

## Richmond Times Dispatch

# With Hurricane Camille in mind, Nelson County worries about potential steep price for pipeline

Michael Martz, August 16, 2019

OLD MYNDUS — Roberts Mountain looms above the Oak Hill Baptist Church Cemetery here where so many victims of Hurricane Camille lie, 50 years after torrential rains brought a flood of mud, boulders and trees out of the mountain hollows along Davis Creek.

Standing at the cemetery's edge, Jim Bolton points to a slight dip in the mountain crest where the Atlantic Coast Pipeline is planned to reach the top of Roberts Mountain from the north and then follow its ridgeline east toward U.S. 29 near Woods Mill, another scene of Camille's destructive power a half-century ago where Davis and Muddy creeks met.

Dominion Energy and its partners chose an alternate route for the 42-inch natural gas pipeline through Nelson County four years ago to avoid crossing Davis Creek where Camille triggered the worst debris flows, killing more than 50 people there after at least 27 inches of rain fell overnight on Aug. 19–20, 1969.

But the \$7.5 billion project — currently stalled in federal court — still would top the mountain above Huffman Hollow, home to some of the roughly 20 members of the Huffman family who perished during Camille and now lie in the cemetery here.

“They moved it from one bad area to another bad area,” said Bolton, a Davis Creek resident who recently urged federal regulators to reconsider approval of the pipeline’s path through the steep mountains that Camille proved vulnerable to catastrophic landslides.

Dominion officials say they have detailed plans to guard against landslides on 439 steep slopes identified in the path of the 605-mile pipeline, including 224 in Virginia and 72 in Nelson County.

Their plans include site-specific designs for 20 of the steepest, most sensitive slopes — 12 in Virginia — and use of “best in class” measures that exceed federal and state requirements to control water and reduce landslide potential on the rest.

“This will establish the industry gold standard,” Dominion spokesman Aaron Ruby vowed.

The scope of Nelson’s vulnerability has become clearer in the early stages of a new federally funded study by the Virginia Department of Mines, Minerals and Energy that has already identified more than 5,900 landslides and debris flows, almost all caused by Camille.

About 4,800 sites identified by the study represent debris flows — each a narrow flood of mud, rock, trees and other debris that moves quickly and crushes anything in its path.

“They’re very dangerous,” said Anne Carter Witt, a state geohazards geologist who is directing the study, focused on mapping landslide hazards in western Nelson and Albemarle counties. “Everything coming down Davis Creek was pretty much an enormous debris flow.”

A report released more than two years ago by Friends of Nelson, a local opponent of the pipeline, warned that Dominion and its partners had not adequately identified and avoided areas where the risk of landslides is high to ensure “the safety of the pipeline as well as protect the surrounding slopes, waterways and residents from a potentially catastrophic failure.”

The study by Blackburn Consulting Services relied on field testing of geology and slopes that focused on three areas vulnerable to landslides: Roberts Mountain on the north side of Davis Creek; the mountains along Wheelers Cove Road east of U.S. 29; and Wintergreen, a resort community next to the planned site of a pipeline tunnel that Dominion wants to drill through the Blue Ridge from Augusta County into Nelson.

The pipeline company’s plans for reducing the threat of landslides “do not appear to fully take into account the potentially dangerous conditions that the project poses to Nelson’s slopes and residents,” Blackburn states in the report, which raises concerns about the effect of removing trees, excavating soil and blasting rock on already unstable mountain ridges.

Friends of Nelson estimates that the pipeline route passes through or near 60 debris flows and 10 debris slides documented from Camille in the new state study.

Dominion officials say they accept the challenge of building a pipeline through the Appalachian Mountain ranges of West Virginia and Virginia to reach natural gas markets on the Atlantic coast from Hampton Roads to southeastern North Carolina.

### Steep slopes

Steep slopes have been a major issue in how the pipeline would cut through the George Washington National Forest in Virginia and Monongahela National

Forest in West Virginia. In December, the 4th U.S. Circuit Court of Appeals threw out permits the U.S. Forest Service issued to allow the project to cross 21 miles of national forest and tunnel beneath the Appalachian Trail at Reeds Gap above Wintergreen.

