

Cowpasture River Preservation Association
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March 21, 2015

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

REFERENCE: Atlantic Coast Pipeline

FERC DOCKET NO.: PF15-6-000

SUBJECT: Environmental Threat No. 1 – Leaching of Hazardous Materials

Dear Secretary Bose:

The Cowpasture River of Virginia, nestled among the Allegheny Mountains, is arguably the cleanest and most pristine river basin in the Commonwealth of Virginia. Citizens of the Cowpasture Valley formed in 1972 the Cowpasture River Preservation Association (CRPA), a 501(c)3 not-for-profit, for the dual purposes of protecting water quality and quantity in the Cowpasture River watershed. With our charter-driven purpose in mind, the Association welcomes this opportunity to offer public “scoping” comments on the proposed Atlantic Coast Pipeline.

1 Definition:

- 1.1 “Leaching of Hazardous Materials” is defined as the rainfall-induced movement of hazardous materials, chemicals or elements from imported (i.e., not native to the specific site) fly ash and/or another substances that are used by a pipeline construction company to fill an excavated trench after a natural gas pipeline is installed within the trench.

2 Deficiency:

- 2.1 Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and the Natural Resources Group collectively have failed to disclose to the FERC, Non-Governmental Organization stakeholders and the general public, the specific trench back-fill materials that the supplicants propose to use along 554 miles of pipeline, the chemical composition of these back-fill materials and the source(s) of these materials.
- 2.2 Because Dominion Resources operates eight coal-powered electric generating plants, including: Chesapeake, Chesterfield, Clover, Mecklenburg, Mount Storm (West Virginia), North Branch (West Virginia), Virginia City Hybrid Energy Center and Yorktown that each produce fly ash as a by-product; the Federal Energy Regulatory Commission, Non-Governmental Organization stakeholders and the general public must

reasonably assume that Dominion Resources would like to dispose of this hazardous industrial waste in a 554-mile long trench that could reasonably receive 4,000,000 cubic yards or more of fly ash waste.

3 Significance:

3.1 Planning Note: The following three criteria are recommended by Dr. Larry W. Cantor, Professional Engineer, Environmental Impact Assessment, Chapter 4 – Description of Environmental Setting, page 115, to determine whether or not to include a specific environmental factor as part of the essential environmental setting. The environmental factor should be included if any one or more of these three criteria is operative and in this case all three are operative.

3.2 Criteria No. 1 – Will the environmental factor be adversely affected by the pipeline construction?

Yes. Hazardous materials leaching becomes a critical environmental issue and particularly in rugged mountainous and karst terrain, when a pipeline construction company decides to use fly ash or another toxic material, as trench back-fill material, although otherwise, the leaching of hazardous materials is not anticipated to be an issue.

3.3 Criteria No. 2 – Will the environmental factor exert an influence on the construction of the pipeline?

Yes. The risk of surface and ground water contamination by the leaching of hazardous materials will influence: (a) the choice of back-fill material (i.e., native soils, imported sands, clay, coal fly ash or another substance), (b) the remedial measures that must be taken to eliminate rain-induced leaching down back-filled trenches, (c) the miles that the back-fill materials must be hauled by heavy-duty earth-moving trucks over county or state roads, and (d) the frequency, design and engineering of trench dams or plugs to reduce or eliminate water seepage and trench erosion in rugged mountainous terrain.

3.4 Criteria No. 3 – Will the environmental factor be of public interest, engender controversy or litigation?

Yes. The general public is informed and concerned about the possible negative influences of pipeline construction and the trench back-fill material as these materials effect surface and ground water quality, ecosystems and wildlife. The Cowpasture River Preservation Association, Highlanders for Responsible Development, Friends of Shenandoah Mountain, the Augusta County Alliance and 29 other local non-governmental organizations or more consider the protection of surface and ground water quality and quantity as a vitally important issue.

4 Compliance:

4.1 National Environmental Policy Act (NEPA):

- 4.1.1 NEPA's fundamental purposes is to "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." NEPA § 102 [42 USC § 4321]
- 4.1.2 NEPA is intended to "assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings." [42 USC § 4331]
- 4.1.3 NEPA works to "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences." [42 USC § 4331]
- 4.1.4 CEQ's NEPA Regulations define, "significance," as "the degree to which the effects on the human environment are likely to be highly controversial" [40 CFR § 1508.27]
- 4.1.5 CEQ's NEPA Regulations define "health effects" as including "ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative." [40 C.F.R. § 1508.8]

4.2 U.S Environmental Protection Agency – The disposal of coal combustion residues is governed by the following final rule signed on December 19, 2014: HAZARDOUS AND SOLID WASTE MANAGEMENT SYSTEM; DISPOSAL OF COAL COMBUSTION RESIDUALS FROM ELECTRIC UTILITIES [RIN-2050-AE81; FRL-9149-4].

5 Health Risks:

- 5.1 Human Beings – Known chemicals and heavy metals in coal "fly ash" include: lead, mercury, cadmium, chromium, selenium, aluminum, antimony, barium, beryllium, boron, chlorine, cobalt, manganese, molybdenum, nickel, thallium, vanadium, zinc, and arsenic. These hazardous materials cause cancer, nervous system disorders, heart damage, lung disease, respiratory distress, kidney disease and reproductive problems. Ground water aquifers supply fresh potable water for drinking, cooking and bathing water through municipal wells, domestic wells and springs for all residents and visitors of the Cowpasture River Watershed.
- 5.2 Livestock & Poultry – Toxic elements and metals that leach out of "fly ash" and that are highly poisonous or deadly for livestock and poultry include: arsenic, lead, mercury, cadmium, chromium and selenium. The Cowpasture River Valley is home for numerous poultry farms and cattle ranches. Mammals and birds that live in or consume surface waters also will be exposed to dangerous neurological effects. Wildlife at risk in the Cowpasture Valley include: bald eagles, rivers otters and common mink.
- 5.3 Fishes & Macro-invertebrates – Again, toxic elements and metals that leach out of "fly ash" and that are poisonous or deadly for fishes and macro-invertebrates include: arsenic, lead, mercury, cadmium, chromium and selenium. Fishes, crayfishes and macro-invertebrates that live in and consume surface waters will be exposed to dangerous

neurological effects. The Cowpasture River Watershed is home for the official Virginia state fish, the eastern brook trout; several endemic species such as the globally rare roughhead shiner; more common endemics such as the stripeback darter and longfin darter. Overall 28 different fish species are found in the Watershed including: largemouth bass, smallmouth bass, rock bass, redbreast sunfish and muskellunge. Fresh water mussels in the Cowpasture watershed include: the James spinymussel, a federally endangered species and the subject of ongoing restoration and augmentation work by the Virginia Department of Game and Inland Fisheries and the US Fish and Wildlife Service, the green floater, another rare species, plus the more common creeper mussel, the notched rainbow, and the triangle floater.

6 Methodology:

- 6.1 Dominion Resources, Inc and its affiliate Atlantic Coast Pipeline, LLC should (many think “must”) be required by the Federal Energy Regulatory Commission on the front-end of the environmental impact assessment process and not after the fact:
- 6.2 To specify the trench back-fill materials that will be used in the Cowpasture River Valley of Virginia and similarly, for all other segments of the 554-mile pipeline right-of-way.
- 6.3 To certify the chemical composition of the trench back-fill materials and specifically including trace elements and industrial contaminants known by the U.S. Environmental Protection Agency as being harmful to the health of human beings, livestock and poultry, native fishes and/or other aquatic fauna and flora.
- 6.4 To specify the source and location of the trench back-fill materials.
- 6.5 To calculate the volume of trench back-fill material, expressed in cubic yards, that will be imported into the Cowpasture River Valley and similarly, for all other segments of the 554-mile pipeline right-of-way.
- 6.6 To estimate the number and specify the size of earth-moving truck loads that will haul these trench back-fill materials into the Cowpasture River Valley over county and state roads and similarly, for all other segments of the 554-mile pipeline right-of-way.
- 6.7 To forecast and document the predicted rainfall-induced leaching of pollutants, industrial contaminants and trace elements down a back-filled pipeline trenches in rugged mountainous and karst terrain taking into consideration slope or gradient, trench plug or dam construction, frequency and useful life, and over time horizons of one day, one month one year and ten years. **NOTE: THAT TRENCH PLUGS OR BREAKERS ARE NOT DESIGNED, ENGINEERED OR CONSTRUCTED FOR THE PURPOSE OF ELIMINATING THE LEACHING BY WATER OF HAZARDOUS MATERIALS USED AS TRENCH BACKFILL MATERIAL.**
- 6.8 To specify the location where excavated rock, soil and debris from the pipeline trench excavation in the Cowpasture River Valley will be disposed and similarly, for other

segments of the 554-mile long pipeline.

- 6.9 To test municipal water wells, domestic water wells, spring-based water supplies and surface waters before, during and after pipeline construction for toxic and hazardous industrial contaminants, including (but not limited to): lead, mercury, cadmium, chromium, selenium, aluminum, antimony, barium, beryllium, boron, chlorine, cobalt, manganese, molybdenum, nickel, thallium, vanadium, zinc, and arsenic.
- 6.10 Develop a pipeline trench monitoring and remediation program for the ten years after the pipeline is placed in operation that checks the condition and functionality of erosion, sedimentation and leaching control measures, including (but not limited to): trench plugs or dams, trench settling, trench water resurfacing, failure of surface dykes or berms, emergence of buried springs or seeps, hazardous materials contamination in surface and ground waters, and water induced erosion and sedimentation on adjacent private or public lands beyond the pipeline right-of-way.

