Preserve Craig ~ *Sustaining the Quality of Life We Value*

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Date: June 15, 2015 **Via FERConline.**

To: Federal Energy Regulatory Commission
Attn: Ms. Kimberly D. Bose

From: Preserve Craig, Inc.

RE: Docket Number PF15-3-000 Mountain Valley Pipeline
EIS Issues Comment -Erosion, sedimentation, water quality and construction techniques
Prepared by Members of the Preserve Craig Science Committee

Preserve Craig Inc. wishes to take the opportunity to provide comments on the scope of the Environmental Impact Statement (EIS) that will be prepared for the Mountain Valley Pipeline (MVP). Preserve Craig is a 501(c)(3) nonprofit corporation formed in 1991. Preserve Craig's nonprofit purpose is to: preserve and protect natural, historical, and cultural resources, conduct research and compile and publish information concerning natural, historical, and cultural resources, and conduct public education programs.

The proposed MVP alternate routes 110, 110J and 110R cross Craig County, Virginia. Craig County is made up of large tracts of National Forest, National Forest Wilderness Areas, private forest, private conservation areas and agricultural lands. The people of Craig County have a strong connection to their land and water resources (James Kent and Associates 1996) and are stakeholders in protecting the county from threats that diminish this connection to the land. This was well demonstrated in the 1990s when 80% of the households in Craig County supported Preserve Craig's fight against a power line proposed to cross the area. The EIS was not favorable to the power line (USFS 1996) and the line was never built in Craig County. The proposed alternative pipeline routes 110, 110J and 110R follow a very similar route to the proposed power line and once again the citizens of Craig County want to ensure the land and cultural values are protected.

This comment focuses on issues related to erosion, sedimentation, water quality and construction techniques, but also touches on viewsheds and species of concern as they relate to the primary issues of this document. Although parts of this comment are specific to Craig County, much of it is also applicable to large portions of all the routes.

"MVP: What is Being Proposed?"

The heading above is intended as a real question to the FERC, and should be specifically answered in the EIS. From the MVP website, the Open House meetings, and the community asking a lot of questions to the FERC and MVP, there are still few, if any, real answers to questions about what is being proposed. We know a 42-inch, high-pressure natural gas pipeline is being proposed, but beyond that there are a wide variety of specifics that may or may not reflect reality. From simple questions concerning the depth of the trench to more in-depth questions about specific BMPs, karst geology and notching of ridge tops, Preserve Craig has been extremely frustrated by the lack of answers and, even worse, the conflicting answers that have been provided. The EIS must provide a coherent, complete and specific description of the project and how it is to be built and maintained**. No project can be properly evaluated in an EIS without knowing what is being proposed; generalities about the critical issues (particularly generalities that dismiss impacts as "inconsequential") are not a useful analysis of the true and specific impacts of this or any project**. Direct answers are needed to specific questions about how ***this*** construction will occur and what mitigation measures are to be utilized to reduce the impact of the construction. The EIS must provide documentation that the mitigation techniques proposed are effective in the specific situations they are to be used and, more importantly, identify when specific techniques have been shown to be or not be effective. Furthermore, if waivers from standard practices or specific mitigation methods are to be allowed, the impacts of granting such waivers and the conditions for waivers and exemptions must be spelled out and fully justified in the EIS. Reducing construction expense for private corporation that stands to make billions in profits is not a valid justification, if it means that the environment could be more fully and appropriately protected with other measures despite more cost.

Sedimentation is a Statewide and Nationwide Problem

One of the most important environmental problems that must be addressed in the EIS is sedimentation. The ability to mitigate erosion and sedimentation problems is an important aspect of minimizing the environmental damage of the pipeline, and the EIS must propose proven, workable techniques for effectively controlling erosion and runoff on the steep slopes in Craig County.

Recent advances in methods that quantify streambed sedimentation have allowed assessment of sediment accumulation nationwide (Kaufman et al 2008, Kaufman et al 1999). Assessments have demonstrated that sediment accumulation is among the most common stressors in streams Nationwide (EPA 2013), and is estimated to affect nearly half of the river-miles in Virginia (VDEQ 2013). Sedimentation is also one of the most commonly occurring stressors identified by the Virginia Department of Environmental Quality (VDEQ) for benthic impairments. Not only are sediment problems common, but repeated analysis has demonstrated that when sediment problems are present the risk of having a degraded benthic community, and resultant cascading environmental effects, is much more likely (EPA 2013, VDEQ 2013).

The importance of stream bed sediment particle size to stream organisms is well documented (Paul and McDonald 2005, Minshall 1984 and references therein) as are the mechanisms of human activities that cause changes in stream bed sediments (VDCR 1992). There are two primary origins for fine sediment entering streams: overland flow transporting sediment off the land surface to streams, and in-stream channel erosion of stream banks and bottoms. Sediment

transport to streams by both overland flow and in-channel erosion is accelerated by many human activities including: poor land use practices, failure to control runoff, compaction of soils, impervious surfaces, vegetation changes and construction activities that disturb soils. It is generally accepted that the least erosion and most infiltration of water occurs on natural, forested landscapes. It is also known that the soils present in these same forested landscapes are among the most sensitive to disturbance and erosion.

