

# Blue Ridge Environmental Defense League

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December 22, 2016

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

**RE: Draft Environmental Impact Statement, OEP/DG2E/Gas 3, Mountain Valley Pipeline, LLC,  
Docket No. CP16-10-000**

Dear Secretary Bose:

On behalf of the Blue Ridge Environmental Defense League and its chapters Preserve Floyd, Preserve Roanoke, Preserve Franklin and Piedmont Residents in Defense of the Environment (PRIDE) and members throughout Virginia, I write to address the draft environmental impact statement (DEIS) for the proposed Mountain Valley Pipeline project, Docket No. CP16-10-000.

## Overview

On October 23, 2015, Mountain Valley Pipeline, LLC (“MVP”) filed an application under section 7(c) of the Natural Gas Act, requesting authorization to construct, own, and operate a new natural gas pipeline system (“Project”), including three compressor stations and appurtenances totaling 171,600 horsepower, four new meter and regulation stations and interconnections, 2 new taps, 5 pig launchers and receivers; and 36 mainline block valves. If constructed, Mountain Valley Pipeline would have approximately 301 miles of 42-inch-diameter natural gas pipeline beginning in Wetzel County, West Virginia and ending in Pittsylvania County, Virginia. Project owner Mountain Valley Pipeline, LLC is a joint venture of EQT Midstream Partners, LP; NextEra US Gas Assets, LLC; Con Edison Gas Midstream, LLC; WGL Midstream; and RGC Midstream, LLC. Mountain Valley Pipeline has also requested a certificate of public convenience and necessity authorizing Mountain Valley to construct, own, and operate the Mountain Valley Pipeline Project; (2) a blanket certificate of public convenience and necessity

authorizing Mountain Valley to provide open-access interstate transportation services, with pre-granted abandonment approval; (3) a blanket certificate of public convenience and necessity under Part 157, Subpart F of the Commission's regulations for Mountain Valley to construct, operate, acquire, and abandon certain eligible facilities, and services related thereto; (4) approval for its proposed interim period rates and initial recourse rates for transportation service and for its pro forma tariff; and (5) such other authorizations or waivers as may be deemed necessary to allow for the construction to commence as proposed.

The pipeline project outlined and addressed in the draft EIS for the Mountain Valley Pipeline, DEIS-D0272, represent a massive assault on the environment and the communities along the proposed routes. Moreover, the impacts of extraction, transport and combustion of natural gas via the process of hydraulic fracturing have to be taken into consideration. The EPA's own estimates up to 140 billion gallons of water are used annually to fracture 35,000 wells in the United States. A large variety of chemicals are used in fracking fluids, and many of these fracking fluid chemicals are known to be toxic to humans, and several are known to cause cancer (e.g. formaldehyde, ethylene glycol, methanol, benzene). According to studies conducted by the EPA, the oil and gas industry, and interviews with regulators, anywhere from 20 to 85% of fracking fluids remain in the formation, a dangerous source of groundwater contamination for many generations to come in the source areas for the natural gas that would be transmitted via the Mountain Valley Pipeline from West Virginia to Virginia.<sup>1</sup>

Under the law, these national and global impacts must be accounted for by the Federal Energy Regulatory Commission; i.e., to "recognize the worldwide ... environmental problems and ... maximize international cooperation."<sup>2</sup>

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<sup>1</sup> [https://www.earthworksaction.org/issues/detail/hydraulic\\_fracturing\\_101#.Vi1QOn6rQdV](https://www.earthworksaction.org/issues/detail/hydraulic_fracturing_101#.Vi1QOn6rQdV)

<sup>2</sup> National Environmental Policy Act, §102(2)

Once the impacts are weighed, we believe the no action alternative—that is, the denial of the certificate of convenience and public necessity—will be the agency’s only recourse.

## **Background**

The proposal under consideration includes multiple facilities which would be capable of delivering about 2 billion cubic feet of natural gas per day. The DEIS encompasses many miles of pipelines, three compressor stations, and numerous valves, pig sites and other appurtenances in two states. The environmental impacts of such a large number of facilities would be devastating to the environment and public health. Natural gas extracted by hydraulic fracturing, or fracking, is transported in trucks, compressed and delivered by pipelines. At each stage in this process, pollution is created.

## **COMMENTS**

### **Protection of Water Resources**

#### ***Waterway Mitigation Concerns***

The Williams-Transcontinental (Transco) pipeline traverses over 10,000 miles with 42 inch diameter along the southeast, mid-Atlantic and northeast of the United States. A pipeline incident was documented by a local in Pittsylvania County, near where the proposed MVP would terminate at compressor station 165. In September 2015, SW Virginia had a week of heavy rain and flooding. Creeks swelled and overflowed with the massive downpour and water washed away entire trees and large limbs. Along a small creek near the Transco station in Pittsylvania, a landowner found that the pipe was completely exposed and “catching” limbs and brush from the flooding. Williams Transco’s solution to mitigate the problem was to lay a concrete block mesh across the entire creek in the easement area (approximately 50 feet wide). Below are images of their “fix.”



*The concrete mesh – photo taken May 2016*



*The water has an oily sheen – is there a leak? Photo taken May 2016*





*The concrete mesh spans the easement ROW covering the creek with concrete.*

Because of the lack of erosion and sediment control through waterways, the creek bottom was washed away, exposing the pipe and water hammered at it, as the pipe stopped branches and limbs from flowing. What damage was caused to the pipe with the amount of water and other external forces? If this is standard mitigation practices for waterways, what will become of the hundreds upon hundreds of creeks and waterways the proposed MVP intends to cross? This is not mitigation. This is placing an unnatural, concrete burden on a much needed natural resource in communities – WATER.

### ***Franklin County***

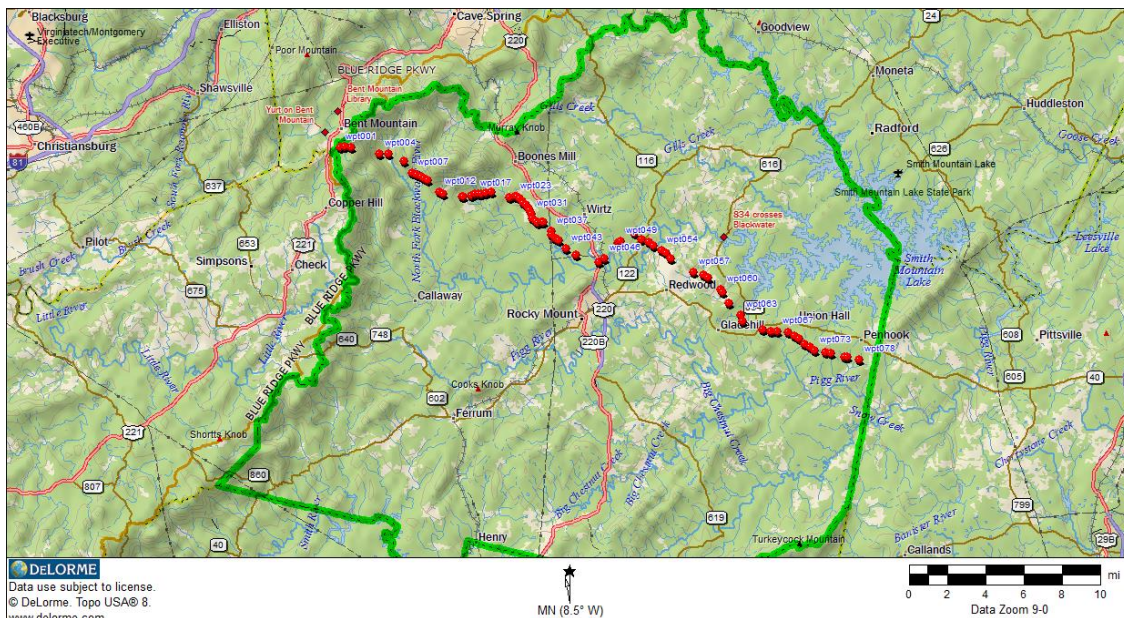
Comments on behalf of BREDL Chapter Preserve Franklin

### ***Smith Mountain Lake and Franklin County Water Quality Concerns***

According to MVP's Resource Report 2, 128 different waterbodies in Franklin County are listed to be crossed by the proposed pipeline. This includes:

- 3 tributaries just east of the Blue Ridge Parkway forming the headwaters of the South Fork of the Blackwater River
- 7 tributaries forming the headwaters of the North Fork of the Blackwater River

- 8 tributaries whose water flows into Little Creek, then into Mill Creek, then into the Blackwater River
- over 20 tributaries of Mill Creek in an area where the pipeline follows Mill Creek for about 4 and a quarter miles
- The Blackwater River and its tributaries, crossed at least 12 times east of U.S. 220, it's last crossing west of U.S. 220 being ¾ of a mile upstream from the Town of Rocky Mount's water supply.
- And as referenced below, 22 tributaries emptying into Smith Mountain Lake
- Plus, an unknown quantity of unmapped and unnamed tributaries and springs.



● = Mountain Valley Pipeline stream crossing in Franklin County, VA. This map shows 78 such crossings.

Source: Roanoke County, VA's online map of the Mountain Valley pipeline at

<http://gisweb.roanokecountyva.gov/pipeline/> USGS National Map

As noted above, concerns surrounding the number of water crossings by the proposed Mountain Valley Pipeline pose a threat to Smith Mountain Lake as well as the various creeks, rivers and watershed areas.

The Smith Mountain Lake Association has filed multiple comments to FERC on the proposed Mountain Valley Pipeline project, including most recently on the DEIS. Key concerns from their filings are highlighted below:

### **Background Information**

The Smith Mountain Lakes Project (SMLP) is a two-reservoir pumped storage hydroelectric generation project facility near Roanoke, Virginia, completed in the mid-1960s. SMLP is operated by Appalachian Power Company (APCO) which is owned by American Electric Power (AEP). SMLP has 600 miles of shoreline and 25,000 surface acres of water. The project is also used for recreation and a source of potable water for two of the surrounding four counties comprising Bedford, Campbell, Franklin, and Pittsylvania. It is a major tourism attraction for the region and an important source of tax revenue for the surrounding counties.

The SMLP has a larger upper reservoir -- Smith Mountain Lake (SML) -- and a smaller lower reservoir-- Leesville Lake (LVL). Water stored in SML first passes through turbine-generators in the powerhouse to produce electricity and is discharged into LVL. Much of the water is retained in (LVL) and pumped back into the SML for re-use. A portion of the water goes through the turbine-generators at the Leesville powerhouse to generate additional electricity and to meet the minimum discharge requirements of the project's operating license. Three significant rivers flow into the project. The Roanoke and Blackwater Rivers flow into the SML project above the SML Dam and the Pigg River flows into LVL above the LVL Dam. Via the pumpback feature of the project, some of the water from the Pigg River and LVL also co-mingles with the SML waters.

The MVP as planned will pass the SMLP to the south, mainly in Franklin County, and then into Pittsylvania County where it crosses under the Pigg River and continues to

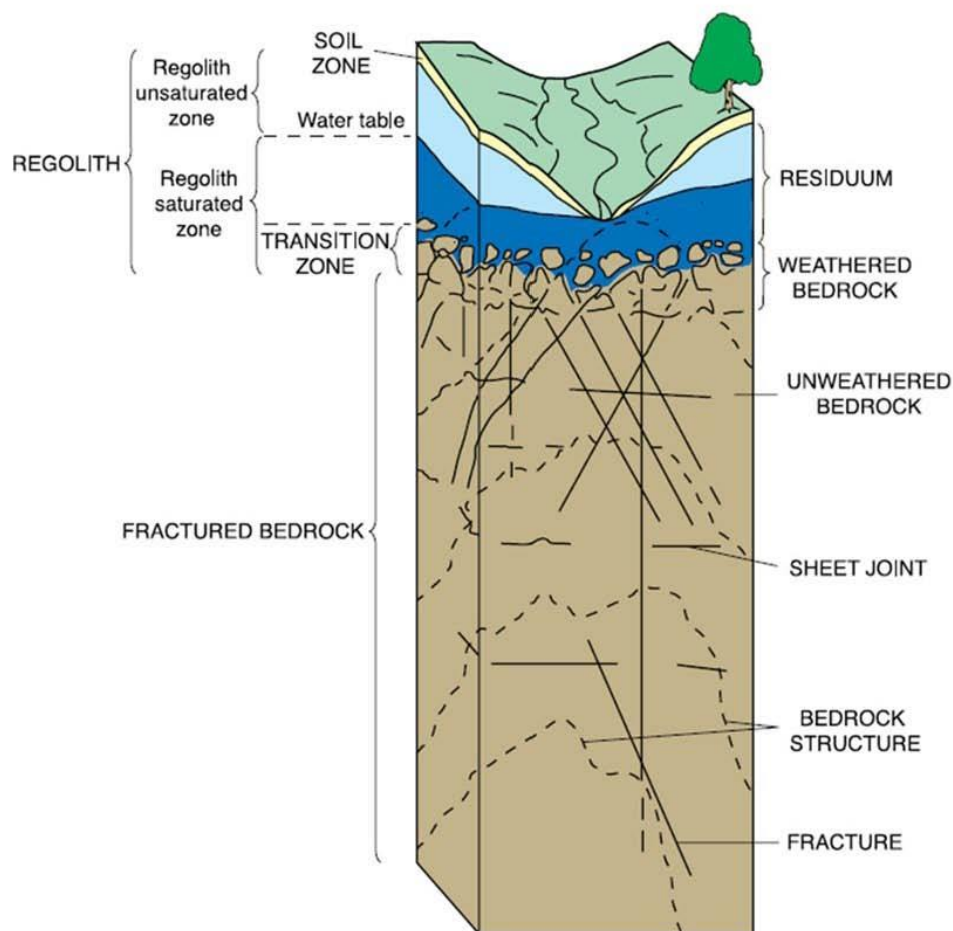
terminate at the existing Transcontinental Gas Pipeline Company LLC's existing Zone 5 Compressor Station 165 in Pittsylvania County, Virginia. The pipeline as planned will pass four miles north of the town of Rocky Mount, Virginia, the Franklin County seat. It should be noted that water released from the LVL dam flows into the downstream Virginia Department Game and Inland Fisheries Hatchery and past the Dominion Power Plant then into Lake Gaston and eventually the Albemarle-Pamlico Sounds in North Carolina.

Continued comments:

The SMLP is fed by the Roanoke, Blackwater and Pigg Rivers, representing drainage from Montgomery, Salem, Roanoke, Franklin and Pittsylvania counties, together with some drainage from Bedford County. The drainage area for the SML/Leesville project below the Niagara dam on the Roanoke River below Roanoke is primarily from Franklin and Pittsylvania counties, about 965 sq. mi or roughly 65% of the total drainage area (Reference 1). As shown in Figure 1 (below), reproduced from Reference 2, groundwater in this region can be roughly divided into two components: (1) the deep groundwater in the fractured bedrock and (2) the nearsurface (or surficial) groundwater lying above the bedrock in the regolith saturated zone.

Reference 2 states “Because of the relative high porosity of the regolith, most recharge is stored in this unit and is released slowly to the underlying bedrock fractures. Because fractures and dissolution openings in the bedrock are conduits for ground-water flow, well yields are greatest where wells intersect fractures or dissolution opening that are large, numerous, or both.”

**Figure 1: Groundwater Components of the Regolith and Bedrock**



This near-surface groundwater constitutes a major portion of the water flow into the SMLP, primarily through its flow into streams and rivers and through the lake shores.

This near-surface groundwater flow also shows a distinct seasonal variability and a strong dependence on winter groundwater recharge. Reference 3 indicates this groundwater flow (also referred to as base flow) constitutes about 60-70% of the total annual flow into the project. The results of our analyses in References 4 and 5 are consistent with these findings.

The filing continues stating water table concerns:



In the SML/Leesville drainage areas in Franklin and Pittsylvania counties, the median depth of the bedrock is about 58 ft. below the land surface, with the water table median depth about 12 to 17 ft. above the bedrock (Reference 6). However, Reference 6 also states that minimum depths to the bedrock can be within a meter or so from the land surface. We believe it is reasonable to assume these regions of shallow bedrock have shallow water tables in the saturated regolith that are also nearer the surface.

Under these conditions and this assumption, anytime the MVP pipeline cuts into the bedrock it will cut into the water table and potentially disrupt the flow of near-surface groundwater. From Appendix 6B of the MVP FERC filing, locations in Franklin County where the bedrock can potentially lie within the depth of the pipeline trench occur 43 times, for a total distance of 15.9 miles, about 44% of the total pipeline 36 mile path through Franklin County.

**Smith Mountain Lake Association (SMLA) Comments on the DEIS:**

An estimate of the drainage area potentially affected by the MVP can be made using the USGS (US Geological Survey) streamflow gages closest to where the MVP cuts the rivers and streams of interest. These gages are the Lafayette gage for the Roanoke River in Montgomery County, the Rocky Mount gage for the Blackwater River in Franklin County and the Sandy Level gage for the Pigg River in Pittsylvania County. These gages represent drainage areas of 254, 115 and 351 square miles, respectively, totaling 720 square miles or 50 percent of the total SML/Leesville drainage area. Since surficial groundwater flow comprises ~ 50 percent or more of the total stream flow on the average at these USGS gage sites, a significant portion of the groundwater flow into SML and Leesville Lakes may be “upstream” of the MVP route through Franklin and Pittsylvania Counties and consequently compromised by the MVP pipeline.

