The Recorder

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Threats to safety, health, environment from pipeline still not addressed

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Editor's note: The following excerpts were taken from a letter regarding the proposed Atlantic Coast Pipeline that was sent Dec. 27 to Terry Turpin, director, Office of Energy Projects, at the Federal Energy Regulatory Commission, and entered into FERC's docket on the case. The full letter can be found at: https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=15444387.

Director Turpin:

I wrote to you on July 10, 2019 regarding the May 3, 2019 Little Valley and Bolar dye trace study, karst survey reports, and electrical resistivity testing completed by Geo Concepts Engineering Inc. in December 2018 for my property, neighboring properties, and Little Valley, in Bath County, Virginia.

In that letter, I advised you the reports, tests, and studies did not satisfy Condition 26 of the FERC certificate for the Atlantic Coast Pipeline. At this time, I have not seen that Atlantic has satisfied Condition 26.

In this correspondence I will review additional threats to drinking water sources of residents of Little Valley, and elsewhere along the proposed ACP route, and review further concerns regarding public health, the environment, and wildlife, including endangered species.

The new information I am reviewing includes a significant threat from pipeline pollutant leakage that FERC has heretofore not satisfactorily addressed.

Pipeline pollutant leaks

I have researched leaks from gas transmission lines, and found they are extensive.

Alvarez et al, in an article in Science Magazine in 2018, found that natural gas transmission lines, like the ACP, lose 0.35 percent of their product during transmission. EPA's 2017 National

Inventory of Greenhouse Gases and Sinks found that 10 percent of those transmission losses were from intentional releases, including blowdowns for pipe repair and maintenance, and routine compressor station blowdown releases.

Therefore, 90 percent of transmission losses, or 0.315 percent of total pipeline volume is lost by leakage.

Given the very large volume of gas transported through transmission lines, a large volume of pipeline pollutants are being released into our environment … The ACP is proposed to travel through 71 miles of karst terrain in the current route. Therefore, expected ACP pipeline losses to karst terrain along the ACP would be 554,510 cubic feet of pollutant leakage per day when carrying 1.5 bcf/d, and 739,323 cubic feet of pollutant leakage per day when carrying 2.0 bcf/d.

The ACP is proposed to travel 21,800 feet through Little Valley. Expected ACP pollutant leakage to Little Valley would be 32,760 cubic feet per day when carrying 1.5 bcf/d, and 43,600 cubic feet per day when carrying 2.0 bcf/d.

The ACP is proposed to travel 3,049 feet through my property. Expected ACP pollutant leakage to my property would be 4,573 cubic feet per day when carrying 1.5 bcf/d, and 6,098 cubic feet per day when carrying 2.0 bcf/d.

Please note leak locations may not be uniform over the entire pipeline. They may be higher in some areas, and lower in other areas. The above figures represent an average of losses over the entire transmission line. The amount and composition of the pollutant leakage from the ACP is reasonably expected to be similar to the gas transmission pipeline leakage research findings.

However, leakage from the ACP may actually be higher than the average gas transmission pipeline, due to the following factors:

• The ACP would be constructed on extreme and unstable slopes with geohazards, including land movement, that would stress the pipe, and particularly the pipe welds, leading to increased leakage. The proposed route includes over 160 miles with a significant risk of landslides, and over 120 miles where a high incidence of landslides has already occurred. The Pipeline and Hazardous Materials Safety Administration recently sent out a safety warning to pipeline operators regarding pipe stability concerns from soil movement in steep terrain. This warning was prompted by a large number of recent pipeline explosions and ruptures in steep terrain, similar to the area that would be traversed by the ACP.

• Karst terrain is unstable as well, with underground voids that are prone to dynamic change as limestone dissolves in underground aquifers. Pipeline construction is likely to accelerate these changes through redirection of stormwater (which is known to create new sinkholes in karst) and altered underground flow routes. This inherent instability would also stress the pipe and welds, leading to increased leakage.

• In response to a PHMSA request for information regarding welding errors obtained through a FOIA request, the ACP stated, “The intent is that a completed weld having defects exceeding 15

percent of the circumference of the pipe diameter is an integrity issue and shall be removed." This does not even guarantee that weld defects nearly 20 inches in length on the 42-inch diameter pipes would be removed, and gives no assurance that weld defects less than 20 inches in length would be repaired. Defective welds lead to leaks, and explosions.

• Since the ACP would be constructed primarily in sparsely populated areas, PHMSA safety requirements are reduced. This includes substantially thinner pipe walls, less weld inspections, reduced hydrostatic testing requirements, and less inspections once the pipe is in operation. This would also increase the likelihood of leaks, and continuing leakage.