Although some sediment naturally enters waterways, and there are undoubtedly instances where natural processes have caused substantial amounts of sediment to enter streams, human activities are estimated to be responsible for 80-90% of the sediment delivered to coasts today (Farnsworth and Milliman 2003). The most common anthropogenic sources of sediment are agricultural activities (Collins et al 1997, Walling et al 1999, Owens et al 2000), forestry (Mohta et al 2003), and construction and mining (Owens et al 2005).

The importance of watershed protection is clear and well stated throughout the current Jefferson National Forest Plan (USFS 2004), and is effectively summarized in the following excerpts:

a. *"Maintenance and restoration of healthy, diverse, and resilient watersheds, which include not only the water, but also the soil and air, will be given the highest priority in all of our management activities."* (Page 2-2, paragraph 2, line 2)

b. *"Water quality remains within a range that ensures survival, growth, reproduction, and migration of aquatic and riparian wildlife species; and contributes to the biological, physical, and chemical integrity of aquatic ecosystems. Water quality meets or exceeds State and Federal standards."* (p. 3-180)

c. *"The biological integrity of aquatic communities is maintained, restored, or enhanced. Aquatic species distributions are maintained or are expanded into previously occupied habitat. The amount, distribution, and characteristics of aquatic habitats for all life stages are present to maintain populations of indigenous and desired nonnative species. Habitat conditions contribute to the recovery of species under the Endangered Species Act."* (p. 3-180*)*

d. *"Any human caused disturbances or modifications that may concentrate runoff, erode the soil, or transport sediment to the channel or water body are rehabilitated or mitigated to reduce or eliminate impacts. Channel stability of streams is protected during management activities."* (p. 3-181)

e. *"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."* (p. 2-7)

f. *"No herbicide is aerially applied within 200 horizontal feet, nor ground-applied within 30 horizontal feet, of lakes, wetlands, perennial or intermittent springs and streams."* (p. 2-28)

g. *"Use advanced harvesting methods on sustained slopes 45 percent or greater to avoid adverse impacts to the soil and water resources. Use advanced harvest systems on*

sustained slopes over 20 percent when soils have a high erosion hazard or are failure-prone." (p. 2-33)

h. *"This Forest Plan meets or exceeds State Best Management Practices. Current State BMP handbooks or manuals are incorporated as direction in the Forest Plan and are implemented for those resource management activities that are covered by the handbooks/manuals. Standards for activities not included in BMP handbooks/manuals are included in Chapters 2 and 3 of this Forest Plan."* (p. A-3)

If any of the proposed routes through Craig County (110, 110J, 110R) are approved, every goal and strategy listed above inevitably would be violated during both construction and operations, and some of the most important stream habitats within the National Forest boundaries would be adversely affected.

The Virginia Department of Environmental Quality Water Quality Standards (VDEQ 2011) state:

"All state waters, including wetlands, are designated for the following uses: recreational uses, e.g., swimming and boating; the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them; wildlife; and the production of edible and marketable natural resources, e.g., fish and shellfish."

and goes on to say:

"State waters, including wetlands, shall be free from substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations which contravene established standards or interfere directly or indirectly with designated uses of such water or which are inimical or harmful to human, animal, plant, or aquatic life."

VDEQ has interpreted this to include sedimentation especially when it affects aquatic life. This means that anthropogenic sedimentation should not occur in streams at levels that have an effect on aquatic life.

BMPs – Tools for Controlling Sediment

Although sedimentation has been demonstrated to be one of the most common water-quality problems affecting the aquatic life of streams, and policies have been adopted to control it, administrative processes to regulate sedimentation have been slow to develop. Historically, water-quality contaminants have been managed from point sources with Water Quality Standards (WQS). WQS are in-stream limits (often measured as concentrations) set as law, and are not to be violated. Management of sedimentation has taken a completely different approach. Sediment problems occur on the stream bed, not in the water column, and therefore cannot be managed as concentrations, or as suspended measures of effect. Therefore, traditional paradigms of suspended load don't work well. For this, and other reasons, most sediment-control measures have focused on utilizing a set of methods that are thought to adequately control sediment at its source rather than as limits on how much should be in a stream (WQSs). Best Management Practices (BMPs) are the methods for controlling erosion and runoff.

In Virginia, BMP enforcement is administered through local and/or state government entities and recently the oversight of these programs has shifted to VDEQ. **In a recent interview with The Recorder (Adams 2015), VDEQ officials were reported to say the agency does not have the resources to effectively and closely monitor water quality when construction is underway.** In reference to the Atlantic Coast Pipeline, VDEQ exempted the company from filing an erosion and sedimentation control plan with the state. This is allowed under the oil and gas exemption of the U.S. Natural Gas Act for transmission pipelines and their associated facilities. But this represents a complete abdication of authority and efforts to preserve critical environmental quality and ecosystem services. **Clearly, there is a problem with the administrative oversight of erosion and sediment control in general and especially in the regulation of pipelines.**

