

# Mountain Valley Pipeline Project

## State of WV Application for Individual 401 Water Quality Certification for Non Coal Related Activity

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**Division of Water and Waste Management**

**401 Certification Program**

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## 1.0 INTRODUCTION

Mountain Valley Pipeline, LLC (MVP) is proposing to construct a pipeline 303-miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at an existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, West Virginia (WV) and extend to the Transcontinental Gas Pipe Line Company, LLC's (Transco) Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia (VA). In addition to the proposed pipeline, the Project will include the construction of three compressor stations currently planned along the route, as well as the installation of other ancillary facilities that are required for the safe and reliable operation of the pipeline. A Federal Energy Regulatory Commission (FERC) application requesting a certificate of public convenience and authorization for the Project was filed on October 23, 2015.

MVP is seeking to permit the Project under United States Army Corps of Engineers (USACE) Nationwide Permit (NWP) 12 – Utility Line Activities for Obstruction and Encroachment of the Waters of the United States under Section 404 of the Clean Water Act and under Section 10 of the Rivers and Harbors Act of 1899. In accordance with NWP 12, WV 401 Water Quality Certification Special Condition B, certification is limited to pipelines 36 inches or less in diameter. The proposed Project involves the installation and operation of a 42-inch diameter pipeline and is anticipated to have impacts greater than 300 linear feet on perennial and intermittent streams; therefore, the proposed Project requires an Individual State Water Quality Certification from the WV Department of Environmental Protection (WV DEP). Therefore, MVP is submitting this application for Individual 401 Water Quality Certification for the Mountain Valley Pipeline Project (Project). A separate WV Natural Streams Preservation Act Application, not included in this permit application package will be provided under separate cover.

## **2.0 STATE OF WEST VIRGINIA APPLICATION FOR 401 WATER QUALITY CERTIFICATION FOR NON COAL RELATED ACTIVITY**

The State of WV Application for 401 Water Quality Certification for Non Coal Related Activity was completed for the Project and is included in Appendix A. The application includes applicant and agent contact information, Project description and purpose, general Project information, and information pertaining to avoidance, mitigation, and restoration measures for potential impacts of the Project on Waters of the United States (U.S.). Table 1 lists all the counties and towns crossed by the Project and Table 2 lists all watersheds in the Project area. Additional details and information requested in the application are included in the following sections.

## **3.0 GENERAL PROJECT INFORMATION**

### **3.1 PROJECT DESCRIPTION**

The 42-inch-diameter, approximately 303-mile pipeline will deliver gas from the Equitrans L.P. transmission system and other natural gas facilities located near the pipeline to downstream delivery points. To move the gas from the starting point in Wetzel County, WV to the terminus in Pittsylvania County, VA, the pipeline will require three compressor stations along the route (Bradshaw, Harris, and Stallworth compressor stations). Currently, MVP anticipates four interconnects located along the pipeline (Mobley, Sherwood, WB, and Transco Interconnects).

The pipeline will generally require a 125-foot wide construction right-of-way and a 50-foot permanent right-of-way. The additional temporary right-of-way will be necessary for the safe travel of construction and maintenance vehicles and equipment as well as stockpiling any additional material that may be encountered during trenching.

Additional temporary workspace (ATWS) areas will be required for construction activities requiring space outside the 125-foot construction right-of-way. The ATWS will be utilized by construction for the purpose of material storage, storage of excess spoil at crossings, parking, and tractor trailer turning radius.

The availability of previously used roads and other existing roads is sufficient to provide access to most work areas; however, new access roads are required in several locations that do not parallel existing infrastructure. Maintenance will be required on some of the existing roads prior to hauling construction equipment and materials. Some of the existing dirt or gravel access roads will be graded and maintained to prevent rutting. Others may require placement of additional gravel or crushed stone on the existing surface and/or widening.

MVP will use contractor yards during construction to stage construction operations, store materials, park equipment, and set up temporary construction offices. Depending upon the condition of these yards and their current use, some surface grading, drainage improvements, placement of surface materials (e.g., crushed rock), and internal roadways may be required. Impacts to wetlands or streams are not anticipated in any of the yards.

MVP has considered the avoidance of potential impacts to wetlands and waterbodies in selecting its proposed route, access roads, and facilities. Where wetlands and waterbodies cannot be avoided, MVP will seek to minimize impacts by reducing to a 75-foot construction right-of-way where practicable, and through the use of wetland and waterbody-specific construction procedures.

#### **3.1.1 Pipeline Construction Description**

MVP will adhere to the FERC Plan and Procedures for pipeline construction. Additionally, MVP has implemented Erosion and Sedimentation Control Plan's (ESCP's) best management practices (BMPs) for the entire Project.

The majority of the pipeline construction will be accomplished using conventional open-cut methods. Hydrological conditions along the construction corridor in areas proposed for open ditch construction will likely dictate the use of either open ditch lay or open ditch push/pull lay methods. The conventional open ditch lay method will be the most frequently used technique for installing the pipeline in wetlands. The push/pull lay method will be used in inundated or saturated wetland areas that necessitate this technique. Selection of the push/pull method will be decided during construction by the construction supervisor and/or the MVP representative depending on the conditions at the time of construction. Wetlands within the construction corridor that will not be excavated will be crossed with timber mats. Once construction is complete, the timber mats will be removed as soon as practicable and the original contours will be restored.

After pipeline installation, previously excavated material will be used to backfill the pipeline trench and restore the grade to pre-excavation conditions. The first 12 inches above the top of the pipe will be clean fill free of rocks from the excavation; where the previously excavated material contains large rocks or other materials that could damage the pipe or coating, clean fill will be used to protect the pipe. If additional fill is required, it will be either flowable fill or topsoil.



To prevent mixing of the soil horizons or incorporation of additional rock into the topsoil, topsoil segregation (topsoil set in a separate pile) will be performed in non-saturated wetlands, croplands, pastures, hayfields, and in areas requested by the landowner. Implementing proper topsoil segregation will help ensure post-construction revegetation success, thereby minimizing loss of crop productivity and the potential for long-term erosion problems. Up to 12 inches of topsoil will be removed from the ground surface, segregated, as appropriate, from all subsoil and replaced in the proper order during backfilling and final grading. Where topsoil is less than 12 inches deep, the actual depth of the topsoil will be removed and segregated. Segregated topsoil will be placed in the trench following subsoil backfilling. Topsoil segregation may not be practical in saturated wetlands with standing water.

In saturated wetlands where topsoil segregation is not practical, erosion control measures such as silt fences and erosion control sock will be installed and maintained to minimize sedimentation. Trench plugs will be installed where necessary to prevent the unintentional draining of wetlands. Following backfilling, wetlands will be restored to pre-existing contours and excess soil will be distributed evenly on the pipeline right-of-way (ROW), only in upland areas, while maintaining existing contours. Upon completion of construction, the ROW will be restored, and a 10-foot wide strip centered on the pipeline will be maintained in an herbaceous state. Restoration and monitoring of wetland crossings will be conducted in accordance with the FERC Procedures to ensure successful wetland revegetation.

At waterbody crossings, normal backfill cover requirements will be met per FERC procedures. Compaction percentage of backfill will be equal to or above that of the adjacent undisturbed areas. Ditch plugs of crushed stone, sandbags, or dry soil may also be used to keep backfill from sloughing in toward the center of the waterbody. All waterbody banks will be restored to their original contours and foreign objects will be removed from the waterbody. Excavated material not required for backfill will be removed and disposed of at an upland site.

A description of waterbody and wetland restoration can be found in Section 6.0 (Restoration Plans).

### **3.1.2 Wetland and Waterbody Crossings in ATWS**

Where practicable, ATWS were located and designed to avoid stream and wetland impacts. Many streams and wetlands in ATWS will be protected by Erosion & Sedimentation (E&S) BMPs and will not be impacted by project activities. Many streams in ATWS that need to be crossed during construction will be spanned entirely by temporary stream crossing structures; however, some temporary impacts to streams in ATWS are unavoidable. There will be no permanent stream impacts in ATWS. Some impacts to wetlands in ATWS are unavoidable. Timber mats will be utilized during construction to cross wetlands in ATWS, resulting in temporary impacts to PEM wetlands and permanent conversion impacts to PFO and PSS wetlands. There will be no permanent impacts from the placement of fill in wetlands habitat in ATWS.

### **3.1.3 Wetland and Waterbody Crossings on Access Roads**

#### **3.1.3.1 Permanent Access Roads in Good Condition**

On proposed permanent access roads utilizing existing roads in good condition, widening or significant grading is not anticipated. Existing, well-maintained proposed permanent access roads will only require crushed stone placement and smoothing within the existing roadway to repair minor rutting or road degradation. Replacement of existing culverts is not anticipated on these access roads and any portion of these streams outside of the culvert that needs to be crossed will be spanned entirely during construction, from bank to bank, using temporary stream crossing structures. No in-stream work is anticipated for installation or removal of temporary stream crossing structures at existing culverts, therefore streams crossing these access roads in existing culverts will not be impacted. Most un-culverted stream crossings of these access roads will be culverted and will therefore have permanent impacts. Streams crossing these access roads with existing ford crossings will be spanned by temporary stream crossing structures during construction. Due to the large width of these crossings, the temporary stream crossing structures may require in-stream structural support; therefore, streams with existing ford crossings will have temporary impacts. Many wetlands identified within the limit of disturbance (LOD) of these access roads will be permanently impacted, due to the placement of fill in the wetlands for road maintenance. Some wetlands along permanent access roads will be crossed with timber mats during construction, will not have any permanent fill placed in them, and therefore, will only have temporary impacts.

### **3.1.3.2 Permanent Access Roads Requiring Widening or Grading**

Some proposed permanent access roads will utilize existing roads that require widening or significant grading. Replacement of existing culverts is not anticipated on these access roads and any portion of these streams outside of the culvert that needs to be crossed will be spanned entirely during construction, from bank to bank, using temporary stream crossing structures. No in-stream work is anticipated for installation or removal of temporary stream crossing structures at existing culverts, therefore streams crossing these access roads in existing culverts will not be impacted. Most un-culverted stream crossings of these access roads will be culverted and will therefore have permanent impacts. Streams crossing these access roads with existing ford crossings will be spanned by temporary stream crossing structures during construction. Due to the large width of these crossings, the temporary stream crossing structures may require in-stream structural support; therefore, streams with existing ford crossings will have temporary impacts. Many wetlands identified within the LOD of these access roads will be permanently impacted, due to the placement of fill in the wetlands for road maintenance. Some wetlands along permanent access roads will be crossed with timber mats during construction, will not have any permanent fill placed in them, and therefore, will only have temporary impacts.

### **3.1.3.3 Temporary Access Roads**

Some proposed temporary access roads will utilize existing roads that may require widening or significant grading. Replacement of existing culverts is not anticipated on these access roads and any portion of these streams outside of the culvert that needs to be crossed will be spanned entirely during construction, from bank to bank, using temporary stream crossing structures. No in-stream work is anticipated for installation or removal of temporary stream crossing structures at existing culverts, therefore streams crossing these access roads in existing culverts will not be impacted. Most un-culverted stream crossings of these access roads will be spanned by temporary stream crossing structures. It is anticipated that temporary stream crossing structures on at these crossing locations will have temporary impacts to streams. Streams crossing these access roads with existing ford crossings will be spanned by temporary stream crossing structures during construction. Due to the large width of these crossings, the temporary stream crossing structures may require in-stream structural support; therefore, streams with existing ford crossings will have temporary impacts. Many wetlands identified within the LOD of these access roads will be temporarily impacted, due to the placement of temporary crossing structures in wetlands during construction. PFO and PSS impacts along temporary access roads are considered permanent impacts due to the conversion from woody to herbaceous wetland habitat.

## **3.2 PROJECT PURPOSE**

The Project is a new pipeline designed to transport up to 2.0 million dekatherms per day (MMDth/d) of natural gas from the Appalachian Basin to growing markets in the Mid-Atlantic and southeastern United States. A sizable portion of natural gas production growth is occurring in the Appalachian Basin shale region. Appalachian Basin shale gas production has increased from 2 billion cubic feet per day (Bcf/d) in 2010 to over 16.5 Bcf/d in July 2015. The Project will provide for transportation of these prolific natural gas supplies to Station 165, the pooling point for natural gas in Transco Zone 5, where this natural gas can serve the growing demand for natural gas use by LDCs, industrial users, and power generation facilities along the Eastern seaboard.

The purpose of the Project is to provide timely, cost-effective access to meet the growing demand for natural gas use by LDCs, industrial users, and power generation facilities in the Mid-Atlantic, southeastern, and Appalachian markets. The Project will also provide the opportunity for unserved and underserved markets along the route to access natural gas supplies. For example, the routing of the project through the south WV area resulted in Roanoke Gas Company (Roanoke Gas) becoming a Project shipper and requesting a specific tap location to support its LDC system's growth and expansion. Roanoke Gas' involvement as a shipper and its site-specific delivery point are concrete evidence of the Project's purpose and need to provide opportunities for economic growth and development along the route of the Project.

### 3.3 PROJECT COORDINATES

Coordinates for the northern terminus of the Project in WV are: 39.56258° N, -80.54302° W

Coordinates for the Project crossing from WV to VA are: 37.40302° N, -80.68917° W

Coordinates for the southern terminus of the Project in VA are: 36.83369° N, -79.33784° W

### 3.4 DIRECTIONS TO SITE

Directions are provided from the WV DEP, Division of Water and Waste Management (DWWM), Section 401 Program, 601 57<sup>th</sup> Street SE, Charleston, WV 25304 to:

- The WV – VA border crossing
  - Take I-64E / I-77S from Charleston for approximately 53 miles
  - Continue on I-77S for approximately 31.6 miles to Exit 9 for US-460 toward Princeton / Pearisburg, VA
  - Left onto US-460E and continue on US-460E for approximately 14.8 miles
  - Left onto Island St
  - Left onto US-219N / Federal St
  - Follow US-219N for approximately 7.4 miles and turn right onto Wilson Mill Rd
  - Follow Wilson Mill Rd for approximately 1.9 miles until destination is reached
  
- The Mobley processing facility in Wetzel County, WV
  - Take I-64W / I-77N for approximately 2.5 miles to I-77N
  - Continue on I-77N for approximately 1.9 miles to I-79N
  - Take I-79N for approximately for approximately 118 miles to Exit 115 (US-50 towards Clarksburg/Bridgeport)
  - Turn left onto US-50W and continue on US-50W for approximately 5.9 miles
  - Right onto Co Rd 5035 and continue for approximately 0.2 miles
  - Right onto Wilsonburg Rd and continue for approximately 0.7 miles
  - Right onto Bean Run/Gregory Run and continue for approximately 5.8 miles
  - Left onto WV-20N and continue for approximately 17.1 miles
  - Right onto Co Rd 7/8 and continue for approximately 2.8 miles
  - Slight left onto Fallen Timber Rd / Shuman Hill and continue for approximately 2.3 miles
  - Left onto N Fork Rd and continue for approximately 0.3 miles
  - Right onto Co Rd 15/3 and continue for 0.5 miles to destination

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### **3.5 FEDERAL ENERGY REGULATORY COMMISSION (FERC) DOCUMENTS**

A FERC *NOI to Prepare an Environmental Impact Statement for the Planned Mountain Valley Pipeline Project* was issued on April 17, 2015 for Docket No. PF15-3-000. A FERC application requesting a certificate of public convenience and authorization for the Project was filed on October 23, 2015 for Docket No. CP16-10-000 (formerly Docket No. PF15-3-000). A *Notice of Availability of the Draft Environmental Impact Statement [DEIS] for the Proposed Mountain Valley Project and Equitrans Expansion Project* was issued on September 16, 2016. A copy of the FERC NOI, FERC Notice of Application, and FERC Notice of Availability for the DEIS are attached for your review (Appendix B).

### **3.6 PUBLIC NOTICE PROJECT DESCRIPTION**

The Project would involve the construction and operation of about 303 miles of 42-inch diameter buried steel pipeline in Wetzell, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe Counties, WV and Giles, Craig, Montgomery, Roanoke, Franklin, and Pittsylvania Counties, VA. The proposed pipeline route will begin at an existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzell County, WV and extend to the Transco Zone 5 compressor station 165 in Transco Village, in Pittsylvania County, VA. In addition to the proposed pipeline, the Project will include the construction of three compressor stations currently planned along the route, as well as the installation of other ancillary facilities that are required for the safe and reliable operation of the pipeline.

The MVP Project would provide about 2 MMDth/d of natural gas to markets in the Mid-Atlantic United States, Appalachian Basin, and Southeastern United States. The general location of the project is shown on the attached United States Geological Survey (USGS) Project Location Maps (Figures 1-1 to 1-41).

The WV DEP Public Notice is provided in Appendix C. This Public Notice of the 30 day availability of the 401 Application was published throughout West Virginia in each county where the Project occurs. Details of the publication dates and newspapers are provided in Table 3. Affidavits of publication are provided in Appendix C.

## **4.0 NO PRACTICAL ALTERNATIVE DEMONSTRATION**

The No Practical Alternative Demonstration discusses the various Project alternatives that could accomplish all or a portion of the Project's goals without implementing the Project. The initial alternatives that were considered included the No Action Alternative and major Route Alternatives. After identifying the preferred major route, minor route modifications were made to avoid or minimize potential impacts to major waterbodies and wetlands, specifically palustrine forested and palustrine scrub-shrub wetlands. The LOD width was reduced from 125-feet to 75-feet at wetland and waterbody crossings to further avoid or minimize potential impacts to wetlands and waterbodies.

The 303-mile pipeline will extend from an interconnection with Equitrans' existing H-302 pipeline near the MarkWest Liberty Midstream & Resources, L.L.C. (MarkWest) Mobley processing facility in Wetzel County, WV and traverse south-southeast to the town of Wallace, Harrison County, WV. The pipeline will then traverse south past Salem, Harrison County, WV approximately 10 miles west of Clarksburg, WV. The pipeline will continue to head in a southerly direction until approximate milepost (MP) 101.5 between the towns of Webster Springs, Webster County, WV and Tioga, Nicholas County, WV; here the line will slightly turn to the southwest to avoid the U.S. Forest Service Ownership Boundary for the Monongahela National Forest. The pipeline then will head south passing west of Pence Springs, Summers County, WV near MP 171.7 and Greenville, Monroe County, WV near MP 182.7. The pipeline will then cross the Jefferson National Forest (MP 196.2 to 199.4) including the Appalachian National Scenic Trail (between MP 196.3 and 196.4) northwest of the town of Goldbond, Giles County, VA. At approximate MP 200.0, the pipeline co-locates with an Appalachian Power Company (AEP) transmission line west of the town of Kimballton, Giles County, VA. The pipeline deviates from the transmission line in several areas to avoid structures and follow topography with a large deviation from MP 208.6 to 210.7. Northeast of the town of Newport, Giles County, WV, the pipeline heads to the northeast to avoid karst terrain until MP 218.1. Here, the pipeline heads south-southeast and crosses the Jefferson National Forest from approximate MP 218.5 to 223.3. The pipeline continues in a southerly direction, rejoins the AEP transmission line at approximate MP 228.3 and generally remains co-located with the AEP transmission line aside from a few small deviations to avoid structures and follow more favorable terrain until approximate MP 231.7 where it deviates to the northeast to follow more favorable terrain and crosses Interstate 81 at approximate MP 234.3. The line then heads south passing approximately one mile west of Spring Hollow Reservoir at approximate MP 236.5 and shifts to the south-southeast passing to the west of Bent Mountain, Roanoke County, VA at approximate MP 244.9. At MP 246.0, the pipeline heads east, crossing the Blue Ridge Parkway in an open field between MP 246.1 and 246.6, and continues in an easterly direction passing in between Boones Mill and Rocky Mount, Franklin County, VA at approximate MP 263.8. The pipeline then heads in a general southeast direction following the terrain until it terminates at Station 165, near Transco Village, in Pittsylvania County, VA.

### **4.1 NO ACTION ALTERNATIVE**

If the Project is not authorized by the FERC, the Project's potential short-term and long-term environmental impacts would not occur. If the No Action Alternative is implemented however, the stated purpose and need for the Project could not be accomplished. The Project aims to provide timely, less costly natural gas access to meet the growing demand by LDCs, industrial users and power generation facilities in the Mid-Atlantic and southeastern markets. Additionally, the Project would provide this natural gas to potential markets in the Appalachian region. If the No Action Alternative is implemented, benefits that would result from the Project would be forgone. These benefits include: the economical access to new sources of natural gas supply from the Appalachian Basin production regions by natural gas markets in the Mid-Atlantic, southeastern, and Appalachian regions of the United States, and for new and existing electricity generation facilities to obtain access to greater sources of cleaner burning natural gas supply. This in turn would create opportunities to improve regional air quality.

The No Action Alternative would not allow MVP to offer the growing Mid-Atlantic, southeastern, and Appalachian markets access to an abundant supply of a cleaner-burning, low-cost source of fuel, and would potentially limit the economic growth of these regions by not providing improved access to a natural gas supply. In particular, the No Action Alternative would not allow MVP to bring natural gas supplies to Roanoke

Gas' local customers in southwestern VA. Thus, the No Action alternative would have both adverse economic and environmental consequences.

## **4.2 ROUTE ALTERNATIVES ANALYSIS**

During Project development, MVP conducted a review of potential pipeline routes to identify potential pipeline corridors. This initial review was then further refined to determine the most feasible route in the most optimal corridor. A primary objective during this process was to avoid (if possible) or minimize crossings of major population centers and significant natural resources such as crossings of National Forests, National Parks, the Appalachian National Scenic Trail, and the Blue Ridge Parkway.

MVP also evaluated potential colocations with existing highways and linear utilities in the region. The existing major pipelines in the region traverse generally from the southwest-to-northeast and do not provide a north-south option for colocation. Major highways in the region generally traverse either southwest-northeast, or east-west, providing limited opportunities for significant colocation. Although some sections of major electric transmission lines initially looked suitable for colocation, in most areas construction would not be feasible due to potential slope stability issues.

Following the initial analysis, a more detailed analysis of site-specific data was performed taking into consideration topography at road and waterbody crossings as well as identification of ridge lines. Special consideration was also given to residential areas, which were avoided whenever possible. The proposed route minimized or avoided potential impacts on known sensitive biological and cultural resources, protected lands, wetlands and waterbodies, and floodplains within the Project vicinity. The route identified after this initial review was considered MVP's initial preferred route, Route Alternative 1.

As a result of the review of over 1,700 miles of pipeline route alternatives and over 3,000 miles of pipeline route variations, MVP identified the preferred pipeline route (Proposed Route) discussed in this Application.

### **4.2.1 Route Alternative 1**

Route Alternative 1 is approximately 324 miles long and collocated with existing utilities for approximately 101 miles (31 percent) as opposed to the 22.0 miles (7 percent) for the Proposed Route (Figure 2). This route is located in a predominantly forested, low-density rural area with several small towns and small patches of agricultural land. Route Alternative 1 is 23 miles longer than the Proposed Route, resulting in approximately 335 more acres of construction impact. Flight reconnaissance and field verification revealed that approximately 105 miles of Route Alternative 1's first 200 miles would be collocated with existing overhead electric transmission line ROWs along severe side slopes. Based on this review, MVP determined that Route Alternative 1 contained insurmountable construction challenges, as well as a high risk of slope failure and pipeline slips once the pipeline was in operation.

In addition to Route Alternative 1, additional route alternatives were considered, including: Modified Route Alternative 1, Hybrid Alternative 1/Proposed Route, Northern Pipeline Alternative, Dominion Supply Header Pipeline Alternative, and the East Tennessee Natural Gas (ETNG) Alternative.

### **4.2.2 The Modified Route Alternative 1**

The Modified Route Alternative 1 considered deviations away from existing electric transmission lines periodically to avoid areas of severe side slope and then returning to collocate with the transmission lines after passing the areas of side slope. However, as described above, approximately 105 miles of Route Alternative 1 follows existing ROWs which are adjacent to overhead electric transmission line ROWs that are along severe side slopes. Therefore modifications to Route Alternative 1 avoiding severe side slopes would retract the benefits of collocation and offer no environmental advantage over the Proposed Route.

### **4.2.3 The Hybrid Alternative 1/Proposed Route**

The Hybrid Alternative 1/Proposed Route combined portions of Route Alternative 1 and the Proposed Route. Because the two routes cross near the middle (about MP 135 of the Proposed Route, see Figure 2), the most logical option for creating hybrid routes is the northern one-half of Route Alternative 1 combined with the southern one-half of the Proposed Route, or the reverse. The significant length of severe side slope crossed by Route Alternative 1, approximately 105 total miles, is roughly split between both the northern and southern sections of this route. Therefore, a hybrid route would not avoid this concern. MVP believes

that a hybrid using portions of Route Alternative 1 and the Proposed Route would not provide an environmental advantage over the Proposed Route.

#### **4.2.4 The Northern Pipeline Alternative**

The Northern Pipeline Alternative considered a route parallel to a project planned by Atlantic Coast Pipeline, LLC. (ACP) from WV to North Carolina. Based on publicly available information filed with FERC, the ACP would begin near approximately MP 36.7 of the MVP Project and then traverse generally in a southeast direction, crossing into VA and then North Carolina (NC). At about MP 180 of the ACP it would cross the Transco pipeline system, approximately 60 miles north of the end point of the MVP Project (Transco Station 165; Figure 3). In concept, the Northern Pipeline Alternative would be adjacent to the northernmost 180 miles of the ACP route, and then follow the existing Transco pipeline south for about another 60 miles to Transco Station 165.

The Northern Pipeline Alternative would be about 25 miles shorter than the corresponding segment of Proposed Route, and result in about 376 acres less land disturbance during construction than the corresponding segment of Proposed Route. The Northern Pipeline Alternative would be adjacent to existing ROWs for about 73 miles, mostly along the last 60 miles which would be adjacent to the Transco pipeline, compared to about 21 miles along the Proposed Route. The Northern Pipeline Alternative would also be collocated with another proposed pipeline, the ACP, for about 180 miles. The Northern Pipeline Alternative would cross about 29.2 miles of National Forest Service lands within the Monongahela National Forest and George Washington National Forest, compared to about 3.4 miles crossed by the corresponding segment of the Proposed Route within the Jefferson National Forest. Both the Northern Pipeline Alternative and Proposed Route would cross the Appalachian National Scenic Trail and Blue Ridge Parkway.

A major impediment for the Northern Pipeline Alternative is that the mountainous terrain along portions of the route, particularly in northern WV, would not allow for construction of two large diameter pipelines in a common corridor. Constructing two large diameter pipelines in the mountainous terrain would add significant construction personnel risk with the amount of equipment necessary to move and install both pipelines in the steep terrain. Sidebooms do not have enough weight capacity or levered distance to hold or move a second pipe over the first pipe trench. Erosion and sediment control risks would significantly increase with the amount of soil and steep slope disturbance required for the two 42-inch pipelines ditch excavation and soil control. Use of this alternative would then greatly increase the area of impact and the duration of construction-related disturbance where the two pipelines are collocated, including across 29 miles of National Forest lands and the crossing of the Appalachian National Scenic Trail and Blue Ridge Parkway. For these reasons, MVP does not consider the Northern Pipeline Alternative to be environmentally preferable and to meet its purpose and need.

#### **4.2.5 The Dominion Supply Header Pipeline Alternative**

The Dominion Supply Header Pipeline Alternative considered a route parallel to a project planned by Dominion Resources, Inc. to transport natural gas from supply areas in Ohio, Pennsylvania, and WV to market areas in VA and NC (Figure 4). This alternative would begin at MP 0.0 of the Proposed Route and continue southwest along an existing pipeline for about 4.5 miles until intersecting the Supply Header pipeline route. The alternative would then be collocated in the Supply Header pipeline route for about 28.5 miles until rejoining the Proposed Route at about MP 36.7. The primary disadvantage of the Supply Header Pipeline Alternative would be the lack of suitable construction area for the construction of two adjacent pipelines in much of the steep terrain crossed by the alternative route. The only suitable location for placement of a large diameter pipeline in the areas of steep terrain are along ridge tops, which in the region are commonly less than 50 feet wide, which is not wide enough for placement of two large diameter adjacent pipelines without significant earth movement to level the ridgetops. Collocation of two large diameter pipelines along the steep ridgelines would require significant cut and fill, significantly increasing the area of impact, and side-slope installation of at least one of the pipelines. For this reason, the Supply Header Pipeline Alternative is not a reasonable alternative.

#### **4.2.6 The East Tennessee Natural Gas (ETNG) Alternative**

The ETNG Alternative considered a route parallel to the existing ETNG pipeline near Blacksburg, VA, proceeding southeast to the existing Transco pipeline, and then following the Transco pipeline northeast to Transco Station 165 (Figure 5). The Proposed Route crosses the existing ETNG pipeline near MP 235.2 about 1 mile west of where the ETNG pipeline crosses under Spring Hollow Reservoir. To utilize the existing ETNG ROW, this alternative would turn southwest at MP 235.2 and follow the ETNG pipeline for about 50 miles to Wytheville, VA, then turn south and southeast following the ETNG pipeline for about 90 miles before joining the Transco pipeline near the VA/NC state line. The alternative would then turn northeast and follow the Transco pipeline for about 30 miles before ending at Station 165 at MP 300.97 of the Proposed Route. The ETNG Alternative would be adjacent to existing pipeline ROW for nearly its entire length, or about 171 miles, compared to 3.8 miles of the corresponding segment of Proposed Route. However, the alternative would cross about 5 miles of the Jefferson National Forest, require two crossings of the New River, would be about 106 miles longer and result in about 1,607 more acres of land disturbance during construction than the corresponding segment of Proposed Route. The ETNG would cross a significantly greater length of forest area and NWI mapped wetlands than the Proposed Route. The ETNG Alternative would cross 13 city or town limits, identified as populated areas, as shown in ESRI data compared to 2 crossed by the corresponding segment of Proposed Route. The ETNG alternative would require construction within 50 feet of approximately 46 residences, compared to 8 for the corresponding segment of Proposed Route. In some locations, it is likely that there is not enough room adjacent to the existing ROW for a new pipeline, and in these locations, the MVP pipeline would need to be moved away from the existing ROW to avoid the developed areas. Because of the significant additional length and increase in communities that would be crossed, the ETNG Alternative is not a reasonable alternative.

#### **4.2.7 Proposed Route Minor Modifications**

Since the identification of the Proposed Route, over 500 minor route modifications have been made to avoid or minimize potential impacts wetlands and waterbodies, avoid impacts to sensitive resources and habitats, improve constructability, and avoid residential and commercial areas. A reduction of the LOD width from 125-feet to 75-feet at wetland and waterbody crossings will be utilized to further avoid or minimize potential impacts to wetlands and waterbodies.



## 5.0 WETLAND DELINEATION AND WATERS OF THE U.S. SURVEY

### 5.1 INTRODUCTION

The proposed Project is approximately 196 miles long within WV, with approximately 147 miles of proposed temporary and permanent access roads. Wetland delineation and Waters of the U.S. surveys were performed for approximately 189 miles of centerline and 141 miles of proposed access roads within WV for the Mountain Valley Pipeline Project. The study area was limited to a 300-foot wide corridor for the proposed pipeline route, a 100-foot wide corridor for proposed access roads, and to the proposed LOD for compressor stations, storage yards, and other ancillary facilities.

The results of the wetland and waterbody field survey are presented in the Aquatic Resource Reports (Appendix D). While a majority of the Project has currently been surveyed for wetlands and waterbodies, field teams have not been granted access by landowners to approximately 7 miles of proposed pipeline ROW and 6 miles of proposed access roads within WV. A desktop wetland and waterbody evaluation of these unsurveyed areas was conducted to evaluate the likely presence and approximate location of wetlands and waterbodies in order to estimate potential impacts until surveys can be conducted in these areas.

### 5.2 METHODS

#### 5.2.1 Field Delineated Wetlands and Streams

USACE requires the use of the procedures enumerated in the *USACE Wetland Delineation Manual (1987 Manual; Environmental Laboratory, 1987)* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (USACE Regional Supplement; Environmental Laboratory, 2012)* for making jurisdictional determinations. According to the *1987 Manual*, an area is defined as a wetland if, under normal circumstances, it meets all three of the following criteria:

1. Predominance of hydrophytic vegetation (plants adapted for life in saturated soil conditions);
2. Hydric soils (soils formed under water, or in saturated conditions); and
3. Wetland hydrology (presence of inundated or saturated soils at some time during the growing season).

Wetlands identified in the field were classified in accordance with the U.S. Fish and Wildlife Service's (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), *A Hydrogeomorphic (HGM) Classification for Wetlands* (Brinson, 1993), and USACE Waters Type (USACE, 2007). Cowardin wetland classifications (Cowardin et al., 1979) are as follows:

- *Palustrine emergent (PEM)* – emergent, herbaceous (non-woody) plants are the tallest life form with at least 30 percent aerial coverage
- *Palustrine scrub-shrub (PSS)* – woody plants less than six meters (20 feet) in height are the tallest life form with at least 30 percent aerial coverage, or, when trees or shrubs alone cover less than 30 percent of an area but in combination cover 30 percent or more. Trees are defined as woody plants at least six meters (20 feet) in height, and shrubs are defined as woody plants less than six meters (20 feet) in height
- *Palustrine forested (PFO)* - woody plants at least six meters (20 feet) in height are the tallest life form with at least 30 percent aerial coverage

Dominant vegetation was identified and classified according to *The National Wetland Plant List: 2016 wetland ratings* (Lichvar, 2016). Plant classifications are as follows:

*Obligate (OBL)* - essentially always found in wetlands; estimated probability >99%

*Facultative Wetland (FACW)* - usually found in wetlands; estimated probability 67%-99%

*Facultative (FAC)* - equally likely to occur in wetlands and non-wetlands; estimated probability 34%-66%

*Facultative Upland (FACU)* - usually occurs in non-wetlands; estimated probability 1%-33%

*Upland (UPL)* –rarely occurs in wetlands; estimated probability <1%

Streams identified in the field were classified by Flow Regime, USACE Water Type (USACE, 2007), Cowardin Classification (Cowardin et al., 1979), and WV DEP Water Quality Standard Antidegradation Policy tier classification.

Streams were designated in the field as ephemeral if they exhibited the following characteristics. Ephemeral streams typically exhibit short duration flow derived from precipitation and precipitation driven run-off from the localized surrounding landscape. Ephemeral streams are located above the groundwater table and are not augmented by groundwater sources. Ephemeral streams are often dry. Therefore, no permanent fish species persistently reside in streams exhibiting this flow regime. Aquatic macroinvertebrates are also not common within this flow regime and the absence is often used to support the determination of a stream being ephemeral. As practical, the source of hydrology for a stream was identified. If the stream received no groundwater contributions then it was designated as ephemeral.

Streams were designated in the field as intermittent if they exhibited the following characteristics. Intermittent streams exhibit periods of flowing water during the wet season (winter through spring), but normally flow does not persist year-round. Intermittent streams derive at least a portion of their hydrology from ground water sources. Precipitation and precipitation driven run-off from the surrounding landscape serve as supplemental hydrologic contributors. Only pioneer fish species potentially occupy streams of this flow regime when conditions are optimal. Aquatic macroinvertebrate populations in intermittent streams differ from season to season depending on stream flow fluctuations. As practical, the source of hydrology for a stream was identified. If the stream received groundwater contributions then it was designated as either an intermittent or perennial.

Streams were designated in the field as perennial if they exhibited the following characteristics. Perennial streams have continuous flow year-round during years of normal rainfall. Perennial streams, like intermittent streams, derive hydrology from ground water sources. Precipitation and precipitation driven run-off from the surrounding landscape serve as supplemental hydrologic contributors. Usually numerous ephemeral and intermittent streams are tributaries to perennial streams. These tributaries allow for a large enough drainage area and groundwater inflow to allow for continuous flow year-round. Various fish and macroinvertebrate species may be present if suitable water quality parameters are present.

## 5.2.2 Desktop Evaluated Wetlands and Streams

A desktop evaluation using available Geographic Information Systems (GIS) data was used to interpret site conditions and evaluate the likely presence and approximate locations of wetlands and waterbodies. Data used for this desktop review included:

- US Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) color infrared (CIR) imagery at 1-meter resolution
- USFWS National Wetland Inventory (NWI) mapping (USFWS, 2009)
- Natural Resource Conservation Service (NRCS) Soil Survey mapping (NRCS, 2014)
- Light Detection and Ranging (LiDAR) survey data showing 2-foot topographic contours
- USGS 7.5-Minute Topographic Maps (USGS, 2009)
- Google Earth aerial imagery (current and historic aerial imagery)
- National Hydrography Dataset (NHD) mapping (USGS, 2015)

The evaluation of site conditions for likely waterbody features primarily utilized LiDAR topographic contours, NHD imagery, and aerial imagery to identify potential stream channels that may exhibit regular water flow, typical of jurisdictional waterbodies. Updated LiDAR and aerial photography were gathered via aerial fly over in November 2014.

The evaluation of site conditions for likely wetland locations utilized all of the datasets listed above and were evaluated for the potential to contain all three criteria required to be a wetland by the *1987 Manual* as described previously. NWI mapping was used to identify any previously mapped wetlands in the unsurveyed areas. USGS and LiDAR contours were used to identify flat, gently sloping, or concave areas where wetlands may naturally form. NRCS Soil Survey mapping was used to identify hydric or poorly drained soils

where wetlands may naturally form. CIR and aerial imagery was used to identify any potential inundated, wet, or clayey areas. CIR imagery is a false color image that shows the reflected electromagnetic waves from an object such that near infrared (NIR) is projected in red color, green light is projected as blue, and red light is projected as green. Intense bright red colors indicate vigorously growing, dense vegetation. Light red, magenta, or pink colors indicate slow-growing vegetation (mature evergreens, agricultural fields outside of growing season). Light pink colors indicate dead or dormant vegetation. Gray-tan to blue-green colors indicate clayey soils and light blue to pale colors indicate sediment-laden water. Dark blue and black colors indicate asphalt or deep water in larger rivers, lakes, and ponds.

Upon review of the available GIS data, professional experience and judgement was used to identify likely waterbody channels and areas likely to exhibit a predominance of wetland characteristics on the unsurveyed sites.

## **5.3 FIELD SURVEYED WETLANDS AND STREAMS SUMMARY**

### **5.3.1 Field Surveyed Wetlands and Streams Findings**

Wetland delineation and Waters of the U.S. surveys were performed for approximately 189 miles of centerline and 141 miles of proposed access roads within WV for the Mountain Valley Pipeline Project. The study area was limited to a 300-foot wide corridor for the proposed pipeline route, a 100-foot wide corridor for proposed access roads, and to the proposed LOD for compressor stations, storage yards, and other ancillary facilities. A total of 662 wetlands and 904 streams were identified during the field surveys within the study area. The findings are presented in the Aquatic Resource Reports, separated by county, presented in Appendix D. Each Aquatic Resources Report provides a summary of the features identified within the full study corridor.

### **5.3.2 Field Surveyed Wetlands and Streams Impacts**

MVP is committed to avoiding and minimizing impacts to sensitive resources such as wetlands and waterbodies. As discussed in Section 4.0 – No Practicable Alternatives Demonstration, MVP conducted an initial routing analysis and a more comprehensive alternatives analysis to avoid and minimize environmental impacts. Since the initial pipeline route was identified, there have been over 500 minor route modifications to avoid and minimize environmental impacts, improve constructability, avoid residential and commercial areas, and comply with landowner requests.

While significant effort was made to avoid wetland and waterbody impacts, both temporary and permanent impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a 303-mile linear project. Proposed permanent impacts will result from stream culverting along permanent access roads, constructing above ground facilities, converting PFO and PSS wetlands along the pipeline ROW, and filling of wetlands for permanent access roads.

In an effort to reduce permanent impacts to PFO and PSS wetlands, clearing for construction within PFO and PSS wetlands and vegetation maintenance during pipeline operation will be limited per the FERC Procedures, such that only the minimum width needed for pipeline protection and surveillance is maintained. In compliance with USACE NWP 12 conditions, any unavoidable permanent impacts that may occur to wetlands, including PFO or PSS wetland habitat conversion to PEM, will be kept under 0.5 acres of cumulative impacts per single and complete crossing (project).

Where wetlands cannot be avoided, MVP will minimize impacts through the use of wetland construction procedures. Techniques to avoid or minimize impacts include top soil conservation, reducing the ROW, avoiding placement of workspaces in critical habitats, revegetation, backfilling and grading, and open-cut/conventional lay or dry ditch crossing methods. The majority of impacts are temporary impacts to PEM wetlands and streams in the temporary work areas and permanent ROW. Temporary construction impacts in wetlands and may include loss of herbaceous vegetation; soil disturbance associated with grading, trenching, and stump removal, soil compaction, sedimentation and turbidity increases, and hydrological profile changes. Restoration plans and minimization efforts during construction are discussed in Section 6.0.

Not all wetlands and streams located within the Project LOD are anticipated to be impacted. The Detail Figures 6-1 to 6-538 include tags which identify wetlands and streams in the Project LOD that are protected

and either have no impact or only a temporary impact for permanent access roads and ATWS/Laydown Yards. Wetlands and streams that do not have tags will have temporary or permanent impacts and those resources and impacts are included in the impact tables (Tables 4.1, 4.2, 5.1, and 5.2). The resource-specific tags include the following:

- Maintained road, no impact
  - This tag is for existing culverted streams, streams running parallel to, and wetlands along existing and maintained access roads that will not be upgraded. Features with these tags will not be impacted.
- Existing culvert/bridge, no impact
  - Culvert/bridge replacements are not anticipated for features with this tag; therefore, these features will not be impacted.
- Temporary stream crossing structure to be placed at existing crossing during construction. May include temporary in-stream work. Temporary impact.
  - This tag is for permanent access roads with existing ford crossings - temporary crossing structures will be utilized to cross streams during construction. These features will not be permanently impacted by the placement of fill or new culverts; all impacts will be temporary.
- Stream entirely spanned by temporary stream crossing structure during construction. No temporary in-stream work. No impact
  - This tag is for streams spanned by timber mats in ATWS and laydown yards. Streams will be spanned entirely and there will be no impacts to the stream from the temporary crossing structure. There will be no in-stream work or other temporary stream impacts on these features.
- E&S BMP protections. No impact
  - This tag is for wetlands and streams in access roads, ATWS, and laydown yards with no timber mat crossing and with CFS or other E&S protection. These features will be protected by E&S BMPs and will not be impacted by project activities.
- Timber mat crossing in wetlands during construction.
  - For PEM wetlands in access roads, ATWS, or pipeline construction area with timber mat crossings. Timber mats will be utilized during construction to cross wetlands, resulting in temporary impacts.
  - For PSS or PFO wetlands in access roads, ATWS, or pipeline construction area with timber mat crossings. These will be counted as permanent impacts due to the conversion of these systems to PEM systems.
- Outside of LOD. No impact
  - These features are located outside of the LOD and will not be impacted. Not all features outside of the LOD are labeled with this tag; only features close to the LOD are labeled with this tag.

Proposed temporary and permanent wetland impacts are summarized in Tables 4.1 and 4.2. Proposed temporary and permanent stream impacts are summarized in Tables 5.1 and 5.2. Table 6 lists traditional navigable waterways (TNW) impacted by the Project.

It is anticipated that the Project will have unavoidable permanent impacts to a total of 0.5657 acres of PEM wetland, 0.5766 acres of PSS wetland, and 0.9901 acres of PFO wetland. These impacts include 0.5587 acres of PEM wetland and 0.0084 acres of PSS wetland on permanent access roads. It is also anticipated that the Project will have unavoidable permanent impacts to 0.0070 acres of PEM wetland at compressor stations. Additionally, conversion impacts are anticipated to 0.9901 acre of PFO wetland and 0.5683 acres of PSS wetland within the proposed Project ROW.

It is anticipated that the Project will have unavoidable permanent impacts to approximately 2,392 linear feet of streams. Proposed permanent impacts to streams will result from the culverting of streams at proposed permanent Project access road crossings and from the construction of compressor stations. All unavoidable permanent wetland and stream impacts will be mitigated by the purchase of wetland credits from approved

mitigation banks in the Project area or In-Lieu-Fee (ILF) Program credits. A Mitigation/Compensation Plan is discussed in Section 7.0.

## 5.4 DESKTOP EVALUATION OF UNSURVEYED AREAS SUMMARY

### 5.4.1 Desktop Evaluation of Unsurveyed Areas Findings

Field surveys have not been performed for approximately 7 miles of proposed pipeline ROW and 6 miles of proposed access roads within WV. A desktop wetland and waterbody evaluation of these unsurveyed areas was conducted to evaluate the likely presence and approximate location of wetlands and waterbodies in order to estimate potential impacts until surveys can be conducted in these areas. Unsurveyed areas are shown in black hatching on the Detail Maps provided as Figures 6-1 to 6-538.

The desktop evaluation identified 36 areas in the Desktop Evaluation Study Area that may contain a predominance of wetland characteristics indicative of the required criteria, as outlined in the *1987 Manual* and amended by the *USACE Regional Supplement*. In addition, 66 areas were identified within the Desktop Evaluation Study Area that likely exhibit jurisdictional stream characteristics. Desktop delineated wetland and waterbody features are shown on the Detail Maps provided as Figures 6-1 to 6-538. To help distinguish between desktop delineated features and field-delineated features, the feature identification names of all desktop delineated wetlands and waterbodies begin with “TTWV”. The results of this desktop evaluation have not been field verified; field verification of results will occur when wetland and waterbody survey permission is granted for inaccessible, or recently accessible, parcels.

### 5.4.2 Desktop Evaluation of Unsurveyed Areas Impacts

It is anticipated that 11 desktop wetland areas and 9 desktop streams would incur permanent impacts from the proposed Project. The remaining desktop wetlands and desktop streams would incur temporary impacts. MVP anticipates additional permanent impacts to a total of 0.0978 acres of PEM wetland, 0.0058 acres of PSS wetland, and 1.5894 acres of PFO wetland identified in the desktop evaluation. These desktop impacts include 0.0978 acres of PEM wetland and 0.0120 acres of PFO on permanent access roads, and conversion impacts on 1.5774 acres of PFO wetland and 0.0120 acres of PSS wetland within the pipeline ROW (Tables 7.1 and 7.2). MVP anticipates a total of 265 linear feet of permanent impacts to desktop streams (Tables 8.1 and 8.2).

## 5.5 WETLAND FUNCTIONS AND VALUES

Wetland functions and values were assessed for all wetlands located within the proposed Project LOD using the USACE Highway Methodology (USACE 1999). The USACE Highway Methodology is a well-established and effective methodology for evaluating wetland functions and values.

In accordance with the method the eight functions and five values listed below were assessed for each impacted wetland. The considerations/qualifiers for each is listed below the function or value. The suitability of the wetland to provide the function or value is assessed. Those determined to not provide the function or value or provide it at an insignificant level were considered not to be providing the function and were not listed. Wetland delineation data sheets, pictures, topographical maps, soils maps, aerial maps, wetland and stream delineations, agency information (e.g., endangered species presence), other field survey information (e.g., threatened and endangered species), and best professional judgement were used during each evaluation. The results are presented in tabular format and lists only the principle functions provided.

**GROUNDWATER RECHARGE/DISCHARGE** — this function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where groundwater can be discharged to the surface.

1. Public or private wells occur downstream of the wetland.
2. Potential exists for public or private wells downstream of the wetland.
3. Wetland is underlain by stratified drift.
4. Gravel or sandy soils present in or adjacent to the wetland.
5. Fragipan does not occur in the wetland.
6. Fragipan, impervious soils, or bedrock does occur in the wetland.
7. Wetland is associated with a perennial or intermittent watercourse.
8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet.

10. Wetland contains only an outlet, no inlet.
11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
12. Quality of water associated with the wetland is high.
13. Signs of groundwater discharge are present (e.g., springs).
14. Water temperature suggests it is a discharge site.
15. Wetland shows signs of variable water levels.
16. Other

**FLOODFLOW ALTERATION (Storage & Desynchronization)** — This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.

1. Area of this wetland is large relative to its watershed.
2. Wetland occurs in the upper portions of its watershed.
3. Effective flood storage is small or non-existent upslope of or above the wetland.
4. Wetland watershed contains a high percent of impervious surfaces.
5. Wetland contains hydric soils which are able to absorb and detain water.
6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other

**FISH AND SHELLFISH HABITAT** — This function considers the effectiveness of seasonal or permanent waterbodies associated with the wetland in question for fish and shellfish habitat.

1. Forest land dominant in the watershed above this wetland.
2. Abundance of cover objects present.  
STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE
3. Size of this wetland is able to support large fish/shellfish populations.
4. Wetland is part of a larger, contiguous watercourse.
5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter.
6. Stream width (bank to bank) is more than 50 feet.
7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.
8. Streamside vegetation provides shade for the watercourse.
9. Spawning areas are present (submerged vegetation or gravel beds).
10. Food is available to fish/shellfish populations within this wetland.
11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland.
12. Evidence of fish is present.
13. Wetland is stocked with fish.
14. The watercourse is persistent.
15. Man-made streams are absent.