...The potential economic losses associated with groundwater loss to the SML-Leesville pumpback project for electrical generation and county benefits can be as much as \$1.6 to \$7.2 million annually and possibly more. This potential economic loss, together with the fact that it may be impossible to remedy changes in groundwater flow once they occur, is considered a major deficiency that the FERC Draft EIS has not seriously addressed.

### **Pigg River Dam Removal in Franklin County**

A recent project to remove an old dam along the Pigg River in Franklin County<sup>3</sup> has raised alarming concerns regarding erosion and sedimentation as well as the health of the water for the endangered Roanoke Logperch (see further comments below concerning Roanoke Logperch). Questions arise as to MVP's mitigation practices with regards to their plans to cross through so many creeks and rivers through Franklin County. Friends of the Rivers of Virginia have coordinated and been responsible for the Pigg River Restoration Project, as well as seeking approval from Virginia Department of Environmental Quality (VDEQ). Bill Tanger, project manager, posted disturbing photos after heavy rains and flooding in late September, 2016.

“Monday, October 3, 2016

Here are some shots after the high water event of 9-30-16, when the flow got up to 4,000 cfs at the Sandy Level gauge. That would translate to over 800 cfs at the dam area.

In any case, the high water is continuing to eat at the banks, sometimes bringing whole sections sliding down with trees attached.

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<sup>3</sup> <https://www.fws.gov/northeast/virginiafield/partners/powerdam.html>



Below the dam, sediment continues to create new wetlands. The channel continues to shift about, undecided, and will continue to do so for several years or more.





The stripping away of trees, shrubs and plants along creeks and rivers increases erosion and sediment within the waterbody excavated. It also presents a loss of groundwater for localities and downstream bodies, such as Smith Mountain Lake. In a recent study completed for the Roanoke County Board of Supervisors, Pamela Dodd notes that, “Deforestation for construction in the headwater areas of first order high gradient streams reduces the amount of precipitation to recharge groundwater. Compaction of soils for roads and work areas reduces and/or destroys the process of soils to be saturated and to serve as an avenue for groundwater recharge. Blasting for gas pipeline trenches and also for leveling of road and work corridor surfaces destroys or changes the bedrock fractures,

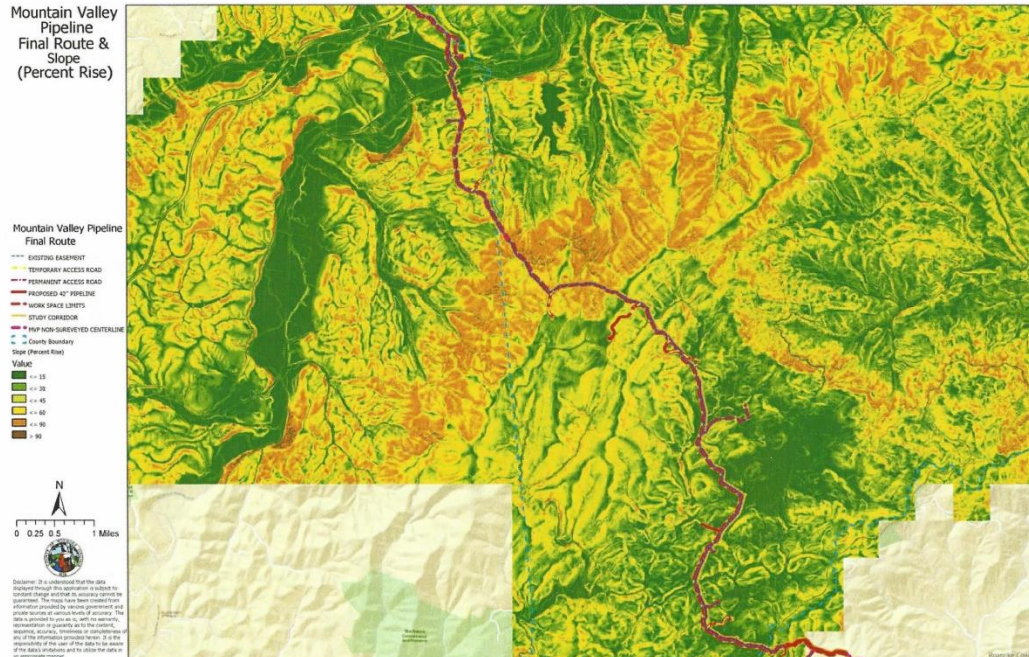
compromising the amount of groundwater flow and the direction of groundwater flow to seeps and springs which provide water to wetlands and to streams and rivers.”<sup>4</sup>

## ***Roanoke County***

### ***Bent and Poor Mountain Water Quality Concerns***

There are multiple atypical aspects of the proposed Mountain Valley Pipeline (MVP) project, including the following impacts on the Bent Mountain community and Roanoke County:

- the unprecedented 42” diameter of the proposed pipeline;
- the area that would be clear cut;
- the certainty of erosion and potential for slope failure in an unprecedented crossing of extremely steep slopes (>60-70°); blasting will occur through metamorphic and intrusive igneous bedrock (capped by a sedimentary layer on Poor Mountain) with excavation through a thin layer of highly erodible soil on both Poor and Bent Mountains (steep slopes image below)



<sup>4</sup> HYDROGEOLOGICAL ASSESSMENT OF WATERSHED IMPACTS CAUSED BY CONSTRUCTING THE MOUNTAIN VALLEY GAS PIPELINE THROUGH ROANOKE COUNTY, VIRGINIA  
By Pamela C. Dodds, Ph.D., Licensed Professional Geologist, Prepared for the Roanoke County Board of Supervisors, December 2016



Much smaller pipelines, 8-12 inches in diameter, for example, one crossing Peters Mountain for the Celanese Plant Giles County completed in April 2015, have resulted in uncontrolled erosion, sedimentation and pollution. (Photo courtesy of VA Pipeline Monitoring Coalition – see below).



- the resulting sedimentation that would occur in a complex watershed that provides half the drinking water for Roanoke County; and
- the presence on Poor and Bent Mountains of over twenty square miles of upland marsh, ephemeral springs and streams protected under the Clean Water Act.
- Springs and well water are the *only sources* of drinking water for the community of Bent Mountain.

Pipeline construction is anthropogenic by definition, and would exacerbate the existing temperature impairment of Bottom Creek by cutting trees and permanently removing vegetation adjacent to streams in the Bottom Creek watershed.

Removal of vegetation in the pipeline corridor, erosion and sedimentation consequent to blasting and excavating extreme slopes and highly erodible soils will be *permanent*. The impacts to Tier III Bottom Creek would continue in perpetuity, and stream restoration will not be possible. Pipeline construction and post construction activities will degrade and irreparably harm the uses of Tier III Bottom Creek and the natural trout waters in its watershed. Virginia's antidegradation policy clearly mandates the protection of waterbody uses.

An "exceptional" stream in the path of the MVP is already impaired and requires action. Bottom Creek (a portion of which is a Tier III stream) and all of its tributaries in Roanoke and Montgomery Counties are designated in the Water Quality Standards as Class ii wild natural trout streams" (9VAC25-260-450). In accordance with the Clean Water Act and Virginia's antidegradation policy (9VAC25-260-30) VDEQ must maintain and protect all designated stream uses, including fishing and aquatic life habitat. Significantly, this native trout stream is already listed in Virginia's 305(b)/303(d) Water Quality Assessment Integrated Report as an "impaired stream" [303(d) list] due to violations of the Virginia Water Quality Standards for temperature. This listing requires VDEQ to develop a "Total Maximum Daily Load" (TMDL), specifying actions taken and being taken to correct the impairment as mandated under Section 303(e) of the Clean Water Act and EPA's implementing regulations and in accordance with Section 62.1-44.15 of Virginia's Water Control Law.

The MVP corridor would further degrade an already impaired Bottom Creek -- and not just temporarily. Construction of the MVP will result in clear cutting of trees and vegetation along the pipeline corridor. Since the pipeline is projected to traverse the Bottom Creek watershed, running adjacent to and crossing Bottom Creek and its tributaries in more than a dozen locations, the water temperature of Bottom Creek would be expected to increase. This effect would be long term in nature since the right-of-way must be maintained in perpetuity. Therefore, construction of the pipeline on Bent Mountain in Roanoke County

would adversely affect development of the TMDL for Bottom Creek, exacerbate the impairment of this trout stream and its tributaries, and permanently degrade designated stream uses.

As you know, the Clean Water Act, Section 401 Certification states clearly that: “Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this title. In the case of any such activity for which there is not an applicable effluent limitation or other limitation under sections 301(b) and 302 of this title, and there is not an applicable standard under sections 306 and 307 of this title, the State shall so certify, except that any such certification shall not be deemed to satisfy section 511(c) of this title. Such State or interstate agency shall establish procedures for public notice in the case of all applications for certification by it and, to the extent it deems appropriate, procedures for public hearings in connection with specific applications.”<sup>5</sup>

It is not clear that the proper notifications and opportunities for public comment have been undertaken to the fullest extent of the law, which is of great concerns, considering that “an agency must provide the public with information regarding the project as well as the evaluation process, including descriptions of the project, its adverse effects on the floodplain, and all alternatives considered. This information must be

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<sup>5</sup> Clean Water Act, Section 401 Certification: Section (a) Compliance with applicable requirements; application; procedures; license suspension. <http://water.epa.gov/lawsregs/guidance/wetlands/sec401.cfm>

made available to the affected public as well as federal, state, tribal, and local agencies with legal jurisdiction or “special expertise” in environmental and floodplain management matters.”<sup>6</sup>

The proposed Mountain Valley Pipeline project would create serious problems related to erosion and sediment control. It is likely that there have not been adequate measures taken to meet state and federal requirements for proper monitoring and mitigating of the harm that is done by the devastating and disruptive practices of pipeline construction. The Virginia Department of Environmental Quality (DEQ) administers the Virginia Water Protection (VWP) Permit Program and an associated compliance program through regulation of surface water withdrawals and non-agricultural impoundments. Impacts to surface waters such as land clearing, dredging, filling, excavating, draining, or ditching in open water, streams, and wetlands are included. As part of a larger effort to protect water quality, they are tasked with protecting wetlands and streams to protect their beneficial uses, striving to protect state waters and prevent and reduce water pollution in Virginia. The Virginia Water Protection Permit Program serves as Virginia’s Section 401 certification program for federal Section 404 permits issued under the authority of the Clean Water Act. State law requires that a VWP permit be obtained before disturbing a wetland or stream by clearing, filling, excavating, draining, or ditching.<sup>7</sup> Section 404 of the Clean Water Act (CWA) established a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters

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<sup>6</sup> “Wetlands Overview and Update Current Trends, Issues and Practical Considerations” © By Sharon M. Mattox, Vinson & Elkins, L.L.P. Houston, Texas. 2010. Accessed at: <http://www.velaw.com/UploadedFiles/VEsite/Presentations/WetlandsOverviewUpdate.pdf>

<sup>7</sup> <http://www.deq.virginia.gov/Programs/Water/WetlandsStreams.aspx>

of the United States.<sup>8</sup> The proposed MVP project would create serious problems related to erosion and sediment control. It is likely that there have not been adequate measures taken to meet state and federal requirements for proper monitoring and mitigating of the harm that is done by the devastating and disruptive practices of pipeline construction.

All of our waters, including groundwater aquifers, are connected; harm done to one body of water affects others, often irreparably. Therefore every proposed water crossing (e.g. Blackwater, Pigg, Bottom Creek) must also take into account the adjacent waters. Furthermore, according to The Clean Water Act: “The agencies emphasize that the rule has defined as “adjacent waters” those waters that currently available science demonstrates possess the requisite connection to downstream waters and function as a system to protect the chemical, physical, or biological integrity of those waters. The agencies also emphasize that the rule does not cover “adjacent waters” that are otherwise excluded. Further, the agencies recognize the establishment of bright line boundaries in the final proposed rule for adjacency does not in any way restrict states from considering state specific information and concerns, as well as emerging science to evaluate the need to more broadly protect their waters under state law. The Clean Water Act establishes both national and state roles to ensure that states specific circumstances are properly considered to complement and reinforce actions taken at the national level.”<sup>9</sup>

It is BREDL’s assertion that all water is exceptional and must be protected; therefore strict adherence to FERC’s own statement, quoted here, is insufficient: “The MVP would cross two waterbodies on the Virginia Significant Rivers List: the Blackwater River at MP 266.9, and the Pigg River at MP 286.3. As discussed in section 4.3.2.2, the MVP would come in close proximity to two Tier III water segments: Bottom Creek and Little Stony Creek.”

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<sup>8</sup> <http://water.epa.gov/lawsregs/guidance/cwa/dredgdis/>

<sup>9</sup> [http://www2.epa.gov/sites/production/files/2015-05/documents/finding\\_of\\_no\\_significant\\_impact\\_the\\_clean\\_water\\_rule\\_52715.pdf](http://www2.epa.gov/sites/production/files/2015-05/documents/finding_of_no_significant_impact_the_clean_water_rule_52715.pdf)



## Endangered/Keystone Species

### *Roanoke Logperch*

As clearly stated in the DEIS, FERC “concluded that the MVP... would be *likely to adversely affect* 3 [endangered] species (Indiana bat, northern long-eared bat, and **Roanoke logperch**.)” According to a 2007 study entitled, *Range-wide Assessment of Habitat Suitability for Roanoke Logperch (Percina Rex)*, the Roanoke logperch “is one of three federally endangered fish species occurring in Virginia. The entire known range of the species comprises six disjunct areas in Virginia, including portions of the drainages of Smith, Pigg, upper Roanoke, Big Otter, and Nottoway rivers and Goose Creek. Logperch occur primarily in medium-size rivers with silt-free, unembedded pebble and gravel substrate. Distribution and abundance of logperch are greatest in the upper Roanoke, Smith and Nottoway drainages. Potentially suitable areas outside the known range of logperch have not been extensively surveyed for logperch.”<sup>10</sup> The report continues, “Logperch populations in the upper Roanoke and Pigg drainages continue to be seriously threatened by siltation and contaminants stemming primarily from urbanization, agriculture, and highways. The status of Roanoke logperch has not improved since it was listed as endangered in 1989. U.S. Fish and Wildlife Service (USFWS) biologists are increasingly concerned about the continued decline of habitat in logperch waters.”<sup>11</sup> BREDL asserts that there have not been adequate measures taken for the protection of the Roanoke logperch along the route of the proposed pipeline.



Photo Source: [http://www.ncwildlife.org/Portals/0/Fishing/Images/Nongame/Roanoke\\_Logperch.jpg](http://www.ncwildlife.org/Portals/0/Fishing/Images/Nongame/Roanoke_Logperch.jpg)

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<sup>10</sup><http://www.virginiadot.org/vtrc/main/online%5Freports/pdf/07-cr8.pdf>

<sup>11</sup><http://www.virginiadot.org/vtrc/main/online%5Freports/pdf/07-cr8.pdf>

### *The American Chestnut*

There are American Chestnut trees that have been carefully monitored and observed for several years in Roanoke County. The American Chestnut Foundation (TACF) exists to “to restore the American chestnut tree to our eastern woodlands to benefit our environment, our wildlife, and our society. The American Chestnut Foundation is restoring a species - and in the process, creating a template for restoration of other tree and plant species.”<sup>12</sup> Ed Kinser, a retired Biology teacher from Roanoke County Schools, is a local botanist and birding expert. Kinser shared about TACF and their tasks: “The task of the state chapters within the organization is to locate surviving flowering chestnut trees and utilize their pollen and/or nuts in producing resistant trees that are adapted to regional soils and climatic conditions. This is why the [American chestnut] survivors on Bent and Poor Mountains are so important. Their genetics hold the key to producing resistant American chestnut trees that are adapted to the growing conditions on the mountains.”



*American chestnut on Poor Mountain in Roanoke County, VA*

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<sup>12</sup> [http://www.acf.org/mission\\_history.php](http://www.acf.org/mission_history.php)



*American chestnut fruits*



*American chestnut leaves*

### **Export Issues and Eminent Domain**

It is of great concern that natural gas from the Mountain Valley Pipeline may be shipped to ports around the world. Today, ships transporting natural gas with a capacity of up to 145,000 cubic meters are common. The comprehensive review, the *hard look*, required by the National Environmental Policy Act must encompass the sum of cumulative impacts from extraction to end use, no matter where that end use occurs, including export terminals and liquefied natural gas exports.

If even a portion of the gas transported through the Mountain Valley Pipeline is intended for export it should not fall under the jurisdiction of eminent domain. It would not be for the public good. An investor who of the Mountain Valley Pipeline, WGL Midstream, recently announced a 3% increase in their

original 7% investment in the proposed MVP. In a November Roanoke Times article, it was reported that “[t]wo years ago, WGL Midstream and Vega Energy Partners signed a 20-year natural gas sales agreement with a U.S.-based subsidiary of GAIL Ltd., a natural gas company in India, to supply natural gas for export through the Dominion Cove Point liquefied natural gas export facility in Maryland. WGL reported that “the majority of the natural gas would be purchased by WGL Midstream through an existing arrangement with Antero Resources Corp. In a June 2015 email, Ruben Rodriguez of WGL affirmed that most of the natural gas for the GAIL agreement would be supplied by Antero but noted that “natural gas from the Mountain Valley Pipeline could be part of the remaining GAIL supply portfolio.”<sup>13</sup>

The Roanoke Times article points also out that “...the draft environmental impact statement for the Mountain Valley project, FERC notes, ‘There is no direct connection from the Transco station 165 to the Cove Point [liquefied natural gas] terminal.’”