Many construction activities have specific BMPs that apply to the specific activity. For example, forestry, road building and general construction typically have activity-specific BMPs that apply. Many use-specific BMPs such as those for forestry or road construction, limit construction to slopes well below 20% because many BMPs cannot effectively stop erosion on and sedimentation from very steep slopes. The extreme mountain slopes that the MVP proposes to cross simply cannot be effectively protected during and after construction. Any exemption from normal construction BMPs does not exempt pipeline construction from protecting aquatic life, or controlling runoff and erosion from their construction sites. **The selection of routes and adherence to the erosion controls that are implemented are especially critical because pipelines are allowed to construct on steep slopes, don't follow the BMPs that are logically and conscientiously required for other activities, and are not likely to be inspected by government agencies.**

MVP Senior Vice President for Engineering and Construction, Shawn Posey, has been quoted in MVP sponsored advertising (http://mountainvalleypipeline.info/wp-content/uploads/2015/06/EQT_MVP_Ecological_Resources_Advertorial.pdf.) as saying:

> *"From planning to construction, MVP will work with local, state, and federal regulators and agencies, as well as environmental experts from the WHC to make sure that we effectively restore or enhance waterways and wetlands along the route."*

This may not be enough. Because state and federal regulators do not have the resources to ensure protection of our waterways this quote does little to reassure us of anything. It is interesting to note that that the quote focuses on restoration and enhancement and says nothing about protecting our resources from damage in the first place.

PRESERVE CRAIG HAS FOUR PRIMARY ISSUES CONCERNING SEDIMENTATION:

1. Steep Slopes and Side Slopes
2. Sensitive Aquatic Habitats and Species
3. Long-term Maintenance
4. Route Proposals

STEEP SLOPES AND SIDE SLOPES

One justification that MVP cited for developing alternative pipeline routes was that their engineers were worried about the presence of steep slopes and side slopes along the originally proposed route These proposed alternates do nothing to alleviate that concern. Alternative Route 110 and all related routes (110J, 110R) traverse extreme slopes in Craig County, including:

- the southeast face of Potts Mountain: 40% slope
- the northwest face of Sevenmile Mountain: 60% slope
- the northwest face of Johns Creek Mountain: 63% slope
- the southeast face of Johns Creek Mountain: 85% slope
- the northwest face of Sinking Creek Mountain: 60% slope
- the northwest face of Cove Mountain: 60% slope

These map-calculated slopes were measured over a large distance and slopes over smaller distances are likely much greater than the ones listed. Still, these numbers indicate extreme slopes even for pipeline construction, if effective erosion and sedimentation control measures are to be truly accomplished. It should also be noted that the steepest slopes are on USFS lands, and USFS policies will apply. As clearly stated, "*Current Forest Service policy directs compliance with required CWA permits and State regulation and requires the use of BMPs to control nonpoint source pollution to meet applicable water quality standards and other CWA requirements"* (USFS 2012; p. v), which includes adherence to BMPs with respect to slope runoff. Pipeline construction activity on these steep slopes will create problems with slope failure, erosion, sedimentation, ground water and surface water quality.

These problems are not merely *potential* effects – they are certainties, even if state-of-the-art mitigation practices observed. BMPs are implemented to minimize negative effects; they are never assumed to eliminate effects. Moreover, the effectiveness of BMPs is dependent on many factors, including the steepness of the landscape which is generally ignored in pipeline construction. **The slopes involved in Alternate Routes 110, 110J, and 110R are clearly outside the design limits of BMPs and are inappropriate places to build.**

The sediment problems associated with erosion from pipelines on steep slopes are well documented by local examples. The Jewell Ridge Lateral of the East Tennessee Gas Pipeline in Tazewell and Smyth Counties, Virginia and the recent extension of the Columbia Gas Pipeline to the Celanese plant in Giles County, Virginia have both had severe erosion problems.

In 2014, Columbia Gas of Virginia installed a new, 12-inch, 3.5-mile pipeline to the Celanese Acetate LLC plant in Giles County, Virginia. All appropriate permits were issued and required BMPs were utilized. Weekly site inspections were conducted by Columbia's inspector. The inspector found problems on multiple visits and required the company to address the problems. Even with the Columbia Gas inspector's efforts to correct problems, severe erosion occurred. During inspections conducted by USFS inspectors, it was apparent the company was either unable to install workable BMPs or purposefully installed BMPs incorrectly. Excerpts from the USFS inspector's field notes(http://pipelineupdate.org/national-forest-pipeline-inspection-reports/)indicate the severity of the problems:

• *Sept. 5, 2014 — "… checked a drain that showed signs of wash from the gas line corridor. I have never seen that much sediment move off site before."*

• Sept. 15, 2014 — "… a new flow from ditch that looks like equipment took muck out and put on the downhill side. It looked like a lava flow, just barely got to stream."

• Sept. 26, 2014 — "Had a discussion (with others) about what has been going on with the line. It appears we had a period or an event where sediment left the site and got into a stream course on USFS. Since that event the contractor has made adjustments and it appears stopped additional offsite movement … we intend to add large woody debris to the stream on the national forest to stabilize the soil that did make it there."

