These alternatives clearly offer advantages. However, they are compared to the proposed alternative as though adverse impacts of these alternatives would be replaced by the proposed alternative. This is clearly not the case. Adverse impacts of the utility right of ways in alternative 1 are already largely in place. Collocating MVP along these rights-of-way would in most cases piggy back on the adverse impacts already established along these rights-of-way as implied by Table 3.4.2-1[1]. These adverse impacts are already largely established. Collocating along these rights-of -way would not generally impact more trails or more forest or more wetlands or additional conservation resources than is currently the case. These lands are already impacted by the rights-of-way. In some cases, the impact could increase, but the DEIS fails to disclose that these adverse impacts would not be totally new with MVP colocation. Alternative 1 is rejected from further detailed study because of this invalid and misleading comparison.

CO107-3

We believe that neither the ACP nor MVP is necessary. Nonetheless, FERC does not undertake a meaningful evaluation of colocation of these two projects in the DEIS. Co-locating MVP along the ACP corridor is improperly compared with independently constructing the ACP corridor as though it were not a separate proposal also being considered by FERC (Table 3.4.2-2 [2]). When compared in this way, the MVP route has advantages and disadvantages, while the ACP route has advantages and disadvantages. However, this is an improper comparison. If ACP is approved and built and MVP were collocated with it, the

[1] DEIS. p. 3-24
[2] DEIS. p. 3-27.

CO107-2

We disagree. The draft EIS adequately documented impacts on environmental resources. Numerous alternatives were examined in section 3 of the EIS. The text stated that we would only recommend an alternative that could meet the projects purposes and had clear environmental advantages over the proposed routes.

CO107-3

See the response to FA11-12 regarding need. See the response to LA15-6 regarding the evaluation of the ACP Project.

CO107-3 cont'd

adverse impacts of the MVP route would be replaced by some additional impact on the ACP route but would not replicate the ACP adverse effects as implied by the DEIS. Comparison of the adverse effects of the ACP route to the adverse impacts of the MVP route to reject colocation of MVP on the ACP route defies logic and is an improper comparison. The DEIS states: *"However, we also note that overall, the resource impacts for the proposed route and the alternative are similar. Consequently, the alternative does not provide a significant environmental advantage and we do not consider it further."*[3] Clearly if two pipelines were collocated with roughly the same adverse environmental effects as one of the pipelines, that would be a more environmentally preferable alternative for the region than having both. We believe that neither the ACP nor MVP is necessary. However, this highlights the need for a programmatic EIS to address overall routing of the various proposed pipelines as well as to comprehensively and systematically address the needs for the various gas pipeline proposals. Such a programmatic EIS could determine the least environmentally damaging route not only for MVP but also for ACP. It could also solve the issues of colocation mentioned in the DEIS (e.g. route alternatives could be found for ridges too narrow for colocation), possibly utilizing existing rights-of-way in alternative 1 and other existing rights-of-way.

CO107-4

The DEIS states: *"The amount of right-of-way necessary to construct the two pipelines would be considerable, given the amount space needed to safely accommodate equipment and personnel, as well as spoil storage."*[4] However, a programmatic EIS could address collocating much of both MVP and ACP along existing rights-of-way. Adverse impacts to national forest lands are an important consideration for both MVP and ACP. Under the proposed MVP alternative analyzed, the Forest Service would provide a 500 foot right-of-way to accommodate future proposals needing right-of-way. Instead FERC should conduct programmatic NEPA that would look at the potential for collocating proposed pipelines wherever possible and making use of existing rights-of-way wherever possible so that adverse environmental impacts could be cumulatively minimized. The DEIS also states: *"The*

CO107-5

constructability issues alone are likely to render this alternative technically infeasible."[5] *This*

[3] DEIS. p. 3-28.
[4] DEIS. p. 3-28
[5] DEIS. p. 3-28

CO107-4 See the response to LA15-6 regarding the evaluation of the ACP Project.

CO107-5 See the response to LA15-6 regarding the evaluation of the ACP Project.

CO107-5 cont'd

statement is unconvincing and an artifact of the separation of processes for MVP and ACP. Design constraints could accommodate colocation of the two pipelines.

CO107-6

III. FERC and Cooperating Agencies should use available science based tools to determine routes that minimize adverse environmental effects

The route being considered would impact critical conservation lands on Jefferson National Forests, would fragment the landscape disrupting habitat and movement corridors for numerous wildlife species, would open the way for establishment of non-native invasive species, and would threaten water supplies and clean water. The current approach fails to examine the demands, need, and life of the pipeline in the context of other proposed pipelines.

The justification for not considering in detail Alternative 1 (maximizing locating MVP along existing right of way) and the Northern Pipeline – ACP Colocation Alternative (the "two pipelines – one route" alternative) is misleading as discussed in Section II above. These alternatives clearly offer advantages that should have been considered comprehensively in the context of all pipeline proposals through a programmatic EIS. The route selection process for the MVP pipeline appears to have only taken a cursory and patching approach to minimizing conservation and environmental impacts. Besides minor route changes that came out of initial public meetings and Forest Service input, there appears to have been little consideration for planning the route from the start to minimize adverse environmental effects. The DEIS indicates that FERC did consider minor alternatives:

> *Mountain Valley adopted into its proposed pipeline route 14 minor route alternatives to resolve issues raised by landowners or other stakeholders. There are 18 other minor route alternatives to be considered, where issues with landowners have not yet been resolved. We are recommending that Mountain Valley provide additional data for each variation. We also are recommending that Mountain Valley adopt three minor route variations into the proposed route.*[6]

However, these minor route alternatives are only variations of the alternative that was proposed by the Applicants. There appears to have been little if any attempt to minimize adverse environmental impacts in designing this proposed route.

[6] DEIS. P. E13-E14.

CO107-6 We stand by our analyses in the draft EIS. Alternatives were examined in section 3 of the EIS.

CO107-7

There are tools to minimize conservation impacts of energy corridors. The US Department of Energy funded the development of the Energy Zones Mapping Tool and an associated study. This tool is specifically tailored to allow flexible modeling of energy and corridor siting factors such as slope and land protections. The tool and background material can be found here:

http://ezmt.anl.gov/

Below is some of the background material on the tool and its development from the website:

The main purpose of the Eastern Interconnection States Planning Council (EISPC) Energy Zones Study was to develop a methodology and a comprehensive mapping tool that would enable EISPC members and other stakeholders to identify areas within the U.S. portion of the Eastern Interconnection that are suitable for the development of clean (low- or no-carbon) power generation. The product of this study, the comprehensive web-based decision support system, was the EISPC Energy Zones Mapping Tool.

In addition to enabling EISPC members and other stakeholders to identify areas with a high concentration of clean energy resources that could provide significant power generation in the future, another objective of the Study was to promote open and transparent collaboration among state-level energy planning and regulatory agencies and to foster consistent and coordinated direction for regional and interconnection-level electricity analyses and planning.

The Energy Zones Study final report, Energy Zones Study - A Comprehensive Web-Based Mapping Tool to Identify and Analyze Clean Energy Zones in the Eastern Interconnection provides detailed information about the study and the EISPC Energy Zones Mapping Tool.

The Energy Zones Study was led by the EISPC Energy Zones Workgroup in collaboration with three U.S. Department of Energy (DOE) National Laboratories. The multi-laboratory effort was led by Argonne National Laboratory (Argonne) in collaboration with the National Renewable Energy Laboratory (NREL) and Oak Ridge National Laboratory (ORNL).

The project team also worked closely with the Clean Energy States Alliance (CESA) to implement its energy policy and regulations database into the Energy Zones Mapping Tool, as well as with Navigant Consulting to incorporate their contributions related to demand.side resources.

In addition, numerous environmental and non-governmental organizations, including The Conservation Fund, NatureServe, National Audubon Society, The Wilderness Society, and many others, played an active role in the Energy Zones Study. Many of these organizations provided valuable environmental information for the Study.

The EZ Mapping Tool was developed at public expense to aid development of plans for generation and of clean energy and location of energy utility corridors while minimizing adverse environmental effects. We question why it was not used by the as a part of a

CO107-7 This tool does not appear to be applicable to FERC review of natural gas pipeline projects. As stated in section 1, the Applicant chooses its route, and FERC staff analyzes the environmental impacts of that route. Mountain Valley and Equitrans explained their route selection process in their applications to the FERC.

CO107-7 cont'd

programmatic effort to plan for gas transport relating to the several gas pipelines proposed for this area of the Appalachian Mountains. It could have also been used by the MVP Applicants to come up with an initial MVP route proposal to minimize adverse impacts. The Energy Zones study and mapping tool development spent a lot of effort and involved numerous public and private entities to put together the best data and tools to inform decisions about where to locate energy facilities and transport corridors. We have seen no evidence that it has been used at all in planning any of the several gas pipeline routes in the Appalachian Mountains of Virginia. We see no evidence that it has been used in planning he MVP pipeline route or attempting to avoid high conservation value areas to minimize adverse environmental effects.

CO107-8

IV. Specific Inadequacies of the DEIS

A. Impacts to Inventoried Roadless Area and SPNM Lands Inadequately Addressed

The proposed route for the Mountain Valley Pipeline (MVP) would cut through Brush Mountain Inventoried Roadless Area (IRA). We are very concerned with the impacts to this area and the precedent involved if the pipeline is allowed to pass through this IRA resulting in degradation of the values for which the Roadless Rule was put in place.

As is the case with other high conservation lands, impacts to Brush Mountain IRA were not properly avoided by conducting programmatic NEPA to properly identify real needs for pipelines among the various proposal and not using a systematic and science based routing methodology to avoid and minimize adverse impacts to high value conservation lands. Minimizing right-of-way crossings of IRAs and other high conservation lands by critically evaluating multiple pipeline proposals, collocating pipelines, and utilizing existing rights-of-way could avoid crossings of IRAs and other critical conservation lands.

Timber harvest would have to occur for the right-of-way establishment and construction. The Roadless Rule prohibits timber cutting except under rather narrow exceptions. The DEIS and USFS material accompanying the DEIS maintain that this logging

CO107-8 The Roadless Area Conservation Rule and impacts to roadless areas under this regulation are discussed in section 4.8 of the EIS.

CO107-8 cont'd

of mature timber is "incidental" tree cutting under the Roadless Rule provision. This exception "(2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited by this subpart;..." would not apply because construction of a utility line is not the implementation of a management activity under the Forest Plan. Pipeline construction is not covered in the LRMP as a "management activity" on the national forest. Indeed, the pipeline would require amendment of the Forest Plan to change management allocation as well as exceptions for visual quality, old growth cutting, and riparian impacts.

Nor is the proposed timber cutting "incidental". As the district court explained in *Hogback Basin Preservation Association v. U.S. Forest Service*, 577 F.Supp. 2d 1139, 1153 (W.D.Wash. 2008), the scale of timber cutting may be so "disproportionate" that it cannot qualify as merely incidental to other activities under the Roadless Rule. In that case, the court found that cutting on two percent of the land area of an authorized project qualified as incidential. In contrast, here MVP would cut one-hundred percent of the proposed right-of-way through the Brush Mountain Roadless Area for the pipeline. The developers cannot claim that they will minimize or mitigate the amount of timber to be cut because the right-of-way must be cleared for pipeline construction. Finally, the timber cutting and establishment of a permanent, cleared right-of-way through the roadless area is one of the primary impacts of this project. To categorize it as "incidental" minimizes the severity of its impacts and undermines the conservation objectives of the Roadless Rule. *See* 36 C.F.R. 294.11 (2001).

In light of the conservation objective of the Rule, we also note that the exemptions for certain timber cutting activities primarily involve "pre-existing contracts or decisions; the satisfaction of legal or treaty rights; and environmental preservation, public safety, or the public interest." *See Hogback Basin Pres. Ass'n*, 577 F.Supp. 2d at 1147. The MVP does not easily fit within any of these general categories, and the Forest Service should be wary of compromising the integrity of the Brush Mountain Roadless Area without a thorough review of alternatives. In fact the preamble in the Roadless Rule states: "Other, new non-recreation special uses may be limited in the future as well. Such special uses include communication

CO107-8 cont'd

sites and energy-related transmission uses (such as ditches and pipelines, and electric transmission lines)."[7]

CO107-9

While the status of the proposed construction zone used to construct and maintain the pipeline is unclear, it is clear that this corridor through the IRA would degrade its values and integrity. The construction zone proposed for of the pipeline would appear to qualify by the definitions in the Roadless Rule as ***at least*** a temporary road: "*(3)Temporary road. A road authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be part of the forest transportation system and not necessary for long-term resource management."* However, since this corridor would be maintained in grass cover and presumably would be essential for ongoing maintenance and access to the pipeline, it is difficult to see the road as just temporary. Regardless, the prohibition on road construction in the Roadless Rule as written applies to temporary roads. The Roadless Rule defines Road Construction as: "*Road construction.* Activity that results in the addition of forest classified or temporary road miles." And a road is defined in the Roadless Rule as "A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary. The pipeline construction zone would seem to fit this definition."[8]

CO107-10

The MVP route will impact a mile of the Brush Mountain Roadless Area. While the area was designated 4J Urban-Suburban Interface, most roadless areas were designated as a 12A, B, or C Remote Backcountry depending on the size of the area. While 4J is silent on utility right-of-ways, the Remote Backcountry designation whether A, B, or C prohibited new utility right-of ways. It has long been TWS and VWC's belief that the Brush Mountain Roadless area should have been designated 12A. Further, it is hard to comprehend how allowing an amendment to the forest plan from 4J to 5C would help to enhance the roadless character of the area. A pipeline would also prohibit future consideration of this area as an addition to the existing Brush Mountain Wilderness. Brush Mountain is a steep, highly

CO107-11

[7] Part VI; Department of Agriculture Forest Service; 36 CFR Part 294; Special Areas; Roadless Area Conservation; Final Rule; Federal Register / Vol. 66, No. 9 / Friday, January 12, 2001 / Rules and Regulations. 3272. p. 3268

[8] Ibid. p. 3272

CO107-9 See the response to comment CO107-8.

CO107-10 The Brush Mountain Inventoried Roadless Area was allocated to the Rx4J-Urban/Suburban Interface because of the adjacent high density subdivision and concerns about the abilities to provide wildfire suppression on NFS lands. See the response to comment FA8-1.

CO107-11 Sedimentation effects and mitigation measures, including consideration of steep slopes, aquatic habitats, long-term maintenance, and routing, are discussed throughout the EIS.

CO107-11 cont'd incised ridge with numerous small year round and wet weather streams flowing down its slopes. In places the ridge slope exceeds thirty percent. The resulting erosion and sedimentation would have a significant negative impact on Craig Creek. As with Peters

CO107-12 Mountain and Sinking Creek Mountain, there already exist two powerline crossing. Adding a third utility right-of-way would only serve to increase forest fragmentation and increase the opportunity for non-native invasive species.

CO107-13 The pipeline corridor will also inevitably become access for illegal off-road-vehicle use. The Roadless Rule specifically recognizes "off-road vehicle tracks that have been designated and managed as a trail" as 'unclassified roads" subject to the road building prohibition. 36 C.F.R. § 294.11. The Forest Service must take into account the real, if unintended, consequences of opening a right-of-way through the Brush Mountain Roadless Area for this pipeline.

CO107-14 Finally, the MVP proposed route would bisect over 13,500 feet of semi-primitive non-motorized land on the Jefferson National Forest. These lands are generally larger than 2500 acres but less 5000 acres. On a forest that is already highly fragmented and the opportunities for solitude and "isolation from sounds" limited, the construction of a pipeline through these lands would only serve to further fragment and already fragmented landscape. Under Naturalness in Appendix I of the Revised Jefferson National Forest Management Plan, the degree of Naturalness is "High" and the "Setting may experience subtle modification that would be noticed but not draw the attention of an observer." Under roads it states, "No new permanent or temporary road construction or reconstruction. A pipeline would not fit a high degree of naturalness and to build a pipeline would require the construction of a temporary road. This is not allowed in either Semi-primitive Non-motorized or even Semi-Primitive motorized.

CO107-15 **B. Impacts to Designated Wilderness is Inadequately addressed**

The DEIS discloses that it would be in close proximity to a number of designated wilderness areas:

CO107-12 We examined alternative routes crossing Peters Mountain and Sinking Creek Mountain in section 3 of the EIS; including alternative routes that followed existing powerlines, pipelines, and roads. Invasive species are discussed in section 4.4.