16. Water velocities are not too excessive for fish usage.
17. Defined stream channel is present.
18. Other

**SEDIMENT/TOXICANT/PATHOGEN RETENTION** — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens.

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Fine grained mineral or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.  
STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.
10. Wetland is associated with an intermittent or perennial stream or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present.
17. Other

**NUTRIENT REMOVAL/RETENTION/TRANSFORMATION** — This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.
4. Potential sources of excess nutrients are present in the watershed above the wetland.
5. Wetland saturated for most of the season. Pondered water is present in the wetland.
6. Deep organic/sediment deposits are present.
7. Slowly drained fine grained mineral or organic soils are present.
8. Dense vegetation is present.
9. Emergent vegetation and/or dense woody stems are dominant.
10. Opportunity for nutrient attenuation exists.
11. Vegetation diversity/abundance sufficient to utilize nutrients.  
STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.
12. Waterflow through this wetland is diffuse.
13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
14. Water moves slowly through this wetland.
15. Other

**PRODUCTION EXPORT (Nutrient)** — This function relates to the effectiveness of the wetland to produce food or usable products for humans or other living organisms.

1. Wildlife food sources grow within this wetland.
2. Detritus development is present within this wetland
3. Economically or commercially used products found in this wetland.
4. Evidence of wildlife use found within this wetland.
5. Higher trophic level consumers are utilizing this wetland.
6. Fish or shellfish develop or occur in this wetland.
7. High vegetation density is present.



8. Wetland exhibits high degree of plant community structure/species diversity.
9. High aquatic vegetative diversity/abundance is present.
10. Nutrients exported in wetland watercourses (permanent outlet present).
11. “Flushing” of relatively large amounts of organic plant material occurs from this wetland.
12. Wetland contains flowering plants that are used by nectar-gathering insects.
13. Indications of export are present.
14. High production levels occurring, however, no visible signs of export (assumes export is attenuated).
15. Other

**SEDIMENT/ShORELINE STABILIZATION** — This function relates to the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.

1. Indications of erosion or siltation are present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. Potential sediment sources are present upstream.
5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout.
7. Wide wetland (>10') borders watercourse, lake, or pond.
8. High flow velocities in the wetland.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond.
14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.
16. Other

**WILDLIFE HABITAT** — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/ or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, woodland, active farmland, or idle land) at least 500 feet in width.
6. Wetland is contiguous with other wetland systems connected by a watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.
9. Wetland exhibits a high degree of interspersed vegetation classes and/or open water.
10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/  
1. shrub/vine/grasses/mosses)

16. Plant/animal indicator species are present. (List species for project)
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or it's potential.
22. Indications of less disturbance-tolerant species are present.
23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources)

**RECREATION (Consumptive and Non-Consumptive)** — This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive activities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland, whereas non-consumptive activities do not.

1. Wetland is part of a recreation area, park, forest, or refuge.
2. Fishing is available within or from the wetland.
3. Hunting is permitted in the wetland.
4. Hiking occurs or has potential to occur within the wetland.
5. Wetland is a valuable wildlife habitat.
6. The watercourse, pond, or lake associated with the wetland is unpolluted.
7. High visual/aesthetic quality of this potential recreation site.
8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.
9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.
10. Off-road public parking available at the potential recreation site.
11. Accessibility and travel ease is present at this site.
12. The wetland is within a short drive or safe walk from highly populated public and private areas.
13. Other

**EDUCATIONAL/SCIENTIFIC VALUE** — This value considers the effectiveness of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research.

1. Wetland contains or is known to contain threatened, rare, or endangered species.
2. Little or no disturbance is occurring in this wetland.
3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible.
4. Potential educational site is undisturbed and natural.
5. Wetland is considered to be a valuable wildlife habitat.
6. Wetland is located within a nature preserve or wildlife management area.
7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.).
8. Off-road parking at potential educational site suitable for school bus access in or near wetland.
9. Potential educational site is within safe walking distance or a short drive to schools.
10. Potential educational site is within safe walking distance to other plant communities.
11. Direct access to perennial stream at potential educational site is available.
12. Direct access to pond or lake at potential educational site is available.
13. No known safety hazards exist within the potential educational site.
14. Public access to the potential educational site is controlled.
15. Handicap accessibility is available.
16. Site is currently used for educational or scientific purposes.
17. Other

**UNIQUENESS/HERITAGE** — This value relates to the effectiveness of the wetland or its associated waterbodies to produce certain special values. Special values may include such things as archaeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geologic features.

1. Upland surrounding wetland is primarily urban.
2. Upland surrounding wetland is developing rapidly.

3. More than 3 acres of shallow permanent open water (less than 6.6 feet deep), including streams, occur in wetlands.
4. Three or more wetland classes are present.
5. Deep and/or shallow marsh or wooded swamp dominate.
6. High degree of interspersion of vegetation and/or open water occur in this wetland.
7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland.
8. Potential educational site is within a short drive or a safe walk from schools.
9. Off-road parking at potential educational site is suitable for school buses.
10. No known safety hazards exist within this potential educational site.
11. Direct access to perennial stream or lake exists at potential educational site.
12. Two or more wetland classes are visible from primary viewing locations.
13. Low-growing wetlands (marshes, scrub-shrub, bogs, and open water) are visible from primary viewing locations.
14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.
15. Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.
17. Overall view of the wetland is available from the surrounding upland.
18. Quality of the water associated with the wetland is high.
19. Opportunities for wildlife observations are available.
20. Historical buildings are found within the wetland.
21. Presence of pond or pond site and remains of a dam occur within the wetland.
22. Wetland is within 50 yards of the nearest perennial watercourse.
23. Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland.
24. Wetland contains critical habitat for a state- or federally-listed threatened or endangered species.
25. Wetland is known to be a study site for scientific research.
26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
27. Wetland has local significance because it serves several functional values.
28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique.
29. Wetland is known to contain an important archaeological site.
30. Wetland is hydrologically connected to a state or federally designated scenic river.
31. Wetland is located in an area experiencing a high wetland loss rate.
32. Other

**VISUAL QUALITY/AESTHETICS** — This value relates to the visual and aesthetic qualities of the wetland.

1. Multiple wetland classes are visible from primary viewing locations.
2. Emergent marsh and/or open water are visible from primary viewing locations.
3. A diversity of vegetative species is visible from primary viewing locations.
4. Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.
6. Visible surrounding land use form contrasts with wetland.
7. Wetland views absent of trash, debris, and signs of disturbance.
8. Wetland is considered to be a valuable wildlife habitat.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.
12. Relatively unobstructed sight line exists through wetland.
13. Other

**THREATENED or ENDANGERED SPECIES HABITAT** — This value relates to the effectiveness of the wetland or associated waterbodies to support threatened or endangered species.

1. Wetland contains or is known to contain threatened or endangered species.

2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.

MVP will restore wetlands to preexisting conditions as discussed in Section 6.0 Restoration and will therefore not change their current functions and values. In cases where wetlands are permanently converted, a loss of functions and values may occur. To offset for the loss of these wetlands, MVP will mitigate for these losses as described in Section 7.0 - Mitigation/Compensation Plan.

## **5.6 SENSITIVE STREAM RESOURCES**

### **5.6.1 National Wild and Scenic Rivers Evaluation**

No National Wild and Scenic Rivers occur within the Project area, and therefore, no Wild and Scenic Rivers will be impacted by this Project.

### **5.6.2 WV Natural Stream Preservation Act**

One waterbody crossed by the Project is included in the WV Natural Stream Preservation Act. This is the Greenbrier River. A separate WV Natural Streams Preservation Act Application will be submitted to the WV DEP.

### **5.6.3 Tier 3 Protection**

Tier 3 Protected Waters are outstanding national resource waters. Tier 3 Protected Waters were identified in the Project area using an ArcGIS shapefile provided by WV DEP in June, 2016. These resources will be protected during construction using WV DEP approved E&S BMPs.

It is anticipated that there will be impacts to 57 Tier 3 Protected Waters by the proposed Project (Table 5.2). As per USACE NWP Regional General Condition 9, prior written notification to the WV DEP DWWM is required for all pre-construction notifications involving work in Tier 3 Protected Waters. This application is in the written notification.

### **5.6.4 Category B-2 Trout Waters**

A total of 63 streams listed as Category B-2 Trout Waters will be impacted by the proposed Project (Table 5.2). Category B-2 Trout Waters were identified in the Project area using an ArcGIS shapefile provided by WV DEP in June, 2016. These resources will be protected during construction using WV DEP approved E&S BMPs.

If stream crossings of Category B-2 Trout Waters, or their adjacent tributaries, are anticipated to occur during the trout spawning season (September 15 – March 31), MVP will submit spawning season waiver requests to the WV Division of Natural Resources (WV DNR), Wildlife Resources Section.

As per Condition 9 of the WV State 401 Water Quality Certification Conditions for Nationwide Permits, all reasonable measures will be taken to minimize turbidity and sedimentation downstream for in-stream work done in streams during the trout spawning season

### **5.6.5 Warm Water Fishery**

A total of 67 streams designated as Warm Water Fishery (WWF) will be impacted by the proposed Project (Table 5.2). WWF were identified using the WV 2014 Integrated Report 305(b) Designated Use and Overall Category Designation file available on the WV DEP website. As per Condition 9 of the WV State 401 Water Quality Certification Conditions for Nationwide Permits, MVP will request a spawning season waiver from the WV DNR, Wildlife Resources Section for any in stream work in designated warm water streams and their adjacent tributaries during the fish spawning season, April – June.

As per Condition 9 of the WV State 401 Water Quality Certification Conditions for Nationwide Permits, all reasonable measures will be taken to minimize turbidity and sedimentation downstream for in-stream work done in streams. These resources will be protected during construction using WV DEP approved E&S BMPs.

### 5.6.6 Freshwater Mussels

Thirteen stream crossings were identified in WV during a desktop assessment for freshwater mussels and surveyed from July to September 2015 and June to September 2016. Three proposed Project crossings yielded collections of live mussels, including Sand Fork, Little Kanawha River (Access Road 1), and Greenbrier River (Table 5.2). Live mussels were not observed within the survey extent at the remaining 10 stream crossings. No signs of federally endangered species were encountered during any mussel survey efforts along the Project route in West Virginia during 2015 or 2016. In 2016, route modifications and the addition of Project features necessitated additional mussel surveys at two existing access road ford crossings of the Little Kanawha River.

MVP will implement and strictly adhere to applicable federal and state erosion and sediment control/storm water management laws and regulations. If instream disturbances are proposed at the aforementioned stream crossings, mussel relocation efforts will be required prior to Project construction. Of the 13 stream crossings surveyed, mussel relocation efforts are warranted at the three Project crossings that yielded live mussels including Sand Fork, Little Kanawha River (Access Road 1), and Greenbrier River. Neither live mussels nor fresh deadshell were encountered in 2015 or 2016 at the 10 remaining stream crossings, and therefore do not necessitate additional mussel concerns nor require additional investigation at this time. Construction is scheduled to commence in early 2018; therefore, mussel relocation efforts will likely occur in 2017 during the approved mussel survey field season.

The 2015 mussel survey report was submitted to the USFWS and WV DNR on November 13, 2015. Results of 2016 mussel surveys at the two access road crossings of the Little Kanawha River were submitted to USFWS and WV DNR as addendum reports on July 28, 2016 and October 28, 2016.

## 6.0 RESTORATION PLANS

### 6.1 WETLAND RESTORATION

MVP will minimize impacts to wetlands during the construction process through the use of specific wetland construction methodology. Techniques to avoid or minimize impacts include top soil conservation, reducing the ROW, avoiding placement of workspaces in critical habitats, revegetation, backfilling and grading, and open-cut/conventional lay or dry ditch crossing methods. Crossing of jurisdictional wetlands will be completed in accordance with USACE NWP 12 conditions and the FERC Plan and Procedures and WV DEP conditions. Restoration and monitoring of wetland crossings will be conducted in accordance with the FERC plan and procedures to ensure successful wetland revegetation. Additionally, MVP has implemented ESCP's BMPs for the entire Project. Appendix E contains the ESCPs for the Project, which have been provided to WV DEP for review as a separate submittal under the National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit. Typical and temporary wetland crossing details are provided on the attached Drawings 5-1 to 5-3.

Wetland soils (hydric soils) are susceptible to compaction with operation of construction equipment over wet soils, thereby reducing the porosity and moisture-holding capacity of the soils and interfering with the hydrology of the wetland. MVP will segregate the topsoil up to one foot in depth in wetlands where hydrologic conditions permit this practice. Segregated topsoil will be placed in the trench following subsoil backfilling. In order to minimize compaction, MVP will limit construction traffic to only that required to accomplish the task. Low-ground-pressure equipment will be used, or temporary equipment mats will be installed to allow passage of equipment with minimal disturbance of the surface soils and vegetation. Compacted areas will be tilled as necessary.

Original surface hydrology will be re-established in wetlands by backfilling the pipe trench and grading the surface with backhoes operating from equipment mats or low ground-pressure tracked vehicles working in the spoil pile, depending upon the ambient water level, degree of soil saturation, and the bearing capacity of the soils. Roots and stumps will have been removed only in the areas of the pipe trench, allowing existing vegetation to recover more rapidly in the remainder of the ROW once the equipment mats and spoil piles have been removed.

Wetlands along the proposed pipeline are expected to exhibit varying degrees of saturation and water elevation, requiring a variety of plant species to be re-established. In unsaturated wetlands, most vegetation will be replaced by seeding. Due to low success rates of revegetation from seeding in saturated soils, saturated wetlands will typically be allowed to re-vegetate naturally. Wetland revegetation will be considered successful when the cover of herbaceous species is equal to at least 70 percent of the vegetative coverage of the adjacent wetland areas that were not disturbed by construction. Revegetation efforts will continue until wetland revegetation is successful.

Crossing of the pipeline through PFO and PSS wetlands has been minimized to the maximum extent practicable through Project siting placement. Impacts to PFO and PSS wetlands may include long-term conversion to emergent wetland types as a result of tree and/or shrub removal within the construction and operational ROW. Clearing for construction within PFO and PSS wetlands and vegetation maintenance during pipeline operation will be limited per the FERC Procedures, such that only the minimum width needed for pipeline protection and surveillance is maintained, in an effort to reduce permanent impacts to PFO and PSS wetlands. In compliance with USACE NWP 12 conditions, any unavoidable permanent impacts that may occur to wetlands, including PFO or PSS wetland habitat conversion to PEM, have been kept under 0.5 acres of cumulative impacts per single and complete crossing (project).

### 6.2 STREAM RESTORATION

Stream impacts within the pipeline LOD will be temporary and occur during pipeline construction activities only. Streams crossings along temporary access roads will also be temporary and occur only while travel lanes are necessary for construction. Temporary waterbody crossings will not result in a long-term impact to water quality, physical habitat, or aquatic species within the Project area due to the short duration of stream crossing construction activities and the implementation of the ESCP's BMPs (Appendix E).

Construction across waterbodies will be performed in a manner that minimizes the amount of time that the pipeline trenches will be left open. Construction methods at waterbody crossings will vary with the characteristics of the waterbody encountered. Typical and temporary stream crossing details are shown on Drawings 5-1 to 5-3. Proposed methods for waterbody crossings include: dam and pump, flume, and open-cut.

Intermediate waterbodies (between 10 and 100 feet wide at water's edge) and minor waterbodies (less than 10 feet wide at water's edge) will be crossed by the open-cut/conventional lay or dry ditch crossing methods, unless otherwise required. Where a dry-ditch crossing method is not specifically required by the FERC Procedures, the waterbody may be crossed using the open-cut crossing method.

The pipeline will be installed to provide a minimum of four feet of cover from the waterbody bottom to the top of the pipeline, except in consolidated rock, where a minimum of two feet of cover will be required. A scour analysis has also been completed for the Project at areas where scour may be an issue for the pipeline in the future. The analysis evaluated the potential for erosion and scour across the Project and MVP has adjusted the depth of cover when trenching through waterbodies based on this analysis. The Scour Analysis is included as Appendix F.

Trench spoil will be placed on the bank above the high water mark for use as backfill. Major waterbodies (over 100 feet wide at water's edge) have been assessed on a case by case basis to determine the best crossing method and site specific construction and restoration plans. MVP will follow the FERC procedures to limit water quality and aquatic resource impacts during and following construction. Construction activities will be scheduled so that the pipeline trench is excavated immediately prior to pipe laying activities. In accordance with the FERC Procedures, the duration of construction will be limited to 24 hours across minor waterbodies (10 feet wide or less) and 48 hours across intermediate waterbodies (between 10 and 100 feet wide) when blasting or extensive rock excavation is not required.

In accordance with the FERC procedures, normal backfill cover requirements will be met. Compaction percentage of backfill will be equal to or above that of the adjacent undisturbed areas. Ditch plugs of crushed stone, sandbags, or dry soil may also be used to keep backfill from sloughing in toward the center of the waterbody. All waterbody banks will be restored to their original grades and foreign objects will be removed from the waterbody. Excavated material not required for backfill will be removed and disposed of at an upland site.

Cleanup and restoration will commence as soon as practicable following the completion of backfilling and testing. Cleanup and restoration activities include replacing grade cuts to original contours, seeding, fertilizing, and mulching to restore ground cover, minimize erosion, and stabilize stream banks for their natural reversion toward their previous state. Completed stream crossings using the flume or dam and pump methods will be stabilized before returning flow to the channel. Where the flume technique is used, stream banks will be stabilized before removing the flume pipes and returning flow to the waterbody channel. Original streambed and bank contours will be re-established for surface water and groundwater flow, and mulch, jute thatching, or bonded fiber blankets will be installed on the stream banks.

Seeding of disturbed stream approaches will be completed in accordance with FERC's Procedures after final grading, weather and soil conditions permitting. MVP is committed to increasing conservation and biodiversity in the region by using native grasses and wildflower seed mixes. Slope breakers will be installed adjacent to stream banks to minimize the potential for erosion and sediment barriers, such as silt fence and/or compost filter sock will be maintained across the ROW until permanent vegetation is established. Temporary equipment bridges will be removed following construction.

## 7.0 MITIGATION/COMPENSATION PLAN

MVP is committed to avoiding and minimizing impacts to sensitive resources such as wetlands and waterbodies. As discussed in Section 4.0 – No Practicable Alternatives Demonstration, MVP conducted an initial routing analysis and a more comprehensive alternatives analysis to avoid and minimize environmental impacts. Since the initial pipeline route was identified, there have been over 500 minor route modifications to avoid and minimize environmental impacts, improve constructability, avoid residential and commercial areas, and comply with landowner requests.

While significant effort was made to avoid wetland and waterbody impacts, both temporary and permanent impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a 303-mile linear project. Proposed permanent impacts will result from stream culverting along permanent access roads, constructing above ground facilities, converting PFO and PSS wetlands along the pipeline ROW, and filling of wetlands for permanent access roads.

The WV DEP has developed a suitable metric to consistently correlate levels of proposed impacts to streams and wetlands with all forms of compensatory mitigation including Mitigation Banking, ILF Program and Permittee Responsible (on-site and off-site). This tool is the West Virginia Stream and Wetland Valuation Metric (SWVM). The SWVM requires project or site specific data to evaluate impacts for proposed compensatory mitigation. The wetland portion of the SWVM has been designed based upon the classification of the wetland being assessed and acreage, which is consistent with the WV DEP ratios for replacement of wetlands. For streams, information required includes: the extent of a proposed impact; a broad spectrum of physical, chemical and biological indicators; and other factors including temporal loss and mitigation site protection. These are used in the SWVM to interpret the physical, chemical and biological integrity of waters of the United States. The SWVM utilizes this data to generate an index score which is multiplied by the linear feet to result in a unit score. The index score ranges from 0 (poor condition) to 1.0 (best condition). Overall, each of the three indicators are provided equal weight.

SWVMs have been prepared for field surveyed wetlands and streams that are permanently impacted for the Project. Each of these wetlands and streams has been evaluated with the option of using an approved mitigation bank and also for the use of the WV ILF. A package for each feature is included as Appendix G which includes SWVM forms for both a mitigation bank and ILF option, a Figure with the location of each resource, field data sheets, and photos. The SWVM scores for each field delineated wetland and stream impact are presented on Tables 9.1 to 9.4. Tables 9.1 and 9.3 show impacts and SWVM scores calculated assuming all impacts can be mitigated using available, approved mitigation banks for wetlands and streams, respectively. Tables 9.2 and 9.4 show impacts and SWVM scores calculated assuming all impacts can be mitigated using the ILF program for wetlands and streams, respectively. SWVMs have not been calculated for desktop surveyed areas. Instead, a conservative value was used for preliminary impacts using a 1:1 mitigation ratio for both wetland and stream impacts.

## 7.1 FIELD SURVEYED WETLAND AND STREAM MITIGATION

### 7.1.1 Wetlands

It is anticipated that the Project will have unavoidable permanent impacts to a total of 0.5657 acres of PEM wetland, 0.5766 acres of PSS wetland, and 0.9901 acres of PFO wetland. These impacts include 0.5587 acres of PEM wetland and 0.0084 acres of PSS wetland on permanent access roads, 0.0070 acres of PEM wetland at compressor stations, in addition to conversion impacts on 0.9901 acre of PFO wetland and 0.5683 acres of PSS wetland within the pipeline ROW (Tables 4.1 and 4.2).

MVP is proposing to mitigate the approximately 2.1324 acres of cumulative impacts on wetlands with the purchase of approximately 2.2389 credits from approved mitigation banks in the Project area and the WV ILF Program for Project impacts occurring outside of the primary or secondary service areas of approved mitigation banks. The wetland mitigation credit requirements presented have been determined using the SWVM calculations presented in Appendix G and summarized on Table 9.5.

MVP is proposing to purchase approximately 1.0320 credits from the Beverly Mitigation Bank Site #1 (3.06 credits available), approximately 0.1378 credits from the Hayes Run Mitigation Bank (0.14 credits available), and approximately 0.0778 credits from the Spanishburg Mitigation Bank (4.5 credits available).



Additionally, MVP is proposing to purchase approximately 0.9913 credits from the WV ILF Program to mitigate for anticipated wetland impacts occurring outside of the primary or secondary service areas of approved mitigation banks in the Project area.

### **7.1.2 Streams**

It is anticipated that the Project will have unavoidable permanent impacts on approximately 2,392 linear feet of streams identified during the wetland delineation and Waters of the U.S. surveys (Tables 5.1 and 5.2). MVP is proposing to mitigate the anticipated 2,392 linear feet of stream impacts with the purchase of approximately 1,454.2624 credits from approved mitigation banks in the Project area and the WV ILF Program for Project impacts occurring outside of the primary or secondary service areas of approved mitigation banks. The stream mitigation credit requirements presented have been determined using the SWVM calculations presented in Appendix G and summarized on Table 9.6.

MVP is proposing to purchase approximately 786.2761 credits from the Hayes Run Mitigation Bank (1,064 credits available), approximately 97.0808 credits from the Kincheloe Mitigation Bank (1,378 credits available), approximately 39.5477 credits from the Lower Dempsey Mitigation Bank (3,118 credits available), and approximately 129.1676 credits from the Beverly Mitigation Bank Site #1 (1,092 credits available). Additionally, MVP is proposing to purchase approximately 402.1903 credits from the WV ILF Program to mitigate for anticipated stream impacts occurring outside of the primary or secondary service areas of approved mitigation banks in the Project area.

## **7.2 DESKTOP SURVEYED WETLAND AND STREAM MITIGATION**

It is anticipated that 11 wetland areas and 9 streams would incur permanent impacts from the proposed Project. The remaining wetlands and streams would incur temporary impacts. The results of this desktop evaluation have not been field verified; field verification of results will occur when wetland and waterbody survey permission is granted for inaccessible, or recently accessible, parcels. Once the field work is complete, updated impact tables, figures and values will be provided to the USACE and WV DEP. Anticipated wetland impacts identified in the desktop survey that are greater than 0.5 acres will be field verified when survey permission is granted. It is anticipated that these impacts will decrease after field verification. MVP will ensure that avoidance and minimization measures will be utilized so that any impacts to field-verified features complies with NWP 12 conditions.

### **7.2.1 Wetlands**

MVP anticipates additional permanent impacts to a total of 0.0978 acres of PEM wetland, 0.0058 acres of PSS wetland, and 1.5894 acres of PFO wetland identified in the desktop evaluation. These impacts include 0.0978 acres of PEM wetland and 0.0120 acres of PFO on permanent access roads, and conversion impacts on 1.5774 acres of PFO wetland and 0.0058 acres of PSS wetland within the pipeline ROW (Tables 7.1 and 7.2). MVP will provide additional mitigation for the desktop evaluated stream impacts once these areas are surveyed. It is anticipated that these impact numbers will actually decrease once the field surveys are complete. However, if the impact numbers remain constant or increase, there are sufficient mitigation opportunities available.

MVP anticipates using the Beverly Mitigation Bank Site #1 (3.06 credits available) and the Spanishburg Mitigation Bank (4.5 credits available) for impacts in the primary or secondary service areas of these mitigation banks. The WV ILF Program may also be used for impacts occurring outside of the primary or secondary service areas of these mitigation banks.

### **7.2.2 Streams**

MVP anticipates a total of 265 linear feet of permanent impacts to streams identified in the desktop evaluation of unsurveyed Project areas (Table 8.1 and 8.2). MVP will provide additional mitigation for the Desktop Evaluated stream impacts once these areas are surveyed. It is anticipated that these impact numbers will actually decrease once the field surveys are complete. However, if the numbers remain constant or increase, there are sufficient mitigation opportunities available. MVP anticipates using the existing Beverly Mitigation Bank Site #1 (1,092 credits available), the Lower Dempsey Mitigation Bank (3,118 credits available), the Kincheloe Mitigation Bank (1,378 credits available), and the Hayes Run

Mitigation Bank (1,064 credits available). The WV ILF Program may also be used for impacts occurring outside of the primary or secondary service areas of the mitigation banks.

## **8.0 WV 401 WATER QUALITY CERTIFICATION CONDITION COMPLIANCE**

### **8.1 WV 401 WATER QUALITY CERTIFICATION SPECIAL CONDITIONS**

This section summarizes the proposed Project compliance with all of the WV 401 Water Quality Certification Special Conditions, as listed below in the order they appear on the WV USACE NWP:

- A. Points of ingress and egress to streams for equipment will be within the work site. The ESCP (Appendix E) shows points of ingress and egress to streams for equipment.
- B. The proposed Project involves the installation and operation of a 42 inch diameter pipeline and therefore requires an Individual State Water Quality Certification from the WV DEP. Construction activities will be scheduled so that the pipeline trench is excavated immediately prior to pipe laying activities. In accordance with the FERC Procedures, the duration of construction will be limited to 24 hours across minor waterbodies (10 feet wide or less) and 48 hours across intermediate waterbodies (between 10 and 100 feet wide) when blasting or extensive rock excavation is not required.
- C. Equipment tracking in wetlands will utilize protective mats when practical. Restoration of the disturbed areas will be completed within 72 hours of the completion of pipeline installation across the watercourse. The ESCP (Appendix E) contains further details about the pipeline construction and restoration sequence.
- D. Surface disturbance will not extend beyond the right-of-way limits. Stream crossings will be conducted as close to a right angle to the watercourse as practical and the area of disturbance will be limited to reduce in stream activity. Stream crossing methods are detailed in Section 3.1.1 and in the ESCP (Appendix E).
- E. No dredging of backfill material will take place. Pipeline construction methods are described in Section 3.1.1 (Pipeline Construction) and in the ESCP (Appendix E).
- F. The pipeline will be installed to provide a minimum of four feet of cover from the waterbody bottom to the top of the pipeline, except in consolidated rock, where a minimum of two feet of cover will be required. Details of stream crossing are described in Section 3.1.1 and in the ESCP (Appendix E).
- G. Warning signs will be placed a minimum of 50 feet upstream and downstream of the stream crossings construction site to advise stream users of the potential danger. The ESCP contains further details on pipeline construction.
- H. Exempt. The MVP pipeline will be carrying natural gas.
- I. The use of herbicides may be considered for right-of-way maintenance. A State of WV Application for Individual 401 Water Quality Certification has been prepared.
- J. If temporary pumps will be used to withdraw water for the proposed Project written notification will be provided to the WV DEP DWWM detailing the amount of water to be withdrawn by the intake structures.
- K. A State of WV Application for Individual 401 Water Quality Certification has been prepared; however, the Project will not permanently impact more than 200 linear feet of Tier 3, naturally reproducing trout, or WV Natural Stream Preservation Act listed streams.
- L. A State of WV Application for Individual 401 Water Quality Certification has been prepared. The Project will have more than 300 linear feet of permanent impact on one perennial stream (S-IJ27, Little Knawl Creek,). The Project will have more than 300 linear feet of temporary impact on five perennial (S-F22, UNT to Williams Branch; S-J26 & S-MN9, Little Laurel Creek; S-VV13, Second Big Run; S-J29, Gauley River, and S-I8, Greenbrier River ) and three intermittent (S-CD20, UNT to Second Big Run; S-A98, UNT to Left Fork Holly River; and S-H111, UNT to Elk River) streams.
- M. The pipeline will be submerged to provide a minimum of four feet of cover from the waterbody bottom to the top of the pipeline, except in consolidated rock, where a minimum of two feet of cover will be required. The ESCP contains further details on pipeline construction.

## 8.2 WV 401 WATER QUALITY CERTIFICATION STANDARD CONDITIONS

This section summarizes the proposed Project compliance with all of the WV 401 Water Quality Certification Standard Conditions, as listed below in the order they appear on the WV USACE NWP:

1. MVP will give notice to operators of any such water supply intakes and such other water quality dependent activities within ½ mile downstream before beginning work in the watercourse in sufficient time to allow preparation for any change in water quality.
2. Excavation, dredging or filling in the watercourse will be done only to the extent necessary to achieve the project's purpose.
3. Spoil materials from the watercourse or onshore operations, including sludge deposits, will not be dumped in the watercourse, or deposited in wetlands or other areas where the deposit may adversely affect the surface or ground waters of the state.
4. Storage areas and refueling areas shall be a minimum distance of 100 feet from any surface water body. All spills shall be promptly reported to the State Center for Pollution, Toxic Chemical and Oil Spills. Further details are described in the ESCP (Appendix E).
5. The duration of construction will be limited to 24 hours across minor waterbodies (10 feet wide or less) and 48 hours across intermediate waterbodies (between 10 and 100 feet wide) when blasting or extensive rock excavation is not required. Stream crossing methods are detailed in Section 3.1.1 and in the ESCP (Appendix E).
6. Runoff from any storage areas or spills will not be allowed to enter storm sewers without acceptable removal of solids, oils and toxic compounds. Discharges from retention/detention ponds will comply with permit requirements of the National Pollutant Discharge Elimination System permit program of the WV DEP. Further details are described in the ESCP.
7. Land disturbances, which are integral to the completion of the permitted activity and are one (1) acre or greater in total area, will comply with the NPDES or other state stormwater permit requirements. Further details are described in the ESCP.
8. Concrete will not enter any watercourses.
9. A total of 63 Category B-2 Trout Streams and 67 Warm Water Fisheries will be impacted by the proposed Project (Table 5.2, Section 5.6.4, and Section 5.6.5). If stream crossings of Category B-2 Trout Waters, Warm Water Fisheries, or either of their adjacent tributaries, are anticipated to occur during the spawning seasons, MVP will submit spawning season waiver requests to the WV DNR, Wildlife Resources Section.
10. Disturbance and removal of vegetation from project construction area will be avoided, where practicable, and minimized when necessary.
11. Operation of equipment instream will be minimized and accomplished during low flow periods when practical. Ingress and egress for equipment shall be within the work site.
12. As detailed in this permit application and the ESCP (Appendix E), MVP will comply with water quality standards as contained in the West Virginia Code of State Regulations, Requirements Governing Water Quality Standards, Title 47, Series 2.
13. MVP will be applying for a West Virginia Public Lands Corporation Right of Entry. MVP will obtain clearance from county floodplain coordinators for temporary impacts within the 100-year floodplain.
14. No dredge or fill materials will be deposited in island back channels, embayments or stream mouths on Section 10 Rivers. TNWs are listed in Table 6.
15. MVP is requesting prior written authorization from the WV DEP DWWM for work in the following:
  - A. 57 Tier 3 Streams will be impacted by the proposed Project (Table 5.2 and Section 5.6.3).
  - B. 63 Category B-2 Trout Streams will be impacted by the proposed Project (Table 5.2 and Section 5.6.4).
  - C. One stream (Greenbrier River) is a West Virginia Natural Stream Preservation Act stream (Table 5.2 and Section 5.6.2)
16. MVP anticipates mitigation for unavoidable permanent Project impacts.
  - 1 There are no permanent wetland impacts greater than 0.5 acres associated with the proposed Project (Table 4.2). A Mitigation/Compensation Plan is provided in Section 7.0.
  - 2 It is anticipated that the proposed Project will have permanent impacts to wetlands greater than 0.1 acres. A Mitigation/Compensation Plan is provided in Section 7.0.
  - 3 The SWVM was completed for all wetlands and streams with proposed permanent impacts.

17. Surveys for mussels were conducted at 13 stream crossings identified in a desktop assessment; freshwater mussel populations were identified in 3 streams in the proposed Project area (Table 5.2 and Section 5.6.6).
  - A. If native freshwater mussels are encountered during construction, activity will cease immediately and the Wildlife Resources Section, Wildlife Diversity Program will be contacted to determine significance of the mussel population and the action to be taken.
  - B. A survey for rare, threatened, and endangered aquatic species was conducted and no populations of rare, threatened, and endangered freshwater mussel species were identified in the proposed Project area (Section 5.6.6).
18. The proposed Project will require a 404 permit from the USACE and an Individual 401 Water Quality Certification from the WV DEP DWWM. This Individual 401 Water Quality Certification Application will be reviewed by WV DEP DWWM for potential impacts to isolated waters designated as waters of the State.

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## 9.0 REFERENCES

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## Figures

<b>Figures 1-1 to 1-41</b>	<b>USGS Project Location Map</b>
<b>Figure 2</b>	<b>Route Alternative 1 and Hybrid Alternative 1/Proposed Route</b>
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## Tables

<b>Table 1</b>	<b>Counties and Towns Crossed by Project</b>
<b>Table 2</b>	<b>HUC 8 Watersheds in Project Area</b>
<b>Table 3</b>	<b>Public Notice Publication List</b>
<b>Table 4.1</b>	<b>Wetland Impacts Summary Table</b>
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<b>Table 5.1</b>	<b>Stream Impacts Summary Table</b>
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<b>Table 7.1</b>	<b>Desktop Evaluation Wetland Impacts Summary Table</b>
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<b>Table 8.1</b>	<b>Desktop Evaluation Stream Impacts Summary Table</b>
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<b>Table 9.1</b>	<b>Wetland Mitigation – Mitigation Bank</b>
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<b>Table 9.3</b>	<b>Stream Mitigation – Mitigation Bank</b>
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<b>Table 9.5</b>	<b>Potential Wetland Mitigation</b>
<b>Table 9.6</b>	<b>Potential Stream Mitigation</b>

**Table 1.  
Counties and Towns Crossed by Project  
Mountain Valley Pipeline Project**

Counties Crossed by Project	Towns Near the Project Area
Wetzel	Mobley
	Smithfield
	Folsom
Harrison	Wallace
	Salem
	Bristol
Doddridge	Big Issac
Lewis	Churchville
	Camden
	Orlando
Braxton	Orlando
	Falls Mill
Webster	Webster Springs
	Guardian
	Erbacon
	Halo
	Cowen
	Camden-On-Gauley
Nicholas	Calvin
	Donald
	Tolbert
	Leivasy
	Snow Hill
	Green Valley
Greenbrier	Quinwood
	Leslie
	Orient Hill
	Rainelle
	Craig
	Lawn
Fayette	Springdale
Summers	Tempa
	Pence Springs
Monroe	Creamery
	Wayside
	Greenville
	Lindside



**Table 2.  
HUC 8 Watersheds in Project Area  
Mountain Valley Pipeline Project**

HUC 8 Watershed Name	HUC 8 Code	HUC 8 Watershed Size (acres)	County	State
Elk	05050007	981225	Braxton, Nicholas, Webster	WV
Gauley	05050005	909316	Greenbrier, Nicholas, Summers, Webster, Fayette	WV
Greenbrier	05050003	1052738	Monrow, Greenbrier, Craig, Summers	WV
Little Kanawha	05030203	1478042	Braxton, Doddridge, Lewis, Webster	WV
Little Muskingum-Middle Island	05030201	1161523	Doddridge, Harrison, Lewis, Wetzel	WV,OH
Lower New	05050004	442578	Greenbrier, Summers, Fayette	WV
Middle New	05050002	1045500	Monroe, Summers	WV,VA
Upper James	02080201	1413729	Monroe, Greenbrier	WV,VA
West Fork	05020002	563439	Braxton, Doddridge, Harrison, Lewis, Wetzel	WV

**Table 3.  
Public Notice Publication List**

<b>1st Run Date</b>	<b>2nd Run Date</b>	<b>Expiration Date</b>	<b>Newspaper Title</b>	<b>Coverage</b>
4/6/2016	4/13/2016	5/6/2016	Wetzel Chronicle	Wetzel County, WV
4/16/2016	4/23/2016	5/17/2015	The Exponent Telegram	Harrison and Braxton Counties, WV
4/9/2016	4/16/2016	5/9/2016	Harrison Extra	Harrison County, WV
4/14/2016	4/21/2016	5/15/2016	Bridgeport News	Harrison County, WV
4/1/2016	4/8/2016	5/1/2016	Doddridge Independent	Doddridge County, WV
4/6/2016	4/13/2016	5/6/2016	The Weston Democrat	Lewis County, WV
4/6/2016	4/13/2016	4/6/2016	Webster Echo	Webster County, WV
4/7/2016	4/14/2016	5/7/2016	The Nicholas Chronicle	Nicholas and Braxton Counties, WV
4/5/2016	4/12/2016	5/5/2016	Hinton News	Summers County, WV
4/7/2016	4/14/2016	5/7/2016	Monroe Watchman	Monroe County, WV
3/31/2016	4/7/2016	4/30/2016	West Virginia Daily News	Greenbrier, WV
3/31/2016	4/7/2016	4/30/2016	Fayette Tribune	Fayette, WV

**Table 4.1  
Wetland Impacts Summary Table  
Mountain Valley Pipeline Project**

<b>County</b>	<b>Cowardin Class<sup>1</sup></b>	<b>Temporary Impacts (Acres)<sup>2</sup></b>	<b>Permanent Impacts (Acres)<sup>3</sup></b>
Wetzel	PEM	1.3513	0.0138
	PSS	0.0000	0.0000
	PFO	0.0000	0.0547
Harrison	PEM	1.3509	0.0242
	PSS	0.0000	0.1444
	PFO	0.0000	0.0110
Doddridge	PEM	0.5657	0.0693
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Lewis	PEM	3.3820	0.1034
	PSS	0.0000	0.0024
	PFO	0.0000	0.1009
Braxton	PEM	0.4687	0.0039
	PSS	0.0000	0.0074
	PFO	0.0000	0.0361
Webster	PEM	1.8093	0.1052
	PSS	0.0000	0.1340
	PFO	0.0000	0.4235
Nicholas	PEM	1.4271	0.0195
	PSS	0.0000	0.1909
	PFO	0.0000	0.2800
Greenbrier	PEM	6.0257	0.1416
	PSS	0.0000	0.0976
	PFO	0.0000	0.0839
Fayette	PEM	0.0000	0.0070
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Summers	PEM	0.1969	0.0550
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Monroe	PEM	0.9161	0.0228
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
WV Totals	PEM	17.4938	0.5657
	PSS	0.0000	0.5766
	PFO	0.0000	0.9901

Notes:

- 1 - PEM = Palustrine Emergent  
- PSS = Palustrine Scrub-Shrub  
- PFO = Palustrine Forested
- 2 - Temporary impacts to PEM wetlands in the Temporary limit-of-disturbance
- 3 - Includes 1) permanent conversion impacts to PSS and PFO impacts in the temporary and permanent limit-of-disturbance, and 2) permanent impacts to PEM within permanent access road limit-of-disturbance

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-A1a	Wetzel	West Virginia	39.553912	-80.544941	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0038	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Nutrient Removal/Retention/Transformation, Floodflow Alteration	6-3
W-A2a	Wetzel	West Virginia	39.553508	-80.545518	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0732	-	Sediment/Toxicant/Pathogen Retention	6-3
W-A4a	Wetzel	West Virginia	39.544654	-80.542771	PEM	SLOPE	NRPWW	Pipeline ROW	0.0226	-	None	6-5
W-YZ8	Wetzel	West Virginia	39.535721	-80.525972	PEM	DEPRESSIONAL	NRPWW	Station	0.0104	-	Sediment/Toxicant/Pathogen Retention	6-10
W-IJ31	Wetzel	West Virginia	39.505764	-80.541781	PEM	SLOPE	RPWWN	ATWS	0.0992	-	Sediment/Toxicant Retention	6-16
W-IJ31	Wetzel	West Virginia	39.505612	-80.541681	PEM	SLOPE	RPWWN	Permanent Access Road	-	0.0082	Sediment/Toxicant Retention	6-16
W-A27-PFO	Wetzel	West Virginia	39.502389	-80.523497	PFO	SLOPE	RPWWD	Pipeline ROW	-	0.0547	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Floodflow Alteration	6-17
W-A27-PEM	Wetzel	West Virginia	39.502356	-80.523420	PEM	SLOPE	RPWWD	Pipeline ROW	0.0497	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Floodflow Alteration	6-17
W-A35	Wetzel	West Virginia	39.491159	-80.520537	PEM	SLOPE	NRPWW	Pipeline ROW	0.0066	-	None	6-21
W-A34	Wetzel	West Virginia	39.489742	-80.520750	PEM	SLOPE	RPWWD	Pipeline ROW	0.0833	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Floodflow Alteration	6-21
W-A31	Wetzel	West Virginia	39.486706	-80.531774	PEM	SLOPE	NRPWW	Temporary Access Road	0.0270	-	None	6-23
W-A28	Wetzel	West Virginia	39.486505	-80.537877	PEM	SLOPE	NRPWW	Temporary Access Road	0.2609	-	None	6-24
W-A30	Wetzel	West Virginia	39.486248	-80.534108	PEM	SLOPE	RPWWN	Temporary Access Road	0.1546	-	None	6-24
W-A29	Wetzel	West Virginia	39.485936	-80.536196	PEM	SLOPE	NRPWW	Temporary Access Road	0.0129	-	None	6-24
W-A33	Wetzel	West Virginia	39.484775	-80.526191	PEM	SLOPE	NRPWW	Temporary Access Road	0.0294	-	None	6-23
W-A32	Wetzel	West Virginia	39.484485	-80.528316	PEM	SLOPE	NRPWW	Temporary Access Road	0.0713	-	None	6-23
W-A26	Wetzel	West Virginia	39.473051	-80.524008	PEM	SLOPE	RPWWD	Temporary Access Road/ATWS	0.4412	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Floodflow Alteration	6-27
W-WX5	Wetzel	West Virginia	39.463909	-80.502672	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0011	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-30
W-WX4	Wetzel	West Virginia	39.463864	-80.502581	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0040	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	2-31
W-WX4	Wetzel	West Virginia	39.463844	-80.502622	PEM	RIVERINE	RPWWD	Permanent Access Road	-	0.0055	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	2-31
W-A6a	Harrison	West Virginia	39.443946	-80.481194	PEM	SLOPE	NRPWW	Pipeline ROW	0.0047	-	None	6-37
W-KL27	Harrison	West Virginia	39.436519	-80.473660	PEM	RIVERINE	RPWWD	ATWS	0.0052	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention, Nutrient Removal	6-38
W-B55	Harrison	West Virginia	39.436246	-80.474973	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0182	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Nutrient Removal/Retention/Transformation, Floodflow Alteration	6-38
W-J32-PEM-1	Harrison	West Virginia	39.391614	-80.477085	PEM	SLOPE	RPWWN	Temporary Access Road	0.0417	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-47
W-F58	Harrison	West Virginia	39.370236	-80.485065	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0001	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention	6-51
W-F67a	Harrison	West Virginia	39.369948	-80.484904	PEM	DEPRESSIONAL	RPWWD	Pipeline ROW	0.0024	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention	6-51
W-A10a	Harrison	West Virginia	39.369569	-80.485054	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0276	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention	6-51
W-B1a	Harrison	West Virginia	39.360192	-80.492766	PEM	SLOPE	NRPWW	Pipeline ROW	0.0119	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Floodflow Alteration	6-52
W-A40	Harrison	West Virginia	39.358924	-80.493367	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW/ATWS	0.3111	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Nutrient Removal/Retention/Transformation, Floodflow Alteration	6-53
W-A39	Harrison	West Virginia	39.358865	-80.490797	PEM	SLOPE	RPWWN	Temporary Access Road	0.0038	-	Sediment/Toxicant/Pathogen Retention	6-53
W-A39	Harrison	West Virginia	39.358842	-80.490742	PEM	SLOPE	RPWWN	Permanent Access Road	-	0.0242	Sediment/Toxicant/Pathogen Retention	6-53
W-ST11	Harrison	West Virginia	39.338239	-80.519656	PEM	SLOPE	ISOLATE	Temporary Access Road/ATWS	0.0228	-	None	6-58
W-ST12-PSS	Harrison	West Virginia	39.337471	-80.522128	PSS	RIVERINE	RPWWD	Temporary Access Road/ATWS	-	0.1444	Groundwater Recharge/Discharge; Sediment/Toxicant Retention; Wildlife Habitat; Production Export	6-58
W-ST12-PEM	Harrison	West Virginia	39.337457	-80.522185	PEM	RIVERINE	RPWWD	Temporary Access Road/ATWS	0.0582	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention; Wildlife Habitat; Production Export	6-58
W-A11a	Harrison	West Virginia	39.335687	-80.522467	PEM	DEPRESSIONAL	RPWWD	Pipeline ROW	0.0061	-	Groundwater Recharge/Discharge, Sediment/Toxicant/Pathogen Retention, Nutrient Removal/Retention/Transformation	6-58
W-OP6	Harrison	West Virginia	39.321869	-80.526052	PEM	SLOPE	ISOLATE	Temporary Access Road	0.0167	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-60
W-B2a	Harrison	West Virginia	39.316856	-80.525315	PEM	RIVERINE	RPWWD	Anode Bed	0.1953	-	Sediment/Toxicant Retention, Nutrient Removal	6-61
W-B4a	Harrison	West Virginia	39.316784	-80.526129	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0313	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-61