7 Economic Costs:

- 7.1 Domestic Water Contamination – Homesteaders in the Cowpasture River Valley who must replace a domestic water well that becomes contaminated with hazardous industrial contaminants with a new water well drilled into a potable aquifer, if a clean aquifer can be found, face an out-of-pocket expense of an estimated \$35,000 or more, plus emergency supply of 300 gallons of water on a daily basis.
- 7.2 Livestock Water Contamination – Dairies and ranches in the Cowpasture River Valley that must replace a farm water supply well that becomes contaminated with hazardous industrial contaminants with a new well drilled into a potable aquifer, if a clean aquifer can be found, face an out-of-pocket expense of an estimated \$50,000 or more, plus an emergency supply of 20,000 gallons on a daily basis.
- 7.3 Aqua-agriculture Contamination – The Virginia Department of Game and Inland Fisheries, Coursey Springs Fish Cultural Center in the Cowpasture River Valley depends upon cold and pure water from the Cowpasture River which sinks and resurges as Coursey Springs, a flow rate of 4,000 to 15,000 gallons per minute, and this third largest spring in the Commonwealth most likely cannot be replaced at any cost.
- 7.4 Recreational Fisheries Contamination – Visitors from the Baltimore, Washington and Richmond corridor enjoy recreational fishing along the Bullpasture River and eastern brook trout fishing in the upper Cowpasture River, Benson Run, Crab Run, Davis Run and Shaws Fork with estimated expenditures of \$238 per person per day for lodging, travel and meals.

8 Science & Policy:

- 8.1 Canter, Larry W., Environmental Impact Assessment (New York, New York: McGraw-Hill, 1996), 600 pages.

- 8.2 Commonwealth of Virginia, Wellhead Protection Plan (Richmond, Virginia: Department of Environmental Quality, 2005), 43 pages.
- 8.3 Forest Service, Technical Guide to Managing Ground Water Resources (Washington, DC: U.S. Department of Agriculture, Forest Service, Volume 1: National Core BMP Technical Guide, FS-881, 2012), 165 pages.
- 8.4 Forest Service, National Best Management Practices for Water Quality Management on National Forest System Lands (Washington, DC: U.S. Department of Agriculture, Forest Service, Minerals and Geology Management, Engineering, FS-990a, 2007), 165 pages.
- 8.5 Gottlieb, Barbara, Coal Ash: The toxic threat to our health and environment (Washington, DC: Physicians for Social Responsibility and Earth Justice, 2010), 38 pages.
- 8.6 Neven Kresic, Water in Karst: Management, Vulnerability, and Restoration (New York, New York: McGraw-Hill Professional, 2012), 736 pages.
- 8.7 Virginia Department of Environmental Quality, Virginia Stormwater Management Handbook (Richmond, Virginia: Department of Environmental Quality, 2013 Revision).
- 8.8 U.S. Environmental Protection Agency, “Disposal of Coal Combustion Residuals from Electric Utilities” (Washington. DC: Environmental Protection Agency, Final Rule Dated December 19, 2014, RIN-2050-AE81, FRL-9149-4), 745 pages.

NOW THEREFORE: The Board of Directors of the Cowpasture River Preservation Association does hereby petition the Federal Energy Regulatory Commission and asks the FERC to ensure that the environmental impact assessment process for the Atlantic Coast Pipeline and the Environmental Impact Statement address the threats caused by the leaching of hazardous materials into surface water resources and ground water aquifers, as more specifically outlined above.

Thank you for this opportunity to provide public scoping comments.

With warm regards,

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April 23, 2015

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

REFERENCE: Atlantic Coast Pipeline

FERC DOCKET NO.: PF15-6-000

SUBJECT: Environmental Threat No. 2 – Erosion in Rugged Mountainous Terrain

Dear Secretary Bose:

This letter is an appeal from citizens of arguably the least populated rural watershed east of the Mississippi River for the Federal Energy Regulatory Commission to protect our surface and ground water resources from sedimentation and contamination. Our science- and policy-based environmental assessment presented below shows that the construction of the Atlantic Coast Pipeline through rugged mountainous terrain in Virginia and West Virginia will undoubtedly cause extraordinary erosion. Business-as-usual at FERC headquarters with the gas utility industry being coddled and the natural environment being ignored will be a catastrophe.

The Cowpasture River of Virginia, nestled among the Allegheny Mountains, is arguably the cleanest and most pristine river basin in the Commonwealth of Virginia. Citizens of the Cowpasture Valley formed the Cowpasture River Preservation Association (CRPA) in 1972 as a 501(c)3 not-for-profit, for the dual purposes of protecting water quality and quantity in the Cowpasture River watershed. With our charter-driven purpose in mind, the Association welcomes this opportunity to offer public “scoping” comments on the proposed Atlantic Coast Pipeline.

1 Definition:

- 1.1 “Erosion in Rugged Mountainous Terrain” is defined as water-induced movement downhill, off-site and/or into surface water streams or ground water aquifers of rock, soil, debris and/or imported fill.

2 Deficiency:

- 2.1 Dominion Resources, Inc. and its affiliate Atlantic Coast Pipeline, LLC have failed to disclose to Federal Energy Regulatory Commission, interested Non-Governmental Organizations and the general public, the amount of rainfall-induced erosion that may be reasonably predicted in the Cowpasture River Valley and similarly for all other segments of

the proposed 554-mile long pipeline.

- 2.2 The Federal Energy Regulatory Commission and its subcontractor Natural Resources Group (NRG) have failed to convince either the general public or Non-Governmental Organizations with concerns about the environment that the National Environmental Policy Act (NEPA) will be taken seriously.

3 Significance:

- 3.1 Planning Note: The following three criteria are recommended by Dr. Larry W. Cantor, Professional Engineer, Environmental Impact Assessment, Chapter 4 – Description of Environmental Setting, page 115, to determine whether or not to include a specific environmental factor as part of the essential environmental setting. The environmental factor should be included if any one or more of these three criteria is operative and in this case, all three are operative.

- 3.2 Criteria No. 1 – Will the environmental factor be adversely affected by the pipeline construction?

Yes. Trees, shrubs and grasses will be cleared from 8,000,000 square feet of mountainous terrain in the Cowpasture River Valley alone. Nine Hundred Thousand (900,000) cubic yards of debris, soil and rock will be broken loose on steep mountain slopes and in narrow mountain valleys. Mountain sides will be exposed to severe water-induced erosion and particularly during the seasonally wet season in Virginia and West Virginia – November, December, January, February, March and April.

- 3.3 Criteria No. 2 – Will the environmental factor exert an influence on the construction of the pipeline?

Yes. Heavy construction equipment must be anchored onto steep mountain sides. Shallow soils will necessitate trench excavation in the harder sedimentary bedrock with rock-ripping equipment and/or explosives. Erosion control measures will require a herculean effort and will not be adequately effective.

- 3.4 Criteria No. 3 – Will the environmental factor be of public interest, engender controversy or litigation?

Yes. The general public is well informed and concerned about excavation in rugged mountainous terrain. The Cowpasture River Preservation Association, Highlanders for Responsible Development, Friends of Shenandoah Mountain and many other local non-profit public interest groups consider that the environmental protection of rugged mountainous terrain is a critical issue.

4 Compliance:

- 4.1 National Environmental Policy Act (NEPA):

- 4.1.1 NEPA’s fundamental purpose is to “promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man.” NEPA § 102 [42 USC § 4321]
- 4.1.2 NEPA is intended to “assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.” [42 USC § 4331]
- 4.1.3 NEPA works to “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.” [42 USC § 4331]
- 4.1.4 Council on Environmental Quality's (CEQ's) NEPA Regulations define, “significance,” as “the degree to which the effects on the human environment are likely to be highly controversial” [40 CFR § 1508.27]
- 4.1.5 CEQ's NEPA Regulations define “health effects” as including “ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative.” [40 C.F.R. § 1508.8]

4.2 Commonwealth of Virginia –

- 4.2.1 Commonwealth of Virginia, Erosion and Sedimentation Control Regulations, 9VAC25-840-30. Scope and Applicability, states on page 27 that “***B. The submission of annual standards and specifications does not eliminate the need where applicable for a project specific Erosion and Sediment Control Plan.***”
- 4.2.2 The Commonwealth of Virginia, Erosion and Sedimentation Control Regulations, **9VAC25-840-40. Minimum standards**, Sub-section 16 states: “Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria: (a) ***No more than 500 linear feet of trench may be opened at one time...***”

5 Scoping the Challenge:

5.1 Atlantic Coast Pipeline

The Atlantic Coast Pipeline is 554 miles long. The western section of the Atlantic Coast Pipeline is characterized by rugged mountainous terrain from Harrison County, West Virginia eastward through Nelson County, Virginia and an overall distance of 160 miles.

5.2 Rugged Mountainous Terrain

Dominion's Atlantic Coast Pipeline is a huge industrial construction project with no known precedent in rugged mountainous terrain that will nevertheless cross 20-odd Appalachian Mountains in West Virginia and Virginia, including: Cheat Mountain, Back Allegheny Mountain, Burner Mountain, Frank Mountain, Spruce Ridge, Little Spruce Ridge, Allegheny Mountain, Tamarack Mountain, Red Oak Knob, Lantz Mountain, Monterey

Mountain, Jack Mountain, Doe Hill Mountain, Bullpasture Mountain, Shaws Ridge, Gwin Mountain, Bushy Ridge, Shenandoah Mountain, Chestnut Oak Knob, Little North Mountain and Elk Mountain.

5.3 Highly Vulnerable Soils

The USDA Natural Resources Conservation Service (NRCS) in its soil survey classification schema judges these soils as being medium to highly erodible.

5.4 Steep Gradients or Slopes

The USDA Natural Resources Conservation Service in its soil survey classification schema judges these slopes as exceptionally steep varying from 10% to 80%.