CO107-13 The FS recognizes the potential for illegal motorized use throughout the pipeline corridor on NFS lands and has worked with Mountain Valley to develop an Off-Highway Vehicle Management Plan (POD Appendix Z). This plan identifies methods to limit OHV use within the right-of-way in order to avert user conflicts in adjacent areas, as well as to avoid problems with revegetation efforts and prevent potential erosion within the right-of-way. To minimize OHV access within the right-of-way, Mountain Valley would install barriers at appropriate locations in coordination with the FS. The proposed OHV barriers would be designed and constructed in a manner that attempts to prevent unauthorized motor vehicle/OHV use of and along the right-of-way. A plan for monitoring involving FS law enforcement personnel will be included in the communication plan. Monitoring of forest resources would be conducted by the FS and funded through cost recovery.

CO107-14 Forest fragmentation is discussed in section 4.4 of the EIS. The FS is a cooperating agency and assisted in preparation of the EIS.

CO107-15 We have revised the final EIS to clarify the distance from the pipeline to the boundary of wilderness areas within the Jefferson National Forest. As discussed in section 4.11.2 of the EIS, noise would be temporary during construction. See the response to comment IND343-1 regarding invasive species. The pipeline would be buried underground and would not be an obstacle to wildlife movement. In addition, the potential for spills would be limited to oil and fuel from equipment used during construction of the projects. As discussed in section 4.3 of the EIS, the Applicants would implement their respective spill plans during construction and operation to prevent, contain, and clean-up accidental spills. Prevention of the use of ORV on the right-of-way is discussed in section 2.6.1.

CO107-15 cont'd

"The MVP pipeline route would be within 0.25 mile of the Peters Mountain Wilderness, Brush Mountain Wilderness, within 2.5 miles of Mountain Lake Wilderness, and within 7.5 miles of Brush Mountain East Wilderness."[9]

Other portions of the DEIS (e.g. Table 4.8.1-8 [10] and Table 4.8.1-10 [11] document that the pipeline right of way would be within 74 or 75 feet of the Peters Mountain Wilderness. This documentation itself is confusing because Table 4.8.1-8 appears to document distance to right-of-way while Table 4.8.1-10 appears to document distance to pipeline. At any rate, it is clear that the pipeline would be very close on other national forest land to several designated wilderness areas, especially Peters Mountain. Yet the unstated assumption embedded in the DEIS is that the pipeline would have no effect (with the exception of visual impacts) unless the pipeline were within the wilderness areas. This is clearly a false assumption. Sound impacts during construction and maintenance should have been considered. Impacts from invasive exotic species should have been considered. Disruption of wildlife movement corridors should have been considered for wilderness and other national forest wildlands. Chemical pollution should have been considered. Providing pathways for unauthorized and illegal use (e.g. OHV vehicles) should have been considered.

CO107-16

These and other factors impacting designated wilderness from the pipeline located on national forest land should have been considered on two levels. First, critical conservation lands such as wilderness could have been avoided through comprehensive and programmatic NEPA that looked at all proposed pipelines and used a scientific approach to avoid conflicts with priority conservation lands as suggested in Section III. The methodology for determining the MVP route appears inadequate for avoiding impacts to designated wilderness and other priority conservation lands. The route determination methodology is not documented in the DEIS, but the route was presumably determined to minimize cost between start and terminus points. There is no indication in the DEIS that the proposed route used route design tools or considerations to avoid important conservation lands or to minimize adverse environmental impacts from the beginning of route design. As pointed out in Section III, avoidance of

[9] DEIS. p. 4-217.
[10] DEIS. p. 4-218
[11] DEIS. p. 4-230

CO107-16 Mountain Valley explained its route selection process in its application to the FERC. The purpose of the MVP is to transport natural gas from areas of production, beginning in Wetzel County, West Virginia with interconnects to producer facilities, and terminating at the Transco Station 165, in Pittsylvania County, Virginia, which is a hub selected by shippers to supply customers in the Mid-Atlantic and Southeastern states. Such a route would have to cross NFS lands; as explained in section 3 of the EIS. However, the pipeline route would avoid crossing any designated Wilderness areas within the Jefferson National Forest.

CO107-16 cont'd

important conservation lands and minimization of environmental conflicts should have been a part of route design from the beginning. There are tools and data available for this purpose; in fact the EZ Mapping Tool developed by Argonne Labs for Department of Energy was developed for this purpose.

CO107-17

Secondly, NEPA analysis must address the real adverse impacts of alternatives being analyzed and cannot have unrealistic assumptions that improperly ignore adverse impacts. Visual impacts cannot be adequately evaluated by cherry picking observation points that minimize adverse effects. It is easy to pick an observation point (even very close to the pipeline) such as in Table 4.8.1-10[12] for Peters Mountain where the pipeline on adjacen national forest land is not visible. However, this is meaningless in relationship to the visual impact of the pipeline to the entire area. In addition, other impacts of the pipeline on wilderness values must be documented and analyzed. These effects include sound impacts during construction and maintenance; impacts from invasive exotic species; disruption of wildlife movement; chemical pollution; and access for illegal and damaging use such as ORV use.

CO107-18

C. Impacts to Appalachian National Scenic Trail inadequately addressed

Similar to other high conservation lands, impacts to the Appalachian National Scenic Trail (ANSC) were not properly avoided by conducting programmatic NEPA to properly identify real needs for pipelines among the various proposal and not using a systematic and science based routing methodology to avoid and minimize adverse impacts to high value conservation lands. Minimizing right-of-way crossings of the ANSC by critically evaluating multiple pipeline proposals, collocating pipelines, and utilizing existing rights-of-way could avoid crossings of this nationally significant trail or located crossings in areas that are already impacted.

[12] DEIS. p. 4-230.

CO107-17 Alternatives are analyzed in section 3 of the EIS. A revised visual impact assessment is included in section 4.8 of the final EIS.

CO107-18 The EIS discusses the ANST in section 4.8. We examine alternative routes and methods for crossing the ANST in section 3.

CO107-19 In addition ANST issues are still unresolved, both USFS and ATC have asked for visual simulation of scenic quality impacts. As scenic quality will be impaired by the MVP, a larger public process should also be utilized

CO107-20 Management Prescription 4A-Appalachian Trail management in the Forest Plan clearly lays out management direction for the Appalachian Trail. 4A-024 in the Plan allows for "special use authorization only where compatible with Appalachian Trail management or where there is a demonstrated public need or benefit and where no other reasonable alternative exist". The VWC and TWS believe that the Mountain Valley Pipeline proponents have not adequately demonstrated a true public need for this project. Studies have indicated that the proposed movement of natural gas could be accomplished by other means without the need for new infrastructure.

CO107-21 Secondly, 4A-028 in the Plan states "Locate new public utilities and rights-of-way in areas of this management prescription area where major impacts already exist". There are already existing utility corridors on Peters Mountain south of the proposed MVP crossing. The VWC and TWS believe that allowing a new utility corridor would be in violation of the management prescription established in A4 Appalachian Trail. They also believe that

CO107-22 allowing another utility corridor on Peters Mountain would not only increase forest fragmentation along the crest of Peters Mountain but would also serve as a vector for non-native invasive species. The treatment for these species would most likely have to be accomplished with herbicides. This was not explained in the draft EIS. TWS and VWC believe this information must be provided to the public. The pipeline will also bisect Mystery

CO107-23 Ridge. Its impact on the hydrology of the springs located below the ridge crest could negatively affect a major tributary of Stony Creek, that is both a Department of Game and Inland Fisheries (DGIF) designated Cold Water Stream as well as a significant stream in the Peters Mountain Wilderness.

CO107-24 **D. Impacts to Water Quality and Aquatic Species are Inadequately Addressed**

CO107-19 The EIS discusses the ANST and visual resources in section 4.8.

CO107-20 See the response to FA11-12 regarding need.

CO107-21 The draft EIS discussed alternatives that would increase collocation with existing corridors, including near Peters Mountain and the ANST. See section 3.5 of the EIS and the analyses for the CGV Peters Mountain Variation and the AEP-ANST Variation.

CO107-22 As stated in section 4.4.2, Mountain Valley does not propose the wide-scale use of pesticides and/or herbicides, but would consider them for localized use, only after a request from a landowner or land management agency. The final EIS has been updated to reflect that the FS may require herbicide use on NFS lands.

CO107-23 The EIS addressed water resources and hydrology in section 4.3. Little Stony Creek's status as a trout stream is listed in appendix F.

CO107-24 Comment noted.

CO107-24 cont'd

We strongly oppose the project specific amendment to allow MVP to exceed restrictions on soil and riparian corridor conditions.

CO107-25

The public has not been supplied with sufficient information to comment effectively on the DEIS as it pertains to water bodies and wetlands. FERC is still waiting on a signification amount of information and analysis. The DEIS acknowledges specific issues that need to be addressed prior to construction (bullet #s 1 -5 in the list below). These issues should have been addressed prior to release of the DEIS to allow public comment, including but not limited to:

1. *MVP's request to install permanent culverts and permanent fill within waterbodies along permanent access roads permanent fill of wetlands. While we appreciate that this request is not a typical FERC practice, a detailed analysis with site-specific plans, justification and analysis should be made public with an opportunity for public comment.*
2. *A complete list of locations not already approved by FERC staff where the pipeline route or access road parallels a waterbody within 15 feet or travels linearly within the waterbody channel, along with adequate justification for – and appropriate mitigation – for locations where MVP cannot realign the route.*
3. *Results of quantitative modeling for turbidity and sedimentation associated with wet open-cut crossings of the Elk River, Gauley river, and Greenbrier, including all of the elements that FERC listed in this DEIS (section 4.3.2.2)*
4. *The results of all remaining environmental and biological surveys, particularly bog turtle (of which 50 miles – or approximately 16% of pipeline route - of surveying remain as of the date of the DEIS). TWS also advocates for a freshwater mussel survey in the Gauley River (instead of assuming that the mussels of special concern are not present there – 4-191; discussed further below).*
5. *Feasibility and geotechnical studies for the alternative alignments identified for the Pigg River crossing at MP 286.8 and the Blackwater River crossing at MP 262.8.*
6. Revised stream scour analysis by MVP.

CO107-25

While some information was still pending at the time of issuance of the draft EIS, the lack of this final information does not deprive the public of a meaningful opportunity to comment on the projects potential impacts on a range of environmental resources, and measures that would avoid, reduce, or mitigate those impacts. See the response to comment IND209-1 regarding culverts and permanent fill in wetlands. See the response to comment IND226-6 regarding the list of waterbodies paralleling the right-of-way within 15 feet. See the response to comment FA11-15 regarding sedimentation and turbidity at waterbody crossings. The results of recent biological surveys are summarized in sections 4.5, 4.6, and 4.7 of the final EIS. The final EIS was updated to reflected changes to the Blackwater River crossing following issuance of the draft EIS. We recommend in this final EIS that Mountain Valley use an HDD to cross under the Pigg River to reduce impacts on the waterbody and its aquatic environment. The final EIS clarifies the route through the Jefferson National Forest, and states there would only be one crossing of Craig Creek. The removal of fish and mussels at dry stream crossings is discussed in section 4.6. Acres of wetlands impacts is provided in section 4.3. Blasting is discussed in sections 2, 4.1, and 4.2. Erosion Control Plans are discussed in section 2.

CO107-25 cont'd

7. Details of the potential route adjustment through the Jefferson National Forest that would only cross Craig Creek once. The results of the MVP evaluation should be shared with the public.
8. Details of methods that will be used to move fish and mussels from dry open-cut crossings.
9. Number of acres of wetlands that will be impacted is specified, but not the absolute size of the wetlands. The public needs to know how big these wetlands are in relation to the right-of-way if MVP has requested permission for a right-of-way greater than 75 feet in some areas, and permission to setback equipment less than 50 feet from the wetland. DEIS does not state which wetlands are in question.
10. Blasting may be required at waterbody crossings, but the locations of potential blasting have not been determined or disclosed. The DEIS understates the potential direct and indirect effects of blasting on aquatic life.
11. The specific erosion and sediment control measures that MVP plans to follow in the Jefferson National Forest

CO107-26

Impact on Roanoke logperch and freshwater mussels of special concern has not been adequately addressed. FERC concurs with MVP that "the expected effects on Roanoke logperch from construction within the Jefferson National Forest would be minimal and temporary … given the relatively far distance downstream that the logperch is known to occur. (4-197)" This is very vague and needs to be clarified.

CO107-27

According to the DEIS, the WVDNR waived the requirement to survey Gauley River for state-listed species due to the conditions at the time, and no further surveys are planned. This river is known to contain freshwater mussels but is not known to contain federally listed species at the proposed crossing location. Still, it would behoove FERC to request that MVP conduct these surveys.

CO107-28

VDGIF reported to MVP that presence/absence surveys of orangefin madtom are not effective due to their behavior, and are not necessary either. MVP should take a precautionary approach and find a way to confirm the presence of orangefin madtom within its range.[13]

[13] DEIS. p. 4-186)

CO107-26 As stated in section 4.7 of the EIS, we concluded that the MVP would be likely to adversely Roanoke logperch. Therefore, we requested formal Section 7 consultation with the FWS for this species. As stated in section 4.6.2.7 of the EIS, Mountain Valley would reduce impacts on freshwater mussels by relocating mussels in the construction zone in accordance with both West Virginia and Virginia mussel protocol documents.

CO107-27 The WVDNR waived the mussel survey for the Gauley River.

CO107-28 The VADGIF did not require surveys for orangefin madtom.

CO107-29

At the base of Sinking Creek Mountain is Craig Creek. Upper Craig Creek is identified as a Priority Watershed for its outstanding aquatic biodiversity. Upper Craig Creek hosts the rare aquatic species, Orangefin Madtom, a federally listed endangered species. The presences of the Orangefin madtom is an indication of exceptional stream quality. The pipeline will cross under the Upper Craig Creek and parallel the creek for a significant distance. In addition, the pipeline will cross one significant instream flow near the crossing. It is hard to understand how allowing the construction of the MVP would increase the agency's ability to accomplish goals and objectives identified in the Watershed Section of Chapter 2. The construction of the pipeline and the associated sedimentation increase would also negative impact the Lower Craig Creek another Priority Watershed possessing outstanding Aquatic Diversity including the Orangefin Madtom, the James spinymussel, a federally protected endangered species and the Atlantic pigtoe mussel, a species that has been proposed for listing. In addition, both the upper and lower Craig Creek are DGIF designated Cold Water Streams and upper Craig Creek also host wild populations of native Brook trout. Additionally, shortly after crossing Craig Creek the MVP crosses a small inflow stream.

CO107-30

FERC concurs with MVP that the measures in its Erosion and Sediment Control Plan "would adequately minimize any downstream effects on the James spineymussel" in the Jefferson National Forest (4-197). The DEIS also states that "MVP's proposed freshwater mussel conservation measures would also provide protection for the state-listed pistolgrip in Virginia." These measures need to be explicitly defined and tailored towards the needs of freshwater mussels rather than broad-sweeping sediment control measures given that freshwater mussels are one of the most rapidly declining taxa in the world and 71.7% of species in North America are endangered, threatened or of special concern. [14]As such, FERC is in no position to take any risks with potential impacts of construction and restoration on freshwater mussels.

[14] Archambault, J. M., W. G. Cope, and T. J. Kwak. 2014. Survival and behavior of juvenile unionid mussels exposed to thermal stress and dewatering in the presence of a sediment temperature gradient. Freshwater Biology 59: 601-613.

CO107-29 Craig Creek, its surroundings, and its mussels are discussed in sections 4.3, 4.5, 4.6, and 4.7 of the EIS.

CO107-30 Potential impacts to aquatic habitats, mussels, and fish are discussed in sections 4.3, 4.6, and 4.7 of the EIS. Erosion Control Plans are discussed in section 2.

CO107-31 The June 2016 draft Sediment and Erosion Control Plan (the only version that we could easily find) does not adequately address sediment and erosion control at water crossings.

- Clearing: we are concerned that clearing operations will be permitted two passes through each waterbody or wetland crossing. We are also concerned that "all woody debris will be removed from within the waterbody or wetland crossing for disposal (emphasis added)." Woody debris is a very important habitat for fish, and large woody debris allows a stream to support a larger population of trout. Woody debris removed from within the waterbody should not be disposed but rather returned to its original location as best as possible.

CO107-32
- Spoil Pile Placement and Control: the Sediment and Erosion Control Plan dated June 2016 states that "spoil from minor and intermediate waterbody crossings … will be placed at least 10 feet from the water's edge." We are concerned that this is not enough distance from the water body, even with sediment barriers in place, given the potential for rainfall in this region and the length of time that spoil will be stored near the water's edge.

CO107-33
- Restoration: It is not clear which sites warrant riprap instead of vegetative stabilization. Site-specific plans are needed. The Sediment and Erosion Control Plan draft also states that "if grubbing has not been extensive, then native shrub and tree species are expected to sprout and regenerate naturally." This could take years and extend the impact of construction on stream conditions as the banks return to natural condition. We are also very concerned that "stream banks will be treated with lime and fertilizer as directed in the VESCH."