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-F67b	Harrison	West Virginia	39.316715	-80.526347	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0005	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-61
W-B56	Harrison	West Virginia	39.297002	-80.518809	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0871	-	None	6-66
W-UU1	Harrison	West Virginia	39.290258	-80.518898	PFO	RIVERINE	RPWWD	Pipeline ROW	-	0.0045	Sediment/Toxicant/Pathogen Retention	6-69
W-UU3	Harrison	West Virginia	39.289750	-80.518517	PFO	RIVERINE	RPWWN	Pipeline ROW	-	0.0065	Sediment/Toxicant/Pathogen Retention	6-69
W-UU4	Harrison	West Virginia	39.253028	-80.540563	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0180	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-78
W-F52	Harrison	West Virginia	39.250487	-80.551891	PEM	SLOPE	NRPWW	Temporary Access Road	0.0625	-	None	6-80
W-F54	Harrison	West Virginia	39.249640	-80.550121	PEM	SLOPE	NRPWW	Pipeline ROW	0.0063	-	None	6-80
W-F53	Harrison	West Virginia	39.249629	-80.549909	PEM	SLOPE	NRPWW	Pipeline ROW	0.0412	-	None	6-80
W-F55	Harrison	West Virginia	39.249464	-80.551040	PEM	SLOPE	NRPWW	Pipeline ROW/Temporary Access Road	0.0579	-	None	6-80
W-K43	Harrison	West Virginia	39.243915	-80.553961	PEM	RIVERINE	RPWWD	Pipeline ROW	0.2086	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-81
W-K44	Harrison	West Virginia	39.243493	-80.554033	PEM	SLOPE	RPWWD	Pipeline ROW	0.0671	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration	6-81
W-K52	Doddridge	West Virginia	39.236762	-80.558524	PEM	SLOPE	RPWWN	Temporary Access Road	0.0021	-	None	6-82
W-K52	Doddridge	West Virginia	39.236727	-80.558550	PEM	SLOPE	RPWWN	Permanent Access Road	-	0.0115	None	6-82
W-K45	Doddridge	West Virginia	39.228900	-80.552328	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0401	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-84
W-K48	Harrison	West Virginia	39.226209	-80.550469	PEM	SLOPE	RPWWD	Pipeline ROW	0.0077	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-84
W-K49	Harrison	West Virginia	39.225328	-80.549854	PEM	SLOPE	RPWWN	Pipeline ROW	0.0085	-	Sediment/Toxicant/Pathogen Retention	6-84
W-K51	Harrison	West Virginia	39.224516	-80.549293	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0283	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-85
W-K41	Doddridge	West Virginia	39.208990	-80.551957	PEM	DEPRESSIONAL	RPWWD	Pipeline ROW	0.0160	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-88
W-K40	Doddridge	West Virginia	39.208395	-80.552038	PEM	SLOPE	NRPWW	Pipeline ROW	0.0096	-	Sediment/Toxicant/Pathogen Retention	6-88
W-A23	Doddridge	West Virginia	39.201219	-80.552848	PEM	DEPRESSIONAL	RPWWD	ATWS	0.2277	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Sediment/Shoreline Stabilization	6-89
W-A23	Doddridge	West Virginia	39.201188	-80.552996	PEM	DEPRESSIONAL	RPWWD	Pipeline ROW	0.2701	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Sediment/Shoreline Stabilization	6-89
W-A23	Doddridge	West Virginia	39.201157	-80.553264	PEM	DEPRESSIONAL	RPWWD	Permanent Access Road	-	0.0579	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Sediment/Shoreline Stabilization	6-89
W-J40	Lewis	West Virginia	39.167631	-80.578355	PEM	RIVERINE	RPWWD	Pipeline ROW	0.2931	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Sediment/Shoreline Stabilization	6-96
W-J40	Lewis	West Virginia	39.167564	-80.578800	PEM	RIVERINE	RPWWD	Temporary Access Road	0.1812	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Sediment/Shoreline Stabilization	6-96
W-A24	Harrison	West Virginia	39.165608	-80.569523	PEM	SLOPE	NRPWW	Temporary Access Road	0.0002	-	None	6-95
W-VV5	Lewis	West Virginia	39.137820	-80.576075	PEM	RIVERINE	RPWWD	ATWS	0.0202	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization; Nutrient Removal/Retention/Transformation	6-103
W-I26	Lewis	West Virginia	39.136899	-80.577082	PEM	SLOPE	RPWWN	Pipeline ROW	0.0017	-	Sediment/Toxicant/Pathogen Retention	6-103
W-J20	Lewis	West Virginia	39.116053	-80.589196	PEM	SLOPE	NRPWW	Permanent Access Road	0.0081	-	None	6-107
W-IJ23	Lewis	West Virginia	39.131093	-80.572126	PEM	SLOPE	RPWWN	Temporary Access Road/ATWS	0.1544	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention, Nutrient Removal	6-104
W-IJ24	Lewis	West Virginia	39.130718	-80.571966	PEM	SLOPE	RPWWN	Temporary Access Road/ATWS	0.0616	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention, Nutrient Removal	6-104
W-I28	Lewis	West Virginia	39.130046	-80.578095	PEM	SLOPE	RPWWN	Temporary Access Road	0.0010	-	Sediment/Toxicant/Pathogen Retention	6-104
W-I27	Lewis	West Virginia	39.129832	-80.577642	PEM	SLOPE	RPWWN	Temporary Access Road	0.0397	-	Sediment/Toxicant/Pathogen Retention	6-104
W-J23	Lewis	West Virginia	39.114118	-80.586522	PEM	SLOPE	RPWWN	Pipeline ROW	0.0130	-	None	6-107
W-B57	Lewis	West Virginia	39.111745	-80.587352	PEM	SLOPE	NRPWW	Pipeline ROW/Temporary Access Road	0.0336	-	None	6-108
W-K33-PSS	Lewis	West Virginia	39.095059	-80.585064	PSS	RIVERINE	RPWWD	Pipeline ROW	-	0.0024	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-110
W-K33-PEM	Lewis	West Virginia	39.095056	-80.584787	PEM	RIVERINE	RPWWD	Pipeline ROW	0.1544	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-110
W-K34-PEM	Lewis	West Virginia	39.093945	-80.585460	PEM	SLOPE	RPWWD	Pipeline ROW	0.0345	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-110
W-K39	Lewis	West Virginia	39.092655	-80.586749	PEM	SLOPE	NRPWW	Temporary Access Road	0.0030	-	None	6-110

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-K31	Lewis	West Virginia	39.080555	-80.581362	PEM	SLOPE	NRPWW	Pipeline ROW/Temporary Access Road	0.1135	-	Sediment/Toxicant/Pathogen Retention	6-113
W-ST14	Lewis	West Virginia	39.079947	-80.583108	PEM	SLOPE	RPWWD	Anode Bed	0.0394	-	Sediment/Toxicant Retention	6-114
W-ST15	Lewis	West Virginia	39.079855	-80.582499	PEM	SLOPE	RPWWN	Anode Bed	0.0711	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-114
W-B46	Lewis	West Virginia	39.079854	-80.581439	PEM	RIVERINE	RPWWD	Pipeline ROW/Temporary Access Road	0.1255	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-114
W-B47	Lewis	West Virginia	39.079451	-80.581349	PEM	SLOPE	RPWWD	Pipeline ROW	0.1529	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-114
W-B48	Lewis	West Virginia	39.079200	-80.582099	PEM	SLOPE	RPWWD	Temporary Access Road	0.0073	-	Sediment/Toxicant/Pathogen Retention	6-114
W-B51	Lewis	West Virginia	39.078107	-80.581235	PEM	SLOPE	NRPWW	Pipeline ROW	0.0071	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-114
W-B52	Lewis	West Virginia	39.077693	-80.582713	PEM	SLOPE	RPWWD	Temporary Access Road	0.0078	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-114
W-B54	Lewis	West Virginia	39.073907	-80.581491	PEM	SLOPE	NRPWW	Pipeline ROW	0.0094	-	None	6-114
W-B53	Lewis	West Virginia	39.073757	-80.580882	PEM	SLOPE	NRPWW	Temporary Access Road	0.0676	-	Wildlife Habitat; Production Export	6-114
W-H112	Lewis	West Virginia	39.066480	-80.581624	PEM	SLOPE	NRPWW	Pipeline ROW	0.0231	-	None	6-115
W-H111	Lewis	West Virginia	39.064848	-80.581267	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0002	-	Sediment/Toxicant/Pathogen Retention	6-116
W-H110	Lewis	West Virginia	39.062946	-80.580391	PEM	SLOPE	NRPWW	Pipeline ROW	0.2625	-	None	6-116
W-H109	Lewis	West Virginia	39.053324	-80.582020	PEM	SLOPE	NRPWW	Pipeline ROW	0.0027	-	None	6-121
W-I22-PEM	Lewis	West Virginia	39.052768	-80.582196	PEM	RIVERINE	RPWWD	Pipeline ROW/Temporary Access Road/ATWS	0.0386	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration	6-121
W-I22-PEM	Lewis	West Virginia	39.052760	-80.582147	PEM	RIVERINE	RPWWD	Permanent Access Road	-	0.0059	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration	6-121
W-I22-PEM-2	Lewis	West Virginia	39.052499	-80.580974	PEM	SLOPE	RPWWD	ATWS	0.1395	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration	6-121
<b>W-I22 Total</b>	-	-	-	-	-	-	-	-	<b>0.3608</b>	<b>0.0059</b>	-	-
W-KK6	Lewis	West Virginia	39.017820	-80.596977	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0104	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-126
W-L42	Lewis	West Virginia	39.011413	-80.594436	PEM	SLOPE	NRPWW	Temporary Access Road	0.0021	-	Sediment/Toxicant/Pathogen Retention	6-127
W-K28	Lewis	West Virginia	39.009891	-80.597843	PEM	SLOPE	NRPWW	Temporary Access Road	0.0088	-	None	6-127
W-K28	Lewis	West Virginia	39.009838	-80.598294	PEM	SLOPE	NRPWW	Permanent Access Road	-	0.0091	None	6-127
W-L41	Lewis	West Virginia	39.005782	-80.595121	PEM	SLOPE	NRPWW	Temporary Access Road	0.0048	-	Sediment/Toxicant/Pathogen Retention	6-128
W-L41	Lewis	West Virginia	39.005703	-80.595151	PEM	SLOPE	NRPWW	Permanent Access Road	-	0.0111	Sediment/Toxicant/Pathogen Retention	6-128
W-L39	Lewis	West Virginia	38.986897	-80.601380	PEM	SLOPE	NRPWW	Temporary Access Road	0.0071	-	Sediment/Toxicant/Pathogen Retention	6-132
W-I15	Lewis	West Virginia	38.968609	-80.592042	PEM	SLOPE	RPWWN	Pipeline ROW	0.0631	-	Sediment/Toxicant/Pathogen Retention	6-135
W-I16	Lewis	West Virginia	38.964758	-80.590881	PEM	SLOPE	NRPWW	Pipeline ROW	0.0299	-	None	6-136
W-I21	Lewis	West Virginia	38.964195	-80.590961	PEM	SLOPE	ISOLATE	Pipeline ROW	0.0584	-	None	6-136
W-I20	Lewis	West Virginia	38.962362	-80.590607	PEM	SLOPE	NRPWW	Pipeline ROW	0.0113	-	Wildlife Habitat	6-136
W-I17	Lewis	West Virginia	38.962126	-80.590741	PEM	DEPRESSIONAL	NRPWW	Pipeline ROW	0.0017	-	None	6-136
W-UU7	Lewis	West Virginia	38.933646	-80.585074	PEM	SLOPE	NRPWW	Pipeline ROW	0.0038	-	Sediment/Toxicant/Pathogen Retention	6-142
W-H103	Lewis	West Virginia	38.933290	-80.584765	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW/ATWS	0.0138	-	Sediment/Toxicant/Pathogen Retention	6-142
W-H102	Lewis	West Virginia	38.933168	-80.584990	PEM	DEPRESSIONAL	RPWWN	ATWS	0.0129	-	Sediment/Toxicant Retention, Nutrient Removal	6-142
W-H104	Lewis	West Virginia	38.933071	-80.585385	PEM	DEPRESSIONAL	RPWWN	ATWS	0.0203	-	Sediment/Toxicant Retention, Nutrient Removal	6-142
W-H107	Lewis	West Virginia	38.932901	-80.584200	PEM	SLOPE	RPWWD	Pipeline ROW	0.0284	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-142
W-IJ39	Lewis	West Virginia	38.932381	-80.587400	PEM	SLOPE	RPWWN	ATWS	0.0842	-	Sediment/Toxicant Retention, Nutrient Removal	6-142
W-H98	Lewis	West Virginia	38.925976	-80.578373	PEM	SLOPE	NRPWW	Permanent Access Road	-	0.0331	None	6-143
W-H98	Lewis	West Virginia	38.925868	-80.578367	PEM	SLOPE	NRPWW	Temporary Access Road	0.0032	-	None	6-143

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-UU8	Lewis	West Virginia	38.921791	-80.569178	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road/ATWS	0.1477	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Sediment/Shoreline Stabilization	6-148
W-L36	Lewis	West Virginia	38.921541	-80.568772	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road/ATWS	0.0566	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration	6-148
W-WX6	Lewis	West Virginia	38.919959	-80.571769	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0111	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-147
W-H108	Lewis	West Virginia	38.918766	-80.573564	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0261	-	Sediment/Toxicant/Pathogen Retention	6-147
W-H96	Lewis	West Virginia	38.913939	-80.571910	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0039	-	Sediment/Toxicant/Pathogen Retention	6-149
W-H95	Lewis	West Virginia	38.913311	-80.571953	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0934	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-149
W-VV9	Lewis	West Virginia	38.904701	-80.563951	PEM	SLOPE	RPWWD	Pipeline ROW	0.0534	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-151
W-CD17	Lewis	West Virginia	38.904074	-80.563709	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0335	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-151
W-CD16	Lewis	West Virginia	38.903722	-80.563418	PEM	SLOPE	RPWWN	Pipeline ROW/Temporary Access Road/ ATWS	0.0249	-	Sediment/Toxicant Retention, Nutrient Removal	6-151
W-VV8	Lewis	West Virginia	38.903514	-80.563258	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0708	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-151
W-CD18	Lewis	West Virginia	38.902751	-80.564644	PEM	SLOPE	RPWWD	Temporary Access Road	0.0322	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-151
W-CD19	Lewis	West Virginia	38.902618	-80.564694	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0080	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-151
W-CD20	Lewis	West Virginia	38.901264	-80.566126	PEM	SLOPE	RPWWD	Temporary Access Road	0.0059	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-153
W-CD21	Lewis	West Virginia	38.901049	-80.566582	PEM	SLOPE	RPWWN	Temporary Access Road	0.0161	-	Sediment/Toxicant Retention, Nutrient Removal	6-153
W-CD22	Lewis	West Virginia	38.899690	-80.568061	PEM	SLOPE	RPWWD	Temporary Access Road	0.0448	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-153
W-CD23	Lewis	West Virginia	38.898699	-80.568306	PEM	SLOPE	RPWWD	Temporary Access Road	0.0349	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-153
W-CD24	Lewis	West Virginia	38.898648	-80.568238	PEM	SLOPE	RPWWD	Temporary Access Road	0.0094	-	Sediment/Toxicant Retention, Nutrient Removal	6-153
W-CD36	Lewis	West Virginia	38.898177	-80.568287	PEM	SLOPE	RPWWN	Temporary Access Road	0.0049	-	Sediment/Toxicant Retention, Nutrient Removal	6-153
W-CD25	Lewis	West Virginia	38.898021	-80.568159	PEM	SLOPE	RPWWN	Temporary Access Road	0.0100	-	Sediment/Toxicant Retention, Nutrient Removal	6-153
W-CD26	Lewis	West Virginia	38.897805	-80.568155	PEM	RIVERINE	RPWWN	Temporary Access Road	0.0114	-	Sediment/Toxicant Retention, Nutrient Removal	6-153
W-VV10	Lewis	West Virginia	38.897282	-80.567014	PEM	DEPRESSIONAL	NRPWW	Temporary Access Road	0.0091	-	Sediment/Toxicant/Pathogen Retention	6-153
W-CD27	Lewis	West Virginia	38.895449	-80.566532	PEM	SLOPE	RPWWD	Temporary Access Road	0.0025	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-154
W-CD28	Lewis	West Virginia	38.893740	-80.566012	PEM	SLOPE	RPWWD	Temporary Access Road	0.0950	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-154
W-CD33	Lewis	West Virginia	38.893519	-80.566006	PEM	SLOPE	RPWWN	Temporary Access Road	0.0120	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-154
W-UV17	Lewis	West Virginia	38.893199	-80.556196	PFO	RIVERINE	RPWWN	Pipeline ROW	-	0.0055	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-155
W-ST16	Lewis	West Virginia	38.892534	-80.556680	PEM	DEPRESSIONAL	RPWWN	Anode Bed	0.0711	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-155
W-VV11	Lewis	West Virginia	38.890612	-80.554981	PEM	DEPRESSIONAL	ISOLATE	Permanent Access Road	-	0.0236	Sediment/Toxicant/Pathogen Retention	6-155
W-VV11	Lewis	West Virginia	38.890576	-80.554852	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0010	-	Sediment/Toxicant/Pathogen Retention	6-155
W-VV12	Lewis	West Virginia	38.890309	-80.553784	PEM	DEPRESSIONAL	NRPWW	Temporary Access Road	0.0070	-	Sediment/Toxicant/Pathogen Retention	6-155
W-VV12	Lewis	West Virginia	38.890278	-80.553822	PEM	DEPRESSIONAL	NRPWW	Permanent Access Road	-	0.0207	Sediment/Toxicant/Pathogen Retention	6-155
W-VV4-PEM	Lewis	West Virginia	38.863280	-80.525705	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0082	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-165
W-VV4-PFO	Lewis	West Virginia	38.863238	-80.525813	PFO	RIVERINE	RPWWD	Pipeline ROW	-	0.0954	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization; Wildlife Habitat; Production Export	6-165
W-VV3-PEM	Lewis	West Virginia	38.862795	-80.525190	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0447	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-165
W-VV3-PFO	Braxton	West Virginia	38.862691	-80.525163	PFO	RIVERINE	RPWWD	Pipeline ROW	-	0.0160	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization; Wildlife Habitat; Production Export	6-165
W-UU9	Lewis	West Virginia	38.857677	-80.532592	PEM	SLOPE	NRPWW	Temporary Access Road	0.0005	-	Sediment/Toxicant/Pathogen Retention	6-163
W-L33	Braxton	West Virginia	38.828587	-80.525834	PEM	DEPRESSIONAL	NRPWW	Temporary Access Road	0.0205	-	None	6-172
W-IJ25	Braxton	West Virginia	38.810321	-80.540558	PEM	DEPRESSIONAL	RPWWN	Temporary Access Road	0.0015	-	Sediment/Toxicant Retention, Nutrient Removal	6-175
W-IJ26	Braxton	West Virginia	38.809174	-80.542584	PEM	SLOPE	RPWWN	Permanent Access Road	-	0.0039	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-176

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

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W-IJ26	Braxton	West Virginia	38.809149	-80.542548	PEM	SLOPE	RPWWN	Temporary Access Road	0.0024	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-176
W-EF9	Braxton	West Virginia	38.808212	-80.544270	PFO	SLOPE	RPWWN	Temporary Access Road	-	0.0201	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-176
W-EF10	Braxton	West Virginia	38.805312	-80.537286	PEM	SLOPE	ISOLATE	Pipeline ROW/Temporary Access Road	0.0729	-	Sediment/Toxicant Retention, Nutrient Removal	6-175
W-I12	Braxton	West Virginia	38.779865	-80.524136	PEM	SLOPE	RPWWD	Temporary Access Road	0.0002	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-181
W-K25	Braxton	West Virginia	38.775374	-80.526492	PEM	SLOPE	NRPWW	Pipeline ROW	0.0549	-	None	6-181
W-KK4	Braxton	West Virginia	38.768899	-80.514468	PEM	SLOPE	RPWWN	Temporary Access Road	0.0215	-	None	6-183
W-K24	Braxton	West Virginia	38.766065	-80.520414	PSS	RIVERINE	RPWWD	Pipeline ROW	-	0.0074	Sediment/Toxicant/Pathogen Retention	6-185
W-H90	Braxton	West Virginia	38.760419	-80.513602	PEM	SLOPE	RPWWD	Pipeline ROW	0.0388	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-186
W-H93	Braxton	West Virginia	38.753968	-80.515672	PEM	RIVERINE	RPWWD	Temporary Access Road/ATWS	0.0133	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-187
W-H92	Braxton	West Virginia	38.753114	-80.512182	PEM	SLOPE	RPWWN	Temporary Access Road/ATWS	0.0113	-	Sediment/Toxicant/Pathogen Retention	6-187
W-QR13	Braxton	West Virginia	38.751445	-80.516905	PEM	DEPRESSIONAL	RPWWN	Temporary Access Road	0.0618	-	Sediment/Toxicant Retention, Nutrient Removal	6-187
W-H94	Braxton	West Virginia	38.750690	-80.514837	PEM	SLOPE	RPWWN	Pipeline ROW/Temporary Access Road	0.0091	-	Sediment/Toxicant Retention, Nutrient Removal	6-187
W-QR12	Braxton	West Virginia	38.749364	-80.522081	PEM	DEPRESSIONAL	RPWWN	Temporary Access Road	0.0881	-	Sediment/Toxicant Retention, Nutrient Removal	6-188
W-QR11	Braxton	West Virginia	38.747846	-80.521602	PEM	DEPRESSIONAL	RPWWN	Temporary Access Road	0.0559	-	Sediment/Toxicant Retention, Nutrient Removal	6-188
W-H89	Braxton	West Virginia	38.728893	-80.506315	PEM	SLOPE	RPWWD	Pipeline ROW	0.0065	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-195
W-I11b	Braxton	West Virginia	38.708869	-80.489369	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0098	-	Sediment/Toxicant/Pathogen Retention	6-201
W-R2	Webster	West Virginia	38.667178	-80.480225	PEM	SLOPE	RPWWD	Temporary Access Road	0.0620	-	Sediment/Toxicant/Pathogen Retention	6-208
W-KK3	Webster	West Virginia	38.667027	-80.478547	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0222	-	Sediment/Toxicant/Pathogen Retention	6-208
W-R3	Webster	West Virginia	38.666869	-80.480889	PEM	DEPRESSIONAL	NRPWW	Temporary Access Road	0.0155	-	Sediment/Toxicant/Pathogen Retention	6-208
W-F45	Webster	West Virginia	38.664402	-80.478856	PEM	SLOPE	RPWWN	Pipeline ROW	0.0022	-	None	6-209
W-F46	Webster	West Virginia	38.664132	-80.479008	PEM	SLOPE	RPWWN	Pipeline ROW	0.0039	-	None	6-209
W-R4	Webster	West Virginia	38.664021	-80.483434	PEM	SLOPE	NRPWW	Temporary Access Road	0.0432	-	None	6-211
W-B44	Webster	West Virginia	38.633084	-80.486943	PEM	SLOPE	RPWWN	Permanent Access Road	0.0056	-	Sediment/Toxicant Retention, Nutrient Removal	6-223
W-B42	Webster	West Virginia	38.623424	-80.486240	PEM	SLOPE	NRPWW	Permanent Access Road	0.0185	-	None	6-222
W-H75	Webster	West Virginia	38.607280	-80.504722	PEM	SLOPE	RPWWN	Pipeline ROW	0.0108	-	None	6-228
W-H79	Webster	West Virginia	38.602069	-80.508493	PEM	SLOPE	NRPWW	Pipeline ROW	0.0077	-	None	6-229
W-H81	Webster	West Virginia	38.599491	-80.506376	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0258	-	None	6-229
W-H82	Webster	West Virginia	38.598415	-80.505238	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0128	-	None	6-230
W-T5	Webster	West Virginia	38.591863	-80.526411	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road	0.0166	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-236
W-H86	Webster	West Virginia	38.591803	-80.508481	PEM	SLOPE	NRPWW	Pipeline ROW	0.0013	-	None	6-231
W-H83	Webster	West Virginia	38.591372	-80.508904	PEM	SLOPE	NRPWW	Pipeline ROW/Temporary Access Road	0.0177	-	None	6-231
W-T4	Webster	West Virginia	38.586855	-80.518697	PEM	RIVERINE	NRPWW	Temporary Access Road	0.0403	-	Sediment/Toxicant/Pathogen Retention	6-233
W-H85	Webster	West Virginia	38.586644	-80.510350	PEM	SLOPE	NRPWW	Pipeline ROW	0.0069	-	None	6-231
W-A20-PFO	Webster	West Virginia	38.566923	-80.529968	PFO	DEPRESSIONAL	ISOLATE	Pipeline ROW	-	0.0725	Sediment/Toxicant/Pathogen Retention; Production Export; Wildlife Habitat	6-242
W-A20-PEM	Webster	West Virginia	38.566910	-80.530098	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0117	-	Sediment/Toxicant/Pathogen Retention; Production Export; Wildlife Habitat	6-242
W-KK2	Webster	West Virginia	38.558192	-80.524167	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0161	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-248
W-KK2	Webster	West Virginia	38.558182	-80.524141	PEM	DEPRESSIONAL	ISOLATE	Permanent Access Road	-	0.0085	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-248
W-H69	Webster	West Virginia	38.557523	-80.525222	PEM	DEPRESSIONAL	NRPWW	Temporary Access Road	0.0078	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-248



**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-H69	Webster	West Virginia	38.557502	-80.525163	PEM	DEPRESSIONAL	NRPWW	Permanent Access Road	-	0.0060	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-248
W-H68	Webster	West Virginia	38.557425	-80.525181	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0002	-	Sediment/Toxicant/Pathogen Retention	6-248
W-A19	Webster	West Virginia	38.557156	-80.538578	PEM	SLOPE	RPWWD	Temporary Access Road	0.0265	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-245
W-H70	Webster	West Virginia	38.557097	-80.526293	PEM	DEPRESSIONAL	ISOLATE	Permanent Access Road	-	0.0057	Sediment/Toxicant/Pathogen Retention	6-248
W-H70	Webster	West Virginia	38.557075	-80.526280	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0021	-	Sediment/Toxicant/Pathogen Retention	6-248
W-H71	Webster	West Virginia	38.556481	-80.526853	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0055	-	Sediment/Toxicant/Pathogen Retention; Wildlife Habitat	6-248
W-H71	Webster	West Virginia	38.556454	-80.526913	PEM	DEPRESSIONAL	ISOLATE	Permanent Access Road	-	0.0205	Sediment/Toxicant/Pathogen Retention; Wildlife Habitat	6-248
W-H72	Webster	West Virginia	38.553783	-80.527760	PEM	DEPRESSIONAL	ISOLATE	Permanent Access Road	-	0.0064	None	6-247
W-O17	Webster	West Virginia	38.553578	-80.508257	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0012	-	None	6-250
W-H73	Webster	West Virginia	38.553085	-80.528148	PEM	DEPRESSIONAL	ISOLATE	Permanent Access Road	-	0.0061	None	6-247
W-H73	Webster	West Virginia	38.553074	-80.528114	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0020	-	None	6-247
W-H74	Webster	West Virginia	38.552748	-80.533585	PEM	DEPRESSIONAL	ISOLATE	Permanent Access Road	-	0.0115	None	6-247
W-H67	Webster	West Virginia	38.549313	-80.539242	PFO	RIVERINE	RPWWD	Pipeline ROW/Temporary Access Road	-	0.0908	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Production Export; Wildlife Habitat	6-246
W-H66	Webster	West Virginia	38.548873	-80.539592	PFO	SLOPE	RPWWD	Pipeline ROW	-	0.2496	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Production Export; Wildlife Habitat	6-246
W-H64-PEM	Webster	West Virginia	38.548175	-80.540709	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0276	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-246
W-H64-PSS	Webster	West Virginia	38.548099	-80.540896	PSS	RIVERINE	RPWWD	Pipeline ROW	-	0.0422	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-246
W-H64-PEM-2	Webster	West Virginia	38.548058	-80.540847	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0289	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-246
<b>W-H64 Total</b>	-	-	-	-	-	-	-	-	<b>0.0564</b>	<b>0.0422</b>	-	-
W-H56	Webster	West Virginia	38.545807	-80.542983	PEM	SLOPE	RPWWD	Pipeline ROW	0.0206	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Wildlife Habitat	6-258
W-O15	Webster	West Virginia	38.536021	-80.511990	PEM	SLOPE	NRPWW	Temporary Access Road	0.0247	-	Sediment/Toxicant Retention, Nutrient Removal	6-254
W-O13	Webster	West Virginia	38.533730	-80.513482	PEM	SLOPE	RPWWN	Temporary Access Road	0.0278	-	Sediment/Toxicant Retention, Nutrient Removal	6-254
W-O13	Webster	West Virginia	38.533655	-80.513682	PEM	SLOPE	RPWWN	Permanent Access Road	-	0.0405	Sediment/Toxicant Retention, Nutrient Removal	6-254
W-H58	Webster	West Virginia	38.523642	-80.546324	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0299	-	None	6-257
W-H59-PEM	Webster	West Virginia	38.521027	-80.546343	PEM	SLOPE	NRPWW	Pipeline ROW	0.0074	-	None	6-262
W-KL8	Webster	West Virginia	38.519565	-80.545076	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0976	-	None	6-262
W-H60	Webster	West Virginia	38.517850	-80.544693	PEM	SLOPE	NRPWW	Pipeline ROW	0.0869	-	None	6-263
W-H61	Webster	West Virginia	38.517345	-80.545025	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0094	-	Wildlife Habitat	6-263
W-H62	Webster	West Virginia	38.517147	-80.545591	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0335	-	Wildlife Habitat	6-263
W-B39	Webster	West Virginia	38.508151	-80.559329	PEM	SLOPE	NRPWW	Pipeline ROW	0.0906	-	None	6-265
W-B38	Webster	West Virginia	38.495397	-80.559910	PEM	SLOPE	RPWWN	Temporary Access Road	0.0519	-	Sediment/Toxicant/Pathogen Retention	6-267
W-B31	Webster	West Virginia	38.494322	-80.561155	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0320	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-267
W-B35	Webster	West Virginia	38.493757	-80.560962	PSS	RIVERINE	RPWWD	Pipeline ROW	-	0.0108	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-267
W-A18	Webster	West Virginia	38.481237	-80.555783	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road	0.2038	-	Sediment/Toxicant/Pathogen Retention	6-270
W-E28	Webster	West Virginia	38.443010	-80.551309	PSS	RIVERINE	RPWWD	Permanent Access Road	-	0.0084	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Wildlife Habitat	6-276
W-F18	Webster	West Virginia	38.438835	-80.577826	PEM	SLOPE	NRPWW	Temporary Access Road	0.0012	-	None	6-280
W-F19	Webster	West Virginia	38.438588	-80.577142	PEM	SLOPE	RPWWN	Temporary Access Road	0.0085	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-280
W-F20	Webster	West Virginia	38.437197	-80.575137	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0168	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-280
W-F26	Webster	West Virginia	38.428623	-80.567054	PEM	SLOPE	NRPWW	Pipeline ROW	0.0045	-	None	6-283

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-F29	Webster	West Virginia	38.424050	-80.570711	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0054	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-284
W-F28	Webster	West Virginia	38.423890	-80.570659	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0037	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-284
W-F40	Webster	West Virginia	38.421461	-80.570007	PSS	RIVERINE	RPWWD	Temporary Access Road	-	0.0188	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-284
W-F37	Webster	West Virginia	38.420097	-80.572466	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0007	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-284
W-F36	Webster	West Virginia	38.420084	-80.572603	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0005	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-284
W-F33	Webster	West Virginia	38.418139	-80.574370	PEM	SLOPE	RPWWN	Temporary Access Road	0.0005	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-285
W-F32	Webster	West Virginia	38.418041	-80.575053	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0002	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-285
W-F42	Webster	West Virginia	38.417838	-80.575730	PEM	SLOPE	RPWWN	Temporary Access Road	0.0065	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-285
W-F31	Webster	West Virginia	38.417806	-80.576227	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0223	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-285
W-F41	Webster	West Virginia	38.417599	-80.576458	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0002	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-285
W-B30	Webster	West Virginia	38.405713	-80.591171	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0485	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-287
W-EF29	Webster	West Virginia	38.401209	-80.597852	PEM	RIVERINE	RPWWD	Anode Bed	0.1733	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-288
W-B28	Webster	West Virginia	38.399940	-80.597527	PEM	RIVERINE	RPWWD	Pipeline ROW/Anode Bed	0.2983	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-288
W-E21	Webster	West Virginia	38.370595	-80.611923	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0389	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-294
W-IJ43	Nicholas	West Virginia	38.368775	-80.822726	PEM	DEPRESSIONAL	ISOLATE	Temporary Ancillary Site	0.0144	-	None	6-539
W-E18-PEM	Webster	West Virginia	38.367359	-80.612334	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0208	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-295
W-E18-PSS	Webster	West Virginia	38.367284	-80.612248	PSS	RIVERINE	RPWWD	Pipeline ROW	-	0.0538	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Production Export; Wildlife Habitat	6-295
W-E16	Nicholas	West Virginia	38.364427	-80.614459	PEM	SLOPE	NRPWW	Pipeline ROW	0.0124	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-296
W-E13	Webster	West Virginia	38.364017	-80.616570	PFO	DEPRESSIONAL	RPWWN	Pipeline ROW	-	0.0107	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-296
W-F13	Nicholas	West Virginia	38.356737	-80.631888	PEM	SLOPE	RPWWN	Pipeline ROW	0.0354	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-298
W-F12	Nicholas	West Virginia	38.356528	-80.632264	PEM	SLOPE	RPWWD	Pipeline ROW/Temporary Access Road	0.1068	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-298
W-F11	Nicholas	West Virginia	38.355680	-80.633383	PEM	SLOPE	RPWWN	Pipeline ROW	0.1542	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-298
W-K23	Nicholas	West Virginia	38.355273	-80.633811	PEM	SLOPE	RPWWN	Pipeline ROW	0.0294	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-298
W-K23	Nicholas	West Virginia	38.355237	-80.633777	PEM	SLOPE	RPWWN	Permanent Access Road	-	0.0195	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-298
W-K20	Nicholas	West Virginia	38.354644	-80.634586	PEM	SLOPE	RPWWD	Pipeline ROW	0.0100	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-298
W-IJ51	Nicholas	West Virginia	38.352366	-80.636369	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0410	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-298
W-IJ50	Nicholas	West Virginia	38.350787	-80.637226	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0528	-	Sediment/Toxicant Retention, Nutrient Removal	6-299
W-IJ55	Nicholas	West Virginia	38.343568	-80.646491	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0218	-	None	6-301
W-B27	Nicholas	West Virginia	38.339713	-80.655364	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0515	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-304
W-B26-PEM-1	Nicholas	West Virginia	38.339034	-80.659282	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0273	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-304
W-B26-PEM-2	Nicholas	West Virginia	38.338935	-80.659254	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0060	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-304
<b>W-B26 Total</b>	-	-	-	-	-	-	-	-	<b>0.0332</b>	-	-	-
W-FF6-PSS	Nicholas	West Virginia	38.337803	-80.658933	PSS	SLOPE	RPWWN	Pipeline ROW	-	0.0987	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Wildlife Habitat	6-304
W-FF6-PEM	Nicholas	West Virginia	38.337774	-80.658995	PEM	SLOPE	RPWWN	Pipeline ROW	0.1780	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-304
W-FF3	Nicholas	West Virginia	38.332776	-80.669068	PEM	SLOPE	RPWWN	Pipeline ROW	0.0444	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-306
W-FF4	Nicholas	West Virginia	38.329122	-80.671098	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0037	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-306
W-A17	Nicholas	West Virginia	38.327813	-80.670776	PEM	SLOPE	NRPWW	Pipeline ROW	0.1300	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-306
W-A15	Nicholas	West Virginia	38.323735	-80.670118	PSS	RIVERINE	RPWWD	Pipeline ROW	-	0.0891	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Production Export; Wildlife Habitat	6-306

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-A14	Nicholas	West Virginia	38.321643	-80.670901	PFO	RIVERINE	RPWWD	Pipeline ROW	-	0.0972	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Production Export; Wildlife Habitat	6-306
W-H52	Nicholas	West Virginia	38.313104	-80.673749	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0638	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-309
W-H50	Nicholas	West Virginia	38.309707	-80.676585	PEM	SLOPE	NRPWW	Temporary Access Road	0.0114	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-309
W-N25	Nicholas	West Virginia	38.302028	-80.674533	PEM	DEPRESSIONAL	RPWWD	Pipeline ROW	0.0104	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-311
W-N24	Nicholas	West Virginia	38.299148	-80.675928	PEM	SLOPE	RPWWN	Pipeline ROW	0.0031	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-312
W-N22	Nicholas	West Virginia	38.296941	-80.676479	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0030	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-312
W-I7	Nicholas	West Virginia	38.293453	-80.677084	PFO	SLOPE	NRPWW	Pipeline ROW	-	0.0391	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Production Export; Wildlife Habitat	6-313
W-EF8	Nicholas	West Virginia	38.267034	-80.670429	PEM	SLOPE	RPWWN	Permanent Access Road	0.0053	-	Sediment/Toxicant Retention	6-319
W-J8	Nicholas	West Virginia	38.263168	-80.687930	PFO	SLOPE	RPWWD	Pipeline ROW	-	0.0533	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Production Export; Wildlife Habitat	6-320
W-W5	Nicholas	West Virginia	38.243285	-80.741101	PEM	SLOPE	RPWWN	Temporary Access Road	0.0058	-	Sediment/Toxicant/Pathogen Retention	6-339
W-W4	Nicholas	West Virginia	38.243122	-80.740672	PEM	SLOPE	RPWWN	Temporary Access Road	0.0241	-	Sediment/Toxicant/Pathogen Retention	6-339
W-J7	Nicholas	West Virginia	38.233731	-80.708250	PFO	SLOPE	RPWWD	Pipeline ROW	-	0.0693	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration; Wildlife Habitat; Production Export	6-330
W-U3	Nicholas	West Virginia	38.226324	-80.687293	PEM	SLOPE	RPWWN	Temporary Access Road	0.0099	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-327
W-N18	Nicholas	West Virginia	38.224246	-80.716448	PEM	SLOPE	NRPWW	Pipeline ROW	0.0075	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-332
W-L28	Nicholas	West Virginia	38.203621	-80.719372	PEM	DEPRESSIONAL	RPWWD	Pipeline ROW	0.0064	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-345
W-L27	Nicholas	West Virginia	38.202610	-80.718505	PEM	SLOPE	RPWWN	Pipeline ROW	0.0029	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-345
W-I11a	Nicholas	West Virginia	38.179434	-80.729511	PEM	RIVERINE	RPWWN	Pipeline ROW	0.0579	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration	6-350
W-U7	Nicholas	West Virginia	38.178298	-80.729744	PEM	SLOPE	RPWWN	ATWS	0.0666	-	Sediment/Toxicant/Pathogen Retention; Wildlife Habitat	6-350
W-I5	Nicholas	West Virginia	38.175595	-80.730736	PEM	SLOPE	RPWWN	Pipeline ROW	0.0082	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-350
W-VV2	Nicholas	West Virginia	38.161072	-80.735000	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0229	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Floodflow Alteration; Sediment/Shoreline Stabilization	6-359
W-N16	Nicholas	West Virginia	38.157063	-80.738304	PEM	SLOPE	NRPWW	Pipeline ROW	0.0348	-	None	6-359
W-H48	Nicholas	West Virginia	38.138565	-80.727192	PEM	SLOPE	RPWWD	Temporary Access Road	0.0078	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-363
W-H49	Nicholas	West Virginia	38.138550	-80.725571	PEM	SLOPE	RPWWD	Temporary Access Road	0.0012	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-363
W-H46	Nicholas	West Virginia	38.137490	-80.728993	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0061	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-363
W-H45-PFO	Nicholas	West Virginia	38.137212	-80.729564	PFO	RIVERINE	RPWWD	Temporary Access Road	-	0.0211	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	6-362
W-H45-PEM	Nicholas	West Virginia	38.137146	-80.729716	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0115	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	6-362
W-H41	Nicholas	West Virginia	38.127873	-80.733868	PEM	SLOPE	RPWWN	Pipeline ROW	0.0151	-	None	6-365
W-H38	Nicholas	West Virginia	38.127800	-80.734855	PEM	SLOPE	RPWWD	Temporary Access Road	0.0067	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-365
W-H40	Nicholas	West Virginia	38.127525	-80.734781	PEM	SLOPE	RPWWD	Temporary Access Road	0.0043	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention	6-365
W-H33	Nicholas	West Virginia	38.124326	-80.735761	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0590	-	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Sediment/Shoreline Stabilization, Production Export	6-365
W-H35	Nicholas	West Virginia	38.124117	-80.736018	PEM	SLOPE	RPWWN	Pipeline ROW	0.0177	-	Sediment/Toxicant/Pathogen Retention	6-365
W-H31	Nicholas	West Virginia	38.116376	-80.735285	PEM	SLOPE	RPWWN	Pipeline ROW	0.0139	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-367
W-V4	Nicholas	West Virginia	38.115834	-80.731137	PSS	RIVERINE	RPWWN	Pipeline ROW	-	0.0031	Sediment/Toxicant/Pathogen Retention; Wildlife Habitat	6-368
W-EF31	Nicholas	West Virginia	38.107483	-80.726303	PEM	RIVERINE	RPWWD	Pipeline ROW/ATWS	0.0208	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	6-369
W-M15	Greenbrier	West Virginia	38.068055	-80.718035	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0027	-	None	6-375
W-M16	Greenbrier	West Virginia	38.067873	-80.718034	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0037	-	None	6-375
W-M17	Greenbrier	West Virginia	38.067698	-80.718179	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0042	-	None	6-375
W-M18	Greenbrier	West Virginia	38.061194	-80.720732	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0415	-	Sediment/Toxicant/Pathogen Retention	6-375

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-M20	Greenbrier	West Virginia	38.060869	-80.723064	PEM	DEPRESSIONAL	NRPWW	Pipeline ROW	0.0031	-	None	6-375
W-M23	Greenbrier	West Virginia	38.060683	-80.722348	PEM	SLOPE	NRPWW	Pipeline ROW	0.0616	-	None	6-375
W-M22	Greenbrier	West Virginia	38.060661	-80.722616	PSS	SLOPE	NRPWW	Pipeline ROW	-	0.0039	Sediment/Toxicant/Pathogen Retention; Wildlife Habitat; Production Export	6-375
W-QR4	Greenbrier	West Virginia	38.057094	-80.729024	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road	0.0370	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention; Nutrient Removal	6-378
W-J6	Greenbrier	West Virginia	38.053361	-80.732198	PFO	SLOPE	RPWWD	Pipeline ROW	-	0.0744	Sediment/Toxicant/Pathogen Retention; Wildlife Habitat; Production Export	6-379
W-J9	Greenbrier	West Virginia	38.039366	-80.747651	PEM	SLOPE	NRPWW	Temporary Access Road	0.0179	-	Sediment/Toxicant/Pathogen Retention	6-386
W-KL37	Greenbrier	West Virginia	38.033817	-80.731491	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0126	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-392
W-KL38	Greenbrier	West Virginia	38.033422	-80.732880	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0098	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-392
W-ST27	Greenbrier	West Virginia	38.029124	-80.742585	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0075	-	None	6-385
W-KL40	Greenbrier	West Virginia	38.029060	-80.736807	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road	0.0312	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-391
W-IJ61	Greenbrier	West Virginia	38.026898	-80.738411	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0214	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-391
W-IJ60	Greenbrier	West Virginia	38.024335	-80.739643	PEM	SLOPE	RPWWN	Temporary Access Road	0.0174	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-390
W-IJ59	Greenbrier	West Virginia	38.022031	-80.743027	PEM	SLOPE	RPWWN	Temporary Access Road	0.0024	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-390
W-IJ58-PEM-5	Greenbrier	West Virginia	38.030548	-80.736023	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0004	-	Groundwater Recharge/Discharge; Floodflow Alteration; Sediment/Toxicant Retention; Nutrient Removal; Wildlife Habitat	6-391
W-IJ58-PEM-4	Greenbrier	West Virginia	38.024068	-80.739750	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0024	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-390
W-IJ58-PEM-2	Greenbrier	West Virginia	38.022593	-80.741917	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0031	-	Groundwater Recharge/Discharge; Floodflow Alteration; Sediment/Toxicant Retention; Nutrient Removal; Wildlife Habitat	6-390
W-IJ58-PEM-3	Greenbrier	West Virginia	38.021808	-80.743351	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0056	-	Groundwater Recharge/Discharge; Sediment/Toxicant Retention	6-390
W-IJ58-PEM-1	Greenbrier	West Virginia	38.021745	-80.744012	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0015	-	Groundwater Recharge/Discharge; Floodflow Alteration; Sediment/Toxicant Retention; Nutrient Removal; Wildlife Habitat	6-390
W-IJ57	Greenbrier	West Virginia	38.021723	-80.745579	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0017	-	Sediment/Toxicant Retention	6-389
W-J5	Greenbrier	West Virginia	38.028817	-80.743566	PSS	DEPRESSIONAL	NRPWW	Pipeline ROW	-	0.0052	Sediment/Toxicant/Pathogen Retention; Wildlife Habitat; Production Export	6-385
W-ST28	Greenbrier	West Virginia	38.028800	-80.743155	PEM	DEPRESSIONAL	ISOLATE	Temporary Access Road	0.0310	-	None	6-385
W-V6	Greenbrier	West Virginia	37.993269	-80.756363	PEM	SLOPE	RPWWN	Temporary Access Road	0.0422	-	Sediment/Toxicant/Pathogen Retention	6-397
W-M5	Greenbrier	West Virginia	37.987898	-80.764724	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0058	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Wildlife Habitat; Floodflow Alteration	6-399
W-M6	Greenbrier	West Virginia	37.987344	-80.761908	PEM	SLOPE	NRPWW	Temporary Access Road	0.0192	-	Sediment/Toxicant/Pathogen Retention	6-399
W-QR2	Greenbrier	West Virginia	37.983978	-80.756817	PEM	SLOPE	RPWWD	Permanent Access Road	-	0.0010	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Production Export	6-400
W-QR2	Greenbrier	West Virginia	37.983212	-80.756099	PEM	SLOPE	RPWWD	Pipeline ROW/Temporary Access Road	0.2435	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Production Export	6-400
W-L16	Greenbrier	West Virginia	37.980653	-80.754908	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0247	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-400
W-PP7	Greenbrier	West Virginia	37.966818	-80.738483	PEM	DEPRESSIONAL	ISOLATE	Pipeline ROW	0.0255	-	None	6-403
W-L20	Greenbrier	West Virginia	37.962843	-80.732518	PEM	SLOPE	NRPWW	ATWS	0.0172	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-404
W-L22	Greenbrier	West Virginia	37.962713	-80.732241	PEM	SLOPE	NRPWW	ATWS	0.0131	-	None	6-404
W-L21	Greenbrier	West Virginia	37.962682	-80.732475	PEM	SLOPE	NRPWW	ATWS	0.0266	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-404
W-L19	Greenbrier	West Virginia	37.954250	-80.739757	PEM	DEPRESSIONAL	RPWWD	Pipeline ROW/Temporary Access Road	0.1060	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-405
W-L13	Greenbrier	West Virginia	37.953825	-80.740037	PEM	SLOPE	RPWWN	Pipeline ROW	0.0316	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Wildlife Habitat	6-405
W-L12	Greenbrier	West Virginia	37.953736	-80.739892	PEM	SLOPE	RPWWN	Pipeline ROW	0.0075	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-405
W-L11	Greenbrier	West Virginia	37.949563	-80.742715	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0194	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-406
W-L8	Greenbrier	West Virginia	37.939016	-80.745277	PEM	SLOPE	RPWWN	Temporary Access Road	0.0001	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-408
W-L4	Greenbrier	West Virginia	37.938675	-80.746774	PEM	SLOPE	RPWWN	Pipeline ROW	0.0404	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-408
W-L3	Greenbrier	West Virginia	37.938569	-80.746480	PEM	SLOPE	RPWWN	Temporary Access Road/ATWS	0.0136	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-408

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Wetland Impacts Table  
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W-L2	Greenbrier	West Virginia	37.938326	-80.746878	PEM	RIVERINE	RPWWD	Pipeline ROW/Temporary Access Road	0.0393	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Floodflow Alteration	6-408
W-L7	Greenbrier	West Virginia	37.934077	-80.744896	PEM	SLOPE	RPWWD	Permanent Access Road	-	0.0015	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-409
W-L7	Greenbrier	West Virginia	37.934074	-80.744879	PEM	SLOPE	RPWWD	Temporary Access Road	0.0021	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-409
W-L6	Greenbrier	West Virginia	37.933862	-80.745240	PEM	SLOPE	RPWWD	Temporary Access Road	0.0223	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-409
W-L6	Greenbrier	West Virginia	37.933720	-80.745329	PEM	SLOPE	RPWWD	Permanent Access Road	-	0.0188	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-409
W-EF28	Greenbrier	West Virginia	37.923033	-80.740465	PFO	SLOPE	NRPWW	Anode Bed	-	0.0095	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Wildlife Habitat, Production Export	6-411
W-KL30	Greenbrier	West Virginia	37.917261	-80.745506	PEM	SLOPE	RPWWD	Permanent Access Road	0.0664	-	Floodflow Alteration, Sediment/Toxicant Retention	6-413
W-KL29-PEM	Greenbrier	West Virginia	37.916791	-80.744943	PEM	RIVERINE	RPWWD	Permanent Access Road	0.1438	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Production Export	6-413
W-IJ47-PEM	Greenbrier	West Virginia	37.916423	-80.743551	PEM	RIVERINE	RPWWD	Permanent Access Road	-	0.0113	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Production Export	6-413
W-IJ47-PEM	Greenbrier	West Virginia	37.916255	-80.743867	PEM	RIVERINE	RPWWD	Permanent Access Road	-	0.0520	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Production Export	6-413
<b>W-IJ47-PEM</b>	-	-	-	-	-	-	-	-	-	<b>0.0633</b>	-	-
W-W11	Greenbrier	West Virginia	37.911778	-80.729952	PEM	SLOPE	RPWWD	Permanent Access Road	-	0.0044	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-414
W-W11	Greenbrier	West Virginia	37.911778	-80.729952	PEM	SLOPE	RPWWD	Temporary Access Road	0.0016	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-414
W-W10	Greenbrier	West Virginia	37.911495	-80.727880	PEM	SLOPE	NRPWW	Permanent Access Road	-	0.0439	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-415
W-W10	Greenbrier	West Virginia	37.911495	-80.727880	PEM	SLOPE	NRPWW	Temporary Access Road	0.0050	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-415
W-W9	Greenbrier	West Virginia	37.910671	-80.728841	PEM	SLOPE	RPWWN	Permanent Access Road	-	0.0087	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-415
W-W9	Greenbrier	West Virginia	37.910671	-80.728841	PEM	SLOPE	RPWWN	Temporary Access Road/ATWS	0.0089	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-415
W-FF1	Greenbrier	West Virginia	37.908821	-80.733706	PEM	SLOPE	RPWWN	Pipeline ROW	0.0320	-	Groundwater Recharge/Discharge	6-416
W-W13	Greenbrier	West Virginia	37.908489	-80.734405	PEM	SLOPE	RPWWD	Pipeline ROW	0.0019	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-416
W-U8	Greenbrier	West Virginia	37.884175	-80.746490	PEM	SLOPE	NRPWW	Pipeline ROW	0.0014	-	None	6-420
W-EE6	Fayette	West Virginia	37.869071	-80.759476	PEM	SLOPE	NRPWW	Station	-	0.0026	None	6-422
W-EE7	Fayette	West Virginia	37.868952	-80.759689	PEM	SLOPE	NRPWW	Station	-	0.0045	Sediment/Toxicant/Pathogen Retention	6-422
W-KL25	Greenbrier	West Virginia	37.865552	-80.762049	PEM	SLOPE	RPWWN	Temporary Ancillary Site	0.1183	-	Floodflow Alteration, Sediment/Toxicant Retention	6-423
W-KL26	Greenbrier	West Virginia	37.865505	-80.762470	PEM	DEPRESSIONAL	ISOLATE	Temporary Ancillary Site	0.0121	-	Floodflow Alteration, Sediment/Toxicant Retention	6-423
W-KL22	Greenbrier	West Virginia	37.865324	-80.761812	PEM	SLOPE	RPWWN	Temporary Ancillary Site	0.0694	-	Floodflow Alteration, Sediment/Toxicant Retention	6-423
W-KL23	Greenbrier	West Virginia	37.864995	-80.761621	PEM	SLOPE	RPWWN	Temporary Ancillary Site	0.4982	-	Floodflow Alteration, Sediment/Toxicant Retention	6-423
W-K7	Greenbrier	West Virginia	37.863527	-80.757286	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.3206	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-424
W-IJ30	Greenbrier	West Virginia	37.862357	-80.757476	PEM	SLOPE	RPWWD	Pipeline ROW	0.3236	-	Floodflow Alteration, Sediment/Toxicant Retention	6-424
W-IJ28	Greenbrier	West Virginia	37.862331	-80.758500	PEM	SLOPE	RPWWN	Temporary Access Road/ATWS	2.2955	-	Floodflow Alteration, Sediment/Toxicant Retention	6-424
W-UV9	Greenbrier	West Virginia	37.862309	-80.757756	PEM	SLOPE	RPWWN	Pipeline ROW/ATWS	0.4361	-	Floodflow Alteration, Sediment/Toxicant Retention	6-424
W-UV11	Greenbrier	West Virginia	37.861173	-80.757726	PEM	SLOPE	RPWWN	Pipeline ROW	0.0285	-	Sediment/Toxicant Retention	6-424
W-UV10	Greenbrier	West Virginia	37.861066	-80.757954	PEM	SLOPE	RPWWN	Pipeline ROW	0.0035	-	Sediment/Toxicant Retention	6-424
W-UV10	Greenbrier	West Virginia	37.861078	-80.757968	PEM	SLOPE	RPWWN	ATWS	0.0092	-	Sediment/Toxicant Retention	6-424
W-K9-PEM-1	Greenbrier	West Virginia	37.860916	-80.757817	PEM	SLOPE	RPWWD	Pipeline ROW	0.0354	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Production Export	6-424
W-IJ38	Greenbrier	West Virginia	37.860502	-80.759420	PEM	SLOPE	RPWWN	Temporary Access Road/ATWS	0.0638	-	Sediment/Toxicant Retention	6-424
W-IJ29	Greenbrier	West Virginia	37.859892	-80.759247	PEM	SLOPE	RPWWN	ATWS	0.0302	-	Floodflow Alteration, Sediment/Toxicant Retention	6-424
W-K10	Greenbrier	West Virginia	37.858743	-80.755724	PEM	SLOPE	RPWWN	Pipeline ROW	0.0068	-	None	6-425
W-K12	Greenbrier	West Virginia	37.857129	-80.755257	PEM	SLOPE	RPWWN	Pipeline ROW	0.0024	-	Sediment/Toxicant/Pathogen Retention	6-425

