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Bath resident finds Dominion pipe coating analysis inadequate

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Editor's note: The following letter was recently submitted to Kimberly Bose, secretary of the Federal Energy Regulatory Commission, in response to Dominion Energy's explanation and data about the coating it uses on pipe for the proposed Atlantic Coast Pipeline. Included were several studies and fact sheets, and expert analysis. This is an excerpt of the full letter.

Secretary Bose:

I have reviewed Dominion's July 22 and Aug. 23 reports to the Federal Energy Regulatory Commission. The reports were in response to FERC's July 3 request for data regarding possible environmental and health impacts from the 3M Scotchkote Fusion Bonded Epoxy 6233 external pipe coating, and other pipe coating products used for the Atlantic Coast Pipeline.

I believe Dominion's reports significantly understate the risk to public health and the environment from this coating, and other products used on the exterior of the pipe. I believe the reports use questionable data, and questionable methodologies to arrive at unreliable conclusions, and therefore, do not adequately answer the FERC's request for information, or the concerns raised by the Virginia Department of Health.

The following comments critique the July 22 report.

No leaching studies

Response to question 1 — Dominion states that manufacturer 3M has stated that hazardous substances shown on the safety data sheet for Scotchkote Fusion Bonded

Epoxy coating 6233 is expected to be encapsulated in the coating and not migrate onto the surface or leach out of the coating. Coating manufacturer 3M states in its September 19, 2018 Material Declaration on 3M EMD Products sold in the USA, "As leaching studies have not been performed on these products, soil leachability from these products is unknown."

This definitive declaration from 3M contradicts the 3M statement in the preceding paragraph.

The Virginia Department of Health has determined that epoxy resins similar to this coating can leach out substances that negatively impact human health, including carcinogens benzene and styrene.

Dominion further states in ... their July 22, report, “Potential environmental pathways include (1) possible leaching by contact with water into soil and groundwater.”

These facts are contrary to 3M’s above stated expectations.

Dominion states that 3M’s FBE coating has obtained NSF 61 certification.

3M Scotchkote Fusion Bonded Epoxy 6233W has received that certification. 3M Scotchkote Fusion Bonded Epoxy 6233 (6233), which is used to coat the exterior of the pipes for the ACP, has not received that certification.

Although these materials are similar or identical, they are used differently, and subject to vastly different environmental stressors which impact them in different ways. NSF certification for 6233W, which is used on the interior of drinking water pipes, does not indicate that 6233, used on the exterior of the pipes, will not release substances that are detrimental to human health or the environment.

Perhaps the most outstanding difference is 6233W is not subject to UV degradation when applied to the interior of potable water pipes, while 6233 is subject to UV degradation when stored in sunlight.

In fact, many of the pipes for the ACP have been exposed to UV degradation during storage for over three years, and may be exposed to further UV degradation for an undetermined period into the future, since the project is currently inactive due to multiple permit revocations by the courts.

The same Sept. 19, 2018 3M Materials Declaration document cited above indicates that “some photo degradation products will be toxic to aquatic life.”

6233 is also subject to mechanical impacts from construction handling, and abrasive materials in the backfill that will cause particulate matter to dislodge from the main body of the coating. This does not occur with 6233W; 6233 is subject to contact with groundwater with widely variable chemical properties, including pH, salinity, and a variety of minerals, microbes, and other organisms, including burrowing animals. 6233W is exposed to regulated static water contact.

Application techniques and procedures for 6233W and 6233 may be different as well, and this could create a difference in how this product leaches, extracts, or discharges particulate matter and pollutants.

Degradation will have impacts

Stating that 6233W has received NSF 61 does not indicate that 6233 is free from negative health or environmental impacts when applied to the exterior of gas pipelines.

Dominion states, “According to 3M, chalking is a phenomenon that occurs when epoxy-based coatings are exposed to UV for an extended period of time. The chalk is a thin layer (microns thick) that adheres to the surface of the pipe that is composed of polymer degradation products (not typically known with specificity) that are created by exposure of the surface of the pipe to UV light from the sun. Although 3M has no conclusive evidence at this time to confirm their exact identity, the degradation products are generated in low quantities, have low water solubility, and are therefore not expected to enter the environment in amounts capable of producing an adverse human health effect.”

The pipes have been exposed to UV for an extended period of time, exceeding three years at this time, and they could be exposed to UV for an indefinite period of time into the future due to the project shut down.

The Pipeline and Hazardous Materials Safety Administration (PHMSA) confirms that these pipes are chalking. PHMSA has also recently stated Dominion has advised they have not taken any of the actions recommended by 3M to reduce, or stop UV degradation of the coating.

3M states it cannot specifically identify the degradation products in its Material Declaration cited above.

The degradation products are not generated in low quantities. A 3M Technical Brief titled “UV Protection of Coated Pipe” states that UV exposure can cause degradation (chalking) of the coating up to 1.5 mils per year, and that degradation is increased by heat and humidity.

