

# Southeast Natural Gas Race Marcellus- to-Atlantic



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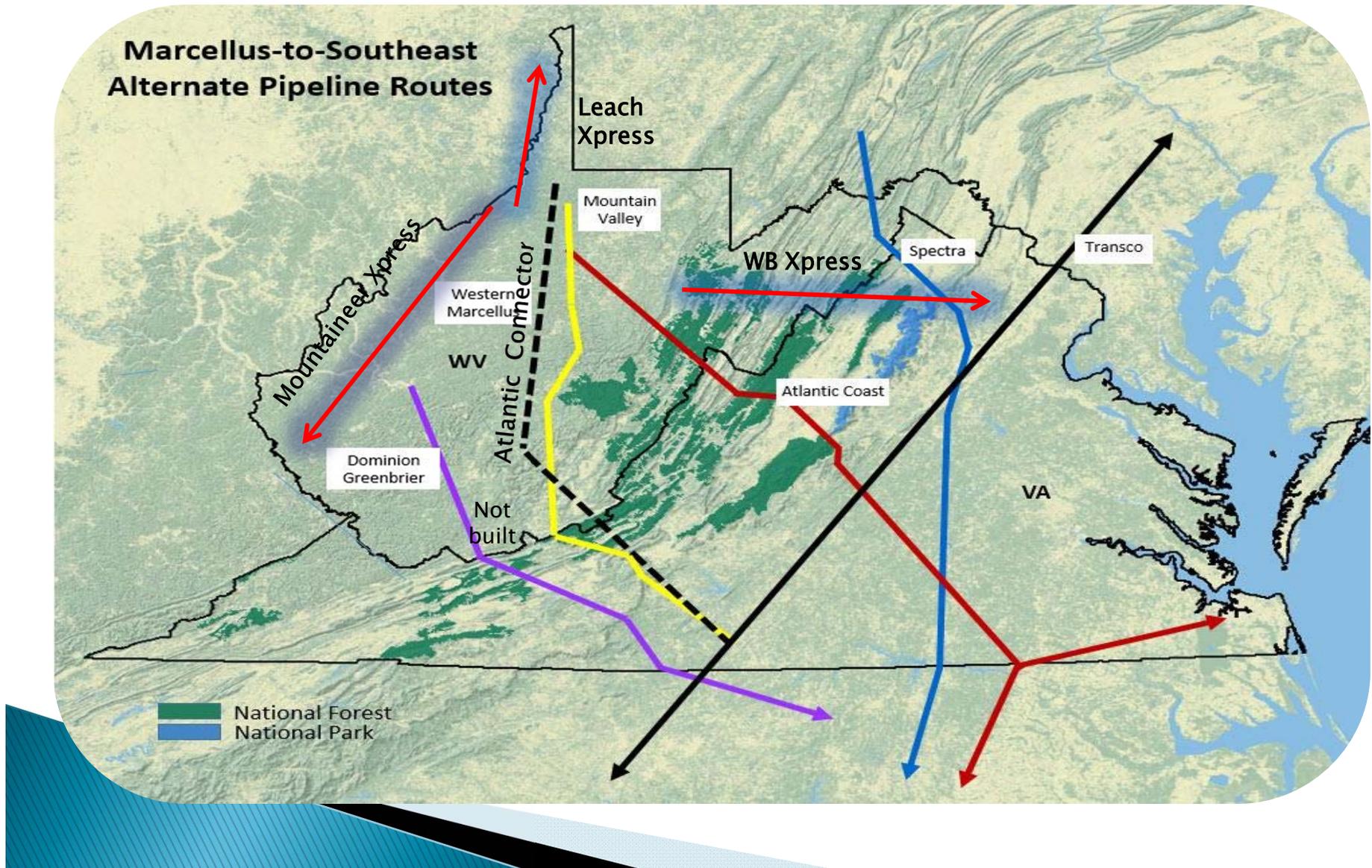
# Mountain Valley Pipeline

The 330-mile Mountain Valley Pipeline project would connect Marcellus natural gas supply to demand markets in the Southeast region of the United States providing at least two billion cubic feet per day transmission capacity.

Delivery to Transco expected to be in service by the fourth quarter of 2019. Project costs are \$4.6 to \$5 billion dollars.