5.5 Standard Mitigative Measures

A review of the best management practices promulgated by the Federal Energy Regulatory Commission, the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality suggests that these mitigative measures were developed, recommended and adopted for less difficult circumstances than found in the highlands of Virginia and West Virginia and further, that no engineering authority contemplated the challenges of building a 42" in diameter pipeline in rugged mountainous terrain and nor in the much wetter (than the arid west) climates of the Virginias.

5.6 Trained, Certified & Experienced Inspectors

It appears that there is not a single federal, state or local jurisdiction with sufficient trained, certified and experienced soil erosion control inspectors to handle the day-by-day inspection of construction and restoration activities contemplated with the Atlantic Coast Pipeline, including: the Federal Energy Regulatory Commission, the USFS George Washington National Forest, the USFS Monongahela National Forest, the USDI National Park Service, the Virginia Department of Environmental Quality and additionally, none of the individual counties in Virginia and West Virginia.

5.7 Environmental Situation

The environmental situation described above suggests a real possibility that the construction of a 42" in diameter pipeline through the rugged mountainous terrain of the Virginias will create extraordinary erosion and sedimentation that for the Cowpasture River Valley will be an environmental catastrophe.

6 Erosion Variables:

- 6.1 Planning Note: There are eight engineering variables that influence rain-induced erosion in rugged mountainous terrain, as follows: (a) slope (or open trench) length, (b) percent slope (or gradient), (c) rock, soil and debris erodibility, (d) rainfall intensity, (e) vegetative cover, (f) equipment and vehicular traffic, and (g) mitigative measures.

- 6.2 Slope (or Open Trench) Length – Slope length is arguably the most important engineering variable because it is largely under the control of engineering and construction management.
- 6.3 Percent Slope (or Gradient) – Percent slope was, but is no longer, a very important engineering variable because Dominion Resources made a strategic business decision to locate the Atlantic Coast Pipeline corridor straight through the most rugged mountainous terrain in the eastern United States and thereby, created a self-imposed adverse condition.
- 6.4 Rock, Soil and Debris Erodibility – Soil erodibility is almost completely outside of the influence of engineering and construction management, but in all segments along the route will be medium to highly erodible.
- 6.5 Rainfall Intensity – Rainfall, its occurrence and distribution is largely an uncontrollable engineering variable, however, the mountain ridges of Highland County create an orographic lift effect that intensifies local rainfall.
- 6.6 Vegetative Cover – Vegetation exerts a huge influence over the erosion of rock, soil and debris, but pipeline construction methods or techniques dictate that the work area will be completely cleared of all trees, shrubs and grasses, so there will not be any vegetative cover.
- 6.7 Equipment and Vehicular Traffic – Machinery compacts soils, creates potholes, and plows ruts in loose rock, soil and debris, and it is largely uncontrollable in a construction zone used by heavy-duty equipment and trucks.
- 6.8 Mitigative Measures – Mitigation offers environmental engineering and construction opportunities that may reduce erosion, but only offer promise when: (a) the best management practices were conceived, designed and vetted for the purpose of eliminating erosion in rugged mountainous terrain; (b) the best management practices are properly designed and constructed on-site; (c) the best management practices are properly maintained after each and every rainfall and otherwise checked weekly; and (d) trained, certified and experienced inspectors are on-site every single day to make sure this all happens. With the above four caveats in mind, best management practices promulgated by the Virginia Department of Mines, Minerals and Energy should offer a minimum standard of excellence and might include: minimizing the width of the cleared right-of-way, restrictions on the length of open trench and excavated work area; immediate application of rain-impact reduction non-vegetative stabilization materials (i.e., wood chips or shredded bark); stop work procedures triggered by forecasts of storms and rain; diversion dykes, interception ditches and sediment basins; restrictions on construction activities during the wet months of November, December, January, February, March and April; and permanent trench plugs at frequent intervals for steep gradients with trench drains as necessary.

7 Erosion Prediction Models:

- 7.1 Computer Models Evaluated – More than thirty computer-based soil erosion prediction models were reviewed in preparation for assessing the risk of soil erosion in rugged mountainous terrain and in the Cowpasture River Valley. See the Internet website, Soil

Erosion Site, at www.soilerosion.net and its sub-section on soil erosion models at http://soilerosion.net/doc/models_menu.html .

7.2 Model Selection Criteria

- 7.2.1 Planning Note: The criteria used in screening these 30-odd computer-based erosion prediction models are enumerated below.
- 7.2.2 Does the computer based model allow for local rainfall history?
- 7.2.3 Does the model allow for the designation of local soil types?
- 7.2.4 Does the computer model allow an option for no vegetative cover?
- 7.2.5 Does the model allow for relatively steep slope gradients?
- 7.2.6 Does the computer model allow for analyzing construction sites?
- 7.2.7 Does the computer model allow for a mature forested cover type?
- 7.2.8 Does the computer model allow for introducing mitigative measures?
- 7.2.9 Does the model provide for relatively simple and efficient inputs with readable and accurate outputs?

7.3 Best Choices

- 7.3.1 Planning Note: Based upon an evaluation of 30-odd computer-based erosion prediction models the two best choices for predicting erosion on Shenandoah Mountain during the construction of the Atlantic Coast Pipeline are listed and briefly described below.
- 7.3.2 RUSLE On Line Soil Erosion Assessment Tool – The Revised Universal Soil Loss Equation (RUSLE) is being refined and supported through collaborative efforts of scientists at the Institute of Water Research at the Michigan State University, and with the USDA Natural Resources Conservation Service. Since implementation, RUSLE2 has been used by the NRCS to estimate water-induced soil loss from sheet and rill erosion. RUSLE2 is an update of the Revised Universal Soil Loss Equation (RUSLE) as described in Agriculture Handbook 703. The RUSLE2 Computer Model allows for the selection of several applicable prediction options, including: construction sites, grass restoration and mitigative measures.
- 7.3.3 WEPP Water Erosion Prediction Project – The U.S, Department of Agriculture, Forest Service, Rocky Mountain Research Station, Moscow Forestry Sciences Laboratory is overseeing the development of the WEPP Water Erosion Prediction Project for forest land management applications. Collaborating scientists represent the US Department of Agriculture's Forest Service, Agricultural Research Service, and Natural Resources Conservation Service; and the U.S, Department of the Interior's Bureau of Land Management and Geological Survey. The WEPP Computer Model allows for the selection of several applicable prediction options including a hardwood forest cover.

8 NRCS Soil Erodibility:

8.1 The USDA Natural Resources Conservation Service (NRCS) characterizes the soils of the Cowpasture and Bullpasture Rivers Valleys as being medium and high in erodibility and with slopes progressing from 10% to 80%. The NRCS reports that the average annual precipitation in Highland County, Virginia is 37.7 inches. The Service further reports that the average rainfall runoff in Highland County is 9.26 inches per year.

8.2 Bullpasture River Valley

8.2.1 The USDA Natural Resources Conservation Service (NRCS) soils survey data reports that soils along Dominion Resources' preferred pipeline route from Jack Mountain east into the Bullpasture River Valley and up Bullpasture Mountain are generally characterized as being medium to high in erodibility. The three major NRCS-designated soil types are listed below.

8.2.2 Elliber-Watahala complex, 15 to 35% slopes, fine-loamy over clayey soil

8.2.3 Caneyville silt loam, 35-55% slopes, very rocky, silt loam soil

8.2.4 McClung-Watahala-Dekalb complex, 15-35% slopes, fine-loamy soil

8.3 Cowpasture River Valley

8.3.1 The USDA Natural Resources Conservation Service (NRCS) soils survey data reports that soils along Dominion Resources' preferred pipeline route from Bullpasture Mountain down across the Cowpasture River Valley and over Shaws Ridge are generally characterized as being medium to high in erodibility. The four major NRCS-designated soil types are listed below.

8.3.2 Shelocta – Berks; (35% - 55% slopes) channery silt loam

8.3.3 Weikert – Berks rough; (35% - 55% slopes) silt channery loam

8.3.4 Macove Channery; (3% - 15% slopes) silty clay loam

8.3.5 Weikert –Rough complex, (55% - 80%) silty loam, very stony

8.4 Shenandoah Mountain

8.4.1 The USDA Natural Resources Conservation Service (NRCS) soils survey data reports that soils along Dominion Resources' preferred pipeline route from Shaws Fork up and over Shenandoah Mountain and down to Ramsey's Draft are generally characterized as being medium to high in erodibility. The four major NRCS-designated soil types are listed below.

8.4.2 Weikert – Berks rough; (15% - 35% slopes) silt channery loam

8.4.3 Shelocta – Berks; (35% - 55% slopes) silt loam

8.4.4 Hazleton-Lehew complex; (25% - 70% slopes) Sandy loam

8.4.5 Weikert – Berks rough; (55% - 80% slopes) silt loam, very stony

9 Site-specific Erosion Prediction:

9.1 Dominion Pipeline Right-of-way:

Water-induced soil erosion was predicted along Dominion Resources' preferred pipeline route from Shaws Fork eastward over Shenandoah Mountain and down to Ramsey's Draft.

9.2 Site-specific Assumptions:

- 9.2.1 Thirty years of weather records used were for Monterey, Virginia.
- 9.2.2 The Natural Resource Conservation Service reports that the average annual precipitation in Highland County, Virginia is 37.7 inches per year.
- 9.2.3 A RUSLE2 option was applied that defined mechanical treatment of soils as contouring both up and down slopes.
- 9.2.4 Slope steepness was defined as 35%.
- 9.2.5 Soils were defined as Berks Soils Series – Silty Loam.
- 9.2.6 The right-of-way width was defined as 125 feet.
- 9.2.7 The right-of-way length was defined as 1,000 feet.