**Table 4.2  
Wetland Impacts Table  
Mountain Valley Pipeline Project**

Wetland ID	County	State	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type	Impact Type	Temporary Impacts (Acres) <sup>4</sup>	Permanent Impacts (Acres) <sup>5</sup>	Wetland Functions and Values <sup>6</sup>	Figure
W-UV4	Greenbrier	West Virginia	37.854391	-80.755038	PSS	SLOPE	RPWWD	Pipeline ROW	-	0.0885	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Wildlife Habitat, Production Export	6-425
W-UV8	Greenbrier	West Virginia	37.851590	-80.752937	PEM	SLOPE	RPWWD	Pipeline ROW	0.4913	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	6-426
W-EE4	Summers	West Virginia	37.813845	-80.748769	PEM	SLOPE	RPWWD	Pipeline ROW	0.0453	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Wildlife Habitat	6-432
W-M2	Summers	West Virginia	37.807878	-80.746307	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0381	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation; Wildlife Habitat	6-433
W-I10	Summers	West Virginia	37.783907	-80.718899	PEM	DEPRESSIONAL	NRPWW	Permanent Access Road	-	0.0550	None	6-440
W-I10	Summers	West Virginia	37.783879	-80.718903	PEM	DEPRESSIONAL	NRPWW	Temporary Access Road	0.0190	-	None	6-440
W-EF40	Summers	West Virginia	37.693888	-80.735663	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0568	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention	6-464
W-EF36	Summers	West Virginia	37.675423	-80.732001	PEM	RIVERINE	RPWWN	Pipeline ROW	0.0047	-	Sediment/Toxicant Retention	6-468
W-K2-PEM	Summers	West Virginia	37.668130	-80.723493	PEM	SLOPE	RPWWD	Pipeline ROW	0.0140	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention	6-471
W-G7	Summers	West Virginia	37.654106	-80.702592	PEM	SLOPE	NRPWW	Pipeline ROW	0.0191	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-474
W-OP1	Monroe	West Virginia	37.600067	-80.700400	PEM	RIVERINE	RPWWD	Pipeline ROW	0.1359	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization	6-490
W-CD37	Monroe	West Virginia	37.598471	-80.699393	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road	0.0176	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat, Production Export	6-490
W-CD40	Monroe	West Virginia	37.598069	-80.699728	PEM	SLOPE	RPWWN	Temporary Access Road	0.0112	-	None	6-490
W-CD39	Monroe	West Virginia	37.598051	-80.700150	PEM	DEPRESSIONAL	RPWWD	Temporary Access Road	0.0024	-	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat, Production Export	6-490
W-A13	Monroe	West Virginia	37.559410	-80.710082	PEM	SLOPE	RPWWD	Pipeline ROW/Temporary Access Road	0.2991	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-496
W-A13	Monroe	West Virginia	37.559332	-80.709734	PEM	SLOPE	RPWWD	Permanent Access Road	-	0.0228	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-496
W-MN1	Monroe	West Virginia	37.473153	-80.675740	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0342	-	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization	6-515
W-G6	Monroe	West Virginia	37.472534	-80.675718	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0684	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-515
W-G6	Monroe	West Virginia	37.472502	-80.676002	PEM	RIVERINE	RPWWD	Permanent Access Road	0.0842	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-515
W-E12	Monroe	West Virginia	37.450761	-80.667516	PEM	RIVERINE	RPWWD	Pipeline ROW	0.0041	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-520
W-C14	Monroe	West Virginia	37.427083	-80.694569	PEM	DEPRESSIONAL	RPWWN	Pipeline ROW	0.0113	-	Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-525
W-C13	Monroe	West Virginia	37.426734	-80.694534	PEM	RIVERINE	RPWWD	Pipeline ROW	0.2172	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-525
W-C17	Monroe	West Virginia	37.425547	-80.693481	PEM	RIVERINE	RPWWD	Temporary Access Road	0.0306	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Nutrient Removal/Retention/Transformation	6-525

**Notes:**

- 1 - in decimal degrees
- 2 - Field classification based on Cowardin et al. 1979. See wetland delineation report for more details.
- 3 - Field classification based on Brinson, M.M. 1993.
- 4 - Temporary impacts to PEM wetlands in the temporary limit-of-disturbance
- 5 - Includes 1) permanent conversion impacts to PSS and PFO impacts in the temporary and permanent limit-of-disturbance, and 2) permanent impacts to PEM within permanent access road limit-of-disturbance
- 6 - Wetland Functions and Values assessed according to the USACE Highway Method, as described in Section 5.5

**Table 5.1  
Stream Impacts Summary Table  
Mountain Valley Pipeline Project**

<b>County</b>	<b>Flow Regime</b>	<b>Temporary Linear Feet Impact (ft)</b>	<b>Permanent Linear Feet Impact (ft)</b>
Wetzel	Ephemeral	148	227
	Intermittent	1036	406
	Perennial	443	41
Harrison	Ephemeral	577	202
	Intermittent	699	32
	Perennial	1153	26
Doddridge	Ephemeral	267	0
	Intermittent	631	25
	Perennial	77	0
Lewis	Ephemeral	1926	36
	Intermittent	1556	0
	Perennial	1875	0
Braxton	Ephemeral	812	79
	Intermittent	789	173
	Perennial	2101	474
Webster	Ephemeral	3255	0
	Intermittent	2458	30
	Perennial	3719	0
Nicholas	Ephemeral	1110	0
	Intermittent	1746	0
	Perennial	3132	30
Greenbrier	Ephemeral	560	40
	Intermittent	859	57
	Perennial	1328	0
Fayette	Ephemeral	115	215
	Intermittent	91	147
	Perennial	0	0
Summers	Ephemeral	1256	0
	Intermittent	1011	95
	Perennial	1192	0
Monroe	Ephemeral	899	26
	Intermittent	366	0
	Perennial	1247	31
WV Totals	Ephemeral	10,923	825
	Intermittent	11,241	965
	Perennial	16,267	602
	Grand Total	38,431	2,392

**Table 5.2  
Stream Impacts Table  
Mountain Valley Pipeline Project**

Stream ID	NHD Stream Name <sup>1</sup>	County	Latitude <sup>2</sup>	Longitude <sup>2</sup>	Flow Regime	Water Type <sup>3</sup>	Impact Type	Designation <sup>4,5,6</sup>	Top of Bank Width (ft)	Temporary Linear Feet Impact (ft)	Permanent Linear Feet Impact (ft)	Figure
S-J63	UNT to Mobley Run	Wetzel	39.562824	-80.541691	Intermittent	RPW	Station	Tier 2	3	100	-	6-1
S-ST13	UNT to Mobley Run	Wetzel	39.562750	-80.541814	Intermittent	RPW	Station	Tier 2	3	-	152	6-1
S-ST13	UNT to Mobley Run	Wetzel	39.562545	-80.541549	Intermittent	RPW	Station	Tier 2	3	27	-	6-1
S-ST14	UNT to Mobley Run	Wetzel	39.562629	-80.541666	Ephemeral	NRPW	Station	Tier 2	2	-	102	6-1
S-ST14	UNT to Mobley Run	Wetzel	39.562580	-80.541378	Ephemeral	NRPW	Station	Tier 2	2	79	-	6-1
S-ST10	UNT to Mobley Run	Wetzel	39.562384	-80.542424	Intermittent	RPW	Station	Tier 2	4	-	158	6-1
S-ST10	UNT to Mobley Run	Wetzel	39.562262	-80.542374	Intermittent	RPW	Station	Tier 2	4	20	-	6-1
S-ST18	UNT to Mobley Run	Wetzel	39.561766	-80.540136	Intermittent	RPW	Temporary Access Road	Tier 2	10	11	-	6-1
S-ST18	UNT to Mobley Run	Wetzel	39.561753	-80.540125	Intermittent	RPW	Permanent Access Road	Tier 2	10	-	10	6-1
S-A1a	North Fork Fishing Creek	Wetzel	39.553946	-80.545046	Perennial	RPW	Pipeline ROW	Tier 1	35	80	-	6-3
S-A3a	UNT to North Fork Fishing Creek	Wetzel	39.551814	-80.545633	Intermittent	RPW	Pipeline ROW	Tier 2	9	80	-	6-4
S-J66	UNT to North Fork Fishing Creek	Wetzel	39.546334	-80.544020	Intermittent	RPW	Temporary Access Road	Tier 2	3	83	-	6-5
S-J66	UNT to North Fork Fishing Creek	Wetzel	39.546030	-80.544314	Intermittent	RPW	Pipeline ROW	Tier 2	3	77	-	6-5
<b>S-J66 Total</b>	<b>UNT to North Fork Fishing Creek</b>									<b>160</b>	<b>-</b>	
S-A5a	UNT to Fallen Timber Run	Wetzel	39.534241	-80.540995	Intermittent	RPW	Pipeline ROW	Tier 2	4	137	-	6-9
S-A6a	Fallen Timber Run	Wetzel	39.534023	-80.540889	Perennial	RPW	Pipeline ROW	Tier 1	20	82	-	6-9
S-A115	Price Run	Wetzel	39.506513	-80.526502	Perennial	RPW	Permanent Access Road	Tier 1	30	30	-	6-19
S-A125	Price Run	Wetzel	39.503477	-80.532902	Perennial	RPW	Pipeline ROW	Tier 1	35	77	-	6-17
<b>S-A115 &amp; S-A125 Total</b>	<b>Price Run</b>									<b>107</b>	<b>-</b>	
S-A124	UNT to Price Run	Wetzel	39.503288	-80.532680	Intermittent	RPW	Pipeline ROW	Tier 2	12	100	-	6-17
S-A116	UNT to Price Run	Wetzel	39.505572	-80.525608	Intermittent	RPW	Temporary Access Road	Tier 2	8	8	-	6-19
S-A116	UNT to Price Run	Wetzel	39.505571	-80.525615	Intermittent	RPW	Permanent Access Road	Tier 2	8	-	26	6-19
S-A116	UNT to Price Run	Wetzel	39.505489	-80.525655	Intermittent	RPW	Temporary Access Road	Tier 2	8	8	-	6-19
S-A117	UNT to Price Run	Wetzel	39.503142	-80.522977	Intermittent	RPW	Permanent Access Road	Tier 2	8	-	27	6-18
S-A117	UNT to Price Run	Wetzel	39.503135	-80.523044	Intermittent	RPW	Temporary Access Road	Tier 2	8	8	-	6-18
S-A117	UNT to Price Run	Wetzel	39.503132	-80.522918	Intermittent	RPW	Temporary Access Road	Tier 2	8	13	-	6-18
<b>S-A117 &amp; A116 Total</b>	<b>UNT to Price Run</b>									<b>37</b>	<b>53</b>	
S-A118	UNT to Price Run	Wetzel	39.502399	-80.523520	Intermittent	RPW	Pipeline ROW	Tier 2	6	79	-	6-18
S-A120	Stout Run	Wetzel	39.489914	-80.522135	Intermittent	RPW	Temporary Access Road	Tier 1	6	8	-	6-21
S-A120	Stout Run	Wetzel	39.489890	-80.522083	Intermittent	RPW	Permanent Access Road	Tier 1	6	-	26	6-21
S-A120	Stout Run	Wetzel	39.489866	-80.522029	Intermittent	RPW	Temporary Access Road	Tier 1	6	9	-	6-21
S-A120	Stout Run	Wetzel	39.489712	-80.520728	Intermittent	RPW	Pipeline ROW	Tier 1	6	108	-	6-21
<b>S-A120 Total</b>	<b>Stout Run</b>									<b>125</b>	<b>26</b>	
S-A119	UNT to Stout Run	Wetzel	39.489589	-80.520532	Intermittent	RPW	Pipeline ROW	Tier 2	5	149	-	6-21
S-QR34	UNT to Stout Run	Wetzel	39.489083	-80.520519	Ephemeral	NRPW	Permanent Access Road	Tier 2	3	-	125	6-21
S-QR34	UNT to Stout Run	Wetzel	39.489062	-80.520519	Ephemeral	NRPW	Temporary Access Road	Tier 2	3	8	-	6-21
S-A114	UNT to Sams Run	Wetzel	39.481424	-80.518386	Ephemeral	NRPW	Temporary Access Road	Tier 2	3	61	-	6-26
S-J60	Sams Run	Wetzel	39.474354	-80.511825	Perennial	RPW	Pipeline ROW	Tier 2	14	76	-	6-28
S-J56	Manion Run	Wetzel	39.464315	-80.502077	Perennial	RPW	Pipeline ROW	Tier 2	10	75	-	6-30
S-J56	Manion Run	Wetzel	39.464105	-80.502318	Perennial	RPW	Temporary Access Road	Tier 2	10	23	-	6-30
S-J56	Manion Run	Wetzel	39.463899	-80.502594	Perennial	RPW	Permanent Access Road	Tier 2	10	-	41	6-30
<b>S-J56 Total</b>	<b>Manion Run</b>									<b>99</b>	<b>41</b>	
S-J59	UNT to Manion Run	Wetzel	39.462705	-80.504726	Intermittent	RPW	Permanent Access Road	Tier 2	3	-	7	6-30
S-J59	UNT to Manion Run	Wetzel	39.462684	-80.504736	Intermittent	RPW	Temporary Access Road	Tier 2	3	10	-	6-30
S-J62	Right Fork Big Elk Creek	Harrison	39.445033	-80.482635	Perennial	RPW	Pipeline ROW	Tier 2	8	107	-	6-37
S-B75/F49	UNT to Goose Run	Harrison	39.436626	-80.475154	Intermittent	RPW	Pipeline ROW	Tier 2	6	49	-	6-38
S-B75/F49	UNT to Goose Run	Harrison	39.436487	-80.475215	Intermittent	RPW	Pipeline ROW	Tier 2	6	60	-	6-38
<b>S-B75/F49 Total</b>	<b>UNT to Goose Run</b>									<b>109</b>	<b>-</b>	
S-B74	Goose Run	Harrison	39.436245	-80.474976	Intermittent	RPW	Pipeline ROW	Tier 2	4	77	-	6-38
S-B79	UNT to Big Elk Creek	Harrison	39.423571	-80.476278	Ephemeral	NRPW	Temporary Access Road	Tier 2	2	11	-	6-41
S-B79	UNT to Big Elk Creek	Harrison	39.423499	-80.476392	Ephemeral	NRPW	Permanent Access Road	Tier 2	2	-	60	6-41
S-B79	UNT to Big Elk Creek	Harrison	39.423434	-80.476486	Ephemeral	NRPW	Temporary Access Road	Tier 2	2	24	-	6-41
<b>S-B79 Total</b>	<b>UNT to Big Elk Creek</b>									<b>34</b>	<b>60</b>	
S-B78	UNT to Big Elk Creek	Harrison	39.422669	-80.477546	Ephemeral	NRPW	Permanent Access Road	Tier 2	2	-	89	6-41
S-B78	UNT to Big Elk Creek	Harrison	39.422602	-80.477662	Ephemeral	NRPW	Temporary Access Road	Tier 2	2	8	-	6-41
S-J54	UNT to Little Tenmile Creek	Harrison	39.400324	-80.479967	Perennial	RPW	Permanent Access Road	Tier 2	8	-	26	6-45
S-J51	Little Tenmile Creek	Harrison	39.398116	-80.477174	Perennial	RPW	Pipeline ROW	Tier 1	30	76	-	6-45
S-B80/J50	UNT to Little Tenmile Creek	Harrison	39.398006	-80.476763	Intermittent	RPW	ATWS	Tier 2	5	26	-	6-45
S-QR35	Jake Run	Harrison	39.391736	-80.477186	Intermittent	RPW	Temporary Access Road	Tier 1	4	51	-	6-47
S-A10a	Little Rockcamp Run	Harrison	39.370005	-80.484974	Perennial	RPW	Pipeline ROW	Tier 1	12	115	-	6-51
S-B2a	UNT to Rockcamp Run	Harrison	39.359262	-80.493290	Ephemeral	NRPW	Pipeline ROW	Tier 2	8	115	-	6-53
S-A130	UNT to Rockcamp Run	Harrison	39.356914	-80.489556	Intermittent	RPW	ATWS/Temporary Access Road	Tier 2	6	50	-	6-53
S-B3a	Rockcamp Run	Harrison	39.358871	-80.493707	Perennial	RPW	Pipeline ROW	Tier 1	20	97	-	6-53
S-A128	Rockcamp Run	Harrison	39.355569	-80.490100	Perennial	RPW	Permanent Access Road	Tier 1	48	61	-	6-53
<b>S-B3a &amp; S-A128 Total</b>	<b>Rockcamp Run</b>									<b>157</b>	<b>-</b>	
S-RR22	UNT to Grass Run	Harrison	39.342166	-80.512422	Perennial	RPW	Pipeline ROW	Tier 1	12	94	-	6-57
S-ST20	UNT to Grass Run	Harrison	39.336959	-80.522247	Intermittent	RPW	Temporary Access Road	Tier 2	8	46	-	6-58













**Table 5.2  
Stream Impacts Table  
Mountain Valley Pipeline Project**

Stream ID	NHD Stream Name <sup>1</sup>	County	Latitude <sup>2</sup>	Longitude <sup>2</sup>	Flow Regime	Water Type <sup>3</sup>	Impact Type	Designation <sup>4,5,6</sup>	Top of Bank Width (ft)	Temporary Linear Feet Impact (ft)	Permanent Linear Feet Impact (ft)	Figure
S-MN8	UNT to Little Laurel Creek	Nicholas	38.266362	-80.683559	Perennial	RPW	Temporary Access Road	Tier 2, Trout Waters*	3	43	-	6-321
S-J28	UNT to Little Laurel Creek	Nicholas	38.263235	-80.687908	Intermittent	RPW	Pipeline ROW	Tier 2	5	79	-	6-320
S-J26	Little Laurel Creek	Nicholas	38.268317	-80.682864	Perennial	RPW	Temporary Access Road	3, Trout Waters	30	36	-	6-318
S-J26	Little Laurel Creek	Nicholas	38.268267	-80.68288	Perennial	RPW	Permanent Access Road	3, Trout Waters	30	-	30	6-318
S-J26	Little Laurel Creek	Nicholas	38.268218	-80.682896	Perennial	RPW	Temporary Access Road	3, Trout Waters	30	35	-	6-318
S-MN9	Little Laurel Creek	Nicholas	38.261759	-80.684644	Perennial	RPW	Temporary Access Road	3, Trout Waters	25	46	-	6-352
<b>S-J26 &amp; S-MN9</b>	<b>Little Laurel Creek</b>									<b>117</b>	<b>30</b>	
S-J25	UNT to Little Laurel Creek	Nicholas	38.256724	-80.687047	Ephemeral	NRPW	Temporary Access Road	Tier 2	5	41	-	6-322
S-J25	UNT to Little Laurel Creek	Nicholas	38.256682	-80.687348	Ephemeral	NRPW	Pipeline ROW	Tier 2	5	77	-	6-322
<b>S-J25 Total</b>	<b>UNT to Little Laurel Creek</b>									<b>118</b>	-	
S-J24	UNT to Little Laurel Creek	Nicholas	38.256302	-80.687350	Perennial	RPW	Pipeline ROW	Tier 3	15	76	-	6-322
S-J24	UNT to Little Laurel Creek	Nicholas	38.256248	-80.687358	Perennial	RPW	Pipeline ROW	Tier 3	15	76	-	6-322
<b>S-J24 Total</b>	<b>UNT to Little Laurel Creek</b>									<b>152</b>	-	
S-J23-EPH	UNT to Little Laurel Creek	Nicholas	38.234331	-80.707513	Ephemeral	NRPW	Pipeline ROW	Tier 2, WWF*	1	109	-	6-322
S-J22	UNT to Little Laurel Creek	Nicholas	38.233718	-80.708268	Intermittent	RPW	Pipeline ROW	Tier 2, WWF*	3	85	-	6-330
S-N10	Skelt Run	Nicholas	38.231025	-80.710633	Perennial	RPW	Pipeline ROW	Tier 3	4	78	-	6-331
S-N10-Braid	Skelt Run	Nicholas	38.230934	-80.710804	Intermittent	RPW	Pipeline ROW	Tier 3	3	101	-	6-331
<b>S-N10 Total</b>	<b>Skelt Run</b>									<b>179</b>	-	
S-EE1	UNT to Skelt Run	Nicholas	38.228924	-80.713076	Ephemeral	NRPW	Pipeline ROW	Tier 2, Trout Waters*	4	81	-	6-331
S-N13-Braid	UNT to Skelt Run	Nicholas	38.226869	-80.715487	Intermittent	RPW	Pipeline ROW	Tier 2, Trout Waters*	6	37	-	6-332
S-N13	UNT to Skelt Run	Nicholas	38.226851	-80.715393	Intermittent	RPW	Pipeline ROW	Tier 2, Trout Waters*	2	89	-	6-332
<b>S-N13 Total</b>	<b>UNT to Skelt Run</b>									<b>126</b>	-	
S-L42	UNT to Jims Creek	Nicholas	38.221567	-80.718197	Ephemeral	RPW	Temporary Access Road	Tier 2, WWF*	3	110	-	6-332
S-L41	Jims Creek	Nicholas	38.220793	-80.717100	Perennial	RPW	Pipeline ROW	Tier 3	20	76	-	6-332
S-L38	UNT to Riley Branch	Nicholas	38.205534	-80.718246	Perennial	RPW	Pipeline ROW	Tier 3	3	75	-	6-345
S-L37	UNT to Riley Branch	Nicholas	38.203873	-80.718989	Intermittent	RPW	Pipeline ROW	Tier 2	4	8	-	6-345
S-L35	Riley Branch	Nicholas	38.203887	-80.719122	Perennial	RPW	Pipeline ROW	Tier 3	4	86	-	6-345
S-L35	Riley Branch	Nicholas	38.203097	-80.719248	Perennial	RPW	Pipeline ROW	Tier 3	4	87	-	6-345
S-L35	Riley Branch	Nicholas	38.200338	-80.717177	Perennial	RPW	Pipeline ROW	Tier 3	4	79	-	6-345
<b>S-L35 Total</b>	<b>Riley Branch</b>									<b>252</b>	-	
S-I37	UNT to Hominy Creek	Nicholas	38.196644	-80.718856	Ephemeral	NRPW	Pipeline ROW	Tier 2, WWF*	6	40	-	6-346
S-I38	UNT to Hominy Creek	Nicholas	38.194221	-80.719357	Intermittent	RPW	Pipeline ROW	Tier 2	5	77	-	6-346
S-I39	UNT to Hominy Creek	Nicholas	38.194025	-80.719298	Intermittent	RPW	Pipeline ROW	Tier 3	7	79	-	6-346
S-I40	UNT to Hominy Creek	Nicholas	38.187582	-80.723025	Intermittent	RPW	Pipeline ROW	Tier 3	7	82	-	6-347
S-I41	UNT to Hominy Creek	Nicholas	38.179384	-80.729497	Intermittent	NRPW	Pipeline ROW	Tier 2, WWF*	8	78	-	6-348
S-I36	Hominy Creek	Nicholas	38.178889	-80.729790	Perennial	RPW	Pipeline ROW	Tier 3	55	77	-	6-350
S-I31	UNT to Hominy Creek	Nicholas	38.163802	-80.730743	Ephemeral	NRPW	Pipeline ROW	Tier 2	2	73	-	6-358
S-N8a	UNT to Hominy Creek	Nicholas	38.162363	-80.733602	Perennial	RPW	Pipeline ROW	Tier 3	4	187	-	6-358
S-VV1	UNT to Hominy Creek	Nicholas	38.161085	-80.734282	Intermittent	RPW	Temporary Access Road	Tier 2	4	45	-	6-334
S-VV1	UNT to Hominy Creek	Nicholas	38.161064	-80.735022	Intermittent	RPW	Pipeline ROW	Tier 2	4	79	-	6-334
<b>S-VV1 Total</b>	<b>UNT to Hominy Creek</b>									<b>125</b>	-	
S-H90	UNT to Sugar Branch	Nicholas	38.137462	-80.729246	Intermittent	RPW	Temporary Access Road	Tier 2	3	8	-	6-362
S-H88	Sugar Branch	Nicholas	38.136744	-80.730560	Perennial	RPW	Pipeline ROW	Tier 3	40	76	-	6-362
S-H80	UNT to Hominy Creek	Nicholas	38.128044	-80.733815	Intermittent	RPW	Pipeline ROW/Temporary Access Road	Tier 2	2	20	-	6-365
S-H71	UNT to Hominy Creek	Nicholas	38.124315	-80.735783	Perennial	RPW	Pipeline ROW	Tier 3	12	93	-	6-365
S-H67	UNT to Hominy Creek	Nicholas	38.120580	-80.736772	Perennial	RPW	Pipeline ROW	Tier 2	12	85	-	6-666
S-H66	UNT to Hominy Creek	Nicholas	38.120088	-80.737022	Intermittent	RPW	Pipeline ROW	Tier 2	10	10	-	6-666
S-H64	UNT to Hominy Creek	Nicholas	38.116279	-80.735319	Intermittent	RPW	Pipeline ROW	Tier 2	3	87	-	6-367
S-V3	UNT to Hominy Creek	Nicholas	38.115823	-80.730960	Perennial	RPW	Pipeline ROW	Tier 2, Trout Waters*	12	80	-	6-368
S-EF41	UNT to Hominy Creek	Nicholas	38.107549	-80.726284	Intermittent	RPW	Pipeline ROW	Tier 2	2	82	-	6-369
S-J31	UNT to Meadow Creek	Greenbrier	38.041774	-80.745842	Ephemeral	NRPW	Temporary Access Road	Tier 2	2	153	-	6-387
S-J19	UNT to Meadow Creek	Greenbrier	38.028599	-80.743623	Ephemeral	NRPW	Pipeline ROW	Tier 2	2	96	-	6-385







**Table 5.2  
Stream Impacts Table  
Mountain Valley Pipeline Project**

Stream ID	NHD Stream Name <sup>1</sup>	County	Latitude <sup>2</sup>	Longitude <sup>2</sup>	Flow Regime	Water Type <sup>3</sup>	Impact Type	Designation <sup>4,5,6</sup>	Top of Bank Width (ft)	Temporary Linear Feet Impact (ft)	Permanent Linear Feet Impact (ft)	Figure
S-C39	Painter Run	Monroe	37.426686	-80.694499	Perennial	RPW	Pipeline ROW	Tier 3	5	109	-	6-525
S-C41	UNT to Painter Run	Monroe	37.426161	-80.694592	Intermittent	RPW	Pipeline ROW	Tier 2, WWF*	3	59	-	6-525
S-C40	UNT to Painter Run	Monroe	37.425372	-80.693417	Perennial	RPW	Temporary Access Road	Tier 3	3	77	-	6-525

Notes:

- 1 - For identified streams without a NHD name, the identified stream was given the name, "Unidentified Tributary (UNT)", of the first named receiving waterbody.
- 2 - in decimal degrees
- 3 - RPW = Relatively Permanent Waters  
- NRPW = Non-Relatively Permanent Waters  
- TNW = Traditional Navigable Waters
- 4 - WWF - Warm Water Fishery listed in WV 2014 Integrated Report 305(b) Designated Use and Overall Category Designation; Trout waters - Category B-2 Trout Waters; \* - Indicates a tributary to a stream designated as WWF or Trout Water, as noted. As upstream tributaries to designated WWF or Trout Waters, these tributaries are also considered WWF or Trout Waters.; WV Natural Stream - streams identified in WV Natural Streams Preservation Act listed in Nationwide Permits for the State of West Virginia General Conditions; Tier 1 - A waterbody that is listed as impaired on the states 303(d) list is considered a Tier 1 water as it pertains to the specific pollutant listed; Tier 2 - the default assignment for a waterbody not listed as impaired on the states 303(d) list; Tier 3 - outstanding national resource waters, streams were identified using an ArcGIS shapefile provided by WVDEP in June, 2016, M - freshwater mussels observed in the proposed Project crossing area.
- 5 - In stream work in designated warm water streams and their adjacent tributaries during the fish spawning season, April - June and trout waters and their adjacent tributaries during the trout water fish spawning season September 15-March 31st requires a spawning season waiver from the WVDNR, Wildlife Resources Section.
- 6 - In stream work may occur during the respective spawning season in ephemeral waters without a waiver if all reasonable measures are taken to minimize turbidity and sedimentation downstream associated with the proposed project.

**Table 6  
Traditional Navigable Waterways Impacts Table  
Mountain Valley Pipeline Project**

Stream ID	NHD Stream Name <sup>1</sup>	County	Latitude <sup>2</sup>	Longitude <sup>2</sup>	Flow Regime	Water Type	Stream Length in Temporary ROW (ft)	Top of Bank Width (ft)	Temporary Linear Feet Impact (ft)
S-E68	Elk River	Webster	38.615066	-80.506112	Perennial	TNW	93	150	150
S-J29	Gauley River	Nicholas	38.274348	-80.691350	Perennial	TNW	78	300	300
S-I8	Greenbrier River	Summers	37.677504	-80.734060	Perennial	TNW	98	270	407
<b>Total Lengths - (linear feet):</b>							269	720	857

Notes:

- 1 - For identified streams without a NHD name, the identified stream was given the name, "Unidentified Tributary (UNT)", of the first named receiving waterbody
- 2 - in decimal degrees

**Table 7.1  
Desktop Evaluation Wetland Impacts Summary Table  
Mountain Valley Pipeline Project**

County	Cowardin Class <sup>1</sup>	Temporary Impacts (Acres) <sup>2</sup>	Permanent Impacts (Acres) <sup>3</sup>
Wetzel	PEM	0.0000	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Harrison	PEM	0.0012	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Doddridge	PEM	0.0000	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Lewis	PEM	0.5173	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Braxton	PEM	0.0000	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Webster	PEM	0.0000	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Nicholas	PEM	0.0000	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Greenbrier	PEM	0.0000	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.3865
Fayette	PEM	0.0000	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.0000
Summers	PEM	0.1401	0.0000
	PSS	0.0000	0.0000
	PFO	0.0000	0.5270
Monroe	PEM	0.6549	0.0978
	PSS	0.0000	0.0058
	PFO	0.0000	0.6759
Totals	PEM	1.3135	0.0978
	PSS	0.0000	0.0058
	PFO	0.0000	1.5894

Notes:

- 1 - PEM = Palustrine Emergent  
- PSS = Palustrine Scrub-Shrub  
- PFO = Palustrine Forested
- 2 - Temporary impacts to PEM wetlands in the temporary limit-of-disturbance
- 3 - Includes 1) permanent conversion impacts to PSS and PFO impacts in the temporary and permanent limit-of-disturbance, and 2) permanent impacts to PEM within permanent access road limit-of-disturbance

**Table 7.2  
Desktop Evaluation Wetland Impacts Table**

Wetland ID	County	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Cowardin Class <sup>2</sup>	HGM <sup>3</sup>	USACE Water Type <sup>4</sup>	Temporary Impacts (Acres) <sup>5,7</sup>	Permanent Impacts (Acres) <sup>6,7</sup>	Impact Type	USACE District	Figure
TTWV-W-3	Harrison	39.220158	-80.547303	PEM	DEPRESSIONAL	ISOLATE	0.0012	-	Temporary Access Road	Pittsburgh	6-85
TTWV-W-204	Lewis	39.138094	-80.578452	PEM	RIVERINE	RPWWD	0.4947	-	ATWS	Huntington	6-103
TTWV-W-201	Lewis	39.052728	-80.583223	PEM	RIVERINE	RPWWD	0.0226	-	ATWS	Pittsburgh	6-121
TTWV-W-56 PFO	Summers	37.775814	-80.75768	PFO	RIVERINE	RPWWD	-	0.0015	Temporary Access Road	Huntington	6-447
TTWV-W-56 PEM	Summers	37.775722	-80.757056	PEM	RIVERINE	RPWWD	0.1401	-	Temporary Access Road	Huntington	6-447
TTWV-W-55	Summers	37.775376	-80.755362	PFO	RIVERINE	RPWWD	-	0.3435	Temporary Access Road	Huntington	6-447
TTWV-W-54	Summers	37.774952	-80.742788	PFO	RIVERINE	RPWWD	-	0.1820	Temporary Access Road	Huntington	6-447
TTWV-W-MM20	Greenbrier	37.681648	-80.730271	PFO	DEPRESSIONAL	RPWWD	-	0.1407	Pipeline ROW	Huntington	6-467
TTWV-W-MM20	Greenbrier	37.681037	-80.730074	PFO	DEPRESSIONAL	RPWWD	-	0.2458	Temporary Access Road	Huntington	6-467
<b>TTWV-W-MM20 Total</b>								<b>0.3865</b>			
TTWV-W-29	Monroe	37.540583	-80.725577	PEM	SLOPE	RPWWN	0.0280	-	ATWS	Huntington	6-500
TTWV-W-21	Monroe	37.540505	-80.723946	PEM	RIVERINE	RPWWD	0.1613	-	Temporary Access Road	Huntington	6-500
TTWV-W-21	Monroe	37.540366	-80.723439	PEM	RIVERINE	RPWWD	-	0.0342	Permanent Access Road	Huntington	6-500
<b>TTWV-W-21 Total</b>	-	-	-	-	-	-	<b>0.1613</b>	<b>0.0342</b>		-	
TTWV-W-20	Monroe	37.539873	-80.722782	PEM	SLOPE	RPWWD	0.0878	-	Temporary Access Road	Huntington	6-500
TTWV-W-20	Monroe	37.539856	-80.722691	PEM	SLOPE	RPWWD	-	0.0631	Permanent Access Road	Huntington	6-500
<b>TTWV-W-20 Total</b>	-	-	-	-	-	-	<b>0.0878</b>	<b>0.0631</b>		-	
TTWV-W-200	Monroe	37.520155	-80.707392	PEM	RIVERINE	RPWWD	0.0324	-	Temporary Access Road/ATWS	Huntington	6-503
TTWV-W-32	Monroe	37.501271	-80.690426	PFO	RIVERINE	RPWWD	-	0.3927	ipeline ROW/Temporary Access Roa	Huntington	6-508
TTWV-W-34	Monroe	37.492285	-80.682884	PEM	SLOPE	NRPWW	-	0.0006	Permanent Access Road	Huntington	6-511
TTWV-W-34	Monroe	37.492164	-80.682924	PEM	SLOPE	NRPWW	0.0511	-	ipeline ROW/Temporary Access Roa	Huntington	6-511
<b>TTWV-W-34 Total</b>	-	-	-	-	-	-	<b>0.0511</b>	<b>0.0006</b>		-	
TTWV-W-35	Monroe	37.487575	-80.681867	PFO	RIVERINE	RPWWD	-	0.2570	Pipeline ROW	Huntington	6-513
TTWV-W-9	Monroe	37.486843	-80.690214	PFO	RIVERINE	RPWWD	-	0.0142	Temporary Access Road	Huntington	6-512
TTWV-W-9	Monroe	37.48678	-80.690297	PFO	RIVERINE	RPWWD	-	0.0120	Permanent Access Road	Huntington	6-512
<b>TTWV-W-9 Total</b>	-	-	-	-	-	-	-	<b>0.0262</b>		-	
TTWV-W-37	Monroe	37.46571	-80.660611	PEM	RIVERINE	RPWWD	0.0044	-	Temporary Access Road	Huntington	6-517
TTWV-W-36	Monroe	37.465668	-80.662252	PSS	RIVERINE	RPWWD	-	0.0058	Temporary Access Road	Huntington	6-517
TTWV-W-7	Monroe	37.458675	-80.664933	PEM	SLOPE	RPWWN	0.1518	-	Pipelein ROW	Huntington	6-518
TTWV-W-203	Monroe	37.418745	-80.694581	PEM	RIVERINE	RPWWD	0.1382	-	Pipeline ROW/ATWS	Huntington	6-526

**Notes:**

- 1 - in decimal degrees
- 2 - PEM = Palustrine Emergent  
- PSS = Palustrine Scrub-Shrub  
- PFO = Palustrine Forested
- 3 - HGM = Hydrogeomorphic
- 4 - RPWWD = Wetlands directly abutting Relatively Permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs)  
- RPWWN = Wetlands adjacent but not directly abutting RPWs that flow directly or indirectly into TNWs  
- NRPWW = Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs  
- Isolate = Isolated (interstate or intrastate) waters, including isolated wetlands
- 5 - Temporary impacts to PEM wetlands in the temporary limit-of-disturbance
- 6 - Includes 1) permanent conversion impacts to PSS and PFO impacts in the temporary and permanent limit-of-disturbance, and 2) permanent impacts to PEM within permanent access road limit-of-disturbance
- 7 - Anticipated wetland impacts identified in the desktop survey that are greater than 0.5 acres will be field verified when survey permission is granted. It is anticipated that these impacts will significantly decrease after field verification. MVP will ensure that avoidance and minimization measures will be utilized so that any impacts to field-verified features complies with NWP 12 conditions

**Table 8.1  
Desktop Evaluation Stream Impacts Summary Table  
Mountain Valley Pipeline Project**

<b>County</b>	<b>Flow Regime</b>	<b>Temporary Linear Feet Impact (ft)</b>	<b>Permanent Linear Feet Impact (ft)</b>
Wetzel	Ephemeral	0	0
	Intermittent	0	0
	Perennial	0	0
Harrison	Ephemeral	93	0
	Intermittent	112	0
	Perennial	0	0
Doddridge	Ephemeral	0	0
	Intermittent	0	0
	Perennial	0	0
Lewis	Ephemeral	110	0
	Intermittent	299	0
	Perennial	175	0
Braxton	Ephemeral	0	0
	Intermittent	0	0
	Perennial	0	0
Webster	Ephemeral	0	0
	Intermittent	51	0
	Perennial	0	0
Nicholas	Ephemeral	0	0
	Intermittent	0	0
	Perennial	0	0
Greenbrier	Ephemeral	0	0
	Intermittent	0	0
	Perennial	0	0
Fayette	Ephemeral	0	0
	Intermittent	0	0
	Perennial	0	0
Summers	Ephemeral	145	155
	Intermittent	203	32
	Perennial	695	0
Monroe	Ephemeral	145	25
	Intermittent	960	53
	Perennial	670	0
Totals	Ephemeral	493	180
	Intermittent	1626	85
	Perennial	1541	0



**Table 8.2  
Desktop Evaluation Stream Impacts Table  
Mountain Valley Pipeline Project**

Stream ID	NHD Stream Name <sup>1</sup>	County	Latitude <sup>2</sup>	Longitude <sup>2</sup>	Flow Regime	Water Type <sup>3</sup>	Designation <sup>4</sup>	Temporary Linear Feet Impact (ft)	Permanent Linear Feet Impact (ft)	Impact Type	USACE District	Figure
TTWV-S-125	UNT to Hans Creek	Monroe	37.465786	-80.661202	Intermittent	RPW	Tier 2	199	-	Temporary Access Road	Huntington	6-517
TTWV-S-126	UNT to Hans Creek	Monroe	37.465202	-80.663681	Ephemeral	NRPW	Tier 2	43	-	Temporary Access Road	Huntington	6-517
TTWV-S-127	UNT to Hans Creek	Monroe	37.464463	-80.665418	Ephemeral	NRPW	Tier 2	47	-	Temporary Access Road	Huntington	6-517
TTWV-S-122	UNT to Hans Creek	Monroe	37.464026	-80.666227	Ephemeral	NRPW	Tier 2	43	-	Temporary Access Road	Huntington	6-517
TTWV-S-123	UNT to Hans Creek	Monroe	37.465757	-80.660709	Perennial	RPW	Tier 3	0	-	Temporary Access Road	Huntington	6-517
TTWV-S-123	UNT to Hans Creek	Monroe	37.464474	-80.665269	Perennial	RPW	Tier 3	169	-	Temporary Access Road	Huntington	6-517
TTWV-S-123	UNT to Hans Creek	Monroe	37.463796	-80.667350	Perennial	RPW	Tier 3	41	-	Temporary Access Road	Huntington	6-517
<b>TTWV-S-123 Total</b>	<b>UNT to Hans Creek</b>							<b>131</b>				
TTWV-S-121	Blue Lick Creek	Monroe	37.462815	-80.669597	Perennial	RPW	Tier 3	75	-	Pipeline ROW	Huntington	6-516
TTWV-S-120	UNT to Blue Lick Creek	Monroe	37.462794	-80.670256	Intermittent	RPW	Tier 2	76	-	Pipeline ROW	Huntington	6-516
TTWV-S-131	UNT to Painter Run	Monroe	37.426069	-80.694762	Intermittent	RPW	Tier 2	81	-	Pipeline ROW	Huntington	6-525
TTWV-S-200	UNT to Painter Run	Monroe	37.418765	-80.694621	Intermittent	RPW	Tier 3	271	-	Pipeline ROW	Huntington	6-526

- Notes:**
- 1 - For identified streams without a NHD name, the identified stream was given the name, "Unidentified Tributary (UNT)", of the first named receiving waterbody
  - 2 - in decimal degrees
  - 3 - RPW = Relatively Permanent Waters  
- NRPW = Non-Relatively Permanent Waters  
- TNW = Traditional Navigable Waters
  - 4 - WWF - Warm Water Fishery listed in WV 2014 Integrated Report 305(b) Designated Use and Overall Category Designation; Trout waters - Category B-2 Trout Waters; \* - Indicates a tributary to a stream designated as WWF or Trout Water, as noted. As upstream tributaries to designated WWF or Trout Waters, these tributaries are also considered WWF or Trout Waters.; Tier 1 - A waterbody that is listed as impaired on the states 303(d) list is considered a Tier 1 water as it pertains to the specific pollutant listed; Tier 2 - the default assignment for a waterbody not listed as impaired on the states 303(d) list; Tier 3 - outstanding national resource waters, streams were identified using an ArcGIS shapefile provided by WVDEP in June, 2016, M - freshwater mussels observed in the proposed Project crossing area.