# Proposed Pipelines in Virginia and West Virginia





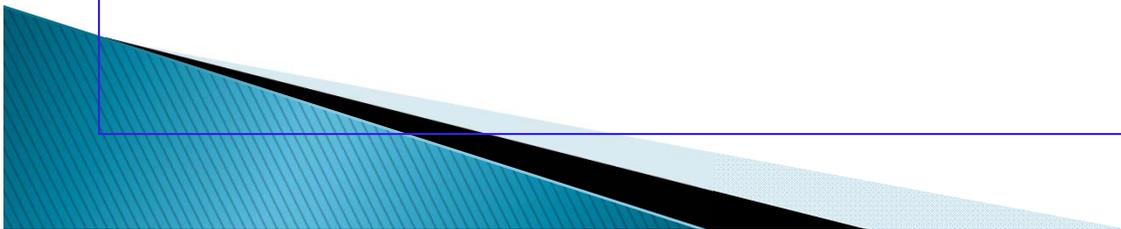
Geology, karst terrain  

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and  
Steep slopes

# Slope Failure

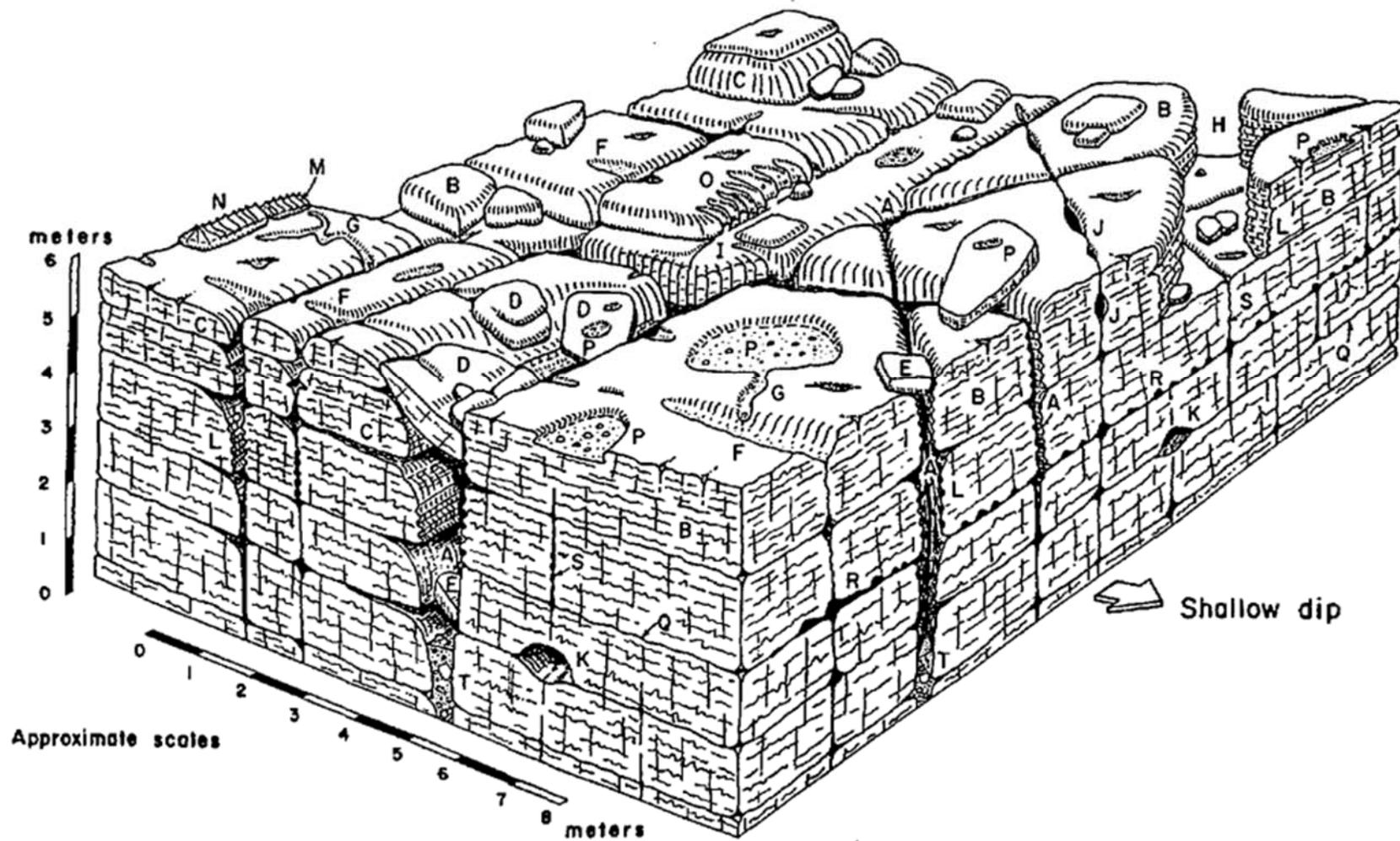
Studies have identified major slope failures in Giles County VA on a large scale. These are slope failures that predate the modern period and are among the largest slope failures in the continental US in the last several million years. Some slide masses are many hundreds of meters across and tens of meters thick. Many lie very near the proposed pipeline route through central and eastern Giles County.



# Karst Topography 101



# LIMESTONE PAVEMENT AND FISSURED KARST



# Augusta County is a High Consequence Area.

## Quick-forming sinkholes:

In 2013 a resident drove across a crack in the pavement on Route 250, near Staunton and the proposed pipeline. When he returned in 2 hours, there was a 10 foot deep hole about 30 feet across and a line of dump trucks and equipment repairing the damage.

The same year another sinkhole took out half of Interstate 81 just south of Staunton, near the proposed pipeline route.

Everyone has a sinkhole story in Augusta County; ruined wells, cars falling in, \$28,000 wells, livestock loss. Engineers from around the world study our quirky Karst formations and warn of hazards. Even the Virginia DMME warns against pipelines in Augusta County in the 2013 Virginia Hazard Mitigation Plan.