9.3 Erosion Prediction:

- 9.3.1 Planning Note: The Cowpasture River Preservation Association has prepared four erosion predictions along the Atlantic Coast Pipeline preferred right-of-way over Shenandoah Mountain. The first prediction forecasts erosion on Shenandoah Mountain in its natural state with a hardwood forest cover. The second prediction forecasts erosion during the construction of the pipeline with the right-of-way cleared of all trees, shrubs and grasses, and with exposed rock, soil and debris. The third prediction forecasts erosion during the construction of the pipeline and with mitigative measures in place. And the fourth prediction forecasts erosion after restoration with southern grasses planted in the spring.
- 9.3.2 Natural Forest Cover – The WEPP erosion prediction with a “20 Year Old Hardwood Forest” establishes a natural state baseline of 0.77 tons/ac/yr.

Interpretive Note: The forest cover over Shenandoah Mountain is a mature (i.e., 75 – 150 year old) hardwood and mixed conifer forest with substantial forest floor duff and so, the baseline erosion would undoubtedly be less than predicted.
- 9.3.3 Right-of-way Cleared and Excavated – The RUSLE2 erosion prediction for “Bare Cut Rough” establishes a worse case scenario under excavation and construction with a value of 450 tons/ac/yr.
- 9.3.4 Construction /w/ Mitigative Measures – The RUSLE2 erosion prediction under “Construction with Mitigative Measures” establishes a most likely scenario with 150 tons/ac/yr.

- 9.3.5 Right-of-way /w/ Grass Restoration – The RUSLE2 erosion prediction after “Restoration with Southern Grasses Grown in Spring” establishes a best possible restoration scenario with 20 tons/ac/yr.

Interpretive Note: A grass vegetative cover takes two years or more to become fully established. The USFS prescribed grass seed mix was not a prediction model option.

9.3.6 **Conclusions –**

- **The construction of a 42” natural gas pipeline over the great Shenandoah Mountain will most assuredly cause extraordinary and perhaps catastrophic, erosion of rock, soil and debris in the rough order of magnitude of Five Hundred (500) times the erosion that now occurs with a mature hardwood and mixed conifer forest cover.**
- **Although best management practices or engineering mitigative measures, will definitely reduce the rainfall-induced erosion during construction phase, the erosion of rock, soil and debris actually experienced will still be at least One Hundred and Fifty (150) times the erosion that now occurs with a mature hardwood and mixed conifer forest cover, or more but not less.**
- **Restoration of a vegetative cover over the pipeline right-of-way will reduce the predicted erosion of rock, soil and debris to approximately Twenty (20) times the erosion that now occurs with a mature hardwood and mixed conifer forest cover, however, best management practices will never come close to restoring the environment to its natural state.**

10 Economic Costs:

- 10.1 Domestic Water Contamination – Homesteaders in the Cowpasture River Valley who must replace a domestic water well that becomes contaminated with sedimentation or hazardous industrial contaminants with a new water well drilled into a potable aquifer, if a clean aquifer can be found, face an out-of-pocket expense of an estimated \$35,000 or more, plus emergency supply of 300 gallons of water on a daily basis.
- 10.2 Livestock Water Contamination – Dairies and ranches in the Cowpasture River Valley that must replace a farm water supply well that becomes contaminated with sedimentation or hazardous industrial contaminants with a new well drilled into a potable aquifer, if a clean aquifer can be found, face an out-of-pocket expense of an estimated \$50,000 or more, plus an emergency supply of 20,000 gallons on a daily basis.
- 10.3 Aqua-agriculture Contamination – The Virginia Department of Game and Inland Fisheries, Coursey Springs Fish Cultural Center in the Cowpasture River Valley depends upon cold and pure water from the Cowpasture River which sinks and resurges as Coursey Springs

and a flow rate of 4,000 to 15,000 gallons per minute, and this third largest spring in the Commonwealth most likely cannot be replaced at any cost.

- 10.4 Municipal Water Supply Contamination – City and town governments in Virginia and West Virginia that must replace a municipal water supply well that becomes contaminated with hazardous industrial chemicals or sedimentation with a new well drilled into a potable aquifer, if a clean aquifer can be found, face out-of-pocket expenses of an estimated \$2,500,000 or more for geophysical and hydrological studies, land purchases, engineering studies, drilling a 1,000 foot deep well and casing, pumping equipment, transmission piping, water treatment system (including filters, chlorine, fluoride, and softener), telemetry, monitoring and control systems, plus, the construction of a building.
- 10.5 Recreational Fisheries Contamination – Visitors from the Baltimore, Washington and Richmond corridor enjoy recreational fishing for trout (which are highly sensitive to sedimentation and contamination) along the Bullpasture River and eastern brook trout fishing in the upper Cowpasture River, Benson Run, Crab Run, Davis Run and Shaws Fork with estimated expenditures of \$238 per person per day for lodging, travel and meals, and with no value placed upon their time.

11 Science & Technology:

- 11.1 Canter, Larry W., Environmental Impact Assessment (New York, New York: McGraw-Hill, 1996), 600 pages.
- 11.2 Commonwealth of Virginia, Wellhead Protection Plan (Richmond, Virginia: Department of Environmental Quality, 2005), 43 pages.
- 11.3 Forest Service, Technical Guide to Managing Ground Water Resources (Washington, DC: U.S. Department of Agriculture, Forest Service, Volume 1: National Core BMP Technical Guide, FS-881, 2012), 165 pages.
- 11.4 Forest Service, National Best Management Practices for Water Quality Management on National Forest System Lands (Washington, DC: U.S. Department of Agriculture, Forest Service, Minerals and Geology Management, Engineering, FS-990a, 2007), 165 pages.
- 11.5 Forest Service, Water Erosion Prediction Project (WEPP), WEPP: Road Interface (Moscow, Idaho: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Moscow Forestry Sciences Laboratory, See Internet website at <http://forest.moscowfsl.wsu.edu/engr/software.html>, 2015).
- 11.6 Neven Kresic, Water in Karst: Management, Vulnerability, and Restoration (New York, New York: McGraw-Hill Professional, 2012), 736 pages.
- 11.7 Virginia Department of Environmental Quality, Virginia Stormwater Management Handbook (Richmond, Virginia: Department of Environmental Quality, 2013 Revision).
- 11.8 Virginia Department of Environmental Quality, Erosion and Sedimentation Control Handbook (Richmond, Virginia: Department of Environmental Quality, 1992), 10

Chapters.

- 11.9 Commonwealth of Virginia, Virginia Erosion and Sediment Control Law (Richmond, Virginia: Department of Environmental Quality, FY 2014), 45 pages.
- 11.10 Renard, et al, Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Soil Loss Equation (RUSLE) (Washington, DC: USDA Agriculture Research Service, Handbook No. 703, 1997), 385 pages.

12 Recommended Actions:

- 12.1 Preamble – The general public and environmentally oriented Non-Governmental Organizations have little or no confidence that the Federal Energy Regulatory Commission (FERC) through its subcontractor the National Resources Group (NRG) will ensure a rigorous environmental assessment of rainfall-induced erosion in rugged mountainous terrain because: (a) the demonstrable track record of the Federal Energy Regulatory Commission since its establishment in 1972 shows that FERC's compulsion to expedite private sector applications for pipeline construction and its overriding emphasis on economic considerations always trump environmental protection, (b) environmental impact assessments overseen by the Federal Energy Regulatory Commission are viewed by informed observers as perfunctory in nature being done as a matter of form, rushed against arbitrary deadlines and largely devoid of substantive environmental analysis. The Cowpasture River Preservation Association, therefore, recommends the following specific actions:
- 12.2 The Federal Energy Regulatory Commission (FERC) shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall reimburse the FERC for any and all expenses associated with the National Resources Group or another FERC-selected contractor, in preparing scientifically rigorous and computer-based erosion predictions for each and every mountain crossed by the proposed pipeline as further enumerated above in Section 5.2 Rugged Mountainous Terrain.
- 12.3 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall prepare and submit for public review and comments a site-specific “Erosion and Sedimentation Control Plan” and furthermore, that annual general erosion and sedimentation control plans and specifications are not acceptable for a 554-mile long linear development through rugged mountainous terrain.
- 12.4 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall not have open more than Five Hundred linear feet (500') of pipeline trench at any time.
- 12.5 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall reimburse the following jurisdictions and in a timely fashion, for any and all expenses associated with hiring, training, certifying, employing and retaining or replacing “Erosion and Sedimentation Control Inspectors” – the Federal Energy Regulatory Commission (3

Inspectors), the USFS George Washington National Forest (1 Inspector), the USFS Monongahela National Forest (1 Inspector), the USNPS Shenandoah National Park (1 Inspector), the Virginia Department of Environmental Quality (3 Inspectors), and in Virginia the Counties of Augusta, Highland and Nelson (1 Inspector each), and in West Virginia the counties of Harrison, Lewis, Pocahontas, Randolph and Upshur (1 Inspector each).