**Table 9.1 Wetland Mitigation - Mitigation Bank  
Mountain Valley Pipeline Project**

<b>Feature</b>	<b>HUC 8 Name</b>	<b>HUC 8 #</b>	<b>Cowardin Class<sup>1</sup></b>	<b>Impact (acres)</b>	<b>SWVM - Mitigation Bank<sup>2</sup></b>
W-IJ31	Middle Ohio	05030201	PEM	0.0082	0.0082
W-A27-PFO	Middle Ohio	05030201	PFO	0.0547	0.0547
W-WX4	Middle Ohio	05030201	PEM	0.0055	0.0055
W-A39	West Fork	05020002	PEM	0.0242	0.0242
W-ST12-PSS	West Fork	05020002	PSS	0.1444	0.1444
W-UU1	West Fork	05020002	PFO	0.0045	0.0045
W-UU3	West Fork	05020002	PFO	0.0065	0.0065
W-K52	Middle Ohio	05030201	PEM	0.0115	0.0115
W-A23	Middle Ohio	05030201	PEM	0.0579	0.0579
W-K33-PSS	Little Kanawha	05030203	PSS	0.0024	0.0024
W-I22-PEM	Little Kanawha	05030203	PEM	0.0059	0.0059
W-K28	Little Kanawha	05030203	PEM	0.0091	0.0091
W-L41	Little Kanawha	05030203	PEM	0.0111	0.0111
W-H98	Little Kanawha	05030203	PEM	0.0331	0.0331
W-UV17	Little Kanawha	05030203	PFO	0.0055	0.0055
W-VV11	Little Kanawha	05030203	PEM	0.0236	0.0236
W-VV12	Little Kanawha	05030203	PEM	0.0207	0.0207
W-VV4-PFO	Little Kanawha	05030203	PFO	0.0954	0.0954
W-VV3-PFO	Little Kanawha	05030203	PFO	0.016	0.016
W-IJ26	Little Kanawha	05030203	PEM	0.0039	0.0039
W-EF9	Little Kanawha	05030203	PFO	0.0201	0.0201
W-K24	Little Kanawha	05030203	PSS	0.0074	0.0074
W-A20-PFO	Elk	05050007	PFO	0.0725	0.0725
W-KK2	Elk	05050007	PEM	0.0085	0.0085
W-H69	Elk	05050007	PEM	0.006	0.006
W-H70	Elk	05050007	PEM	0.0057	0.0057
W-H71	Elk	05050007	PEM	0.0205	0.0205
W-H72	Elk	05050007	PEM	0.0064	0.0064
W-H73	Elk	05050007	PEM	0.0061	0.0061
W-H74	Elk	05050007	PEM	0.0115	0.0115
W-H67	Elk	05050007	PFO	0.0908	0.0908
W-H66	Elk	05050008	PFO	0.2496	0.2496
W-H64-PSS	Elk	05050007	PSS	0.0422	0.0422
W-O13	Elk	05050007	PEM	0.0405	0.0405
W-B35	Elk	05050007	PSS	0.0108	0.0108
W-E28	Elk	05050007	PSS	0.0084	0.0084
W-F40	Elk	05050007	PSS	0.0188	0.0188
W-E18-PSS	Gauley	05050005	PSS	0.0538	0.0538
W-E13	Gauley	05050005	PFO	0.0107	0.0107
W-K23	Gauley	05050005	PEM	0.0195	0.0195
W-FF6-PSS	Gauley	05050005	PSS	0.0987	0.0987
W-A15	Gauley	05050005	PSS	0.0891	0.0891
W-A14	Gauley	05050005	PFO	0.0972	0.0972
W-I7	Gauley	05050005	PFO	0.0391	0.0391



**Table 9.1 Wetland Mitigation - Mitigation Bank  
Mountain Valley Pipeline Project**

<b>Feature</b>	<b>HUC 8 Name</b>	<b>HUC 8 #</b>	<b>Cowardin Class<sup>1</sup></b>	<b>Impact (acres)</b>	<b>SWVM - Mitigation Bank<sup>2</sup></b>
W-J8	Gauley	05050005	PFO	0.0533	0.0533
W-J7	Gauley	05050005	PFO	0.0693	0.0693
W-H45-PFO	Gauley	05050005	PFO	0.0211	0.0211
W-V4	Gauley	05050005	PSS	0.0031	0.0031
W-M22	Gauley	05050005	PSS	0.0039	0.0039
W-J6	Gauley	05050005	PFO	0.0744	0.0744
W-J5	Gauley	05050005	PSS	0.0052	0.0052
W-QR2	Gauley	05050005	PEM	0.001	0.001
W-L7	Gauley	05050005	PEM	0.0015	0.0015
W-L6	Gauley	05050005	PEM	0.0188	0.0188
W-EF28	Gauley	05050005	PFO	0.0095	0.0095
W-IJ47-PEM	Gauley	05050005	PEM	0.0633	0.0633
W-W11	Gauley	05050006	PEM	0.0044	0.0044
W-W10	Gauley	05050005	PEM	0.0439	0.0439
W-W9	Gauley	05050007	PEM	0.0087	0.0087
W-EE6	Gauley	05050005	PEM	0.0026	0.0026
W-EE7	Gauley	05050005	PEM	0.0045	0.0045
W-UV4	Gauley	05050005	PSS	0.0885	0.0885
W-I10	Lower New	05050005	PEM	0.055	0.055
W-A13	Upper New	05050002	PEM	0.0228	0.0228
			<b>TOTALS</b>	<b>2.1324</b>	<b>2.1324</b>

Notes:

- 1 - Field classification based on Cowardin et al. 1979. PEM - palustrine emergent wetland. PSS - palustrine scrub-shrub wetland. PFO - palustrine forested wetland
- 2 - SWVM score if impact is mitigated at an approved mitigation bank

**Table 9.2 Wetland Mitigation - In-Lieu-Fee (ILF)  
Mountain Valley Pipeline Project**

Feature	HUC 8 Name	HUC 8 #	Cowardin Class <sup>1</sup>	Impact (acres)	SWVM - ILF <sup>2</sup>
W-IJ31	Middle Ohio	05030201	PEM	0.0082	0.009184
W-A27-PFO	Middle Ohio	05030201	PFO	0.0547	0.061264
W-WX4	Middle Ohio	05030201	PEM	0.0055	0.00616
W-A39	West Fork	05020002	PEM	0.0242	0.027104
W-ST12-PSS	West Fork	05020002	PSS	0.1444	0.161728
W-UU1	West Fork	05020002	PFO	0.0045	0.00504
W-UU3	West Fork	05020002	PFO	0.0065	0.00728
W-K52	Middle Ohio	05030201	PEM	0.0115	0.01288
W-A23	Middle Ohio	05030201	PEM	0.0579	0.064848
W-K33-PSS	Little Kanawha	05030203	PSS	0.0024	0.002688
W-I22-PEM	Little Kanawha	05030203	PEM	0.0059	0.006608
W-K28	Little Kanawha	05030203	PEM	0.0091	0.010192
W-L41	Little Kanawha	05030203	PEM	0.0111	0.012432
W-H98	Little Kanawha	05030203	PEM	0.0331	0.037072
W-UV17	Little Kanawha	05030203	PFO	0.0055	0.00616
W-VV11	Little Kanawha	05030203	PEM	0.0236	0.026432
W-VV12	Little Kanawha	05030203	PEM	0.0207	0.023184
W-VV4-PFO	Little Kanawha	05030203	PFO	0.0954	0.106848
W-VV3-PFO	Little Kanawha	05030203	PFO	0.016	0.01792
W-IJ26	Little Kanawha	05030203	PEM	0.0039	0.004368
W-EF9	Little Kanawha	05030203	PFO	0.0201	0.022512
W-K24	Little Kanawha	05030203	PSS	0.0074	0.008288
W-A20-PFO	Elk	05050007	PFO	0.0725	0.0812
W-KK2	Elk	05050007	PEM	0.0085	0.00952
W-H69	Elk	05050007	PEM	0.006	0.00672
W-H70	Elk	05050007	PEM	0.0057	0.006384
W-H71	Elk	05050007	PEM	0.0205	0.02296
W-H72	Elk	05050007	PEM	0.0064	0.007168
W-H73	Elk	05050007	PEM	0.0061	0.006832
W-H74	Elk	05050007	PEM	0.0115	0.01288
W-H67	Elk	05050007	PFO	0.0908	0.101696
W-H66	Elk	05050008	PFO	0.2496	0.279552
W-H64-PSS	Elk	05050007	PSS	0.0422	0.047264
W-O13	Elk	05050007	PEM	0.0405	0.04536
W-B35	Elk	05050007	PSS	0.0108	0.012096
W-E28	Elk	05050007	PSS	0.0084	0.009408
W-F40	Elk	05050007	PSS	0.0188	0.021056
W-E18-PSS	Gauley	05050005	PSS	0.0538	0.060256
W-E13	Gauley	05050005	PFO	0.0107	0.011984
W-K23	Gauley	05050005	PEM	0.0195	0.02184
W-FF6-PSS	Gauley	05050005	PSS	0.0987	0.110544
W-A15	Gauley	05050005	PSS	0.0891	0.099792
W-A14	Gauley	05050005	PFO	0.0972	0.108864
W-I7	Gauley	05050005	PFO	0.0391	0.043792

**Table 9.2 Wetland Mitigation - In-Lieu-Fee (ILF)  
Mountain Valley Pipeline Project**

<b>Feature</b>	<b>HUC 8 Name</b>	<b>HUC 8 #</b>	<b>Cowardin Class<sup>1</sup></b>	<b>Impact (acres)</b>	<b>SWVM - ILF<sup>2</sup></b>
W-J8	Gauley	05050005	PFO	0.0533	0.059696
W-J7	Gauley	05050005	PFO	0.0693	0.077616
W-H45-PFO	Gauley	05050005	PFO	0.0211	0.023632
W-V4	Gauley	05050005	PSS	0.0031	0.003472
W-M22	Gauley	05050005	PSS	0.0039	0.004368
W-J6	Gauley	05050005	PFO	0.0744	0.083328
W-J5	Gauley	05050005	PSS	0.0052	0.005824
W-QR2	Gauley	05050005	PEM	0.001	0.00112
W-L7	Gauley	05050005	PEM	0.0015	0.00168
W-L6	Gauley	05050005	PEM	0.0188	0.021056
W-EF28	Gauley	05050005	PFO	0.0095	0.01064
W-IJ47-PEM	Gauley	05050005	PEM	0.0633	0.070896
W-W11	Gauley	05050006	PEM	0.0044	0.004928
W-W10	Gauley	05050005	PEM	0.0439	0.049168
W-W9	Gauley	05050007	PEM	0.0087	0.009744
W-EE6	Gauley	05050005	PEM	0.0026	0.002912
W-EE7	Gauley	05050005	PEM	0.0045	0.00504
W-UV4	Gauley	05050005	PSS	0.0885	0.09912
W-I10	Lower New	05050005	PEM	0.055	0.0616
W-A13	Upper New	05050002	PEM	0.0228	0.025536
			<b>TOTALS</b>	<b>2.1324</b>	<b>2.3887</b>

Notes:

- 1 - Field classification based on Cowardin et al. 1979. PEM - palustrine emergent wetland. PSS - palustrine scrub-shrub wetland. PFO - palustrine forested wetland
- 2 - SWVM score if impact is mitigated using the In-Lieu-Fee (ILF) program

**Table 9.3 Stream Mitigation - Mitigation Bank  
Mountain Valley Pipeline Project**

<b>Feature</b>	<b>HUC 8 Name</b>	<b>HUC 8 #</b>	<b>Flow Regime</b>	<b>Impact (LF)</b>	<b>SWVM - Mitigation Bank<sup>1</sup></b>
S-ST13	Middle Ohio	05030201	Intermittent	152	76.19
S-ST14	Middle Ohio	05030201	Ephemeral	102	52.8275
S-ST10	Middle Ohio	05030201	Intermittent	158	69.65166667
S-ST18	Middle Ohio	05030201	Intermittent	10	6.879166667
S-A116	Middle Ohio	05030201	Intermittent	26	12.69666667
S-A117	Middle Ohio	05030201	Intermittent	27	19.0395
S-A120	Middle Ohio	05030201	Intermittent	26	13.45066667
S-QR34	Middle Ohio	05030201	Ephemeral	125	64.89583333
S-J56	Middle Ohio	05030201	Perennial	41	32.185
S-J59	Middle Ohio	05030201	Intermittent	7	4.461333333
S-B79	West Fork	05020002	Ephemeral	60	23.075
S-B78	West Fork	05020002	Ephemeral	89	32.74458333
S-J54	West Fork	05020002	Perennial	26	17.238
S-F55/F55-Braid	West Fork	05020002	Intermittent	32	18.72
S-OP12	West Fork	05020002	Ephemeral	54	25.74
S-A110/K62	Middle Ohio	05030201	Intermittent	25	9.90625
S-VV22	Little Kanawha	05030203	Ephemeral	26	19.29416667
S-VV21	Little Kanawha	05030203	Ephemeral	10	7.054166667
S-OP4	Little Kanawha	05030203	Intermittent	30	15.675
S-IJ28	Little Kanawha	05030203	Perennial	28	18.83
S-IJ31/IJ31-Braid	Little Kanawha	05030203	Intermittent	102	56.185
S-IJ32	Little Kanawha	05030203	Ephemeral	26	17.42
S-IJ27	Little Kanawha	05030203	Perennial	447	335.25
S-AA15	Little Kanawha	05030203	Intermittent	94	51.465
S-H107	Elk	05050007	Intermittent	30	11.65
S-J26	Gauley	05050005	Perennial	30	22.77
S-L13	Gauley	05050005	Intermittent	24	14.192
S-I23a	Gauley	05050005	Intermittent	33	17.7375
S-IJ54	Gauley	05050005	Ephemeral	31	16.895
S-W22	Gauley	05050005	Ephemeral	9	8.375
S-A104	Gauley	05050005	Ephemeral	215	125.8645833
S-QR4	Gauley	05050005	Intermittent	147	97.902
S-I12	Lower New	05050004	Intermittent	38	21.67266667
S-I10	Lower New	05050004	Intermittent	26	17.875
S-K10	Greenbrier	05050003	Intermittent	31	11.40541667
S-Q19	Greenbrier	05050003	Perennial	31	19.7625
S-A61	Upper New	05050002	Ephemeral	26	24.19444444
<b>TOTALS</b>				<b>2392</b>	<b>1411.1706</b>

Notes:

1 - SWVM score if impact is mitigated at an approved mitigation bank

**Table 9.4 Stream Mitigation - In-Lieu-Fee (ILF)  
Mountain Valley Pipeline Project**

<b>Feature</b>	<b>HUC 8 Name</b>	<b>HUC 8 #</b>	<b>Flow Regime</b>	<b>Impact (LF)</b>	<b>SWVM - ILF<sup>1</sup></b>
S-ST13	Middle Ohio	05030201	Intermittent	152	85.3328
S-ST14	Middle Ohio	05030201	Ephemeral	102	59.1668
S-ST10	Middle Ohio	05030201	Intermittent	158	78.00986667
S-ST18	Middle Ohio	05030201	Intermittent	10	7.704666667
S-A116	Middle Ohio	05030201	Intermittent	26	14.22026667
S-A117	Middle Ohio	05030201	Intermittent	27	21.32424
S-A120	Middle Ohio	05030201	Intermittent	26	15.06474667
S-QR34	Middle Ohio	05030201	Ephemeral	125	72.68333333
S-J56	Middle Ohio	05030201	Perennial	41	36.0472
S-J59	Middle Ohio	05030201	Intermittent	7	4.996693333
S-B79	West Fork	05020002	Ephemeral	60	25.844
S-B78	West Fork	05020002	Ephemeral	89	36.67393333
S-J54	West Fork	05020002	Perennial	26	19.30656000
S-F55/F55-Braid	West Fork	05020002	Intermittent	32	20.9664
S-OP12	West Fork	05020002	Ephemeral	54	28.8288
S-A110/K62	Middle Ohio	05030201	Intermittent	25	11.095
S-VV22	Little Kanawha	05030203	Ephemeral	26	21.60946667
S-VV21	Little Kanawha	05030203	Ephemeral	10	7.900666667
S-OP4	Little Kanawha	05030203	Intermittent	30	17.556
S-IJ28	Little Kanawha	05030203	Perennial	28	21.0896
S-IJ31/IJ31-Braid	Little Kanawha	05030203	Intermittent	102	62.9272
S-IJ32	Little Kanawha	05030203	Ephemeral	26	19.5104
S-IJ27	Little Kanawha	05030203	Perennial	447	375.48
S-AA15	Little Kanawha	05030203	Intermittent	94	57.6408
S-H107	Elk	05050007	Intermittent	30	13.048
S-J26	Gauley	05050005	Perennial	30	25.5024
S-L13	Gauley	05050005	Intermittent	24	15.89504
S-I23a	Gauley	05050005	Intermittent	33	19.866
S-IJ54	Gauley	05050005	Ephemeral	31	18.9224
S-W22	Gauley	05050005	Ephemeral	9	9.38
S-A104	Gauley	05050005	Ephemeral	215	140.9683333
S-QR4	Gauley	05050005	Intermittent	147	109.65024
S-I12	Lower New	05050004	Intermittent	38	24.27338667
S-I10	Lower New	05050004	Intermittent	26	20.02
S-K10	Greenbrier	05050003	Intermittent	31	12.77406667
S-Q19	Greenbrier	05050003	Perennial	31	22.134
S-A61	Upper New	05050002	Ephemeral	26	27.09777778
<b>TOTALS</b>				<b>2392</b>	<b>1580.5111</b>

Notes:

1

- SWVM score if impact is mitigated using the In-Lieu-Fee (ILF) program

**Table 9.5  
Potential Wetland Mitigation  
Mountain Valley Pipeline Project**

Feature	HUC 8 Name	HUC 8 #	Cowardin Class <sup>1</sup>	Impact (acres)	SWVM - Mitigation Bank <sup>2</sup>	SWVM - ILF <sup>3</sup>	Proposed Mitigation Type <sup>4</sup>	Projected Mitigation Requirement
W-IJ31	Middle Ohio	05030201	PEM	0.0082	0.0082	0.009184	Hayes Run	0.0082
W-A27-PFO	Middle Ohio	05030201	PFO	0.0547	0.0547	0.061264	Hayes Run	0.0547
W-WX4	Middle Ohio	05030201	PEM	0.0055	0.0055	0.00616	Hayes Run	0.0055
W-A39	West Fork	05020002	PEM	0.0242	0.0242	0.027104	Beverly Site #1	0.0242
W-ST12-PSS	West Fork	05020002	PSS	0.1444	0.1444	0.161728	Beverly Site #1	0.1444
W-UU1	West Fork	05020002	PFO	0.0045	0.0045	0.00504	Beverly Site #1	0.0045
W-UU3	West Fork	05020002	PFO	0.0065	0.0065	0.00728	Beverly Site #1	0.0065
W-K52	Middle Ohio	05030201	PEM	0.0115	0.0115	0.01288	Hayes Run	0.0115
W-A23	Middle Ohio	05030201	PEM	0.0579	0.0579	0.064848	Hayes Run	0.0579
W-K33-PSS	Little Kanawha	05030203	PSS	0.0024	0.0024	0.002688	Beverly Site #1	0.0024
W-I22-PEM	Little Kanawha	05030203	PEM	0.0059	0.0059	0.006608	Beverly Site #1	0.0059
W-K28	Little Kanawha	05030203	PEM	0.0091	0.0091	0.010192	Beverly Site #1	0.0091
W-L41	Little Kanawha	05030203	PEM	0.0111	0.0111	0.012432	Beverly Site #1	0.0111
W-H98	Little Kanawha	05030203	PEM	0.0331	0.0331	0.037072	Beverly Site #1	0.0331
W-UV17	Little Kanawha	05030203	PFO	0.0055	0.0055	0.00616	Beverly Site #1	0.0055
W-VV11	Little Kanawha	05030203	PEM	0.0236	0.0236	0.026432	Beverly Site #1	0.0236
W-VV12	Little Kanawha	05030203	PEM	0.0207	0.0207	0.023184	Beverly Site #1	0.0207
W-VV4-PFO	Little Kanawha	05030203	PFO	0.0954	0.0954	0.106848	Beverly Site #1	0.0954
W-VV3-PFO	Little Kanawha	05030203	PFO	0.0160	0.0160	0.01792	Beverly Site #1	0.0160
W-IJ26	Little Kanawha	05030203	PEM	0.0039	0.0039	0.004368	Beverly Site #1	0.0039
W-EF9	Little Kanawha	05030203	PFO	0.0201	0.0201	0.022512	Beverly Site #1	0.0201
W-K24	Little Kanawha	05030203	PSS	0.0074	0.0074	0.008288	Beverly Site #1	0.0074
W-A20-PFO	Elk	05050007	PFO	0.0725	0.0725	0.0812	Beverly Site #1	0.0725
W-KK2	Elk	05050007	PEM	0.0085	0.0085	0.00952	Beverly Site #1	0.0085
W-H69	Elk	05050007	PEM	0.0060	0.0060	0.00672	Beverly Site #1	0.0060
W-H70	Elk	05050007	PEM	0.0057	0.0057	0.006384	Beverly Site #1	0.0057
W-H71	Elk	05050007	PEM	0.0205	0.0205	0.02296	Beverly Site #1	0.0205
W-H72	Elk	05050007	PEM	0.0064	0.0064	0.007168	Beverly Site #1	0.0064
W-H73	Elk	05050007	PEM	0.0061	0.0061	0.006832	Beverly Site #1	0.0061
W-H74	Elk	05050007	PEM	0.0115	0.0115	0.01288	Beverly Site #1	0.0115
W-H67	Elk	05050007	PFO	0.0908	0.0908	0.101696	Beverly Site #1	0.0908
W-H66	Elk	05050008	PFO	0.2496	0.2496	0.279552	Beverly Site #1	0.2496
W-H64-PSS	Elk	05050007	PSS	0.0422	0.0422	0.047264	Beverly Site #1	0.0422
W-O13	Elk	05050007	PEM	0.0405	0.0405	0.04536	Beverly Site #1	0.0405
W-B35	Elk	05050007	PSS	0.0108	0.0108	0.012096	Beverly Site #1	0.0108
W-E28	Elk	05050007	PSS	0.0084	0.0084	0.009408	Beverly Site #1	0.0084
W-F40	Elk	05050007	PSS	0.0188	0.0188	0.021056	Beverly Site #1	0.0188
W-E18-PSS	Gauley	05050005	PSS	0.0538	0.0538	0.060256	ILF	0.060256
W-E13	Gauley	05050005	PFO	0.0107	0.0107	0.011984	ILF	0.011984
W-K23	Gauley	05050005	PEM	0.0195	0.0195	0.02184	ILF	0.02184
W-FF6-PSS	Gauley	05050005	PSS	0.0987	0.0987	0.110544	ILF	0.110544
W-A15	Gauley	05050005	PSS	0.0891	0.0891	0.099792	ILF	0.099792
W-A14	Gauley	05050005	PFO	0.0972	0.0972	0.108864	ILF	0.108864
W-I7	Gauley	05050005	PFO	0.0391	0.0391	0.043792	ILF	0.043792
W-J8	Gauley	05050005	PFO	0.0533	0.0533	0.059696	ILF	0.059696
W-J7	Gauley	05050005	PFO	0.0693	0.0693	0.077616	ILF	0.077616
W-H45-PFO	Gauley	05050005	PFO	0.0211	0.0211	0.023632	ILF	0.023632
W-V4	Gauley	05050005	PSS	0.0031	0.0031	0.003472	ILF	0.003472

**Table 9.5  
Potential Wetland Mitigation  
Mountain Valley Pipeline Project**

Feature	HUC 8 Name	HUC 8 #	Cowardin Class <sup>1</sup>	Impact (acres)	SWVM - Mitigation Bank <sup>2</sup>	SWVM - ILF <sup>3</sup>	Proposed Mitigation Type <sup>4</sup>	Projected Mitigation Requirement
W-M22	Gauley	05050005	PSS	0.0039	0.0039	0.004368	ILF	0.004368
W-J6	Gauley	05050005	PFO	0.0744	0.0744	0.083328	ILF	0.083328
W-J5	Gauley	05050005	PSS	0.0052	0.0052	0.005824	ILF	0.005824
W-QR2	Gauley	05050005	PEM	0.0010	0.0010	0.00112	ILF	0.00112
W-L7	Gauley	05050005	PEM	0.0015	0.0015	0.00168	ILF	0.00168
W-L6	Gauley	05050005	PEM	0.0188	0.0188	0.021056	ILF	0.021056
W-EF28	Gauley	05050005	PFO	0.0095	0.0095	0.01064	ILF	0.01064
W-IJ47-PEM	Gauley	05050005	PEM	0.0633	0.0633	0.070896	ILF	0.070896
W-W11	Gauley	05050006	PEM	0.0044	0.0044	0.004928	ILF	0.004928
W-W10	Gauley	05050005	PEM	0.0439	0.0439	0.049168	ILF	0.049168
W-W9	Gauley	05050007	PEM	0.0087	0.0087	0.009744	ILF	0.009744
W-EE6	Gauley	5050005	PEM	0.0026	0.0026	0.002912	ILF	0.002912
W-EE7	Gauley	5050005	PEM	0.0045	0.0045	0.00504	ILF	0.00504
W-UV4	Gauley	05050005	PSS	0.0885	0.0885	0.09912	ILF	0.09912
W-I10	Lower New	05050005	PEM	0.0550	0.0550	0.0616	Spanishburg	0.0550
W-A13	Upper New	05050002	PEM	0.0228	0.0228	0.025536	Spanishburg	0.0228
<b>TOTAL</b>				<b>2.1324</b>	<b>2.1324</b>	<b>2.3887</b>	<b>-</b>	<b>2.2389</b>

**Notes:**

- 1 - Field classification based on Cowardin et al. 1979. PEM - palustrine emergent wetland. PSS - palustrine scrub-shrub wetland. PFO - palustrine forested wetland
- 2 - SWVM score if impact is mitigated at an approved mitigation bank
- 3 - SWVM score if impact is mitigated using the In-Lieu-Fee (ILF) program
- 4 - Proposed mitigation type based on the location of the impact and availability of mitigation credits in the impact area.
  - Beverly Site #1 - Beverly Mitigation Bank Site #1
  - Hayes Run - Hayes Run Wetland and Stream Mitigation Bank.
  - ILF - In-Lieu-Fee Program
  - Spanishburg - Spanishburg Wetland and Stream Mitigation Bank

**Table 9.6  
Potential Stream Mitigation  
Mountain Valley Pipeline Project**

Feature	HUC 8 Name	HUC 8 #	Flow Regime	Impact (LF)	SWVM - Mitigation Bank <sup>1</sup>	SWVM - ILF <sup>2</sup>	Proposed Mitigation Type <sup>3</sup>	Projected Mitigation Requirement
S-ST13	Middle Ohio	05030201	Intermittent	152	76.19	85.3328	Hayes Run	76.19
S-ST14	Middle Ohio	05030201	Ephemeral	102	52.8275	59.1668	Hayes Run	52.8275
S-ST10	Middle Ohio	05030201	Intermittent	158	69.65166667	78.00986667	Hayes Run	69.65166667
S-ST18	Middle Ohio	05030201	Intermittent	10	6.879166667	7.704666667	Hayes Run	6.879166667
S-A116	Middle Ohio	05030201	Intermittent	26	12.69666667	14.22026667	Hayes Run	12.69666667
S-A117	Middle Ohio	05030201	Intermittent	27	19.0395	21.32424	Hayes Run	19.0395
S-A120	Middle Ohio	05030201	Intermittent	26	13.45066667	15.06474667	Hayes Run	13.45066667
S-QR34	Middle Ohio	05030201	Ephemeral	125	64.89583333	72.68333333	Kincheloe	64.89583333
S-J56	Middle Ohio	05030201	Perennial	41	32.185	36.0472	Kincheloe	32.185
S-J59	Middle Ohio	05030201	Intermittent	7	4.461333333	4.996693333	Hayes Run	4.461333333
S-B79	West Fork	05020002	Ephemeral	60	23.075	25.844	Beverly Site #1	23.075
S-B78	West Fork	05020002	Ephemeral	89	32.74458333	36.67393333	Beverly Site #1	32.74458333
S-J54	West Fork	05020002	Perennial	26	17.238	19.30656	Beverly Site #1	17.238
S-F55/F55-Braid	West Fork	05020002	Intermittent	32	18.72	20.9664	Beverly Site #1	18.72
S-OP12	West Fork	05020002	Ephemeral	54	25.74	28.8288	Beverly Site #1	25.74
S-A110/K62	Middle Ohio	05030201	Intermittent	25	9.90625	11.095	Hayes Run	9.90625
S-VV22	Little Kanawha	05030203	Ephemeral	26	19.29416667	21.60946667	Hayes Run	19.29416667
S-VV21	Little Kanawha	05030203	Ephemeral	10	7.054166667	7.900666667	Hayes Run	7.054166667
S-OP4	Little Kanawha	05030203	Intermittent	30	15.675	17.556	Hayes Run	15.675
S-IJ28	Little Kanawha	05030203	Perennial	28	18.83	21.0896	Hayes Run	18.83
S-IJ31/IJ31-Braid	Little Kanawha	05030203	Intermittent	102	56.185	62.9272	Hayes Run	56.185
S-IJ32	Little Kanawha	05030203	Ephemeral	26	17.42	19.5104	Hayes Run	17.42
S-IJ27	Little Kanawha	05030203	Perennial	447	335.25	375.48	Hayes Run	335.25
S-AA15	Little Kanawha	05030203	Intermittent	94	51.465	57.6408	Hayes Run	51.465
S-H107	Elk	05050007	Intermittent	30	11.65	13.048	Beverly Site #1	11.65
S-J26	Gauley	05050005	Perennial	30	22.77	25.5024	ILF	25.5024
S-L13	Gauley	05050005	Intermittent	24	14.192	15.89504	ILF	15.89504
S-I23a	Gauley	05050005	Intermittent	33	17.7375	19.866	ILF	19.866
S-IJ54	Gauley	05050005	Ephemeral	31	16.895	18.9224	ILF	18.9224
S-W22	Gauley	05050005	Ephemeral	9	8.375	9.38	ILF	9.38
S-A104	Gauley	05050005	Ephemeral	215	125.8645833	140.9683333	ILF	140.9683333
S-QR4	Gauley	05050005	Intermittent	147	97.902	109.65024	ILF	109.65024
S-I12	Lower New	05050004	Intermittent	38	21.67266667	24.27338667	Lower Dempsey	21.67266667
S-I10	Lower New	05050004	Intermittent	26	17.875	20.02	Lower Dempsey	17.875
S-K10	Greenbrier	05050003	Intermittent	31	11.40541667	12.77406667	ILF	12.77406667
S-Q19	Greenbrier	05050003	Perennial	31	19.7625	22.134	ILF	22.134
S-A61	Upper New	05050002	Ephemeral	26	24.19444444	27.09777778	ILF	27.09777778
<b>TOTAL</b>				<b>2392</b>	<b>1,411.1706</b>	<b>1,580.5111</b>	<b>-</b>	<b>1,454.2624</b>

**Notes:**

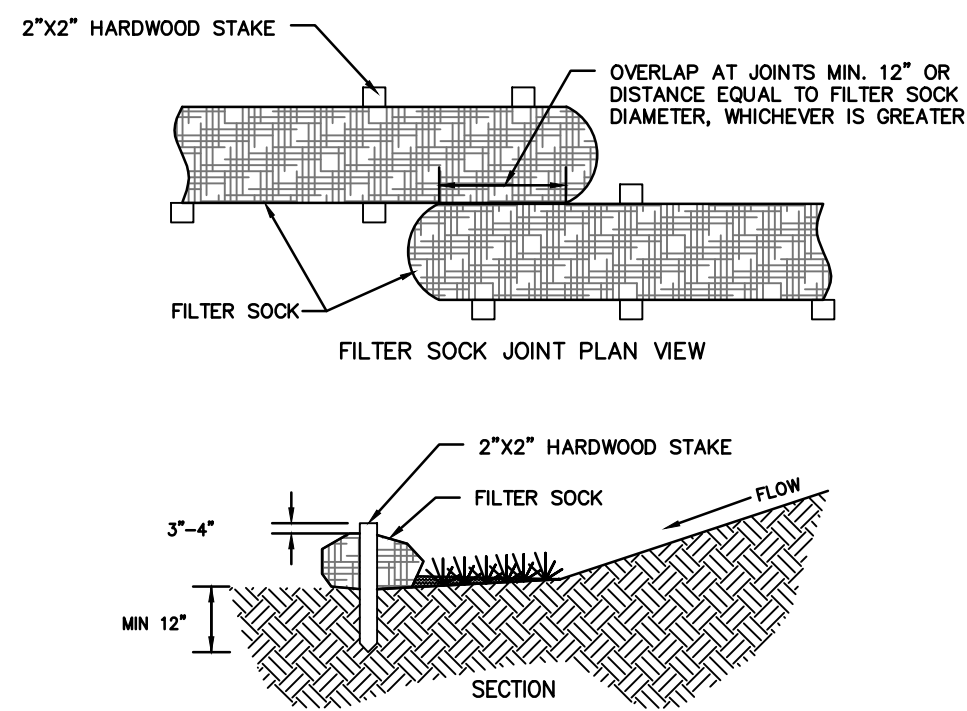
- 1 - SWVM score if impact is mitigated at an approved mitigation bank
- 2 - SWVM score if impact is mitigated using the In-Lieu-Fee (ILF) program
- 3 - Proposed mitigation type based on the location of the impact and availability of mitigation credits in the impact area.
  - Beverly Site #1 - Beverly Mitigation Bank Site #1
  - Hayes Run - Hayes Run Wetland and Stream Mitigation Bank.
  - ILF - In-Lieu-Fee Program
  - Kincheloe - Kincheloe Wetland and Stream Mitigation Bank
  - Lower Dempsey - Lower Dempsey Mitigation Bank



## Drawings

Drawings 5-1 to 5-3

Construction Plans

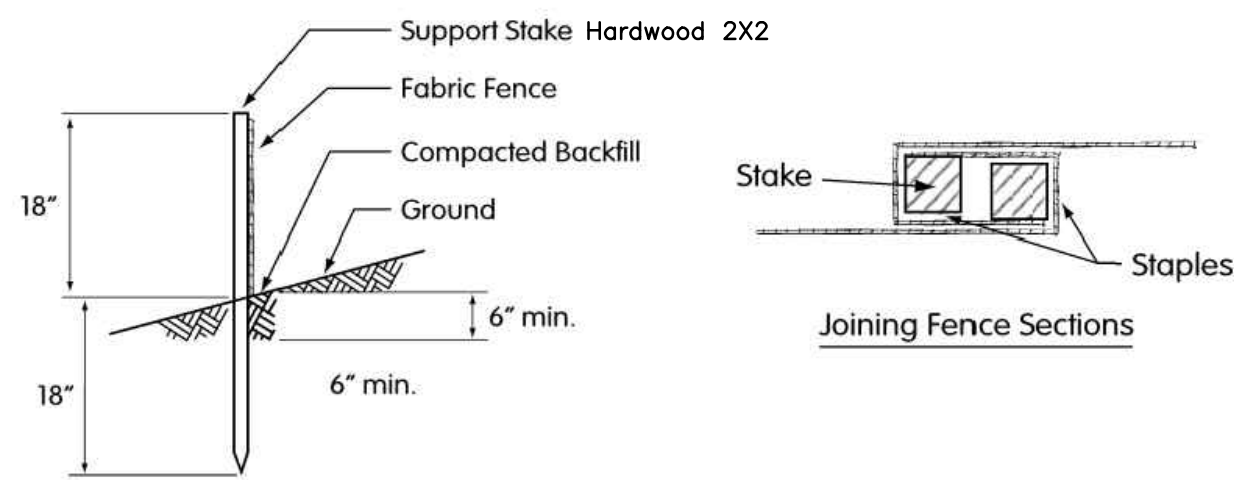


- NOTES:**
- MATERIALS - COMPOST USED FOR FILTER SOCKS SHALL BE WEED, PATHOGEN, AND INSECT FREE AND FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH. THEY SHALL BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER AND CONSIST OF PARTICLES RANGING FROM 3/8 INCH TO 2 INCHES.
  - FILTER SOCKS SHALL BE 3 TO 5 MIL CONTINUOUS TUBULAR HDPE 3/8 INCHES KNITTED MESH NETTING MATERIAL, FILLED WITH COMPOST PASSING THE ABOVE SPECIFICATIONS FOR COMPOST PRODUCTS.
  - FILTER SOCKS WILL BE PLACED ON A LEVEL LINE ACROSS SLOPES, GENERALLY PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA. ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND AS NEEDED MID-SLOPE.
  - STAKES SHALL BE INSTALLED EVERY 5 FT FOR THE ENTIRE LENGTH OF THE FILTER SOCK AND WITHIN 1 FT OF EACH END. STAKES MAY GO THROUGH THE CENTER OF THE FILTER SOCK OR BE CRISS-CROSSED OVER THE TOP.
  - MANUFACTURER'S SPECIFICATIONS ARE TO BE FOLLOWED WHEN JOINING FILTER SOCK SEGMENTS. PLAN VIEW ABOVE IS TO BE CONSIDERED A MINIMUM.
  - FILTER SOCKS INTENDED TO BE LEFT AS A PERMANENT FILTER OR PART OF THE NATURAL LANDSCAPE, SHALL BE SEEDED AT THE TIME OF INSTALLATION FOR ESTABLISHMENT OF PERMANENT VEGETATION.
- MAINTENANCE:**
- ROUTINELY INSPECT FILTER SOCKS AFTER EACH SIGNIFICANT RAIN, MAINTAINING FILTER SOCKS IN A FUNCTIONAL CONDITION AT ALL TIMES.
  - REMOVE SEDIMENTS COLLECTED AT THE BASE OF THE FILTER SOCKS WHEN THEY REACH 1/2 OF THE EXPOSED HEIGHT OF THE PRACTICE.
  - WHERE THE FILTER SOCK DETERIORATES OR FAILS, IT WILL BE REPAIRED OR REPLACED WITH A MORE EFFECTIVE ALTERNATIVE.
  - REMOVAL - FILTER SOCKS WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED IN SUCH A WAY AS TO FACILITATE AND NOT OBSTRUCT SEEDING.

Maximum Slope Length for Compost Filter Sock in Feet					
Slope Percent	Note: Table developed from Filtrix Sediment Control product cut sheet by Filtrix International, LLC. As a general reference. Refer to manufacturer's specifications for brand of compost filter sock used.				
	8 in	12 in	18 in	24 in	32 in
2 (or less)	600	750	1000	1300	1650
5	400	500	650	850	1100
10	200	250	300	400	500
15	140	170	200	275	350
20	100	125	140	200	250
25	80	100	110	150	200
30	60	75	90	130	170
35	60	75	80	115	150
40	60	75	80	100	125
45	40	50	60	80	100
50	40	50	55	65	75

**MAXIMUM SLOPE LENGTH ABOVE COMPOST FILTER SOCK AND RECOMMENDED DIAMETER**

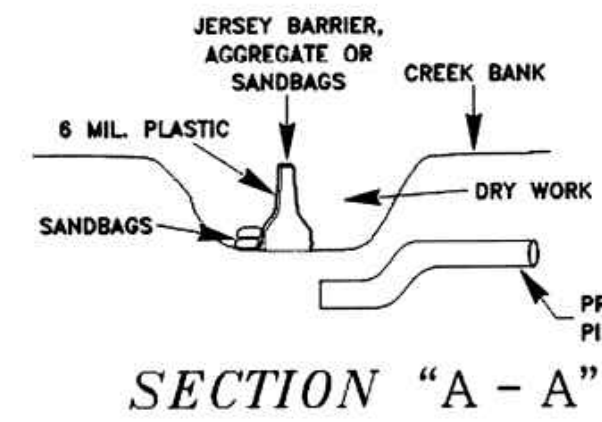
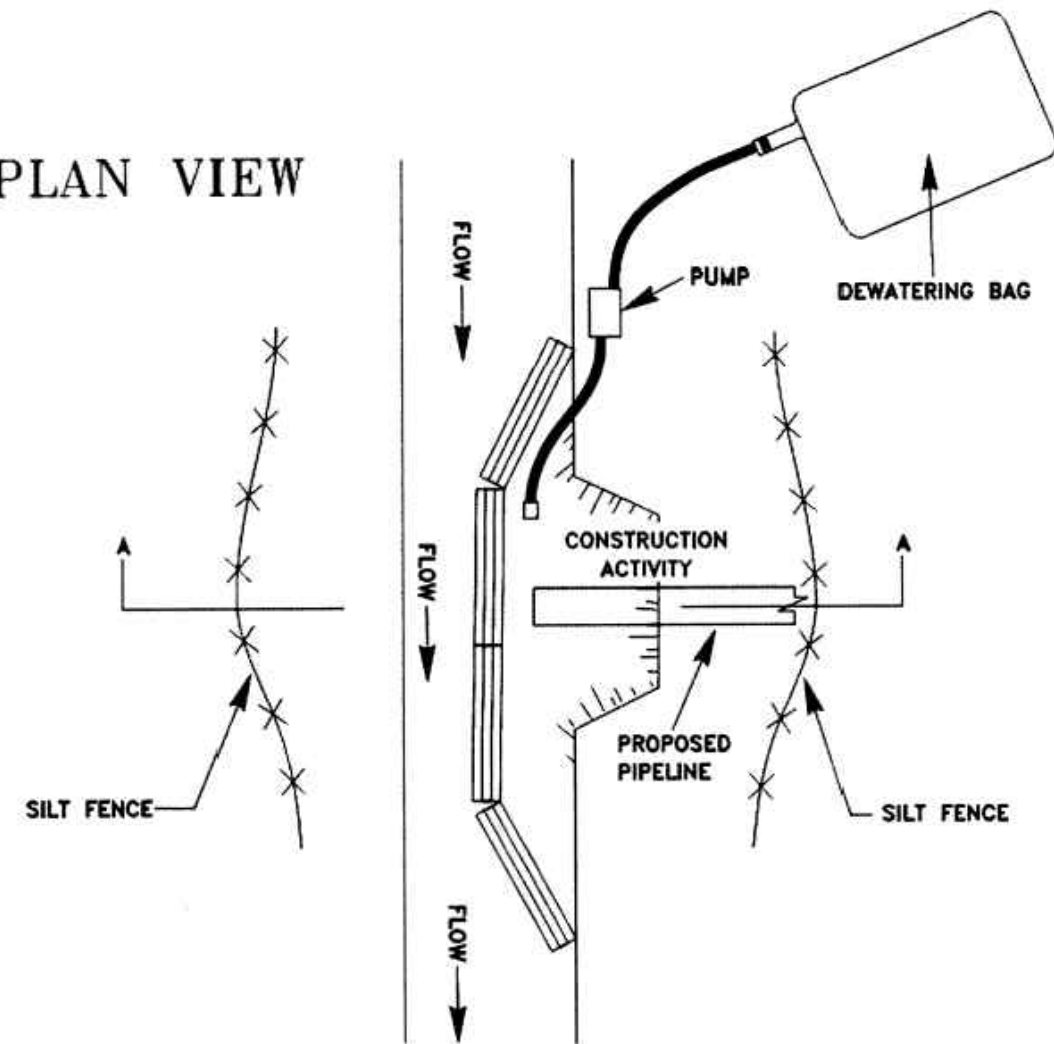
**COMPOST FILTER SOCK**



**SILT FENCE**  
TAKEN FROM 2006 MANUAL

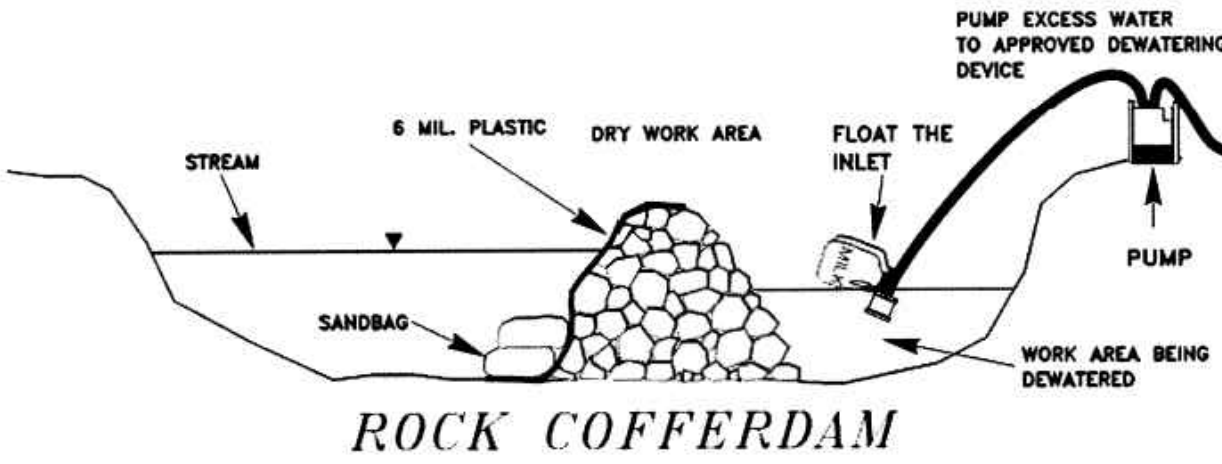
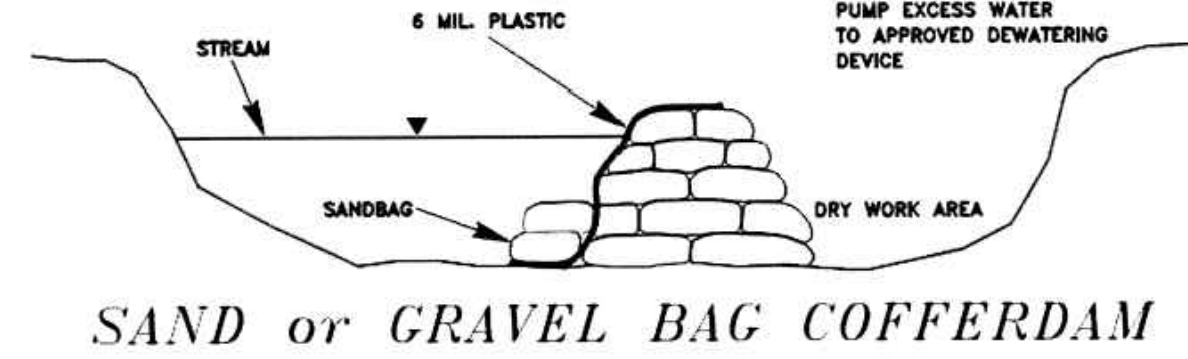
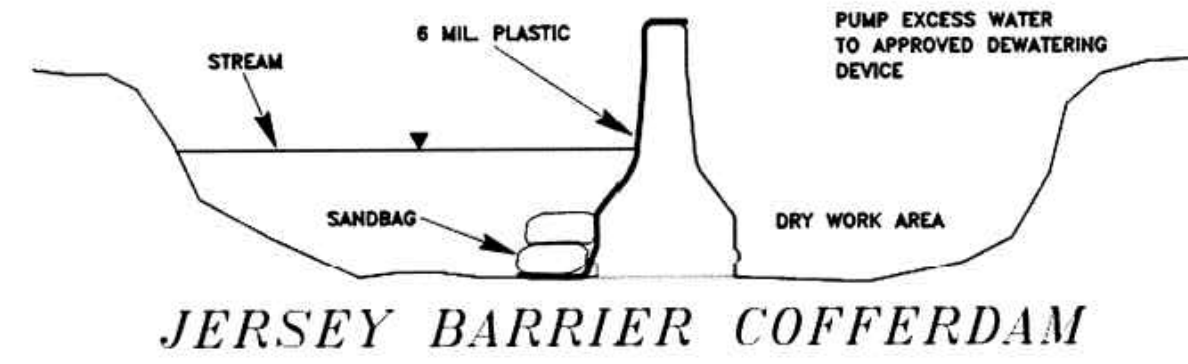
**COFFERDAM CROSSING**

**PLAN VIEW**

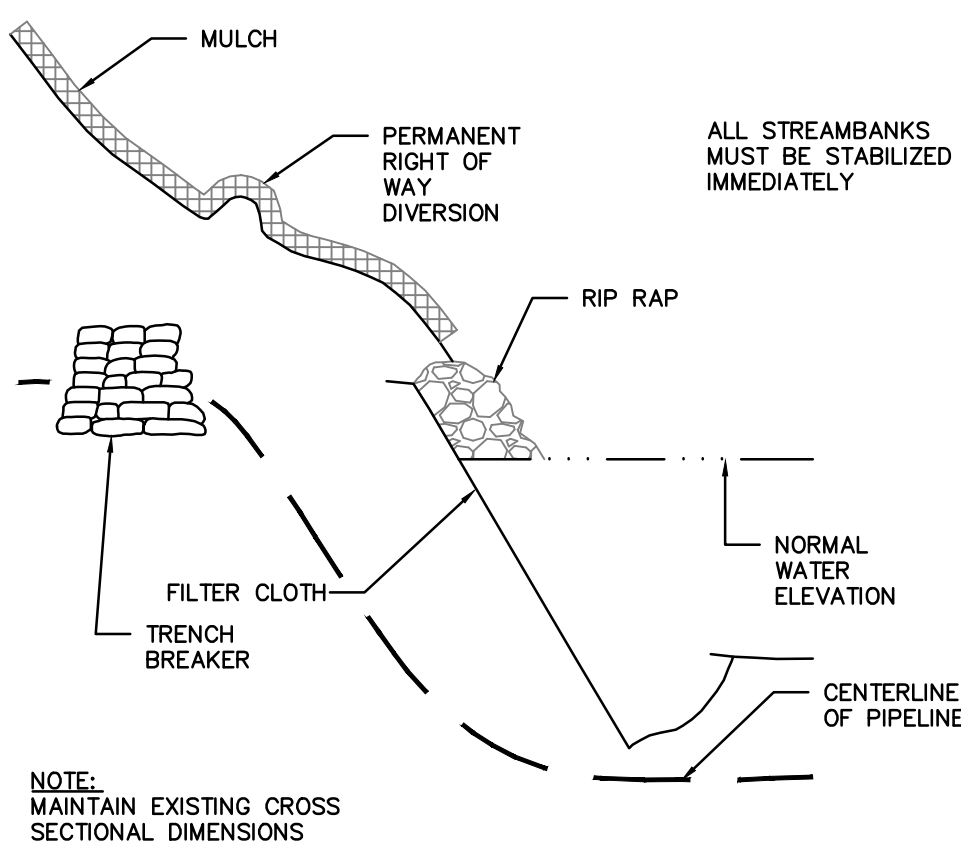
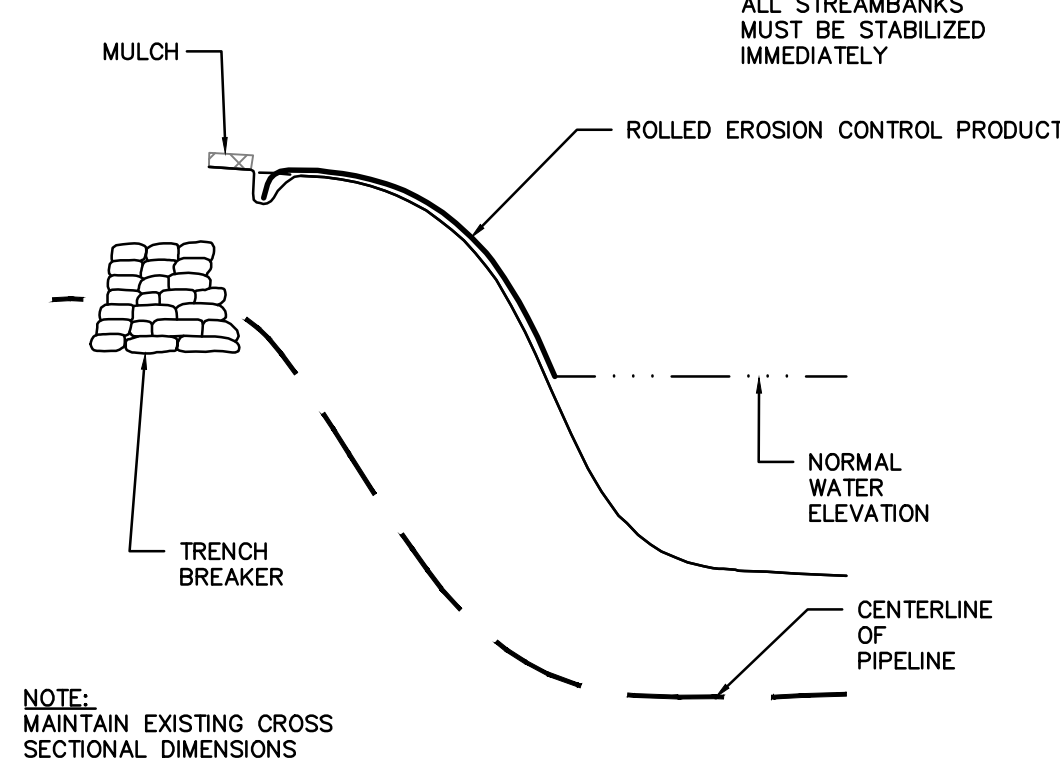