CO107-34
- Where temporary culvert crossings are constructed, MVP must ensure that all foreign material used is removed completely from the streambed.

  The DEIS does not adequately address public concern of the impact of pipeline crossings on first-order streams. It is not sufficient to simply state "the applicants would minimize impacts on first-order streams by adhering to the Mountain Valley and Equitrans Procedures."

CO107-35 FERC language is misleading regarding classification of stream size, and the width of the water bodies where wet open-cut or HDD methods are used. For example, the waterbody

CO107-31 Clearing methods and waterbody and wetland crossing methods are discussed in section 2 of the EIS. Equipment bridges would be used over waterbodies; and matting would be used in wetlands. The removal of riparian vegetation is discussed in sections 4.3 and 4.4.

CO107-32 Our Procedures have proven to be protective of waterbodies.

CO107-33 See the response to comment CO107-32. Revegetation is addressed in sections 2 and 4.4 of the EIS. The document discloses that it make take years for the reestablishment of trees in temporary work areas. We expect shrubs to regenerate much faster.

CO107-34 Based on our extensive experience with pipeline construction and restoration , we feel that following the measures outlined in the FERC Procedure would be sufficient to minimize impacts during stream crossings.

CO107-35 Stream crossings are discussed in section 4.3 of the EIS. FERC uses a standard stream size classification in order to address impacts and crossing methods.

CO107-35 cont'd

that the EEP will cross that is "more than 100 feet wide" actually requires a 900 foot pipeline crossing. This information should be made more explicit. FERC defines "major waterbodies" as greater than 100 feet, but there are ten stream crossings in the DEIS between 50 and 100 feet wide. These should be recognized as significantly sized water body crossings given the topography of the region.

CO107-36

E. Impacts to Old Growth are Inadequately Addressd

The proposed MVP route bisects old growth communities on Sinking Mountain in the Jefferson National Forest that are currently designated as 6C – Old Growth Communities Associated with Disturbance. The Forest Plan's management prescription for 6C old growth communities prohibits construction of the MVP: "These areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites."

The only means by which the MVP could obtain permission to build through old growth forest is for the Forest Service to approve an amendment to the Forest Plan. The Forest Service should decline to make two proposed Plan amendments that would adversely and permanently impact old growth communities in the forest. First, the plan-level amendment would convert some portions of the forest currently designated as 6C – Old Growth Communities Associated with Disturbance to 5C – Designated Utility Corridors. That amendment would establish a permanent 500-ft right-of-way through a portion of the forest that is currently designated as 6C old growth forest. Second, a proposed amendment specific to the operation and construction of the MVP would eliminate the Forest Plan's prohibition against removal of old growth trees within the 125-ft MVP corridor.

The Forest Service highlighted the importance of old growth in its 1997 *Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region*, which the Forest Service relied on when formulating the 2004 revised plan. For instance, because old-growth communities serve as optimal habitat for some species associates, the Forest Service has taken a "coarse filter" approach to maintaining old growth communities that provide a "biological safety net." Construction of the MVP would chip away at what remains of old growth communities in the Jefferson National Forest, thus

CO107-36 See the response to comment FA15-5 regarding forest impacts. The EIS acknowledges adverse impacts from the clearing of forest. However, the construction right-of-way through the Jefferson National Forest would be restricted to 125-feet (not 500-feet). See also the response to comments FA8-1 and FA10-1.

CO107-36 cont'd

weakening that safety net. Old growth communities also provide important opportunities for research by serving as a baseline against which to evaluate other forest types, as well as recreational, educational, and cultural values. The Forest Plan's designations for old growth communities reflect years of work and compromise, and any amendment that would result in the destruction of old growth forest must not be approved lightly.

The DEIS attempts to downplay these important concerns. With respect to the plan-level amendment, FERC notes that remaining old growth within the 500-ft utility corridor would remain for now. However, establishment of a 500-ft corridor means that additional old growth communities could be removed in the future if other infrastructure were collated with the MVP. The DEIS also refers to the proposed MVP-specific amendments, including the one that will destroy these old growth communities, as "temporary waiver[s]" of the Forest Plan. But the removal of old growth trees is by no means "temporary." The DEIS also claims that only a "small acreage of existing old growth would be removed" and that the amendment would "not significantly change the future management of any resources or alter the level of output of any goods and services." However, the DEIS provides no support for its contention that destruction of *any* old growth forest in a 125-ft corridor—with the potential for destruction in a 500-ft corridor—is insignificant.

CO107-37

F. The DEIS Does Not Adequately Address Other Environmental Issues

The DEIS does not adequately address additional environmental issues on National Forest lands such as:

- Landslides

CO107-38

- Seismic Activity

CO107-39

- Non-native invasive species introduction

CO107-40

- Soil Compaction

CO107-41

- Ongoing management of pipeline corridor as herbaceous layer only

CO107-37 Landslides in Jefferson National Forest are discussed in section 4.1 of the EIS.

CO107-38 The EIS discusses seismic activity in section 4.1.

CO107-39 See the response to comment IND343-1 regarding invasive species.

CO107-40 Soil compaction testing and mitigation is discussed in sections 2 and 4.2 of the EIS.

CO107-41 Mountain Valley would inspect and maintain the permanent right-of-way in accordance with the FERC Plan and as described in section 2.6 of the EIS.

CO107-42

On the Jefferson National Forest, construction of the MVP would impact a total of about 81 acres (see table 4.8.1-12)[15]. Of this acreage, 64.5 percent would be used for pipeline right-of-way and about 1.2 percent would be used for "additional temporary workspace". Project access roads would impact 27.6 acres, including 6.3 miles of the Pocahontas Road (FR #972) and about 1.1 miles of Mystery Ridge Road (FR #11080). During operation 20.5 acres would be used for the pipeline easement and 17.3 acres would be used for permanent access roads.

CO107-43

V. The FERC NEPA process is inadequate to cover proposed Jefferson National Forest Plan Amendments; At the very least the USFS should conduct their own NEPA process to address Plan level amendments.

As pointed out elsewhere in these comments and also acknowledged in the DEIS activities and impacts required by the MVP proposal are inconsistent with the Jefferson National Forest Management Plan. Two types of plan amendments are being proposed. One is a "plan level amendment" that would be a change in land allocation and change the future management of land in this allocation. This proposed plan amendment would transfer land that is currently included in management designation for old growth management, riparian corridors, urban/suburban interface, and a mix of successional habitats and forested landscapes.

Three other plan amendments would be required to allow the MVP project activities to

1) Exceed restrictions on soil and riparian corridor conditions,
2) Remove old growth trees, and
3) Cross the Appalachian National Scenic Trail on Peters Mountain in Monroe County, West Virginia.

As discussed in detail in other portions of these comments, especially under Section IV "Specific Inadequacies of the DEIS", the DEIS fails to adequately address these issues and fails to adequately document, analyze, or propose mitigation for these and other issues. In

[15] DEIS p.4-235

CO107-42 Comment noted.

CO107-43 Since the draft EIS, Mountain Valley has provided additional inventories and analyses as requested by the FS to evaluate the effects of the proposed project. The FS has worked extensively with Mountain Valley to develop project design features, mitigation measures and monitoring procedures to ensure that NFS resources are protected as much as possible in order to determine that the LRMP standards can be exempted or modified for the MVP. The determination that the EIS is sufficient to meet FS NEPA obligations will be made in the FS Record of Decision for the plan amendments decision.

CO107-43 cont'd

particular the DEIS fails to provide adequate justification and analysis for these Plan amendments.

The reallocation of important conservation lands including old growth, riparian buffers, and wildlife habitat were intensely debated issues during the development of the Jefferson Management Plan. Management of the Appalachian Trail was an issue of intense public interest. The standards and guidelines for management of old growth resources, riparian buffers, soil resources were also vigorously debated issues. The dubious needs of a pipeline that has not been put through a screen of programmatic assessment to examine on a regional basis the energy supply from renewable sources as well as gas production, the current capacity as well as anticipated needs of gas supply, and the tradeoffs between any economic and energy benefits with the inevitable impacts to conservation, environmental, and cultural values cannot be allowed to trump the long and involved NEPA process that led to the Jefferson National Forest Management Plan. The USFS planning process is collaborative in nature. The FERC process has had less opportunity for public participation and has not given the public adequate opportunity to understand the tradeoffs involved and participate fully in a collaborative way.

There are numerous instances documented in Section IV of these comments addressing data and information gaps and inadequate and faulty analysis around issues related to the proposed Plan amendments. Sections II and III call into question the needs, rationale and justification for the pipeline, including the need for the proposed Plan amendments. It is clear that numerous conservation and ecological adverse effects of the proposed MVP within the Jefferson National Forest run counter to the intended management prescriptions and standards and guidelines contained in the Management Plan. This fact argues for rejection of the MVP proposal rather than Plan amendments to accommodate these adverse impacts.

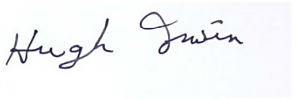
The MVP and other pipeline proposals in the region need programmatic NEPA to address these proposals on a comprehensive basis to minimize impacts of all these proposals on public lands and public and private resources. At the very least, these MVP amendments require additional NEPA by the USFS to adequately address the impacts of the proposed Plan

CO107-43 cont'd

amendments on national forest lands. The national forest is an important resource and treasure for public use and requires full analysis of the impacts. The fact that plan and project level amendments would be required at all for the granting of the ROW for the MVP warrants the need for a higher level of scrutiny by the USFS before changing the LRMP for the JNF. The USFS process for amending the LRMP at the plan level requires a complete review process with appropriate NEPA documentation, which in this case is not complete. In addition the new management prescription area for utility ROWs, what is being proposed in the DEIS and the proposed amendments, would pave the way for future additional utility transmission lines, a plan level amendment of this scope this needs full public scrutiny and analysis which has not occurred in the FERC DEIS.

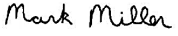
Thank you for considering these comments.

Sincerely,



Hugh Irwin,
Landscape Conservation Planner
The Wilderness Society
P. O. Box 817
Black Mountain, NC 28711

828-357-5187
hugh_irwin@tws.org



Mark Miller, Executive Director
Virginia Wilderness Committee
P.O. Box 1235
Lexington, VA 24450
(540) 464-1661
mmiller@rockbridge.net

PRESERVE MONROE

CO108-1

FERC (Attention: Kimberley Bose)
888 First Street
Washington DC, 20426
December 19, 2016

Re: Mountain Valley Pipeline
Docket # CP16-10-000

Dear Ms. Bose,

Preserve Monroe is a coalition of landowners, residents, businesses and organizations in Monroe County, WV. Preserve Monroe encourages citizens to participate in the responsible stewardship of our resources to assure the healthy and prosperous future of Monroe County and of our families.

Preserve Monroe opposes the attempt by private corporations to build large, 42-inch interstate transmission pipelines and large scale utility corridors through our county. These projects would cut across our mountains, streams and farmlands spoiling pristine view sheds and threaten contamination of water, air and soil to transport natural gas and other to points east and overseas .

CO108-2 The DEIS does not provide sufficient evidence to validate the 'need' for increased natural gas transportation facilities. Nor does it provide a thorough cost-benefit analysis that would refute

CO108-3 the growing trend of 'privatizing profits and socializing damage' that was brought to public awareness by the sub-prime mortgage scandal and other financial bail-outs where the taxpayer pays the brunt of mistakes, miscalculations and risky ventures.

CO108-4 We are united by the concern that these large excavation and construction projects—as well as the long-term presence of high-pressure gas pipelines of this magnitude—are a very real threat to our water, to our families and community, and to our property values and landowner rights.

CO108-5 There are also significant concerns with regards to the ability of emergency vehicles to reach their destination and damage to our road and bridge infrastructure during construction.

Preserve Monroe, P.O. Box 76, Union, West Virginia, 24983

CO108-1 Impacts on streams are discussed in section 4.3 of the EIS. Impacts on farmland soils is discussed in section 4.2. Impacts on air quality is discussed in section 4.11. The viewsheds in Monroe County, West Virginia are not "pristine." As listed in section 4.9, about 13,500 people reside in the county. The county includes existing infrastructure, such as cities, housing and commercial developments, farmsteads, highways, powerlines, etc. that have modified the environment. Visual impacts are discussed in section 4.8. See the response to comment IND2-3 regarding export.

CO108-2 See the response to FA11-12 regarding need.

CO108-3 This comment is not relevant to the MVP, which is a privately funded project that does not depend on taxpayer contributions.

CO108-4 Safety is discussed in section 4.12 of the EIS. We conclude that the MVP represents a low risk that is not a threat to the public. The EIS addressed water resources in section 4.3. See the response to IND36-2 regarding economic impact and property values. See the response to comment IND12-1 regarding property values. Landowner rights and communities are discussed in section 4.9 of the EIS.

CO108-5 See the response to comment IND18-2 regarding emergency plans. See the response to comment IND288-3 regarding infrastructure damage such as roads.

PRESERVE MONROE

CO108-6

Preserve Monroe has conducted research, performed on-site surveys with our Environmental Impact Consultant, Dale McCutcheon to map water resources, geological formations and historical and cultural data along the pipeline route in Monroe County.

We have seen from the data collected so far that there are significant issues which require in-depth hydrological and geological studies which were not taken into account in the DEIS. Monroe County Public Service Districts have raised issues which need to be addressed. Due to the unpredictable flow of water through karst, Preserve Monroe is focusing its attention on individual source point water for private wells and springs throughout the county which would be in jeopardy of contamination if a pipeline were to be constructed.

We therefore respectfully submit a request that the FERC imperatively address the need for in-depth studies of the impacts of the MVP on economy, geology, hydrology, cultural attachment and climate change specifically as related to Monroe County.

Thank you for taking into account our requests for further studies to be conducted before the issuance of the final EIS.

Sincerely,

Preserve Monroe

Monroe County, West Virginia

Preserve **Monroe, P.O. Box 76, Union, West Virginia, 24983**

CO108-6

The EIS addressed water resources and hydrology in section 4.3. Geological resources, including karst terrain, are discussed in section 4.1. Preserve Monroe and Dale McCucheon have filed no data with the FERC about historical and cultural resources along the pipeline route in Monroe County. Section 4.3 discusses potential impacts on wells and public water supplies. Mountain Valley would identify all wells within 150 feet (500 feet in karst) of the pipeline, test water supplies, and repair or replace damaged wells or supplies. Mountain Valley's spill plans would prevent contamination of water supplies from equipment leaks of oil or fuel. Impacts on the local economy is addressed in section 4.9. Cultural attachment is discussed in section 4.10 of the EIS. Climate change is discussed in section 4.13 of the EIS.

CO109-1

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

Re: DEIS for the Mountain Valley Pipeline (Docket No. CP16-10-000)

Dear Secretary Bose:

On behalf of Protect Our Water, Heritage, Rights (POWHR), we submit the following comments to support our determination that there is a need for a Revised Draft Environmental Impact Statement for the proposed Mountain Valley Pipeline in the above-referenced dockets.

Description of this submission

This report is the result of a two-year effort. Our first report (Submittal 201612205142) was an assessment of information provided in MVP Resource Reports accompanying its application for a Certificate of Necessity and Convenience (Submittal 20151023-5035). This report is an assessment of subsequent information the applicant provided in response to Environmental Information Requests (EIR) from FERC and cooperating government agencies.

The following individuals have contributed to this report; in alphabetical order, they are:

Mr. Peter Anderson, J.D., Appalachian Voices, Charlottesville
Ms. Hazel Beeler, Wildlife Botanist, Montgomery County landowner
Dr. Thomas Bouldin, retired English Professor, Monroe County landowner
Mr. Kirk Bowers, Civil Engineer, Sierra Club, Charlottesville
Mr. Guy Buford, Civil Engineer, Montgomery County landowner
Dr. Bruce Zoecklein, Emeritus, Professor of Ecology, Montgomery County landowner
Mr. Russell Chisholm, business owner, Giles County landowner
Dr. Alden W. Dudley Jr, Physician, Roanoke County landowner
Ms. Jennifer Fenrich, business owner, Montgomery County landowner
Dr. Pamela Ferrante, Veterinarian, Montgomery County landowner
Dr. Louisa Gay, retired Biochemist, Montgomery County landowner
Ms. Nan Gray, Social Scientist, Craig County landowner
Dr. Robert M. Jones, Mechanical Engineer Professor, Montgomery County landowner
Dr. Bill Henley, Fish and Wildlife Scientist, Montgomery County landowner
Ms. Darlene Hines, Franklin County Landowner
Dr. Cully Hession, Biological Systems Engineer, Montgomery County landowner
Dr. Steve C. Hodges, Crop Soil Environmental Scientist, Craig County landowner
Mr. Thomas Hoffman, business owner, Giles County
Ms. Pam Humphrey, retired university administrator, Giles County landowner
Dr. Ernst Kastning, Hydro Geologist (Radford County landowners)
Mr. Tim Ligon, Director of Safety, Montgomery County landowner
Dr. Ronald B. Meyers, Environmental Policy Scientist, Craig County landowner
Dr. Brian Murphy, Fish and Wildlife Scientist, Craig County landowner
Ms. Patricia Tracy, Realtor, Montgomery County landowner
Ms. Kris Peckman, Roanoke County landowner
Dr. Ron Perrone, Education Director of the Three Rivers Avian Center, Summers County

CO109-1 See the response to comment CO5-1 regarding preparation of the draft EIS.