The ruling by a three-judge panel, led by Chief Judge Roger L. Gregory of Richmond, cited the shifting position of the Forest Service, which previously had questioned whether it was possible, in the words of one national forest supervisor, to permit pipeline construction on steep slopes and “keep the mountain on the mountain.”

The pipeline company and the U.S. solicitor general have asked the U.S. Supreme Court to review and reverse the 4th Circuit’s decision to block the Appalachian Trail crossing, but Dominion expects the Forest Service to issue a new permit that addresses the panel’s concerns about the project’s protection of steep mountain slopes.

Nine of the 20 steep slopes Dominion identified for specific site designs lie in the two national forests. Six of the 12 most sensitive slopes in Virginia lie in Highland County, four in Augusta County and two in Nelson.

The two Nelson sites lie on Roberts Mountain near Woods Mill and Piney Mountain near Wintergreen.

Dominion says it will use “best in class” techniques for the remaining 212 steep slopes identified in Virginia — 74 in Augusta, 70 in Nelson, 47 in Bath County, 19 in Highland, and two in Buckingham County.

Those techniques target sources of water that can destabilize both the soil surface and the 10-foot-deep trench that holds the pipe. “The management of water ... is paramount to the success of the program,” said Robert Hare, manager of technical services for the project.

The plans also include the excavation, retention and restoration of soil and rock in a 125-foot construction right of way that would require leveling of narrow mountain ridgelines and their restoration after the work is done. The company says it would generally follow ridgelines because they are more stable and drier than side slopes and the tops of hollows.

Bolton, a retired biomedical research scientist at the University of Virginia, doesn't believe it's possible to safely restore excavated ridgelines to keep them from sliding down the mountain.

"It's loose fill — no compaction, no trees on it, no nothing," he said.

Dominion says its plans are informed by extensive work along the pipeline route, where its crews will reassess and adjust their work on steep slopes as they proceed.

"I've personally hiked most of the [439] steep slopes," said Alex Greene, an engineering geologist for Geosyntec Consultants, a contractor based in California.

## West Virginia

Construction of the pipeline was suspended in December after the 4th Circuit vacated a U.S. Fish & Wildlife Service permit for protecting endangered species, but the company said it had already begun using "best in class" techniques to build the pipeline in West Virginia.

"We've seen it function like it's supposed to," said Greg Park, who is supervising pipeline construction in West Virginia.

But federal regulators warned Dominion last month about "probable violations" of pipeline safety rules at two sites in West Virginia where inspectors found the

pipeline laid in cramped trenches lined with rocks, including “unsupported boulders susceptible of damaging the pipeline from settlement above if allowed to remain.”

“The identified conditions also have the potential to be exacerbated in the event of heavy rains and/or washouts,” an administrator for the Pipeline and Hazardous Materials Safety Administration said in a July 25 letter.

The notice, first reported by E&E Energywire on Thursday, ordered the company to correct the problems but did not propose a fine or further enforcement action.

Ruby, Dominion’s spokesman, said the inspections occurred before the Federal Energy Regulatory Commission accepted the company’s plan for stabilizing trenches after halting work in December. “Once the stabilization work was authorized by FERC, we remediated the issues found in the inspection,” he said.

Park, now construction supervisor in West Virginia, took a lead role in plotting the entire pipeline route, including the “east of Lovington” alternative, adopted in May 2015, that shifted the path away from the portion of Davis Creek in Nelson County hit hardest by Camille.

Dominion made the change early in the planning process, so he said he can’t attest to the differences in terrain between the original and alternative routes.

But Park said, “Why go into that area knowing the history of it?”

Camille

Wisteria Johnson was 18 years old and preparing to leave Harris Cove to attend Virginia State University when Camille swamped the mountain hollows along Wheelers Cove Road.

When Johnson awoke the morning after the storm, she saw nothing but water from the road to the mountains that surround the house where her family has lived for more than 120 years. Somehow, the house had been spared, even with two creeks running through the property.