• Oct. 18, 2014 — "Looked at water bars on top on south side and talked about putting erosion control matting on water bars. (The material was there and they planned on doing it the next day). Also looked on north side and saw erosion on the lower slope. Water came off NF and ate out right of way on private (property).

Clearly, the methods for controlling erosion, sedimentation and water runoff and the administrative procedures for ensuring compliance through inspections are not working to protect the environment. And some of the alternative routes developed for Craig County cross slopes even more extreme than those on which these severe problems occurred on the recent Columbia Gas project.

Another example of the best intentions going awry occurred in 2006, during construction of a 20-inch gas pipeline for Duke Power. The Jewell Ridge Lateral of the East Tennessee Natural Gas, LLC's pipeline system was known to be crossing extremely sensitive aquatic habitats with 20 Federal and state-listed threatened and endangered species. The most critical of the aquatic systems to be crossed was Indian Creek. The US Fish and Wildlife Service (USFWS) issued a biological opinion (BO) that the construction of the pipeline would not jeopardize the existence of the endangered species in the streams because East Tennessee Gas agreed to exceed the expectations of the Virginia Soil and Erosion Handbook (VDCR 1992). Virginia Department of Game and Inland Fisheries agreed to enforce the erosion control measures. This level of effort was thought to represent extreme care to ensure that state-of-the-art erosion control measures would be in place (TRC et al. 2009). In addition, hourly turbidity monitoring was conducted by the USGS during construction to provide nearly real-time feedback on effects of construction activities (USGS 2009).

In spite of the extreme attention to detail, slopes failed in two independent sedimentation events, eroding fine sediment into Indian Creek and the North Fork Holston River and impacting protected species of freshwater mussels. These failures of BMPs were caused by 1.8 inch and 1.75 inch rain events a month and a half apart. These rain events can be considered well within the event frequencies BMPs are designed to control. The worst sediment problems originated high in the watershed where less effort was employed to monitor conditions. In this case, small streams transported heavy sediment loads to the larger streams where the mussels lived (USGS 2009, TRC et al. 2009). Again, even though well-documented BMPs were utilized they were overwhelmed largely because of the steep slopes that simply cannot be effectively mitigated (protected?)

These events document that commonly used BMPs do not work on steep slopes. During construction and after BMP failure is the wrong time to find solutions to erosion and sediment

control problems. The MVP should not be an experimental proving ground for new methods. The EIS must address the lack of effectiveness of all methods used to date to control erosion from steep slopes as are present along the alternative routes for the MVP. **It is Preserve Craig's position that there are not proven methods for controlling erosion on these slopes and effective mitigation is not possible.** In fact, the record clearly demonstrates that the slopes encountered in Craig County cannot be crossed without the occurrence of clearly predictable, severe erosion. **The National Environmental Policy Act (NEPA) requires the analysis of the efficacy of mitigation that is used to reduce identified impacts. Preserve Craig demands that the efficacy of the mitigation measures used by MVP be proven effective in the EIS analysis.**

Another slope-related issue for MVP is severe side slopes along the alternative routes. MVP has obfuscated this issue, and simply stated that the construction corridor "might need to be enlarged in some areas." In truth, the 300-ft survey corridor, the 125 ft construction corridor and the ultimate 75-ft maintenance corridor described in the MVP pre-application will be completely inadequate on virtually all the slopes in Craig County, so the MVP will impact far more acreage and have much more-severe environmental effects than the public and the USFS have been led to believe. In their detailed route analysis of the initial Proposed Route and Alternative Route 1 (MVP 2014; filed 1 December 2014), MVP rejected using some existing transmission line right-of-ways along portions of Route Alternative 1 due to steep side slopes that would have to be traversed by the pipeline. MVP further stated that if such slopes were indeed to be traversed, then the impact corridor for pipeline construction will necessarily be much wider than the 125-ft corridor initially described:

> *"Initial flight reconnaissance and ground check revealed that much of the route that followed existing overhead electric transmission line rights-of-way was along severe side slopes. While the overhead transmission lines span significant areas of slide slope, these areas would be required to be crossed directly by the pipeline. As a result of this next phase of route analysis, MVP determined that Route Alternative 1 represented insurmountable construction challenges, as well as a high risk of slope failure and pipeline slips, once the pipeline was to be in operation." (MVP 2014: p. 1-4) . . . However, in areas where Route Alternative 1 is alongside slopes, the construction right-of-way would need to be significantly wider than 125 feet to accommodate significant cut-and-fill that would be required for construction, which would result in an even greater area of construction impact."* (MVP 2014: p. 1-5)

In other words, MVP's own extensive route analyses (MVP 2014) ruled out portions of Route Alternative 1 as presenting *"insurmountable construction challenges"* because of steep slopes. Yet in MVPs filing Summary of Alternative February 2015 (MVP 2015a), the company proposed new Route Alternatives 110/110J/110R through Craig County that cross extreme slopes and side slopes that reach and even exceed 80%. The exact same construction challenges MVP identified on Route Alternative 1 are present on the severe side slopes along Route Alternatives 110, 110J, and 110R, and would also require a construction corridor significantly wider than 125 feet. This point is never revealed in either MVP's 18 February 2015 filing to FERC that first describes these Route Alternatives (MVP 2015a), nor is it ever mentioned in MVP's application to USFS for the permit to survey in the Jefferson National Forest (MVP 2015b).