Pollutant leakage from the ACP to our environment, and to karst would be very substantial.

Pollutants in pipeline stream

The largest constituent carried in natural gas pipelines is methane. There are other constituents as well, including liquids that can precipitate out of the gas stream. All of these can cause environmental damage when released, and all can be detrimental to human and wildlife health.

The percent of constituents carried in natural gas pipelines can vary considerably according to where the natural gas is obtained. Virtually all of these, with the exception of oxygen, are pollutants.

Methane amounts in natural gas pipelines are generally between 90 percent and 95 percent, but can be as low as 60 percent. Other pollutants include ethane, propane, butane, pentane, hexane, heptane, octane, hydrogen sulfide, and aromatic chemicals, including benzene, toluene, benzoic acid, and naphthalene.

Negative impacts of pollutants

Virtually all of the pollutants carried in gas pipelines mentioned here have negative health and environmental impacts.

The pollutants have carcinogenic, mutagenic, and toxic properties. They negatively impact respiration, and the central nervous system, cause cardiac arrhythmia, displace oxygen, and cause toxicity to aquatic life, with long lasting impacts … All of these polluting chemicals are likely to enter confined karst underground environments, and groundwater, and surface water along, and near the current proposed route of ACP. Each of them has specific negative impacts to human health, the environment, and to living organisms, including endangered species. In combination, these pollutants pose an even more significant threat.

Pathways of pollutants in karst

The ACP is a 42-inch diameter pipeline that would be buried underground. On average, the top of the pipe would be up to six feet under the surface of the ground, and the bottom of the pipe would be up to 9-10 feet under the surface.

However, on steeper ridges the pipe could be considerably deeper, since the ridges would need to be initially flattened for construction safety, and then the ridge returned to its original contour after the pipe is placed in the ground. On some ridges, this could put the top of the pipe under more than 30 feet of fill. Compacted soil and other backfill would cover the pipe to those depths.

Gas in the pipeline would be under 1,440 pounds per square inch pressure. This is about 100 times more pressure than atmospheric pressure. Due to the very large difference in pressure inside and outside of the pipe, leaks in the pipe would be constantly forced out of the pipe under high pressure.

Renowned karst expert and hydrogeologist Christopher Groves pointed out in comments to the FERC Mountain Valley Pipeline docket that caves and karst areas are interconnected to a greater extent than previously thought, and pollutants can travel rapidly through them. He also points out that pollutants can enter karst aquifers not only through sinkholes and sinking streams, but through diffuse infiltration, or diffuse autogenic recharge, through highly permeable bedrock covering large areas, with little filtering.

Since the pipe will be covered with 6-10 feet of compacted soil, the pressurized leaks will flow along the path of least resistance, and in many cases enter karst voids and caves, rather than discharge to the atmosphere.

There are three possible pipeline pollutant pathways to the karst voids and caves:

• Through interconnected karst passages, no matter how small, in the immediate area of the pipe leak.

• By following the outside of the pipe along voids around the pipe created by subsurface water flow, and inherent difficulty in completely compacting soils immediately adjacent to a large 42-inch diameter pipe, and then entering karst voids and caves through an interconnected karst passage.

• By diffuse infiltration, either at the leak location, or along the voids in the ground along the pipe.

Once the pollutants reach the karst voids and caves, they are likely to accumulate and concentrate within these confined spaces, rather than mix and dilute into our atmosphere, as above ground blowdowns from pipe repair and maintenance, and blowdowns from compressor stations do.

FERC ACP inaccuracies

FERC's Environmental Impact Statement is severely deficient regarding pipeline leaks, and pipeline leaks to karst … (the) FERC statements do not accurately assess the negative impacts of ACP pipe leaks, and pipe leaks to subterranean karst areas.

• The EIS only addresses methane, and none of the other numerous chemical pollutants that would be leaked from the pipe.

• Even though methane is lighter than air, it would be discharged from leaks in the underground pipe up to and greater than 10 feet below the surface of the ground. It would not dissipate into the air. The compacted earth above the pipe would prevent the methane from reaching the atmosphere. Instead, the methane would be more likely to follow the path of least resistance, and be drawn into the many nearby interconnected karst passages and voids, or enter the karst passages and voids by diffuse infiltration through permeable material. Many of the other pipeline pollutants are heavier than air.

• Barometric pressure differences would have little or no impact on methane being drawn into karst, because the leaks are effectively blocked from the atmosphere by the large amount of fill material over the underground pipe. Regardless of the barometric pressure, methane, and other gas stream pollutants are likely to be drawn into underground voids in the karst.