CO109-1 cont'd

Dr. Robert Tracy, Geoscientist, Montgomery County landowner
Dr. Carl Zipper, Crop Soil Environmental Scientist, Montgomery County landowner
Dr. Richard Shingles, Emeritus, Political Science Professor, Giles County landowner
Ms. Torsten Sponenberg, Montgomery County landowner

Any and all inquiries about this report should be addressed to: Richard Shingles (shingles@vt.edu)

Method of Review

A group of over two dozen volunteers were organized in October, 2016 to determine whether and to what degree MVP provided appropriate and valid information necessary to write a sound, and legitimate DEIS. To make this task manageable, MVP information was divided up in terms of relevant Resource Reports, and then further divided by date of EIR: Dec. 24, March 31 and June 28 of this year. Specific information for agency requests and MVP responses were entered into a standardized form (Appendix A). The forms provide a highly efficient method of *matching* otherwise highly scattered applicant provided information to the appropriate requests. Then subject experts evaluated the quality of information: (1) Was a response provided? (2) Did it consists of data only ("data dumps"), a written analysis or both? (3) Expert Comments and analysis. These assessments serve as the primary basis of this report; however, supplemental information from other public submittals were also used.

What follows is a summary of our findings. We reserve the right to supplement this report with the much larger compendium on which it is based and to obtain and develop additional factual evidence and evaluate it as MVP submits further information.

CO109-2

Overview

We begin a summary of our overall assessment of MVP Resource Reports submitted to FERC in November 2015:

> A thorough reading and analysis of the eleven resource reports submitted as part of MVP LLC's application for a certificate of necessity and convenience leads us to the conclusion that the applicant has done the minimum it thought necessary to receive the certificate. The resource reports are substandard - by almost any criterion.
>
> They are blatantly biased, making sweeping unsubstantiated claims of the need for Mountain Valley Pipeline while dismissing any and all potential adverse effects, no matter how serious or well documented by independent sources.
>
> The applicant responds to data requests in a perfunctory manner without analyses or serious discussion on how information provided by the applicant, let alone other pertinent information known to reliable publically available sources, bear on the possible adverse effects of constructing the pipeline. Much of the information provided by the applicant is fragmented and scattered across resource reports in a manner that makes it exceedingly difficult to pull together.
>
> The reports do one thing consistently well: they obfuscate and obscure information that could jeopardize the application. The Resource Reports are replete with knowledge claims repudiating the possibility of serious adverse effects, confidently assuring the

CO109-2

FERC staff, together with our contractor and cooperating agencies, produced the EIS. Mountain Valley's application to the FERC met our requirements per 18 CFR 380. We supplemented Mountain Valley's environmental reports with results from independent research and EIRs. We did not ignore studies submitted by the public; and acknowledge Dr. Kastning's report in section 4.1 of the EIS. The King report is addressed in section 4.10; and the KeyLog reports are discussed in sections 4.8 and 4.9.

CO109-2 cont'd

reader that adversity can be either avoided and/or successfully mitigated. Much too often such assertions are completely unsubstantiated by reason or facts. We find the Resource Reports supercilious and disrespectful of the FERC.

For these reasons, we find the application to be fatally flawed. It does not meet the minimum criteria of the National Environmental Protection Act, nor section 106 of the National Historic Preservation Act, nor the Environmental reports for Natural Gas Act applications.

By failing to provide required information, the applicant has failed to make reasonable efforts to avoid when possible and minimize otherwise adverse effects on communities, landowners and environment impacted by the proposed pipeline. It is incumbent on FERC to reject the application. We recommend FERC schedule evidentiary hearings to allow for an open and balanced discussion of disputed facts by independent, credentialed specialists and extend the public comment period to ensure the necessary information pertinent to writing an Environmental Impact Statement.

Assessment of Information Included in the Draft Environmental Impact Statement
Implications for the Legitimacy of the DEIS

One year later, and gigabytes of additional applicant provided information, have not changed our initial assessment. In response to repeated requests from FERC and cooperating government agencies, the applicant has provided information in large "downloads" that contained no Table of Contents, or index; hence, the public and 'cooperating agencies' cannot locate or evaluate needed information. Additionally, these poorly organized data downloads were usually without analysis or adequate discussions of methodology.

The data and analyses provided by the applicant are clearly biased in favor of the application. Publically available information (e.g., scientific reports in referred journals; public comments to FERC), to the contrary, was either ignored or dismissed out of hand. Along with many others who object to the DEIS, we to voice our displeasure and document here the most blatant deficiencies.

FERC has erred in writing a DEIS without first requiring the applicant provide all the requested information as required by NEPA. Furthermore, FERC should have insisted the applicant rewrite its resource reports in a professional, and organized manner. Much of the applicant provided information does not facilitate evaluation of the DEIS.

The problem does not lie solely with the applicant, because FERC has shown a propensity to accept information provided by the applicant while ignoring substantive submissions from independent experts and the public. Numerous public comments submitted to FERC offered specific details, based on ground level observations and scientific reports; regrettably, they were not used. The most substantive and critical submittals have been uniformly ignored, including major studies by qualified experts commissioned by citizens in the affected counties; the most important being the Kastning Report, "Geological Hazards in the Karst Regions of Virginia and

CO109-2 cont'd

West Virginia"(Submittal 20160713-5029) and King Report, "Traditional Cultural Places in Appalachian Virginia and the Mountain-Valley Pipeline" (Submittal 5133). Two other reports by Key-Log Economic that address the costs and benefits of the Mountain Valley Pipeline are discussed, but rejected out of hand, but see the Key-Log reply (Submittal 5186).

As a consequence of the FERC's excessive dependence on inadequate and deficient applicant provided information, the DEIS reads as if it were taken directly from the applicants resource reports and EIR responses. We see no daylight between the applicant and the DEIS. For this reason, we will refer to Applicant/FERC (or MVP/DEIS) in much of the following.

CO109-3

Review of MVP/DEIS Assessment of Environmental Impact

The following observations and analysis documents the deficiencies in a DEIS that is primarily reliant upon incomplete, and flawed applicant information to the exclusion of comments to the contrary from the public and independent experts. This discussion focuses on one of the most important questions addressed in the DEIS: geological challenges to the Mountain Valley Pipeline.

Our analysis proceeds in two parts. First there is an independent expert's assessment of geological hazards in the Valley and Ridge Region (Appalachian Fold Belt) that the proposed pipeline route would transect. This is followed by our volunteers' collective presentation of numerous instances of the DEIS reliance on clearly *deficient information* where valid facts to the contrary have been provided to FERC. That presentation also will focus on geological hazards.

We believe the information and analysis presented here raises serious questions about the validity of the DEIS. FERC's failure to hold the applicant accountable while ignoring other sources is a violation of legal requirements (Appalachian Mountain Advocates letter of October 19, 2016 - 31744414) and the "public" face FERC extends to legitimize the DEIS.

CO109-4

We begin with two submissions to FERC from an independent subject expert, Dr. Ernst H. Kastning: (1) his 12/12/2016 (Submittal 20161212-5032) observations about the DEIS treatment of the Kastning Report and of the hazard karst presents for the MVP that were submitted on 7/13/2016 (Submittal 20160713-5029) and then (2) the information provided in Section 4 of the Kastning Report on compound geological hazards associated with the MVP.

The information on hazards discussed by Dr. Kastning will be contrasted with information provided in the DEIS and used to justify the conclusion that there no significant environmental hazards ("with the exception of impacts on forests").

CO109-3 See the response to FA11-2 regarding the adequacy of the draft EIS.

CO109-4 See the response to comment IND62-1 regarding Dr. Kastning's report. Steep slopes, landslides, karst, bedrock, and seismic activity along the GCSZ are addressed in sections 4.1 and 4.2 of the EIS. See the response to IND177-1 regarding landslides and Mountain Valley's revised *Landslide Mitigation Plan*. Impacts and mitigation measures for soils are addressed in section 4.2.

CO109-4 cont'd

Edited excepts from
Kastning Response to
DEIS
A Critical Analysis of Interpretation in the Draft Environmental Impact Statement Regarding the Proposed Mountain Valley Gas Pipeline
10 December 2016

Karst Hazards to the MVP

This discourse is a follow-up to a comprehensive report on geologic hazards previously submitted to the Federal Energy Regulatory Commission by this author on 3 July 2016 (Submittal 20160713-5029). It is entitled: An Expert Report on Geologic Hazards in the Karst Regions of Virginia and West Virginia: Investigations and Analysis Concerning the Proposed Mountain Valley Gas Pipeline (Referred to here as the Kastning Report).

The Draft Environmental Impact Statement (DEIS) makes no mention nor reference to the substantive information concerns discussed in detail in the Kastning Report. This my reply.

The analysis of the Kastning report unequivocally demonstrates that the Mountain Valley Pipeline cannot be safely built through the areas of Monroe, Giles, Montgomery, and Roanoke Counties that are characterized by karst terrain and steep slopes. Doing so would significantly threaten the structural integrity of the pipeline, and the ecological integrity of the surrounding environment. Many of the potential hazards are immitigable; they cannot be adequately circumvented with engineering or construction practices. The same is true should a catastrophic event occur, such as a breach of the pipeline"

Karst is a landscape that is formed by hydrogeologic dissolution of bedrock. Carbonate-rock terrains pose environmental hazards that are unique with respect to the wide spectrum of bedrock types, and karstic landscapes are particularly sensitive to environmental degradation (LeGrand, 1973; White, 1988). Human induced stress in karstic terrain results in more acute environmental problems than in other areas. This is particularly the case for groundwater supply and quality and land instability in the karst valleys of the mountainous Appalachian region. The New River Valley, which is largely coincident with the area addressed in this report, has historically been one of the most sensitive karst regions within the Valley and Ridge Region Valley (Appalachian Fold Belt) (Kastning, 1989a, 1990; Kastning and Kastning, 1998) (Kastning, p. 25).

Clusters of visible surface karst are evidence of potential well integrated subsurface, hydrogeologic systems. Considering the extent of the soluble rock exposed at the surface in this region, much of it is tied to extensive networks of alternating surficial and groundwater flow.

Karst can create hazards for structures that are built on or across it. The environment, both on the surface and in the subsurface, is more easily degraded in karst than in most other terrains. Karst poses severe constraints on engineering, construction, and maintenance of large-scale structures

CO109-4 cont'd

built upon or across it. The procession of valleys and ridges, many with steep slopes, increases the likelihood and complexity of hazards.

However, in any given location, karst features visible on the surface are not a *sufficient* indicator of a well-integrated subsurface flow system. Yet, that is methodology that informs the DEIS . For this reason, the DEIS grossly misinterprets the potential threat of karst terrain.

MVP consultant, Draper Aden Associates, provide a record of karst features visible within a 0.25-mile of the corridor centerline. The data are listed in a 25 page table in Appendix L of the DEIS. They include milepost and position, county, type of karst feature, level of concern, the potential hazard, and construction recommendations, (i.e. mitigation). These features were identified by 'desk-top' methods and some field work. The data have not been updated since the 2015 Draper Aden Associates study, despite supplementary input from several contributors in their depositions to FERC since that time.

Altogether Appendix L indicates approximately 28 caves, 68 sinkholes, 17 springs, and 10 insurgences enumerated within five counties with karst (Summers and Monroe counties in West Virginia and Giles, Craig, and Montgomery counties in Virginia). This adds to 123 karst features that occur along a combined distance of 22.0 miles along the proposed route. These numbers do not include estimates given for sinkholes within clusters, compounded sinkholes, all features in large areas of sinkholes (such as the Mount Tabor Sinkhole Karst Plain in Montgomery County), very small sinkholes or difficult to observe karst features. Therefore, the number of surface karst features may conservatively be higher than 130 reported. This amounts to an average of about six identified and confirmed karst features per mile within a narrow, half- mile wide zone across potentially larger karst landscapes. Another way to visualize this is to note that the average spacing among the cataloged karst features is less than 0.2 mile (or slightly more than 900 feet).

Based on the experiences of many karst researchers (including this author), there are only three reliable methods to determine the true extent of karst in the subsurface and thus fully delimit integrated networks and paths of groundwater flow from zones of recharge to zones of discharge. These are: (1) a high-resolution surveying and mapping of surficial features (i.e. including the very subtle features discussed above), (2) extensive and detailed geotechnical methods such as dye tracing and a variety of established geophysical techniques (e.g. seismic exploration, electrical resistivity, microgravity measurements, and ground-penetrating radar), and (3) exploration and surveying of enterable caves. Even at best, the employment of any, or all, of these methods may not adequately determine precise locations where potential impacts from construction and land alteration will not be a problem or even have a minimal effect.

In lieu of these methods, the paucity of detailed data in Appendix L strongly suggests the karst inventory in Appendix L is insufficient for routing the proposed pipeline corridor. The real density of karst features is undoubtedly considerably more than six per mile and the average spacing would be much less than 900 feet if subtle karst features were included.

CO109-4 cont'd

There are several areas along the proposed MVP corridor where karst density is documented to be high (Hayman, 1972; Hubbard, 1988; Miller and Hubbard, 1986). The Mount Tabor Karst Sinkhole Plain has been identified as a particularly significant and sensitive area by Draper Aden Associates, cave researchers, and this author. Several dye tracings there confirm the extent of flow paths beneath the karst plain. The extent of the Mount Tabor complex karst aquifer very likely exceeds the area that exhibits sinkholes. For the MVP corridor to effectively avoid producing environmental impacts to this system would necessitate considerable geotechnical study to determine the parameters of the karst as well as the extent of contributing recharge area.

There are additional, significant karst complexes with similar hazards along the corridor that are not recognized by FERC. The Kastning Report discusses several sites, including some in Monroe County in West Virginia and in Giles County in Virginia (Section 4, pages 47-52).

The extent of the planned mitigation of karst hazards in the DEIS is to make minor adjustments in the route to circumvent *individual* surface features and, where this is not feasible, to bridge them. This blindly ignores the interconnectivity of surficial and subsurficial karst and paths of water flow that is almost certain for large karst complexes. By analogy, if an army were to encounter a mine field in battle, it would be prudent for it to skirt the area completely rather than tip-toe through it in the hopes that a catastrophic event would not be triggered.

As discussed in the Kastning Report, it is remiss *not* to consider the contributing surficial drainage basins, including allogenic recharge from mountains and upland non-karstic areas, in the delineation of karst terrain. The DEIS also fails in this regard. Nor does it detail how buffer zones may be determined.

The Kastning Report was submitted to FERC in July 2016. Based on comments made after that date (including personally to me in Roanoke, Virginia, on 3 November 2016 by a FERC representative), the report was received and reviewed. However, substantial information and conclusions in the Report have been completely left out of the DEIS.

The following statement occurs in the DEIS (Section 4.13.2.1, pages 4-500 to 4-501, entitle. The **bold** emphasis is mine:

> "**We do not have data about impacts on karst features** and related groundwater resources for all of the other projects within the HUC10 watersheds crossed by the MVP and the EEP." However, a review of information available regarding karst features crossed by other FERC jurisdictional projects shows whether or not there are karst impacts associated with any of those projects. The Columbia Smithfield Expansion III and the Virginia Southside projects do not cross karst terrain. And while the ACP Project and Supply Header do, it is unclear whether any of it occurs within the HUC10 watersheds shared by the MVP or the EEP. The Rover Pipeline would cross 89.4 miles of potential karst terrain, most of which is in northwest Ohio, outside of the geographic scope of analyses for the MVP or the EEP. Other projects that may also cross karst terrain include transportation or other energy projects."The MVP pipeline route would cross considerable karst terrain between. about MPs 190 to 237. Mountain Valley has

CO109-4 cont'd

developed a Karst Mitigation Plan to reduce the impacts on karst terrain (see discussion in section 4.1.2). In consideration of available information for other projects, and the protective measures proposed by MVP, **we have not identified any cumulative impacts on karst terrain that would result from construction and operation of the projects**.