**COFFERDAM STREAM CROSSING**  
DEVELOPED FROM 2006 MANUAL

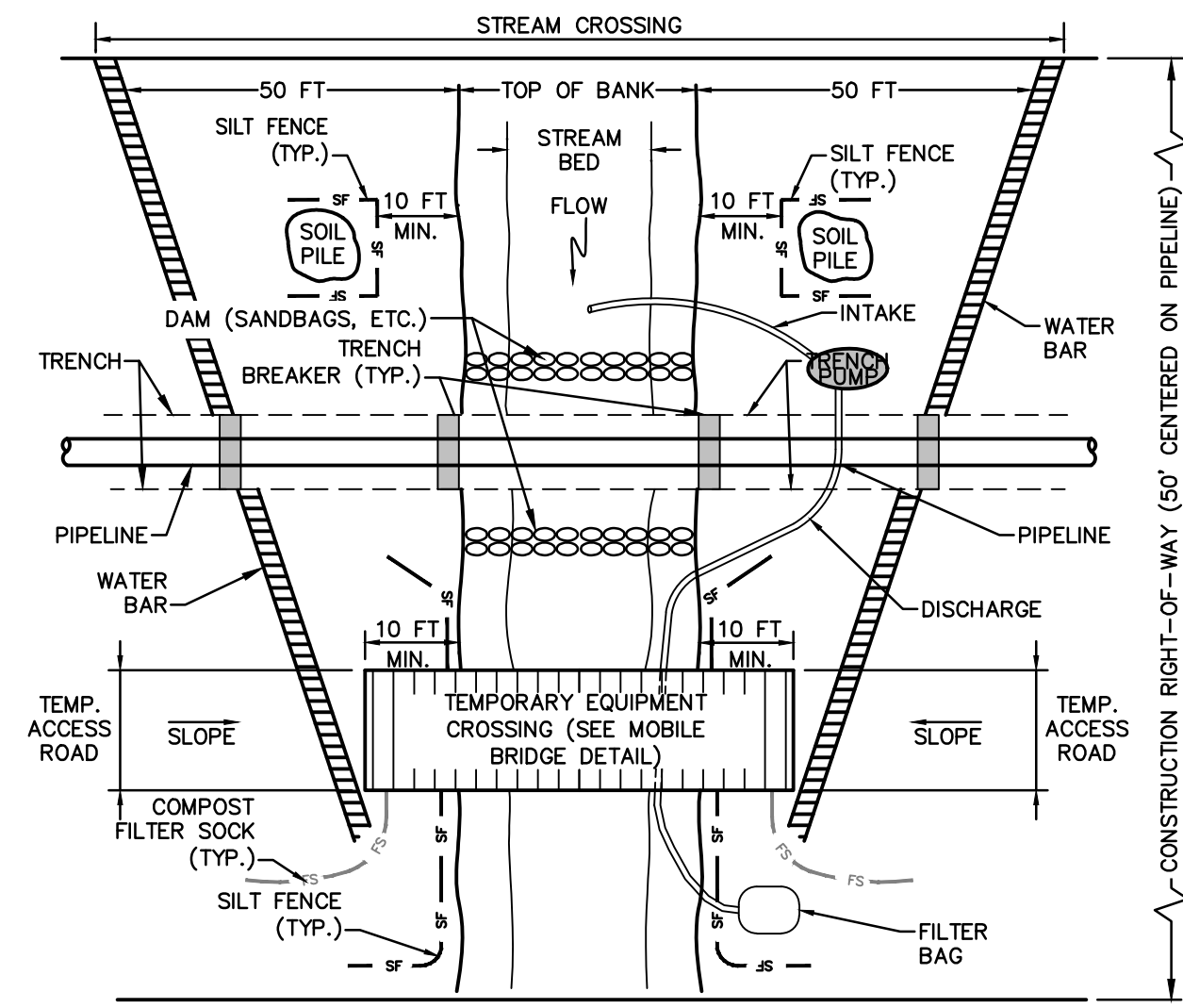
**COFFERDAMS**



**STREAM BANK STABILIZATION W/R.E.C.P.**  
DEVELOPED FROM 2006 MANUAL

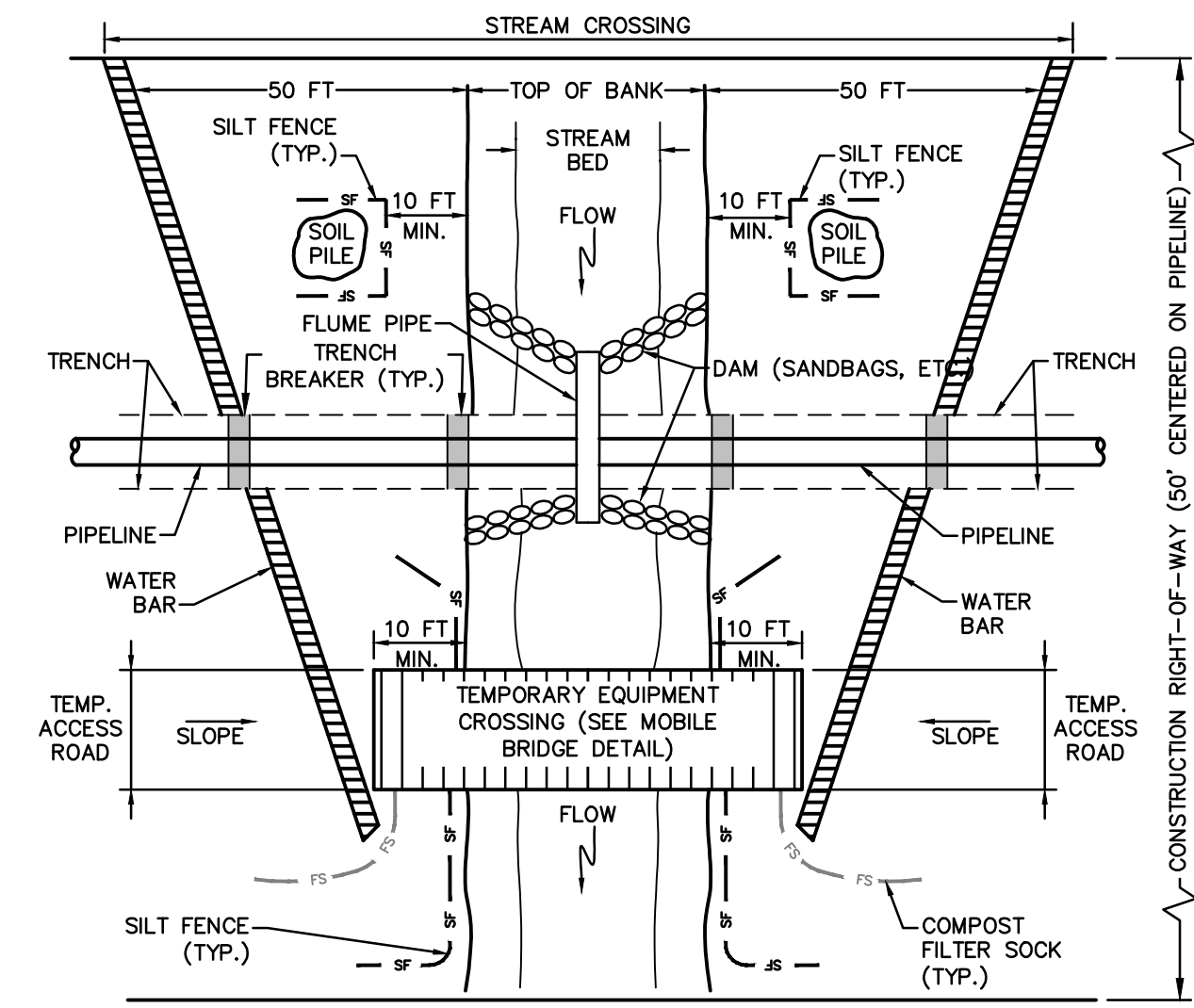


**STREAM BANK STABILIZATION W/ RIP RAP**  
DEVELOPED FROM 2006 MANUAL



- NOTES:**
- INSTALL COMPOST FILTER SOCKS, TRENCH BREAKERS, PUMP, ENERGY DISSIPATER, AND DAMS BEFORE TRENCHING STREAM.
  - PUMP MUST BE OF SUFFICIENT CAPACITY TO CONVEY NORMAL AND/OR EXISTING STREAM FLOW OVER TRENCH. A BACK-UP PUMP OF EQUAL CAPACITY MUST BE AVAILABLE ON-SITE DURING CONSTRUCTION OF THE PIPELINE CROSSING.
  - PLACE SOIL PILES A MINIMUM OF 10 FEET FROM TOP OF BANK.
  - INSTALL WATER BARS AT APPROACHES TO STREAM CROSSING AND COMPOST FILTER SOCKS, SILT FENCE, OR SUPER SILT FENCE (AS INDICATED ON PLAN SHEETS).
  - MAINTAIN SURFACE OF TEMPORARY EQUIPMENT CROSSING TO PREVENT SOIL DISCHARGES TO STREAM.
  - APPROACHES TO CROSSINGS ARE NOT TO EXCEED A DEPTH OF 6 INCHES ABOVE ORIGINAL GRADE.
  - RESTORE AREA TO APPROXIMATE ORIGINAL CONTOURS.

**TYPICAL STREAM CROSSING PUMP DIVERSION**



- NOTES:**
- INSTALL COMPOST FILTER SOCKS, TRENCH PLUGS, PUMP, AND DAMS BEFORE TRENCHING STREAM.
  - FLUME PIPE MAY BE NEEDED TO SPAN STREAM CHANNEL.
  - PLACE SOIL PILES A MINIMUM OF 10 FEET FROM TOP OF BANK.
  - INSTALL WATER BARS AT APPROACHES TO STREAM CROSSING AND COMPOST FILTER SOCKS, SILT FENCE, OR SUPER SILT FENCE (AS INDICATED ON PLAN SHEETS).
  - ALONG STREAM BANKS AND DOWNSLOPE END OF WATER BARS.
  - MAINTAIN SURFACE OF TEMPORARY EQUIPMENT CROSSING TO PREVENT SOIL DISCHARGES TO STREAM.
  - APPROACHES TO CROSSINGS ARE NOT TO EXCEED A DEPTH OF 6 INCHES ABOVE ORIGINAL GRADE.
  - RESTORE AREA TO APPROXIMATE ORIGINAL CONTOURS.

**FLUME PIPE DIVERSION**

- REFERENCES:**
- WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, DATED 2006.
  - WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL, DRAFT DATED 7-28-2010.
  - WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL, DATED MAY 2012.

NO.	DATE	CHKD.	APPD.	DESCRIPTION

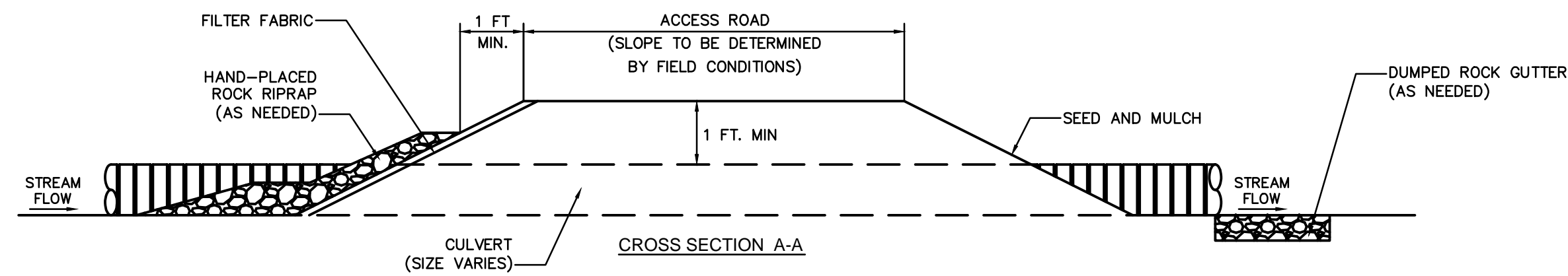
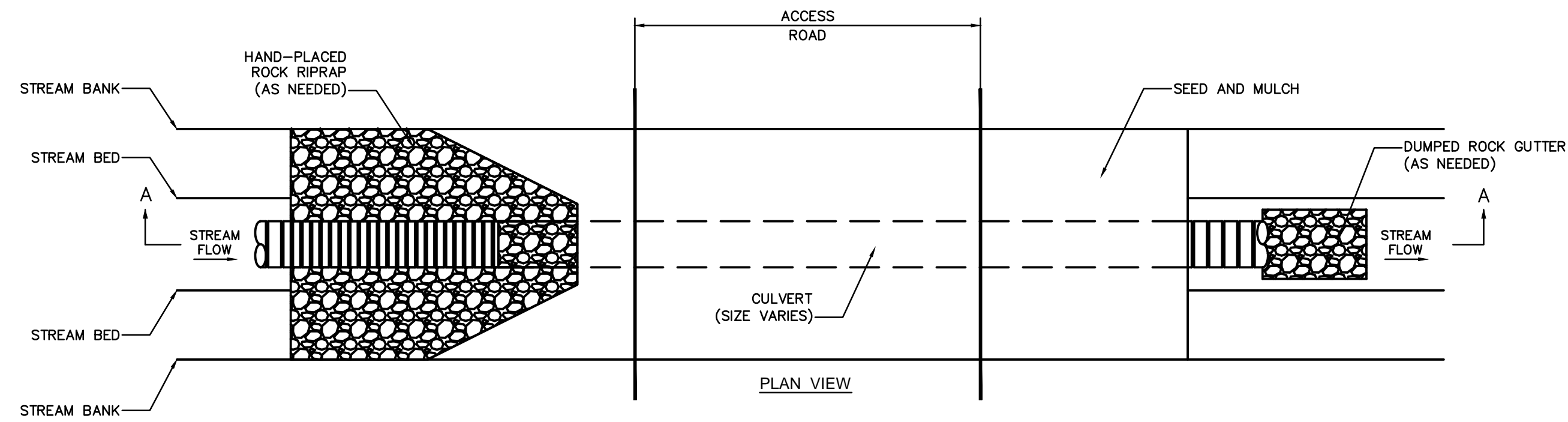
**Mountain Valley Pipeline**  
EROSION AND SEDIMENT CONTROL DETAILS  
MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE  
WETZEL COUNTY THROUGH MONROE COUNTY, WEST VIRGINIA  
MOUNTAIN VALLEY PIPELINE, LLC  
555 SOUTHPOINTE BOULEVARD, SUITE 200  
CANONSBURG, PA 15317

**TETRA TECH**  
complex world | CLEAR SOLUTIONS™  
661 ANDERSEN DRIVE  
FOSTER PLAZA 7  
PITTSBURGH, PA 15220

**CONSTRUCTION PLANS**

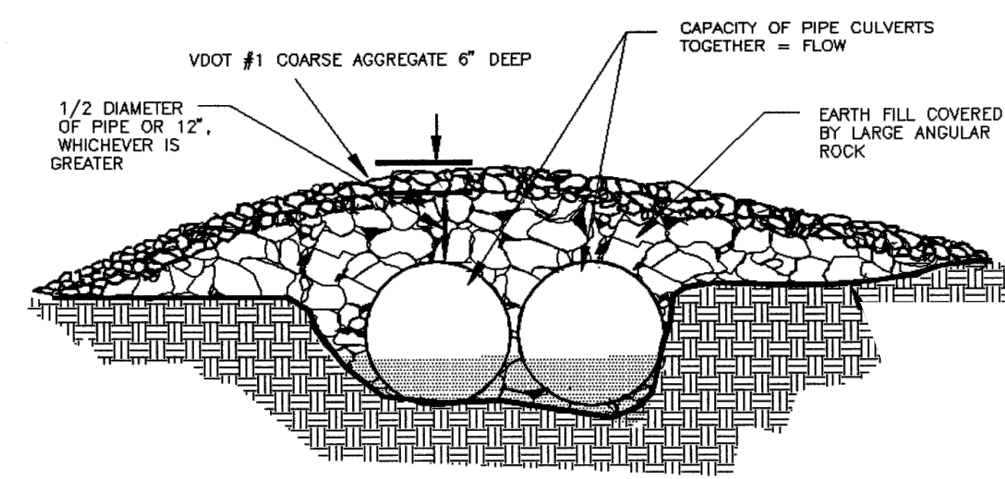
DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	2/19/2016
SCALE:	AS SHOWN
SHT. NO.	1 OF 2



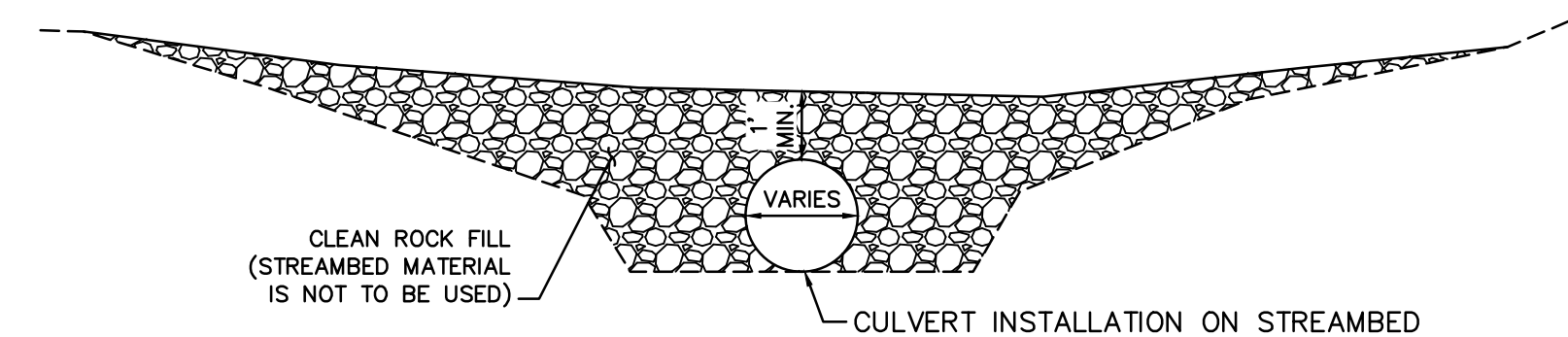


CULVERT SHALL BE DEPRESSED A MINIMUM OF 6 INCHES INTO STREAM BED TO ENSURE UPSTREAM AND DOWNSTREAM CONNECTIVITY

TYPICAL ROAD CROSS-SECTION AT STREAM CROSSING



TEMPORARY CULVERT CROSSING  
TAKEN FROM VADEQ 1992 MANUAL



TYPICAL STREAM CROSSING PROFILE - SINGLE CULVERT  
TAKEN FROM WVDEP MANUAL

**NOTE:**  
THE CULVERT TYPES, SIZES, AND LOCATIONS RELATIVE TO THE PIPELINE ARE SHOWN ON THE TABLE INCLUDED AS ATTACHMENT DR3 WATER RESOURCES -6A.

NO.	DATE	DWN.:	CHKD.:	APPD.:	DESCRIPTION:

  
**EROSION AND SEDIMENT CONTROL DETAILS**  
 MOUNTAIN VALLEY PIPELINE PROJECT - H600 LINE  
 MOUNTAIN VALLEY PIPELINE, LLC  
 555 SOUTHPOINTE BOULEVARD, SUITE 200  
 CANONSBURG, PA 15317

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 PITTSBURGH, PA 15220

THIS TYPICAL CONSTRUCTION DETAIL IS INTENDED TO PROVIDE GUIDANCE TO THE PIPELINE CONTRACTOR. THE ACTUAL CONSTRUCTION TECHNIQUES MAY DIFFER DEPENDING UPON FIELD CONDITIONS AND/OR REGULATORY REQUIREMENTS

DRAWN BY:	KAL
CHECKED BY:	HT
APPROVED BY:	RE
DATE:	2/19/2016
SCALE:	AS SHOWN
SHT. NO.	5-3

**APPENDIX A**  
**Application for 401 Water Quality Certification**

*Application for  
Individual Water Quality State 401 Certification  
State of West Virginia*



*for  
Non Coal Related Facilities*

**STATE OF WEST VIRGINIA  
APPLICATION FOR 401 WATER QUALITY CERTIFICATION  
FOR NON COAL RELATED ACTIVITY**

This application must be completed whenever a proposed activity requires a Clean Water Act Section 401 Individual State Water Quality Certification from the West Virginia Department of Environmental Protection (WVDEP). Section 401 of the Clean Water Act requires that any applicant for a federal license or permit to conduct an activity that will or may discharge into waters of the United States (as defined in the Clean Water Act) to present the federal authority with a certification from the appropriate state agency. Federal license and/or permits requiring 401 Certification include those from the United States Army Corps of Engineers under Section 404 of the Clean Water Act, 33 U.S.C. §1344; Section 10 of the Rivers and Harbors Act of 1899, 33 U.S.C. §403; and licenses issued by the Federal Energy Regulatory Commission under the Federal Power Act, 16 U.S.C. §1791 et. seq. To determine whether you need to submit this application to the WVDEP, contact the U.S. Army Corps of Engineers District Office with jurisdiction over your permit area, and the WVDEP - Division of Water and Waste Management at (304) 926-0499 X 1599.

The WVDEP Section 401 Water Quality Certification program, is authorized by Section 401 of the Federal Clean Water Act, 33 U.S.C. §1341 and W. Va. Code §§22-1-6(d)(7) and 22-11-7(a). West Virginia Legislative Rule §47CSR5A outlines the application process and criteria for decision by the Secretary of the WVDEP. In order for the WVDEP to issue a Section 401 Certification, the project must comply with the State Water Quality Standards (§47CSR2) and not potentially result in an adverse long-term or short-term impact on water quality. Included with the Water Quality Standards is the Antidegradation Implementation Rule (§60CSR5) effective July 2, 2001. The Rule includes additional application requirements and public participation procedures. Because there is a potential for lowering of water quality, or impacts to designated uses, associated with every project being reviewed for Section 401 Certification, every applicant must provide the information required of this application.

Information provided with the application will be used to evaluate the project for certification and is a matter of public record. If the Secretary determines that the application lacks information necessary to determine whether the applicant has demonstrated the criteria set forth in Legislative Rule 47CSR5A, the WVDEP will inform the applicant in writing of the additional information that must be submitted. The application will not be accepted until it is considered complete by the Department. You will be informed in writing when your application is determined to be complete.

Please submit the following with the \$350 application fee to: Division of Water and Waste Management, Section 401 Program, 601 57<sup>th</sup> Street SE, Charleston, West Virginia 25304

\* Two (2) sets of the completed application form, or an electronic application including a map of location and scaled plan drawings and sections.

*Please submit two (2) copies of this form along with the \$350 filing fee for review. Any information missing in this package will be considered incomplete. A full permit review will not be made until all information is provided. The Department of Environmental Protection will notify you of any missing and/or further information necessary for a proper and thorough review for certification.*

For Agency Use Only

Date Received by Agency:	DEP Application No.:
Public Notice No.:	Filing Fee of \$350 received:                      Check No.:
Reviewer's Name:	Date Application Deemed Complete:

## APPLICANT INFORMATION

Applicant Name:			Agent Name:		
Shawn Posey			Preston Smith		
Company:			Company:		
Mountain Valley Pipeline, LLC			Tetra Tech, Inc.		
Address:			Address:		
555 Southpointe Blvd, Suite 200			661 Andersen Dr., Foster Plaza 7		
City:	State:	Zip Code:	City:	State:	Zip Code:
Canonsburg	PA	15317	Pittsburgh	PA	15220
Telephone Number:			Telephone Number:		
724-395-3931			412-921-8167		
Email Address:			Email Address:		
sposey@eqt.com			Preston.Smith@tetrattech.com		

## PROJECT DESCRIPTION

State the type of federal permit applicant is applying for:

\_\_\_\_\_ Individual 404/401 Certification – Corps Public Notice # \_\_\_\_\_

Nationwide 404 permit requiring 401 Certification – Nationwide Permit # LRH-2015-592

\_\_\_\_\_ 404 permit modification requiring 401 Certification – Original Corps Public Notice # \_\_\_\_\_

Section 10 of the Rivers and Harbors Act permit – Corps Public Notice # TBD

Federal Energy Regulatory Commission Licenses – FERC Project # PF 16-10-000

Type of Operation: Installation of a 42" diameter natural gas pipeline

Activity proposed in stream or wetland: Temporary and permanent impacts during pipeline and access road installation

Project Purpose: The Project is a new pipeline designed to transport up to 2.0 MMDth/d of natural gas to growing markets in the Mid-Atlantic, southeastern United States, and Appalachian region. See Section 3.2 - Project Purpose for details.

Briefly describe proposed project: \_\_\_\_\_

The proposed pipeline route will begin at the Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, WV and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, in Pittsylvania County, VA. See Section 3.1 - Project Description



## PROJECT INFORMATION

County: See Table 1 for Counties and Towns.	Nearest Town: See Table 1 for Counties and Towns.	Coordinates: See Section 3.3 - Project Coordinates.
--	--	--

Directions to site: include a USGS topographical map section showing location of proposed project.  
The proposed Project will span 11 counties in WV and six counties in VA. See Figures 1-1 to 1-41 for a USGS topographic map of the proposed Project. See Section 3.4 - Directions to Site.

Watershed Name: See Table 2 - HUC 8 Watersheds.	Watershed Size (acres): See Table 2 - HUC 8 Watersheds.
--	--

Name of Stream(s) where work will occur and receiving streams to which they drain:  
A total of 417 streams will be impacted by the Project's limit-of-disturbance in West Virginia. An additional 43 streams will be impacted in the Project's limit of disturbance in West Virginia based on a desktop evaluation of unsurveyed Project areas. See Table 5.2 for a list of streams that will be impacted within the Project's limit-of-disturbance. See Table 8.2 for a list of streams that will be impacted within the Project's limit-of-disturbance identified during the desktop evaluation.

Length and width of Section 10 impacts:  
See Table 6 - Traditional Navigable Waterways Impacts Table

Wetlands on project site: (acres) See Table 4.2 Wetlands Impact Table.	Wetlands impacted by proposed project: (acres) See Table 4.2 - Wetlands Impact Table.
---	--

Briefly describe wetland functions:  
See Section 5.5 for a description of wetland functions and values using the USACE Highway

Method. See Table 4.2 for functions and values of wetlands impacted by the Project.

Describe the type, composition and quantity of fill material:

It is anticipated that potential fill impacts in jurisdictional wetlands and waterbodies will result from pipeline construction or from installing stream culverts along permanent access roads. See Section 3.1.1 for a description of type, composition, and quantity of fill.

### NO PRACTICAL ALTERNATIVE DEMONSTRATION (See Instructions)

The No Action Alternative would not allow MVP to offer the growing Mid-Atlantic, southeastern, and Appalachian markets access to an abundant supply of a cleaner-burning, low-cost source of fuel, and would potentially limit the economic growth of these regions by not providing improved access to a natural gas supply. During Project development, MVP conducted a review of potential pipeline routes to identify potential pipeline corridors. As a result of the review of over 1,700 miles of pipeline route alternatives and over 3,000 miles of pipeline route variations, MVP identified the preferred pipeline route (Proposed Route) discussed in this application. Since the identification of the Proposed Route, over 500 minor route modifications have been made to avoid or minimize potential impacts to PFO and PSS wetlands and major waterbodies, avoid impacts to sensitive resources and habitats, improve constructibility, and avoid residential and commercial areas. See Section 4.0 - No Practical Alternative Demonstration for more details.

### **WETLANDS DELINEATION (See Instructions)**

See Section 5.2.1 - Wetland Delineation and Waters of the U.S. Survey for methods and results of a wetland delineation field survey conducted for the portion of Project located in West Virginia. The Aquatic Resource Report is presented in seven volumes, by county. See Section 5.2.2 - Desktop Evaluated Wetlands and Streams for methods and results of a desktop evaluation of restricted access areas where a field survey could not be conducted at this time.

### **STREAM RESTORATION PLAN (See Instructions)**

It is anticipated that all stream impacts within the pipeline limit-of-disturbance will be temporary, occurring during pipeline construction activities. Cleanup and restoration will commence as soon as practicable following the completion of backfilling and testing. Natural stream channel design practices will be employed during restoration to ensure that the channels proper hydrogeomorphic characteristics are restored. See Section 6.2 - Stream Restoration for more details.

### **MITIGATION / COMPENSATION AGREEMENT**

#### **Include West Virginia Stream and Wetland Valuation Metric (See Instructions)**

MVP is proposing to mitigate anticipated unavoidable permanent impacts to streams and wetlands with the purchase of credits from approved mitigation banks in the appropriate service area and the WV In-Lieu Fee Program for Project impacts occurring outside of the primary or secondary service areas of approved mitigation banks. See Section 7.0 - Mitigation / Compensation Plan for more details.

### **SIGNATURE – STATEMENT OF AFFIRMATION**

*Please read carefully before signing*

Application is hereby made for a water quality certification to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true and accurate. I certify that I have the authority to undertake the activities proposed in the application. I understand and agree to allow representatives of the Department of Environmental Protection to enter upon said property in order to inspect the proposed project. I understand that the granting of other permits by local, state or federal agencies does not release me from the requirements of obtaining the certification requested herein before commencing the project.

Applicants Printed Name: \_\_\_\_\_

Applicant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

### WETLANDS DELINEATION (See Instructions)

See Section 6.0 - Wetland Delineation and Waters of the U.S. Survey for methods and results of a wetland delineation field survey conducted for the portion of Project located in West Virginia. The Aquatic Resource Report is presented in seven volumes, by county. See Section 7.0 - Desktop Wetland Evaluation of Unsurveyed Areas for methods and results of a desktop wetland evaluation of restricted access areas where a field survey could not be conducted at this time.

### STREAM RESTORATION PLAN (See Instructions)

It is anticipated that all stream impacts within the pipeline limit-of-disturbance will be temporary, occurring during pipeline construction activities. Cleanup and restoration will commence as soon as practicable following the completion of backfilling and testing. Natural stream channel design practices will be employed during restoration to ensure that the channels proper hydrogeomorphic characteristics are restored. See Section 12.1 - Stream Restoration for more details.

### MITIGATION / COMPENSATION AGREEMENT

#### Include West Virginia Stream and Wetland Valuation Metric (See Instructions)

MVP is proposing to mitigate anticipated unavoidable permanent impacts to streams and wetlands with the purchase of credits from approved mitigation banks in the Project area and the WV In-Lieu Fee Program for Project impacts occurring outside of the primary or secondary service areas of approved mitigation banks. See Section 13.0 - Mitigation / Compensation Plan for more details.

### SIGNATURE – STATEMENT OF AFFIRMATION

*Please read carefully before signing*

Application is hereby made for a water quality certification to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true and accurate. I certify that I have the authority to undertake the activities proposed in the application. I understand and agree to allow representatives of the Department of Environmental Protection to enter upon said property in order to inspect the proposed project. I understand that the granting of other permits by local, state or federal agencies does not release me from the requirements of obtaining the certification requested herein before commencing the project.

Applicants Printed Name: Shawn Posey

Applicant's Signature: 

Date: 2/29/16

## **APPENDIX B**

### **FERC Documents**

UNITED STATES OF AMERICA  
Federal Energy Regulatory Commission

Mountain Valley Pipeline, LLC

Docket No. PF15-3-000

NOTICE OF INTENT TO PREPARE AN  
ENVIRONMENTAL IMPACT STATEMENT FOR THE PLANNED  
**MOUNTAIN VALLEY PIPELINE PROJECT**,  
REQUEST FOR COMMENTS ON ENVIRONMENTAL ISSUES,  
AND NOTICE OF PUBLIC SCOPING MEETINGS

(April 17, 2015)

The staff of the Federal Energy Regulatory Commission (FERC or Commission) will prepare an environmental impact statement (EIS) that will discuss the environmental impacts of the Mountain Valley Pipeline Project (MVP Project) involving construction and operation of natural gas facilities by Mountain Valley Pipeline, LLC (Mountain Valley), a joint venture between affiliates of EQT Corporation and NextEra Energy, Inc., in West Virginia and Virginia. For further details about the project facilities and locations, see “Summary of the Proposed Project” below. The Commission will use this EIS in its decision-making process to determine whether the project is in the public convenience and necessity.

This notice announces the opening of the scoping process the Commission will use to gather input from the public and interested agencies on the project. You can make a difference by providing us with your specific comments or concerns about the project. Your comments should focus on the potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. Your input will help the Commission staff determine what issues they need to evaluate in the EIS. To ensure that your comments are timely and properly recorded, please send your comments so that the Commission receives them in Washington, DC on or before **June 16, 2015**.

If you sent comments on this project to the Commission **before** the opening of the docket on October 27, 2014, you will need to re-file those comments in Docket No. PF15-3-000 to ensure they are considered as part of this proceeding. Any comments submitted after the establishment of a project docket do not need to be re-filed.

This notice is being sent to the Commission’s current environmental mailing list for this project. State and local government representatives should notify their constituents of this planned project and encourage them to comment on their areas of concern.

Docket No. PF15-3-000

If you are a landowner receiving this notice, a Mountain Valley representative may contact you about the acquisition of an easement to construct, operate, and maintain the planned facilities. The company would seek to negotiate a mutually acceptable agreement. However, if the Commission approves the project, that approval conveys with it the right of eminent domain. Therefore, if easement negotiations fail to produce an agreement, the pipeline company could initiate condemnation proceedings where compensation would be determined in accordance with state law.

A fact sheet prepared by the FERC entitled “An Interstate Natural Gas Facility On My Land? What Do I Need To Know?” is available for viewing on the FERC website ([www.ferc.gov](http://www.ferc.gov)). This fact sheet addresses a number of typically asked questions, including the use of eminent domain and how to participate in the Commission's proceedings.

### **Public Participation**

You can make a difference by providing us with your specific comments or concerns about the project. Your comments should focus on the potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that your comments are timely and properly recorded, please send your comments so that the Commission receives them in Washington, DC on or before **June 16, 2015**.

For your convenience, there are four methods you can use to submit your comments to the Commission. In all instances, please reference the project docket number (PF15-3-000) with your submission. The Commission encourages electronic filing of comments and has expert staff available to assist you at (202) 502-8258 or [efiling@ferc.gov](mailto:efiling@ferc.gov).

- (1) You can file your comments electronically using the eComment feature located on the Commission's website ([www.ferc.gov](http://www.ferc.gov)) under the link to Documents & Filings. This is an easy method for interested persons to submit brief, text-only comments on a project;
- (2) You can file your comments electronically using the eFiling feature located on the Commission's website ([www.ferc.gov](http://www.ferc.gov)) under the link to Documents & Filings. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on eRegister. You must select the type of filing you are making. If you are filing a comment on a particular project, please select Comment on a Filing; or

Docket No. PF15-3-000

- (3) You can file a paper copy of your comments by mailing them to the following address:

Kimberly D. Bose, Secretary  
 Federal Energy Regulatory Commission  
 888 First Street NE, Room 1A  
 Washington, DC 20426

- 4) In lieu of sending written or electronic comments, the Commission invites you to attend one of the public scoping meetings its staff will conduct in the project area, scheduled as follows.

<b>FERC Public Scoping Meetings – MVP Project</b>	
<b>Date and Time</b>	<b>Location</b>
Monday, May 4, 2015 7:00 pm	James Monroe High School Route 1, Lindside, WV 24951
Tuesday, May 5, 2015 7:00 pm	Eastern Montgomery High School 4695 Crozier Road, Elliston, VA 24087
Thursday, May 7, 2015 7:00 pm	Chatham High School 100 Cavalier Circle, Chatham, VA 24531
Monday, May 11, 2015 7:00 pm	Robert C. Byrd Center 992 North Fork Road, Pine Grove, WV 26419
Tuesday, May 12, 2015 7:00 pm	West Virginia University Jackson’s Mill 160 WVU Jackson Mill, Weston, WV 26452
Wednesday, May 13, 2015 7:00 pm	Nicholas County High School 30 Grizzly Road, Summersville, WV 26651

We<sup>1</sup> will begin our sign-up of speakers one hour prior to the start of each meeting (at 6:00 pm). The scoping meetings will begin at 7:00 pm, with a description of our environmental review process by Commission staff, after which speakers will be called. Each meeting will end once all speakers have provided their comments or when our contracted time for the facility closes. Please note that there may be a time limit of **three minutes** to present comments, and speakers should structure their comments accordingly. If time limits are implemented, they will be strictly enforced to ensure that as many individuals as possible are given an opportunity to comment. The meetings will be recorded by a stenographer to ensure comments are accurately recorded. Transcripts will be entered into the formal record of the Commission proceeding. The Commission will give equal consideration to all comments received, whether filed in written form or provided verbally at the scoping meeting.

<sup>1</sup> “We,” “us,” and “our” refer to the environmental staff of the Commission’s Office of Energy Projects.

Docket No. PF15-3-000

Mountain Valley representatives will be present one hour prior to the start of the scoping meetings to provide additional information about the project and answer questions.

### **Summary of the Planned Project**

The MVP Project would involve the construction and operation of about 294 miles of 42-inch-diameter buried steel pipeline in Wetzel, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe Counties, West Virginia and Giles, Montgomery, Roanoke, Franklin, and Pittsylvania Counties in Virginia. The pipeline would originate at Equitrans, L.P.'s existing transmission system in Wetzel County, West Virginia and terminate at the existing Transcontinental Gas Pipeline Company LLC's existing Zone 5 Compressor Station 165 in Pittsylvania County, Virginia. Additional facilities would include 4 new compressor stations in Wetzel, Braxton, and Fayette Counties, West Virginia and Montgomery County, Virginia; 4 new meter stations; 49 main line valves, and 6 pig<sup>2</sup> launchers and/or receivers.

The MVP Project would provide about 2 billion cubic feet of natural gas per day to markets in the Mid-Atlantic and Southeastern United States. The general location of the project facilities are shown in appendix 1.<sup>3</sup>

### **Land Requirements for Construction**

Construction of the planned facilities would disturb about 5,458 acres of land for the pipeline and aboveground facilities, not including temporary access roads which are not yet determined. Following construction, Mountain Valley would maintain about 2,687 acres for permanent operation of the project's facilities, not including permanent access roads; the remaining acreage would be restored and revert to former uses. About 15 percent of the planned pipeline route parallels existing pipeline, utility, and road rights-of-way.

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<sup>2</sup> A "pig" is an internal tool that the pipeline company inserts into and pushes through the pipeline for cleaning, inspections, or other purposes.

<sup>3</sup> The appendices referenced in this notice will not appear in the *Federal Register*. Copies of the appendices were sent to all those receiving this notice in the mail and are available at [www.ferc.gov](http://www.ferc.gov) using the link called "eLibrary" or from the Commission's Public Reference Room, 888 First Street NE, Washington, DC 20426, or call (202) 502-8371. For instructions on connecting to eLibrary, refer to the last page of this notice.



Docket No. PF15-3-000

## **The EIS Process**

The National Environmental Policy Act (NEPA) requires the Commission to take into account the environmental impacts that could result from an action whenever it considers the issuance of a Certificate of Public Convenience and Necessity. The NEPA also requires us to discover and address concerns the public may have about proposals. This process is referred to as scoping. The main goal of the scoping process is to focus the analysis in the EIS on the important environmental issues. By this notice, the Commission requests public comments on the scope of the issues to address in the EIS. We will consider all filed comments (including verbal comments presented at the public scoping meetings) during the preparation of the EIS.

In the EIS we will discuss impacts that could occur as a result of the construction and operation of the planned project under these general headings:

- geology and soils;
- water resources and wetlands;
- vegetation and wildlife;
- cultural resources;
- land use, recreation, and visual resources;
- socioeconomics;
- air quality and noise;
- cumulative impacts; and
- public safety.

As part of our analysis under the NEPA, we will consider or recommend measures to avoid, minimize, or mitigate impacts on specific resources. We will also evaluate possible alternatives to the planned project or portions of the project. Mountain Valley has proposed a number of alternatives, developed through the company's route selection process or identified by stakeholders, in draft Resource Report 10 filed with the FERC in Docket No. PF15-3-000 on April 14, 2015. During scoping, we are specifically soliciting comments on the range of alternatives for the project.

Although no formal application has been filed, we have already initiated our environmental review under the Commission's pre-filing process. The purpose of the pre-filing process is to encourage early involvement of interested stakeholders and to identify and resolve issues before the FERC receives a formal application from Mountain Valley. During the pre-filing process, we contacted federal and state agencies to discuss their involvement in scoping and the preparation of the EIS.

Docket No. PF15-3-000

With this notice, we are asking agencies with jurisdiction by law and/or special expertise with respect to the environmental issues related to this project to formally cooperate with us in the preparation of the EIS.<sup>4</sup> Agencies that would like to request cooperating agency status should follow the instructions for filing comments provided under the Public Participation section of this notice. Currently, the U.S. Department of Agriculture, Forest Service, Jefferson National Forest (USFS); U.S. Army Corps of Engineers, Huntington and Norfolk Districts; U.S. Environmental Protection Agency, Region 3; U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration; West Virginia Department of Natural Resources; and West Virginia Department of Environmental Protection expressed their intention to participate as cooperating agencies in the preparation of the EIS.

The EIS will present our independent analysis of the issues. We will publish and distribute a draft EIS for public comment. After the comment period, we will consider all timely comments and revise the document, as necessary, before issuing a final EIS.

### **Proposed Actions of the USFS**

The USFS is participating as a cooperating agency because the MVP Project would cross the Jefferson National Forest in West Virginia and Virginia. As a cooperating agency, the USFS intends to adopt the EIS per Title 40 Code of Federal Regulations Part 1506.3 to meet its responsibilities under the NEPA regarding Mountain Valley's planned application to the USFS for a Right-of-Way Grant and Temporary Use Permit for crossing federally administered lands. The USFS additionally will assess how the planned pipeline conforms to the directions contained in the Jefferson National Forest's Land and Resource Management Plan (LRMP). Changes in the LRMP could be required if the pipeline is authorized across the National Forest. The EIS will provide the documentation to support any needed amendments to the LRMP.

### **Consultations Under Section 106 of the National Historic Preservation Act**

In accordance with the Advisory Council on Historic Preservation's implementing regulations for section 106 of the National Historic Preservation Act, we are using this notice to initiate consultation with the applicable State Historic Preservation Offices, and to solicit their views and those of other government agencies, interested Indian tribes, and the public on the project's potential effects on historic properties.<sup>5</sup> We will define the

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<sup>4</sup> The Council on Environmental Quality implementing regulations for the NEPA addresses cooperating agency responsibilities at Title 40, Code of Federal Regulations, Part 1501.6.

<sup>5</sup> The Advisory Council on Historic Preservation implementing regulations for the National Historic Preservation Act are at Title 36, Code of Federal Regulations, Part 800.

Docket No. PF15-3-000

project-specific Area of Potential Effects (APE) in consultation with the SHPOs as the project develops. On natural gas facility projects, the APE at a minimum encompasses all areas subject to ground disturbance (examples include construction right-of-way, contractor/pipe storage yards, compressor stations, and access roads). Our EIS for this project will document our findings on the impacts on historic properties and summarize the status of consultations under section 106.

### **Currently Identified Environmental Issues**

We have already identified several issues that we think deserve attention in the EIS, from our preliminary review of the planned facilities, environmental information provided by Mountain Valley, and comments by stakeholders. This preliminary list of issues may change based on your comments and our further analyses. These issues include:

- karst terrain, sinkholes, and caves;
- domestic water sources, wells, springs, and waterbodies;
- forested areas;
- federally-listed threatened and endangered species, including mussels and bats;
- National Register of Historic Places listed Rural Historic Districts and other historic properties;
- Appalachian Trail, Blue Ridge Parkway, and other scenic by-ways;
- residential developments and property values;
- tourism and recreation;
- local infrastructure and emergency response systems;
- public safety;
- operational noise from planned compressor stations; and
- alternatives and their potential impacts on a range of resources.

### **Environmental Mailing List**

The environmental mailing list includes federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Indian tribes and Native American organizations; other interested parties; and local libraries and newspapers. This list also includes all affected landowners (as defined in the Commission's regulations) who are potential right-of-way grantors, whose property may be used temporarily for project purposes, or who own homes within certain distances of

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Those regulations define historic properties as any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places.

Docket No. PF15-3-000

aboveground facilities, and anyone who provides a mailing addressed when they submit comments on the project. We will update the environmental mailing list as the analysis proceeds to ensure that we send the information related to this environmental review to all individuals, organizations, and government entities interested in and/or potentially affected by the planned project.

Copies of the completed draft EIS will be sent to the environmental mailing list for public review and comment. **If you would prefer to receive a paper copy of the document instead of the CD version or would like to remove your name from the mailing list, please return the attached Information Request (appendix 2).**

### **Becoming an Intervenor**

Once Mountain Valley files its formal application with the Commission, you may want to become an “intervenor” which is an official party to the Commission’s proceeding. Intervenors play a more formal role in the process and are able to file briefs, appear at hearings, and be heard by the courts if they choose to appeal the Commission’s final ruling. An intervenor formally participates in the proceeding by filing a request to intervene. Instructions for becoming an intervenor are in the User’s Guide under the e-filing link on the Commission’s website. Please note that the Commission will not accept requests for intervenor status during the pre-filing process. You must wait until the Commission receives a formal application for the project from Mountain Valley, and the FERC issues a Notice of Application.

### **Additional Information**

Additional information about the project is available from the Commission’s Office of External Affairs, at **(866) 208-FERC**, or on the FERC website ([www.ferc.gov](http://www.ferc.gov)) using the eLibrary link. Click on the eLibrary link, click on General Search, and enter the docket number, excluding the last three digits in the Docket Number field (i.e., PF15-3). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at [FercOnlineSupport@ferc.gov](mailto:FercOnlineSupport@ferc.gov) or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to [www.ferc.gov/docs-filing/esubscription.asp](http://www.ferc.gov/docs-filing/esubscription.asp).

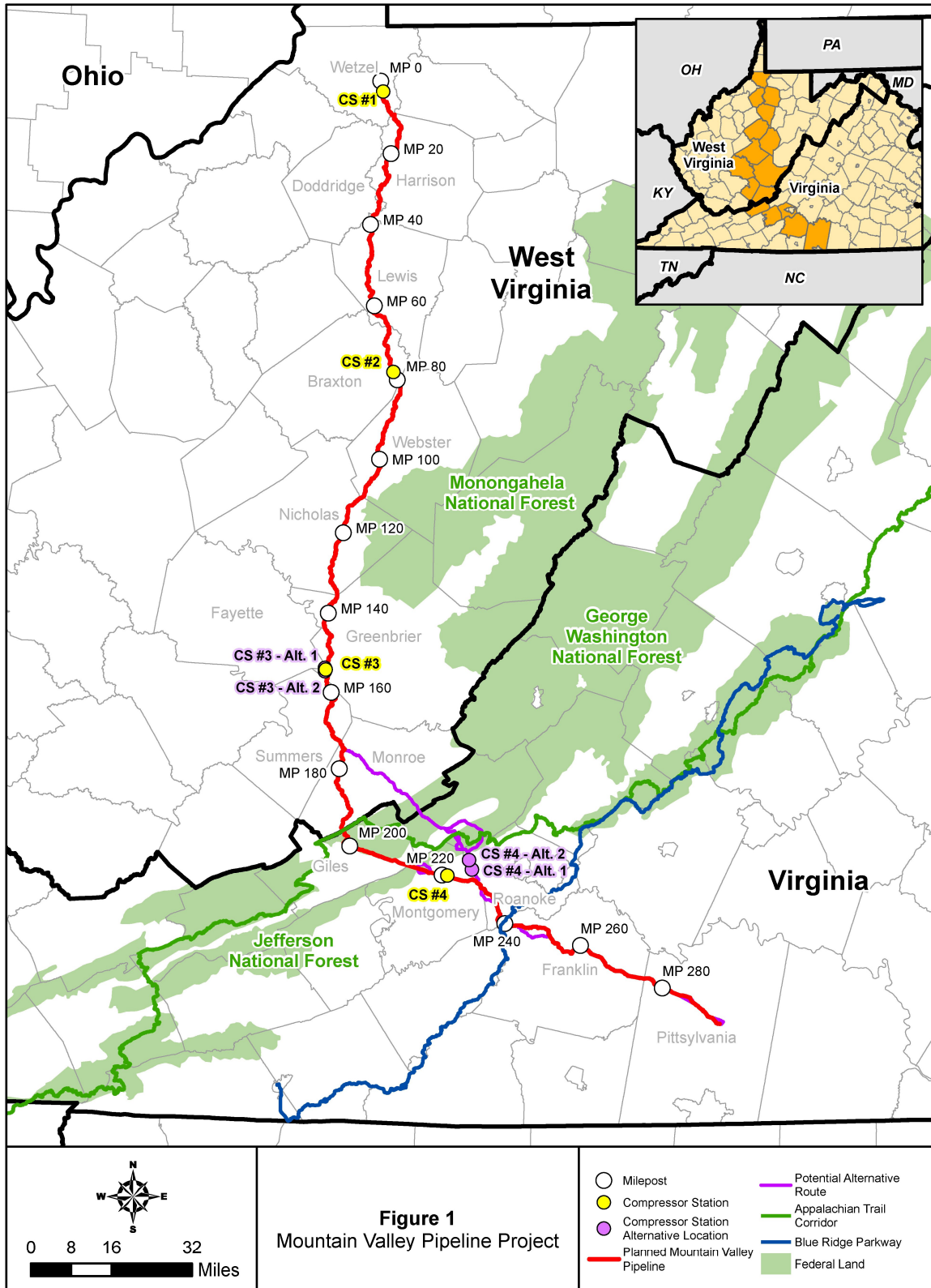
Docket No. PF15-3-000

Finally, public meetings or site visits will be posted on the Commission's calendar located at [www.ferc.gov/EventCalendar/EventsList.aspx](http://www.ferc.gov/EventCalendar/EventsList.aspx) along with other related information.