• Inspections of the trench for openings to karst as described in the karst mitigation plan will not adequately insure all pathways from the trench to karst voids are found and sealed due to the following factors:

• Openings to karst may be too small to be located and sealed during this massive construction project, which is planned on slopes exceeding 60 percent under very adverse conditions, and with much loose material in the trench, making observation of openings extremely difficult. The ACP has previously publicly stated they plan to continue construction throughout the winter, and in snow depths of up to 11 inches. Construction workers, or even karst specialists, will not be able to find all openings to karst, or even a reasonable number of them, under these adverse conditions. Nor will they be able to locate and somehow seal permeable material in the base of the trench that would allow leaked pollutants to enter the karst voids.

• The ACP has failed to conduct satisfactory inspections and procedures to protect the pipes from leaks and damage in just the first few miles of construction, and this risky behavior is likely to continue.

• PHMSA has cited the ACP for probable violations for placing pipe in rock lined trenches which could damage the pipe.

• The ACP has also had to remove pipe from the ground due to pipe coating anomalies that should have been found during mandatory inspections of the pipe required by PHMSA regulations before placing the pipe in the trench, and placing backfill over the pipe. These anomalies were only found by an electrical test after the pipe had already been placed into the ground.

• The project has already created numerous areas of land slippage in just the first few miles of construction.

• The ACP has failed to protect the fusion bonded epoxy pipe coating from UV damage that degrades the coating, making it thinner, and less capable of preventing corrosion. Corrosion is one of the leading causes of pipe failure.

• The EIS incorrectly states the likelihood of a gas release is low. All evidence, as indicated by EPA, the Alvarez study, and others, shows these releases are routine, pervasive, ongoing, and inevitable.

• The EIS states the pipeline will be monitored, but PHMSA regulations only require patrols and leak detection inspections once every 15 months. Regardless, the chances of a patrol or leak detection inspection finding an underground leak to karst is extremely rare.

Pipeline coating issues

I have filed comments to the FERC ACP docket on several occasions regarding concerns about the public health, and environmental threats from the 3M Scotchkote Fusion Bonded Epoxy 6233 coating, used on the exterior of the pipes for corrosion protection.

According to the 3M Material Safety Data Sheet the coating contains numerous carcinogenic, mutagenic, and toxic constituents that could leach out into the groundwater. The coating has also been degrading due to more than three years of exposure to ultraviolet light in sunlight at various pipe storage yards in West Virginia, Virginia, and North Carolina.

Coating manufacturer 3M acknowledges the UV degradation issue, and has stated in a position paper that UV degradation byproducts are expected to be toxic to aquatic life. 3M recommends practices to prevent UV degradation, but the ACP has advised PHMSA they have not completed any of these practices.

Records obtained through a FOIA request show that almost all pipes were already experiencing coating degradation more than two years ago. I do not have current pipe coating degradation information, but I am planning to file another FOIA request with PHMSA in hopes of obtaining it … I advised FERC that the pipe coating public health concerns should be referred to the U.S. Department of Health and Human Services, since this is a public health issue, but to my knowledge, FERC has not done so.

At this time, no state or federal agency has stated the pipe coating is safe for human health or the environment. Nevertheless, tens of thousands of these pipes, with degrading coating, remain in large storage yards in West Virginia, Virginia, and North Carolina with the likelihood that the degraded coating is becoming windborne during wind and storm events, and is falling off the pipes and washing onto the ground.

Erosion, sediment control

The erosion and sediment control plans approved by DEQ for the ACP are inadequate to protect groundwater and surface water from pollution from a project of this size, and with such extreme slopes.

The plans do not contain sediment traps or sediment basins, and do not limit the amount of grading that can occur at any one time. In fact, DEQ has waived the standard requirements for open trench length, as well as other standard control requirements for this project.

I worked for the Maryland Department of Environment for most of my career, and a large part of my work was reviewing, inspecting, and enforcing erosion and sediment control requirements on large construction sites. I have reviewed hundreds, if not thousands, of erosion and sediment control plans. I can tell you, with no reservations whatsoever, that the erosion and sediment control plans approved for the ACP by DEQ are the worst plans that I have ever seen for a large construction project.

DEQ has also waived all stormwater management requirements for this project, even though stormwater runoff will result in pollution, including thermal pollution to receiving waters, and downstream flooding.

Additionally, DEQ enforcement options are limited to penalties that are much too small to effectively influence the ACP to obey the law, and comply with even these substandard plans.

The Mountain Valley Pipeline, with similar ineffective DEQ approved plans, and similar extreme construction conditions, has already caused massive pollution to Virginia waters. The ACP will do the same unless the plans are extensively upgraded.