However, there is an interconnection from the Transco pipeline to the Cove Point pipeline which runs directly to the Cove Point export terminal.

The Roanoke Times article continues:

“...when EQT Corp. and NextEra Energy first sought customers for the natural gas that the Mountain Valley Pipeline would transport, a related “open season” document noted that the Transco pipeline system could offer “deliveries to Cove Point LNG.”

Natalie Cox, a spokeswoman for Mountain Valley Pipeline, noted Thursday that open season documents “are used to identify and attract shippers in order to fill pipeline transportation capacity.”

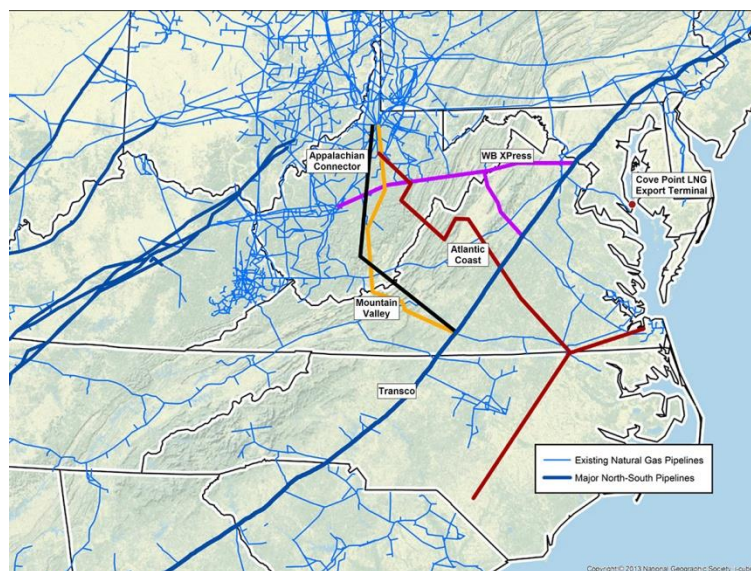
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<sup>13</sup> [http://www.roanoke.com/business/news/wgl-midstream-acquires-larger-stake-in-mountain-valley-pipeline-project/article\\_cdaa8c18-6567-5e52-ae61-5c2293f273e2.html](http://www.roanoke.com/business/news/wgl-midstream-acquires-larger-stake-in-mountain-valley-pipeline-project/article_cdaa8c18-6567-5e52-ae61-5c2293f273e2.html)

Cox said the natural gas zone associated with the Transco pipeline in the mid-Atlantic “is a hub of gas transportation activity and helped us to secure firm transmission capacity commitments, which helped to determine the appropriate sizing of the proposed pipeline.

“It’s important to remember that MVP does not own title to the gas — MVP is only transporting the gas,” Cox said. “The proposed MVP terminates at Transco’s station 165, at which time the shippers determine where their portion of the gas will be used.”

After reviewing multiple maps, existing pipelines, and those under construction, it appears that the export of natural gas through additional LNG facilities that link to the vast pipeline network is imminent. *Maps below.*



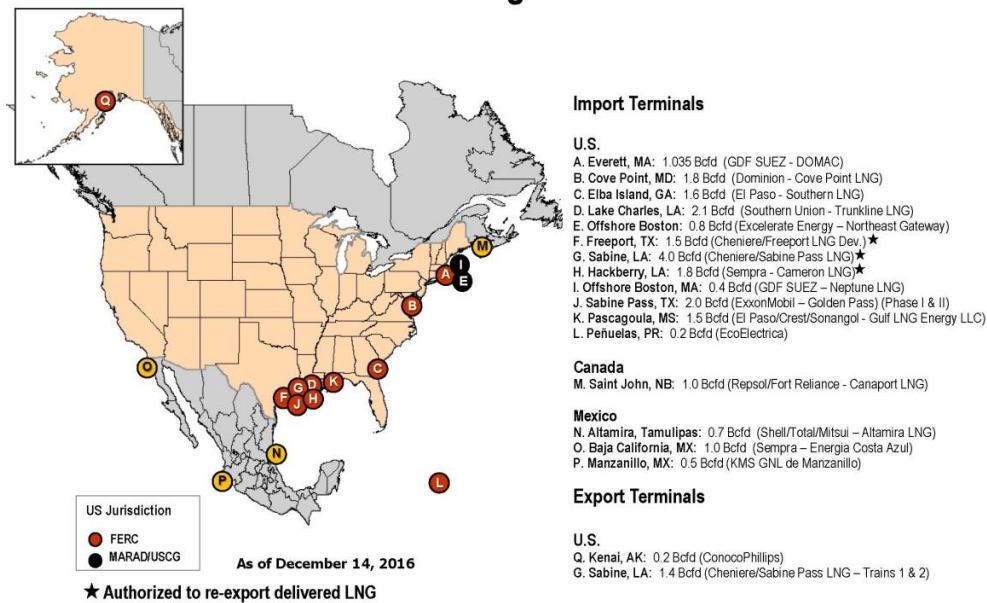
*Proposed Pipelines throughout Appalachia*





Williams-Transco Pipeline – over 10,000 miles long

## North American LNG Import/Export Terminals Existing



It should also be noted that the Mountain Valley Pipeline project is an LLC and therefore a private corporation and not a public utility. There was recently a precedent set in a lawsuit in Kentucky involving

the use of eminent domain to construct a pipeline for a private corporation. The decision was made that “because the natural gas liquids are not directly reaching Kentucky consumers, “the pipeline cannot said to be in the public service of Kentucky,” the court said.”<sup>14</sup>

The gas intended to be transported through the Mountain Valley Pipeline will not benefit the people of Virginia. If we are forced to take this issue to court, it will be obvious that Mountain Valley Pipeline, LLC is not a public utility and therefore not in the public interest.

### **Adherence to the EPA Clean Power Plan**

On August 3, 2015 the EPA released the final Clean Power Plan, establishing interim and final carbon dioxide emission performance rates for the two types of electric generating units - steam electric and natural gas fired power plants - under Section 111(d) of the Clean Air Act. Its purpose is to create enforceable goals for states to reduce emissions and a flexible framework—Best System of Emissions Reduction, or BSER—to implement carbon reductions. The Plan would set carbon dioxide (CO<sub>2</sub>) emission rate goals to be achieved by 2030. According to EPA, if the 2030 emission rate goals are achieved, CO<sub>2</sub> emissions from electric power would be reduced by 30% nationwide.<sup>15</sup> The EPA allows for the fact that states have different electric power resources and expects them to cooperate with the federal government in cutting greenhouse gas pollution. In the final CPP, the EPA determined that BSER is comprised of three “building blocks” that individually and together reduce the carbon intensity of electricity generation:

- 1) Increasing the operational efficiency of existing coal-fired power plants.

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<sup>14</sup> <http://www.kentucky.com/2015/05/22/3865010/court-of-appeals-rules-pipeline.html#storylink=cpy>

<sup>15</sup> Emission rate reductions use 2012 as the baseline year. Interim goals are also established for the 2020–2029 timeframe. EPA’s emission rates are measured in pounds of CO<sub>2</sub> emissions per megawatts-hours (MWh) of electricity generation.

- 2) Shifting electricity generation from higher emitting fossil fuel-fired steam power plants (generally coal-fired) to natural gas-fired power plants.
- 3) Increasing electricity generation from renewable sources of energy.

Under the Clean Power Plan, Renewable Energy generation includes solar, wind, geothermal, wood and wood-derived fuels and other biomass. The Plan excludes hydroelectric power. The EPA basis for determining each state's goal is to total CO<sub>2</sub> emissions from fossil fueled power plants in pounds divided by the state's electric power generation from power plants using both fossil and non-fossil sources in megawatt hours (MWh).

According to the Congressional Research Service report,<sup>16</sup> "The emission rates are a function of EPA's specific emission rate methodology. States may choose to meet emission rate goals by focusing on one or more of the building block strategies or through alternative approaches."

Under the EPA Clean Power Plan, each state chooses how to attain the standard based on its circumstances and policies. They are not limited to the EPA's proposed building blocks so long as they meet the goal.

We assert that the Mountain Valley Pipeline Project cannot, and will not, adhere to the standards projected in the current Clean Power Plan. Considering the devastating impact of methane on climate change, as well as many other issues surrounding natural gas, we also assert that the plan must be revised to take into account the issues surrounding natural gas extraction, transportation and exportation.

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<sup>16</sup> *State CO<sub>2</sub> Emission Rate Goals in EPA's Proposed Rule for Existing Power Plants*, Jonathan L. Ramseur, Specialist in Environmental Policy, Congressional Research Service, July 21, 2014

## **Economic Considerations**

Considering that the expected life time of the Mountain Valley Pipeline is 50 years and that renewable energy markets throughout the world have seen unprecedented growth while conventional and harmful sources of energy production are being outperformed by solar and wind<sup>17</sup>, this project does not make long-term economic sense<sup>18</sup> in the context of global renewable energy markets, a growing fossil fuel divestment movement<sup>19</sup>, and the anticipated economic damages of global warming ranging from record droughts to record precipitation events to rising sea water levels.<sup>20</sup> In this context it should also be noted that the State of Virginia depends to a large degree on a thriving tourist industry with millions of visitors yearly and more than \$23 billion in revenues all of which is threatened by global warming, and based on recent reports the year 2016 will go on record for the hottest year ever.<sup>21</sup>

The place to invest right now is in renewable energy. This has been clearly demonstrated by a dramatic shift in the market. “Equity raising by renewable energy companies on public markets jumped 54% in 2014 to \$15.1 billion, helped by the recovery in sector share prices between mid-2012 and March 2014, and by the popularity with investors of US “yieldcos” and their European equivalents, quoted project funds. These vehicles, owning operating-stage wind, solar and other projects raised a total of \$5 billion from stock market investors on both sides of the Atlantic in 2014.”<sup>22</sup>

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<sup>17</sup> <http://www.sciencealert.com/wind-energy-is-now-as-cheap-as-natural-gas-and-solar-is-getting-close>

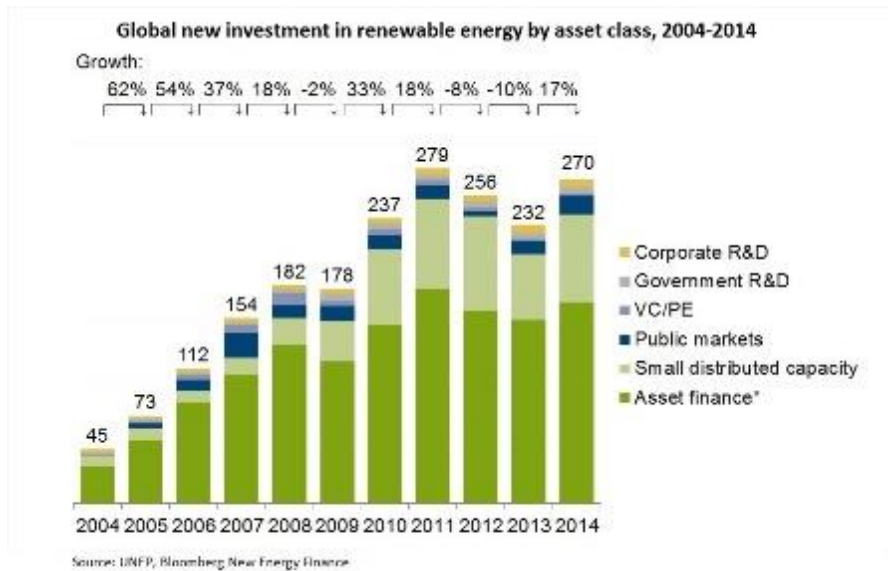
<sup>18</sup> <http://www.ft.com/cms/s/0/5974a3ce-52e0-11e5-b029-b9d50a74fd14.html#axzz3l8iOpCye>

<sup>19</sup> <http://thinkprogress.org/climate/2015/09/22/3704205/divestment-movement-50-times-bigger-in-one-year/>

<sup>20</sup> <http://www.climatehotmap.org/global-warming-effects/economy.html>

<sup>21</sup> <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2016/oct/21/global-warming-continues-2016-will-be-the-hottest-year-ever-recorded>

<sup>22</sup> “Global Trends in Renewable Energy Investment 2015,” <http://www.fs-unep-centre.org> (Frankfurt am Main)  
Copyright © Frankfurt School of Finance & Management gGmbH 2015. Bloomberg New Energy Finance.



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With the market clearly shifting towards investments in clean energy and investors overwhelmingly divesting in fossil fuels, the Mountain Valley Pipeline Project is likely to lose investors and find it difficult to convince new ones that natural gas is a viable investment, given the devastating effects on climate, environment, public safety and human rights.

### Power plants and Compressor Stations

As stated in Oil Change International’s report *A Bridge Too Far*, Natural Gas power generation is not a clean carbon solution for our nation. “The idea of natural gas as a ‘bridge’ to a low carbon future is a much-used talking point for the industry and its supporters, but study after study has examined the issue to find that increasing gas-fired power generation can only at best shave a couple of percentage points from overall emissions rates, and may undermine the transition to clean energy entirely. One of the problems is that rising gas use does not only displace coal; it also displaces zero-carbon energy.”

Natural gas suffers from a series of insoluble problems. Once the gas is removed from the earth, it is transported in trucks, compressed and delivered by pipelines where it is burned for heat and power. At

<sup>23</sup> “Global Trends in Renewable Energy Investment 2015,” <http://www.fs-unep-centre.org> (Frankfurt am Main) Copyright © Frankfurt School of Finance & Management gGmbH 2015. Bloomberg New Energy Finance.

each stage in this process, pollution is created. Compressor stations and electric power plants are two major pollution sources which are often overlooked.

For example, at the Richmond County Energy Complex in Hamlet, North Carolina, Duke Energy Progress operates seven combustion turbines permitted to burn either fuel oil or natural gas to generate 2,000 megawatts of electric power. But turbines are remarkable for their lack of efficiency in converting chemical energy to mechanical energy. More than 50 percent of the turbine's power output is consumed by the turbine itself to aid combustion.<sup>24</sup> Two types of turbines are simple-cycle and combined-cycle. The simple cycle has a thermal efficiency of only 15 to 42 percent. Combined cycle units add a heat recovery steam generator to boost efficiency to between 38 and 60 percent. So, at best 40% of the fuel burned produces no electric power; at worst 85 % of the fuel burned produces no electric power. Of course, air pollution and global warming gases are created whether power is produced or not. There are a number of compressor stations along the proposed Mountain Valley Pipeline which will have to go through a permitting process and will have to be evaluated in regard to air pollution.

A major source of air pollution from natural gas pipelines is compressor stations. Spaced about 50 to 100 miles apart, they keep the gas moving along the pipeline from production site to end use. Power for these compressors is provided by internal combustion engines, turbine or reciprocating, which use natural gas as a fuel source. These engines release huge amounts of air pollution including sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOC), carbon monoxide (CO), particulate matter (PM<sub>10</sub>), and hazardous air pollutants such as benzene and formaldehyde. Our review of compressor

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<sup>24</sup> US EPA Air Pollution Emission Factors, AP-42, Stationary Gas Turbines, Section 3.1.2 Process Description

stations in Virginia and North Carolina reveals high levels of air pollution. For example, a single, medium sized compressor can emit 203 thousand tons of CO<sub>2</sub> annually.<sup>25</sup>

A compressor station in North Carolina operates eight natural gas-fired reciprocating internal combustion engines with a combined total of 37,880 horsepower.<sup>26</sup> This is a medium sized compressor, one of the two moving gas along a 128 mile pipeline from Charlotte to Wilmington, North Carolina. Our review of the state air permit reveals the pollution levels in Table B (next page) and shows an astounding level of greenhouse gas emissions (CO<sub>2</sub>e)—over 200 thousand tons per year—plus over a half a million pounds of toxic air pollution.

**Table B. Medium Sized Compressor Station Air Pollution**

<b>Pollutant</b>	<b>Annual Emission Rates</b>
CO <sub>2</sub> e	203,824 tons
Particulates (2.5, 10 and total)	24,920 pounds
SO <sub>2</sub>	1,460 pounds
NO <sub>x</sub>	367,720 pounds
VOC	70,100 pounds
CO	43,960 pounds
HAP total	25,020 pounds
HAP formaldehyde	17,560 pounds

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<sup>25</sup> Piedmont Natural Gas–Wadesboro Compressor Station, North Carolina DAQ Permit No. 10097T01 operating eight natural gas-fired reciprocating internal combustion engines each rated at 4,735 horsepower, one of the two moving gas along a 128 mile pipeline from Charlotte to Wilmington, North Carolina.

<sup>26</sup> Piedmont Natural Gas–Wadesboro Compressor Station in North Carolina, NC Division of Air Quality Permit No. 10097T01



A recent article<sup>27</sup> points towards the connection between health issues and rural gas compressor stations. Air contaminants from the Millennium pipeline compressor station, located in Minisink, New York has reached levels that exceed that of a big city. Many residents have complained of health ailments, and a research team from the Southwest Pennsylvania Environmental Health Project, a nonprofit group of public health experts, facilitated a study from October to December, 2014.

The study found that,

“spikes in air toxins around the compressor coincided with residents’ adverse health symptoms.... Asthma, nosebleeds, headaches, and rashes were common among the 35 participants in eight families living within one mile of the compressor... Six of the 12 children studied had nosebleeds, which health consultant, David Brown, attributed to elevated blood pressure or irritation of mucous membranes by formaldehyde, a carcinogen found in excess around compressors in a recent SUNY Albany study.”