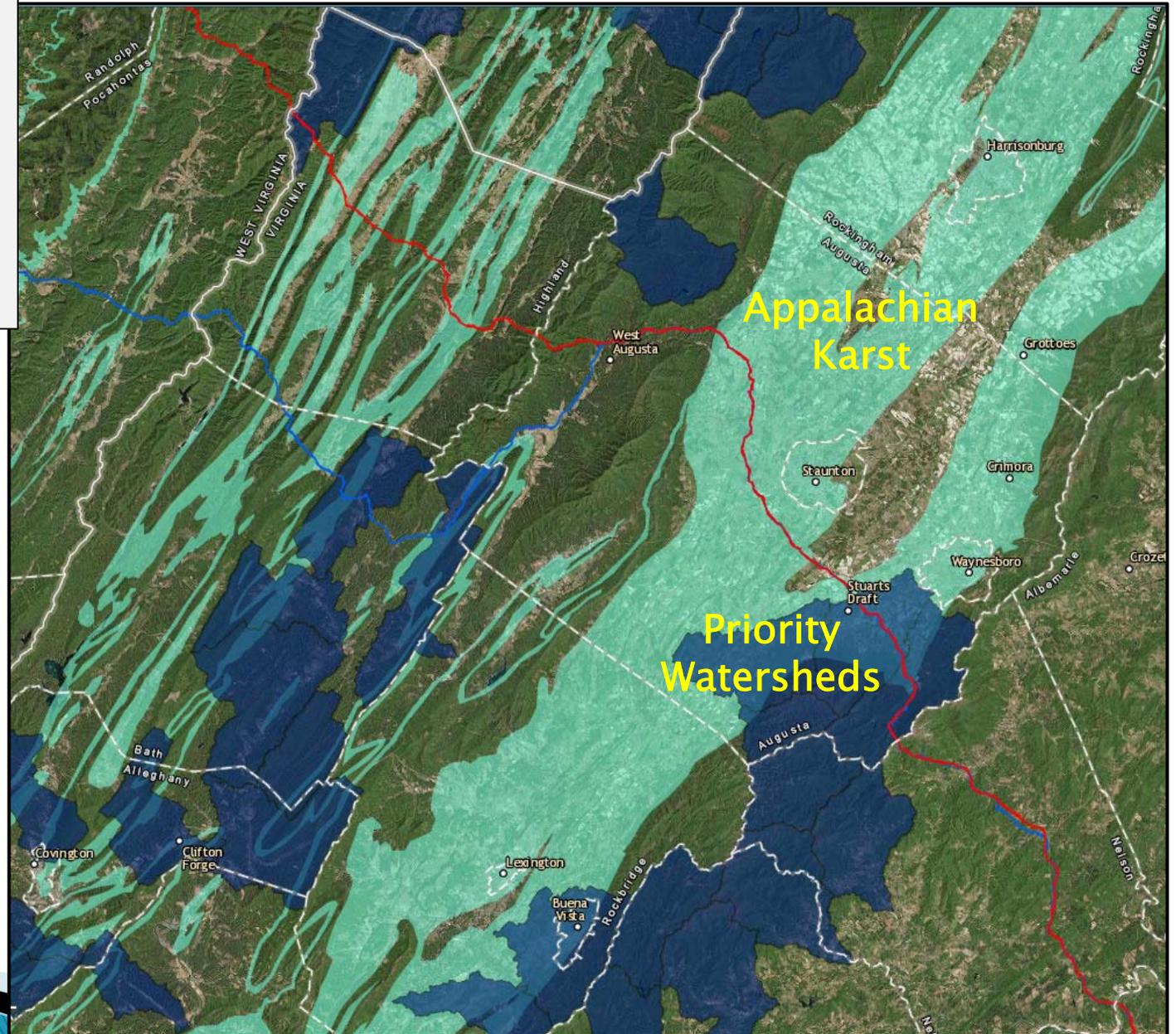


## Karst-related Features in the Proposed MVP Corridor Monroe County, WV

- ▶ Karst features are all part of a limestone formation that extends along the base of Peters Mountain for almost its entire length in Monroe County.
  - ▶ There is a dangerous combination of issues in this situation:
  - ▶ *Known: The limestone formation with related karst features extends the length of Peters Mountain.*
  - ▶ *Known: There is evidence of active sinkhole formation in close proximity to the pipeline route.*
  - ▶ *Known: Immediately after crossing the karst features of Back Valley, the pipeline route ascends Peters Mountain on the mountain's steep western slope.*
  - ▶ *Known: The springs of Peters Mountain provide the source water for all three of the county's public water districts (serving close to 70% of households and all of its public schools, health clinics and government offices), as well as an award-winning water bottling company.*
  - ▶ *Unknown: It is unknown what impact a contamination event might have anywhere along this critical water source, because the extent and possible interconnections of underground aquifers along Peters Mountain have not been studied or mapped.*
- 

# Issues

1. Impact to sensitive watersheds.



# Water Supply Concerns

“The preservation and protection of Monroe County’s natural water supplies is not an aesthetic choice; it is a matter of survival. It is also a matter of protecting the county’s natural resources for economic development that benefits the residents who live and farm and work in this county.”..

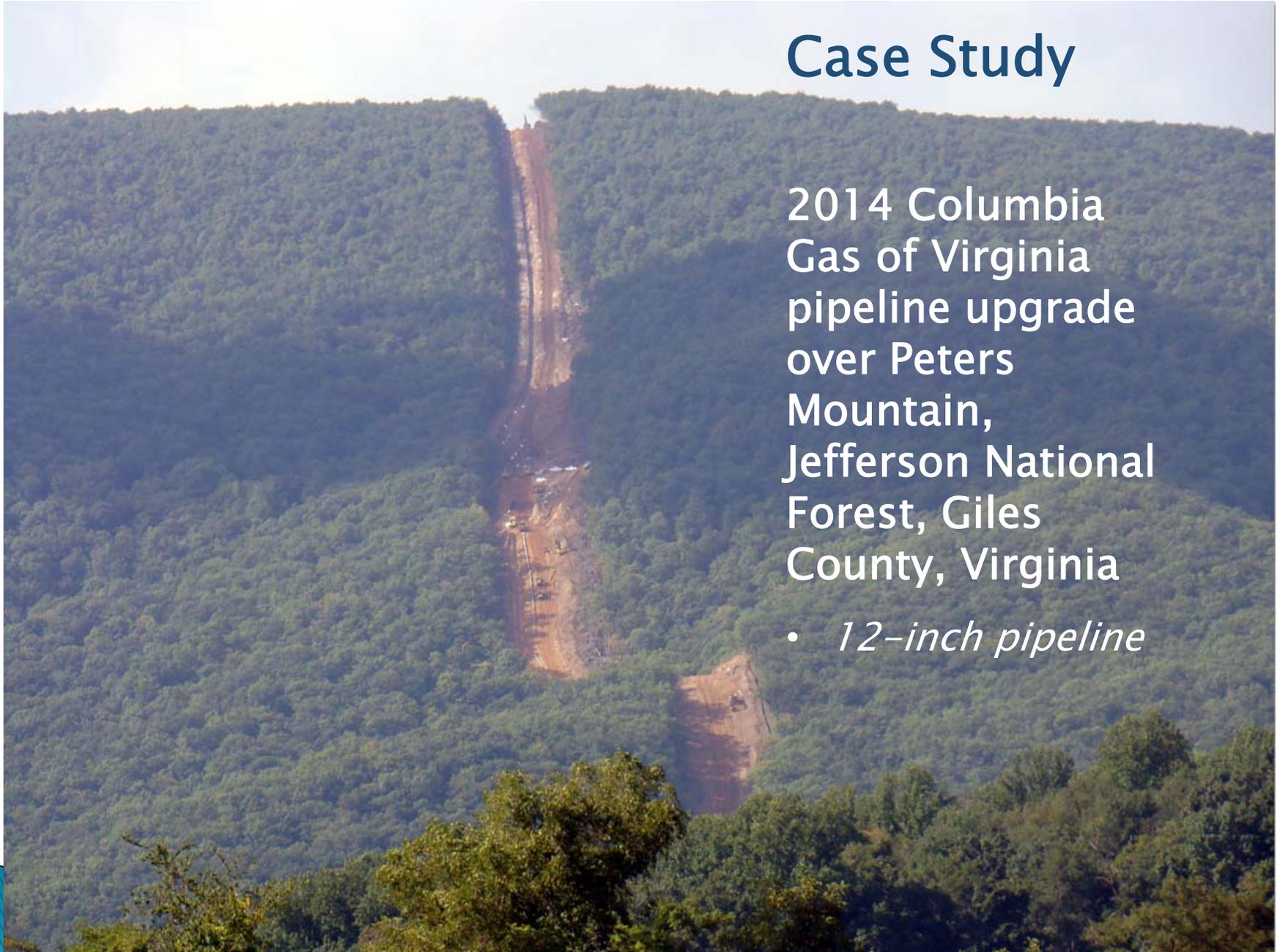
**Indian Creek Watershed Association,  
Monroe County, WV**