“God had to have a hand in it,” she said. “It was because of the mountains he made and had been in place without man’s heavy disturbance.”

One of their neighbors, Wrennie Harris Wright, wasn’t as fortunate.

Johnson’s mother, Doris Harris, was worried about the 75-year-old widow, who lived in a cabin between two streams on a steep mountainside along Wheelers Cove Road near Thoroughfare Gap. The roads were impassable for cars, so Johnson remembers walking 2 miles through water and mud with her mother and sister, Elizabeth, to check on Wright.

The two girls waited on the road while their mother went down the slope to check the cabin, which had been pushed to the foot of the mountain. Doris Harris sent them home to fetch their father, Wister, who returned to find the elderly woman crushed to death between heavy furniture and a bedroom wall in the dislodged cabin.

Wright was among 124 people killed in Nelson during Camille.

“It shows you how fragile the mountains are,” Johnson said.

The pipeline had been planned to pass in front of the home of her sister, Elizabeth Miles, on Wheelers Cove Road and behind her own home at the foot of Bailey Mountain, but Johnson said Dominion shifted the route to follow the ridge of Willoughby Mountain east of them.

Greene, the geologist for Geosyntec, said the pipeline route east of U.S. 29 generally avoided some of the steepest terrain. “We didn’t see anything near as steep as we saw up on Roberts Mountain,” he said.

### Shifting soil

Last spring, a 5-inch rain brought an unwelcome surprise to Curtis Sheets, chief of fire and rescue for Wintergreen Resort and its surrounding community on the eastern slope of the Blue Ridge.

The fire road that connects the community to Nellysford in the Rockfish Valley more than 2 miles away suddenly had a 20-foot-wide gap about a half-mile down the slope.

“The entire road just slid off the mountain,” said Sheets, who also is deputy director of the Wintergreen Property Owners Association.

Landslides and shifting soil aren’t new problems at Wintergreen, a resort developed more than 40 years ago for skiing, vacation and retirement homes on the east side of the Blue Ridge. Wintergreen Development Co. was sold in a bank foreclosure in 1998, three years after a federal judge awarded \$730,000 to a couple whose retirement home detached from its garage because of slipping soils on the mountain.

The resort has had to rebuild its tubing park twice since opening it in 2001 because water from a fault beneath the ground caused the slope to fail two times. Now, the slope is lined with drains to remove the water so the soil will stay in place.

Wintergreen also relocated a new 5 million-gallon water tank after concerns about the geology of the original site.



“We know what happens — the soil moves downhill,” said Jay Roberts, executive director of the property owners association. “There are plenty of examples.”

Mervin J. Bartholomew, a North Carolina geologist who wrote a 1977 state guide to the geology of the area that includes Reeds Gap, warned federal regulators more than two years ago that the planned pipeline route “is inadvisable and the risk of failure is high.”

Bartholomew said the pipeline would emerge from the mountain across from the only entrance and exit for Wintergreen and cross an area with a history of debris flows and avalanches.

Camille didn’t cause as much damage on the Blue Ridge above Nellysford as it did along Davis Creek and other parts of Nelson, but he said a similar deluge in that mountain basin “could literally ‘pull the plug’ and all of the deposits could be swept down the funnel scouring the base of the granite floor with debris tracks.”

Dominion officials and contractors say the mountain is solid where they plan to tunnel and collect any water that drains from faults in the rock. They know that shallow surface soil tends to slip on the bedrock in the area, as it did on the fire road, but they’re confident in their plans both for drilling through the mountain and keeping steep slopes in place.

“It’s very resistant rock,” said Andreas Kammereck, principal engineer at Golder Associates, which is designing the project’s plans for steep slopes.

However, Sheets said he learned soon after arriving in Nelson in 1999 that Camille “is in the front part of their brains” for every fire and rescue official in the county.

“I just don’t think anyone here in Nelson County who lived through Camille doesn’t think about it at least once a month,” he said. “It’s just never going to go away.”