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<sup>27</sup> “Gas Compressors and Nose Bleeds” <http://www.utne.com/environment/gas-compressors-and-nose-bleeds-zm0z15fzsau.aspx?PageId=2#ArticleContent>

*Photo by Fotolia/Aliks*<sup>28</sup>

Environmental health expert, Wilma Subra, has observed the same health issues and concerns around the country, near gas compressor stations, but also near gas power plants and gas drilling sites. She cites:

“[I] typically find symptoms such as asthma, allergies, coughs, nosebleeds, dizziness, weakness, and rashes among 90 percent of residents and workers in a two- to three-mile radius of gas infrastructure... Resulting chronic ailments she cites include lung, cardiovascular, reproductive, liver, kidney, and neurological damage; birth defects; and leukemia.”

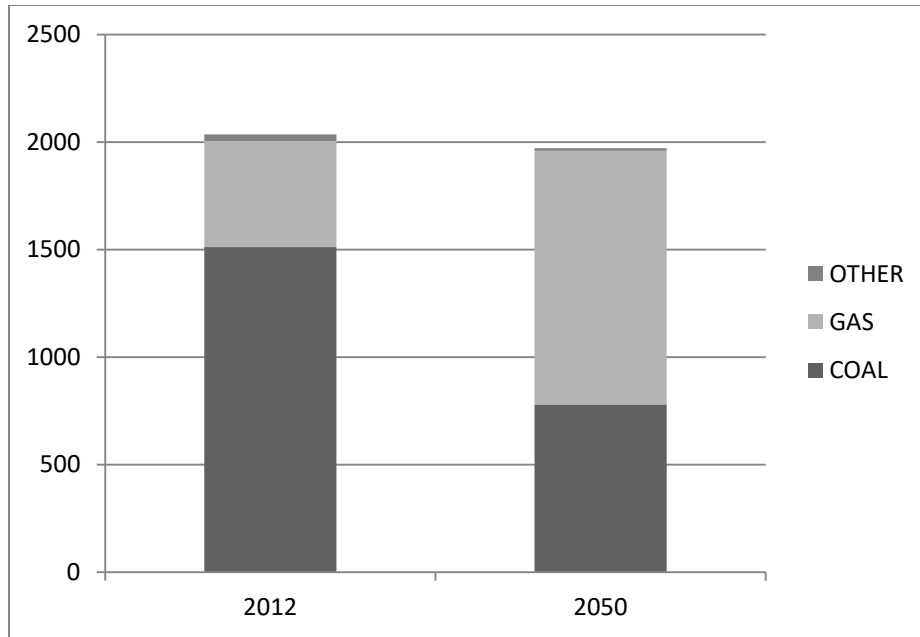
A Union of Concerned Scientists study estimates that unburned natural gas escaping from production infrastructure is equivalent to emissions from about 170 coal-fired power plants. A total of 7.7 million tons of methane are released annually by oil and gas production facilities: wells, processing, compressors, transmission and storage. Methane, the principal component of natural gas, is 34 times more powerful than carbon dioxide at trapping heat. In fact, reducing coal use from the present 74% to 40% of the power supply by mid-century and substituting natural gas would reduce global warming emissions by only 3% (from 2,036 to 1,972 million metric tons, see graph).

Global Warming Emissions are Unchanged by Substituting Natural Gas for Coal<sup>29</sup>

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<sup>28</sup><http://www.utne.com/~media/Images/UTR/Editorial/Articles/Magazine%20Articles/2015/Fall/Gas%20Compressors%20and%20Nose%20Bleeds/Bloody-Nose%20jpg.jpg>

<sup>29</sup> Source: Union of Concerned Scientists. Emissions are annual greenhouse gases in millions of metric tons.



Natural gas combustion releases a wide variety of hazardous air pollutants: benzene, toluene, dichlorobenzene, arsenic, cadmium, chromium and formaldehyde. In fact, some of these pollutants are emitted in greater amounts from natural gas than coal. For example, for a given amount of electricity, emissions of formaldehyde from natural gas are 800% higher than from coal. Formaldehyde is a nearly colorless gas with a pungent, irritating odor even at very low concentrations. It is a probable human carcinogen. It is an eye, skin, and respiratory tract irritant. It can produce narrowing of the bronchi and accumulation of fluid in the lungs. Compressor stations release huge amounts of this hazardous air pollutant. The negative effects of airborne formaldehyde occur at very low levels. Exposure to as little as 0.1 to 2 parts per million causes irritation of the eyes, nose and throat. At 5 to 10 ppm, people experience cough, tightness of the chest and eye damage. At 20 ppm breathing becomes difficult, at 30 ppm there is severe injury to the lungs and 100 ppm is immediately dangerous to life.

Children are more susceptible to the respiratory effects of formaldehyde than adults.

It is obvious that we must protect the health and well-being of our children. As you know, the EPA has established guidelines in its Final Rule regarding Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks and concluded that “the agency has evaluated the environmental health and welfare effects of climate change on children. CO<sub>2</sub> is a potent GHG that contributes to climate change and is emitted in significant quantities by fossil fuel-fired power plants. The EPA believes that the CO<sub>2</sub> emission reductions resulting from implementation of these final guidelines, as well as substantial ozone and PM<sub>2.5</sub> emission reductions as a cobenefit, will further improve children’s health.”<sup>30</sup>

In order to take into account all of the substantial risks to the health and safety of our children, we must include the evidence that natural gas and the risks associated with the gathering, processing and transportation of natural gas have significantly harmful effects.

### **Environmental Justice**

Guidance for enforcement of the National Environmental Policy Act states, “When a disproportionately high and adverse human health or environmental effect on a low-income population, minority population, or Indian tribe has been identified, agencies should analyze how environmental and health effects are distributed within the affected community....This type of data should be analyzed in light of any additional qualitative or quantitative information gathered through the public participation process.”<sup>31</sup>

According to The Department of Transportation’s (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA), there are three fundamental environmental justice principles:<sup>32</sup>

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<sup>30</sup> Pg. 1435: <http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule.pdf>

<sup>31</sup> Council on Environmental Quality. “*Environmental Justice Guidance under the National Environmental Policy Act.*” Environmental Protection Agency. 1997. Accessed May 31, 2015.

[http://www.epa.gov/oecaerth/environmentaljustice/resources/policy/ej\\_guidance\\_nepa\\_ceq1297.pdf](http://www.epa.gov/oecaerth/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf)

<sup>32</sup> <http://www.phmsa.dot.gov/org/civilrights/EnvironmentalJustice>

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

According to the DEIS, it is stated that “There is no evidence that the projects would cause significant adverse health or environmental harm to any community with a disproportionate number of minorities, low income, or other vulnerable populations.” Note that minorities is misspelled (minorities); is this the way FERC communicates a warning for minorities in the path of the proposed Mountain Valley Pipeline?

### **Elderly**

From the DEIS: “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.” Many elderly in Franklin County have not had the ability to physically be present when surveyors and other pipeline representatives show up on their private property. There is a sense of defeat and inability to protect and preserve what is rightfully theirs. The proposed Mountain Valley Pipeline Project stands in direct violation to environmental justice standards.

BREDL’s asserts that Presidential Executive Order 12898 makes it clear that all federal agencies must adhere to environmental justice standards by identifying and addressing disproportionately high and adverse human health or environmental effects of its actions on minority populations and low-income



populations. It is our understanding that the FERC is “an independent government agency that is officially organized as part of the Department of Energy.”<sup>33</sup>

Given that the FERC is an extension of the Department of Energy, which is a federal agency, FERC should be mandated to comply with the same standards as any other federal agency. It must fall upon the DOE to insure that the FERC address these social and environmental injustices perpetuated by the proposed route of the Mountain Valley Pipeline Project.

### **Terrorism and Pipelines**

In April of 2016, Paul W. Parformak, a specialist in Energy and Infrastructure Policy, presented before the Committee on Homeland Security, the Subcommittee on Transportation Security, and the U.S. House of Representatives. In his introduction he states: “Nearly three million miles of pipeline transporting natural gas, oil, and other hazardous liquids crisscross the United States. While an efficient and comparatively safe means of transport, these pipelines carry materials with the potential to cause public injury, destruction of property, and environmental damage. The nation’s pipeline network is also widespread, running alternately through remote and densely populated regions. Pipelines are operated by increasingly sophisticated computer systems which manage their product flows and provide continuous information on their status. Due to their scale, physical exposure, and reliance on computer controls, pipelines are vulnerable to accidents, operating errors, and malicious attacks.”<sup>34</sup>

In an earlier report (January 2013), Parformak shares documented terrorist attacks on pipeline infrastructure in other countries,: “In addition to their vulnerability to accidents, pipelines may also be intentionally damaged by vandals and terrorists. Pipelines may also be vulnerable to “cyber-attacks” on

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<sup>33</sup> Federal Department of Energy. Accessed at <http://www.ferc.gov/students/whatisferc.asp> on June 9<sup>th</sup>, 2015.

<sup>34</sup> *Pipelines: Securing the Veins of the American Economy* (<http://docs.house.gov/meetings/HM/HM07/20160419/104773/HHRG-114-HM07-Bio-ParfomakP-20160419.pdf>)

supervisory control and data acquisition (SCADA) systems or attacks on electricity grids and communications networks. Oil and gas pipelines, globally, have been a favored target of terrorists, militant groups, and organized crime. In Colombia, for example, rebels have bombed the Caño Limón oil pipeline and other pipelines over 950 times since 1993. In 1996, London police foiled a plot by the Irish Republican Army to bomb gas pipelines and other utilities across the city. Militants in Nigeria have repeatedly attacked pipelines and related facilities, including the simultaneous bombing of three oil pipelines in May 2007. A Mexican rebel group similarly detonated bombs along Mexican oil and natural gas pipelines in July and September 2007. In June 2007, the U.S. Department of Justice arrested members of a terrorist group planning to attack jet fuel pipelines and storage tanks at the John F. Kennedy (JFK) International Airport in New York. Natural gas pipelines in British Columbia, Canada, were bombed six times between October 2008 and July 2009 by unknown perpetrators. In 2009, the *Washington Post* reported that over \$1 billion of crude oil had been stolen directly from Mexican pipelines by organized criminals and drug cartels.<sup>35</sup>

The Transportation Security Administration (TSA) is responsible for overseeing pipelines secure from terrorist attacks, but the majority of funding is towards aviation security. Parformak reiterates the need for protection and safety in a Congressional Research report, *Pipeline Cybersecurity: Federal Policy*: “Although the TSA believes a voluntary approach to pipeline security is most effective, Canadian pipeline regulators have come to a different conclusion. In 2010 the National Energy Board (NEB) of Canada mandated security regulations for jurisdictional Canadian petroleum and natural gas pipelines, some of which are cross-border pipelines entering the United States. Many companies operate pipelines in both countries. In announcing these new regulations, the board stated that it had considered adopting the existing cybersecurity standards “as guidance” rather than an enforceable standard, but “taking into consideration the critical importance of energy infrastructure protection,” the board decided to adopt the

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<sup>35</sup> *Keeping America's Pipelines Safe and Secure: Key Issues for Congress* ([www.fas.org/sgp/crs/homesec/R41536.pdf](http://www.fas.org/sgp/crs/homesec/R41536.pdf))

standard into the regulations.<sup>71</sup> Establishing pipeline security regulations in Canada is not completely analogous to doing so in the United States as the Canadian pipeline system is much smaller and operated by far fewer companies than the U.S. system. Nonetheless, Canada's choice to regulate pipeline security may raise questions as to why the United States has not."<sup>36</sup>

And yet FERC's DEIS report gives a false sense of security and that money outweighs the safety of American people: "Despite the ongoing potential for terrorist acts along any of the nation's natural gas infrastructure, the continuing need for the construction of these facilities is not eliminated. Given the continued need for natural gas conveyance and the unpredictable nature of terrorist attacks, the efforts of the Commission, the DOT, and the Office of Homeland Security to continually improve pipeline safety would minimize the risk of terrorist sabotage of the projects to the maximum extent practical, while still meeting the nation's natural gas needs. Moreover, the unpredictable possibility of such acts does not support a finding that these particular projects should not be constructed."

### **NEPA – Section 106/Historic Preservation Comments**

Below we discuss deficiencies in the DEIS' documentation of the MVP's impacts to two historic districts and one proposed historic district located in Roanoke County, VA. These districts include: (1) the Blue Ridge Parkway Historic District, (2) the Coles-Terry Rural Historic District, and (3) the proposed Bent Mountain Rural Historic District. The DEIS's analysis of the MVP's impacts to these significant historic resources is wholly inadequate to inform not only the decision maker, but also the public. The DEIS fails not only to discuss the MVP's impacts to landscape and topographic features of the three individual rural historic districts, but also the cumulative impacts to all three districts, which are all located within a 20-square-mile region of the Blue Ridge highlands of Virginia. The analysis of impacts to the districts is so deficient that FERC must either reject the MVP application or require a supplemental analysis.

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<sup>36</sup> *Pipeline Cybersecurity: Federal Policy* (<http://nsarchive.gwu.edu/NSAEBB/NSAEBB424/docs/Cyber-076.pdf>)

Prior to beginning our discussion of the DEIS's problematic treatment of the concept of “integrity,” we offer the following definition of the term.

***What is “integrity”?***

The idea of integrity is an essential one in considering impacts that will be imposed upon the rural historic districts of Roanoke County by the MVP. With respect to our repeated use of the term throughout this document, we offer the following as definition.

The term “integrity” is defined in the National Park Service publication titled, Guidelines for Evaluating and Documenting Rural Historic Landscapes, U.S. Department of the Interior, National Park Service, Cultural Resources, 1999. The guidelines define integrity to mean “the composite effect of seven qualities: location, design, setting, materials, workmanship, feeling, and association.” The guidelines emphasize the importance of historic vistas, vegetation, and land use to maintaining historic integrity, saying, “Historic integrity requires that the various characteristics that shaped the land during the historic period be present today in much the same way they were historically. . . . The general character and feeling of the historic period . . . must be retained for eligibility. . . . Historical vistas that have remained open often provide a general vantage point for evaluating change. . . . Vegetation and land use are important to an area historically significant for grazing and cropping . . . .”

The guidelines continue to describe elements that contribute to integrity, emphasizing the importance of water bodies, mountains, and rock formations: “Large-scale features, such as bodies of water, mountains, rock formations, and woodlands, have a very strong impact on the integrity of setting . . . Alterations dating from the historic period add to integrity of feeling while later ones do not. . . . New technology, practices, and construction . . . often alter a property's ability to reflect historic associations.”

The guidelines list changes to historic landscapes that can threaten historic integrity, including:

1. changes in land use and management that alter vegetation
2. changes in land use that flatten the contours of land
3. introduction of non-historic land uses (public utilities, industrial development)
4. loss of vegetation related to significant land uses.

The MVP, if constructed, would introduce changes 1 through 4, above, to Roanoke County's rural historic districts, and will drastically alter the physical configuration of bodies of water, mountains, rock formations, and woodlands within the districts, resulting in a profound diminution of integrity, as defined above.

### **BLUE RIDGE PARKWAY HISTORIC DISTRICT**

The proposed MVP crossing of the Blue Ridge Parkway Historic District occurs at MVP Milepost 244.2 and at Blue Ridge Parkway Milepost 136. Below we describe the Blue Ridge Parkway Historic District, provide an overview of its history, discuss values imposed by its landscape and topographic features, and discuss the DEIS's failure to consider the MVP's impacts to the integrity of the district.

#### ***Description of the Blue Ridge Parkway Historic District***

As introductory description of the Blue Ridge Parkway, we quote from Richard Quin, *Blue Ridge Parkway, HAER REPORT No. NC-42* (Historic American Engineering Record, National Park Service, U.S. Department of the Interior, 1997), which begins:

“Blue Ridge Parkway was the first long-distance rural parkway developed by the National Park Service. Its designers adapted parkway development strategies originating in suburban commuter routes and metropolitan park systems and expanded them to a regional scale, creating a scenic motorway linking two of the most prominent eastern national parks. The parkway was conceived as a multiple-purpose corridor that would fulfill a variety of social, recreational, environmental,

and pragmatic functions. In addition to preserving and showcasing attractive natural scenery, the parkway was designed to display the traditional cultural landscapes of the southern Appalachian highlands, providing visitors with an idealized vision of America's rural heritage. At frequent intervals the parkway borders expand to encompass smaller parks, recreational areas, and historic sites, many of which include picnic areas and/or overnight accommodations. Blue Ridge Parkway's attractive natural and cultural features, its diverse recreational attractions, and its relatively accessible East Coast location have long made it the most heavily visited unit of the National Park System.”

Quin continues his description of the Parkway:

“The Blue Ridge Parkway is many things. It is the longest road planned as a single unit in the United States. It is an elongated park, protecting significant mountain landscapes far beyond the shoulders of the road itself. It is a series of nature preserves replete with high mountain fastnesses, splendid natural gardens of flowering mountain plants, waterfalls and water gaps, deep forests and upland meadows. It is a collection of panoramic views extending into far-off states, making it in one sense the "largest park in the world," as the boundaries of its limited right-of-way are rarely apparent and miles of the adjacent countryside appear to be a part of the protected scene. The parkway is an historic cultural landscape preserving the rough-hewn log cabin of the mountain pioneer, the summer home of a textile magnate, and traces of early industries and transportation networks. It is miles of split-rail fence, moss on a wood shingle roof, broomcorn and flax in a pioneer garden. It is the fleeting glimpse of a deer, a wild turkey or a red fox, or for those who prefer their animal life less wild, a herd of cows lolling in a pasture or horses romping in a field. It is a chain of recreational areas, offering motorists a place to picnic in the woods, a place to sleep overnight in a campground or a charming lodge, to refuel their vehicles, enjoy a meal, or purchase a piece of mountaineer handiwork. It is the product of a series of major public



works projects that helped the Appalachian region climb out the depths of the Great Depression. The Blue Ridge Parkway is all these things and much more, therefore it should come as no surprise that this is the most heavily visited unit of the National Park Service.