- 12.6 The FERC shall establish as a condition of its “Certificate of Convenience” issued to Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates that the Federal Energy Regulatory Commission shall organize, oversee and coordinate “Erosion and Sedimentation Control Inspectors”, that FERC shall ensure continuous inspections seven days per week, that reports of environmental violations shall be prepared within 24 hours of the incident's occurrence, that reports on violations shall be made available to both the applicable landowner and the general public within 48 hours of the incident's occurrence, that “transparency” and “sunshine” shall be the watchwords, and further, that obfuscation and delay shall not be tolerated.
- 12.7 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall specify the trench back-fill materials that will be used in the Cowpasture River Valley of Virginia and similarly, for all other segments of the 554-mile pipeline right-of-way, and further, to certify the chemical composition of the trench back-fill materials and specifically including trace elements and industrial contaminants known by the U.S. Environmental Protection Agency as being harmful to the health of human beings, livestock and poultry, native fishes and/or other aquatic fauna and flora.
- 12.8 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall test municipal water wells, domestic water wells, spring-based water supplies and surface waters before, during and after pipeline construction for sedimentation and for toxic and hazardous industrial contaminants, including (but not limited to): lead, mercury, cadmium, chromium, selenium, aluminum, antimony, barium, beryllium, boron, chlorine, cobalt, manganese, molybdenum, nickel, thallium, vanadium, zinc, and arsenic.
- 12.9 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall develop a pipeline trench monitoring and remediation program for the ten years after the pipeline is placed in operation that checks the condition and functionality of erosion, sedimentation and leaching control measures, including (but not limited to): trench plugs or dams, trench settling, trench water resurfacing, failure of surface dykes or berms, emergence of buried springs or seeps, hazardous materials contamination in surface and ground waters, and water induced erosion and sedimentation on adjacent private or public lands beyond the pipeline right-of-way.
- 12.10 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall not be granted or allowed exceptions or variances by any jurisdiction based upon arguments that sufficient reasons are established by: (a) economic hardship, (b) self-imposed or self-created

conditions, or (c) time constraints or project deadlines. Note: that Dominion Resources and Dominion Resources alone, chose to build a 42” in diameter gas transmission pipeline through the most rugged mountainous terrain in the eastern United States, through karst terrain and through highly fragile soils. Note: that Dominion Resources alone made the cost-estimates to construct a 554-mile pipeline and those for better or for worse. Note: that Dominion Resources alone benefits from a fast-tracked, hurried and rushed process.

NOW THEREFORE: The Board of Directors of the Cowpasture River Preservation Association does hereby petition the Federal Energy Regulatory Commission and asks the FERC to ensure that the environmental impact assessment process for the Atlantic Coast Pipeline and the Environmental Impact Statement (EIS) address the threats caused by the proposed construction of a 42” diameter natural gas pipeline through rugged mountainous terrain and with fragile soils, as more specifically outlined above.

Thank you for this opportunity to provide public scoping comments.

With warm regards,

C. Nelson Hoy, Chairperson
CRPA Forest Liaison Committee
CRPA Atlantic Coast Pipeline Oversight Committee
BerriedaleFarms@gmail.com
(540) 925-2308

cc: Cheryl A. LaFleur, Chairwomen
Federal Energy Regulatory Commission

Chief of Staff Mike Boots
Council on Environmental Quality

Senator Elizabeth Warren
Committee on Energy and Natural Resources of the United States Senate

Senator Tim Kaine
United States Senator for Virginia

Senator Mark Warner
United States Senator for Virginia

Representative Raul Grijalva
Committee on Natural Resources of the United States House of Representatives

Representative Bob Goodlatte
United States House of Representatives

Chief Thomas L. Tidwell
USDA Forest Service

Governor Terry McAuliffe
Commonwealth of Virginia

Senator Creigh Deeds
Virginia State Senator

Senator Emmett Hanger
Virginia State Senator

Cowpasture River Preservation Association
Post Office Box 215
Millboro, Virginia 24460

April 27, 2015

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

REFERENCE: Atlantic Coast Pipeline

FERC DOCKET NO.: PF15-6-000

SUBJECT: Environmental Threat No. 3 – Degradation of Karst Terrain, Wells & Springs

Dear Secretary Bose:

This letter is an appeal from citizens of arguably the least populated rural watershed east of the Mississippi River for the Federal Energy Regulatory Commission to protect our surface and ground water resources from sedimentation and contamination. Our science- and policy-based environmental assessment shows that the construction of the Atlantic Coast Pipeline through rugged mountainous terrain in Virginia and West Virginia will undoubtedly cause damage to our karst features, wells and springs. Business-as-usual at FERC headquarters with the gas utility industry being coddled and the natural environment being ignored will be a catastrophe.

The Cowpasture River of Virginia, nestled among the Allegheny Mountains, is arguably the cleanest and most pristine river basin in the Commonwealth of Virginia. Citizens of the Cowpasture Valley formed the Cowpasture River Preservation Association (CRPA) in 1972 as a 501(c)3 not-for-profit for the dual purposes of protecting water quality and quantity in the Cowpasture River watershed. With our charter-driven purpose in mind, the Association welcomes this opportunity to offer public “scoping” comments on the proposed Atlantic Coast Pipeline.

1 Definition:

- 1.1 “Degradation of Karst Terrain, Wells and Springs” is defined as the contamination of sinkholes, losing streams, caves, springs or wells with sedimentation or hazardous industrial chemicals.

2 Deficiency:

- 2.1 Dominion Resources, Inc. and its affiliate Atlantic Coast Pipeline, LLC have failed to disclose to Federal Energy Regulatory Commission, interested Non-Governmental Organizations and the general public, how environmental impact assessments will be

made of fragile karst terrain, wells and springs in the Cowpasture River Valley and similarly for all other segments of the proposed 554-mile long pipeline.

3 Significance:

3.1 Planning Note: The following three criteria are recommended by Dr. Larry W. Cantor, Professional Engineer, Environmental Impact Assessment, Chapter 4 – Description of Environmental Setting, page 115, to determine whether or not to include a specific environmental factor as part of the essential environmental setting. The environmental factor should be included if any one or more of these three criteria is operative and in this case, all three are operative.

3.2 Criteria No. 1 – Will the environmental factor be adversely affected by the pipeline construction?

Yes. Both surface and ground water hydrology in karst terrain can be structurally and functionally altered by construction activities. Karst sinkholes can funnel construction contaminants (i.e., sedimentation, bacteria-infected debris and industrial organic chemicals) into caves and ground water aquifers.

3.3 Criteria No. 2 – Will the environmental factor exert an influence on the construction of the pipeline?

Yes. Karst sinkholes must be avoided in right-of-way siting. Karst sinkholes will require a protective buffer of natural vegetation. Pipeline infrastructure, underlain by karst terrain, can be damaged by a collapse of the supporting soil.

3.4 Criteria No. 3 – Will the environmental factor be of public interest, engender controversy or litigation?

Yes. The general public is informed and concerned about protecting karst terrain features. The Cowpasture River Preservation Association, Highlanders for Responsible Development, and the Augusta County Alliance each consider that the protection of karst terrain features is a flash-point issue.

4 Compliance:

4.1 National Environmental Policy Act (NEPA)

4.1.1 NEPA's fundamental purpose is to "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." NEPA § 102 [42 USC § 4321]

- 4.1.2 NEPA is intended to “assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.” [42 USC § 4331]
- 4.1.3 NEPA works to “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.” [42 USC § 4331]
- 4.1.4 Council on Environmental Quality's (CEQ's) NEPA Regulations define, “significance,” as “the degree to which the effects on the human environment are likely to be highly controversial” [40 CFR § 1508.27]
- 4.1.5 CEQ's NEPA Regulations define “health effects” as including “ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative.” [40 C.F.R. § 1508.8]

4.2 Federal Energy Regulatory Commission

- 4.2.1 Rules-based Vulnerability Measures: Dr. Neven Kresic, Ph.D in Geology, Professor of Groundwater Dynamics at the University of Belgrade, Senior Fulbright Scholar at the U.S. Geological Survey and arguably the world's leading authority on water in karst terrain states, *“Sometimes, with the best intentions, various government agencies...create guidance documents...on karst vulnerabilities that are confusing at best...misleading and potentially harmful. [A] typical example is a recommended minimum distance for which there should be concerns regarding certain practices; if such distance is greater than the rule of thumb, the concern somehow disappears [and] then there is no concern. Whatever the karst-related concern may be, it is best to perform a site-specific assessment and not rely on some rules of thumb...”* (See: Kresic, page 556).
- 4.2.2 FERC Guidance Manual for Environmental Report Preparation: The Federal Energy Regulatory Commission recommends a rule-based vulnerability measure for drinking water supplies stating, *“Identify by milepost all drinking water supply wells, including private, community, municipal/public wells, and springs within 150 feet of any area that would be disturbed by construction. This includes the construction right-of-way, extra work areas, new access roads, pipe storage and contractor yards, and sites for new or modified above ground facilities...”* (See: FERC, page 3-27). **NOTE: that there is no scientific basis whatsoever for the FERC-promulgated 150 foot rule of thumb.** None. The only plausible basis for the FERC 150-foot rule would be to establish for the benefit of the supplicant (i.e., Dominion Resources) an artificially low NEPA-compliance threshold.

4.3 U.S. Forest Service

- 4.3.1 The U. S. Forest Service, “Technical Guide to Managing Ground Water Resources” (See: page 1) states that, *“Ground water and surface water are interconnected and interdependent in almost all ecosystems. Ground water plays*

significant roles in sustaining the flow, chemistry, and temperature of streams, lakes, springs, wetlands, and cave systems in many settings, while surface waters provide recharge to ground water in other settings. Ground water has a major influence on rock weathering, streambank erosion, and the headward progression of stream channels. In steep terrain, it governs slope stability; in flat terrain, it limits soil compaction and land subsidence.”

4.3.2 The U. S. Forest Service, “National Best Management Practices for Water Quality Management on National Forest System Lands” (See: pages v-vi) states that, “*Current Forest Service policy directs compliance with Federal Clean Water Act permits and State regulations and requires the use of Best Management Practices for water quality management...improved accountability for water quality management... improved National Environmental Policy Act analysis, documentation and compliance... and demonstrates the Forest Service's commitment to land stewardship and protection of water quality.*”

4.4 Commonwealth of Virginia

4.4.1 Commonwealth of Virginia, Erosion and Sedimentation Control Regulations, 9VAC25-840-30. Scope and Applicability, states on page 27 that “***B. The submission of annual standards and specifications does not eliminate the need where applicable for a project specific Erosion and Sediment Control Plan.***”

4.4.2 The Commonwealth of Virginia, Erosion and Sedimentation Control Regulations, **9VAC25-840-40. Minimum standards**, Sub-section 16 states: “Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria: (a) ***No more than 500 linear feet of trench may be opened at one time...***”

5 Scoping the Challenge:

5.1 Atlantic Coast Pipeline

The Atlantic Coast Pipeline is 554 miles long. The western section of the Atlantic Coast Pipeline is characterized by rugged mountainous terrain from Harrison County, West Virginia eastward through Nelson County, Virginia and an overall distance of 160 miles. The geology of this rugged mountainous terrain is characterized furthermore by fragile karst topography with losing streams, sinkholes and caves.