Kimberly D. Bose,  
Secretary

Docket No. PF15-3-000

# Appendix 1



**INFORMATION REQUEST**

**MOUNTAIN VALLEY PIPELINE PROJECT**

**Name** \_\_\_\_\_

**Agency** \_\_\_\_\_

**Address** \_\_\_\_\_

**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip Code** \_\_\_\_\_

- Please send me a paper copy of the draft EIS**
- Please remove my name from the mailing list**



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**FROM** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**ATTN: OEP – DG2E - Gas 3, PJ-11.3**  
**Federal Energy Regulatory Commission**  
**888 First Street NE**  
**Washington, DC 20426**

*Docket No. PF15-3-000 Mountain Valley Pipeline Project*

**Staple or Tape Here**

Document Content(s)

PF15-3-000 APRIL 17 2015.DOC.....1-13

UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Mountain Valley Pipeline, LLC

Docket No. CP16-10-000  
Docket No. PF15-3-000

Equitrans, LP

Docket No. CP16-13-000  
Docket No. PF15-22-000

NOTICE OF APPLICATIONS

(November 5, 2015)

On October 23, 2015, Mountain Valley Pipeline, LLC (Mountain Valley), having its principal place of business at 625 Liberty Avenue, Suite 1700, Pittsburgh, Pennsylvania 15222-3111, filed an application pursuant to section 7(c) of the Natural Gas Act (NGA) and the Federal Energy Regulatory Commission's (Commission) regulations seeking: (1) a certificate of public convenience and necessity authorizing Mountain Valley to construct, own, and operate the Mountain Valley Pipeline Project; (2) a blanket certificate of public convenience and necessity authorizing Mountain Valley to provide open-access interstate transportation services, with pre-granted abandonment approval; (3) a blanket certificate of public convenience and necessity under Part 157, Subpart F of the Commission's regulations for Mountain Valley to construct, operate, acquire, and abandon certain eligible facilities, and services related thereto; (4) approval for its proposed interim period rates and initial recourse rates for transportation service and for its pro forma tariff; and (5) such other authorizations or waivers as may be deemed necessary to allow for the construction to commence as proposed.

On October 27, 2015, Equitrans, LP (Equitrans), having its principal place of business at 625 Liberty Avenue, Suite 1700, Pittsburgh, Pennsylvania 15222-3111, filed an application pursuant to sections 7(b) and 7(c) of the Natural Gas Act (NGA) and the Federal Energy Regulatory Commission's (Commission) regulations seeking a certificate of public convenience and necessity to construct, own, and operate the Equitrans Expansion Project. Equitrans also seeks authority to abandon an existing compressor station located in Greene County, Pennsylvania.

The proposals of both applicants are more fully described in the applications, which are on file with the Commission and open to public inspection. The filings may also be viewed on the web at <http://www.ferc.gov> using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC at [FERCOnlineSupport@ferc.gov](mailto:FERCOnlineSupport@ferc.gov) or call toll-free, (866) 208-3676 or TTY, (202) 502-8659.

Any questions regarding the Mountain Valley or Equitrans applications should be directed to Matthew Eggerding, Counsel, 625 Liberty Avenue, Suite 1700, Pittsburgh, PA 15222, or call (412) 553-5786, or fax (412) 553-7781, or by e-mail [meggerding@eqt.com](mailto:meggerding@eqt.com).

Mountain Valley requests authorization to construct facilities that will allow it to provide up to 2.0 million dekatherms per day of firm transportation service. Specifically, Mountain Valley proposes to construct and operate: (1) approximately 301 miles of 42-inch diameter pipeline in West Virginia and Virginia; (2) three new compressor stations providing approximately 171,600 nominal horsepower (hp) of compression; and (3) other minor facilities.

Equitrans requests authorization to construct, own, and operate: (1) approximately 7.87 miles of pipeline in Allegheny, Washington, and Greene Counties, Pennsylvania and Wetzel County, West Virginia; (2) a new 31,300 nominal hp compressor station (Redhook Compressor Station) in Greene County, Pennsylvania; (3) a new interconnect in Wetzel County, West Virginia with Mountain Valley's planned pipeline system (Webster Interconnect); and (4) ancillary facilities. Equitrans also seeks authority to abandon an existing 4,800 hp compressor station in Greene County, Pennsylvania (Pratt Compressor Station) following the construction of the new Redhook Compressor Station.

On October 31, 2014, Commission staff granted Mountain Valley's request to use the pre-filing process and assigned Docket No. PF15-3-000 to staff activities involving the Projects. Now, as of the filing of this application on October 23, 2015, the NEPA Pre-Filing Process for this project has ended. From this time forward, this proceeding will be conducted in Docket No. CP16-10-000 as noted in the caption of this Notice. Additionally, Equitrans, LP (Equitrans) filed a related application under CP16-13-000. On April 9, 2015, Commission staff granted Equitrans request to use the pre-filing process and assigned Docket No. PF15-22-000 to staff activities involving the Projects. Now, as of the filing of Equitrans' application on October 27, 2015, the NEPA Pre-Filing Process for this project has ended. From this time forward, Equitrans' proceeding will be conducted in Docket No. CP16-13-000.

Pursuant to section 157.9 of the Commission's rules, 18 CFR 157.9, within 90 days of this Notice the Commission staff will either: complete its environmental assessment (EA) and place it into the Commission's public record (eLibrary) for this proceeding; or issue a Notice of Schedule for Environmental Review. If a Notice of Schedule for Environmental Review is issued, it will indicate, among other milestones, the anticipated date for the Commission staff's issuance of the final environmental impact statement (FEIS) or EA for this proposal. The filing of the EA in the Commission's public record for this proceeding or the issuance of a Notice of Schedule for Environmental Review will serve to notify federal and state agencies of the timing for the completion of all necessary reviews, and the subsequent need to complete all federal

authorizations within 90 days of the date of issuance of the Commission staff's FEIS or EA.

There are two ways to become involved in the Commission's review of this project. First, any person wishing to obtain legal status by becoming a party to the proceedings for this project should, on or before the comment date stated below file with the Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426, a motion to intervene in accordance with the requirements of the Commission's Rules of Practice and Procedure (18 CFR 385.214 or 385.211) and the Regulations under the NGA (18 CFR 157.10). A person obtaining party status will be placed on the service list maintained by the Secretary of the Commission and will receive copies of all documents filed by the applicant and by all other parties. A party must submit 7 copies of filings made in the proceeding with the Commission and must mail a copy to the applicant and to every other party. Only parties to the proceeding can ask for court review of Commission orders in the proceeding.

However, a person does not have to intervene in order to have comments considered. The second way to participate is by filing with the Secretary of the Commission, as soon as possible, an original and two copies of comments in support of or in opposition to this project. The Commission will consider these comments in determining the appropriate action to be taken, but the filing of a comment alone will not serve to make the filer a party to the proceeding. The Commission's rules require that persons filing comments in opposition to the project provide copies of their protests only to the party or parties directly involved in the protest.

Persons who wish to comment only on the environmental review of this project should submit an original and two copies of their comments to the Secretary of the Commission. Environmental commentators will be placed on the Commission's environmental mailing list, will receive copies of the environmental documents, and will be notified of meetings associated with the Commission's environmental review process. Environmental commentators will not be required to serve copies of filed documents on all other parties. However, the non-party commentators will not receive copies of all documents filed by other parties or issued by the Commission (except for the mailing of environmental documents issued by the Commission) and will not have the right to seek court review of the Commission's final order.

The Commission strongly encourages electronic filings of comments, protests and interventions in lieu of paper using the "eFiling" link at <http://www.ferc.gov>. Persons unable to file electronically should submit an original and 5 copies of the protest or

Docket Nos. CP16-10-000 *et al.*

4

intervention to the Federal Energy regulatory Commission, 888 First Street, NE,  
Washington, DC 20426.

Comment Date: 5:00pm Eastern Time on November 26, 2015.

Nathaniel J. Davis, Sr.,  
Deputy Secretary.

Document Content(s)

CP16-10-000 MVP and Equitrans Notice.DOCX.....1-4

UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Mountain Valley Pipeline LLC  
Equitrans LP

Docket No. CP16-10-000  
Docket No. CP16-13-000

NOTICE OF AVAILABILITY OF THE  
DRAFT ENVIRONMENTAL IMPACT STATEMENT  
FOR THE PROPOSED MOUNTAIN VALLEY PROJECT AND  
EQUITRANS EXPANSION PROJECT

(September 16, 2016)

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared a draft environmental impact statement (EIS) for the projects proposed by Mountain Valley Pipeline LLC (Mountain Valley) and Equitrans LP (Equitrans) in the above-referenced dockets. Mountain Valley requests authorization to construct and operate certain interstate natural gas facilities in West Virginia and Virginia, known as the Mountain Valley Project (MVP) in Docket Number CP16-10-000. The MVP is designed to transport about 2 billion cubic feet per day (Bcf/d) of natural gas from production areas in the Appalachian Basin to markets in the Mid-Atlantic and Southeastern United States. Equitrans requests authorization to construct and operate certain natural gas facilities in Pennsylvania and West Virginia, known as the Equitrans Expansion Project (EEP) in Docket No. CP16-13-000. The EEP is designed to transport about 0.4 Bcf/d of natural gas, to improve system flexibility and reliability, and serve markets in the Northeast, Mid-Atlantic, and Southeast, through interconnections with various other interstate systems, including the proposed MVP.

The draft EIS assesses the potential environmental effects of the construction and operation of the MVP and EEP in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the MVP and EEP would have some adverse environmental impacts; however, these impacts would be reduced with the implementation of Mountain Valley's and Equitrans' proposed mitigation measures, and the additional measures recommended by the FERC staff in the EIS.

The United States Department of Agriculture Forest Service (FS), U.S. Army Corps of Engineers (COE), U.S. Environmental Protection Agency, U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Transportation, West Virginia Department of Environmental Protection, and West Virginia Division of Natural Resources participated as cooperating agencies in the preparation of the EIS. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposals and participated in the NEPA analysis. The BLM, COE, and FS may adopt and use the EIS when they consider the issuance of a



Docket Nos. CP16-10-000  
and CP16-13-000

- 2 -

Right-of-Way Grant to Mountain Valley for the portion of the MVP that would cross federal lands. Further, the FS may use the EIS when it considers amendments to its Land and Resource Management Plan (LRMP) for the proposed crossing of the Jefferson National Forest. Although the cooperating agencies provided input to the conclusions and recommendations presented in the draft EIS, the agencies will present their own conclusions and recommendations in their respective permit authorizations and Records of Decision (ROD) for the projects.

### **Proposed Facilities**

The draft EIS addresses the potential environmental effects of the construction and operation of the proposed facilities. For the MVP, facilities include:

- about 301 miles of new 42-inch-diameter pipeline extending from the new Mobley Interconnect in Wetzel County, West Virginia to the existing Transcontinental Gas Pipe Line Company LLC (Transco) Station 165 in Pittsylvania County, Virginia;
- 3 new compressor stations (Bradshaw, Harris, Stallworth) in West Virginia, totaling about 171,600 horsepower (hp);
- 4 new meter and regulation stations and interconnections (Mobley, Sherwood, WB, and Transco);
- 2 new taps (Webster and Roanoke);
- 5 pig<sup>1</sup> launchers and receivers; and
- 36 mainline block valves.

For the EEP, facilities include:

- about 8 miles total of new various diameter pipelines in six segments;
- new Redhook Compressor Station, in Greene County, Pennsylvania, with 31,300 hp of compression;
- 4 new taps (Mobley, H-148, H-302, H-306) and 1 new interconnection (Webster);
- 4 pig launchers and receivers; and
- decommissioning and abandonment of the existing 4,800 hp Pratt Compressor Station in Greene County, Pennsylvania

### **Actions of the Bureau of Land Management and the Forest Service**

The BLM's purpose and need for the proposed action is to respond to a Right-of-Way Grant application submitted by Mountain Valley on April 5, 2016. Under the Mineral Leasing Act of 1920 the Secretary of the Interior has delegated authority to the BLM to grant a right-of-way in response to the Mountain Valley application for natural

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<sup>1</sup> A "pig" is a device used to clean or inspect the interior of a pipeline.

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and CP16-13-000

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gas transmission on federal lands under the jurisdiction of two or more federal agencies. Before issuing the Right-of-Way Grant, the BLM must receive the written concurrence of the other surface managing federal agencies (i.e., FS and COE) in accordance with Title 43 Code of Federal Regulations (CFR) Part 2882.3(i). Through this concurrence process, the FS and COE would submit to the BLM any specific stipulations applicable to their lands, facilities, waterbodies, and easements for inclusion in the Right-of-Way Grant.

The FS's purpose and need for the proposed action is to consider issuing a concurrence to the BLM for the Right-of-Way Grant and to evaluate the amendments to the LRMP for the Jefferson National Forest that would make provision for the MVP pipeline if the FS decides to concur and BLM decides to issue a Right-of-Way Grant.

The first type of LRMP amendment would be a "plan-level amendment" that would change land allocations. This would change future management direction for the lands reallocated to the new management prescription (Rx) and is required by LRMP Standard FW-248.

**Proposed Amendment 1:** The LRMP would be amended to reallocate 186 acres to the Management Prescription 5C-Designated Utility Corridors from these Rxs: 4J-Urban/Suburban Interface (56 acres); 6C-Old Growth Forest Communities-Disturbance Associated (19 ac); and 8A1- Mix of Successional Habitats in Forested Landscapes (111 acres).

Rx 5C- Designated Utility Corridors contain special uses which serve a public benefit by providing a reliable supply of electricity, natural gas, or water essential to local, regional, and national economies. The new Rx 5C land allocation would be 500 feet wide (250 feet wide on each side of the pipeline), with two exceptions: 1) the area where the pipeline crosses Rx 4A-Appalachian National Scenic Trail Corridor would remain in Rx 4A; and 2) the new 5C area would not cross into Peters Mountain Wilderness so the Rx 5C area would be less than 500 feet wide along the boundary of the Wilderness.

The second type of amendment would be a "project-specific amendment" that would apply only to the construction and operation of this pipeline. The following amendments would grant a temporary 'waiver' to allow the project to proceed. These amendments would not change LRMP requirements for other projects or authorize any other actions.

**Proposed Amendment 2:** The LRMP would be amended to allow construction of the MVP pipeline to exceed restrictions on soil conditions and riparian corridor conditions as described in LRMP standards FW-5, FW-9, FW-13, FW-14 and 11-017,

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provided that mitigation measures or project requirements agreed upon by the Forest Service are implemented as needed.

**Proposed Amendment 3:** The LRMP would be amended to allow the removal of old growth trees within the construction corridor of the MVP pipeline. (reference LRMP Standard FW-77)

**Proposed Amendment 4:** The LRMP would be amended to allow the MVP pipeline to cross the Appalachian National Scenic Trail (ANST) on Peters Mountain. The Scenic Integrity Objective (SIO) for the Rx 4A area and the ANST will be changed from High to Moderate. This amendment also requires the SIO of Moderate to be achieved within five to ten years following completion of the project to allow for vegetation growth. (reference LRMP Standards 4A-021 and 4A-028).

The decision for a Right-of-Way Grant across federal lands would be documented in a ROD issued by the BLM. The BLM's decision to issue, condition, or deny a right-of-way would be subject to BLM administrative review procedures established in 43 CFR 2881.10 and Section 313(b) of the Energy Policy Act. The FS concurrence to BLM to issue the Right-of-Way Grant would not be a decision subject to NEPA, and therefore would not be subject to FS administrative review procedures. The FS would issue its own ROD for the LRMP amendments. The Forest Supervisor for the Jefferson National Forest would be the Responsible Official for the LRMP amendments. Proposed Amendment 1 was developed in accordance to 36 CFR 219 (2012 version) regulations and would be subject to the administrative review procedures under 36 CFR 219 Subpart B. Proposed Amendments 2, 3 and 4 were developed in accordance to 36 CFR 219 (2012) regulations but would be subject to the administrative review procedures under 36 CFR 218 regulations Subparts A and B, per 36 CFR 219.59(b).

The BLM is requesting public comments on the issuance of a Right-of-Way Grant that would allow the MVP pipeline to be constructed on federal lands managed by the FS and COE. The FS is requesting public comments on the consideration of submitting a concurrence to BLM and the draft amendments of the LRMP to allow the MVP pipeline to cross the Jefferson National Forest. All comments must be submitted to the FERC, the lead federal agency, within the timeframe stated in this Notice of Availability. Refer to Docket CP16-10-000 (MVP) in all correspondence to ensure that your comments are correctly filed in the record. You may submit comments to the FERC using one of the four methods listed below in this notice. Before including your address, phone number, email address, or other personal identifying information in your comments, you should be aware that the entire text of your comments—including your personal identifying information— would be publicly available through the FERC eLibrary system, if you file your comments with the Secretary of the Commission.

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and CP16-13-000

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### **Distribution and Comments on the Draft Environmental Impact Statement**

The FERC staff mailed copies of the draft EIS to federal, state, and local government representatives and agencies; elected officials; regional environmental groups and non-governmental organizations; potentially interested Native Americans and Indian tribes; affected landowners; local newspapers and libraries; parties to this proceeding; and members of the public who submitted comments about the projects. Paper copy versions of this draft EIS were mailed to those specifically requesting them; all others received a compact-disc version. In addition, the draft EIS is available for public viewing on the FERC's website ([www.ferc.gov](http://www.ferc.gov)).<sup>2</sup> A limited number of copies are available for distribution and public inspection at:

Federal Energy Regulatory Commission  
Public Reference Room  
888 First Street NE, Room 2A  
Washington, DC 20426  
(202) 502-8371

Any person wishing to comment on the draft EIS may do so. To ensure consideration of your comments on the proposal in the final EIS, it is important that the Commission receive your comments on or before **December 22, 2016**.

For your convenience, there are four methods you can use to submit your comments to the Commission. The Commission will provide equal consideration to all comments received, whether filed in written form or provided verbally. The Commission encourages electronic filing of comments and has expert staff available to assist you at (202) 502-8258 or [efiling@ferc.gov](mailto:efiling@ferc.gov). Please carefully follow these instructions so that your comments are properly recorded.

- 1) You can file your comments electronically using the eComment feature on the Commission's website ([www.ferc.gov](http://www.ferc.gov)) under the link to Documents & Filings. This is an easy method for submitting brief, text-only comments on a project;
- 2) You can file your comments electronically by using the eFiling feature on the Commission's website ([www.ferc.gov](http://www.ferc.gov)) under the link to Documents & Filings. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first

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<sup>2</sup> Go to "Documents & Filings," click on "eLibrary," use "General Search" and put in the Docket numbers (CP16-10 or CP16-13) and date of issuance (09/16/16).

Docket Nos. CP16-10-000  
and CP16-13-000

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create an account by clicking on “[eRegister](#).” If you are filing a comment on a particular project, please select “Comment on a Filing” as the filing type; or

- 3) You can file a paper copy of your comments by mailing them to the following address. Be sure to reference the project docket number (CP16-10-000 or CP16-13-000) with your submission::

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street NE, Room 1A  
Washington, DC 20426

- 4) In lieu of sending written or electronic comments, the Commission invites you to attend one of the public sessions its staff will conduct in the project area to receive verbal comments on the draft EIS. To ensure that interested parties have ample opportunity to attend, the FERC staff has arranged for seven public sessions, at venues spaced a reasonable driving distance apart, and scheduled as listed below.

There will not be a formal presentation by Commission staff at any of the seven public comment sessions, although a format outline handout will be made available. All public sessions will begin at 5:00 pm Eastern time. If you wish to provide verbal comments, the Commission staff will hand out numbers in the order of your arrival, and will discontinue handing them out at 8:00 pm. Comments will be taken until 10:00 pm. However, if no additional numbers have been handed out and all individuals who wish to provide comments have had an opportunity to do so, staff may conclude the session at 8:00 pm.

The primary goal of the public sessions is to allow individuals to provide verbal comments on the draft EIS. Individual verbal comments will be taken on a one-on-one basis with a stenographer (with FERC staff or representative present), called up in the order of the numbers received. Because we anticipate considerable interest from concerned citizens, this format is designed to receive the maximum amount of verbal comments, in a convenient way during the timeframe allotted. If many people are interested in providing verbal comments in the one-on-one setting at any particular session, a time limit of 3 minutes may be implemented for each commenter.

Your verbal comments will be recorded by the stenographer. Transcripts of all comments from the sessions will be placed into the dockets for the projects, which are accessible for public viewing on the FERC’s web site (at [www.ferc.gov](http://www.ferc.gov)) through our eLibrary system.

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and CP16-13-000

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<b>FERC Sponsored Public Sessions in the Project Area to Take Comments on the Draft EIS</b>	
<b>Date</b>	<b>Location <sup>a/</sup></b>
Tuesday, November 1, 2016	Chatham High School 100 Cavalier Circle, Chatham, VA 24531 434-432-8305
Tuesday, November 1, 2016	Lewis County High School 205 Minuteman Drive, Weston, WV 26452 304-269-8315
Wednesday, November 2, 2016	Franklin County High School 700 Taynard Road, Rocky Mount, VA 24151 540-483-0221
Wednesday, November 2, 2016	Nicholas County High School 30 Grizzly Road, Summersville, WV 26651 304-872-2141
Thursday, November 3, 2016	Sheraton Hotel 2801 Hershberger Road, Roanoke, VA 24017 540-563-9300
Thursday, November 3, 2016	Peterstown Elementary School 108 College Drive, Peterstown, WV 24963 304-753-4328
Wednesday, November 9, 2016	California Area High School 11 Trojan Way, Coal Center, PA 15423 724-785-5800
<p><sup>a/</sup> While we have agreements with the venues, contracts have not yet been finalized with the individual Boards of Education. If a School Board declines to sign the contract, the venue may change and the FERC would issue a revised notice to announce the replacement venue.</p>	

Commission staff will be available at each venue of the public sessions to answer questions about our environmental review process. It is important to note that written comments mailed to the Commission and those submitted electronically are reviewed by staff with the same scrutiny and consideration as the verbal comments given at the public sessions.

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR Part 385.214).<sup>3</sup> Only intervenors have the right to seek rehearing of the Commission's decision. The Commission grants affected landowners and others with

<sup>3</sup> See the previous discussion on the methods for filing comments.

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and CP16-13-000

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environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

### **Questions?**

Additional information about the projects is available from the Commission's Office of External Affairs, at (866) 208-FERC, or on the FERC website ([www.ferc.gov](http://www.ferc.gov)). The eLibrary link provides access to all documents filed in a docket, in addition to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings. Go to "Documents & Filings," click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the field (i.e., CP16-10). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at [FercOnlineSupport@ferc.gov](mailto:FercOnlineSupport@ferc.gov) or toll free at (866) 208-3676; for TTY, contact (202) 502-8659.

In addition, the Commission offers a free service called eSubscription that allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to [www.ferc.gov/docs-filing/esubscription.asp](http://www.ferc.gov/docs-filing/esubscription.asp).

Kimberly D. Bose,  
Secretary.

Document Content(s)

CP16-10-000 SEPT 16 2016.DOC.....1-8



## **APPENDIX C**

# **Public Notice Information**

## PUBLIC NOTICE

Publication Date: \_\_\_\_\_

Expiration Date: \_\_\_\_\_ 30 Days After Date of Publication

## TO WHOM IT MAY CONCERN:

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

Mountain Valley Pipeline Project

\_\_\_\_\_  
(Name of Project)

Mountain Valley Pipeline, LLC, 555 Southpointe Boulevard, Suite 200 Canonsburg, Pennsylvania 15317

\_\_\_\_\_  
(Name and address of Applicant)

**SCOPE OF CERTIFICATION:** Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

**DESCRIPTION OF THE ACTIVITY:** Provide a description which details the activity proposed for the wetland, river or stream to be affected.

Mountain Valley Pipeline, LLC (MVP) has proposed to construct a natural gas pipeline that is approximately 301 miles in length and 42-inches in diameter – traversing 11 counties in West Virginia and six counties in Virginia. The design objective of the MVP is to provide timely, cost-effective access to the growing demand for natural gas for use by local distribution companies, industrial users, and power generation facilities in the Mid-Atlantic, southeastern, and Appalachian region. The proposed MVP route would begin at the existing Equitrans, LP transmission system near the Mobley processing facility in Wetzel County, West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Pittsylvania County, Virginia. In addition to the pipeline itself, the MVP project would include three compressor station facilities, each of which are currently planned for location along the route in West Virginia, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

While significant efforts were made to avoid wetlands and waterbodies along the entire route, in select circumstances there are environmental effects that are deemed unavoidable. In West Virginia, the proposed MVP route would consist of 195 miles of pipeline, which is roughly 65% of the total MVP route, and three compressor stations. The MVP project team is proposing to utilize a 125-foot temporary right-of-way to safely construct the pipeline; and a 50-foot permanent right-of-way in order to properly maintain and safely operate the pipeline once in-service. Due to the various constraints of siting and constructing, MVP anticipates that the Project will have temporary impacts to approximately 49,892 linear feet of streams and 18.9 acres of wetlands in West Virginia during the construction phase. And given the size and scope of the project throughout the state, it is estimated that 3,125 linear feet of streams and 10 acres of wetlands would be permanently impacted, primarily due to access road and compressor station facilities.

**Any other State issued permit numbers, if applicable and available:**

**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W  
Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W  
Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

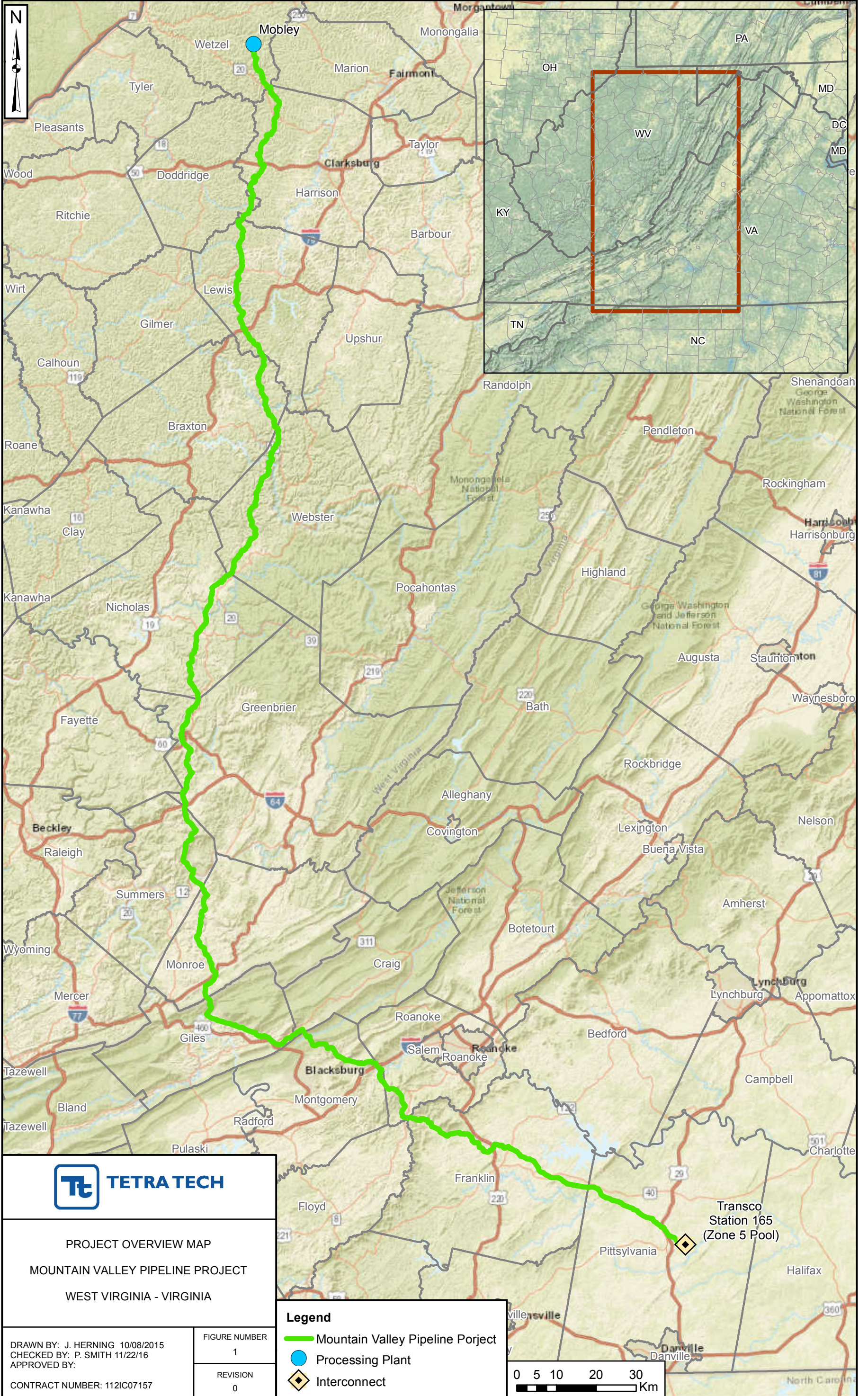
**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

**WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57<sup>th</sup> Street SE  
Charleston, West Virginia 25304**

**COMMENTS: Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:**

**WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57<sup>th</sup> Street SE  
Charleston, West Virginia 25304**

**Comments and information postmarked later than the expiration date may not be considered.**



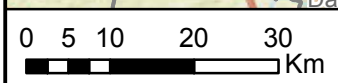
**PROJECT OVERVIEW MAP**  
**MOUNTAIN VALLEY PIPELINE PROJECT**  
**WEST VIRGINIA - VIRGINIA**

DRAWN BY: J. HERNING 10/08/2015  
 CHECKED BY: P. SMITH 11/22/16  
 APPROVED BY:  
 CONTRACT NUMBER: 112IC07157

FIGURE NUMBER	1
REVISION	0

**Legend**

- Mountain Valley Pipeline Project
- Processing Plant
- ◆ Interconnect



**Legal Notices**

**PUBLIC NOTICE**

Publication Date: 4/6/16  
Expiration Date: 5/6/1630  
Days After Date of Publication

**TO WHOM IT MAY CONCERN:**  
State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

Mountain Valley Pipeline Project  
Mountain Valley Pipeline, LLC  
555 Southpointe Boulevard,  
Suite 200 Cannonsburg  
Pennsylvania 15317

**SCOPE OF CERTIFICATION:** Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification; public comment, hearings and appeals are in Title 47, Series 5A.

**DESCRIPTION OF THE ACTIVITY:** Provide a description which details the activity proposed for the wetland, river or stream to be affected.

MVP is proposing to construct a pipeline 301 miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at the existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia. In addition to the pipeline, the Project will include 3 compressor stations currently planned along the route, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

While significant effort was made to avoid wetland and waterbody impacts, impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a linear project of this size. MVP anticipates that the Project will have temporary impacts to approximately 49,892 linear feet of streams and unavoidable permanent impacts to approximately 3,125 linear feet of streams within West Virginia. MVP anticipates that the Project will have temporary impacts to approximately 18.9 acres of wetlands and unavoidable permanent impacts to approximately 10 acres of wetlands within West Virginia.

**Any other State issued permit numbers, if applicable and available:**

**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W  
Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W  
Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57th Street SE  
Charleston, West Virginia 25304

**COMMENTS; and information relating to Section 401 Water Quality Certification for this activity are hereby solicited.** Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57th Street SE  
Charleston, West Virginia 25304

Comments and information postmarked later than the expiration date may not be considered.

**WETZEL CHRONICLE**

New Martinsville, WV April 13, 2016

State of West Virginia, County of Wetzel:

Personally appeared before the undersigned, a Notary Public,  
Brian Clutter who, being duly sworn,

states that he is the manager of the Wetzel Chronicle, a weekly newspaper of general circulation, published at New Martinsville, County of Wetzel, State of West Virginia, and that a copy of the notice attached hereto was published for.....2.....successive

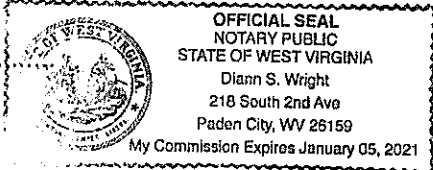
weeks in the Wetzel Chronicle, beginning on the 6.....day of April....., 2016 and ending on the 13.....day of April....., 2016.

Brian Clutter  
.....  
Manager, Wetzel Chronicle

Subscribed and sworn to before me, a Notary Public of said County, on this 13..... day of April....., 2016.

Diann S. Wright  
..... Notary Public

My commission expires on the 5th day of January, 2021.

Printers Fee.....  


**PUBLIC NOTICE**  
 Publication Date: April 7, 2016 & April 14, 2016  
 Expiration Date: May 7, 2016  
 TO WHOM IT MAY CONCERN:  
 State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:  
 Name of Project: Mountain Valley Pipeline  
 Name and address of Applicant: Mountain Valley Pipeline, LLC, 555 Southpointe Boulevard, Suite 200, Canonsburg, Pennsylvania 15317.

**SCOPE OF CERTIFICATION:** Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

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While significant effort was made to avoid wetland and waterbody impacts, impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a linear project of this size. MVP anticipates that the Project will have temporary impacts to approximately 49,892 linear feet of streams and unavoidable permanent impacts to approximately 3,125 linear feet of streams within West Virginia. MVP anticipates that the Project will have temporary impacts to approximately 18.9 acres of wetlands and unavoidable permanent impacts to approximately 10 acres of wetlands within West Virginia.

Any other State issued permit numbers, if applicable and available:

**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

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Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W

Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

WV Department of Environmental Protection  
 Division of Water and Waste Management 401 Certification Program  
 601 57th Street SE  
 Charleston, West Virginia 25304

**COMMENTS:** Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

WV Department of Environmental Protection  
 Division of Water and Waste Management 401 Certification Program  
 601 57th Street SE  
 Charleston, West Virginia 25304

Comments and information postmarked later than the expiration date may not be considered.

**PUBLISHER'S CERTIFICATE**

I, Loretta Greenhouse  
 \_\_, Classified Manager of THE EXPONENT TELEGRAM, a newspaper of general circulation published in the city of Clarksburg, County and state aforesaid, do hereby certify that the annexed:

**PUBLIC NOTICE**

was published in THE EXPONENT-TELEGRAM 2 time(s) commencing on 04/07/2016 and ending on 04/14/2016 at the request of

**EQT CORP..**

Given under my hand this 04/19/16.

The publisher's fee for said publication is: \$196.91.

Loretta Greenhouse

Classified Manager of The Exponent-Telegram

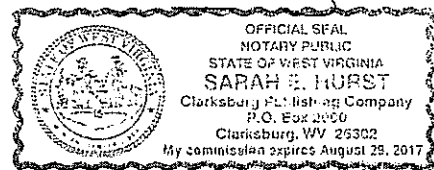
Subscribed to and sworn to before me this 04/19/16

Sarah E. Hurst

Notary Public in and for Harrison County, WV

My commission expires on

The 20th day of August 2017



# Clinic, three eateries and grocery store construction underway

by Darlene J. Swiger  
STAFF WRITER

A new medical facility and three new eateries are under construction in the Bridgeport area, along with a new grocery store.

The Manchin Clinic of Bridgeport should be open June 1 in downtown, according to Dr. John Manchin III.

Sol Azteca, featuring Mexican cuisine, is anticipating opening next month, Bridgeport Community Director Randy Spellman said.

"Located in the Home Depot Plaza on Main Street, it could be open in the next few weeks. It will be in the former Hank's Deli building," Spellman said.

Shop 'n Save is looking at a June opening as well, according to owner Tom Jamieson. The grocery store is located at the corner of East Main Street and W.Va. 131 across from Oliverio's Ristorante & Catering.

Two new restaurants are

coming to the White Oaks development. T.G.I. Friday's broke ground last fall and resumed construction last week, Spellman said.

"It is located across the street from the Courtyard by Marriott Hotel and should be open in late summer or early fall," Spellman said. "A smaller independent restaurant named Cody's is also going in at White Oaks."

Cody's, featuring a wide variety menu, is beside McFly Outdoors. It is scheduled to open by the end of the month, he said.

The Manchin Clinic is working to equip the facility at this time.

"We are about one month away from opening. We were hoping to open in May. But, it looks like it is going to be June 1. Getting all the equipment in the building is the hurdle we are trying to jump now," Manchin said.

The wood frame, two-story, 10,000-square-foot struc-



Photo by Joe Signorelli

The Manchin Clinic in Bridgeport is scheduled to open next month.

ture is located at the site of the former Hardee's on West

Main Street, Spellman said. Petrucci Brothers Construction of Farmington is the general contractor on the \$1.2 million project, Spellman added.

It will feature the same

services as those offered at Manchin Clinic in Farmington and Manchin Clinic South in Fairmont, Manchin explained.

See Clinic, 17

## PUBLIC NOTICE

Publication Date: 4/14/16 & 4/21/16  
Expiration Date: 5/14/16 30 Days After Date of Publication  
TO WHOM IT MAY CONCERN:

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

Mountain Valley Pipeline Project  
(Name of Project)

Mountain Valley Pipeline, LLC, 555 Southpointe Boulevard, Suite 200 Canonsburg, Pennsylvania 15317  
(Name and address of Applicant)

**SCOPE OF CERTIFICATION:** Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

**DESCRIPTION OF THE ACTIVITY:** Provide a description which details the activity proposed for the wetland, river or stream to be affected.

MVP is proposing to construct a pipeline 301 miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at the existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia. In addition to the pipeline, the Project will include 3 compressor stations currently planned along the route, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

While significant effort was made to avoid wetland and waterbody impacts, impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a linear project of this size. MVP anticipates that the Project will have temporary impacts to approximately 49,892 linear feet of streams and unavoidable permanent impacts to approximately 3,125 linear feet of streams within West Virginia. MVP anticipates that the Project will have temporary impacts to approximately 18.9 acres of wetlands and unavoidable permanent impacts to approximately 10 acres of wetlands within West Virginia.

Any other State issued permit numbers, if applicable and available:

**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W  
Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W  
Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57th Street SE, Charleston, West Virginia 25304

**COMMENTS:** Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

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601 57th Street SE, Charleston, West Virginia 25304

Comments and information postmarked later than the expiration date may not be considered.

#026930 **Gutter Express, Inc.**

- 5 and 6 inch seamless gutter
- Leaf-guards with 1-year money-back-guarantee
- We offer a full-time, contractor licensed and insured, professional gutter company with 13 years experience.
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**304-884-7163**  
We are a Licensed Contractor, to find out who isn't, Call 304-558-2447, WV Contractor Lic. Board

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**PREMIER BODY WORKS**  
Your Collision Repair Professionals

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- \* Lifetime Paint Warranty
- \* Ask About Our Color Match Guarantee

**FREE ESTIMATES**  
579 Monumental Road  
1 1/2 miles past the Covered Bridge

RECOGNIZED FOR HIGH QUALITY STANDARDS & QUALITY WORKMANSHIP

**304-363-6049**

# The Doddridge Independent

## The Doddridge Independent PUBLISHER'S CERTIFICATE

I, Michael D. Zorn, Publisher of The Doddridge Independent, A newspaper of general circulation published in the town of West Union, Doddridge County, West Virginia, do hereby certify that:

### PUBLIC NOTICE - TO WHOM IT MAY CONCERN:

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

Mountain Valley Pipeline Project

Mountain Valley Pipeline, LLC. 555 Southpointe Boulevard,  
Suite 200 Canonsburg, Pennsylvania 15317

was published in The Doddridge Independent  
2 times commencing on Friday, April 1, 2016 and  
Ending on Friday, April 15, 2016 at the request of:

**Mountain Valley Pipeline LLC & WV  
Department of Environmental Protection**

Given under my hand this Friday, April 22, 2016

The publisher's fee for said publication is:

**\$ 74.43 1st Run/\$ 55.82 Subsequent Runs**


**This Legal Ad Total: \$ 130.25**

  
\_\_\_\_\_  
Michael D. Zorn

Publisher of The Doddridge Independent

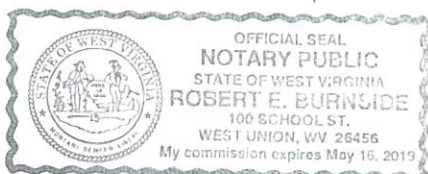
Subscribed to and sworn to before me on

this date: 07 / 26 / 2016

  
\_\_\_\_\_  
Notary Public in and for Doddridge County

My Commission expires on

The 10 day of MAY 20 19





### Public Notice

Publication Date: 4/1/16  
Expiration Date: 5/1/16 30 Days After Date of Publication

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State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

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Mountain Valley Pipeline, LLC. 555 Southpointe Boulevard, Suite 200  
Canonsburg, Pennsylvania 15317

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Any other State issued permit numbers, if applicable and available:  
**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W

Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W

Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

WV Department of Environmental Protection Division of Water and Waste Management 401 Certification Program  
601 57th Street SE

Charleston, West Virginia 25304

**COMMENTS:** Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

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Charleston, West Virginia 25304

**AFFIDAVIT OF PUBLICATION**  
STATE OF WEST VIRGINIA,

COUNTY OF LEWIS, to wit:

I, Robert Billeter, being first duty sworn upon my oath, do depose and say that I am Editor of The Weston Democrat, Inc., a corporation, publisher of the newspaper entitled The Weston Democrat, a Democratic newspaper; that I have been duty authorized by the board of directors of such corporation to execute this affidavit of publication; that such newspaper has been published for more than one year prior to publication of the annexed notice described below; that such newspaper is regularly published weekly; for at least fifty weeks during the calendar year; in the Municipality of Weston, Lewis County, West Virginia; that such newspaper is a newspaper of "general circulation", as that term is defined in article three, chapter fifty-nine of the Code of West Virginia, 1931, as amended, within the publication area or areas of the aforesaid municipality and Lewis County; that such newspaper averages in length four or more pages exclusive of any cover, per issue; that such newspaper is circulated to the general public at a definite price or consideration; that such newspaper is a newspaper to which the general public resorts for passing events of a political,

and for the current happenings, announcements, miscellaneous reading matters, advertisements, and other notices; that the annexed notice of MVP

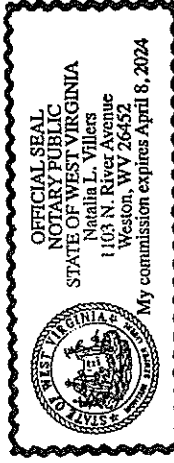
Proposing to construct a Pipeline was duty published in said newspaper once a week for 2 weeks. (Class II), commencing with the issue of the 6 day of April, 2016 and ending with the issue of the 13 day of April, 2016; that said annexed notice was published on the following dates:

April 6 & April 13, 2016; and the cost of publishing said annexed notice as aforesaid was 195.12; total number of words: 932.

Robert Billeter, Editor

Taken, subscribed and sworn to before me in my said county this 13 day of April, 2016.

Natalia A. Villers  
My commission expires 4/8/2024.  
Notary Public in Lewis County, West Virginia.



**LEGAL ADVERTISEMENT**

**PUBLIC NOTICE**  
Publication Date: 4/6/16 & 4/13/16  
Expiration Date: 5/6/16 30 Days After  
Date of Publication

**TO WHOM IT MAY CONCERN:**  
Mountain Valley Pipeline Project  
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Mountain Valley Pipeline, LLC, 555 South-  
pointe Boulevard, Suite 200 Canonsburg,  
Pennsylvania 15317

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pointe Boulevard, Suite 200 Canonsburg,  
Pennsylvania 15317

(Name and address of Applicant)  
**SCOPE OF CERTIFICATION:** Pursu-  
ant to Section 401 of the Federal Clean  
Water Act, the State may, either certify,  
certify with conditions, deny or waive  
certification that the proposed activity  
will comply with Sections 401, 302, 303,  
306 and 307 of the Federal Clean Water  
Act and other appropriate requirements  
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permanent impacts to approximately  
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acres of wetlands and unavoidable pe-  
nent impacts to approximately 10 ac-  
wetlands within West Virginia.

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project and include mile point for r-  
and streams.

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the Project in West Virginia are: 39.562  
-80.54302W

Coordinates for the Project cross  
from West Virginia to Virginia are: 37.403  
-80.68917W

Coordinates for the southern termi-  
of the Project in Virginia are: 36.833  
-79.33784W

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Protection Division of Water and W-  
Management, 401 Certification Progra  
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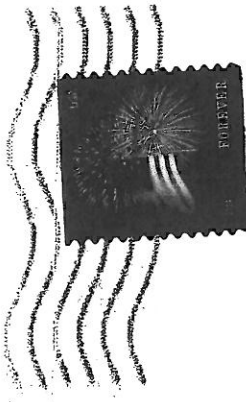
**COMMENTS:** Comments and infor-  
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601 57th Street SE  
Charleston, West Virginia 25304

Comments and information po-  
marked later than the expiration date n  
not be considered.

**BACKFORK PUBLISHING INC.**  
219 Backfork Street  
Webster Springs, WV 26288

CHARLESTON, WV 25304

14 APR 2016 PM 2 1



W Dept of Env. Protection  
601 59th Street Southeast  
Charleston, WV 25304

Attn: Accounting

25304000199



4/13

## LEGAL NOTICE

## LEGAL NOTICE

### PUBLIC NOTICE

Publication Date: 4/6/16 & 4/13/16

Expiration Date: 5/6/16

30 Days After Date of Publication

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Charleston, West Virginia 25304

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**AFFIDAVIT**

STATE OF WEST VIRGINIA  
COUNTY OF WEBSTER, to witt

I, Thomas C. Clark, a publisher of the Webster Echo, a weekly newspaper published in the Town of Webster Springs, County of Webster, State of West Virginia, and the general circulation in that area, the said Webster Echo being a newspaper of opposite politics of the Webster Republican, being duly sworn, do hereby depose and say that the hereto annexed - **Notice of Public Notice**

was duly published in the said paper two consecutive weeks commencing

**April 6th, 2016** and ending **April 13th, 2016**

and I do further depose and say that the said **Notice**

contains **1,176** words and that the publisher's fee was therefore **\$236.67**

Given under my hand this **13th** day of **April, 2016**  
Taken, sworn to and subscribed before me in the state and countys  
aforesaid **13th** day of **April, 2016**

*Thomas C. Clark*

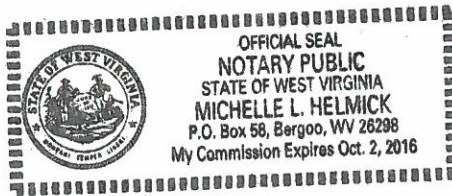
*Michelle L. Helmick*  
\_\_\_\_\_  
Notary Public

My commission expires

*October 3 2016*  
\_\_\_\_\_

Attorney

Code 59-3-4



Webster Echo  
219 Back Fork Street  
Webster Springs, WV 26288

# Invoice

Date	Invoice #
4/8/2016	17180

Bill To
WV Dept. of Env. Protection 601 57th Street Southeast Charleston, WV 25304 Attention: Accounting

**RECEIVED**  
APR 21 2016  
401 PROGRAM

Description	Amount
Legal - Public Notice - 04/06/16	135.24
Legal - same - 04/13/16	101.43
<b>Total</b>	<b>\$236.67</b>

# The Nicholas Chronicle

a division of Nicholas County Publishing Company Inc.

I, Raymond W. Corbin, News Editor of The Nicholas Chronicle, a weekly newspaper published at Summersville in the County of Nicholas, and the State of West Virginia, do certify that the hereto attached Legal Advertisement - EQT Corporation, 625 Liberty Ave., Pittsburgh, PA 15222; MOUNTAIN VALLEY PIPELINE PROJECT appeared in said newspaper for two weeks, on the 7th day of April, 2016; and on the 14th day of April, 2016.

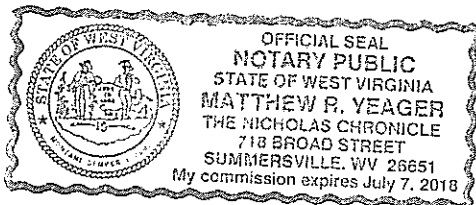
Given under my hand this 14th day of April, 2016.

By Raymond W. Corbin, News Editor.

Fee for publication:

1,288 words @ \$.12 per word, \$154.56 for the first publication; 75% of first publication \$115.92 for all subsequent publications; for a total cost of \$270.48.

The foregoing instrument was acknowledged before me this the 14th day of April, 2016.



Matthew R. Yeager

Notary Public

My commission expires July 7, 2018.

