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Comments: Ice at the crest of Sinking Creek Mountain ridge

Physical Evidence of Ice

New information not before presented to FERC, Jefferson National Forest or Bureau of Land Management January 2023. Based on new information and observations of ice, the mountain valley pipeline project should be denied entry and operation in the Jefferson National Forest, by changing the Forest Plan.

Please use the No Action Option and further, not allow any pipeline to use this ROW. The JNF, especially Sinking Creek Mountain and all Regional mountains should be placed in a "No Build Zone", because of unsuitable unstable ground that goes through extreme freeze-thaw cycles..

Ice that forms when soil freezes may push up little stones that "cap the ice crystals". Vertical ice crystal growth lifted North America's largest landslide and rafted it down the near-vertical rockface of the southside of Sinking Creek Mountain. As the ice melted, the lubrication of landmass (approximately 23 miles intact landslide) was unstoppable. Extreme temperature fluctuations still occur at Sinking Creek Mountain ridge and surrounding mountain ridges. Very Frigid temperatures with wind, in Wintertime, freezes surface water. Groundwater continues to flow as a liquid upon release from the ground pressure into the cold air and around any iceplug that forms, and then freezing too, extending the iceflow four and one-half feet wide and twenty feet long, down the mountain, on both sides of Sinking Creek Mountain, in this case. The little water seeps that occur all along the ridge crest of Sinking Creek Mountain, for nearly thirty miles, freeze, creating masses of ice in numerous, scattered places along the whole length of the ridge of Sinking Creek Mountain.

A site visit to steep Sinking Creek Mountain by those of us who live here, in Craig County, Virginia was conducted in early January 2023 during 50-60 degree Fahrenheit clear weather to observe any freeze-thaw activity after the prior week's frigid five (5) degree F windy cold weather; and to see if stress cracks were visible from ground heaving or creep.

The southside of the ridge of Sinking Creek Mountain slopes downhill at an 85% slope, 44 degree angle, almost vertical, and is a shear(ed) rockface scarp.

The crest of Sinking Creek Mountain marks a headwater Drinking Water Protection Zone, of the Eastern Continental Divide and the edge of Public Jefferson National Forest land. The easily eroded soils and rocks are protected from disturbance or development by the Forest Service Plan, the Clean Water Act and common sense. The redundant freeze-thaw episodes and the water weight move exposed mineral soils and fill material in an act of erosion, uncontrolled, unconfined, unnoticed until ground movement becomes severe enough to change the surface topography and vertical displacement scarps form.

Ice grows horizontally out of the vertical face of scarps, with a stone on the end of what looks like an ice straw (with stone). When the solar warmth melts the ice, the stone drops.

Landslides have common indicators before detachment of ground is transported downhill by gravity or water weight, especially on mountain slopes greater than 35% (which is tough to walk upright).

Ground movement indicators are:

- Freshly exposed soil or mineral faces in an area of ground with vertical or horizontal particle displacement, enmasse or in part.

- Trees with bent trunks, living on actively sliding ground that, requires tree to grow back over roots

- Trees with bent trunks with big slide rocks imbedded in the uphill side of tree

- Large flat rocks tipped up by ice wedges

- Young trees forced to grow around big rocks that move and may be the only thing holding rock in place

- Boulder flow and Debris flow and landscape creep may be slow grinding movement with exposed mineral surface, displacement scrape marks and scarps and cracks

The MVP route through the Jefferson National Forest, BLM lands, Montgomery County and neighboring Counties of Craig and Giles, in Virginia and Peter's Mountain in West Virginia has a larger variety of massive dangers than any alternative route MVP has proposed, and now Ice.

Considering the Ice that forms in frigid temperatures at the crest of every mountain ridge, the MVP project is unsuitable and inappropriate for this Region. Ice breaks down rocks and soils by chemical and physical weathering mechanisms. Ice moved Sinking Creek Mountain's unstoppable landslides intact. Ice breaks pipes. Ice and Relevant Cultural History, previously unreported.

Ice used by locals to break rocks at the crest of Sinking Creek Mountain and ice used to move rocks, has been the kind of information only the local folks would know.