5.2 Rugged Mountainous Terrain

Dominion's Atlantic Coast Pipeline is a huge industrial construction project with no known precedent in rugged mountainous terrain that will nevertheless cross 20-odd Appalachian Mountains in West Virginia and Virginia, including: Cheat Mountain, Back Allegheny Mountain, Burner Mountain, Frank Mountain, Spruce Ridge, Little Spruce Ridge, Allegheny Mountain, Tamarack Mountain, Red Oak Knob, Lantz Mountain, Monterey Mountain, Jack Mountain, Doe Hill Mountain, Bullpasture Mountain, Shaws

Ridge, Gwin Mountain, Bushy Ridge, Shenandoah Mountain, Chestnut Oak Knob, Little North Mountain and Elk Mountain.

5.3 Fragile Karst Terrain

The Dominion Resources preferred right-of-way crosses both the Bullpasture Mountain and the McDowell Anticlines which exhibit extremely high densities of karst features – sinking streams, sinkholes, caves and springs. The pipeline right-of-way crosses two or three faults – Bear Mountain Fault and Seldom Seen Fault (Lambert). Near Liberty, Virginia, the Atlantic Coast Pipeline preferred route parallels the Cowpasture River – a known sinking river – for a quarter mile.

5.4 State & Local Water Supplies

The upper Cowpasture River Valley is well known for its karst topography. The Cowpasture River itself is a losing river that sinks, journeys underground and resurges to supply the Coursey Springs Fish Cultural Station. The Bullpasture River in both Highland and Bath Counties is fed by numerous karst springs and many caves within the world renown Burnsville Cove. In the upper Bullpasture River Valley, the municipal water supply for the hamlet of McDowell is located under karst terrain. In the Upper Jackson River Valley, the municipal water supply for the Town of Monterey, Virginia is located under karst terrain. In the Shenandoah River Valley, the municipal water supply for the City of Staunton, Virginia is located under karst terrain.

5.5 Sedimentation Risk & Exposure

The USDA Natural Resources Conservation Service (NRCS) reports that the average annual precipitation in Highland County, Virginia is 37.7 inches. The NRCS in its soil survey classification schema judges the soils in the Bullpasture and Cowpasture River Valleys as being medium to highly erodible. Additionally, the NRCS judges these slopes over Shenandoah Mountain as exceptionally steep varying from 10% to 80%. Based upon computer predictions of water-induced erosion and sedimentation, prepared by the Cowpasture River Preservation Association and reported in “Environmental Threat No. 2 – Erosion in Rugged Mountainous Terrain”, there is a substantial risk of massive sedimentation being transported into surface watersheds and ground water aquifers.

5.6 Pipeline Hydrostatic Testing & Pigging

The U.S. Environmental Protection Agency (EPA) has determined that natural gas pipelines may be a source of hazardous industrial chemicals. Natural gas pipeline hydrostatic testing and pigging potentially removes both solid and liquid contaminants from the pipeline that are in turn detrimental to surface watersheds and ground water aquifers, including: paraffin wax, asphaltenes, corrosion salts and scales, hydrates, black powder (iron sulfide and/or iron oxides) and emulsions; liquid contaminants including glycols, hydrocarbon condensates, compressor oils; and hazardous materials like Polychlorinated Biphenyls (PCBs), radon, solvents and detergents.

5.7 Risk Assessment

The Bullpasture and Cowpasture Rivers are particularly vulnerable to sedimentation produced by water-induced erosion and to contamination from pipeline construction spills of industrial chemicals because the Dominion Resources preferred right-of-way for the Atlantic Coast Pipeline simultaneously crosses both rugged mountainous and karst terrain.

6 Karst Features, Sinkhole and Springs:

6.1 Overview

The rock formations in the Cowpasture River Valley are highly fractured by folding and faulting from the mountain building processes that created the characteristic the Valley and Ridge Province of Virginia. The principle ground water aquifers in the Cowpasture River watershed are Silurian and Devonian age shale and limestone. All of the surface and ground water flowing through the Cowpasture River Valley begins as precipitation. Water enters the karst aquifers by percolation through limestone anticlines that feature sinkholes, losing surface streams, and the direct capture of surface rivers and streams at sinks or in blind valleys. During the drier months of July, August, and September all of the water flowing in a river or draft comes from ground water and in the Cowpasture River Valley, 60 to 85 percent of the annual surface water runoff is from ground water. Karst ground waters are especially vulnerable to contamination because of the rapid flow rates and the complex and multifaceted but eventually direct, connections to surface water runoff. In karst terrain it becomes very difficult to predict the direction and distance of ground water flows, and the underground flow paths sometimes cross under mountain ridges to emerge in a different drainage basin. Because karst sinkholes are essentially natural injection wells, any sedimentation or industrial chemicals dumped or spilled into a sinkhole have the potential to contaminate a spring many miles away. See: Jones.

6.2 Bullpasture River Valley

6.2.1 Limestone Anticlines

In the Bullpasture River Valley the primary geological formations that exhibit karst terrain features are Devonian-Silurian carbonate limestone formations. By name these formations are recognized as the Jack Mountain Syncline, the Bullpasture Mountain Anticline and the McDowell Anticline. The Dominion Resources preferred pipeline right-of-way knowingly crosses both anticlines and the syncline.

6.2.2 Geological Faults

The Dominion Resources preferred right-of-way for the Atlantic Coast Pipeline knowingly crosses two fault lines in karst terrain – the Bear Mountain Fault (Wilkes, 2011) and the Seldom Seen Fault (Lambert, 2015). Seismic events are a

risk factor as witnessed by the Louisa County, Virginia earthquake on August 23, 2011 with a 5.8 Richter Scale tremor that damaged chimneys and foundations, opened new sinkholes and collapsed cave ceilings in Highland County approximately 110 miles away.

6.2.3 Sinking Streams

Sinking rivers and drafts are a defining attribute of karst terrain. Sinking streams function something like injection wells and recharge karst aquifers with pure, clear and sweet rainwater but unfortunately also funnel the rainfall-induced erosion of rock, soil, and debris into groundwater aquifers. In the Bullpasture River Valley, sinking streams are exceedingly common both north and south of the Dominion Resources preferred right-of-way for the Atlantic Coast Pipeline.

6.2.4 Sinkholes

Sinkholes, like losing streams, funnel rainfall into karst limestone formations. Sinkholes function as conduits and traps for water-carried rock, soil, debris and for pipeline construction or maintenance spilled diesel fuel, gasoline, pigging sludge, hydrostatic testing water and wastes.

6.2.5 Resurging Springs

Resurging karst springs are the final destination points for waters that were originally captured by sinking surface streams and through sinkholes. In between, karst waters passed through fissures, cracks, narrow passages and caves with little filtration of sedimentation or contaminants. Resurging karst waters are fundamental to the maintenance of surface water flows during the drier months of July, August and September. Dozens of karst springs supply pure, clear and cool waters to (Big) Crab Run, a VDGIF Class II Native Brook Trout stream and a tributary of the Bullpasture River. The Bullpasture River itself is a living legend among karst geologists for the intricacy of its karst water springs.

6.2.6 Aquifer Recharge

The Bullpasture Mountain and McDowell limestone anticlines are critical ground water recharge areas for the McDowell Municipal Water Supply wells.

6.3 Cowpasture River Valley

6.3.1 Shale-capped Limestone

Much of the Cowpasture River Valley is characterized by shale-capped limestone formations. Ironically, this overlying formation is Marcellus (Millboro) Shale. Limestone is exposed, however, at several places along the western edge of the Valley and against Bullpasture Mountain. The karst terrain features of the Cowpasture River Valley, therefore, include extensive limestone passages and

cave formations, and some karst features run more than six miles down the valley as determined by dye-tracing studies.

6.3.2 Geological Faults

The prominent geological features of Bullpasture Mountain and the Cowpasture River Valley include numerous second- and third-order folds, faults and shear zones.

6.3.3 Sinking Streams

The Cowpasture River south of Patna, Virginia sinks via several sink points into underground karst drainage passageways in limestone of the Helderberg Group and flows for more than six miles south to resurge as Meadow Springs at the Coursey Springs Fish Cultural Center. North of Liberty, Virginia streams that feed the Cowpasture River are believed to be sinking streams. All streams south of Liberty, Virginia are sinking streams.

6.3.4 Resurging Springs

Meadow Springs, the third largest spring in the Commonwealth of Virginia, resurges at the Coursey Springs Fish Cultural Center with dry weather or drought flow of about 4,000 gallons per minute and a rain- or storm-induced flow of about 16,000 gallons per minute. Clearly, karst ground water aquifers are hugely impacted by storm-water runoff.

6.3.5 Sinkholes

Bullpasture Mountain is peppered with sinkholes and most likely with more than 200. Again, sinkholes function as conduits and traps for water-carried rock, soil, debris and for pipeline construction or maintenance spilled diesel fuel, gasoline, pigging sludge, hydrostatic testing water and wastes.

6.3.6 Aquifer Recharge

The Cowpasture River Valley aquifer supplies potable water to all homesteads, poultry houses, dairies and ranches south of Liberty, Virginia.