Given the nature of shallow pipeline trenching relative to deeper aquifers, Mountain Valley's Karst Mitigation Plan, as well as the protective permitting requirements of other agencies for other projects such as oil and gas well development, **we conclude that the combined cumulative effects upon groundwater would be less than significant**."

The above quotation from the DEIS states that FERC does not have data indicating significant impact of karst features within the HUC10 watersheds crossed by the MVP. This is a clear indication that the Kastning Report was either not read or considered, or it was intentionally ignored. The Kastning Report includes *very substantial and significant* data about the co-impacts between karst and the proposed pipeline. It included specific examples of potential problems in several localities. The DEIS actually has the data in the Kastning Report. So, why was it not acknowledged? Utilized?

To reiterate the conclusion in the Kastning Report (where I provide the detailed support): Karst and associated hazards constitute a serious incompatibility with the proposed pipeline. The effect of these threats on the emplacement and maintenance of the line, as well as the potential hazards of the line on the natural environment, renders this region as a 'no-build' zone for this project.

CO109-4 cont'd

Edited Excerpts from Section 4 of Kastning Report
Compound Effects of Significant Geologic Hazards to the

MVP Introduction

Any one of the individual hazards discussed to this point is of high concern in ascertaining the viability of an environmentally safe natural-gas pipeline in the Appalachian Valley and Ridge Province. However, karst processes (both on or below the surface), slope stability, problem soils, surface hydrology, severe weather, seismicity, and natural habitats are interrelated into a natural system. Similarly, the hazards discussed in Section 3 rarely operate alone in this region. Two or more can act simultaneously or they may occur sequentially as a cascading series of events. In fact, one hazard may induce another. (For example, an earthquake may trigger a landslide that, in turn, may block and disrupt a stream.) This section explores potential compounded effects along the pipeline corridor in detail.

Karst is an important environmental consideration in its own right over much of the proposed pipeline route through these counties. However, in most cases, the karst environment can be impacted by changes in its upstream recharge zone, movement of eroded or landslide induced material onto the karst from above, contamination of surface streams that provide recharge to underlying aquifers, and other events. The specific sites discussed in detail in the Kastning Report illustrate compound hazards.

The documents submitted by MVP and its consultants in general do not address the aggregate effects of multiple hazards. By addressing hazards individually, combined effects of interrelated simultaneous or cascading events are overlooked. In most cases a hazardous condition or event will be complex, with multiple components. It is imperative that a potentially threatening project such as this maximum-size, highly pressured gas pipeline be analyzed systematically based upon compounded potential hazards.

Potential Slope Failure Along the Proposed MVP Corridor,
Compounded by Soil Character and Seismicity

An important aspect of geologic hazards along the proposed corridor of the Mountain Valley Pipeline (MVP) is the compound effect of slopes, soils, and potential earthquakes (seismicity). The following is a summary of parameters that impose these hazards along the corridor in Monroe County, West Virginia, and Giles, Craig, Montgomery, and Roanoke counties in Virginia.

Steep slopes are presented first, in relation to soil characteristics that could exacerbate slope failure. Tables of slopes and soil conditions (Appendix B) list these relationships and are keyed to MVP designated mileposts. The seismicity of the area is then summarized. A seismic event could trigger slope failure, especially after soils and vegetation have been disturbed or removed during construction. However, slopes may be unstable or metastable and failure could be triggered by other contributing factors such as severe storms and precipitation or erosion that lessens slope stability. Soils on unstable slopes can also exhibit a form of slow and persistent movement known as 'soil creep' that can exert significant effects over time. "Soil creep" is the slow down-slope movement of earth materials under the influence of gravitation. It has been documented to occur in steep-slope terrain by numerous studies and is endemic to Giles County owing to the abundance of shrink-swell soils (*e.g.,* Young, 1960; Yamada, 1999; Oehm and

CO109-4 cont'd

Hallet, 2005).

Steep Slopes

The path of the MVP corridor through Monroe County crosses successive valleys and ridges - characterized by steep slopes (Table 1A) and karst terrain. Streams, springs, and groundwater in this region provide drinking water to the population of the county, both through private springs and wells and by public drinking-water providers. The construction of the MVP would pose a significant threat to water supplies for a large number of the residents of this and neighboring counties.

The MVP is projected to cross several "zones of critical concern" (ZCC) - defined as "a section of corridor along streams within a watershed that warrants detailed scrutiny owing to its proximity to a zone of recharge and susceptibility to potential contaminants." Among the most susceptible in Monroe County are the Big Bend Public Service District (PSD) and Red Sulphur PSD.

The preferred route crosses the ZCC for the Big Bend PSD in at least two locations within the county, at Mileposts 175.71-176.06, where slopes are greater than 30 percent with an average maximum vertical slope of 62 percent for approximately one mile.

A significant part of the ZCC for the Red Sulphur PSD lies within an area of karst. The proposed route crosses through this ZCC at least three times and runs along a ridge of Little Mountain where slopes average over 40 percent for more than a mile. The extent of the projected MVP that descends on the west slope of Peters Mountain, in the headwaters of the Red Sulphur PSD, traverses slopes greater than 40 percent for nearly a mile. Construction in this area in 2014 for the Celanese 10-inch Natural Gas pipeline in Giles County resulted in significant turbidity in the Red Sulphur PSD, that has since adversely impacted the drinking-water quality. This PSD serves 4,000 households and is supplied by a groundwater well and spring located in karst terrain. A diesel-fuel spill in this right-of-way resulted in a two-week shutdown of the PSD in July, 2015. These problems resulted in considerable controversy and press coverage, leading to investigation and suggested corrective measures that were imposed by the Virginia Department of Environmental Quality. Additional concerns about this situation are presented in Section 3.

In addition to impacts to public drinking water systems, many private drinking water sources may be impacted by the MVP in this area. A large part of the rural population obtains drinking water from private springs and wells, many of which are located on the steep slopes of Monroe

County and fed by waters from within the karst aquifer. These private water sources are at risk from adverse changes in water quality and quantity owing to disruption of flow patterns.

Table 1-B shows the most severe slopes along the proposed route from Giles County through Roanoke County. The proposed MVP descends from Peters Mountain into Giles County and runs southeastward for about 15 miles across ridges and valleys to Newport, at the eastern end of the county. There it turns northeast, running along the northwestern flank of Sinking Creek Mountain into Craig County and then crosses Sinking Creek Mountain and runs southeast again, over Brush Mountain, and into the Mt. Tabor Karst Sinkhole Plain in Montgomery County. The table identifies twelve areas along the along the west-east route where the maximum slope averages over 40 percent. Seven of these most severe slopes extend for approximately one mile each. One of the steep, karst zones is at the three-way intersection of Mountain Lake Road, Zells Mill Road,

CO109-4 cont'd

and Sinking Creek (within 300 feet of the Link Covered Bridge, near MVP milepost 210). Another steep zone is above Canoe Cave and related karst features there.

In summary, over half (53.5 percent) of the preferred route from Monroe to Roanoke counties has slopes that are 20 percent grade or greater. Over one-third (36 percent) of the slopes that exceed 20 percent grade are 35 percent grade or greater, requiring "special engineering techniques" according to MVP. Thus 19 percent of the slopes along this route are over 35 percent in grade, creating very serious construction problems that in turn would enhance the likelihood of both erosion and slides on slopes.

Soils

The possibility of significant erosion problems, and ensuing slides following construction, is greatly enhanced by a preponderance of the active *shrink-swell soils* with significant *plasticity*: Carbo, Faywood, Frederick, Nolochucky, Poplimento and Sequoia. Additionally, these soils have poor drainage and hence, low bearing strength that would enhance sliding on steep slopes. Table 2 lists soils that contribute to slope stability and their key attributes. These pose severe engineering challenges. The construction of the MVP on slopes of 35 percent or higher will require extraordinary techniques, where machines for excavating trenches and laying pipe are attached by cable to heavier equipment atop ridges. This would result in considerable additional clearing of ridge tops and slopes. Soils of poor *bearing strength* would become loaded with the force of heavy machinery. Indeed, the weight and vibrations of heavy machinery atop ridges covered with these soils, and supporting other heavy machinery, can push saturated cohesive soils over and down ridges (*see drainage* and *hydrology* ratings in the tables). Thus, ironically, the extraordinary solution that MVP plans to use for laying pipe on very steep slopes would compound engineering problems and threaten the integrity of the pipeline.

It is interesting to note that Giles County is blanketed with slip-swell soils, far more than any of the other counties along the route (compare Tables 2 and 3). It also has more areas of karst (approximately 80 percent of its land area) and is the center of the Giles County Seismic Zone. Giles County alone would severely impede construction and maintenance of a safe and viable gas pipeline.

CO109-4 cont'd

Table 1-A. Ridge and Valley Severe Slopes and Soils on MVP route: Monroe County

Mile Posts	Distance miles	Mountain	Ave. Max Vertical Slope %	Predominant Soil Types
175.71-176.06	0.97	Wind Creek crossing, within Zone of Critical Concern for Big Bend Public Water Supply	61.81	Ceteache Litz complex
176.57-176.68	0.11	Crossing of tributary to Stony Creek	57.02	Ceteache Litz complex
180.33-180.66	0.33	High Top	40.46	Ceteache Litz complex, Dekalb channery loam
181.82-183.9	2.08	Crossing of Indian Creek; ridge above Hans Creek, crosses tributaries to Hans Creek	42.76	Litz silt loam, Dekalb channery loam
184.81-186.84	2.03	Ellison Ridge and Hans Creek crossing	51.60	Lily sandy loam, Dekalb channery loam, Laidig channery loam
187.90-187.95	0.05	2,393 ft. Mountain	61.49	Ceteache-Litz complex
190.59-191.48	0.89	Little Mountain	46.38	Frederick and Dunmore, Dekalb channery loam
192.55-192.84	0.29	Little Mountain	41.01	Dekalb channery loam and Weikert channery silt loam
193.62-193.71	0.09	Slope leading to Painter Creek crossing and Red Sulphur PWSD	55.14	Weikert channery silt loam
194.75-195.69	0.73	Peter's Mountain western slope and RS PWSD	48.64	Laidig channery loam

Table derived from MVP 1-J Slope Tables, MVP 7.5 Minutes Topo Maps, and Mountain Valley Pipeline Exploratory GIS Ma

CO109-4 cont'd

Table 1-B. Ridge and Valley Severe Slopes and Soils on MVP route: Giles Co. Roanoke Co.

Mile Posts	Distance miles	Mountain	Ave. Max Vertical Slope %	Predominant Soil Types
196.94 - 198.03	1.09	Peters Mountain east slope	59.4	Nolichucky very stony loam
198.87 - 199.92	1.05	Down slope west of Kimbalton	45.7	Frederick very stony silt loam
200.12 - 201.04	0.92	2317 ft Mountain	36.1	Braddock sandy loam
201.43 - 202.42	0.99	2330 ft Mountain	46.7	Carbo silty clay loam very rocky
203.1 - 204.23	1.13	2500 ft Mountain	47.5	Nolichucky very stony sandy loam
204.26 - 204.76	0.5	2493 ft Mountain	39.5	Frederick very gravelly silt loam
204.77 - 205.58	0.81	2500 ft Mountain	46.0	Frederick very gravelly silt loam
206.79 - 207.27	0.48	2683 ft Mountain	55.1	Carbo, Frederick
207.82 - 208.24	0.42	Down and cross slopes	50.0	Frederick gravely silt loam
209.71 - 209.88	0.23	Down slope to Rt 700 & Rt 604	54.9	Carbo silky clay loam very rocky
209.93 - 210.51	0.58	Rt 700 to Winding Way Dr	40.5	Braddock, Gilpin, Sequoia
211.4 - 212.35	0.95	Newport: Rt 700 to Rt 42	54.0	Frederick gravel-outcrop complex
213.65 - 213.76	0.11	Canoe Cave	56.4	Frederick: Newport to Canoe Cave
214.5 - 214.92	0.42	Rock outcrop complex	44.5	Carbo
220.05 - 220.83	0.78	Slope to Mt Tabor Sinkhole Plain	50.0	Berks-Clymer
225.96 - 226.26	0.3	Paris Mountain western slope	73.3	Carbo - Chilhowie
229.54 -229.82	0.28	Slope : Mont-Roanoke Co. Line	73.3	unclassified
234.66 -235.17	0.51	Slope: Mont-Roanoke Co. Line	60.8	unclassified
236.12- 236.84	0.72	Poor Mountain	64.51	Sylvatus Very Channery Silt Loam
237.67 - 238.94	1.27	Poor Mountain	52.2	Sylvatus Very Channery Silt Loam

Table derived from MVP 1-J Slope Tables, MVP 7.5 Minutes Topo Maps, and Mountain Valley Pipeline Exploratory GIS

CO109-4
cont'd

Table 2. Soils that Contribute to Slope Stability and Their Key Attributes

Soil Series	(1) Plasticity Index	(2) Shrink-swell Potential	(3) Bearing Strength (for Roadfill)	(4) Drainfield/ Suitability	(5) Depth to Rock	(6) Hydrology	(7) Mineralogy
Allegheny	15	L	Good	Mod (Flooding)	>60"	Flooding	Mixed
Bailegap	20	L	Poor (Stony)	Sev	40-60"		Siliceous
Berks	10	L	Poor	Sev (Depth)	20-30"		Mixed
Braddock	33	M	Fair	Mod (Perc)	>60"		Mixed
Carbo	55	H	Poor (LS, SS)	Sev (Perc)	20-40"		Mixed
Chagrin	NP, Sandy	L	Good	Sev (Flooding)	>60"	Flooding	Mixed
Chavies	10	L	Good	Mod (Flooding)	>60"	Flooding	Mixed
Cotaco	15	L	Fair (Wetness)	Sev (Wetness)	>60"	Wetness	Mixed
Drall	10	L	Poor	Sev (Sandy)	40-60"		Siliceous
Faywood	45	M	Poor (LS)	Sev (Perc)	20-40"		Mixed
Fluvaquents	No Data	No Data		Sev (Flooding)		Flood plain	No data
Frederick	55	H-M	Poor (LS)	Sev (Perc)	>60"		Mixed
Gilpin	15	L	Poor (Thinness)	Sev (Depth)	20-40"		Mixed
Jefferson	15	L	Good	Slight	>60"		Siliceous
Lehew	7	L	Poor	Sev (Depth)	20-40"		Mixed
Lily	15	L	Poor	Sev (Depth)	20-40"		Siliceous
Nolichucky	25	M	Poor (LS, SS)	Mod (Sev Perc)	>60"		Siliceous
Poplimento	60 Clayey 30 silty	H-M	Poor (LS, SS)	Sev (Perc)	>60"		Mixed
Sequoia	40	M	Poor (LS)	Sev (Perc)	20-40"		Mixed
Timberville	30	M	Fair (LS, SS)	Sev (Wetness)	>60"	Flooding	Mixed
Wallen	10	L	Poor (Stony)	Sev (Depth)	20-40"		Siliceous

Compiled by Dr. Steven Hodges, Soil Scientist, from USDA NRCS 1985 Soils Survey of Giles County, Virginia: Tables 10 – 16.

Notation: L = Low, M = Medium, H = High, Mod = Moderate, Sev = Severe, Perc = slow percolation; Depth = shallow, LS = low strength, SS = shrink-swell.

Special construction techniques are required for plasticity scores over 30, M, H, Poor, Mod, Sev and Mixed. Blasting required for depth < 60".

CO109-4 cont'd

Bedrock

Data in Tables 1 and 2 (Appendix B) underestimate a likely potential cumulative threat. Further hazards occur in sites with relatively undisturbed thin surface soils and regolith. The extraordinary engineering techniques of MVP would disturb the subsoil, break its structure, expose the subsoil to rainfall and erosion, and compact soils during reclamation. If the native surface soils are unsuitable, the disturbed soil will very likely be much more so. *Depth-to-rock* ratings are included in Table 2 because some of the severe ratings result from shallow soil depth to bedrock. One reason why Giles County has not become highly developed is that steep slopes covered in fragile soils are highly prone to slope slides. The unstable character of these mountain slopes is evidenced bywell-documented, extensive and large, historic landslides along the southeastern flank of Sinking Creek Mountain (Schultz, 1986,1993; Schultz and Southworth, 1989; United States Forest Service, 2000; Whisonant and others, 1991). Such slopes will not be able to bear the load that MVP is planning to impose.

Based on depth-to-rock associated with predominant soils along the MVP route, extensive blasting will likely be necessary. Blasting will occur in areas of sink holes, springs, and wells. The extent of karst underlying these soils, especially in the vicinity of the karst systems associated with Pig Hole, Echols, Smokehole, Tawney's and Canoe caves and the extensive Clover Hollow karst system along Zells Mill Road, presents significant threats to both residential water sources and to the structural integrity of a large, high-pressure pipeline.