Alternatives proposed under NEPA must be reasonable alternatives. The Alternate 110 routes were expressly added to the scheme to avoid hazardous slopes. The Alternate 110 routes also propose to cross mountains with equal or greater slopes. Therefore, the Alternate 110 routes are not reasonable.

The issue of realistic right-of-way width estimates on side slopes may be most critical in the corridor between Brush Mountain Wilderness Area (BMWA) and Brush Mountain East Wilderness Area (BMEWA). Alternate route 110R is proposed to pass between these wilderness areas. The corridor between the two wilderness areas is legally defined as a 500 ft wide corridor and described by the USFS as being centered on the existing power line corridor that is 150 ft wide, leaving 175 ft on either side of the existing right-of-way for pipeline construction. While 175 ft is enough room for the normal 125 ft construction corridor, much of this land is side sloping and, as we have already discussed, not buildable due to width limitations. The exact needs of construction through this restricted area must be determined and the feasibility of building within these limitations must be assessed.

The project will need access roads, and pipeline corridors often become roadways whether intended as such or not. BMPs for road building promulgated by the Virginia Department of Forestry dictate that *"roads should follow contour as much as possible, with grades between two percent and 10 percent"* (VDOF 2011; p. 18). The "Gold Book" (USDI and USDA 2007) that governs oil and gas exploration on federal lands stipulates that:

> *"[road] gradient should fit as closely as possible to the natural terrain . . . The gradient should not exceed 8 percent . . . in order to minimize environmental effects. In mountainous or dissected terrain, grades greater than 8 percent and up to 16% may be permissible with prior approval of the surface management agency." (USDI and USDA 2007; p. 25).*

Pipelines themselves are a much-more-intense disturbance than road building because of the consistent depth of excavation, and because they are oriented perpendicular to the slope. The combination of steep slopes and pipeline orientation will inevitably cause erosion, increased runoff, and sedimentation problems in the watersheds. Experience demonstrates that no mitigation procedures are capable of eliminating these problems on such slopes. These problems will occur, thereby affecting water quality and the sensitive aquatic habitat and protected organisms in surface streams along the route.

Moreover on the steep slopes crossed by Route Alternatives 110, 110J, and 110R, it will be impossible to engineer either construction-access roads or maintenance-access roads that meet required USFS BMPs (USFS 2012), even by utilizing the entire proposed 125-ft temporary construction corridor for switchbacks. Properly built roads that represent responsible land stewardship and meet BMP guidelines would necessarily have multiple switchbacks and a properly designed drainage network, which would be impossible to construct even within the larger 125-ft construction corridor, much less the 75-ft permanent easement corridor described by MVP. It should be noted that temporary access roads built for logging operations are indeed

considered to be "roads" in forestry management. To say that corridors built to drive heavy equipment and vehicles on to construct a pipeline are not roads is inaccurate at best.

Therefore, if the pipeline were ever allowed to be constructed through Craig County, either the corridor though the National Forest and private lands would be much wider than suggested, or MVP would have to violate accepted BMPs and the USFS would have to contradict its own policies to allow such egregious violations.

At an MVP Open House Meeting in New Castle Virginia MVP Proposed to deal with steep slopes and sharp bends over ridge tops by notching the ridges. This form of mountaintop removal has many ramifications that would have to be addressed in the EIS including:

1. The additional sedimentation that would be generated from such a drastic approach.
2. The effects this would have on viewsheds and resultant effects on Craig County's tourism-based economy.
3. The effects that notching the mountains would have on Craig County's residents' cultural attachment to place.
4. The effect notching the mountains would have on changing water recharge and drainage patterns due to rechanneling of ephemeral and intermittent seeps and streams away from the pipeline trench.

SENSITIVE AQUATIC HABITATS AND SPECIES

Another key landscape feature concerns the sensitive aquatic habitats along the Alternatives 110, 110J, and 110R. These routes will negatively affect known sensitive aquatic habitats. Several of the streams to be crossed have exceptional water quality that supports species that are especially sensitive to sedimentation.

With respect to water quality, the proposed routes will remove forest cover that protects critical water resources on both public and private lands, and will destroy streamside buffers. Construction will compact the soil in the construction corridor, thereby causing increased runoff to nearby stream channels outside the corridor. This will result in channel erosion and sediment problems downstream and away from the right-of-way. As was stated previously, these are known, predictable outcomes. Additionally, construction will likely destroy ground water connections and clog underground drainage networks. This is especially a concern if construction plans include filling of caves encountered during construction. Even the small caves that are not easily accessible for humans have unique cave faunas. Much of the proposed Alternatives 110, 110J, and 110R intersect karst geology that provides the supply and protection of clean water for wildlife, residential and agricultural uses. The EIS must address likely effects of construction and the filling of cave passages on water supplies and wildlife. Additionally, the EIS must propose <u>proven</u> mitigation methods for protecting or diverting water supplies.