The Blue Ridge Parkway provides frequent expansive views across a changing countryside, mixing scenes of untouched natural beauty with landscapes reshaped by human handiwork. In addition to featuring some of the finest rural and mountain scenery in the east, the parkway presents motorists with reminders of the culture and history of the Southern Highlands. Traveling the parkway was intended to be a "ride-a-while, stop-a-while" experience. At various stops and parks along the route, old log homes, a rustic mill, outbuildings and rail fences reflect the agricultural heritage of the mountain residents. A reconstructed segment of a logging railway, a restored lock from an antebellum canal, and sites of old mines and other works tell the story of early industries. Farm lands kept in agricultural production through an innovative land lease program maintain the "picture" of the rural landscape. The design and construction of such a road was no small feat, but the culmination of many efforts over long years.”

A major theme in the development of the Blue Ridge Parkway is that it traverses an enormous variety of topographic and landscape features, and that the architects and engineers of the Parkway employed great care and sensitivity in designing the road so as to heighten the traveler's appreciation of the astonishing variety of landscapes and topography contributing to the Southern highlands' subtle and profound beauty. Unlike the Skyline Drive, the Parkway does not follow ridgelines exclusively. Rather, the Parkway's creators deliberately and painstakingly routed the roadway in such a fashion as to integrate it with lowland features such as farm fields, river bottoms, and flatlands, juxtaposed harmoniously with mountain ridges and escarpments found at the higher elevations.

This concept of engineering to enhance the traveler's appreciation of the variety and subtlety of the landscapes crossed by the Blue Ridge Parkway is nowhere expressed as eloquently and authoritatively as in S. Herbert Evison's 1959 interview with Blue Ridge Parkway Resident Landscape Architect, Stanley W. Abbott. Said Abbott:

“A Parkway like Blue Ridge has but one reason for existence, which is to please by revealing the charm and interest of the native American countryside. To accomplish that end requires the finest exercise of the several planning arts. Your composition is one of fields and fences, lakes and streams, and hills and valleys; and your problem is that of placing your roadway in such a position as best to reveal them. It is as if you were going with your camera through the countryside you wanted to photograph to greatest advantage--how long would you look for a spot from which to take your picture. So, the all-important factor was: Where is the road to be located? And you determine upon your location by these very large compositional considerations, balanced by other considerations, lesser but important, such as the opportunity for intimate glimpses into the deep woods and into the flora of those woods. This affords contrast to the heroic panorama--a stretch here along the crest, there on mountainside, along a valley stream, through the woods, along the edge of a meadow, passing a mountain farmstead. There were the ingredients of variety and charm.

Then, having selected a route for the road, you get into the business of designing a road that fits the topography as sympathetically as it can be fit--the engineer, the landscape architect, the architect working together.

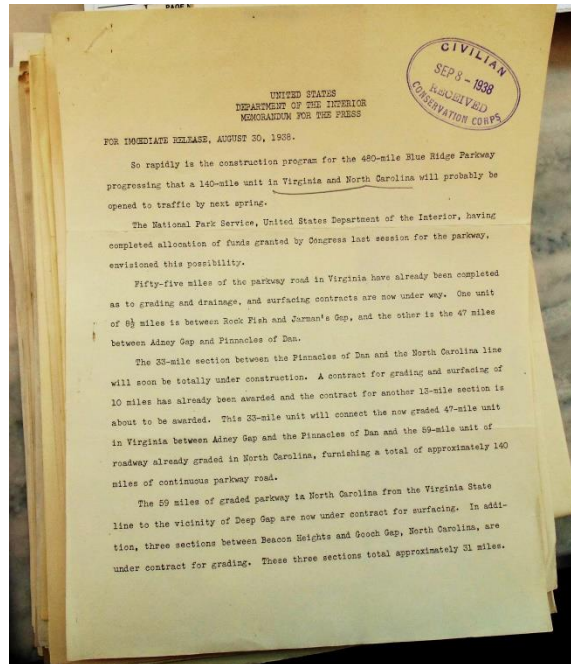
That takes a—well, it's almost a form of sculpture. It takes a third-dimensional mind and insight into what is the main contour of this particular land form, whether one broad curve or, sometimes--since nature doesn't always deplore a straight line—there are places where the road

wanted to straighten out for a while because the conformation of the land straightened out; or there had been a straight cut farm field against a straight edge of woods.”

As inheritors of the remarkable “sculpture” that is the Blue Ridge Parkway as described by Abbott, it is incumbent on 21<sup>st</sup> century stakeholders to maintain the subtle and exquisite conformations of the Parkway as important relics of the cultural, economic, aesthetic, and conservation milieu of the middle-to-late 20th century period during which the Parkway was designed, constructed, and enjoyed by motorists.

***Special significance of Adney Gap section of the Blue Ridge Parkway***

The Blue Ridge Parkway's Adney Gap, through which the proposed MVP has been routed, has special cultural and historic significance. In an August 30, 1938 press release (*below*), The U.S. Department of the Interior announced the anticipated opening to traffic of the first segments of the Blue Ridge Parkway. The document says, “Fifty-five miles of the parkway road in Virginia have already been completed as to grading and drainage, and surfacing contracts are now under way. One unit of 8-1/2 miles is between Rock Fish and Jarman's Gap, and the other is the 47 miles between Adney Gap and Pinnacles of Dan.” This press release, a copy of which was obtained from the National Archives in College Park, MD on April 29, 2016, reveals that Adney Gap was among the first portions of the Blue Ridge Parkway to be completed. This historical fact increases the significance of Adney Gap to the historic narrative of the Parkway.



Full size image available here: <https://app.box.com/s/nffpc4yjm42fcjyuazjldde7bdk9tyd>

The historical significance of Adney Gap is not limited to that conferred by its role in the development of the Blue Ridge Parkway however, but also extends back to the mid-19<sup>th</sup> century. Adney Gap is part of the 20,000 acre tract of land that was deeded to General Andrew Lewis by General George Washington as a reward for Andrew's service in Indian wars and the Revolutionary War. 6,000 to 8,000 acres of the Andrew Lewis tract were purchased from Lewis's heirs by brothers, Tazewell and Morefield Price. According to Deedie Kagey's history of Roanoke County titled *When Past is Prologue* (Roanoke County Sesquicentennial Committee, 1988), Tazewell Price began cultivating his land in 1860. The house that Tazewell Price built in 1871, known as "Les Landes," is located one-half mile north of the Adney Gap entrance to the Blue Ridge Parkway off U.S. 221 and is eligible for listing on the National Register of Historic Places. "Les Landes" and the structure's beautiful rural historic setting near Adney Gap contribute to the historical integrity and scenic values of the Blue Ridge Parkway.

***Blue Ridge Parkway's Designation as historic district***

The Blue Ridge Parkway was listed on the National Register of Historic Places in 2008 under the name, “Blue Ridge Parkway Historic District.”

***DEIS failure to consider impacts to historic integrity of Blue Ridge Parkway District***

The following is a quotation from the DEIS, p. 4-349:

The NPS has not yet provided comments on Mountain Valley’s historic architectural survey reports covering Roanoke and Franklin Counties. We cannot make our official determinations of effect for the Blue Ridge Parkway Historic District until we receive comments from the NPS. However, in our preliminary opinion it is unlikely that the MVP would have any adverse effects on the district. Except for the roadway itself, all other elements of the district in the indirect APE (including sites 80-5161-188, 80-5161-34, 33-5287, and 80-5161-342) would be outside the direct APE, outside the construction right-of-way, and would be avoided. The bridge over Callaway Road is 902 feet from the proposed pipeline; the barn is 1,127 feet away; the Shaver Cemetery is about 1,300 feet away; and the Retail Store is about 1,300 feet away. Mountain Valley intends to bore under the parkway to avoid impacting it. In the vicinity of the crossing, which is mostly pasture, few trees would need to be removed, reducing visual impacts (see our visual analysis of the BRP crossing in section 4.8). The pipeline would be buried underground, and after installation the right-of-way would be restored and revegetated. Operation of the pipeline should not have visual or audible effects that may alter the character or setting of the Blue Ridge Parkway Historic District. Mountain Valley filed with the FERC a site-specific crossing plan for the BRP on April 21, 2016; we are still waiting for the NPS to comment on that plan.”

The position of the DEIS, as cited above, is that the historic significance of the Blue Ridge Parkway lies principally in the manmade structures thereon, and that, since the MVP avoids manmade structures on the

Blue Ridge Parkway, “it is unlikely that the MVP would have any adverse effects on the district.” The DEIS also states that the pipeline right-of-way would be “restored and revegetated” after installation, and that this so-called restoration would return the Blue Ridge Parkway to its original condition, thus prompting the authors of the DEIS to claim that, “Operation of the pipeline should not have visual . . . effects that may alter the character or setting of the Blue Ridge Parkway Historic District.”

We are deeply concerned that the construction of the MVP across Adney Gap is likely to result in permanent, not temporary, visual effects, and would impair the historic and cultural values of the Blue Ridge Parkway Historic District. The MVP will impose a flat stripe of highly condensed soil – called a “grassy highway” by one resident of Bent Mountain, VA – across the historic farm fields of Adney Gap, resulting in an unavoidable interruption of the visitor's experience of the Parkway's historic/scenic attributes. According to Quinn's *Blue Ridge Parkway* (cited above), farm lands within the Parkway that have been kept in production through the Parkway's innovative agricultural lease program maintain the “picture” of the rural landscape. The Adney Gap farm fields have been actively enrolled in the Blue Ridge Parkway Agricultural Lease Program since 1979. By enrolling Adney Gap in this program, the Blue Ridge Parkway has ensured that the traditional farming practices begun there during the mid-19<sup>th</sup> century will continue in the 21<sup>st</sup> century. The historic, breathtakingly beautiful, and locally cherished fields at Adney Gap do in fact offer a scenic reminder of our region's heritage of agriculture and rural life. The excavation that would result from construction of the MVP, along with the use of heavy machinery, disruption of soil strata, severe compaction of soil on the pipeline right-of-way, and imposition of non-indigenous grass species as ground cover, virtually guarantee that the site will never return to its former condition. The MVP will permanently impose the footprint of 21<sup>st</sup> century industrialization on the 19<sup>th</sup> century landscape of Adney Gap. This is an inappropriate use of the Blue Ridge Parkway and should be avoided in the interest of safekeeping this national treasure for the enjoyment and edification of many future generations of Americans.



To support our assertion that the MVP's footprint on the Adney Gap farm fields will be permanent, not temporary, we offer photographs of the 50-year-old Transco Pipeline in Pittsylvania County, Virginia. As shown in the photos, the ground within the pipeline right-of-way has a different color, texture, and appearance from the adjacent lands and, in many places, the sod is not well secured and is slipping away. The grass cover is sparse in many areas, resulting in the unmistakable appearance of a “disturbed” landscape. This is after 50 years – which begs the question – how long must one wait for the Transco pipeline to be restored through natural processes to its original appearance? We are deeply concerned that a similar permanent disruption to the rural landscape will occur as a result of construction of the MVP, in spite of claims in the DEIS that MVP's program of revegetation will eliminate any visual reminders that the pipeline had ever been built across Adney Gap. Please see photos of the Transco Pipeline ROW in Pittsylvania County, Virginia, taken in May, 2016, below (full size downloads available here: <https://app.box.com/s/nffpc4yjm42fcjyuazjldde7bdk9tyd>).





Also see below photo of the Stonewall Gathering Pipeline in West Virginia, taken one year after construction was completed. The slope is failing and the grass that had been planted on the pipeline right-of-way is sliding down the mountain.



## **COLES-TERRY RURAL HISTORIC DISTRICT**

The proposed MVP crossing of the Coles-Terry Rural Historic District occurs between MVP Mileposts 242 and 243. In the narrative, below, we describe the Coles-Terry Rural Historic District, provide an

overview of its history, describe its historic designation, and discuss values imposed by its landscape and topographic features, and how the MVP's impacts to these values are inadequately chronicled in the DEIS.

### ***Description of Coles-Terry Rural Historic District***

This rural, mostly forested district encompasses about 2,500 acres on the eastern slope of Poor Mountain, starting 4/10 mile east of the intersection of Poor Mountain Road and Honeysuckle Road in Bent Mountain, Roanoke County, extending 3.25 miles southwest along the crest of Poor Mountain to the Montgomery County line. It includes the headwaters of Laurel Creek and Bottom Creek where they emerge at the foot of Poor Mountain, and old apple orchards. The district contains a network of Civilian Conservation Corps forest roads and paths connecting to a fire tower at the highest point of Poor Mountain at 3,926 feet elevation. Prehistoric archaeological sites have been found along the creeks.

As in other historic areas of the Bent Mountain/Poor Mountain community, much of the historic relevance of the Coles-Terry Rural Historic District is derived from the fact that all the land in the district was part of the enormous tract given to General Andrew Lewis by General George Washington some time between 1770 and 1780. This tract was estimated by Bent Mountain historian, Grace Fortescue Terry, in her 1957 history titled "Bent Mountain," to be "some hundred thousands of acres." As General Lewis' heirs gradually sold off and subdivided the land, tracts of this land totalling about 17,000 acres were purchased by the Coles and Terry families. These tracts form the basis of today's 2,500 acre historic district.

Thus we can see that the historic significance of Adney Gap on the Blue Ridge Parkway is integrally linked to that of the Coles-Terry Rural Historic District through the fact that both districts were once part of the tract given to Andrew Lewis by George Washington in the 18<sup>th</sup> century.



### *Headwaters of the Roanoke River contribute to historic significance*

The MVP will cross the headwaters of the South Fork of the Roanoke River at Bottom Creek, at a location within the Coles-Terry Rural Historic District. The headwaters formed by Bottom Creek and Laurel Creek are written about in histories of Bent Mountain. One such history was written by Grace Fortescue Terry. Her manuscript, cited above, was issued in typewritten format in 1957 and later revised and published in an article titled “Recollections of Bent Mountain, Virginia” in the Journal of the Roanoke Historical Society, Winter, 1967. Said Terry's history of Bent Mountain:

Following the beginnings of Roanoke River, it is indeed so circuitous that when it passes Shawsville and makes a sharp right turn, it seems to be “aiming” to return to the place of its birth on the east side of Poore Mountain, where several deep hollows – clefts in the range – cool little springs appear among mossed rocks and fern fronds, and in springtime, columbines, windflowers and etherial violets and bright cerise of Adder's tongue. Down they wander, collecting companions on the way, merging with more and more spring branches. Rivulets, with whispering infant voices, turning slowly northward, grow and mature into “Bottom's Creek”, and its cascading becomes a staccato chorus, that hurries to join forces with another liquid traveller from Bent Mountain's Eastern border, for an interlude of tranquility, traversing swamps and meadows, until encountering a blockage of rocks and a sharp obstruction of hills, it gathers force and rises in mimic rage to pour into a gorge where it was later harnessed to give power to operate the first “Bent Mill”, and from that useful development comes its present name, “Mill Creek”.

Returning to Street's Entry, we find other springs beginning in a higher cut or bowl of rocks, seeking companionship below in the seaward adventuring through twilight shadows of hemlock, their gothic spires pointing heavenward – their roots anchored in mosses and ferns, and shaded by barricades of Rhododendron and Laurel – thus, “Laurel Creek” emerges and plunges in rapids downward to join Bottom and Mill Creek. Then, spectacularly, dramatically, it hurls itself

hundreds of feet, fiercely through a great rock-walled gorge, several miles of tumult, to presently grow calm and become a placid river, passing “Hot” or Crockett Springs, on past Allegheny Springs to Shawsville. There it sharply reverses its course and almost completes a circle to pass Big Spring and Elliston, as Roanoke River, at the foot of Poore Mountain, where its infantile venture began. What an odyssey to follow it to its terminus in Albemarle Sound! An epic of the soul of many waters that fulfill their migratory destiny and final union with the “Ocean of Eternity”.

Another history of Poor Mountain was written by Lee Pendleton in 1976 while he was a patient at the Salem Veterans Affairs Medical Center in Salem, VA. Here is an excerpt of Pendleton's description of a recreational expedition taken by a small group of local youth to the top of Poor Mountain, organized by an individual named “Daddy Mack”. The group were riding mules and on foot. Pendleton describes what they saw, including the springs of Laurel Creek and the upland portion of Bottom Creek, which are all inside the Coles-Terry Rural Historic District:

He [Mr. Barnett] showed them the spring gushing out of the top of the mountain, freestone, head of Laurel Creek. Barnett had fenced in the spring, but Coles Terry who had as much land as Barnett on the other side, sued Barnett and both sides had surveys made (have seen Barnett's map), but before it came to trial, Barnett died with cancer and told his boys to drop the suit. Its a wonderful thing how this water gushes up on top of the mountain. It was a little early for lunch, but they were hungry and water handy, so they took the mules out and gave them water and corn and let them eat hay out of the wagon. The mules securely tied, they walked out to the west where there is a fire tower now. A little farther and they could have seen Bottom Creek plunging several hundred feet down the mountain near the present girls' camp. . . .