Based on their soil studies, soil scientists Nan Gray and Steven Hodges judge this region as a no-build zone for the pipeline. Upon a close reading and scrutiny of MVP Resource Report 7-Soils (Appendices 7-A1, 7-A2, 7B, 7C, 7D and Table 7.2-4), Gray observes that the contractors for assessing soils along the route "report the dangers of the route in significant detail." The details indicate approximately 60 percent of the route through West Virginia and Virginia is in karst and/or shrink-swell soils, making it unsafe and unsuitable for the type of construction proposed in the application. (*see* Review of Resource Report 7 in the Motion to Intervene and Protest (Docket CP16-10-000) submitted by Preserve Giles County (20151201-5127).

Giles County Seismic Zone

The Giles County Seismic Zone (GCSZ) further complicates hazards along the proposed MVP corridor. At Pearisburg, the county seat of Giles County, the planned MVP route passes a very short distance from the epicenter of the active Giles County Seismic Zone (GCSZ; *see* map of Figures 6A and 6B in Appendix B). The Virginia Department of Mines, Minerals and Energy (DMME) has designated the GCSZ as a "Seismic Hazard" (DMME. Mapping Seismic Hazards in

CO109-4 cont'd

Virginia. http://dmme.virginia.gov/_DGMR/EQHazardMapping.shtml). The agency web site reports, "Most earthquakes in Virginia are not associated with a known fault, but occur within three distinct seismic zones…," one of which is the otherwise well-documented Giles County Seismic Zone. This zone was not recognized in the MVP resource reports depicting seismic zones in relation to the proposed pipeline. The GCSZ does not appear in Figure 6.1 of Appendix 6-D of their report on geologic hazards. The source of this map was likely a smaller-scale map of seismicity in the entire United States on which the GCSZ did not appear owing to resolution considerations of the map. Nonetheless, omission of the GCSZ is serious because seismicity provides a significant threat along the pipeline route.

Bollinger (1981) and Bollinger and Wheeler (1983, 1988) have described the GCSZ in considerable technical detail. In their recent peer-reviewed paper, Biryol and others (2016) provide a new and major understanding of seismicity in the southeastern United States, including the GCSZ. They confirm that the term "Giles County Seismic Zone" remains in scientific use, and the GCSZ is considered to be an area with enhanced seismic risk. Dr. A.M. Ziegler, Professor Emeritus of Geology from the University of Chicago, in his letter of November 25, 2015, provides further comment on the GCZS, including reference to mapping of the zone by DMME (Figure 6).

MVP Resource Report 6 (Geology) acknowledges that the GCSZ is "primarily known for being the epicenter of a strong May 31,1897 earthquake that was subsequently characterized under modern standards as MM-VIII, magnitude 5.8." MVP dismisses a recurrence of such an event during the life of the pipeline as being exceedingly small. However, the March 9, 2016 letter from U.S. Forest Service to the FERC challenges this conclusion, requesting a more rigorous study of the GCSZ (which has not yet been provided). This letter references pertinent publications, including findings indicating that ridgetop amplification of ground shaking of approximately 0.12 G from seismic activity may have been responsible for massive slope slides along Sinking Creek Mountain, reported by Whisonant and others (1991). These findings forecast the potential for future seismically induced slides on steep slopes in the area.

The U.S. Forest Service letter cites research by Schultz (1993) that "shows that the rock block slides (along Seeking Creek Mountain) may have been emplaced as a single catastrophic event of short duration." Schultz and Southworth (1989) state: 'The apparent clustering of large landslides near the Giles County, Virginia seismic zone suggests that seismic shaking may have been an important triggering mechanism."

An important understanding of the effects of earthquakes in the vicinity of the proposed pipeline needs to be emphasized. Even though a very-high-magnitude earthquake (Richter magnitude 5.0 or greater) has not occurred in the GCSZ since 1897, the more time that elapses, the more likely

CO109-4 cont'd

it is that such an event may occur. This is simply a basic tenet of magnitude-frequency analysis of natural events (earthquakes, volcanic eruptions, floods, storms). The recurrence interval for a 5.0 earthquake in the GCSZ is not well determined, yet the possibility exists that one can occur at any time.

The probability of the catastrophic 1897 re-occurring is unknown and *that* is a problem. However, catastrophic seismic activity is not the only or primary concern. Of equal importance for a 42- inch high-pressure gas pipeline in this area are *frequent moderate earthquakes*. Bollinger and Wheeler (1983) report nine earthquakes in or near Giles County over a 22-year period (1959- 1981), the largest of which was mb = 4.6. MVP Resource Report 6, (Table 6.4-1) indicates a 4.3 GCSZ quake in 1974 and five additional earthquakes of a magnitude of 4.0 or greater within 100 miles of the MVP pipeline for the period 1976-2006. On the basis of these reports, ground shaking of the magnitude 4.0 or higher is highly likely during the planned life time of the pipeline. Given the history of slope slides in Giles County, there should be genuine concern that the combination of steep slopes, poor soils and moderate ground shaking could contribute to an *immitigable* failure with catastrophic consequences. Emergency response time, let alone mitigation, would be moot. This is a major concern that has not been adequately addressed in the MVP resource reports.

Therefore, continuing seismic activity in the GCSZ (a high frequency of magnitude 2.5 or larger earthquakes), produces a major risk when compounded with the already co-existing problems of karst, slope, and soil hazards at sensitive locations along the proposed pipeline route. This poses severe engineering challenges in constructing the pipeline, and calls into question whether the pipeline should be built at all.

Compounding of hazards along the preferred route alone suggests that avoidance of the region altogether is in the best interest of MVP and FERC, and certainly to the overwhelming majority of residents of Giles and adjacent counties. Many of the residents submitted comments to FERC, demonstrating their anguish over the very real threat to water supplies in karst and the possibility of a catastrophic pipeline failure.

With or without a significant seismic event, slope failure is in itself a significant continuing concern. In commenting to FERC on March 30, 2015, Dr. Robert Tracy (Professor of Geosciences at Virginia Tech) states: "Even holding constant the seismic hazards, along the MVP route most subject to seismic activity, there is a very high probably of differential slope failure, with slide masses moving at differential rates with abrupt boundaries (effectively soil faults) separating masses."

CO109-5

Supplementary Analysis (December 21, 2016)

Table 3 has been created for Giles, the county with the largest concentration of hazards. It contains MVP data from DEIS Appendices K, N-2, F-4, and L, which (according to public comments to FERC) are not very reliable. However, an examination of this table provides a clue as to why the DEIS does not include a separate a detailed treatment of compound geologicalhazards bymile post along the proposed pipeline route: Table 3 vindicates the Kastning Report.

The Table shows that the 11 miles of the route through Giles (from Peters Mountain on the border with West Virginia to the border with Craig County) is an engineering nightmare. This table contains only ridges with slopes >30% (with maximum vertical slopes averaging 40% or more) and a preponderance of active soils. With the exception of Peters Mountain, every ridge is underlain with the highly plastic, shrink-swell soils described in Table 2. Steep ridges rise above typically narrow, karst valleys, as indicated in the last two columns showing "water bodies in karst areas" and *karst complexes* identified bymultiple surficial features and caves. Hole Hole #2 and Tawneys Caves are each approximately 4,000 feet long. Hole Hole #2 appears to be part of a karst system that includes the 6.000 foot Pig Hole Cave. Tawney's Cave abuts, and once was connected to, the 10,000 foot Smokehole Cave. Canoe Cave is at least 1000 feet long. Caves are often nestled among sinkholes. Several have known subsurface streams. They could well be connected to the many adjacent tributaries (no one knows).

Without considerable effort, one could never know the information provided in Table 3. Now, MVP and FERC know.

CO109-5 There are existing pipelines in the United States that cross steep slopes and karst terrain. Pipeline companies know how to construct across such environments. In sections 4.1 and 4.3 of the EIS we recognize the underground connectivity between karst features and groundwater. Distances from the MVP to Tawney Cave, Pig Hole Cave, Smoke Hole Cave, and Canoe Cave are discussed in section 4.1.

CO109-5
cont'd

Table 3 Coterminous Severe Slopes >30%, Active Soils, Karst Complexes with Waterbody Crossings along the MVP route in Giles County

Mile Posts	Length miles	Mountain	Ave. Max Vertical Slope	Active Soils	Waterbodies in Karst Area	Karst Complex
194.7 - 196.0	1.30	Peters Mountain NW slope	40.9	None	Kimbalton Branch[EP]	Sinkholes, one open throat
196.94 - 198.03	1.09	Peters Mountain SE slope	59.4	Nolichucky very stony loam	Kimbalton Branch[EP] Curve Branch[I] Big Stony Creek[IP]	
198.3- 199.92	1.62	Kimbalton slopes	41.4	Frederick very stony silt - Carbo-Rock Outcrop complex	Clendennin Creek[P] Big Stony Creek[P]	Lhoist Cave -sinkhole complex, shallow bedrock
200.9 - 201.04	0.50	2317 ft Mountain	39.0	Carbo-Rock outcrop complex - Carbo silty clay	Dry Branch[P]	Shallow bedrock, Possible cave
201.43 - 202.42	0.99	2330 ft Mountain	39.0	Carbo-Rock outcrop complex - Faywood silt loam	Dry Branch[EP]	Shallow bedrock, Crooks Crevice Cave
203.4 - 205.3	1.90	2500 ft Mountain	45.1	Carbo-Rock outcrop - Nolichucky very stony sandy loam	Little Stony Creek[P]	Shallow bedrock, 3-4 caves, sinkholes, shallow bedrock
206.7 - 207.3	0.60	2683 ft Mountain	43.3	Sequoia silt loam	Sinking Creek[IP]	shallow bedrock, losing stream
207.8 - 208.4	0.60	Down and cross slopes	47.3	Frederick gravely silt loam	Sinking Creek[IP]	Pig Hole Cave System, including Echols Cave, sinkholes, losing stream
209.4 - 209.9	0.50	Down slope to Rt 700&Rt 604	42.3	Frederick gravely silt loam	Sinking Creek[IP]	Tawneys and Smokehole caves, sinkholes, losing stream
211.4 - 212.4	1.0	Newport: Rt 700 to Rt 42	47.0	Frederick gravely silt loam	Greenbrier Branch[I]	Sinkholes
213.6 - 214.8	1.2	Mountains - Rocky Outcrop	40.2	Frederick gravely silt loam - Carbo-Rock outcrop complex	Large spring	Canoe Cave, sinkholes, underground stream

Table derived from plus 7.5 MinsTopo Maps, and the Mountain Valley Pipeline Exploratory GIS Map.
Stream flow: E = ephemeral, I = intermittent, P = perennial (Sinking and losing streams appear intermittent or ephemeral.)
MVP appendices K, N-2, F-4 1 and L

CO109-6

Three Expert Reviews of MVP/DEIS Data

Documentation of Karst Hazards to the MVP

Edited excepts from Kastning Response to DEIS
A Critical Analysis of Interpretation in the Draft Environmental Impact Statement
Regarding the Proposed Mountain Valley Gas Pipeline
12 December 2016 (Submittal 5032)

This discourse is a follow-up to a comprehensive report on geologic hazards previously submitted to the Federal Energy Regulatory Commission by this author on 3 July 2016 (Submittal 20160713-5029). It is entitled: An Expert Report on Geologic Hazards in the Karst Regions of Virginia and West Virginia: Investigations and Analysis Concerning the Proposed Mountain Valley Gas Pipeline (Referred to here as the Kastning Report).

The Draft Environmental Impact Statement (DEIS) makes no mention nor reference to the substantive information concerns discussed in detail in the Kastning Report. This my reply.

The analysis of the Kastning report unequivocally demonstrates that the Mountain Valley Pipeline cannot be safely built through the areas of Monroe, Giles, Montgomery, and Roanoke Counties that are characterized by karst terrain and steep slopes. Doing so would significantly threaten the structural integrity of the pipeline, and the ecological integrity of the surrounding environment. Many of the potential hazards are immitigable; they cannot be adequately circumvented with engineering or construction practices. The same is true should a catastrophic event occur, such as a breach of the pipeline"

Karst is a landscape that is formed by hydrogeologic dissolution of bedrock. Carbonate-rock terrains pose environmental hazards that are unique with respect to the wide spectrum of bedrock types, and karstic landscapes are particularly sensitive to environmental degradation (LeGrand, 1973; White, 1988). Human induced stress in karstic terrain results in more acute environmental problems than in other areas. This is particularly the case for groundwater supply and quality and land instability in the karst valleys of the mountainous Appalachian region. The New River Valley, which is largely coincident with the area addressed in this report, has historically been one of the most sensitive karst regions within the Valley and Ridge Region Valley (Appalachian Fold Belt) (Kastning, 1989a, 1990; Kastning and Kastning, 1998) (Kastning, p. 25).

Clusters of visible surface karst are evidence of potential well integrated subsurface, hydrogeologic systems. Considering the extent of the soluble rock exposed at the surface in this region, much of it is tied to extensive networks of alternating surficial and groundwater flow.

Karst can create hazards for structures that are built on or across it. The environment, both on the surface and in the subsurface, is more easily degraded in karst than in most other terrains. Karst poses severe constraints on engineering, construction, and maintenance of

CO109-6 Dr. Kastning's report was considered when preparing sections 4.1 and 4.3 of the EIS. Section 4.1 of the EIS has been revised to include additional analysis of Dr. Kastning's report.

CO109-6 cont'd

large-scale structures built upon or across it. The procession of valleys and ridges, many with steep slopes, increases the likelihood and complexity of hazards.

However, in any given location, karst features visible on the surface are not a *sufficient* indicator of a well-Integrated subsurface flow system. Yet, that is methodology that informs the DEIS .

For this reason, the DEIS grossly misinterprets the potential threat of karst terrain.

MVP consultant, Draper Aden Associates, provide a record of karst features visible within a 0.25-mile of the corridor centerline. The data are listed in a 25 pages of table in Appendix L of the DEIS. They include milepost and position, county, type of karst feature, level of concern, the potential hazard, and construction recommendations, (i.e. mitigation). These features were identified by 'desk-top' methods and some field work. The data have not been updated since the 2015 Draper Aden Associates study, despite supplementary input from several contributors in their depositions to FERC since that time.

Altogether Appendix L indicates approximately 28 caves, 68 sinkholes, 17 springs, and 10 insurgences enumerated within five counties with karst (Summers and Monroe counties in West Virginia and Giles, Craig, and Montgomery counties in Virginia). This adds to 123 karst features that occur along a combined distance of 22.0 miles along the proposed route. These numbers do not include estimates given for sinkholes within clusters, compounded sinkholes, all features in large areas of sinkholes (such as the Mount Tabor Sinkhole Karst Plain in Montgomery County), very small sinkholes or difficult to observe karst features. Therefore, the number of surface karst features may conservatively be higher than 130 reported. This amounts to an average of about six identified and confirmed karst features per mile within a narrow, half- mile wide zone across potentially larger karst landscapes. Another way to visualize this is to note that the average spacing among the cataloged karst features is less than 0.2 mile (or slightly more than 900 feet).

Based on the experiences of many karst researchers (including this author), there are only three reliable methods to determine the true extent of karst in the subsurface and thus fully delimit integrated networks and paths of groundwater flow from zones of recharge to zones of discharge. These are: (1) a high-resolution surveying and mapping of surficial features (i.e. including the very subtle features discussed above), (2) extensive and detailed geotechnical methods such as dye tracing and a variety of established geophysical techniques (e.g. seismic exploration, electrical resistivity, microgravity measurements, and ground-penetrating radar), and (3) exploration and surveying of enterable caves. Even at best, the employment of any, or all, of these methods may not adequately determine precise locations where potential impacts from construction and land alteration will not be a problem or even have a minimal effect.

In lieu of these methods, the paucity of detailed data in Appendix L strongly suggests the karst inventory in Appendix L is insufficient for routing the proposed pipeline corridor. The real density of karst features is undoubtedly considerably more than six per mile and the average spacing would be much less than 900 feet if subtle karst features were included.

CO109-6 cont'd

There are several areas along the proposed MVP corridor where karst density is documented to be high (Hayman, 1972; Hubbard, 1988; Miller and Hubbard, 1986). The Mount Tabor Karst Sinkhole Plain has been identified as a particularly significant and sensitive area by Draper Aden Associates, cave researchers, and this author. Several dye tracings there confirm the extent of flow paths beneath the karst plain. The extent of the Mount Tabor complex karst aquifer very likely exceeds the area that exhibits sinkholes. For the MVP corridor to effectively avoid producing environmental impacts to this system would necessitate considerable geotechnical study to determine the parameters of the karst as well as the extent of contributing recharge area.