The proposed routes will run along and across innumerable small un-named headwater streams that are essential for aquatic habitat and biota, as well as the more well-known named streams (Dicks Creek, Johns Creek, Sinking Creek, and Craig Creek). Construction of buried-pipeline stream crossings is known to cause negative impacts to stream ecosystems (Levesque and Dube 2007). In particular, construction of these crossings will directly impact stream beds and banks,

increase suspended sediment and deposition and, thereby, impact fish and macroinvertebrate habitats (Tsui and McCart 1981, Reid et al. 2002).

All of the variations of alternative route 110 cross all five known locations for the endangered James spinymussel *(Pleurobema collina)* in the Upper James River watershed including: South Fork of Potts Creek, Little Oregon Creek, Dicks Creek, Johns Creek, and Craig Creek. Additionally, the route crosses the only known population of this species in the state of West Virginia. This federally protected endangered species would be negatively impacted by any activities that will increase erosion and resultant sedimentation into the headwater streams. As previously shown there is no doubt that a pipeline on the severe slopes of the proposed routes will cause erosion. There are no BMPs that can possibly eliminate, or even hope to reasonably control, erosion caused by the proposed project. The potential for erosion from the MVP to jeopardize not only these populations of James spinymussel, but also the continued existence of the species, must be considered in the EIS.

Assertions of the ineffectiveness of BMPs for pipelines on steep slopes and the problems this can cause for endangered mussels is documented by the case study of the East Tennessee Gas Pipeline in Tazewell and Smyth Counties, Virginia described above. In spite of the extreme attention to detail, slopes failed in two independent erosion events and resulted in a kill of several hundreds of individuals and multiple species of endangered mussels in Indian Creek and N. F. Holston River (Dinkins 2011).

Dr. Richard Neves, internationally recognized authority on endangered freshwater mollusks, points out the importance of the James spinymussel populations in the upper James basin and specifically relates how projects like the MVP and Alternative Routes 110, 110J and 110R can have catastrophic failures like the incident at Indian Creek. Dr. Neves writes (emphasis added):

> *"Let me answer your 2 questions about the 1) significance of the meta-population of the endangered James spinymussel in upper John's Creek, Dicks Creek, and Little Oregon Creek, and 2) potential effects of a pipeline crossing of those streams. By way of background, I co-conducted the initial status survey of this species (Clarke and Neves 1984), assisted Andy Moser, FWS, with preparation of its federal Recovery Plan in 1990, and have supervised graduate students who worked on its life history and habitat requirements (Hove 1989, Hove and Neves 1989, Hove and Neves 1994), and status of various populations (Ensign and Neves 1995, 2000; Petty and Neves 2002, 2006; Johnson, Petty and Neves 2005) throughout the James and Dan river systems, but particularly in the Craig Creek drainage. I have also conducted many mussel surveys for VDOT in Craig and John's creeks for bridge replacement and ford crossing projects over the last 30 years (e.g., Gatenby and Neves 1994), and discovered the Dicks Creek and Little Oregon Creek populations of the James spinymussel during one of those surveys (Gatenby and Neves 1994). Thus I am very familiar with the species and its habitat requirements.*
>
> ***The meta-population of James spinymussel in John's, Dicks, and Little Oregon creeks is the largest and most reproductively viable population known, throughout the species' range**. Detailed monitoring studies by state malacologist Brian Watson over the last 4 years have confirmed this. My sampling of other populations in various streams throughout its range over the last 30 years, to include Craig Creek, has indicated a*

gradual decline of those populations, with limited recruitment likely due to poor reproductive success. Conversely, John's Creek has maintained its healthy population because of excellent water quality and minimal impacts to physical habitat in the stream(s). For the last 7 years (e.g., Dan and Neves 2014), we have been using gravid females from John's Creek to augment natural reproduction in Craig Creek, as a component of a Biological Opinion issued by FWS to VDOT in 2007. ***Johns Creek drainage is the only creek system throughout the species' range where we can readily collect reproductively mature females for this project.***

With respect to the potential effects of a pipeline crossing of any of these streams, I can say that any negative impact to water quality or physical habitat, such as erosion or sediment (Henley et al. 2000), could jeopardize the resident population, particularly the more isolated populations in Dicks and Little Oregon creeks. *This species does best in high-quality headwater streams, witnessed by its present range in small streams with good water quality, stable substrates, and healthy populations of resident host fishes.* ***Relocation is not an acceptable option for this species****, as the resident population(s) in the upper Johns Creek drainage occupy what has been empirically determined by them to be most suitable for their survival, growth, and reproduction. I conducted many mussel surveys for stream crossings of the Jewell Ridge Lateral Gas Pipeline project by Spectra Energy in southwest Virginia (Ostby and Neves 2005), and was called by FWS to assess two known sediment spills in 2006 from this project; one in Indian Creek, Tazewell County, and the other in upper North Fork Holston River (NFHR), Smyth County. The sediment plume in Indian Creek degraded the habitat of 2 federally endangered species (Ostby and Neves 2006), and the washout of the crossing site on NFHR caused the death of some mussels, particularly in the area of the coffer dam (Ostby and Neves 2006a).* ***Evidence of the sediment was detected as far as 2 km downstream*** *(Ostby and Neves 2006b). Thus in spite of a contractor's best efforts and implementation of Best Management Plans, accidents and unexpected events do happen, with potentially serious consequences to mussels."* [Richard Neves, USGS and Virginia Tech, retired; e-mail communication; March 21, 2015]