People here drilled holes in rock and poured water in the holes when frigid weather was due. The water froze and expanded, breaking off large flat slabs of sandstone bedrock exposed at the crest, then used the Iceflows on the mountain ridges when they rafted very large blocks of sandstone from the crest of the mountain to the mountain flank; local oral history tells of waiting for hard freeze to use the ice to move trees and rocks with communal and familial help, descriptions of teams of mules and sledges used, with evidence being the corner stones of old barns that have stayed in the same family for generations, and as the Tuscarora sandstone corner stones of the rare few covered bridges around Newport, Spruce Run and Sinking Creek Valley.

The covered bridges of the same area attest to historical flooding that resulted from ice melting. Again, in these highland karst areas, redundant freeze-thaw events cause ice to form at the surface of the moist ground (or water) and then some of it melts part-way because the ground is warmer than freezing and maybe it rains so a "perched water table forms"; that is, liquid water below frozen ice and liquid water on top of the ice. Flash flooding can happen any time of year, but water wave "surges" six feet high can happen underground, confined and connected, in karst waterways and surge water into the open air can exceed six feet. Ice layers complicate how much liquid water is released from the karst geology during a thaw. Lakes of water can form above an ice-plugged outlet. That is a lot of water to prepare for in building a covered bridge. Trial and loss of previous bridges left the remaining existing covered bridges to be over eight feet high above Sinking Creek.

The Appalachian Trail is also part of the Ice on Sinking Creek Mountain story, for it was recently reported that iceflows had formed at the AT crossing of Sinking Creek Mountain, as well as where our observations were made, on the same day. That would perchance mean everyone hiking the AT at the right time has seen ice at the crest, and now an uncommon Winter hiker knowledge, in a common foot-traveler culture around here, adds to who shares an important window of time, to a cultural history and natural history of a place.

And, the source of drinking water for everyone in the Sinking Creek Valley is groundwater and springs, which is why the AT comes through here for a drink from a fresh mountain spring: unconfined, free, clean water, even at the summit.

#### CONCERNS

The ground movement concern with Ice is especially important because of MVP blasting of the mountain ridge in July 2018 de-stabilized the Sinking Creek Mountain on the northface near where blasting occurred at the ridge and between the ridge and through the sinkholeplain on the northface of the Sinking Creek Mountain flank. This poses a significant nexus to deny the entry of MVP to enter, construct or operate in the JNF; that is, gas might not ever get there, due to ice heaving the pipe right-out-of-the-ground or ice slipping large heavy pipes downhill in an unstoppable cascade into drinking water sources, or ice just breaking the welds and pitting-corroded pipes. Significant dangers, all avoided by telling MVP, "No, the Jefferson National Forest is too dangerous for the MVP project."

Continuous water seep, subject to freeze-thaw, at crest of Sinking Creek Mountain where mvp project crosses from Private land in Craig County on northface of Sinking Creek Mountain to Jefferson National Forest on southside of the mountain crest, which was blasted through by mvp in 2018, without permits to do so. This is the area once considered the Exclusion Zone - not to be built or disturbed because of the fragile karst ecosystem on the Craig County Private land northface of Sinking Creek Mountain crest and the mvp ROW entryway to the Jefferson National Forest. This was dampland and not suitable for pipeline construction - best avoided. Caves and Sinkholes and Springs in Karst not suitable for construction of a pipeline -best avoided. Fluctuating water table on steep slope not suitable for construction - best avoided, Shrink-swell clay problems not suitable for construction -best avoided, steep slopes-best avoided, landslide soils -best avoided, extreme freeze-thaw episodes -best avoided, moving ground-best avoided, Water Protection Zone -best avoided, Jefferson National Forest -best avoided, source water springs of drinking water for people and livestock- best avoided. The route is

not suitable for construction and best avoided as it currently stands. The soils are not suitable for routing nor construction. Drinking water impacts from construction of pipeline are widespread.

All pipe should be removed and ground restoration performed.

Order 2 compute soil surveys used by mvp show with proper interpretation that the NRCS soil surveys indicate Soils intercepted by the route of the MVP project will fail if trenched; and the soil fertility is acidic Forest Soil, which requires specific laboratory analyses if the plan is to grow vegetation. Otherwise, without vegetation, the forest soil erodes rapidly into Rare and Endangered Species habitat of Craig's Creek.

Every seep place on the ridge corresponds to mass wasting of large proportions on the mountain slopes. The MVP route crosses large rock block geology and unstable, highly erodible soils.