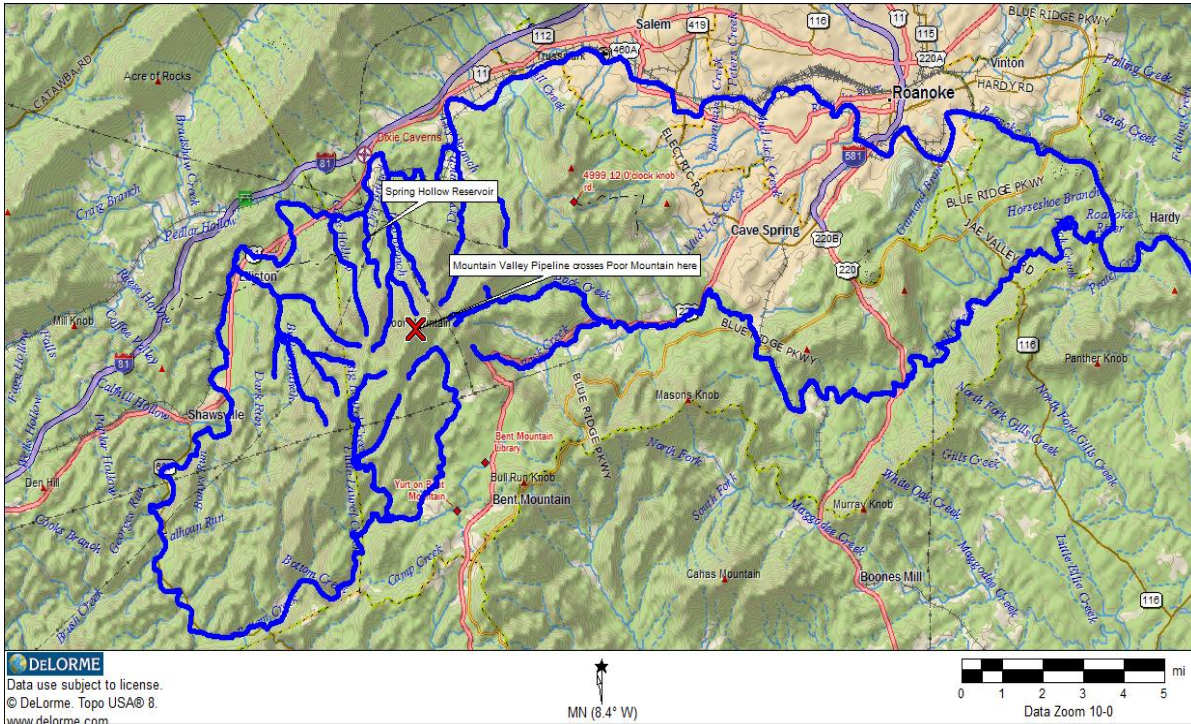


Yet another history, a book titled *History of Roanoke County* (George S. Jack, 1912), includes in its chapter on Bent Mountain the following description:

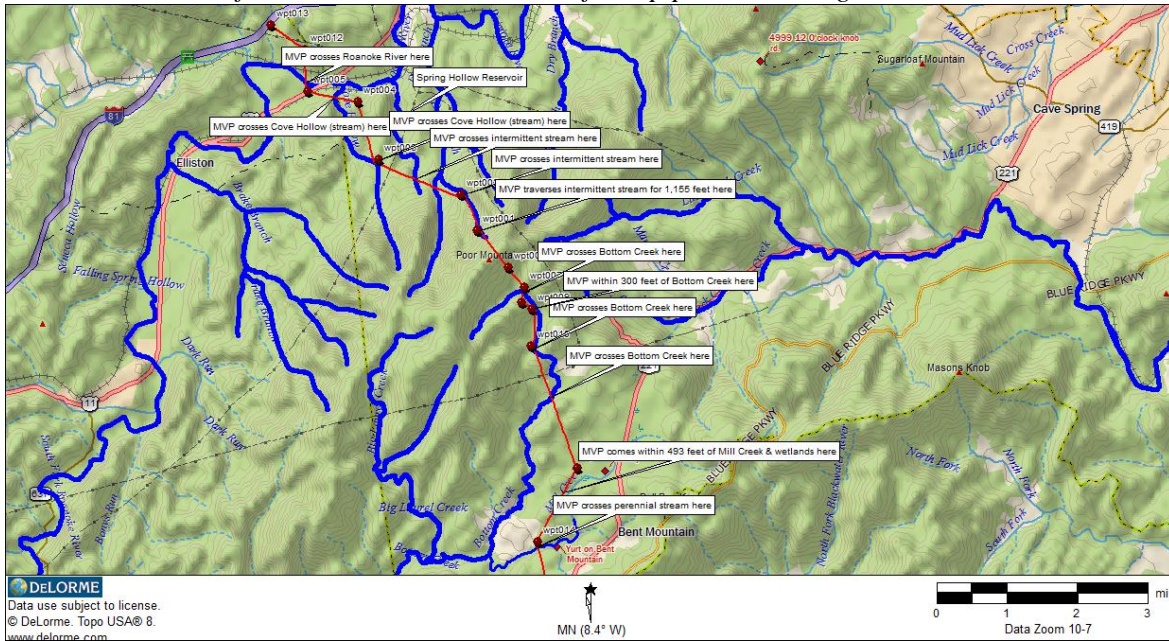
After ascending the mountain a beautiful plateau, practically level, stretches out for miles. The land is well watered by streams and branches flowing from innumerable springs of free-stone water, almost ice cold. Situated some two thousand seven hundred feet above sea level, there is always a delightful breeze in the hottest summer weather and blankets are in demand for sleeping purposes at all seasons of the year.

The headwaters of the South Fork of the Roanoke River can be seen, in the excerpts of histories of Bent and Poor Mountain quoted above, to play an integral role in the history of Poor Mountain and the integrity of the Coles-Terry Rural Historic District. The MVP crosses through the area of springs and first order streams described in the Terry narrative, and crosses Bottom Creek four times. Construction of the MVP through the exquisitely pristine, irreplaceable headwaters of the Roanoke River would undermine the very bedrock of Roanoke County and southwestern Virginia's cherished historic landscapes.

In the below images, we have provided two maps of the matrix of springs and headwater that would be crossed by the MVP inside the bounds of the Coles-Terry Rural Historic District. We have also provided two photographs of construction sites of the Stonewall Gathering Pipeline underway in West Virginia, taken in July, 2015. These maps and photos provide evidence that if allowed to proceed, pipeline construction inside the Coles-Terry Rural Historic District would decimate the aquatic features of Poor Mountain cherished among historians and among residents of Bent Mountain, Poor Mountain, Roanoke County, the Commonwealth of Virginia, and all who have visited this astonishingly beautiful region.



**Origins of the South Fork of the Roanoke River** – This map illustrates the grandeur and complexity of the aquifer that we call the South Fork of the Roanoke River. The symbol “X” shows the place where the Mountain Valley Pipeline crosses the crest of Poor Mountain. The birthplace of the South Fork of the Roanoke River at the headwaters of Bottom Creek is due south of this pipeline crossing.



**The Mountain Valley Pipeline crosses mapped Waters of the United States 13 times near the origin of the South Fork of the Roanoke River.** How many unmapped, unnamed tributaries and streams that do not appear on a topographic map are crossed by the pipeline? The headwaters of Bottom Creek, a Virginia Tier III stream used for recreational purposes, home to wild trout and endangered aquatic species, and the point of origin of the South Fork of the Roanoke River, are crossed at least 9 times. Its tributary, Mill Creek, is crossed at least 14 times. (source: Mountain Valley Pipeline Resource Report 2, Appendix 2-A, Waterbody Crossing Tables. October, 2015)





*Stream crossing at Stonewall Gathering Pipeline construction site on Copley Rd., about 2 miles west of I-79 in central Lewis County, WV*



*Stream crossing at Stonewall Gathering Pipeline construction site on Elk Lick Rd., 6.25 miles west of I-79 in northern Lewis County, WV*

***District's approval by Virginia Department of Historic Resources***

The Coles-Terry Rural Historic District was reviewed by the Virginia Department of Historic Resources' Evaluation Team on August 15, 2016. The team found that the property appears to meet the National Register of Historic Places criteria for eligibility. The Virginia Department of Historic Resources State Review Board concurred with the Evaluation Team's findings on the district's eligibility at their regular meeting on September 15, 2016.

***Mountain Valley Pipeline's acknowledgment of eligibility***

In MVP's June 28, 2016 document titled "Responses to FERC Environmental Information Request #3," MVP stated that it would treat the Coles-Terry Rural Historic District as eligible for the National Register of Historic Places for purposes of Section 106 of the National Historic Preservation Act.

***DEIS failure to consider impacts to historic integrity of Coles-Terry Rural Historic District***

The following is a quotation from the DEIS, p. 4-349:

"The proposed MVP pipeline route would cross the newly identified Coles-Terry Rural Historic District in Roanoke County, Virginia (between MPs 242 and 243), which is potentially eligible for the NRHP. Mountain Valley has provided no information about the Coles-Terry Rural Historic District, so it is unknown if the pipeline would affect resources within this district."

The statement above comprises the only statement within the DEIS on the matter of whether and how the Coles-Terry Rural Historic District would be impacted by the MVP. FERC's use of the phrase, "resources within the district" gives rise to concern that the Commission will restrict its attention to manmade structures within the district, rather than consider the district as a whole, just as we saw in the DEIS' treatment of the Blue Ridge Parkway Historic District. By confining its attention to structures within the district, rather than considering impacts to the district in its entirety, FERC would be missing

opportunities to consider whether the pipeline's permanent imposition of a treeless stripe on the historic landscape would adversely affect the historic integrity of the Coles-Terry Rural Historic District. The failure to consider impacts to landscapes and topographic features of both the Coles-Terry Rural Historic District and the Blue Ridge Parkway Historic District is a serious flaw in the DEIS, and must be corrected in subsequent documentation.

The Section 106 process for the MVP cannot be considered complete prior to the satisfactory assessment of the proposed pipeline's impacts to the Coles-Terry Rural Historic District, and the satisfactory completion of the Section 106 process associated with that assessment.

***Impacts to Coles-Terry Rural Historic District will affect the integrity of the Blue Ridge Parkway Historic District***

The Coles-Terry Rural Historic District, which comprises a 2.4-mile wide expanse of land at the crest and on the east-facing slope of Poor Mountain, is visible from the Poor Mountain Overlook on the Blue Ridge Parkway. The construction of the MVP through the Coles-Terry Rural Historic District will drastically alter the appearance of Poor Mountain as viewed from the Poor Mountain Overlook, as well as from many points on U.S. 221 in Bent Mountain. The imposition of the MVP's treeless vertical “stripe” at the crest and down the eastern slope of Poor Mountain – indelibly demarcating 21<sup>st</sup> century industrialization – will permanently impair the appearance of the mountain as viewed from the Parkway. This incursion will result in further adverse effects to integrity of the Blue Ridge Parkway Historic District.

**PROPOSED BENT MOUNTAIN RURAL HISTORIC DISTRICT**

In March, 2016, MVP issued a document titled, “Responses to FERC Environmental Information Request, Attachment RR4-20e, Phase I Reconnaissance Architectural Survey for the Mountain Valley Pipeline, Roanoke County, VA, VDHR File # 2014 1194, New South Associates Project 4613, Report 2512, March, 2016.” The following is an excerpt from pages i and ii of the report:

“New South has compiled the results of the Phase I architectural reconnaissance survey in five reports organized by county. Roanoke County is contained within this report. This report describes survey results for the APE that covers Roanoke County and a small area within Floyd County. The APE for historic architectural resources includes Roanoke and Floyd counties and is 9.4 miles in length and encompasses 9,167 acres, 8,941 acres in Roanoke County and 226 acres in Floyd County. The historic architecture survey was conducted in May, June, and November 2015. In total, 64 architectural resources were recorded in the online database Virginia Cultural Resources Information System (V-CRIS), 61 resources in Roanoke County and three resources in Floyd County. Thirty-four of these resources were previously recorded and had existing VDHR site identification numbers. Thirty were newly recorded resources, and each was assigned a site identification number by VDHR. Of the 64 resources recorded, 14 . . . were recommended potentially individually eligible for the NRHP and New South recommends Phase II study to determine NRHP eligibility. In addition, New South recommends a Phase II study of the Bent Mountain community to determine its eligibility as a historic district . . . As part of the new Bent Mountain Historic District . . . New South recommends that 42 resources including 10 of the 14 . . . already noted potentially eligible resources and 32 resources recommended not eligible individually . . . undergo Phase II study to determine if they contribute to the proposed Bent Mountain historic district. Three resources . . . have already been listed or determined eligible for listing in the NRHP, and no change is recommended in the NRHP status of these resources. The remaining 14 resources . . . are recommended not eligible for the NRHP, and no further work is recommended under Section 106 of the National Historic Preservation Act of 1966, as amended.”

We are concerned with the use of phrasing in the report quoted above which suggests an approach to assessment of MVP impacts to rural historic districts that focuses exclusively on the MVP's impacts to man-made structures within the districts while failing to consider impacts to landscape and topographic

features and the extent to which these impacts adversely affect the historic integrity of each district. We look forward to receiving the Phase II study containing New South Associates' assessment of eligibility for the proposed Bent Mountain Rural Historic District. We note that the Section 106 process for the MVP will be considered unfinished without: (a) the completion of the Phase II study cited above, (b) the completion of Virginia Department of Historic Resources' determination of the proposed district's eligibility for listing on the National Register of Historic Places, and (c) the satisfactory completion of the Section 106 process subsequent to items (a) and (b).

### **Flora Family– Historic Farm in Franklin County**

The Virginia Department of Historic Resources designated the Flora Farmstead in Franklin County as eligible for the National Registry of Historic Places (NRHP), a farm that is in the direct path of the proposed MVP. DHR ID #033-0389 was specifically referenced in a letter dated August 4, 2016 by Roger Kirchen of the Virginia Department of Historic Resources, Kirchen makes clear stating, “Although VCRIS does not reflect the current status, Flora Farmstead (aka Floradale Farm; DHR ID #033-0389) has already been determined NRHP-eligible by DHR’s National Register Evaluation Committee (April 21, 2016) and State Review Board (June 16, 2016).”

The Flora Farm contains a historic brick home constructed in the early 1800’s as well as a cemetery, a spring and barns.





*Brick Home On Flora Farmstead, site DHR ID #033-0389*



*Brick Home and Old Barn on Flora Farmstead, site DHR ID #033-0389*





*Cemetery on Flora Farmstead, site DHR ID #033-0389*



*View of Brick Home from Cemetery on Flora Farmstead, site DHR ID #033-0389*

## **Archaeological Site in Franklin County**

An archaeological assessment was completed for Dale Angle, a landowner in Franklin County with a vast collection of artifacts from his property. The proposed MVP would bisect the Angle family's land which includes multiple archaeological sites. Tetra Tech performed only a phase one study on the Angle's property. The report below was prepared by the Association for the Study of Archaeological Properties, LLC (ASAP).

### **ARCHAEOLOGICAL ASSESSMENT OF SITE 44FR0240 In Blackwater District of FRANKLIN COUNTY, VIRGINIA**

#### **Introduction**

This report presents the result of an archaeological assessment of site 44FR0240 at the property of Dale Angles in Boones Mill, Franklin County, Virginia. The purpose of this study is to establish the significance and research potential of this site compared to those Paleo-Indian and Archaic site's located at Leesville Lake Pittsylvania County, Virginia. (44PY7, 44PY43 and 44PY152)

Collections and observations made indicated that this site contains an unbroken sequence of occupations spanning the Paleo-Indian and Archaic periods and include a final Late Woodland occupation.

The project area falls within the western portion of the Piedmont physio-graphic provenience. Generally speaking, this province has a rolling topography defined by a dendritic drainage system. Occasionally this landscape is punctuated by prominent ridges or knolls of resistant rock. Elevation in the immediate project vicinity range from a low of about 184 m at the floodplain to about 580 m at the crest of Bent Mountain.

Locally, the geology is dominated by strongly metamorphosed rocks such as schist. Knappable lithic materials are scarce in these formation, but the river has transported cobbles of suitable stone into the area. Quartz and quartzite dominate the siliceous cobbles, but occasional pebbles of chert and jasper are also present. The Piedmont is characterized by red, clayey soils weathered from igneous and metamorphic bedrock. The soil at this site investigated is alluvial in origin, however, and classified as Chenneby loam (USDA Office, Rocky Mount, Virginia). It is describe as a deep soil occurring in nearly level floodplains of large drainages, and it is subject to flooding from late fall to spring.

This site (44FR0240) is located on current agricultural lands. Small beaches exposures are present at low water, and there is great visibility on the uneroded site surface. The constant threat of inundation has prevented any modern construction or improvements. The greatest threats to the site presently are erosion and looting.

The physical setting of this site is impressive as it is consistent with other locations confirmed to have deeply stratified deposits (see Coe 1964). These factors were compelling enough to warrant an investigation to verify the true potential of the Blackwater River sites. Virginia is lacking a carefully excavated record from deposits analogous to those studied by Coe in North Carolina, but this site has the potential to close that gap.