Impacts to karst, Little Valley

Pollution from pipeline leaks, the pipeline coating, and pipeline construction and maintenance will very likely significantly and negatively impact public health, the environment, and wildlife, including endangered species along the entire 605-mile proposed route … I believe the study, surveys, and tests used faulty methodology and faulty data to arrive at unreliable conclusions that do not satisfy Condition 26 of the ACP certificate. They do not show that groundwater, and private drinking water sources will be adequately protected.

In fact, following those studies and surveys, the Virginia Department of Conservation and Recreation's leading karst specialist wrote to karst expert William Jones on Nov. 11, 2019, and stated "My thought is that since the stratigraphic section hosting that aquifer overlies the main block of middle Ordovician limestones, all those shale interlayers make little aquiferlettes bound by aquitards breached intermittently by fractures, small offset faults, and erosional surfaces. Combine that with a local cover of talus and you've got a really messy system, the behavior of which is going to vary dramatically depending on the precipitation event and the antecedent conditions. What a mess! As far as risk from the pipeline ROW to water supplies goes, I think this tells us that anyone along Jack Mountain could be impacted by releases from the pipeline

ROW. Should ACP be built, which looks uncertain at this point, I would recommend to all residents that they make sure ahead of time that DEQ knows and acknowledges that their water supplies may be at risk from the pipeline. In my opinion, any residence along the NW slope of Jack Mountain from Robinsons all the way to Bolar could be impacted (though quantitative estimate of risk is very difficult if not impossible.)"

He goes on to recommend residents prepare for loss of their drinking water by making sure they are eligible for compensation if they lose their water.

Drinking water loss

The means to obtain fair compensation for drinking water polluted by pipeline activities, that have been approved by FERC and the Commonwealth of Virginia Water Quality Certificate for the ACP are unsatisfactory as follows:

• Compensation approved by FERC is limited to private spring and well drinking sources within 500 feet of the pipeline in karst areas. Pollution in karst areas can travel miles per day, and has been shown to travel up to eight miles from the pollution source. Drinking water springs and wells that are more than 500 feet from the pipeline that are polluted by pipeline activities are not eligible for compensation.

• Compensation is limited to only existing drinking water springs and wells, and is not available to persons who wish to use a spring that is not currently a drinking water source, or for a new well ,which may be polluted from the ACP.

• Pre-construction testing for pollutants can only be completed by an ACP contractor under the FERC approved test protocol. Many persons understandably do not trust an ACP contractor to reliably test their well or spring, and therefore, have not requested this testing.

• Under the Virginia Water Quality Certificate compensation procedures, testing in karst may extend to private wells and drinking water springs within 1,000 feet of the pipeline. However, only one test is completed, and that test may be completed after the pipe is already in the ground, where pipeline pollution may have already occurred. This testing protocol, which eliminates needed “before and after” testing, is meaningless.

• Testing protocols may exclude pollutants from the pipe coating or pipe leaks.

• The burden of proof is on the property owner to detect and report their drinking water is polluted. The pollutant may be non-detectable by taste, odor, or appearance, and may be unreported, though still harmful to health.

• The ACP makes the determination as to whether or not pipeline activities polluted the drinking water source.

• Compensation is made by supplying an artificial source of drinking water, with no compensation for inevitable and substantial property value losses from loss of a natural water supply, and polluted aquifer.

FERC’s failure

Our air and our water are our most important natural resources. Our health is our most important asset. Our environment provides all of essential services that have sustained us, and allowed us to prosper.

FERC's cavalier and incorrect assessment of the significant risks … from the ACP is unacceptable, and does not comply with the National Environmental Policy Act.

FERC's failure to adequately, timely, and responsibly respond to citizen and state concerns regarding the impacts of the ACP … is also unacceptable, and does not comply with NEPA … FERC must:

• Require all stored pipe be covered to prevent negative health impacts from windborne degraded coating.

• Fully consult with federal agencies of expertise, including the U.S. Environmental Protection Agency, the U.S. Department of Health and Human Services, and the U.S. Geological Survey regarding the significant threats … from ACP pipeline pollution leakage.

• Obtain independent and unbiased assessments of the Dominion reports, and threats … from private experts, in order to balance the current lack of scientific integrity forced upon federal agencies by the current Administration.

• Route the ACP away from Little Valley and other karst areas.

• Withhold a notice to proceed until all of the above actions and consultations are completed, and a science based conclusion is reached that there will be no impact to our air, our water, our health, our environment, and our wildlife, including endangered species, from ACP construction, operation, and maintenance.

I would be happy to discuss each and any of these issues with you, or your staff.

William F. Limpert
Little Valley, Va.