E&SC structures of fill material are made of acidic blast rock and acidic Forest soils scraped around into high, thick, steeply sloped waterbars on near-vertical southfacing Sinking Creek Mountain slope. The fill material of the E&SC structures are wet-saturated with water going through freeze-thaw cycles for the Winter, and fed water by the water seeps-melting iceflows at the crest of the mountain. Gobs of fill-dirt sloughed downmountain because the grass is dead and dead roots do not hold disturbed rock and soil onto vertical rockfaces well.

When the solar warmth melts the ice, the stone free falls 10-15 feet into an eroded gully, at every erosion control structure of mvp near the crest of our mountain.

This south slope of Sinking Creek Mountain is also home to North America's largest ancient rock-block slide, rare and endangered landscapes, habitat, soils, fish and amphibians that have developed interconnected communities in vernal pools behind the series of ancient rock-block slides for approximately 23 miles along the steep mountain. The mvp ROW intercepts these special unique habitats, without understanding what is there. MVP has created a very unstable, and regrettable, situation on Sinking Creek Mountain. Freeze-Thaw is dangerous to the remaining manmade fill material stability. Wet ground is heavy. Gravity is persistent. Ice breaks pipes.

The steel pipe and welds are brittle and ought not to have temperature fluctuations that welds cannot hold when strained, stressed and frigid. The northface of Sinking Creek Mountain remains frozen while the southface warms daily and freezes again at night during the Winter months, in freeze-thaw cycles.

MVP should not be allowed to proceed with the project through JNF. The No Action Alternative choice would allow for all pipe to be removed and ground restoration of the right-of-way and access roads to begin in earnest. Ice is good reason for taking the "No Action Alternative" to deny MVP a right-of-way through the Jefferson National Forest. Ice breaks mountains.

I have not seen reports of small ground movement, slips, scarps forming in the mvp ROW in the JNF, and not sure why this most dangerous of erosion, at the top of the Sinking Creek Mountain, at the blast cut is under-reported? Does anyone other than a local care about what happens up there?

Obviously, MVP blasted the Sinking Creek Mountain ridge from Craig County into the Jefferson National Forest, irreparably damaging the Jefferson National Forest and Sinking Creek Mountain and Craig County, Virginia. The view from Kelly's Knob along the Appalachian Trail to Sinking Creek Mountain where MVP blasted and left a raw rock gap in the ridgeline spoils the pleasure of a view of continuous forest along a (once) beautiful mountain crest. My sense of pride in our mountains is shamed by the scar, and it saddens me that the blasting was ever permitted. Seeing the blasted gap saddens me when I see it driving along Rt. 42 (currently), as part of local cultural history and telling AT hikers what has happened. The AT hikers cannot believe we let the forests be cleared, further shaming us by our inability to stop the clearing of old growth forests. That becomes a USA cultural shame when the hikers are from all over the World and they see the denudation and spoiled soils left by MVP. So much done to protect views along the AT, for so many years, so that people travelling the AT would become refreshed in the mountain's beauty and diverse unique ecosystems.

Our mountain waters are harmed by the construction of mvp project and the ice will harm the mvp project unless this route through the JNF is abandoned.

Forest Service should deny Mountain Valley Pipeline entry into the Jefferson National Forest on the grounds that Ice will disrupt the pipe and its operation to the grave detriment of the JNF Public lands' health, safety and welfare, redundantly fail if allowed, because extreme cold with extreme temperature fluctuations with ice, breaks steel pipe welds. Both chemical and physical mechanisms of ice crystal formation, melt and re-freeze, expands

the area the meltwater flows to in tiny places and heaves as it must, when it refreezes, widening the watergap for the next melt. Each heaving of growing ice crystals wiggles the pipe. Each time pipe pressure charges, the kickback causes a little wiggle. Add up those little wiggles plus Ice and the trouble is obviously with the Ice on an unstable mountain. Trouble starts at the crest and accumulates 2390 feet down a nearly straight line, with ice and no forest to hold onto. This is not a suitable alternative or main route. This is a place to avoid entirely! JNF is too dangerous for this ROW.

Please use the No Action Option and further, not allow any pipeline to use this ROW. The JNF, especially Sinking Creek Mountain and all Regional mountains should be placed in a "No Build Zone", because of unsuitable unstable ground.