With respect to human-environment relationships, deeply stratified cultural sequences offer the opportunity to examine patterns of cultural change in the context of environmental change. Deep alluvial deposits are conducive to study of depositional process that can be linked to climatic patterns. For example, geomorphologists can document varying rates of sedimentation that reflect stream river dynamics related to precipitation/runoff patterns. Within this sequence, physical and chemical signatures of stable versus unstable surfaces can also be identified. These data are important for formulating more

accurate models of human adaptation in the region, and also for predicting the locations of other deeply stratified sites with early components.

Finally, every effort was made to determine how much of the original site deposits have been lost due to erosion and cultivation. Clearly, significant changes have taken place in the Blackwater River basin with shore line movements. While even small portions of buried Paleo-indian sites may ultimately prove important, their proper interpretation will depend on an appreciation of how representative the surviving portion is. (William and Mary Center for Archaeological Research, William Childress).

### **Environmental Context**

The arrival of humans in this area, and the earliest occupations of sites under study, appears to have coincided with the close of the last ice age or the Pleistocene between 13,000 and 11,000 B.P. This period was characterized by relatively rapid changes in the environment, driven in large measures by the northward retreat of the continental glacier. Although the project area and all of Virginia were unglaciated, the increasing distance from the ice front initiated a distinct “amelioration” of general climate: average temperatures became higher. Sea level rose, stream gradients were altered, and floral communities shifted.

In the Mid-Atlantic in general, one of the more telling impacts of this change was to vegetation, which can be sensitive to even minor changes in temperature and precipitation. Before 13,000 B. P., predating any any confirmed human presence, the dormant floral community was largely boreal in character, akin to what is present today several hundred kilometers farther north. This late Pleistocene forest consisted primarily of boreal conifers such as jack pine and spruce and, at the highest elevations, limited areas of alpine tundra (Delcourt 1985).

By the end of the Pleistocene about 11,000 B.P., the warming climate forced the boreal communities northward or to higher elevations, and they were gradually replace with a forest dominated by mesic

deciduous species such as hornbeam and beech, although oak, hickory, and white pine increase as well. Therefore the forest encountered by the first human groups in the area around this time was probably of this type. The climate warmed further still so that after 8500 B.P., floral communities had assumed a decidedly modern character, with oak-hickory dominated Forest (Joyce 1988-2000).

### **PALEO-INDIAN CULTURE PERIOD 13,000 BC – 8,000 BC**

The first inhabitants of the Southeast came in gradual influx over a long period of centuries; as new waves of migrants entered extreme northwestern North America, pushing down into the western plains, the older inhabitants were gradually pressed outward toward the then uninhabited areas of the continent. The first immigrants traveled in small bands probably one or a few families; they rarely came into contact with other natives, and inbred for centuries. Paleo-Indians lived a nomadic life; ate the meat of large animals they collectively killed; and supplemented their diet with berries, bark, nuts, and fruits in season. They sought convenient and natural habitation sites, as caves or over-hanging rocks; in the Tennessee Valley area, their habitation sites included small knolls near springs, lakes, or streams, and sites at pass approaches to a valley or on slopes.

No human skeletal remains have been found at Paleo-Indian camp sites; there is also an absence of bone tools, which were probably used. The lithic material which remains, indicates that Paleo-Indians produced a variety of tool, including points, scrapers, graters, knives, and choppers; these were struck from natural material at hand such as flint, quartz, and volcanic tuff. Many of the projectile points show remarkable craftsmanship; they are expertly chipped or flaked into shape; they sometimes have concave bases; ground basal edges, to prevent cutting the thongs used in hafting; and central fluting, for blood-letting or ease in hafting. Since men were hunters, they were doubtless responsible for the excellent craftsmanship displayed on the points. Their weapons included spears, stones, and clubs, and late Paleo-Indian probably used the throwing stick, (Atlatl).

Knowledge and use of fire for light, warmth, and the crudest culinary purposes, is believed to have been brought into North America by early migrants from Asia. The Paleo-Indian doubtless had to struggle constantly against the elements of his environment; he probably seldom gathered anything to store,, and wandered frequently in search of food.

The following inventory and photos are of artifacts recovered by the landowner over a period of years as the property was being cultivated for agricultural use. The wide variety of items include the Paleo period, the Archaic period and into the woodland-contact period. This will be broken down into the three periods for better identification.

#### **ARCHAIC-INDIAN CULTURE PERIOD 9,000 – 6,000 BP**

As centuries passed and primitives gained more knowledge of their surroundings, a slow progression of changes in their economic habits and habitation sites resulted. To supplement the food supply, they learned to gather mussels from the river shoals and bivalves from the flats of bays and coastal areas. These shells were discarded in gradually mounting heaps along the banks of rivers, bays, and coast. Upon these rising heaps of shells natives built temporary huts of poles, hide, and brush; they dug fire pits, lined them with large river pebbles, dumped in bivalves and boiled them over the hot stones and coals; they probably heated stones and dropped them into stone, wooden, or leather containers to heat food. The many broken river pebbles may have resulted from this practice. In outdoor kitchens or temporary huts Archaic people probably stored small quantities of roots, bark, berries, nus, and dried meat.

A distinctive feature of the Archaic period was the occurrence of “flint workshops.” The flint workshops were covered chips, spalls, cores, broken points, and rejects. Hammerstones and evidence of percussion chipping were found. In addition to chipped points, the Archaic natives developed a variety of other chipped tools, including drills, scrapers, knives, and celts.

Bone and antler tools and ornaments frequently occur at Archaic sites. These include awls, bodkins, needles, drifts, flakers, projectile points, fishhooks, prickers (used by basket makers), shaft straighteners, animal jaw scrapers, pins, and combs; the Archaic craftsman decorated some of these with carved geometric designs. During the Archaic period, natives began using plant fiber (vines, canes, rushes, and barks) for baskets. The bivalves may have been gathered by use, for stone sinker are found at some Archaic sites. Fiber baskets and wooden vessels were forerunners of the stone/clay bowls. Wood was also used for hafting points and tools, building huts and frames, and for making canoes.

The increased number and variety of weapons, tools, and ornaments produced during the Archaic , indicates that rudimentary specialization in craftsmanship was developing; it was natural for some native to be more skilled than others as hunters, flint workers, basket makers, wood carvers, stone quarrelers or stone drillers; with the development of special skills was doubtless also the beginning of simple barter and trade.

The most revolutionary craft to appear was pottery. From the Late Archaic period pottery vessel shards, several small figurines, tubular pipe fragments, and unusual ball and cylindrical shapes (some effigy forms), which they regarded as substitutes for “cooking stones” started to appear. Though fiber-tempered and even granular-tempered pot sherds occur at transitional Archaic-Woodland levels, the development of pottery is generally considered a Woodland characteristic.

The Archaic Period artifacts recovered from site 44FR0240 consist of the following: Rowan, Jude, Taylor, Kirk Stemmed Scrapper, Kirk Corner Notched, Decatur, Stanley Narrow Stem, South Hampton, Connerly, Guilford (stemmed, straight base, yuma), Appalachian, Halifax, and Misc. Knife blades.

## **WOODLAND-CONTACT CULTURE PERIOD 2500 – 550 AD**

Populations continued to grow and spread from the largest streams and rivers to smaller creeks and quiet sloughs. This spread of the more numerous Woodland population probably accelerated as the bow and arrow gradually displaced the throwing-stick, (Atal-Atal). The tools and ornaments of the Woodland people were similar to those of the Archaic cultures, but they were more varied and often showed finer workmanship. Their tools included chipped drills, knives, celts, scrappers, axes, and a variety of smaller projectile points.

A new addition to the tool assemblage was the large chipped greenstone, limestone, or flint spade; the presence of the spade may have indicated a rudimentary agricultural development; however, it was probably used for digging graves, scooping soil for burial mound fills, and excavating post holes for house framing. These spades are sometimes found in the graves under the skull of the skeleton or in a fill of the mound. Specialized pecked, ground, and polished stone articles found with Woodland remains were poled celts; plummet-net sinkers or ornaments; pipes-elbow, platform, and occasional zoomorphic forms; medicine tubes; boatstones; expanding center gorgets; and a few ornamental or ceremonial effigies. Many Archaic-introduced tools, as stone axes, continued to be used.

Shells other than mussel were more numerous at Woodland than at Archaic sites. *Marginella* and *olivella* shells are numerous at some sites. Pearl beads and turtle carapaces have also been found. In addition to conch shell beads, conch dippers are a significant burial deposit. Shell tools have also occurred at some Woodland sites. The Woodland people doubtless made extensive use of wood also; fragments and impressions of mats, baskets, and house frames are frequently found.

Pottery. The presence of pottery vessels and pottery sherds at Woodland Period sites give evidence of a revolutionary change in culinary equipment. Since women did the storing and cooking of food, they doubtless were responsible for most of the domestic pottery. Pottery vessels increased the ease and effectiveness of preparing food.; enabled women to cook in pots over the fire; and provide a way to



transport and store liquids easily. In addition the making of vessels gave women an outlet for creative abilities, which allowed more freedom of design than did basketry.

The first pottery in the Southeast was molded and modeled, fiber-tempered pottery; it is believed to have been indigenous, though the idea may have come from outside the area; there is no proof. This was soon replaced by coil pottery made from clay tempered with a variety of granular materials. Over the long span of centuries of the Woodland Cultural Period, the potter experimented with temper, firing, form, and application of design. Much of the pottery was plain; however, on some of it, the maker attempted to imitate the chisel marks on stone bowls and the design of basket-weaves; in order to produce these likenesses, the maker developed a variety of stamping and impressing methods; she used reed and brush marks; cord and fabric marking; and stamped designs with carved wooden paddles. When these were impressed in the plastic clay, they left a variety of check stamps, parallel lines, textile weaves, and complicated geometric design.

### **Paleo Period**

The Paleo-Indian period artifacts that were recovered from 44FR0240 consist of the following: Unfluted Clovis, Big Sandy, Alamance, Simpson, Hardaway Blades and a few Paleo knife blade.

The Unfluted Clovis points date between 13,500 to 10,600 BP

The Simpson blade and bases date between 10,000 to 9,000 BP

The Alamance points date between 10,000 to 8,000 BP

The Big Sandy points date between 10,000 to 3,000BP

The Hardaway Blades date between 9,500 to 9,000BP

Unidentifiable Paleo Knife Blades 13,000 to 8,000 BP

### **Archaic Period**

The Rowan Points date between 9,500 to 8,000 BP

The Jude Points date between 9,000 to 6,000 BP

The Taylor Points date between 9,000 to 6,000 BP

The Kirk Stemmed Scrapper date between 9,000 to 6,000 BP

The Kirk Corner Notched Points date between 9,000 to 6,000 BP

The Decatur Point date between 9,000 to 3,000 BP

The Stanley Narrow Base Point date between 8,000 to 5,000 BP

The South Hampton Points date between 8,000 to 6,000 BP

The Connerly Points date between 7,500 to 4,500 BP

The Guilford Points date between 6,500 to 5,000 BP

The Appalachian Points date between 6,000 to 3,000 BP

The Halifax Points date between 6,000 to 3,000 BP

The Knife Blades and fragment span the entire Archaic Period

### **Woodland Period**

Yadkin eared 2500 to 500 BP

Yadkin 2500 to 500 BP

Piscataway 2500 to 500 BP

Uwharrie 1600 to 1000 BP

Clarksville 1000 to 500 AD

Caraway 1000 to 200 BP

Randolph 550 to 170 BP

Miscellaneous Knife Blades and fragments spanning the Woodland Period 3500 to 550 AD



Unfluted Clovis Points, Paleo Period, 11,500 – 10,600 BP



Simpson Blade and Base, Paleo Period, 10,000 – 9,000BP





Alamance Points, Paleo Period, 10,000 – 8,000 BP



Big Sandy Point 10,000 – 3,000 (late Paleo and into the Early Archaic Period)





Hardaway Blades, Paleo Period, 9,500 – 9,000 BP



Unidentifiable Paleo Knife Blades 13,000 – 8,000



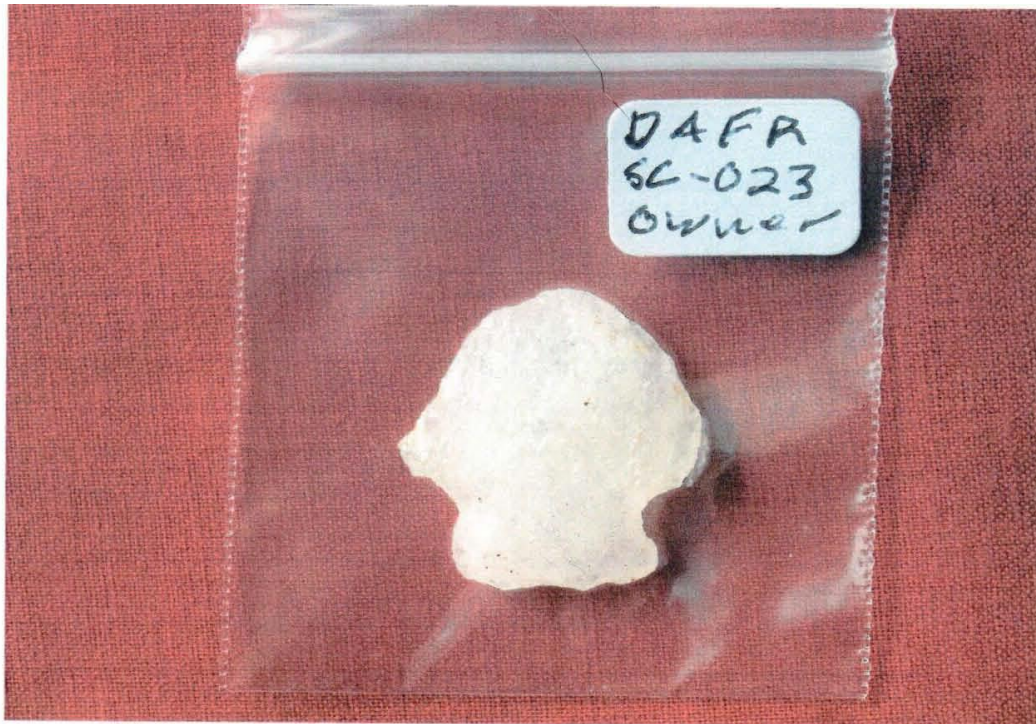


Jude Point Early/Mid-Archaic 9,000 – 6,000 BP



Taylor Points Early/Mid-Archaic 9,000 – 6,000 BP





Kirk Corner Notches Stemmed Scraper Early/Mid-Atlantic 9,000 – 6,000 BP



Kirk Corner Notched Points Early/Mid-Archaic 9,000 – 6,000 BP





DAFR  
SC-026  
OWNER

Decatur Point Early/Late Archaic 9,000 – 3,000 BP



DAFR  
SC-027  
OWNER

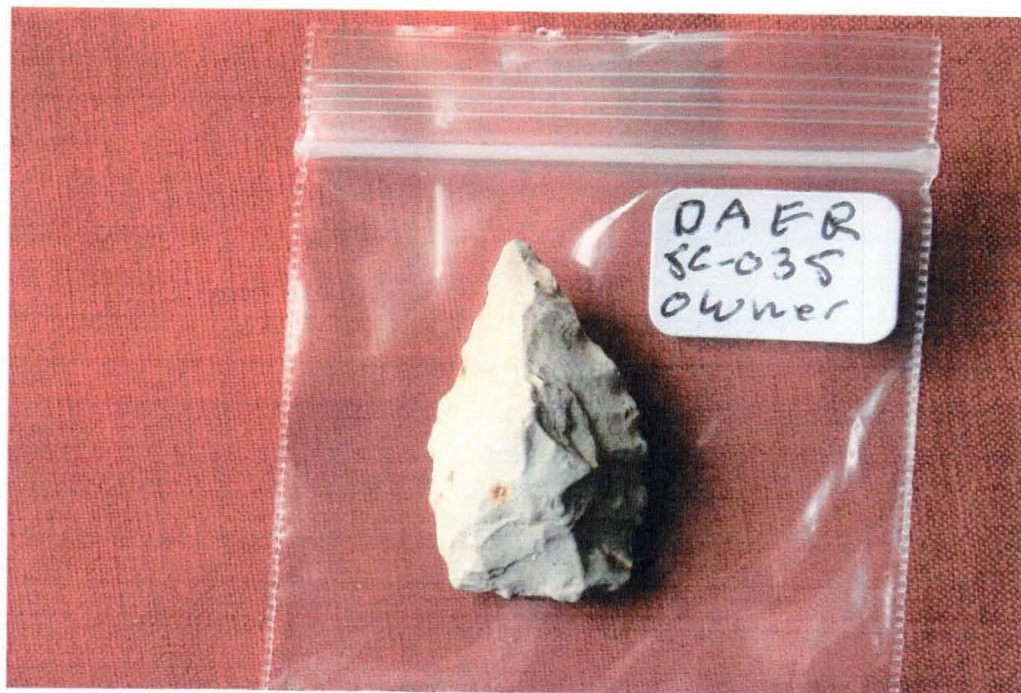
DAFR  
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OWNER

Stanley Narrow Base Points Early/Mid-Archaic 8,000 – 5,000 BP





South Hampton Points Early/Mid-Archaic 8,000 – 6,000 BP



Connerly Points Mid-Archaic 7,500 – 4,500 BP





Guilford Points, Stemmed, Straight Base and Yuma, Mid-Archaic 6,500 – 5,000 BP



Appalachian Points Mid/Late-Archaic 6,000 – 3,000 BP





Halifax Points Mid/Late-Archaic 6,000 – 3,000 BP



Miscellaneous Point fragments and Knife Blades spanning the Archaic Period 9,000 – 3,000 BP