There are additional, significant karst complexes with similar hazards along the corridor that are not recognized by FERC. The Kastning Report discusses several sites, including some in Monroe County in West Virginia and in Giles County in Virginia (Section 4, pages 47-52).

The extent of the planned mitigation of karst hazards in the DEIS is to make minor adjustments in the route to circumvent *individual* surface features and, where this is not feasible, to bridge them. This blindly ignores the interconnectivity of surficial and subsurficial karst and paths of water flow that is almost certain for large karst complexes. By analogy, if an army were to encounter a mine field in battle, it would be prudent for it to skirt the area completely rather than tip-toe through it in the hopes that a catastrophic event would not be triggered.

As discussed in the Kastning Report, it is remiss *not* to consider the contributing surficial drainage basins, including allogenic recharge from mountains and upland non-karstic areas, in the delineation of karst terrain. The DEIS also fails in this regard. Nor does it detail how buffer zones may be determined.

The Kastning Report was submitted to FERC in July 2016. Based on comments made after that date (including personally to me in Roanoke, Virginia, on 3 November 2016 by a FERC representative), that the report was received and reviewed. However, substantial information and conclusions in the Report have been completely left out of the DEIS.

The following statement occurs in the DEIS (Section 4.13.2.1, pages 4-500 to 4-501, entitle. The **bold** emphasis is mine:

> "**We do not have data about impacts on karst features** and related groundwater resources for all of the other projects within the HUC10 watersheds crossed by the MVP and the EEP." However, a review of information available regarding karst features crossed by other FERC jurisdictional projects shows whether or not there are karst impacts associated with any of those projects. The Columbia Smithfield Expansion III and the Virginia Southside projects do not cross karst terrain. And while the ACP Project and Supply Header do, it is unclear whether any of it occurs within the HUC10 watersheds shared by the MVP or the EEP. The Rover Pipeline would cross 89.4 miles of potential

CO109-6
cont'd

karst terrain, most of which is in northwest Ohio, outside of the geographic scope of analyses for the MVP or the EEP. Other projects that may also cross karst terrain include transportation or other energy projects.

"The MVP pipeline route would cross considerable karst terrain between. about MPs 190 to 237. Mountain Valley has developed a Karst Mitigation Plan to reduce the impacts on karst terrain (see discussion in section 4.1.2). In consideration of available information for other projects, and the protective measures proposed by MVP, **we have not identified any cumulative impacts on karst terrain that would result from construction and operation of the projects**.

Given the nature of shallow pipeline trenching relative to deeper aquifers, Mountain Valley's Karst Mitigation Plan, as well as the protective permitting requirements of other agencies for other projects such as oil and gas well development, **we conclude that the combined cumulative effects upon groundwater would be less than significant**."

The above quotation from the DEIS states that FERC does not have data indicating significant impact of karst features within the HUC10 watersheds crossed by the MVP. T h i s is a clear indication that the Kastning Report was either not read or considered, or it was intentionally ignored. The Kastning Report includes *very substantial and significant* data about the co-impacts between karst and the proposed pipeline. It included specific examples of potential problems in several localities. The DEIS actually has the data in the Kastning Report. So, why was it not acknowledged? Utilized?

To reiterate the conclusion in the Kastning Report (where I provide the detailed support): Karst and associated hazards constitute a serious incompatibility with the proposed pipeline. The effect of these threats on the emplacement and maintenance of the line, as well as the potential hazards of the line on the natural environment, renders this region as a 'no-build' zone for this project.

CO109-7

Documentation of Soils

Dr. Steven Hodges Review of DEIS

Dr. Hodges has BSF in Forestry and Wildlife Ecology, an MS in Soil Science (Soils Genesis), both from the University of Florida, and a Ph.D. in Agronomy (Soil Physical Chemistry and Mineralogy) from Virginia Tech. He is a Fellow of the American Society of Agronomy, and has over 35 years of experience in soil-related research, teaching, and extension. He was a licensed soil scientist in North Carolina prior to moving back to Virginia. At Virginia Tech, he served as Head of the Department of Crop and Soil Science from 2002 to 2008, and currently serves as Professor of Managed Ecosystems and Soil Science. He teaches in both the Environmental Science and the Crop and Soil Science programs, and his research explores modeling of managed ecosystems.

OVERVIEW

There is a strong systematic pattern of sloppy work regarding soil limitations as previously found in MVP resource reports, and this pattern continues in the FERC DEIS. First and foremost, repeated calls for on-site evaluations of all soil limitations, particularly on karst landscapes, have been ignored, and only "desktop reviews" have been utilized, as is clearly admitted in the DEIS. Many extremely important factors available by "desktop review" using SSURGO were inexcusably left unused in the FERC environmental analysis. Use of factors such as plasticity index, shrink-swell potential, soil depth, and engineering indices would have greatly improved the ability of FERC to assess soil limitations in an accurate and comprehensive manner. FERC ignored the widely accepted NRCS suitability ratings, also a public, free and internet accessible database available through Web Soil Survey and published soil surveys. Instead, FERC invents its own definitions of soil limitations, and continues the unacceptable practice of treating each of these factors in isolation. The Soil Limitations section of the DEIS clearly does not comply with NEPA regulations to consider the cumulative impacts of multiple interacting limitations, an analysis that is readily accomplished using GIS overlays of the SSURGO database. This is either incompetence or intentional negligence of their duty under NEPA guidelines. Numerous examples of flawed methods are highlighted in the discussion below.

CO109-8

INTRODUCTION

The FERC DEIS review of "Soils" is found in Section 4.2 and broken into two subunits, entitled 4.2.1 Affected Environment, and 4.2.2 Environmental Consequences. Appendix N provides a set of 10 tables with acres rated severe or poor within each mapping unit segment, for a limited set of FERC- selected and defined soil limitations. Within Section 4.2.1, FERC provides brief summaries and affected areas of Soil Limitations (4.2.1.1), Contaminated Soils (4.2.1.2), Ground Heaving (4.2.1.3), Slip-Prone Soils (4.2.1.4), and Jefferson National Forest (4.2.1.5). These topics are repeated in section 4.2.2 where the emphasis is primarily

CO109-7 Section 4.2 of the EIS addresses soil limitations used by FERC staff to identify and characterize the probable hazards and construction challenges likely to be faced by the MVP. Shallow depth to bedrock is identified in the sections 4.1 and 4.2. Soils map units that would be crossed by the proposed pipeline route are presented in appendices N1-N10.

CO109-8 Comment noted.

CO109-8 cont'd

on what MVP should do to mitigate environmental consequences.

ASSESSMENT

CO109-9

The Soil Limitations section of the DEIS, by its design, grossly underestimates the extent and scope of individual soil limitations. FERC has chosen to define its own unique and highly restricted indicators of soil limitations rather than adopt the widely accepted suitability tables and engineering indices prepared by NRCS. In its execution, FERC merely enumerates, and makes

no attempt to assess the magnitude of impact. Even more importantly, the DEIS continues to

CO109-10

consider each factor in complete isolation when, in fact, most soils through which MVP will pass are known to occur only within landscape positions with multiple limitations. By their series definition, prominent soils in the right of way such as Carbo and Frederick exhibit a combination of steep slopes, high compaction, high erosion, slip-proneness, high shrink-swell capacity, AND occur within karst landscapes. Add to that shallowness for the Carbo soil (<40 in to hard bedrock), and MVP will need to add blasting to the list. Taken one at a time, these limitations seem mitigatable. Taken in total, these soil limitations present extreme conditions for construction engineers and land managers who must deal with the impact of disturbance on them long after construction is done. Since FERC has relied on a GIS based SSURGO database, they could easily have overlaid data layers to assess multiple factors for each milepost segment listed in Tables N1 to N10. In the Environmental

CO109-11

Consequences section, FERC again makes no assessment of environmental consequences, nor do they recommend avoidance. Rather, the DEIS sticks to recommending "industry standard" mitigation practices on a factor by factor basis, failing to recognize the fixes for one often exacerbates another.

The entire "Soils" section of the DEIS is very poorly done and does not present an accurate picture of the soil limitations faced by MVP. It is totally inadequate in its design scope and in its execution. In this case, lack of credible, public, and free desktop review databases is not a viable excuse, rather it is a result of failure to use the readily available data in a professional and competent manner.

CO109-12

Supporting Information

1. Inadequate site specific data for assessing soil limitation, hazards, and site specific methods for mitigation.

To state the obvious, relying solely on NRCS SSURGO data for assessing site specific soil limitations is inadequate. The smallest area typically shown on a soil survey map is on the order of 1-4 acres, so inclusions of other soils, including those with more severe limitations, within a soil mapping unit are unavoidable. NRCS clearly states on their website and in their published soil surveys that the intended purpose of their soil surveys is to aid landscape-scale planning. For this reason, NRCS strongly discourages use of soil survey data and maps for intensive development projects, for example a 42-inch diameter high pressure pipeline, access roads, and associated facilities. We are not aware of any on-site soil evaluations conducted by MVP to assess the full range of potential soil limitations, with the exception of corrosion assessment in limited areas. The level of detail and scope of soil maps are simply inadequate to provide an accurate assessment of soil limitations and the environmental consequences of the project's impact on soil and water resources, and future pipeline

CO109-9 The soil limitations discussed in the EIS, erosion potential, prime farmlands, hydric soils, compaction prone soils, rocky/droughty soils, and poor revegetation potential, have been used in a significant number of previous EISs. As stated in section 4.2.1.1 of the EIS, these soil characteristics have the potential to affect, or be affected by, construction and operation of the projects.

CO109-10 Mitigation measures may be required in areas where multiple soil limitations could cause construction challenges. Mountain Valley has identified areas where landslides could be of concern, and developed a *Landslide Mitigation Plan*.

CO109-11 FERC recognizes that some mitigation measures may exacerbate other soil limitations (i.e. decompaction of soils may increase the potential for erosion by water). These soils would still be stabilized following the measures outlined in the FERC Plan, and as discussed in the EIS.

CO109-12 The NRCS developed its SSURGO database to provide the most reliable and standardized soil assessments and allows for compilation and direct comparison of soils data.

CO109-12 cont'd
integrity.

CO109-13
That said, the extremely limited and highly selected SSURGO data provided by the DEIS is adequate proof that large sections of this pipeline, at least in Virginia, are ill-advised based on co-location of multiple soil and landscape limitations, including karst.

CO109-14
2. Shoddy Work

In the "Affected Environment" subsection, slip-prone soils are described in section 4.2.1.4. This section describes only one soil series and 56 acres of affected land found only in West Virginia.

Apparently slip-prone soils are not a problem in Virginia? There is no consideration of Virginia land area, nor are the affected soil series described. This a bewildering omission, since if one is curious about the consequences of this very limited impact, and turns to section 4.2.2.4, very different numbers, are reported, including those for Virginia. This inconsistency is problematic and seems an attempt to disguise the actual area of slip-prone soils. Even more importantly, FERC does not divulge its method for deriving "slip-

CO109-15
proneness", a consistent pattern to be discussed in detail below. SSURGO does not rate "slip proneness". Rather it provides a range of ratings for "slip potential". Any soil with a rating above low should raise a red flag for construction engineers, especially if those soils are located on steep slopes, as many are. I will also note, that this very important rating is not included in the data tables (4.2.1-1 and 4.2.1-2) enumerating the (partial) impacts of MVPs planned construction project. The Tables in Appendix N, likewise show the same shoddy

CO109-16
work. Totals are supposed to be enumerated in Tables N-1 to N-10. Tables N-1 and N-2 are extremely important, in that they show the FERC-selected and defined soil limitations by milepost segments, thus allowing assessment of the continuity and co-location of limitations along the route. However, only Table N-1 contains totals. Tables N-2 to N-10 provide no totals, even though the footnotes indicate totals should be included.

CO109-17
As it turns out, this has much bearing on the conclusions reached. The DEIS describes some rather extreme "mitigation" measures for sites with Landslide potential (Section 4.2.1.4 Slopes and Landslide Potential, p. 4-46). They indicate the same measures will be required for slip-prone soils. These are not "temporary" measures. Yet they somehow conclude that essentially all damage inflicted by MVP, except for land occupied by buildings and permanent access roads, will be "temporary." In fact, because of frequency and continuity of slip-prone soils found on steep slopes along the proposed route throughout Giles County, construction will be very disruptive and will inflict levels of damage unlikely to be mitigated by even the best efforts of MVP.

CO109-18
3. Failure to accurately Define "permanent" and "temporary" damage by MVP

We can find no definition of "permanent" and "temporary" impacts. A reputable soil scientist could never support the FERC conclusion, that sites experiencing this degree of disturbance, having multiple soil limitations, including high slip potential, high shrink-swell, steep slopes, and karst would emerge from massive disturbance with only temporary, and readily mitigatable impacts.

Many of the very same activities proposed by MVP and deemed "temporary" by FERC's DEIS in fact persist for 75 years or more after reclamation, as reported by scientists in Pennsylvania (Fink and Drohan, 2014). So, must we assume "TEMP" is less than 75 years and "PERM" is more than 75 years? (Ref. Cody M. Fink, C.M. and Drohan, P.J. 2014. Soil

CO109-13 See the response to CO109 – 10

CO109-14 In response to comments, the EIS identified areas of slip prone soils. Mountain Valley conducted a review of historic aerial photographs, soils data, and topographic maps to identify areas of landslide hazards.

CO109-15 See the response to CO109-14.

CO109-16 Appendix N-2 tables were revised in the final EIS as appropriate.

CO109-17 In section 4.2, the EIS characterizes soil hazards and limitations that would be crossed by the proposed MVP pipeline route, and identifies the measures that would be used to minimize impacts on soils.

CO109-18 Permanent impacts occur at permanent facilities and the operational right-of-way, while temporary impacts occur during construction in areas outside the permanent easement that are restored. See page 4-1 of the draft EIS.

CO109-18 cont'd

Sci. Soc. Am. J. 79:146–154)

Virginia Tech Professor W. Lee Daniels, a renowned soil expert on reclamation of drastically disturbed soils and landscapes, has also disputed DEIS claims of temporary impacts during construction and fill activities. The following quote appeared in an article in *The Roanoke Times* by Duncan Adams, entitled "A question of effect: Pipelines vs. mortgages, property values, insurance", on April 3, 2016.

Lee Daniels, a professor of environmental soil science at Virginia Tech, said a combination of deep disturbance of soils and deep soil compaction of replacement soil materials, if both occur during pipeline construction, "would and could limit crop production for decades, if not hundreds of years."

CO109-19

4. Omission of key taxonomic classes in describing soil series.

Failure to provide standard soil taxonomic names (despite repeated requests in comments to FERC) is unacceptable. These classes, such as "Fluvaquents" clearly communicate key soil attributes to knowledgeable reviewers who may not be familiar with a particular soil series, which is very likely considering the large number of soil series through which MVP will pass. Appendix N identifies mapping units at each milepost interval, but provides no taxonomic clues as to soil formative conditions at each site. At the very least, the limiting class feature should be provided. This is essential in order for reviewers to verify the validity and credibility of the data reported by MVP, and parroted by the FERC.

CO109-20

5. DEIS Design and Definitions Result in Gross Underestimation of Actual Soil Limitations

The DEIS is highly selective in choosing both soil limitation criteria and in defining which data and rankings will be used in assigning "severe" limitation or "low" potential.

Extremely Limited Assessment Criteria

All Tables in Section 4.2.2.1 Soil Limitations and in Appendix N should have provided additional soil limiting factors and the extent (acres) affected. The missing factors include soils with: 1) plasticity index greater than 30, 2) low liquid limits, 3) depth to bedrock, and 4) slip potential (greater than "Low"). Engineers reviewing the document now, and those who will be charged with inspecting and maintaining the many miles of very poor and unsuitable sites in Giles certainly would appreciate a table showing the AASHTO and Unified soil classes as well, especially those such as Carbo and Frederick which have the lowest rating possible in these indices. They are, to say the very least, difficult when dry, very messy when moist, and impossible for days after a good rain, if they have not eroded away.

CO109-21

To exclude these extremely relevant and SSURGO-supplied soil engineering indices effectively limits the credibility and usefulness of this entire assessment. Clearly MVP and the FERC have provided a partial, deficient, and completely inadequate assessment that reveals only the information they are willing to disclose to the public. This is further compounded by the fact that MVP refused to release centerline GIS data for use by other analysts, and by the FERC's use of undefined and non-standard soil limitation criterial and rankings (discussed below), when NRCS published soil surveys and web soil survey provide generally acceptable and relevant alternatives.