6.4 Exposures Assessment

Both the Bullpasture and Cowpasture River Valleys exhibit a high exposure to the risks of sedimentation and contamination because the geology of both valleys are dominated by the Bullpasture Mountain and McDowell Anticlines which expose limestone rock formations across the path of the Atlantic Coast Pipeline proposed right-of-way. The Bullpasture River Valley, Bullpasture Mountain and the Cowpasture River Valley show an extraordinary concentration of sinking streams, sinkholes, resurging springs and karst aquifers.

7 Site-specific Erosion Prediction:

7.1 Dominion Pipeline Right-of-way

Water-induced soil erosion was predicted along Dominion Resources' preferred pipeline route from Shaws Fork eastward over Shenandoah Mountain and down to Ramsey's Draft. See: Cowpasture River Preservation Association, "Environmental Threat No. 2 – Erosion in Rugged Mountainous Terrain" (Millboro, Virginia: FERC ACP Public Scoping Comments, April 20, 2015), 13 pages.

7.2 Site-specific Assumptions

- 7.2.1 Thirty years of weather records used were for Monterey, Virginia.
- 7.2.2 The Natural Resource Conservation Service reports that the average annual precipitation in Highland County, Virginia is 37.7 inches.
- 7.2.3 The NRCS further reports that the average rainfall runoff in Highland County is 9.26 inches per year.
- 7.2.4 A RUSLE2 option was applied that defined mechanical treatment of soils as contouring both up and down slopes.
- 7.2.5 Slope steepness was defined as 35%.
- 7.2.6 Soils were defined as Berks Soils Series – Silty Loam.
- 7.2.7 The right-of-way width was defined as 125 feet.
- 7.2.8 The right-of-way length was defined as 1,000 feet.

7.3 Erosion Prediction

- 7.3.1 Planning Note: The Cowpasture River Preservation Association has prepared four erosion predictions along the Atlantic Coast Pipeline right-of-way over Shenandoah Mountain. The first prediction forecasts erosion on Shenandoah Mountain in its natural state with a hardwood forest cover. The second prediction forecasts erosion during the construction of the pipeline with the right-of-way cleared of all trees, shrubs and grasses, and with exposed rock, soil and debris. The third prediction forecasts erosion during the construction of the pipeline and with mitigative measures in place. And the fourth prediction forecasts erosion after restoration with southern grasses planted in the spring.

- 7.3.2 Natural Forest Cover – The WEPP erosion prediction with a “20 Year Old Hardwood Forest” establishes a natural state baseline of 0.77 tons/ac/yr.
- 7.3.3 Right-of-way Cleared and Excavated – The RUSLE2 erosion prediction for “Bare Cut Rough” establishes a worse case scenario under excavation and construction with a value of 450 tons/ac/yr.
- 7.3.4 Construction /w/ Mitigative Measures – The RUSLE2 erosion prediction under “Construction with Mitigative Measures” establishes a most likely scenario with 150 tons/ac/yr.
- 7.3.5 Right-of-way /w/ Grass Restoration – The RUSLE2 erosion prediction after “Restoration with Southern Grasses Grown in Spring” establishes a best possible restoration scenario with 20 tons/ac/yr.

7.4 Impact Assessment

- 7.4.1 The construction of a 42” natural gas pipeline over the great Shenandoah Mountain will most assuredly cause extraordinary and perhaps catastrophic, erosion of rock, soil and debris in the rough order of magnitude of Five Hundred (500) times the erosion that now occurs with a mature hardwood and mixed conifer forest cover.
- 7.4.2 Although best management practices or engineering mitigative measures, will definitely reduce the rainfall-induced erosion during construction phase, the erosion of rock, soil and debris actually experienced will still be at least One Hundred and Fifty (150) times the erosion that now occurs with a mature hardwood and mixed conifer forest cover, or more but not less.
- 7.4.3 Restoration of a vegetative cover over the pipeline right-of-way will reduce the predicted erosion of rock, soil and debris to approximately Twenty (20) times the erosion that now occurs with a mature hardwood and mixed conifer forest cover, however, best management practices will never come close to restoring the environment to its natural state.

8 Water Pollution Hotspots:

8.1 Overview

In assessing the future risk of ground water contamination, it is essential to determine whether pipeline construction and operation activities are likely to produce higher concentrations of hazardous industrial chemicals or to create a higher risk of spills, leaks or illicit discharges. See: Virginia Department of Environmental Quality, [Virginia Stormwater Management Handbook, Chapter 6, Appendix 6-B Stormwater Design Guidelines for Karst Terrain in Virginia](#). In the construction and operation of a natural gas pipeline, at least 13 site-specific locations should be identified, evaluated, mitigated and monitored, including:

- 8.2 Determine the location of gas transmission compressor stations.
- 8.3 Determine the location of gas pipeline maintenance (i.e., “pig” clean-out) ports.
- 8.4 Determine the locations of horizontal directional drilling mud effluent discharge.
- 8.5 Determine the locations and quantities of surface or ground water withdrawals.
- 8.6 Determine the locations of gas pipeline hydrostatic testing water and waste disposal points.
- 8.7 Determine the locations of storage areas and dispensing facilities for gasoline, diesel fuel, lubrication oils and greases.
- 8.8 Determine the locations for the use of herbicides and their chemical compositions.
- 8.9 Determine the locations of rock trenching, quarrying or borrow pits.
- 8.10 Determine the locations susceptible to limestone rock leaching.
- 8.11 Determine the locations for blasting and the specific explosive chemicals used.
- 8.12 Determine the locations of temporary and permanent road crossings of rivers, runs and drafts.
- 8.13 Determine the locations of vehicle, truck and construction equipment storage, staging or parking areas.
- 8.14 Determine the locations of proposed dams, impoundments, ponds or catch-basins.
- 8.15 Risk Assessment

Potentially hazardous wastes generated during pipeline operations in studies by the Argonne National Laboratory, include: pipeline sludge, spent pigs, horizontal drilling muds, methyl ethyl ketone, paint thinner, solvents, diesel fuel, gasoline, oils and lubricants. The USFS George Washington National Forest, Non-Governmental Organizations with environmental charters, the general public and private landowners must know now the location of planned, proposed or possible water pollution hotspots, as distinguished from after-the-fact of a FERC-granting of a “Certificate of Convenience” or through petitions for variances or exceptions. Dominion Resources must ensure the identification, evaluation, mitigation and monitoring of water pollution hotspots.

9 Economic Costs:

9.1 Overview

The economic impact assessments commissioned by Dominion Resources and touted by Virginia Governor Terence McAuliffe, highlight state income tax, local property tax, and Virginia-based employment benefits. These same economic impact assessments are utterly silent about local economic risks, exposures and potential financial investment losses due to the sedimentation and contamination of surface waters, karst aquifers, wells and springs.

- 9.2 Domestic Water Contamination – Homesteaders in the Cowpasture River Valley who must replace a domestic water well that becomes contaminated with sedimentation or hazardous industrial contaminants with a new water well drilled into a potable aquifer, if a clean aquifer can be found, face an out-of-pocket expense of an estimated \$35,000 or more, plus emergency supply of 300 gallons of water on a daily basis.
- 9.3 Livestock Water Contamination – Dairies and ranches in the Cowpasture River Valley that must replace a farm water supply well that becomes contaminated with sedimentation or hazardous industrial contaminants with a new well drilled into a potable aquifer, if a clean aquifer can be found, face an out-of-pocket expense of an estimated \$50,000 or more, plus an emergency supply of 20,000 gallons on a daily basis.
- 9.4 Aqua-agriculture Contamination – The Virginia Department of Game and Inland Fisheries, Coursey Springs Fish Cultural Center in the Cowpasture River Valley depends upon cold and pure water from the Cowpasture River which sinks and resurges as Coursey Springs and a flow rate of 4,000 to 16,000 gallons per minute, and this third largest spring in the Commonwealth most likely cannot be replaced at any cost.
- 9.5 Municipal Water Supply Contamination – City and town governments in Virginia and West Virginia that must replace a municipal water supply well that becomes contaminated with hazardous industrial chemicals or sedimentation with a new well drilled into a potable aquifer, if a clean aquifer can be found, face an out-of-pocket expenses of an estimated \$2,500,000 or more for geophysical and hydrological studies, land purchases, engineering studies, drilling a 1,000 foot deep well and casing, pumping equipment, transmission piping, water treatment system (including filters, chlorine, fluoride, and softener), telemetry, monitoring and control systems, plus, the construction of a building.
- 9.6 Recreational Fisheries Contamination – Visitors from the Baltimore, Washington and Richmond corridor enjoy recreational fishing for trout (which are highly sensitive to sedimentation and contamination) along the Bullpasture River and eastern brook trout fishing in the upper Cowpasture River, Benson Run, Crab Run, Davis Run and Shaws Fork with estimated expenditures of \$238 per person per day for lodging, travel and meals, and with no value placed upon their time.
- 9.7 Cost-benefit Analysis

Economic impact assessments that evaluate and tout the purported benefits and completely ignore the costs are disingenuous at the best and otherwise, blatantly dishonest. The National Environmental Policy Act requires a balanced assessment of

costs versus benefits and an equal consideration of protecting the environment, surface waters and ground waters. This balanced perspective is not happening under the stewardship of the Federal Energy Regulatory Commission.