The proposed Alternate Routes 110, 110J and 110R pass through and would disrupt the most important streams on earth for the federally endangered James spinymussel, and because the effect is predictable it violates the Federal Clean Water Act Mandated Best Management Practices, which state:

> "Discharges must not take, jeopardize, adversely modify or destroy the critical habitat of threatened or endangered species as defined under the Endangered Species Act.
>
> In the Recovery Plan the USFWS charges the USFS with giving this area special protection with this statement:
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> "Wherever possible, the Forest Service should acquire those habitat areas and watersheds, with priority placed on the Craig/Johns Creek watershed" (USFWS 1990).

In addition to the likely violations of federal law and stated policies raised above, Alternatives 110, 110R, and 110J also impact other rare, endangered, threatened, and protected species:

- The Johns Creek Watershed has been proposed as Critical Habitat for the James spinymussel (Hartl 2015)

- Johns Creek and Craig Creek are known habitat for the Federally Endangered Orange finned madtom.

- Craig Creek is habitat for the Atlantic pigtoe, which is proposed for Federal Listing as Endangered.

- North Fork of the Roanoke River is documented to contain the Federally Endangered Roanoke Log Perch in the vicinity of Route 110 crossings.

- The proposed routes will pass near known nesting sites for bald eagles.

- All of the proposed routes cross caves that have been historically used by endangered species of bats.

- The proposed routes pass through wetlands that support diverse amphibian assemblages and karst areas that support numerous rare cave organisms.

- Many of the streams that are endangered-species waters are also of concern as known habitat for native brook trout. In addition, Alternate 110J runs alongside Trout Creek for several miles and crosses Pickles Branch, both of which are native brook trout streams.

- Sinking Creek riparian wetlands, in the area crossed by the alternative routes are habitat for an endemic, undescribed species of crayfish that will likely receive Federal Protection. Details regarding this species in the Sinking Creek watershed, and other endangered crayfishes that are threatened by the MVP pipeline, can be found on the FERC Docket for the proposed MVP project (http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20150401-5067).

LONG-TERM MAINTENANCE

Long-term maintenance of the pipeline right-of-way is a concern for several reasons. Erosion, sedimentation, and increased runoff caused by compacted soils are concerns over the entire life of the pipeline, not just during construction. Related to those issues are problems with how to manage the right-of-way's vegetative surface. Currently, MVP states that they intend to manage the right-of-way with mechanical mowing and hand pruning of steep slopes. This is clearly going to be difficult if not impossible on very steep slopes, and at some point in the future MVP will likely decide it is less expensive and more efficient to use herbicides. **Administrative oversight of such decisions must be explained in the EIS. If a decision to use herbicides is even remotely possible, the EIS must consider the effects of such a decision on organic farmers and family farms.** It is preferable to stipulate **now** how such herbicides can be used without cascading environmental and economic impacts, and to analyze the ramifications of possible misuse.

Another critical issue related to long-term maintenance is restoration of erosion scars. The EIS must address the effects of erosion and runoff away from the corridor on local streams. An administrative procedure must be developed to oversee the long-term maintenance and inspection of the pipeline corridor.

Again we don't have to look far for examples of pipelines not being maintained appropriately and causing erosion and runoff problems. In fact, we only have to look as far as the TRANSCO pipeline, the line to which the MVP is proposed to connect. The TRANSCO is a 30-inch pipeline, and was built in 1955. In Virginia, it is perhaps best known for exploding in 2008, injuring five people, and destroying two houses in Appomattox County. The TRANSCO pipeline right-of-way in Appomattox County is also the location of severe erosion and sediment runoff. Aerial views of the pipeline in the area of latitude 37.487072 longitude -78.752346 (See Map 1 or search in Google Maps for a wider perspective) indicate the severe erosion scars and lack of maintenance along this right-of-way, even after 60 years of supposed recovery and restoration. The map coordinates given represent the extreme upstream extent of a small watershed that was sampled in 2009 and again in 2014 in EPA's National Rivers and Streams Assessments. These surveys are intensive assessments of biological, chemical and physical habitat parameters for randomly selected locations on streams. The map coordinates sampled for this watershed was 37.49180 -78.75650. The point sampled is approximately 0.5-mile downstream of the TRANSCO pipeline corridor. Even 0.5-mile downstream of the pipeline, the stream is identified as having a sedimentation problem that originates as erosion and runoff from the "reclaimed" pipeline corridor.

The East Tennessee Gas Pipeline Company again offers an example of a similar problem. In this case the example comes from Tennessee where TV channel 11, WJHL reported a story of a pipeline corridor being left unmaintained after it was constructed. Severe erosion and un-vegetated surfaces still remained three years after construction. The company blamed steep slopes and the need to change BMPs after construction (www.wjhl.com/story/27159282/efforts-to-mend-scar-left-on-rogersville-hillside-after-3-years).