CO109-22

The data that is provided is scattered throughout the document in ways that prevent a holistic analysis of the compound impacts. In its discussion of landslides within the Geology section, for

CO109-19 The EIS provides a greater level of detail regarding soils identifications. Orders and suborders and are general categories and would provide only generalized information regarding the soils that would be impacted. The soil taxonomy for the soil series presented in the EIS and that would be crossed by the MVP are available on the NCRS website.

CO109-20 In section 4.2, the EIS characterizes soil hazards and limitations that would be crossed by the proposed MVP pipeline route, and identifies measures that would be used to minimize impacts on soils. Soils with poor drainage are discussed in section 4.2.1.1 of the EIS.

CO109-21 The EIS identifies areas where soil limitations and/or hazards could potentially occur by soil series crossed in appendices N-1 through N-10. Additional information and soils criteria is easily accessible via the NCRS website.

CO109-22 Mountain Valley conducted a review of historic aerial photographs, soils data, and topographic maps to identify areas of landslide hazards. Permanent and temporary impacts are defined on page 4-1 of the draft EIS.

CO109-22 cont'd

example, FERC does not use SSURGO slip potential in its assessment and concludes only 72.6 miles of the pipeline impact area is subject to "landslides". Yet we see 290 acres of soils are slip-prone in Virginia. So, which is right? Or are both correct, and yet again the DEIS fails to assess cumulative impacts? We are told by the DEIS there will be limited and "temporary" impact on compaction, rutting, landslides and slip potential, erosion during and after construction, slope and spoil instability but, in reality, are left wondering how FERC could draw such a conclusion based on these limited data sets and an utter failure to consider co-located limitations.

CO109-23

Lack of Definitions/Methods, or Use of Questionable Choices

Unlike the landslide Incidence Assessment (4.1.1-10, page 4-30), which offers a more complete picture of incidence and potential with low, moderate and high ratings, this entire section enumerates only soil areas receiving FERC-defined ratings of "severe" or "poor". In truth, the only methods or definitions the DEIS provides for these ratings are in the footnotes of Tables 4.2.1-1. and 4.2.1-2 (and Appendix N). As a soil scientist, I find several of these to be primitive and inadequate measures of the true damage that will be inflicted by the MVP construction and maintenance activities and their impact on permanent modifications to soil hydrology and soil cohesiveness. These are extremely critical factors in karst landscapes where such activities increase the likelihood of soil raveling and collapse sinks. As previously discussed, FERC has not chosen to enlighten us with their definition of TEMP" and "PERM".

CO109-24

The FERC's "definitions" with comments are listed below using the label and order from Tables 4.2.1-1, page 4-56. (differs from Appendix N).

a. Areas identified as **highly water erodible** soils are ranked as "very severe" or "severe" by SSURGO erosion hazard (Off-Road, Off-Trail) criteria.

[COMMENT: Is this criterion (off road/off trail) really applicable to construction sites? Of course, not! If they are this bad on undisturbed, off-road sites, one can only imagine what they would be like under road construction and shallow excavation conditions. A terrible choice of a ranking criteria that grossly underestimates erosion potential, one of the most dangerous threats to water quality in the region. Water erosion is a complicated factor that includes erosivity, cover, local climate, and management features. This factor assumes a forest cover and minimal traffic, a condition which MVP will not tolerate in its right of way.]

CO109-25

b. Areas identified as **highly wind erodible** soils have a wind erodibility index of 1 or 2 as determined by SSURGO.

[COMMENT: No real problem here, since we have little wind erosion potential if they CAN be revegetated, the unspoken assumption.]

CO109-26

c. Areas identified as **prime farmland** are identified as lands that meet the "all prime farmland" or "farmland of statewide and local importance" criteria as determined by NRCS, SSURGO.

[COMMENT: These are well defined by NRCS, so no problem.]

CO109-27

d. Areas identified to have a **hydric rating** include the "all" and "partial" criteria as determined by SSURGO.

CO109-23 Soils are addressed in section 4.2 of the EIS.

CO109-24 The categories presented in section 4.2 of the EIS identify where soils with limitations of concern are located and acres of each soil type that could be affected by construction of the proposed MVP pipeline.

CO109-25 Comment noted. Revegetation is discussed in sections 2.4 and 4.4 of the EIS.

CO109-26 Comment noted.

CO109-27 Comment noted.

CO109-27 cont'd

[COMMENT: Adequate: wetlands are dealt with elsewhere and have additional criteria.]

CO109-28

e. Areas identified to have a **severe compaction potential** are **limited** to silt loam or finer based on particle size and ranked "somewhat poor," "poor," and "very poor" drainage as determined by SSURGO.

[COMMENT: Again, an extremely limited and restrictive definition for soils that could suffer severe compaction. The DEIS definition used in this table to define extent of damage is woefully inadequate. As the DEIS itself describes in the narrative:

• page 4-60: "Compaction is typically of concern when the moisture content of the soils is high such as in hydric soils **or during precipitation events"; (one must assume then no construction will take place until soils are completely "dry"?), and**

• page 4-66: "soils with moderate moisture content would typically be more prone to compaction associated with construction than dry soils."

The DEIS (page 4-60) blindly goes on to use estimates that grossly underestimate the real extent of soil compaction potential based on a definition that in no way agrees with these more honest statements. The compaction factor is so important and so grossly underestimated that more discussion is included below.]

CO109-29

f. Areas identified to have **stony/rocky soils** are soils that as determined by SSURGO include stone, rocky or cobbles in the soil name (does not include rock outcrops).

[
COMMENT: The DEIS considers the impact of this factor on revegetation potential (but says most will be removed) but does not consider this factor or rock removal impacts on compaction potential during trench filling, and erosion potential during disturbance. The real question: why was soil depth not included? How many acres of soils with depth less than the depth of the excavation trench will be drastically altered by this construction? This is readily available in SSURGO. Some of MVPs favorite targeted soils with less than 40 inches to hard bedrock in Giles County include Carbo, Faywood, Lily, Bailegap, and Poplimento.]

CO109-30

g. Areas identified to have **poor revegetation potential** are lands that have a Capability Class 3 or greater, a low available water capacity, and slopes greater than 8 percent as determined by SSURGO.

[COMMENT: Class 3 and slopes >8 are certainly appropriate. But the decision to consider only soils/sites with "low" available water is somewhat baffling. This decision is nowhere explained or justified. It seems an attempt to simply limit "poor" ratings to selected sites. Clearly factors other than soil series per se will determine revegetation success as well: aspect (direction that slope faces), degree of compaction, drainage, choice of species, and other induced changes resulting from disturbance and reshaping. The low available water essentially limits this group to nearly pure sands or bedrock, since MVP claims they will remove stones from

CO109-28 See the response to comment CO109-24.

CO109-29 See the response to comment CO109-24.

CO109-30 See the response to comment CO109-24.

CO109-30 cont'd

"stony" soils they disturb.]

CO109-31

h. Areas identified to have **poor drainage potential** are ranked as "poor" or "very poor" as determined by SSURGO.

[COMMENT: This definition again underestimates potential soil limitations depending on the season in which construction takes place. Somewhat poorly drained soils should be included. By definition, these soils frequently exhibit limitations to agricultural activities, particularly in the spring of the year, and artificial drainage is recommended for agriculture or development activities.]

CO109-32

6. The operational definition of "compaction potential" of soils is woefully inaccurate and inadequate.

Compaction contributes to poor drainage, runoff, erosion, sedimentation of streams, slope creep, and landslides. As noted above the DEIS defines severely compactable soils solely (and misleadingly) as silt loams or finer textured soils AND poorly drained sites. This is simply incorrect. This is an extremely limited definition for compactable soils. The more important variable, plasticity index, is excluded by definition. As a consequence, Appendix N-1 (WVA) arrives at the fallacious observation that only the 7.5 miles of the MVP area crossed in all of WVA has a "severe" compaction potential (Totals shown on page N1-279).

As noted above, even the DEIS narrative disagrees with this definition. Compaction is a function of the degree of pressure placed on the soil, and the amount of moisture present in the soil at the time such pressure is applied. Unless MVP wants to specify soil moisture contents at which it will not perform construction activities, compaction potential is high for essentially all soils through which the MVP will cross (very few dry sands).

A better indicator would consider the publicly available published soil survey Suitability Tables 10-15. These are available as pdfs from the NRCS website, or as interpreted digital maps, or data downloads via Web Soil Survey. These tables include highly relevant suitability ratings, with justifications for the ratings, by mapping unit for uses such as shallow excavation, local roads, building site development and many other activities similar to those MVP intends to use.

The Kastnings report, which FERC has totally ignored in this DEIS, provided for the FERC just such a compilation. I am utterly astounded that FERC would not use the widely accepted and readily available NRCS indicators with clear interpretations of soil limitations.

CO109-33

7. Impacts of trenching, construction, trench drainage, waterproofing, and erosion control structures will have serious effects on future land uses, soil hydrology and potential karst development.

These impacts are simply not considered or addressed by the DEIS. Mitigation plans are not fully revealed, but those that are provided include significant land-use altering erosion control structures, trench drainage, or use of bentonite barriers to limit entry corrosive waters into the trench. There is no effort to identify where these measures will be required, their extent, or to assess the potential impacts. Again, the Carbo and Frederick soils are strong candidates, especially on the long lateral slopes through which the pipeline will pass, at least in southern Giles County, including the Historic Districts of Newport and surroundings. Will these measures induce water accumulation above the pipeline? Will they discharge excess water on slopes below the pipeline inducing soil slippage? Or will they simply increase water flow near the trench into the underlying karst? MVP did no on-site assessments, and has done no karst alignment studies to show where cover or collapse sinks may develop. FERC has no clue and gives no guidance.

CO109-31 See the response to comment CO109-24.

CO109-32 The plasticity index of a soil is mainly affected by clay content thus, soils with high amounts of clay would tend to have a high plasticity index. The definition for compaction potential includes soils with silt loam or finer texture and includes soils that would have high plasticity index. Saturated soils are typically more prone to compaction than dry soils. Soils that are somewhat poorly drained or worse usually display, low hydraulic conductivity, high water table, continuous rainfall, or water from seepage and retain water. These characteristics create a high potential for compaction.

CO109-33 Mitigation measures would be site specific and appropriate for landslide, erosion, karst, and water resources as identified in the EIS. BMPs are identified in the FERC Plan and Procedures, Mountain Valley's *Landslide Mitigation Plan* and *Karst Mitigation Plan*, as summarized in the EIS. The EIS states that construction of the proposed MVP could result in minor fluctuations in groundwater levels. Groundwater flow is typically significantly deeper than the proposed trench depth of 10 feet, which would be refilled and graded to original contours. We concluded that the MVP would not significantly or permanently affect groundwater levels.

CO109-34

8. The DEIS considers each factor in isolation rather than considering overlapping, collocated limitations in reach its conclusions.

FERC does not consider the presence of multiple factors in landscapes along the route. This is somewhat like looking at each individual piece of a magnificent stained-glass window and concluding that a there will be no impact from breaking it into pieces and melting it down to make new beer bottles, since the individual pieces are "just glass". The DEIS must be revised to include the common and readily accomplished technique in overlaying GIS data layers to analyze compound limitations and hazards. This should include all soil limitations, land-slide potential, slope limitations, and, as applicable, karst. This would readily identify areas with many overlapping hazards and facilitate visualization at any given location. MVP and the FERC have both resisted this vital step in hazard assessment. Simply put, there can be no credible claim that NEPA requirements for a cumulative impact assessment have been conducted without providing this information.

Along the entire north-facing slope of Sinking Creek mountain, both Carbo and Frederick soils are common. Thus, this landscape, including the Newport Historic District would include a predominance of soils labeled with the following limitations:

- steeply sloping soils
- "slip-prone" soils
- erodible soils
- compactable soils
- moderate to high corrosivity to uncoated steel
- shallow depth to bedrock (Carbo, Poplimento)
- area of exposed bedrock requiring blasting
- karst topography, including sinkholes within the right of way
- a major cave, and many small cares
- an active seismic zone
- a cluster of many previous land-slides.

There is clearly a reason that development has not come to Newport even though it lies within easy reach of Blacksburg. This is a very fragile landscape with multiple severe limitations. To those who do come, beware of this land. It will test humans to their limits.

CO109-35

Summary

The DEIS grossly underestimates the extent of soil limitations while overestimating MVP's ability to mitigate them, especially when multiple limitations are co-located. It does this by providing a very biased set of indicators, and then defining those indicators in such a way as to minimize the impacts on soil quality and water quality, and threats to the integrity of the pipeline.

CO109-36

The DEIS considers each factor in isolation in reaching its conclusions. FERC does not consider the presence of multiple factors in landscapes along the route.

CO109-37

FERC has totally ignored the Kastnings report, which clearly specified for them the most hazardous soils in Giles County using widely accepted, free, and publically available data from NRCS. From a scientific perspective, this section is indefensible. Considering the demands of NEPA for a professional, competent and unbiased EIS, this entire Soils section is a woefully

CO109-34 See the response to comment CO109-24.

CO109-35 See the response to comment CO109-24.

CO109-36 See the response to comment CO109-24.

CO109-37 Dr. Kastning's report was considered when preparing sections 4.1 and 4.3 of the EIS. Section 4.1 of the EIS has been revised to further consider Dr. Kastning's report.

CO109-38 deficient and should be rejected in total.

CO109-38 See the response to comment FA11-2 regarding the adequacy of the draft EIS.

COMPANIES AND NGOs

CO110 – Four Corners Farm

CO110-1

December 22, 2016

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

RE: Mountain Valley Pipeline, LLC
FERC Docket No: CP16-10-000
DEIS-DO272 September 2016

Dear Secretary Bose:

FERC's Draft Environmental Impact Study (DEIS) is incomplete and lacks detailed data from land the Mountain Valley Pipeline (MVP) proposes to cross. Our property has not been surveyed, as is the case with other landowners along the proposed route. As affected property owners (not "stakeholders") and registered interveners, we insist that FERC deny the application for building the proposed Mountain Valley Pipeline. There are many reasons to deny the permit for MVP; below we share our personal concerns as a family farm business and multi-generational landowners.

CO110-2

Economic Devastation to our Family Farm.

We own and operate a multi-generational family farm raising pastured poultry, range-raised pork, grass only beef, and eggs from hens on pasture. We sell directly to families and individuals as well as restaurants and organizations. Our animals are treated with care, having plenty of room as they are rotated through our three main pastures and woods. We also support local agriculture by using a non-genetically modified (Non-GMO) feed, grown and milled in Franklin County. Additionally, we are moving toward organic certification as we do not allow any chemical inputs or toxic sprays anywhere on our property. The proposed Mountain Valley Pipeline route bisects our lower pasture, which borders a creek and receives ample sun and protection from the north wind during winter months and is, therefore, critical to pasturing our animals.

CO110-1 The draft EIS was based on environmental surveys conducted by Mountain Valley for about 90 percent of its pipeline route. See the response to comment CO5-1 regarding preparation of the draft EIS. See the response to comment FA11-2 regarding pending information in the draft EIS.

CO110-2 Organic farming is addressed in sections 2, 4.2, and 4.8 of the EIS. See the response to comment IND332-1 regarding farming. See the response to LA1-7 regarding herbicide/pesticide use.

CO110-2 cont'd

Interrupting our farming operations by the construction of this proposed pipeline and maintaining a cleared ROW through chemical spraying would clearly put us out of business. We simply cannot afford to have one season of interruption as we would lose most of our customers and would struggle to regain them. We utilize a mob grazing method with our cows (also known as rotational grazing), if our lower pasture is not available to use because of herbicide sprays and treatment on the right of way (ROW), we do not have enough land to properly rotate our cows through a season. We would lose 1/3 of our grass land, which greatly restricts our ability to farm.

Four Corners Farm rests along the foothills of the Blue Ridge Mountains in the Boone District of Franklin County, VA

We are a community focused, family friendly farm that practices sustainable agriculture, raising animals on pasture, supplying clean and healthy food for our local area.

CO110-2
cont'd

We are a multi-generational family farm

We have bi-annual tours of our farm – customers and the community enjoy seeing our organic practices and farm operation –

We strive to restore the land through rotational grazing of a variety of animals.

CO110-2
cont'd

One of our livestock guardian dogs, protecting the layers in our lower pasture where the proposed MVP is routed.

Pigs are a part of our livestock rotation through our land, including our lower pasture

CO110-2
cont'd

Our Laying Chickens enjoying the lower pasture as they are rotated through the land

Our moveable hoop houses safely contain our meat chickens as they are moved to fresh pasture daily

CO110-2
cont'd

Our cows are rotated through all of our pastures as we practice mob grazing techniques to restore soil health and fertility.

CO110-3

We have escorted surveyors off our land – we have refused access to our property

CO110-3 The statements regarding Mountain Valley surveyors are noted.