A number of industry experts have advised that up to 2 mils of degradation can occur per year.

Please note that 3M advises against removing chalking material from the pipes as this will increase UV degradation of the underlying intact coating.

At over 600 miles in length, the ACP has about 80,000 pipes in total. As they are generally stacked four high in storage, the top 25 percent of the pipes will receive most of the UV degradation. Therefore, approximately 20,000 pipes are producing large volumes of degradation product.

The ACP would include 333 miles of pipe 40 feet long and 42 inches in diameter are included. If a 40-foot long by 42-inch diameter pipe at the top of the stack in a pipe storage yard has 3 mils of chalking on the top half (the portion most exposed to UV) that volume of chalked material is approximately 95 cubic inches, or a little more than the volume of seven baseballs (at 13 cubic inches each). That’s one baseball volume of chalking for every six feet of UV exposed pipe, and that unidentified product, which is toxic to aquatic life, according to 3M, is escaping into our environment.

One hundred and eighty-six miles of pipe 40 feet long and 36 inches in diameter are also proposed for the ACP. With 3 mil of chalking, each of these pipes could produce about 82 cubic inches of chalking, about the volume of six baseballs, or one baseball sized volume for every seven feet of pipe.

Eighty-three miles of 20-inch diameter pipe would produce 45 cubic inches of chalked material for each 40-foot length of pipe, and another mile of 16-inch pipe would produce 36 cubic inches of chalked material for each 40-foot section of pipe.

Pipes not at the top of the storage stack will suffer UV degradation as well, although probably to a lesser degree. These will include pipes stored at the outer edges of the stack, pipes that are temporarily stored at contractor yards, and pipes that are resting on the ground prior to placement in the trench.

This is a very large amount of UV degraded coating material, all of which could be detrimental to human health, and according to 3M, some of which is toxic to aquatic life. This material is escaping into our environment, and it is likely that it is being inhaled and ingested by citizens and wildlife. Persons at particular risk are those living near the proposed pipeline, especially those using private wells and springs for their drinking water, even more so for those using private wells and springs in karst areas, and those living near pipe storage locations.

Health impacts

Human health impacts are cumulative. We are subjected to many negative health impacts from a large number of chemicals and products in today's world. Numerous chemicals and products have not even been assessed for their impacts to human health or the environment. We all carry these substances in our bodies, and will be for the rest of our lives. Human health impacts cannot be accurately determined in isolation.

Varying pollutants may interact with each other within our bodies to create impacts that are more negative than the separate impacts from each pollutant.

The assumptions stated by Dominion in response to question 1 are not based on valid scientific evidence, and do not prove that this coating is safe for human health, or our environment.

In fact, the evidence indicates that 3M Scotchkote Fusion Bonded Epoxy coating 6233 used for the pipes on the ACP:

- Contains known carcinogens, mutagens, toxins, and irritants.
- Has not been tested for leachates by manufacturer 3M
- May leach benzene and styrene like similar epoxy resins
- Has been exposed to UV degradation from sunlight for over three years, and will be exposed for an additional undetermined amount of time
- Has not been protected from UV degradation since Dominion has not taken measures recommended by manufacturer 3M to reduce, or stop that degradation
- May be losing 1.5 mil to 2 mil of coating per year to UV degradation

- Will produce 95 cubic inches of UV degradation byproduct, or chalking residue, from a 40 foot long, 42-inch diameter pipe at the top of the storage stack that contains 3 mil of chalking on the upper, sun exposed, half of the pipe
- Produces UV degradation products that are toxic to aquatic life, and whose specificity is unknown to 3M, according to the 3M Material Declaration cited above, and may be harmful to human health.

These facts indicate a substantial threat to human health and the environment from this coating.

Conclusion

The Dominion reports use questionable data and questionable methodologies to arrive at unreliable conclusions. They do not prove the pipeline coating is safe, or that there will be no negative health or environmental impacts from the coating and associated products used on the exterior of the pipes for the ACP. They do not reliably answer the questions presented in FERC's request, nor the concerns of the Virginia Department of Health.

Recommendations

Additional study using valid data and methodology needs to be completed to reliably assess the health and environmental impacts from these products.

FERC should consult with federal agencies with expertise in these matters.

The Environmental Protection Agency and the Department of Health and Human Services should be consulted, and these agencies should conduct needed studies.

FERC should advise the United States Fish and Wildlife Service that a 3M Material Declaration states that UV degradation byproducts will be toxic to aquatic life, and request that USFWS include this information in any future biological opinion and incidental take statement for endangered species for the ACP.

FERC should require the ACP to conduct pre and post construction sampling for chemicals associated with this coating and other products used on the exterior of the pipes in drinking water wells and springs in the vicinity of the proposed pipeline, and provide a potable water source and fair compensation for drinking water sources that are contaminated by these products.

FERC should require that all pipes be immediately covered to prevent UV degradation material from becoming airborne.

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