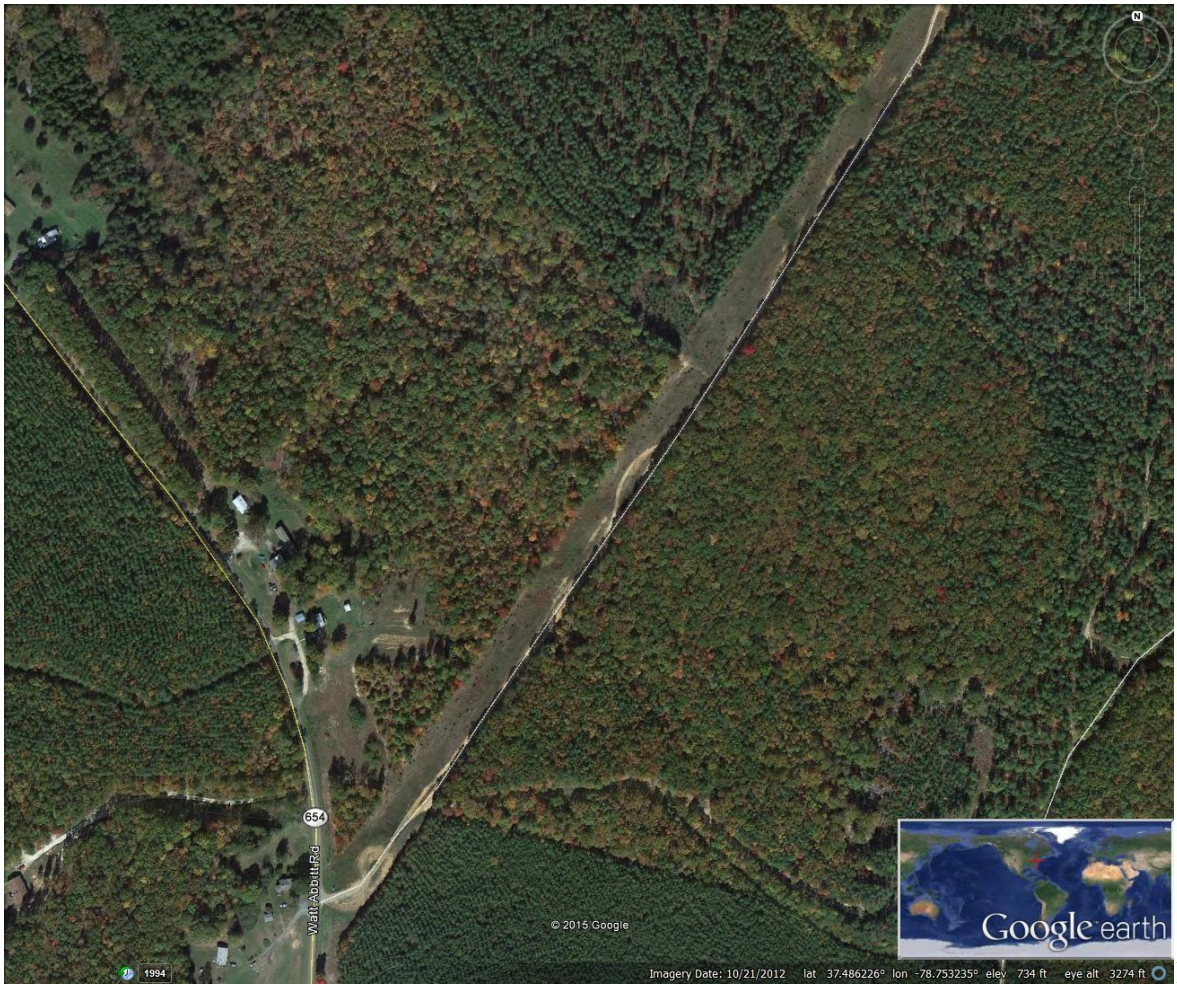
There is apparently no effective oversight for maintenance or sediment-and-erosion control for pipelines, and the effects can be observed well outside of pipeline rights-of-way. A long-term maintenance plan must be developed with third party inspection and oversight issues effectively addressed.

ROUTE PROPOSALS

As explained above, because pipelines are exempt from many BMPs there must be even greater care taken in selecting routes. The routes that have been proposed by MVP have been selected based on expediency of construction, without conscientious or even minimally sufficient consideration for completely predictable environmental effects. Instead MVP chose to let environmental concerns sort out during the EIS development. The EIS should either require MVP to propose and analyze more-constructible and less environmentally damaging route options, or to seriously consider other options for moving gas that have been proposed during the scoping process. FERC and MVP must accept that there are places pipelines don't belong

and that the environmental costs on such routes outweigh the higher construction cost of more appropriate routes.

Preserve Craig believes that realistic assessment of the issues outlined in this document can only conclude that Routes 110, 110J and 110R are unsuitable routes for a pipeline, and it is critical to consider other options for moving gas with lower risks of environmental calamity. We stand ready to work with you to resolve these issues.



Map 1. The Transco pipeline in the vicinity of 37.487072 -78.752346.

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