# Case Study

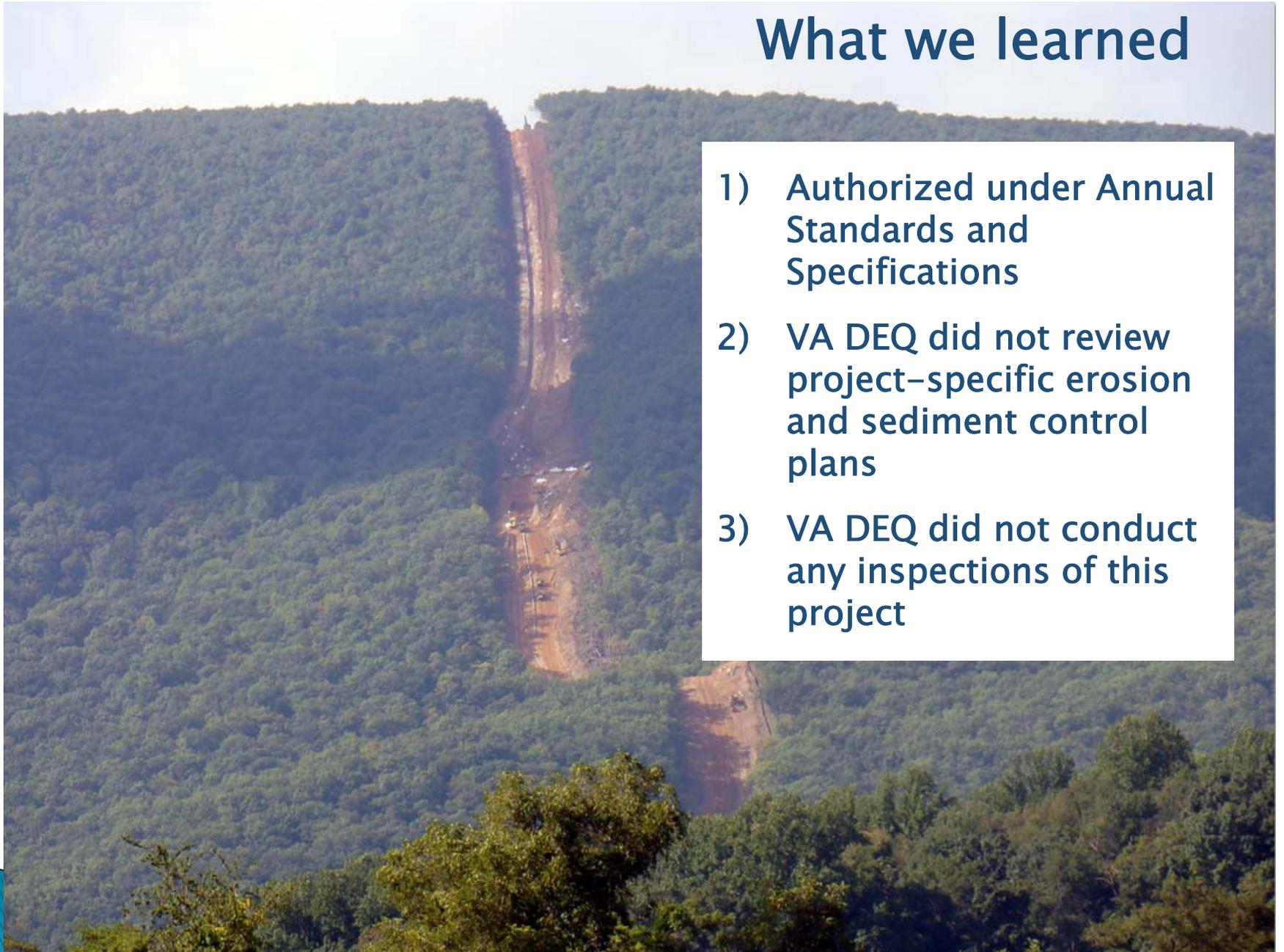
2014 Columbia  
Gas of Virginia  
pipeline upgrade  
over Peters  
Mountain,  
Jefferson National  
Forest, Giles  
County, Virginia