Miscellaneous Point fragments and Knife Blades spanning the Archaic Period 9,000 to 3,000 BP



Miscellaneous Point fragments and Knife Blades spanning the Archaic Period 9,000 – 3,000 BP





Yadkin Points Woodland Period 2,500 to 500 BP



Piscataway Points Woodland Period 2,500 to 500 BP





Uwharrie Points Woodland Period 1,600 to 1,000 BP



Uwharrie Points Woodland Period 1,600 to 1,000 BP





Uwharrie Points Woodland Period 1,600 to 1,000 BP



Clarksville Points Woodland Period 1,000 to 500 AD





Clarksville Points Woodland Period 1,000 to 500 AD



Caraway Points Woodland Period 1,000 to 200 BP





Caraway Points Woodland Period 1,000 to 200 BP

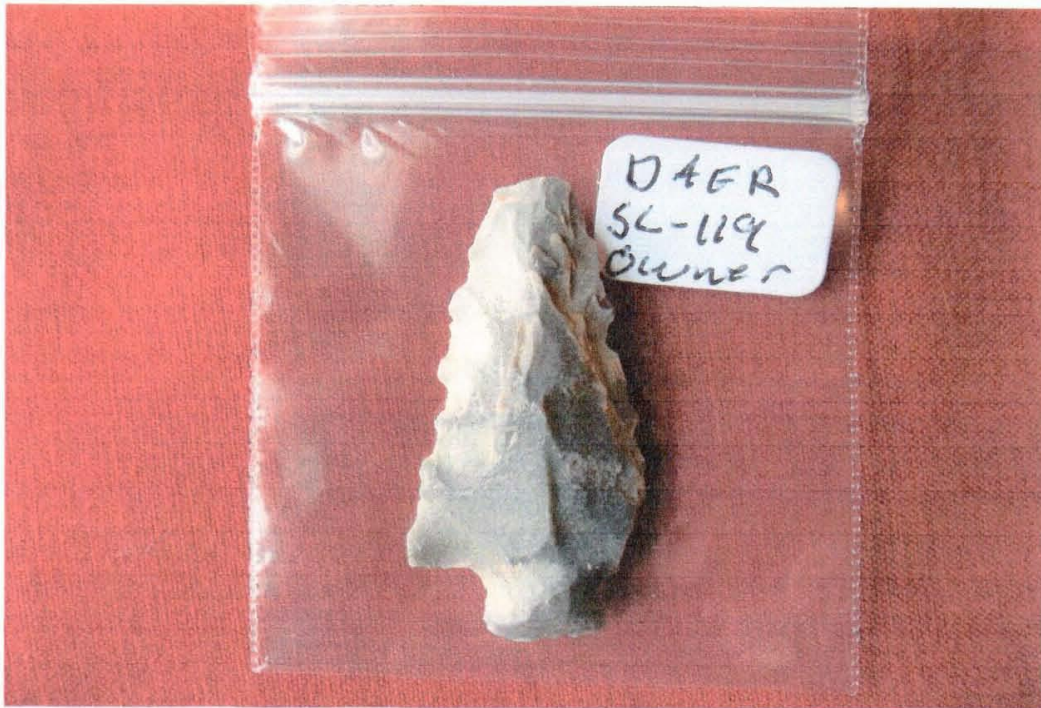


Caraway Points Woodland Period 1,000 to 200 BP





Caraway Points Woodland Period 1,000 to 200 BP



Randolph Point Woodland Period 550 to 170 BP





Miscellaneous Knife Blades and fragments Woodland Period 2,500 to 550 AD



Miscellaneous Knife Blades and fragments Woodland Period 2,500 to 550 AD





Miscellaneous Knife Blades and fragments Woodland Period 2,500 to 550 AD



Miscellaneous Knife Blades and fragments Woodland Period 2,500 to 550 AD





Miscellaneous Knife Blades and fragments Woodland Period 2,500 to 550 AD

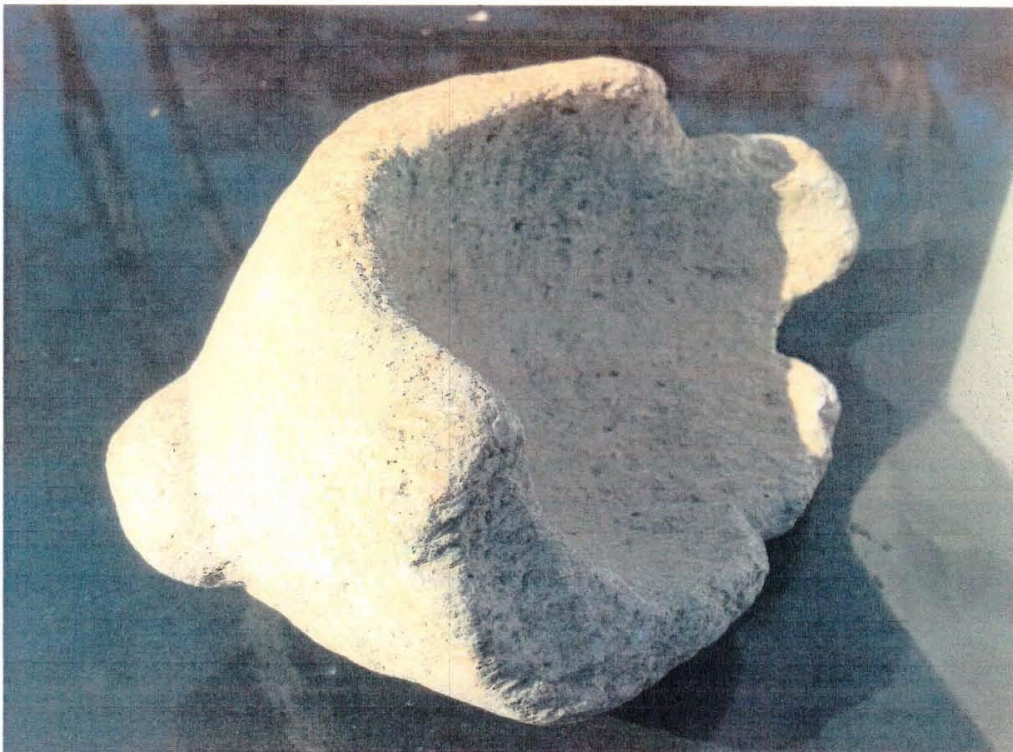


Miscellaneous, Fairy Stones, Unknown Period





Pottery fragments Woodland-contact Period 1,000 to 1700 AD



Hand Carved Soapstone Bowl Woodland Period 2,500 to 1600 AD





Hand Carved Soapstone Bowl Woodland Period 2,500 to 1600 AD



Stone Axes Woodland Period 2,500 to 1600 AD

## Collocation & Electromagnetic Fields

Collocation of the proposed MVP is briefly mentioned in the DEIS. Alternative routes included collocating alongside the proposed Atlantic Coast Pipeline (ACP), following highways and Interstates was also considered as well as traversing along an electric transmission corridor. All collocation alternatives were deemed by FERC as “not offering a significant environmental advantage when compared to the corresponding proposed route.” There is an environmental **disadvantage** of every proposed route of the MVP and is clearly evident based on the comments herein.

An area of specific concern with current collocation plans in the current route of the proposed pipeline is the proximity to high voltage (hv) transmission lines. In a collocation report done by the state of Maine<sup>37</sup>, research shows that pipelines near transmission lines causes electromagnetic field interference which brings multiple issues to light. Below is a detailed excerpt from the report.

When a pipeline runs parallel to a transmission or electric distribution line, the pipeline becomes part of the electrical circuit by electromagnetic and electrostatic coupling (Nelson, 1986). The impact of co-locating metallic pipelines usually buried in the earth directly underneath high-voltage transmission lines can cause electromagnetic interference, which can be grouped into three broad categories:

1. Influence, which is the sum total of the magnetic induction and ground-return currents;
2. Coupling, which is the “distance” between the source of the magnetic induction (power line) and the objects being affected (pipeline); and
3. Susceptibility, which relates to the vulnerability of the induction element (i.e. the metallic pipeline) to induced and ground-return current (Pharris and Kolpa, 2007).

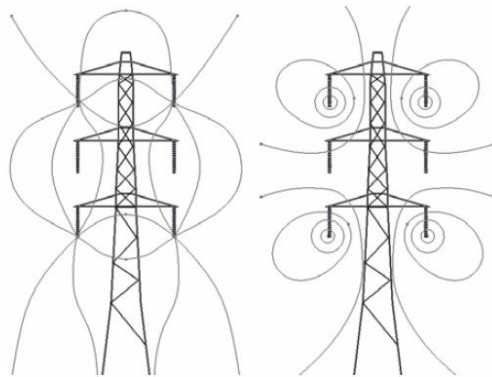
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<sup>37</sup> <https://www1.maine.gov/energy/pdf/LD1786%20Co-Location%20Report%20FINAL%20May%202011.pdf>



For every situation, each of the three categories is highly variable and each co-location project must be evaluated separately. The systems' materials, construction method and design are all factors and can help to minimize overall susceptibility of pipeline systems to magnetic induction and damage due to electrolysis and lightning (Pharris and Kolpa, 2007).

The figure below shows the typical electromagnetic field of a high voltage (HV) transmission line, source of induced voltages. The left shows the electric field and the right shows the magnetic field produced by a HV overhead AC power line.



Source: (Purcar and Munteanu, 2009)

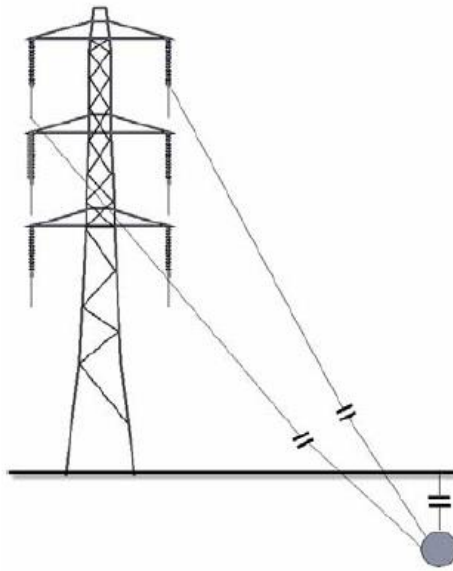
The magnetic and electric fields created by a transmission line induce currents and charges in neighboring metallic objects (Purcar and Munteanu, 2009).

The potential interference problems, attributable to electricity transmission systems in close proximity to pipelines, have been studied closely by the pipeline industry. There are three mechanisms of electromagnetic interference mechanisms between buried pipelines and nearby power systems (Pharris and Kolpa, 2007):

1. Capacitive coupling;
2. Inductive coupling; and
3. Conductive coupling.

## Capacitive Coupling

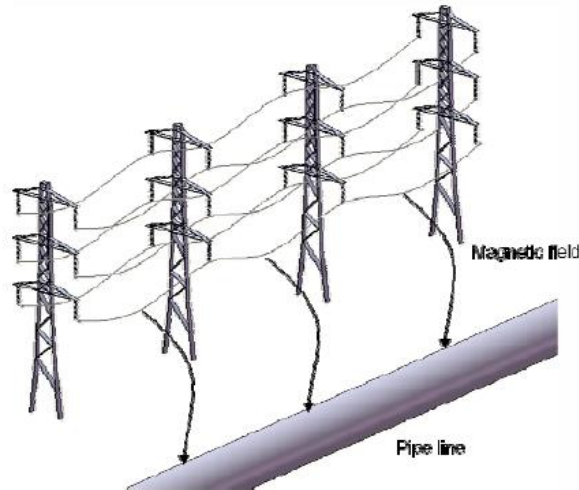
The electric field of the HV transmission line creates capacitive coupling by inducing electric charges in the metallic structure in close proximity. “This represents a form of capacitive coupling operating across the capacitance between the AC transmission lines and the pipeline, in series with the capacitance between the pipeline and the adjacent earth as shown in the figure below (Purcar and Munteanu, 2009).



Source: (Purcar and Munteanu, 2009)

## Inductive Coupling

Inductive interference is the most important of the three coupling mechanisms, and results from the magnetic field generated by the power lines (Purcar and Munteanu, 2009), see figure below.



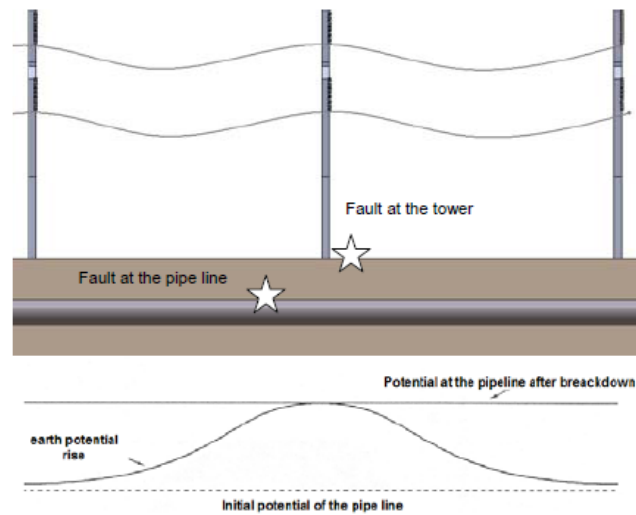
Source: (Purcar and Munteanu, 2009)

The electromagnetic field produced by AC power changes 120 times per second, and metallic structures are subject to the changing electromagnetic field and will exhibit an induced voltage (hence induced AC current) (Rizk and Strike, 2008). The magnitude of such currents depend on many factors such as coating condition, soil composition, power line voltage, and distance, and can cause AC corrosion of the steel and shock hazard to personnel (Rizk and Strike, 2008). Pipelines running parallel to or in close proximity to transmission lines or cables are susceptible to these induced voltages. The inductive influence is the worst in the case of faults, where the induced electromotive forces cause currents circulation on the pipeline and voltages between the surrounding earth, which may result in shock hazards to people or workers touching the pipeline or other metallic structures connected to it (Purcar and Munteanu, 2009).

### **Conductive Coupling**

The current flowing through the grounding electrode produces a potential rise of the electrode and the neighboring soil with related to the remote grounding bed, when a ground fault occurs in an installation (i.e, tower, substation, power plant) (Purcar and Munteanu, 2009). If the pipeline is directly connected to the ground electrode of the transmission

system (i.e inside a power station) or if the pipeline enters the “Zone of influence” of electrical installation, conductive coupling occurs between the nearby pipeline and the electrical installation (Purcar and Munteanu, 2009).



Source: (Purcar and Munteanu, 2009)

With the use of computer models, contributions of each type of interference on pipelines have been studied using various scenarios in order to predict the effectiveness of mitigation techniques (Pharris and Kolpa, 2007). It has been determined that “during normal operating conditions of the electricity transmission system, only inductive voltages are imparted to the pipeline as a result of the magnetic field around the electric current conductors” (Pharris and Kolpa, 2007). The greater the physical separation and the angle between the power conductors and the pipeline, the less interferences exist. The greatest interference is observed when the pipeline is parallel to and directly below the electric transmission system (Pharris and Kolpa, 2007). In addition, interference increases with increasing soil resistivity and also with increasing magnitude and frequency of electric power being transmitted (Pharris and Kolpa, 2007). The Ductile Iron Pipeline Research Association has also determined additional factors that can influence the three mechanisms of



electromagnetic interference, namely the electrically continuous length of pipeline that is parallel to transmission lines directly above, the nature and strength of the electric power, continuity of the corrosion control coating or other wrapping on the pipe, how well the pipe is electrically insulated from the ground, and construction techniques can also influence the extent of interference (Pharris and Kolpa, 2007).

It is apparent that the FERC in their DEIS has not thoroughly researched and assessed the various risks of pipelines along high voltage transmission lines; especially the fact of increased corrosion in pipelines.

## **CONCLUSION**

The Blue Ridge Environmental Defense League (BREDL) has worked for over 30 years in both rural and urban communities, knowing that *all* people matter and deserve to live in healthy, safe and clean environments. The intensity at which we are seeing the proposed build out of multiple fracked gas pipelines throughout the Blue Ridge Mountains and mid-Atlantic region threatens the communities and people within our focus area.

The impacts on the land, air and water resources which would occur if this project advances are contrary to the letter and the spirit of the National Environmental Policy Act, which is to prevent or eliminate damage to the environment and the biosphere. The draft of the Environmental Impact Study which we have reviewed in depth does not begin to alleviate the devastating effects that the Mountain Valley Pipeline would have on West Virginia and Virginia. The impacts of this cannot be mitigated.

As clearly stated above, the FERC's DEIS is flawed in many ways; in fact, other organizations and groups have voiced the lack of independent research and documentation. Andrew Downs, who is the Regional Director of Central and Southwest Virginia Appalachian Trail Conservancy, says that the

“report is flawed, beginning with the front page” and that “he won’t comment on a document that is as inadequate as this.”<sup>38</sup>

In our continued effort to support healthy communities and clean environments, we formally conclude that the Mountain Valley Pipeline Project must be denied a permit for construction and transportation of fossil fuels.

Respectfully submitted,

A handwritten signature in cursive script that reads "Carolyn Reilly". The signature is written in black ink and is positioned to the left of the typed name.

Carolyn Reilly  
Blue Ridge Environmental Defense League  
[www.bredl.org](http://www.bredl.org)

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<sup>38</sup> <http://wvtf.org/post/ferc-s-pipeline-impact-statement-full-errors-say-environmental-groups#stream/0>