10 Science & Policy:

- 10.1 Canter, Larry W., Environmental Impact Assessment (New York, New York: McGraw-Hill, 1996), 600 pages.
- 10.2 Commonwealth of Virginia, Hazard Mitigation Plan, Chapter 3 – Hazard Identification and Risk Assessment, Section 3.14 – Land Subsidence (Karst) (Richmond, Virginia: Virginia Department of Emergency Management, March 2013), 15 pages.
- 10.3 Commonwealth of Virginia, Wellhead Protection Plan (Richmond, Virginia: Department of Environmental Quality, 2005), 43 pages.
- 10.4 Enomoto, C. B., et al, “Geology of the Devonian Marcellus Shale – Valley and Ridge province, Virginia and West Virginia” (Reston, Virginia: U.S. Department of the Interior, US Geological Survey, A Field Trip Guidebook for the American Association of Petroleum Geologists, September 28-29, 2011, Open File Report 2012 – 1194), 55 pages.
- 10.5 Forest Service, Technical Guide to Managing Ground Water Resources (Washington, DC: U.S. Department of Agriculture, Forest Service, Volume 1: National Core BMP Technical Guide, FS-881, 2012), 165 pages.
- 10.6 Forest Service, National Best Management Practices for Water Quality Management on National Forest System Lands (Washington, DC: U.S. Department of Agriculture, Forest Service, Minerals and Geology Management, Engineering, FS-990a, 2007), 165 pages.
- 10.7 Forest Service, Water Erosion Prediction Project (WEPP), WEPP: Road Interface (Moscow, Idaho: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Moscow Forestry Sciences Laboratory, See Internet website at <http://forest.moscowfsl.wsu.edu/engr/software.html>, 2015).
- 10.8 Jones, William K., Karst Hydrologist, “Ground-water Resources of the Cowpasture River Valley” (Monterey, Virginia: *The Recorder*, Essay Series on Water Resource Stewardship, November 6, 2014).
- 10.9 Kresic, Nevin, Water in Karst: Management, Vulnerability, and Restoration (New York, New York: McGraw-Hill Professional, 2012), 736 pages.
- 10.10 Lambert, Richard A., “General and Specific Assessments of Karst Systems in Highland County, Virginia Along the Preferred Route of the Proposed Atlantic Coast Pipeline” (Monterey, Virginia: Highland County Cave Survey, April 19, 2015), 50 pages.

- 10.11 Lambert, Richard A., Virginia Speleological Society, “Karst Sinkholes of the Cowpasture Watershed” (Monterey, Virginia: *The Recorder*, Essay Series on Water Resource Stewardship, January 8, 2015).
- 10.12 Renard, et al, Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Soil Loss Equation (RUSLE) (Washington, DC: USDA Agriculture Research Service, Handbook No. 703, 1997), 385 pages.
- 10.13 Virginia Cave Board, Karst Assessment Standard Practice (Richmond, Virginia: Virginia Department of Conservation and Recreation, circa 2010), 9 pages.
- 10.14 Virginia Department of Environmental Quality, Virginia Stormwater Management Handbook (Richmond, Virginia: Department of Environmental Quality, 2013 Revision).
- 10.15 Virginia Department of Environmental Quality, Erosion and Sedimentation Control Handbook (Richmond, Virginia: Department of Environmental Quality, 1992), 10 Chapters.

11 Recommended Actions:

11.1 Preamble

The general public and environmentally oriented Non-Governmental Organizations have little or no confidence that the Federal Energy Regulatory Commission (FERC) through its subcontractor the Natural Resources Group (NRG) will ensure a rigorous environmental assessment of degradation of karst, wells and springs in rugged mountainous terrain because: (a) the demonstrable track record of the Federal Energy Regulatory Commission since its establishment in 1972 shows that FERC's compulsion to expedite private sector applications for pipeline construction and its overriding emphasis on economic considerations always trump environmental protection, (b) environmental impact assessments overseen by the Federal Energy Regulatory Commission are viewed by informed observers as perfunctory in nature being done as a matter of form, rushed against arbitrary deadlines and largely devoid of substantive environmental analysis. The Cowpasture River Preservation Association, therefore, recommends the following specific actions:

11.2 The Federal Energy Regulatory Commission (FERC) shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall reimburse the FERC for any and all expenses associated with the Natural Resources Group or another FERC-selected contractor, in preparing a scientifically rigorous and computer-based erosion prediction for each and every mountain crossed by the proposed pipeline as further enumerated above in Section 5.2 Rugged Mountainous Terrain.

11.3 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall

ensure that professional engineers who work on or contribute to an environmental impact assessment and statement that deals with surface water and ground water impacts, risks and exposures; best management practices and mitigative measures must be qualified as follows: (a) a Professional Engineer (PE) with a hydrogeological specialty and with a minimum of 8-years of experience; and a Certified Ground Water Professional (CGWP); or (b) a Certified Professional Geologist (CPG) with a minimum of 8-years experience; and a Certified Ground Water Professional (CGWP); and (c) Certified for professional practice in the Commonwealth of Virginia.

- 11.4 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall prepare and submit for public review and comments a site-specific “Erosion and Sedimentation Control Plan” and furthermore, that annual general erosion and sedimentation control plans and specifications are not acceptable for a 554-mile long linear development through rugged mountainous terrain.
- 11.5 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall not have open more than Five Hundred linear feet (500') of pipeline trench at any time.
- 11.6 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall reimburse the following jurisdictions and in a timely fashion, for any and all expenses associated with hiring, training, certifying, employing and retaining or replacing “Erosion and Sedimentation Control Inspectors” – the Federal Energy Regulatory Commission (3 Inspectors), the USFS George Washington National Forest (1 Inspector), the USFS Monongahela National Forest (1 Inspector), the USNPS Shenandoah National Park (1 Inspector), the Virginia Department of Environmental Quality (3 Inspectors), and in Virginia the Counties of Augusta, Highland and Nelson (1 Inspector each), and in West Virginia the counties of Harrison, Lewis, Pocahontas, Randolph and Upshur (1 Inspector each).
- 11.7 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall specify the trench back-fill materials that will be used in the Cowpasture River Valley of Virginia and similarly, for all other segments of the 554-mile pipeline right-of-way, and further, to certify the chemical composition of the trench back-fill materials and specifically including trace elements and industrial contaminants known by the U.S. Environmental Protection Agency as being harmful to the health of human beings, livestock and poultry, native fishes and/or other aquatic fauna and flora.
- 11.8 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall be prohibited from the discharging of hydrostatic test waters and wastes into the waters of the Bullpasture and Cowpasture Rivers and their tributaries and further, prohibited from disposing of hydrostatic test waters and wastes into terrestrial sinkholes or drilled

injection wells within the Cowpasture and Bullpasture Rivers Watershed.

- 11.9 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall test municipal water wells, domestic water wells, spring-based water supplies and surface waters before, during and after pipeline construction for toxic and hazardous industrial contaminants, including (but not limited to): lead, mercury, cadmium, chromium, selenium, aluminum, antimony, barium, beryllium, boron, chlorine, cobalt, manganese, molybdenum, nickel, thallium, vanadium, zinc, and arsenic.
- 11.10 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall develop a pipeline trench monitoring and remediation program for the ten years after the pipeline is placed in operation that checks the condition and functionality of erosion, sedimentation and leaching control measures, including (but not limited to): trench plugs or dams, trench settling, trench water resurfacing, failure of surface dykes or berms, emergence of buried springs or seeps, hazardous materials contamination in surface and ground waters, and water induced erosion and sedimentation on adjacent private or public lands beyond the pipeline right-of-way.
- 11.11 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall not be granted or allowed exceptions or variances by any federal, state or local jurisdiction based upon arguments that sufficient reasons are established by: (a) economic hardship, (b) self-imposed or self-created conditions, or (c) time constraints or project deadlines. Note: that Dominion Resources and Dominion Resources alone, chose to build a 42” in diameter gas transmission pipeline through the most rugged mountainous terrain in the eastern United States, through karst terrain and through highly fragile soils. Note: that Dominion Resources alone made the cost-estimates to construct a 554-mile pipeline and for better or for worse. And Note Further: that Dominion Resources alone benefits from a fast-tracked, hurried and rushed process.
- 11.12 The FERC shall establish as a condition of its “Certificate of Convenience” that Dominion Resources, Inc., the Atlantic Coast Pipeline, LLC and/or its affiliates shall post a surety that insures the Cowpasture River Valley, its landowners, farmers, ranchers, hospitality businesses, municipal water supplies, and the Coursey Springs Fish Cultural Center from loss of water quality and/or quantity and all expenses associated with re-establishing potable water supplies, with the surety in the aggregate amount of Fifteen Million Dollars (\$15,000,000), and with the surety being good or valid for five years after the Atlantic Coast Pipeline becomes fully operational.

NOW THEREFORE: The Board of Directors of the Cowpasture River Preservation Association does hereby petition the Federal Energy Regulatory Commission and asks the FERC to ensure that the environmental impact assessment process for the Atlantic Coast Pipeline and the Environmental Impact Statement (EIS) address the threats caused by the proposed construction of a 42” diameter natural gas pipeline through rugged mountainous and fragile karst terrain, as more specifically outlined above.

Thank you for this opportunity to provide public scoping comments.

With warm regards,

C. Nelson Hoy, Chairperson
CRPA Forest Liaison Committee
CRPA Atlantic Coast Pipeline Oversight Committee
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cc: Cheryl A. LaFleur, Chairwomen
Federal Energy Regulatory Commission

Christy Goldfuss, Managing Director
Council on Environmental Quality

Senator Elizabeth Warren
Committee on Energy and Natural Resources of the United States Senate

Senator Tim Kaine
United States Senator for Virginia

Senator Mark Warner
United States Senator for Virginia

Representative Raul Grijalva
Committee on Natural Resources of the United States House of Representatives

Representative Bob Goodlatte
United States House of Representatives

Chief Thomas L. Tidwell
USDA Forest Service

Governor Terry McAuliffe
Commonwealth of Virginia

Senator Creigh Deeds
Virginia State Senator

Senator Emmett Hanger
Virginia State Senator