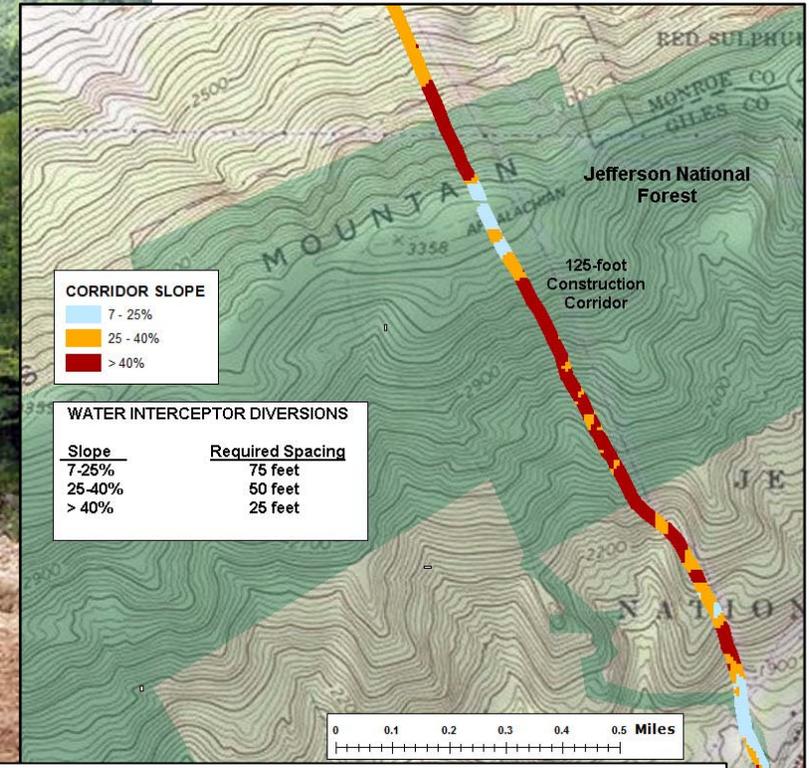
- *12-inch pipeline*



# What we learned

- 1) Authorized under Annual Standards and Specifications
- 2) VA DEQ did not review project-specific erosion and sediment control plans
- 3) VA DEQ did not conduct any inspections of this project





- Lack of runoff controls
- Failed perimeter silt fencing
- Improper placement of excavated material
- Open trench top-to-bottom

