

**APPENDIX P**  
**Plan for Unanticipated Discovery of Paleontological**  
**Resources**

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## **Appendix P**

# **Plan for Unanticipated Discovery of Paleontological Resources**

## **Mountain Valley Pipeline Project**

*Prepared by:*



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## **ACRONYMS AND ABBREVIATIONS**

FERC	Federal Energy Regulatory Commission
Mountain Valley	Mountain Valley Pipeline, LLC
MVP	Mountain Valley Pipeline, LLC
Project	Mountain Valley Pipeline Project

## 1.0 INTRODUCTION

Mountain Valley Pipeline, LLC (MVP or Mountain Valley), a joint venture between EQM Midstream Partners, LP; NextEra Capital Holdings, Inc.; WGL Midstream; and RGC Midstream, LLC, was issued a Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC) on October 13, 2017, pursuant to Section 7(c) of the Natural Gas Act authorizing it to construct and operate the Mountain Valley Pipeline Project (Project) located in 17 counties in West Virginia and Virginia. The Project is an approximately 303-mile, 42-inch-diameter natural gas pipeline to provide timely, cost-effective access to natural gas for use by local distribution companies industrial users and power generation in the Appalachian, Mid-Atlantic, and southeastern markets.

The 303-mile Project traverses several physiographic provinces and sub-provinces in the Appalachian Basin of West Virginia and Virginia and the Virginia Piedmont. In West Virginia the majority of the route lies within the Western Allegheny Plateau section of the Appalachian Plateaus Province before crossing into the Ridge and Valley Province of Virginia on the southern flank of Peters Mountain (West Virginia Geological and Economic Survey 1996). The route turns to the southeast crossing the Great Valley and northern Blue Ridge sub-provinces of Virginia, before descending into the Piedmont Foothills and terminating in the Outer Piedmont sub-province in Pittsylvania County Virginia (Bailey 1999).

### 1.1 Paleontological Setting (Appalachian Basin West Virginia, Virginia)

The sediments of the Appalachian Basin were originally deposited in a shallow tropical sea that existed throughout the Paleozoic Era, from about 570 million to 240 million years ago. This shallow sea received sediments throughout the Paleozoic Era from adjacent lands to the west and east and subsided under the accumulated weight of these sediments forming the Appalachian Basin. With time, these sediments became sedimentary rock. The current topographic expression within the ancient basin-area is the result of compressional forces (folding and thrust faults) from continental collisions of the North American and European-African plates.

Marine invertebrates flourished in the shallow tropical Paleozoic sea. After dying and falling to the bottoms of these seas, some organisms became fossilized in the sedimentary rock that later formed. Other fossils were also deposited by streams. Terrestrial and plant vertebrate fossils have been found throughout the Project area in scattered locations. More recent Quaternary and Tertiary floral and faunal remains may also be encountered in anaerobic environments such as bogs, or in other buried context if the chemical and physical conditions for preservation are favorable.

Neither the West Virginia Geological and Economic Survey or the Virginia Division of Geology Minerals and Mines tracks or regulates paleontological finds or the collection of fossils, and overall, it is unlikely that the segments of the pipeline in the Appalachian Basin would cause a material impact on recorded or undiscovered significant paleontological resources. The Pennsylvanian to Permian age cycles of marine to non-marine deposits of shale, siltstone and sandstone contain marine invertebrate fossils (trilobites, brachiopods, gastropods and crinoids) with occasional terrestrial plant fossils and some fragmented and rare vertebrate remains of fish and amphibians.

### 1.2 Paleontological Setting (Blue Ridge and Piedmont)

The Blue Ridge and Piedmont are composed largely of metamorphic and igneous rocks that have been deformed by stress, strain and heat associated with Mesozoic rifting as the super-continent of Pangea broke apart. Though many of these rocks were initially sedimentary and may have contained fossils from

Palaeozoic continental seas, the fossils like the surrounding rock in which they are preserved have also been deformed by compressional and extensional forces.

Fossils of Mesozoic freshwater and land animals and plants can be found in a narrow band of rocks in the Piedmont in Mesozoic rift basins paralleling the eastern coast of the United States.

The Virginia Division of Geology and Mines does not track or regulate paleontological finds or the collection of fossils, and overall, it is unlikely that the segments of the pipeline in Virginia would cause a material impact on recorded or undiscovered significant paleontological finds. Fossil remains found in Mesozoic rift basins may include ray-finned fish (semionotids, coelacanth) bony fish (palaeoniscids), dinosaur footprints and, in rare cases, dinosaur bone and skeletal fragments.

## 2.0 UNANTICIPATED DISCOVERIES OF PALEONTOLOGICAL RESOURCES

If any unanticipated paleontological resources are discovered, they will most likely be isolated bones, teeth, or jaws, which would not cause delays in construction activities. There is a slight chance that substantial and scientifically significant articulated remains of vertebrate fossils of marine reptiles may be encountered in excavations in areas underlain by fossil bearing formations. It is also possible that the silicified remains of Quaternary and Tertiary fauna may be present. If that occurs, work in the immediate vicinity of the find will cease and the following people will be contacted in each respective state to assess the significance of the find.

**West Virginia:** West Virginia Geologic and Economic Survey, Mitch Blake, Director and State Geologist (304)-594-2331 [blake@geosrv.wvnet.edu](mailto:blake@geosrv.wvnet.edu)

**Virginia:** Virginia Department of Mines Minerals and Energy, Division of Geology and Mineral Resources, David Spears, State Geologist (434) 951-6350 [david.spears@dmme.virginia.gov](mailto:david.spears@dmme.virginia.gov)

## 3.0 PRECONSTRUCTION TRAINING

Mountain Valley will provide training to all Environmental Inspectors regarding the presence, type, and identification of fossil resources and the procedures to be followed when an unanticipated paleontological resource is discovered during construction activities.

## 4.0 REFERENCES

Bailey, C.M. 1999. Physiographic Map of Virginia. Available at <http://web.wm.edu/geology/virginia/provinces/physiography.html>.

West Virginia Geological and Economic Survey. 1996. The Atlas of Major Appalachian Gas Plays: J.B. Roen, B.J. Walker, editors.