# Sediment flowing below silt fence



# Sediment flowing from corridor

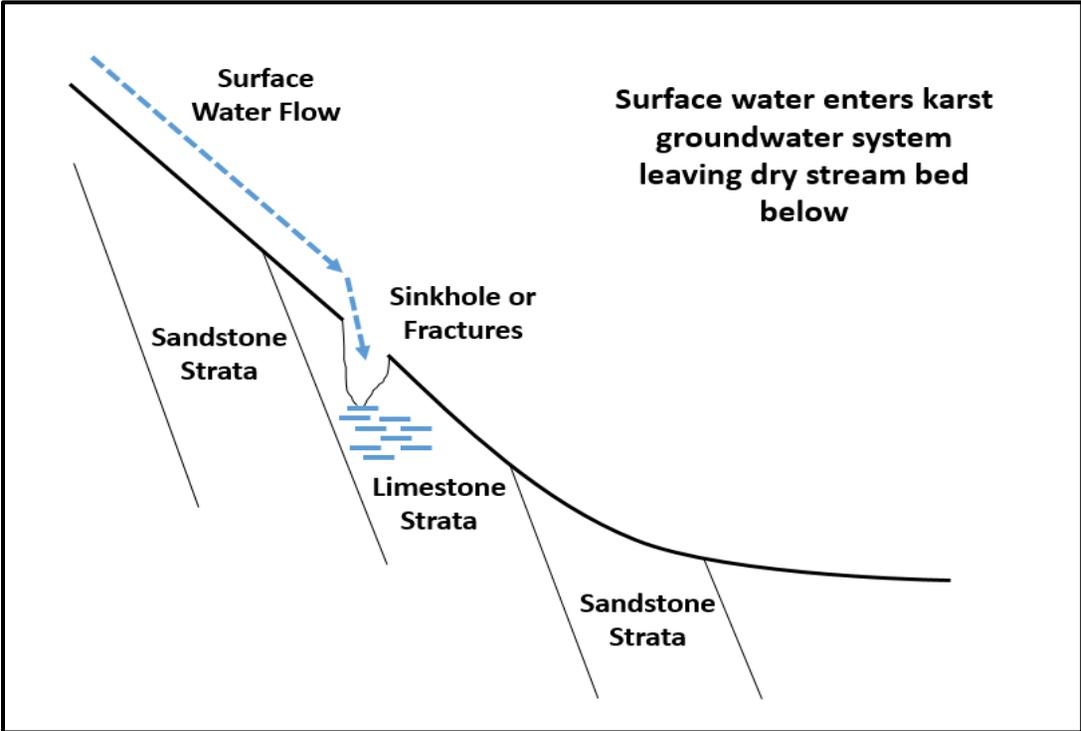


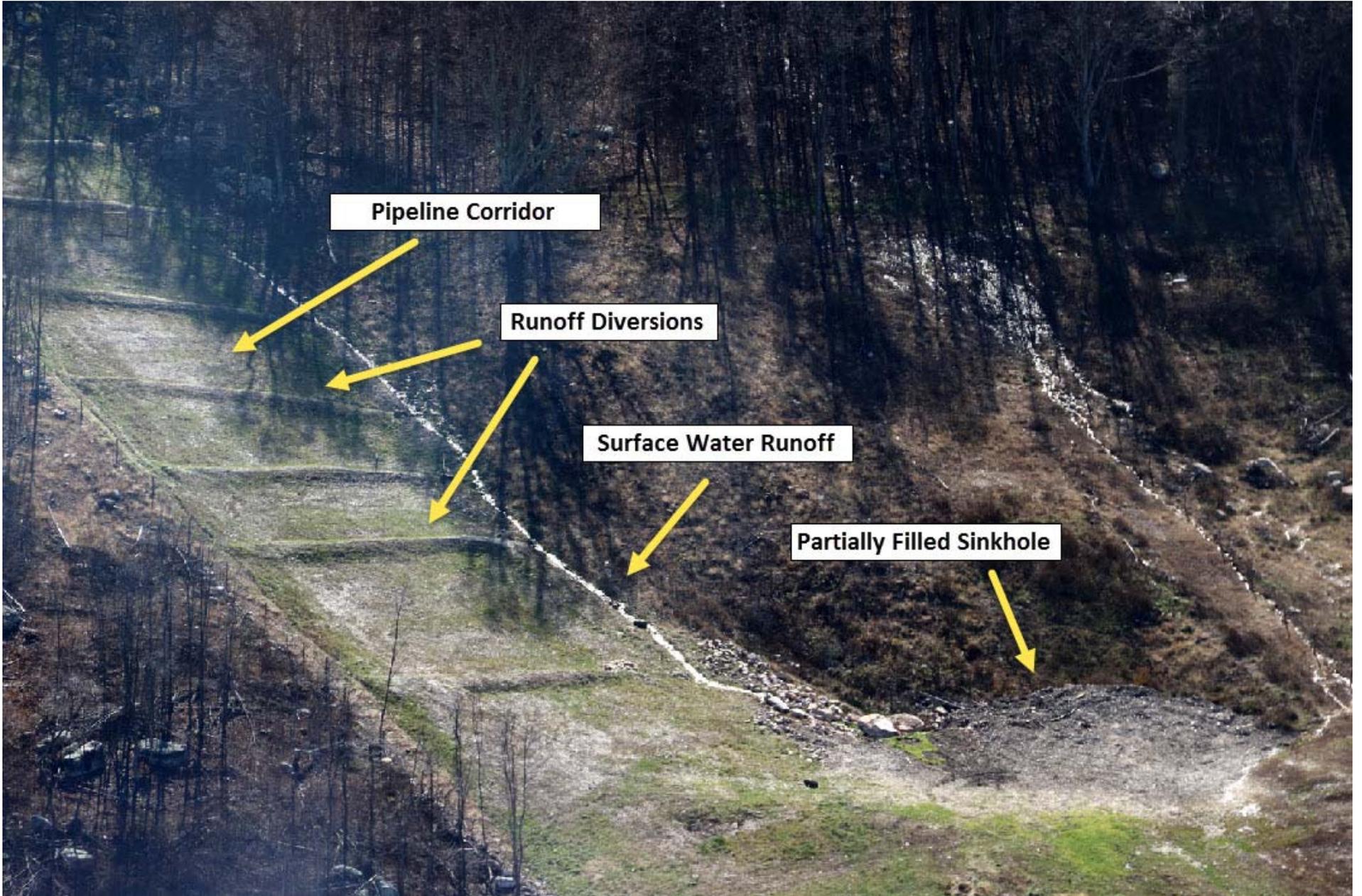
# Sediment flowing down hill side



# Stream filled with mud





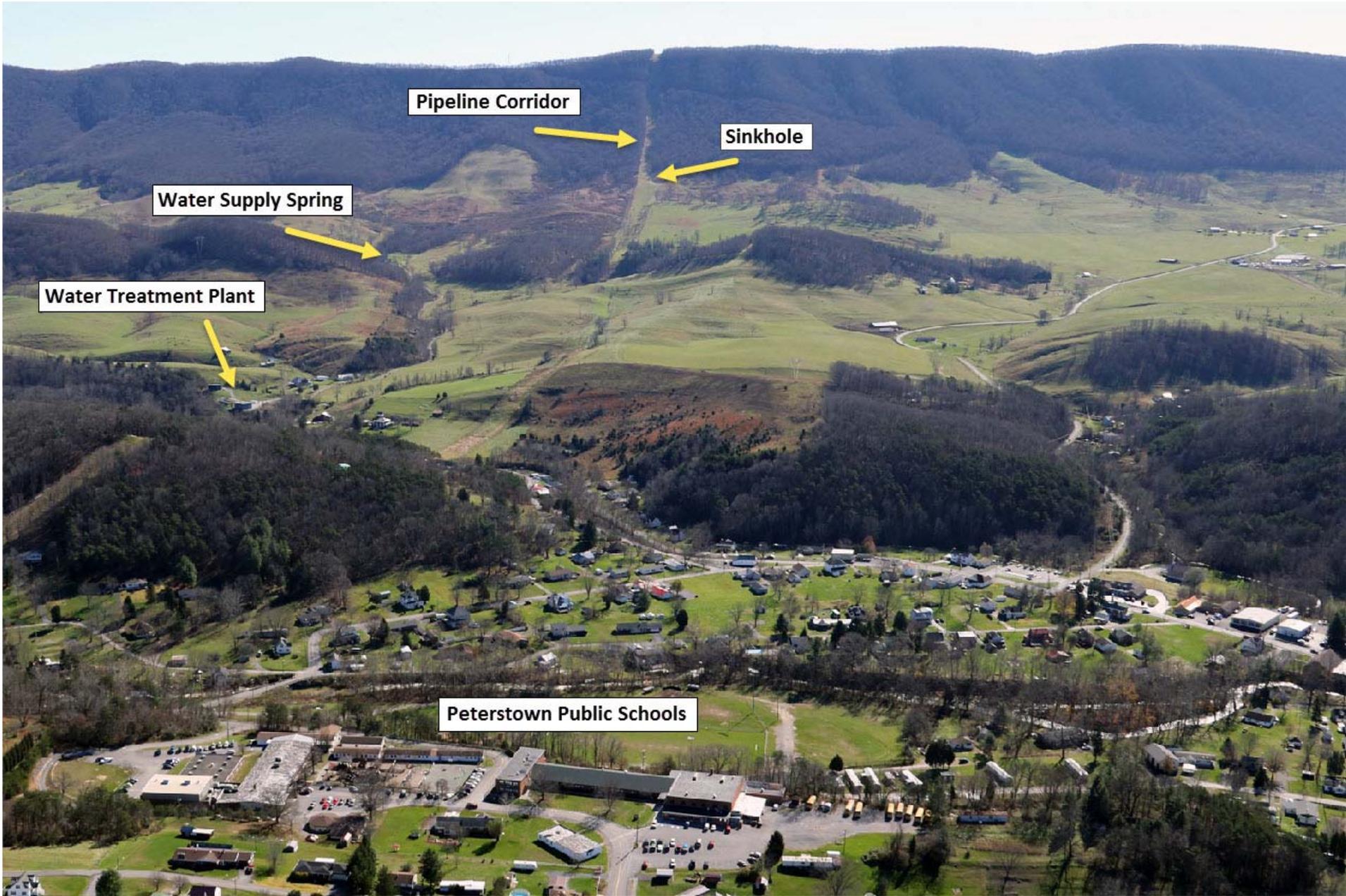


**Pipeline Corridor**

**Runoff Diversions**

**Surface Water Runoff**

**Partially Filled Sinkhole**



Pipeline Corridor

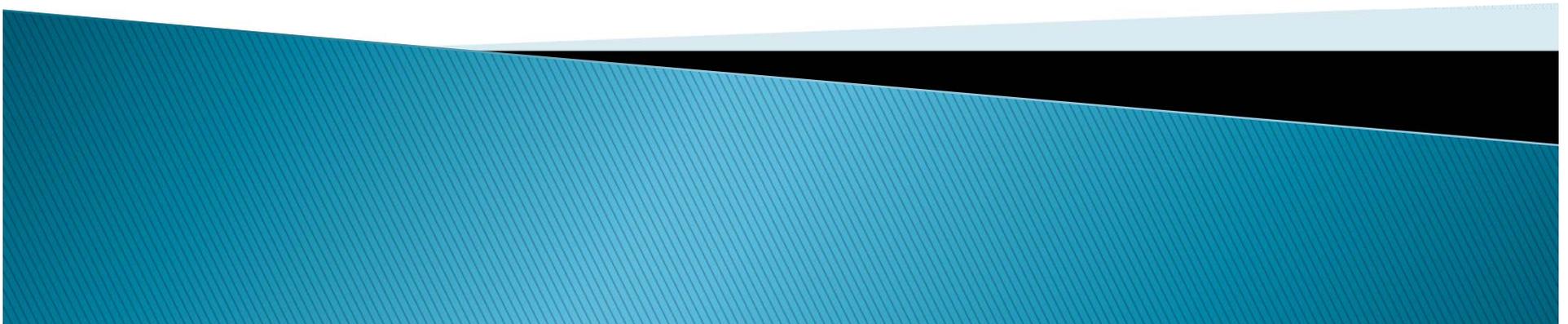
Sinkhole

Water Supply Spring

Water Treatment Plant

Peterstown Public Schools

# Top Ten Most Common Erosion Control Problems



1) Failure to install, or delayed installation of, erosion and sediment control (ESC) measures as required by approved plans or by regulations.



E 90 SE 120 150 180 S 210  
140°SE (T) 37°40'2"N, 80°43'20"W ±16.4ft ▲ 1535ft



no S & E controls on slope,  
fencing failing foreground  
Your Watermark - See Settings

MVP KELLERS  
CREEK RD / KELLY  
CREEK S  
06 Jul 2018, 20:51



37.265461, -80.310469

Slopes along this portion are  
>60% in some sections (see map).

No Erosion & Sediment Control  
on extremely steep slopes.

Those benches are not adequate.

## 2) Lack of maintenance of installed ESC measures as required by regulations.



3) Failed, damaged, missing, or improperly installed silt fences, filter socks or other perimeter control devices.

Sep 9, 2018, 10:05:47 AM





Sep 23, 2018 at 11:47:05 AM

+37.068379, -79.922564

VA, Rocky Mount, Brick Church Rd

Altitude: 316.4 meters

Speed: 0.0 km/h



#### 4) Failed, damaged, improperly constructed or spaced right-of-way diversions





5) Failed or improperly constructed outlet structures at ends of right-of-way diversions.



Sep 9, 2018, 11:58:36 AM



6) Formation of downslope gullies within or at the perimeter of the construction right-of-way.



Sep 23, 2018 at 11:43:10 AM

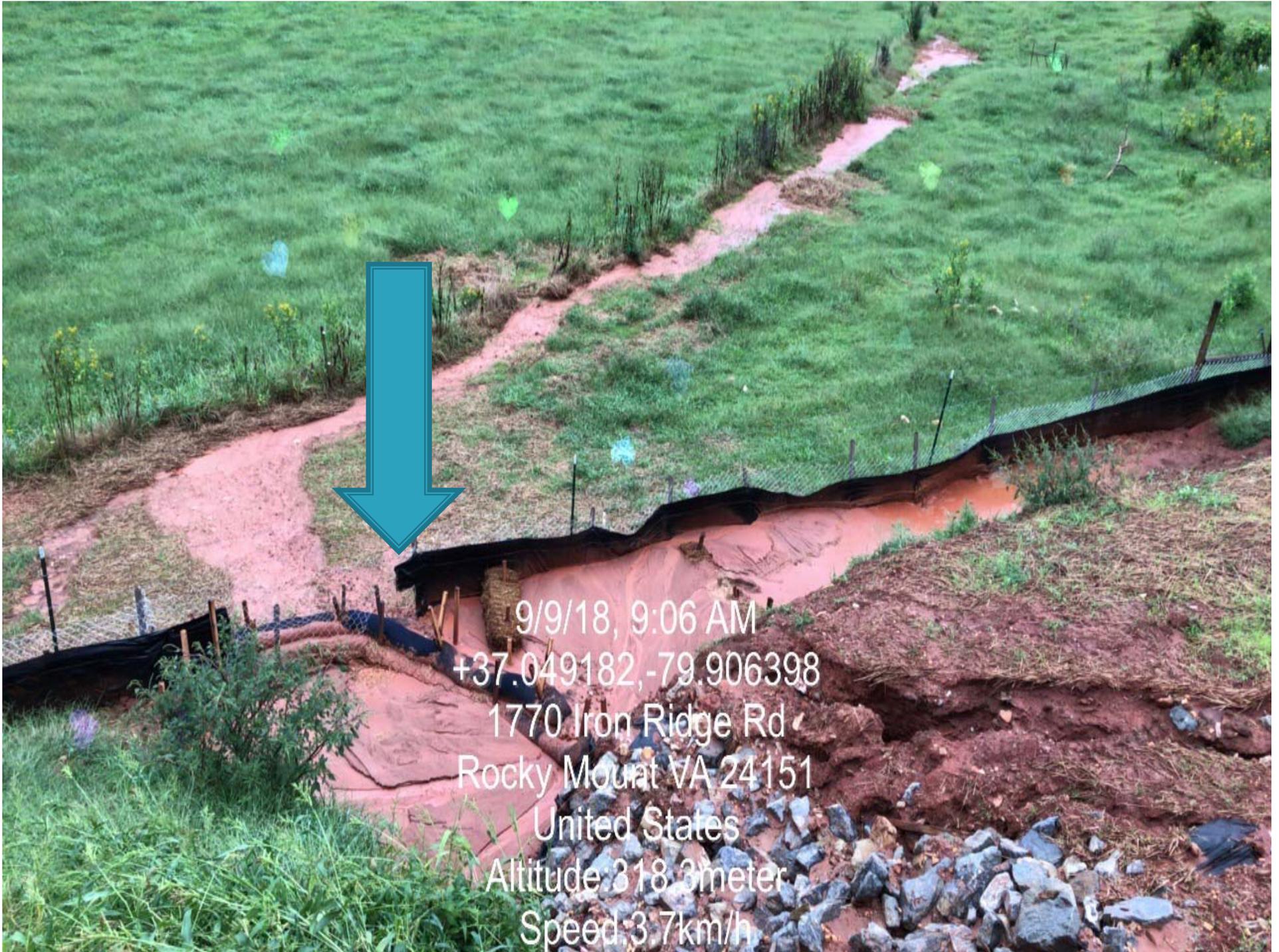
+37.068420,-79.922622

VA,Rocky Mount,Brick Church Rd

Altitude:329.4meter

Speed:1.9km/h





9/9/18, 9:06 AM  
+37.049182,-79.906398  
1770 Iron Ridge Rd  
Rocky Mount VA 24151  
United States  
Altitude: 318.3meter  
Speed: 3.7km/h

7) Sediment discharge into streams and wetlands during trenching operations from failed erosion control devices.





## 8) Failure to construct and properly maintain construction entrances at public roads.



Franklin County  
Mountain Valley Pipeline  
Construction Site

Lat: 37.09064 Lon: -79.99625

Assessment Type  
Pipeline Work Site

Description of potential violation

- Erosion gullies
- Bare soil - no mulch
- Failed BMPs
- Sediment discharge outside construction area



# Cahas Road, Franklin County, VA





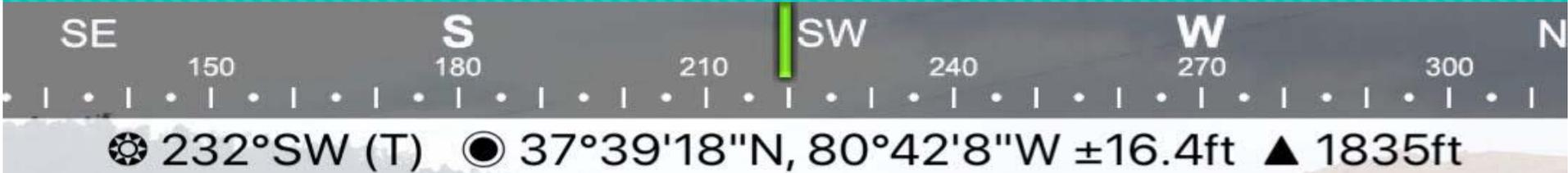


SE S SW W  
120 150 180 210 240 270  
☀ 199°S (T) ● 37.123182, -80.074314 ±8m ▲ 436 m



10 Jun 2018, 18:47:22

9) Failure to stabilize construction areas, bare ground, and stockpiles of spoil or topsoil, after active disturbance.



Failing S&E controls dirt piles  
Your Watermark - See Settings

MVP CREAMERY RD SITE  
06 Jul 2018, 20:35



☀ 146°SE (T) ● 37°39'18"N, 80°42'8"W ±16.4ft ▲ 1836ft



Failing S & E controls on dirt mounds  
Your Watermark - See Settings

MVP CREAMERY RD SITE  
06 Jul 2018, 20:34

# Pipeline Air Force Stonewall Gathering pipeline, WV











# Drone flight in WV