**PUBLIC NOTICE**

Publication Date: 4/7/16 & 4/14/16

Expiration Date: 5/7/16

30 Days After Date of Publication

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Charleston, West Virginia 25304

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4/7, 4/14 2t



# The HINTON NEWS



SUMMERS COUNTY'S BEST AND MOST EFFICIENT ADVERTISING MEDIUM

P. O. DRAWER 1000  
 HINTON, WEST VIRGINIA 25951  
 PHONE (304) 466-0005  
 E-mail Hinton1000@aol.com  
 FEIN #55-053-4497

EQT CORPORATION  
 625 LIBERTY AVE.  
 PITTSBURGH, PA 15222

Terms: 30 Days Net

Date April 18, 2016

Date of Advertising	Items	Price
April 5, 12, 2016	Legal Notice: To Whom it May Concern 675 words @ .11.5¢ first run 75% second..	\$135.85
<p><b>FINANCE CHARGE</b> is computed by a <b>PERIODIC RATE</b> of 1.5% per month which is an <b>ANNUAL PERCENTAGE RATE</b> of 18% applied to the previous balance after deducting current payment and/or credits appearing on this statement.</p>		

P

I, Dawn Crawford, publisher of Hinton News a newspaper in Summers County, West Virginia do hereby certify that the annexed Notice was published in said newspaper for two successive times on the following dates, April 5, 12, 2016

THE PRINTERS FEE THEREFORE IN \$135.85

Given under my hand this 18 day of , 20 16

State of West Virginia)

Dawn Crawford Publisher

County of Summers ) to wit:

Subscribed and sworn to before me this 18 day of April , 20 16

My Commission expires January 17, 2020

NOTARY PUBLIC - OFFICIAL SEAL
STATE OF WEST VIRGINIA
NELLIE M. ROBERTSON
406 Cedar Ave., Hinton WV 25951
My commission expires: 1-17-2020

Nellie M. Robertson
Notary Public

COPY OF PUBLICATION FROM THE HINTON NEWS

NOTARY PUBLIC OFFICIAL SEAL
NELLIE M. ROBERTSON
State of West Virginia
My Comm. Expires Jan 17, 2020
406 Cedar Avenue Hinton WV 25951

LEGAL NOTICE

To Whom It May Concern:

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for Mountain Valley Pipelines.

Scope Certification: Pursuant to Section 401 of the Federal Clean Water Act, the State may either certify, with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and of her appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 6A.

Description of the Activity: Provide a description which details the activity propose for the wetland, river or stream to be affected. MVP is proposing to construct a pipeline 30.1 miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at the existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia. In addition to the pipeline, the Project will include 3 compressor stations currently planned along the route, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

While significant effort was made to avoid wetland and waterbody impacts, impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a linear project of this size. MVP anticipates that the Project will have temporary impacts to approximately 49,892 linear feet of streams and unavoidable permanent impacts to approximately 3,125 linear feet of streams within West Virginia. MVP anticipates that the Project will have temporary impacts to approximately 18.9 acres of wetlands and unavoidable permanent impacts to approximately 10 acres of wetlands within West Virginia.

Any other State issued permit numbers, if applicable and available.

Project Location: Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, 80.64302W. Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, 80.68917W. Coordinates for the southern terminus of the Project in Virginia are: 36.83869N, 79.33784W.

Available: The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday at the following location:

WV Department of Environmental Protection Division of Water and Waste Management 401 Certification Program Charleston, West Virginia 25304

COMMENTS: Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

WV Department of Environmental Protection Division of Water and Waste Management 401 Certification Program 601.571 Street SE Charleston, West Virginia 25304

Comments and information postmarked later than the expiration date may not be considered.

Publication Date: \_\_\_\_\_  
 Expiration Date: \_\_\_\_\_  
 TO WHOM IT CONCERNS: A well-attended Murbles tournament was held at Pipestem last year, featuring the game's creator, Murray Kramer, who will be turning for a second tournament Sunday, May 29, at the state park campground. The event will feature prizes for first, second, and third place and a State Water Quality Murbles set going to first place. Virginia Department of Environmental Protection tournament is open to the public and is free to attend, to pay or to observe.

SCOPE OF CERTIFICATION: "We had a lot of fun in 2015," said Kim Hawkins, activities coordinator at Pipestem. "We offer Murbles as one of our many outdoor games at the park including oddities like disc golf, croquet, golf, wogging, paddle boarding, Irish Road Bowling and more. We're pleased Murray Kramer is returning to conduct this tournament with a game he created and enjoys sharing."

DESCRIPTION: Discover many outdoor activities at Pipestem Resort State Park. To register to play in the Murbles tournament, call the Equitrans, L.P., at 304-466-1800, extension 473 or email Kim.Hawkins@wv.gov

PROJECT LOCATION: While significant Secretary of State Natalie E. Tennant says with the signing of Project 4013, West Virginia becomes the third state in the nation to pass automatic voter registration and continues to be a national leader in election administration. Beginning July 1, 2017, when a West Virginian registers to the DMV for the issuance, renewal or change of address of a motor vehicle driver's license or official identification card, their information will be submitted into the voter registration process.

AVAILABLE: "The passage of automatic voter registration is a perfect example of how West Virginia continues to lead the way in election administration," said Secretary Tennant. "We led the way with our military voting lot project and we've continued to approach our elections administration with innovation and bold initiatives. With the launch of online voter registration on this past fall and the development of automatic voter registration, we are working to make sure that it is as easy as possible for eligible West Virginians to register. Automatic voter registration goes a long way in protecting the integrity of our elections by accurately registering all eligible voters while saving taxpayer dollars in the process."

COMMENTS: \_\_\_\_\_

Comments and \_\_\_\_\_

Comments and \_\_\_\_\_

Comments and \_\_\_\_\_

Comments and \_\_\_\_\_

Comments and \_\_\_\_\_

Things we want you to know: Turn-in required. No cash required. Unlimited use. Valid for the EIT or Card issued by any merchant after final submission. Promotional period ends 10/31/2021. Includes, but not limited to, for Smartphone except in CA where combined.

# Certificate Of Publication

*Mo*

STATE OF WEST VIRGINIA  
 COUNTY OF MONROE, S.S.:

I, Dale P. Mohler, publisher of THE MONROE WATCHMAN, do certify that the annexed advertisement of "Public Notice of A Water Quality Certification Application For Mountain Valley Pipeline Project" in the case (matter) of WV Department of Environmental Protection Division of Water and Waste Management

vs. \_\_\_\_\_  
 was published Two (2) consecutive weeks in THE MONROE WATCHMAN, a newspaper published at Union, Monroe County, West Virginia, beginning the 7th day of April 2016

Given under my hand this 28th day of April 2016

*Dale P. Mohler*

Publisher

Given under my hand this 28th day of April 2016

*McKenzie S. Capaldo*

Notary Public

\$ 269.68

My commission expires on the 2nd day of April 2022  
 McKenzie S. Capaldo  
 Notary Public  
 State of West Virginia  
 My Commission Expires  
 October 03, 2022  
 H C 83 Box 56 A  
 Can Mills, WV 24941

PUBLIC NOTICE

Publication Date: 4/7/16 & 4/14/16

Expiration Date: 5/7/16 30 Days After Date of Publication

TO WHOM IT MAY CONCERN:

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

Mountain Valley Pipeline Project

(Name of Project)

Mountain Valley Pipeline, LLC, 555 Southpointe Boulevard, Suite 200 Canonsburg, Pennsylvania 15317

(Name and address of Applicant)

SCOPE OF CERTIFICATION: Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

DESCRIPTION OF THE ACTIVITY: Provide a description which details the activity proposed for the wetland, river or stream to be affected.

MVP is proposing to construct a pipeline 301 miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at the existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia. In addition to the pipeline, the Project will include 3 compressor stations currently planned along the route, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

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Any other State issued permit numbers, if applicable and available:

PROJECT LOCATION: Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W
Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W
Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

AVAILABLE: The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

WV Department of Environmental Protection
Division of Water and Waste Management
401 Certification Program
601 57th Street SE
Charleston, West Virginia 25304

COMMENTS: Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

WV Department of Environmental Protection
Division of Water and Waste Management
401 Certification Program
601 57th Street SE
Charleston, West Virginia 25304

Comments and information postmarked later than the expiration date may not be considered.

Date Of Publication

of THE MONROE WATCHMAN, do certify of "Public Notice of A Certification Application Mountain Valley Pipeline Project" Department of Environmental Protection and Waste Management

consecutive weeks in THE MONROE published at Union, Monroe County, West Virginia, day of April 20, 16

28th day of April

Q. Mohler

Publisher

28th April day of

J. Capaldo

Notary Public

\$ 269.68

My commission expires on the 20th day of April 2016



Mc Kenzie S. Capaldo
Notary Public
State of West Virginia
My Commission Expires
October 03, 2022
H C 83 Box 56 A
Gap Mills, WV 24941

The West Virginia Daily News  
PO Box 471  
Lewisburg, WV 24901  
PHONE: (304) 645-1206

**AFFIDAVIT OF PUBLICATION**

STATE OF WEST VIRGINIA  
COUNTY OF GREENBRIER,  
TO WIT:

I, Louise Bassett,  
one of the editors of The West Virginia  
Daily News, a daily newspaper of general  
circulation published at Lewisburg, West  
Virginia, in the County of Greenbrier,  
State of West Virginia, do certify that  
publication of the advertisement or  
advertisements attached hereto was made  
in two (2) issues of said  
newspaper, dated

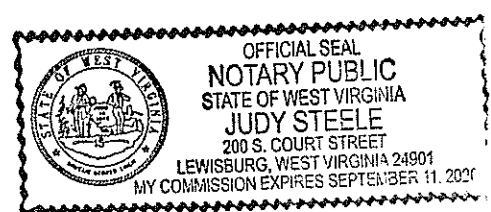
31 March 2016  
7 April 2016  
\_\_\_\_\_  
\_\_\_\_\_

Given under my hand this 7<sup>th</sup> day  
of March, 2016  
Louise Bassett  
\_\_\_\_\_  
Editor or Publisher

Subscribed and sworn to before me this 5<sup>th</sup> day of April, 2016

My commission expires Sept 11, 2020  
Judy Steele, Notary Public

Publication Fee: \$ 174.56



**PUBLIC NOTICE**

Publication Date: 3/31/16 & 4/7/16  
Expiration Date: 4/30/2016  
30 Days After Date of Publication

**TO WHOM IT MAY CONCERN:**

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for: Mountain Valley Pipeline Project  
(Name of Project)

Mountain Valley Pipeline, LLC, 555 Southpointe Boulevard, Suite 200, Canonsburg, Pennsylvania 15317

(Name and address of Applicant)

**SCOPE OF CERTIFICATION:** Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

**DESCRIPTION OF THE ACTIVITY:**

Provide a description which details the activity proposed for the wetland, river or stream to be affected. MVP is proposing to construct a pipeline 301 miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at the existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia. In addition to the pipeline, the Project will include 3 compressor stations currently planned along the route, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

While significant effort was made to avoid wetland and waterbody impacts, impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a linear project of this size. MVP anticipates that the Project will have temporary impacts to approximately 49,892 linear feet of streams and unavoidable permanent impacts to approximately 3,125 linear feet of streams within West Virginia. MVP anticipates that the Project will have temporary impacts to approximately 18.9 acres of wetlands and unavoidable permanent impacts to approximately 10 acres of wetlands within West Virginia.

Any other State issued permit numbers, if applicable and available:

**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W

Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W

Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57<sup>th</sup> Street SE  
Charleston, West Virginia 25304

**COMMENTS:** Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57<sup>th</sup> Street SE  
Charleston, West Virginia 25304

Comments and information postmarked later than the expiration date may not be considered.

(31mr,7ap)

**AFFIDAVIT OF PUBLICATION  
BECKLEY NEWSPAPERS  
BECKLEY, WEST VIRGINIA 25801**

04/07/2016

STATE OF WEST VIRGINIA  
COUNTY OF FAYETTE, to wit:

I, Sonya G. Mitchell, being duly sworn upon my oath, do depose and say that I am Legal Advertising Clerk for Beckley Newspapers, a corporation, publisher of the newspaper entitled The Fayette-Tribune, a Republican newspaper; that I have been duly authorized by the board of directors of such corporation to execute this affidavit of publication; that such newspaper has been published for more than one year prior to publication of the annexed notice described below; that such newspaper is regularly published twice-weekly for at least fifty weeks during the calendar year, in the municipality of Oak Hill, Fayette County, West Virginia: that such newspaper is a newspaper of "general circulation" as that term is defined in article three, chapter fifty-nine of the Code of West Virginia, 1931, as amended, within the publication area of areas of the aforesaid municipality and county; that such newspaper averages in length four or more pages, exclusive of any cover, per issue; that such newspaper is circulated to the general public at a definite price of consideration; that such newspaper is a newspaper to which the general public resorts for passing events of a political, religious, commercial and social nature, and for current happenings, announcements, miscellaneous reading matter, advertisements and other notices; that the annexed notice

of PUBLIC NOTICE

(Description of notice)

was duly published in said newspaper once a week for 2 successive weeks (Class 2), commencing with the issue of 03/31/2016 and ending with the issue of 04/07/2016, that said annexed notice was published on the following dates: 03/31/2016, 04/07/2016, and that the cost of publishing said annexed notice as aforesaid was \$ 302.99

Signed

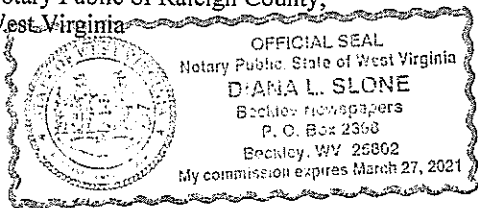
*Sonya G. Mitchell*

Sonya G. Mitchell  
Legal Advertising Clerk  
Beckley Newspapers

Taken, subscribed and sworn to before me in my said county this day:  
04/07/2016

My commission expires March 27, 2021

*Diana L. Slone*  
Notary Public of Raleigh County,  
West Virginia



**COPY OF PUBLICATION**

**PUBLIC NOTICE**

Publication Date:  
March 31, 2016 &  
April 7, 2016

Expiration Date:  
April 30, 2016  
30 Days After Date  
of Publication

**TO WHOM IT MAY CONCERN:**

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

Mountain Valley Pipeline Project  
(Name of Project)  
Mountain Valley Pipeline, LLC  
555 Southpointe Boulevard, Suite 200, Canonsburg, Pennsylvania 15317  
(Name and address of Applicant)

**SCOPE OF CERTIFICATION:**

Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

**DESCRIPTION OF THE ACTIVITY:**

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MVP is proposing to construct a pipeline 301 miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at the existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia. In addition to the pipeline, the Project will include 3 compressor stations currently planned along the route, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

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Any other State issued permit numbers, if applicable and available:

**PROJECT**

**LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are:

39.56258N,  
80.54302W

Coordinates for the Project crossing from West Virginia to Virginia are:

37.40302N,  
80.68917W

Coordinates for the southern terminus of the Project in Virginia are:

36.83369N,  
-79.33784W

**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57th Street SE  
Charleston, West Virginia 25304

**COMMENTS:** Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if post-marked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to: WV Department of Environmental Protection Division of Water and Waste Management 401 Certification Program 601 57th Street SE Charleston, West Virginia 25304 Comments and information post-marked later than the expiration date may not be considered.

4-7-THU-2-FT; LG 190



# The Exponent Telegram

324 Hewes Ave., P.O. Box 2000, Clarksburg, WV 26302-2000  
[www.theet.com](http://www.theet.com)

Loretta Greathouse  
Classified Office Manager

Phone: 304-626-1414  
Fax: 34-622-3629

## PROOF OF PUBLICATION

STATE OF WEST VIRGINIA

COUNTY OF HARRISON

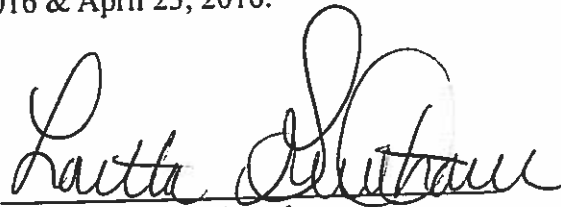
I, Loretta Greathouse, Classified Office Manager of Clarksburg Publishing Company, newspaper of general circulation published in the City of Clarksburg, County and State aforesaid, do hereby certify that

### MOUNTAIN VALLEY PIPELINE PROJECT

was published in the Harrison Xtra on April 16, 2016 & April 23, 2016.

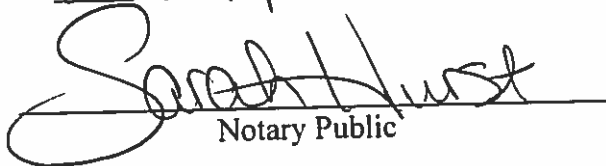
The cost of said publication is \$343.04.

By:



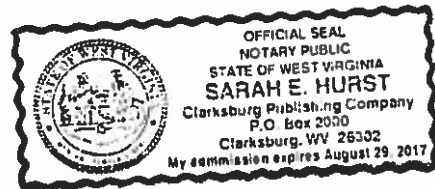
Loretta Greathouse,  
Classified Office Manager

Subscribed and sworn to before me  
this 27<sup>th</sup> day of April, 2016.



Notary Public

Notary Seal:



## PUBLIC NOTICE

**Publication Date:** 4/16/16 & 4/23/16

**Expiration Date:** 5/16/16 30 Days After Date of Publication

### TO WHOM IT MAY CONCERN:

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

**Name of Project:**  
Mountain Valley Pipeline

**Name and address of Applicant:**  
Mountain Valley Pipeline, LLC.  
555 Southpointe Boulevard, Suite 200,  
Canonsburg, Pennsylvania 15317.

**SCOPE OF CERTIFICATION:** Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

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Any other State issued permit numbers, if applicable and available:

**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W  
Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W  
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**WV Department of Environmental  
Protection Division of Water and  
Waste Management  
401 Certification Program  
601 57th Street SE  
Charleston, West Virginia 25304**

**COMMENTS:** Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

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Protection Division of Water and  
Waste Management  
401 Certification Program  
601 57th Street SE  
Charleston, West Virginia 25304**

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# The Exponent Telegram

324 Hewes Ave., P.O. Box 2000, Clarksburg, WV 26302-2000

[www.theet.com](http://www.theet.com)

Loretta Greathouse  
Classified Office Manager

Phone: 304-626-1414

Fax: 34-622-3629

## PROOF OF PUBLICATION

STATE OF WEST VIRGINIA

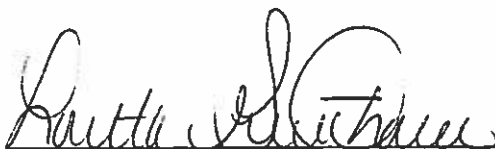
COUNTY OF HARRISON

I, Loretta Greathouse, Classified Office Manager of Clarksburg Publishing Company, newspaper of general circulation published in the City of Clarksburg, County and State aforesaid, do hereby certify that

### MOUNTAIN VALLEY PIPELINE PROJECT

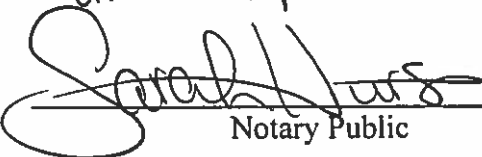
was published in the Bridgeport News on April 14, 2016 & April 21, 2016.

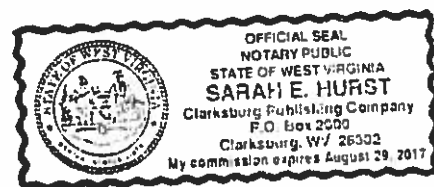
The cost of said publication is \$257.28.

By:   
Loretta Greathouse,  
Classified Office Manager

Subscribed and sworn to before me  
this 21<sup>st</sup> day of April, 2016.

Notary Seal:

  
Notary Public



# PUBLIC NOTICE

Publication Date: 4/14/16 & 4/21/16

Expiration Date: 5/14/16 30 Days After Date of Publication

**TO WHOM IT MAY CONCERN:**

State Water Quality Certification, as required by Section 401 of the Clean Water Act, has been requested of the West Virginia Department of Environmental Protection (WVDEP) for:

Mountain Valley Pipeline Project

(Name of Project)

Mountain Valley Pipeline, LLC, 555 Southpointe Boulevard, Suite 200 Canonsburg, Pennsylvania 15317

(Name and address of Applicant)

**SCOPE OF CERTIFICATION:** Pursuant to Section 401 of the Federal Clean Water Act, the State may, either certify, certify with conditions, deny or waive certification that the proposed activity will comply with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act and other appropriate requirements of State law. When issuing certification, the WVDEP may consider the proposed activity's impact on water resources, fish and wildlife, recreation, critical habitats, wetlands and other natural resources under its jurisdiction. Procedural and interpretive regulations governing the scope of the Department's certification, public comment, hearings and appeals are in Title 47, Series 5A.

**DESCRIPTION OF THE ACTIVITY:** Provide a description which details the activity proposed for the wetland, river or stream to be affected.

MVP is proposing to construct a pipeline 301 miles in length and 42-inches in diameter in order to provide timely and affordable access to the growing demand for natural gas. The proposed Project route will begin at the existing Equitrans, L.P. transmission system near the Mobley processing facility in Wetzel County, West Virginia and extend to the Transco Zone 5 Compressor Station 165 in Transco Village, Pittsylvania County, Virginia. In addition to the pipeline, the Project will include 3 compressor stations currently planned along the route, as well as other ancillary facilities that are required for the safe and reliable operation of the pipeline.

While significant effort was made to avoid wetland and waterbody impacts, impacts to wetlands and waterbodies are unavoidable due to the constraints of siting and constructing a linear project of this size. MVP anticipates that the Project will have temporary impacts to approximately 49,892 linear feet of streams and unavoidable permanent impacts to approximately 3,125 linear feet of streams within West Virginia. MVP anticipates that the Project will have temporary impacts to approximately 18.9 acres of wetlands and unavoidable permanent impacts to approximately 10 acres of wetlands within West Virginia.

Any other State issued permit numbers, if applicable and available:

**PROJECT LOCATION:** Provide a general highway map showing location of project and include mile point for rivers and streams.

Coordinates for the northern terminus of the Project in West Virginia are: 39.56258N, -80.54302W

Coordinates for the Project crossing from West Virginia to Virginia are: 37.40302N, -80.68917W

Coordinates for the southern terminus of the Project in Virginia are: 36.83369N, -79.33784W

**AVAILABLE:** The Water Quality Certification application is available for inspection between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, at the following location:

WV Department of Environmental Protection  
Division of Water and Waste Management  
401 Certification Program  
601 57th Street SE, Charleston, West Virginia 25304

**COMMENTS:** Comments and information relating to Section 401 Water Quality Certification for this activity are hereby solicited. Such information on the activity's impact will be considered if postmarked prior to the expiration date of this notice. The need for a public hearing will be determined based on an evaluation of specific request for such hearing. All comments and information should be mailed to:

WV Department of Environmental Protection Division of Water and Waste Management  
401 Certification Program  
601 57th Street SE, Charleston, West Virginia 25304

Comments and information postmarked later than the expiration date may not be considered.

## **APPENDIX D**

# **Aquatic Resource Reports**

## **Volume 1 – Wetzel, Harrison, and Doddridge Counties**

## **Volume 2 – Lewis County**

## **Volume 3 – Braxton County**



## **Volume 4 – Webster and Nicholas Counties**

## **Volume 5 – Greenbrier and Fayette Counties**

## **Volume 6 – Summers County**

## **Volume 7 – Monroe County**

## **APPENDIX E**

# **Erosion and Sedimentation Control Plan**

## **APPENDIX F**

# **Scour Analysis**



**Mountain Valley Pipeline:  
Vertical Scour and  
Lateral Channel Erosion Analyses  
October 2016**

**Prepared for Mountain Valley Pipeline, LLC**

**Prepared by Tetra Tech, Inc.**

**Submitted: October 7, 2016**

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**APPENDICES**

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Appendix A:	Vertical Scour Estimates and Mitigation
Appendix B:	Potential Lateral Channel Erosion and Mitigation

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LIST OF ACRONYMS

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CFS	Cubic Feet per Second
D50	Median Particle Size
DRNAREA	Drainage Area
EQT	EQT Midstream Partners, LP
EROS	Earth Resources Observation and Science
FERC	Federal Energy Regulatory Commission
FS	Factor of Safety
Ft	Feet
GPS	Global Positioning System
HEC-RAS	Hydrologic Engineering Center River Analysis System
HMZ	Historical Migration Zone
ID	Identification
LDB	Left Descending Bank
LiDAR	Light Detection and Ranging
mm	Millimeter
Mountain Valley	Mountain Valley Pipeline, LLC
MP	Mile Post
MVP	Mountain Valley Pipeline
NA	Not Applicable
NRPW	Non-Relatively Permanent Waterway
RDB	Right Descending Bank
RI	Recurrence Interval
ROW	Right-of-Way
RPW	Relatively Permanent Waterway
Sq. mi.	Square Mile(s)
UNT	Unnamed Tributary
Q	Discharge
RTK	Real-Time Kinematic
TNW	Traditional Navigable Waterway

## **1.0 OVERVIEW**

The proposed Mountain Valley Pipeline (MVP) is a 42-inch diameter natural gas pipeline traversing approximately 301 miles and 17 counties in West Virginia and Virginia. The project will extend the existing EQT Midstream Partners, LP (EQT) system from Wetzel County, West Virginia to the Transcontinental Gas Pipe Line Company, LLC Zone 5 Compressor Station 165 in Pittsylvania County, Virginia. The proposed pipeline crosses 128 perennial waterbodies with Federal Energy Regulatory Commission (FERC) classifications of intermediate or major. This includes 124 intermediate and four (4) major. FERC permitting requires vertical scour and lateral channel erosion analyses. This report describes the methods, assumptions, data limitations, and results for the analyses, which were conducted at all proposed perennial major and perennial intermediate FERC classification waterbody crossings.

## **2.0 DATA**

### **2.1 VERTICAL SCOUR ANALYSIS**

Vertical scour analyses require a number of data inputs to estimate potential scour depth. The approach used in this study utilized the following primary data inputs:

- Design discharge
- Stream bed particle size
- Channel hydraulics (i.e., width, depth, velocity)
- Depth to bedrock

The following sections describe the methods to obtain data outlined above and the associated assumptions.

#### **2.1.1 Design Discharge**

Gaging stations are not present directly at the proposed waterbody crossings. Therefore, design discharge estimates were required. This study utilized the estimated 2-year and 100-year peak discharge values. The 2-year peak discharge is assumed to be equivalent to bankfull discharge (Messinger, 2009; Lotspeich, 2009). The bankfull discharge is required to estimate the median particle size; details are provided in Section 2.1.2.2. The bankfull discharge was also utilized to calculate bend scour; details are provided in Section 3.1.2.1. The 100-year peak discharge is a standard design discharge for estimating general channel scour.

These design discharges were estimated via the peak-flow regional regression equations developed by the United States Geological Survey (USGS) (Wiley & Atkins, 2010; Austin, Krstolic, & Wiegand, 2011). The equations require two input parameters: drainage area and location of the drainage area. Drainage areas located in West Virginia were estimated via the online tool offered by the West Virginia Department of Environmental Protection Technical Applications and GIS Unit (7Q10 Flow Estimates, n.d.). Drainage areas located in Virginia were estimated via the online tool offered by the USGS (StreamStats, n.d.). The waterbody crossings are located within two West Virginia regions (Central Mountains and Western Plateaus) (Wiley & Atkins, 2010) and three Virginia regions (Piedmont, Blue Ridge, and Valley and Ridge) (Austin, Krstolic, & Wiegand, 2011).

#### **2.1.2 Particle Size Distribution**

Particle size distribution data, specifically the median particle size (D50), is a required data input for scour calculations. Therefore, a D50 estimate is required for each waterbody crossing. The following describes the methods utilized for major and intermediate waterbody crossings.

### **2.1.2.1 Major Waterbody Crossings**

Detailed field data was collected to generate surface and subsurface particle size distributions at the four major waterbody crossings, which include the Gauley River, Greenbrier River, Elk River, and Little Kanawha River. A pebble count study was performed to estimate surface particle size distributions, because an established armor layer is present (Bunte & Abt, 2001). A sieve analysis was performed to estimate subsurface particle size distribution (Bunte & Abt, 2001).

The particle size distribution, specifically subsurface, represents a single point in the river. However, river systems are complex, non-homogeneous systems, and point data does not necessarily represent conditions across the river reach of interest. Therefore, scour calculations using pebble count and sieve analysis data were run at 90, 100, and 110 percent of the estimated D50 value to account for uncertainties. The particle size that produced the deepest potential scour depth was used in the calculation estimate.

### **2.1.2.2 Intermediate Waterbody Crossings**

Quantitative and qualitative methods were used to estimate a D50 value at each proposed intermediate waterbody crossing. The D50 value was estimated quantitatively via a regime relationship that utilizes the bankfull discharge and the channel slope (USACE, Channel Stability Assessment for Flood Control Projects, 1994). Bankfull discharge was assumed to be the estimated 2-year peak-flow discharge (Messinger, 2009; Lotspeich, 2009) and was estimated via the methods described in Section 2.1.1. The channel slope was estimated from 2-foot contour light detection and ranging (LiDAR) data obtained from Mountain Valley Pipeline, LLC (Mountain Valley). The estimated D50 value was verified qualitatively by reviewing project stream assessment field notes and photographs.

Regime estimated D50 values have a relatively high degree of uncertainty. Therefore, scour calculations using regime estimated values were run at 50, 100, and 150 percent of the estimated D50 value to account for uncertainties. The particle size that produced the deepest potential scour depth was used in the calculation estimate.

## **2.1.3 Channel Hydraulics**

Channel hydraulics were estimated via a simplified Hydrologic Engineering Center River Analysis System (HEC-RAS) model at each proposed waterbody crossing. The primary inputs in the HEC-RAS model included the following: channel geometry, channel slope, Manning's roughness coefficient, and design discharge. Channel geometry and channel slope were generated from project LiDAR with 2-foot contours. The Manning's roughness coefficient was estimated according to USGS guidelines (Arcement & Schneider, 1989). The hydraulic model was run for two design discharges: 2-year peak-flow discharge and 100-year peak-flow discharge. The peak-flow discharge values were estimated via the methods described in Section 2.1.1.

**2.1.4 Bedrock**

Vertical scour estimates performed in this study assume near surface bedrock material is not present. Vertical scour would be limited to depth of bedrock. Therefore, Tetra Tech conducted detailed field work via seismic refraction and electrical resistivity analyses at the four (4) major waterbody crossings, and Mountain Valley conducted a desktop review via geographic information system (GIS) data and soil resistivity data at the 124 intermediate waterbody crossings.

**2.2 LATERAL CHANNEL EROSION ANALYSIS**

This study utilizes a framework for delineating channel migration zones to predict areas at risk of future lateral channel erosion due to fluvial processes (Rapp & Abbe, 2003). This analysis requires topographic data and present and historic aerial imagery. Topographic data was obtained from project LiDAR with 2-foot contours. Aerial imagery was obtained from the Earth Resources Observation and Science (EROS) Center (Aerial Photography, n.d.). Present and historic aerial imagery dates included 2010-2015 and 1949-1976, respectively. Analysis method details are described in Section 3.2.

### **3.0 METHODS**

The following sections describe the methods used in this study to estimate potential vertical scour and lateral channel erosion.

#### **3.1 VERTICAL SCOUR ANALYSIS**

Total potential vertical scour at a given river location may be estimated via general scour equations and/or the summation of component scour. Component scour calculation estimates must consider the summation of long-term bed elevation change, bedform scour, contraction scour, and scour associated with structures (i.e., local scour). Therefore, a comprehensive approach is required to estimate scour for a given design discharge and river reach. This study took the following components into consideration:

- General channel scour
- Component scour
  - Bend scour
  - Bedform scour
  - Contraction scour
  - Local scour (scour associated with structures)

The following briefly describes the components outlined above and the associated assumptions.

##### **3.1.1 General Scour**

General scour equations assume uniform degradation of the channel for a given river reach and discharge. The 100-year peak-flow discharge estimate from methods described in Section 2.1.1 was utilized in this study to estimate general scour. Empirical and regime equations have been developed to estimate total general scour. However, the various equations are only applicable for specified condition ranges. This study assessed the applicability of three general scour equations: Lacey regime equation, Blench regime equation, and Borah armor layer equation. The Lacey and Blench regime equations are only appropriate when the predominant bed material is 0.06 – 2 mm (sand particle size range) (NRCS, 2007). The Borah armor layer equation is typically only applicable when the predominant bed material is greater than 6 mm (gravel and larger) (NRCS, 2007).

##### **3.1.2 Component Scour**

The component method estimates potential vertical scour by summing the estimates from each contributing scour mechanism. This study assessed the following contributing scour components: bend, bedform, contraction, and local. The following briefly describes each component.

### **3.1.2.1 Bend Scour**

Bend scour occurs when flow through channel meander bends results in eddy flow patterns that move sediment from the outside to the inside of the meander bend. This scour effect is most significant at bankfull events because the flow energy dissipates when waterbody levels overtop the channel bank. Therefore, bend scour estimates in the study use values associated with the 2-year flood event peak discharge estimate, which was assumed to be approximately equivalent to a bankfull event (Lotspeich, 2009; Austin, Krstolic, & Wiegand, 2011). Bend scour was estimated via regime relationships described in the Corps of Engineers Manual 1110-2-1601 (USACE, Hydraulic Design of Flood Control Channel, 1994).

### **3.1.2.2 Bedform Scour**

Bedform scour occurs when ripples, dunes, and antidunes form on the bed surface. This is applicable when the predominant bed material is in the sand particle size range. Bedform scour was estimated, when appropriate, to be half of the calculated bedform height (NRCS, 2007).

### **3.1.2.3 Contraction Scour**

Contraction scour occurs when higher velocities are present due to constricted flow conditions. Natural (i.e. ice jams, bedrock, etc) and/or anthropogenic (i.e. bridges, culverts, etc) features in the channel can restrict the flow cross-section. Contraction scour is most typically associated with bridge structures (NRCS, 2007). Aerial imagery (Google, 2013, 2015, 2016) and project stream assessment field photographs were reviewed for possible contraction scour.

### **3.1.2.4 Local Scour**

Local scour occurs when anthropogenic structures (i.e., bridge piers, weirs/sills, culverts, dams, etc.) in the channel alter the natural flow regime (NRCS, 2007). Aerial imagery (Google, 2013, 2015, 2016) and project stream assessment field photographs were reviewed for possible contraction scour.

## **3.2 LATERAL CHANNEL EROSION ANALYSIS**

This study utilized a framework for delineating the historical migration zone (HMZ) to predict areas at risk of future lateral channel erosion due to fluvial processes (Rapp & Abbe, 2003). The HMZ is defined by the extent of area the channel occupied over the available historic record. It encompasses the current waterbody course and has the highest likelihood of lateral erosion. Planimetric analysis of historical aerial photography is typically used to determine the HMZ (Rapp & Abbe, 2003). However, planimetric analysis using aerial photography is not feasible for small streams due to difficulty distinguishing channel banks through closed, as well as open, canopy and resolution limitations common to older photographic sources. Furthermore, the margin of error during the digitization process is often too large, as a percentage of bank width, to be useful. Therefore, two approaches were required: one for waterbody crossings with top of bank widths



greater than 40 feet and another for waterbody crossings with top of bank widths less than 40 feet.

**3.2.1 HMZ – Greater than 40 feet Top of Bank Width**

The oldest, digitally available, historic aerial photography for each waterbody crossing was obtained and georeferenced (Aerial Photography, n.d.). The most recently available, high-resolution orthophotography was also obtained (Aerial Photography, n.d.). The bank lines for both the historic and recent aerial imagery were digitized and merged to delineate the extent of the HMZ (Rapp & Abbe, 2003). Project LiDAR was also analyzed for evidence of historic channel locations that may not have been captured by available aerial photography.

**3.2.2 HMZ – Less than 40 feet Top of Bank Width**

High-resolution project LiDAR was analyzed to estimate the HMZ. Project LiDAR and its first derivative (slope) were used to map the existing banks and identify relic channels, meander scars, and other fluvial features that indicate previous channel locations. The HMZ was drawn to encompass the existing channel corridor and any identified features that indicate past channel locations (Rapp & Abbe, 2003).

## **4.0 RESULTS**

### **4.1 POTENTIAL VERTICAL SCOUR**

Potential vertical scour was analyzed via the methods described in Section 3.1. This included a general scour and component scour analysis. The following summarizes the vertical scour results generated by this study.

#### **4.1.1 General Scour**

The appropriate general scour equation(s) described in Section 3.1.1 were selected based on the predominant bed material present at a given waterbody crossing. The predominant bed material at some waterbody crossings was a mix of sand and gravel. Therefore, the general scour equations for both bed types were assessed at these waterbody crossings.

The predominant bed material was gravel or larger at the 4 major and 109 intermediate waterbody crossings. Therefore, the Borah armor layer equation was utilized to estimate the potential vertical scour at these waterbody crossings. The general scour estimates via the Borah armor layer equation for the 4 major and 109 intermediate ranged from 0.1 – 4.8 feet and 0.1 – 18.6 feet, respectively.

The predominant bed material was sand at 18 intermediate waterbody crossings. Therefore, the Lacey and Blench regime equations were utilized to estimate the potential vertical scour at these waterbody crossings. The general scour estimates via the Lacey and Blench regime equations for the 18 intermediate waterbody crossings ranged from 0.8 – 12.6 feet.

The most conservative (deepest) potential vertical scour estimate for waterbody crossing was retained as the maximum general scour. The maximum general scour estimates for the 4 major and 124 intermediate waterbody crossings ranged from 0.1 – 4.8 feet and 0.3 – 18.6 feet, respectively. The general scour estimate details for each waterbody crossing are presented in Appendix A, Table A-1.

#### **4.1.2 Component Scour**

Potential vertical scour was estimated via the summation of each applicable scour component outlined in Section 3.1.2 at a given waterbody crossing. The components included the following: bend scour, bedform scour, contraction scour, and local scour. Bend scour estimates for the 4 major and 124 intermediate waterbody crossing ranged from 0.0 – 10.4 and 0.0 – 8.7 feet, respectively. There was no potential for bedform scour at the 4 major waterbody crossings (NRCS, 2007). Furthermore, potential for bedform scour was only present at 15 intermediate waterbody crossings and the estimates ranged from 0.0 – 0.6 feet. Aerial photography (Google, 2013, 2015, 2016) and project stream assessment field photographs were reviewed for potential contraction and/or local scour effects. Potential for significant contraction scour resulting from structures (i.e., bridges) was not observed. Similarly, no structures were identified that would cause local scour at any proposed waterbody crossings. Therefore, these values are reported as not applicable (NA). Total component scour estimates for the 4 major and 124 intermediate

waterbody crossings ranged from 0.0 – 10.4 and 0.0 – 8.7 feet, respectively. The component scour estimate details for each waterbody crossing are presented in Appendix A.

#### **4.1.3 Maximum Vertical Scour Estimate**

The most conservative (deepest) result via the general and component scour analyses was retained for the maximum potential vertical scour estimate at each waterbody crossing. Furthermore, a 20% factor of safety (FS) was also added to the maximum potential vertical scour estimate. This is an engineering standard best practice, which is intended to account for data uncertainties and potential long-term bed elevation change. The maximum vertical scour estimates with a 20% FS for the 4 major and 124 intermediate waterbody crossings ranged from 0.1 – 12.5 and 0.4 – 22.3 feet, respectively. The maximum vertical scour estimates with a 20% FS details for each waterbody crossing are presented in Appendix A. These vertical scour estimates assume near surface bedrock material is not present. Vertical scour would be limited to the depth of bedrock. Bedrock details are provided in Section 2.1.4 and Appendix A.

#### **4.2 POTENTIAL LATERAL CHANNEL EROSION**

The HMZ was delineated for each waterbody crossing via the methods described in Section 3.2. The length of pipeline within the HMZ was measured from the current channel centerline to the lateral extent associated with left descending bank (LDB) and right descending bank (RDB). The HMZ may not be symmetrical about the current channel centerline. The length of pipeline within the HMZ for the 4 major waterbody crossings ranged from 58 – 220 feet and 53 – 215 feet for the LDB and RDB, respectively. The length of pipeline within the HMZ for the 124 intermediate waterbody crossings ranged from 5 – 505 feet and 3 – 463 feet for the LDB and RDB, respectively. Pipeline length measurements within the HMZ for each waterbody crossing are presented in Appendix B, Table B-1.

## 5.0 MITIGATION MEASURES

### 5.1 VERTICAL SCOUR

Mountain Valley proposes to employ a variety of mitigation strategies to prevent scour from affecting the proposed MVP at waterbody crossings. The primary mitigation strategies are provided in Table 5-1 below. The proposed burial depths for each waterbody crossing are provided in Appendix A, Table A-1.

Table 5-1: Primary Mitigation Measures

Estimated Scour Depth (ft)	Proposed Mitigation Measure(s)	Mitigation ID
<1.50	None Required; installed per 49 CFR 192.327 (PHMSA & DOT, 2011)	NA
≥1.50 and <2.25	Pipeline buried with a minimum of 3-foot depth of cover Pipeline buried with a minimum 4-foot depth of cover if considered a navigable waterbody	A
≥2.25 and <3.00	Pipeline buried with a minimum of 4-foot depth of cover	B
≥3.00 and <3.75	Pipeline buried with a minimum of 5-foot depth of cover	C
≥3.75 and <4.50	Pipeline buried with a minimum of 6-foot depth of cover	D
≥4.50 and <5.25	Pipeline buried with a minimum of 7-foot depth of cover	E
≥5.25	Mitigation option(s) detailed in Sections 5.1.1, 5.1.2, and/or 5.3	F

**Notes:**

- ID: Identification
- NA: not applicable

#### 5.1.1 Bedrock

Potential scour is limited to the bedrock surface. Therefore, no additional mitigation is required if the pipeline is installed below the bedrock surface. Pipeline burial depths provided in Table 5-1 will be decreased to the bedrock surface if two requirements are met: bedrock depth is shallower than 7 feet and bedrock depth is shallower than the burial depth provided in Table 5-1. Estimated bedrock depth data was gathered via the methods outlined in Section 2.1.4 and is presented in Appendix A, Table A-1. Bedrock depths will be field verified during construction.

#### 5.1.2 Armoring Layer

Mountain Valley would consider using an armoring layer at the pipeline crossing as a mitigation option if the estimated scour depth exceeds 5.25 feet and bedrock depth is greater than 7 feet. An armoring layer with a given minimum particle size would restrict potential scour for a given discharge event. The proposed armoring layer would consist of particle sizes that are equal to or greater than the minimum armor particle size corresponding to the 100-year peak discharge



design estimate. The armoring layer would also be placed upstream and downstream of the pipeline crossing to prevent local scour. Pipeline burial depth would be determined after the size of the armoring layer is finalized.

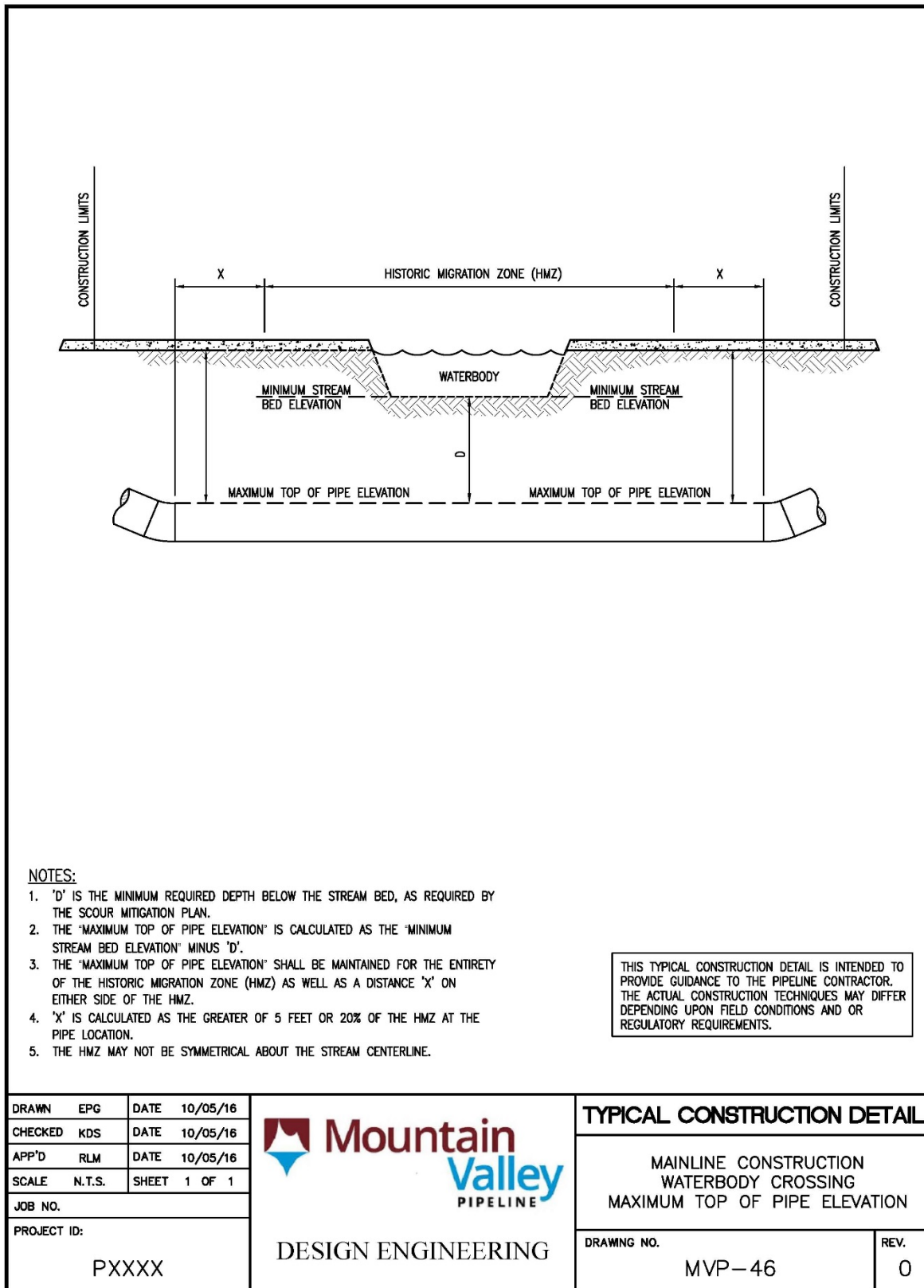
### **5.1.3 Revetment Mats**

Mountain Valley would consider using revetment mats at the pipeline crossing as a mitigation option if the estimated scour depth exceeds 5.25 feet and bedrock depth is greater than 7 feet. Revetment mats are engineered materials that form an erosion-resistant protective barrier. Revetment mats would also be placed upstream and downstream of the pipeline crossing to prevent local scour. Pipeline burial depth would be determined after the size of the revetment mat is finalized.

## **5.2 POTENTIAL LATERAL CHANNEL EROSION**

Mountain Valley proposes to utilize the delineated HMZ with a FS to determine the horizontal setback for each waterbody crossing. The added FS will be the greater of 5 feet or 20% of the HMZ width at the waterbody crossing. Figure 5-1 is a construction typical of the proposed horizontal setback for a hypothetical waterbody crossing. The X setback value corresponds to the 20% FS. The proposed pipeline will be installed at an elevation equal to or greater than the elevation corresponding to the in-channel maximum potential vertical scour depth reported in Section 4.1.3 while within the HMZ and 20% FS. Pipeline length measurements within the HMZ with 20% FS for each waterbody crossing are presented in Appendix B, Table B-1.

Figure 5-1: Construction Typical Horizontal Setback



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**APPENDIX A: VERTICAL SCOUR ESTIMATES AND MITIGATION**

Table A-1: Vertical Scour Estimates and Mitigation

Waterbody Name	FERC Classification	Location			Drainage Basin		Estimated Peak-Flow Discharge (RI)		Particle Size Estimated D50 (mm)	General Scour Estimates (ft)				Component Scour Estimates (ft)					Maximum Vertical Scour Estimate with 20% FS	Estimated Bedrock Depth (ft) <sup>1</sup>	Proposed Vertical Scour Mitigation Method (ID) <sup>2</sup>	Proposed Pipeline Burial Depth (ft) <sup>3</sup>
		State	County	MP	Drainage Area (sq. mi.)	Regression Region	2-year (cfs)	100-year (cfs)		Borah	Lacey	Blench	Maximum General	Bend	Bedform	Contraction	Local	Total Component				
North Fork Fishing Creek	Intermediate	West Virginia	Wetzel	0.7	5.7	Western-Plateaus Region	462	1809	10	1.1	NA	NA	1.1	0.3	NA	NA	NA	0.3	1.3	6.7	NA	3
Fallen Timber Run	Intermediate	West Virginia	Wetzel	2.3	0.7	Western-Plateaus Region	101	446	1	NA	0.8	3.6	3.6	0.0	0.3	NA	NA	0.3	4.3	6.7	D	6
Price Run	Intermediate	West Virginia	Wetzel	5.0	11.0	Western-Plateaus Region	741	2797	43	1.7	NA	NA	1.7	1.7	NA	NA	NA	1.7	2.0	6.7	A	3 (4 if Navigable Waterbody)
Sams Run	Intermediate	West Virginia	Wetzel	7.9	1.1	Western-Plateaus Region	141	605	86	3.5	NA	NA	3.5	0.0	NA	NA	NA	0.0	4.2	6.7	D	6
Little Tenmile Creek	Intermediate	West Virginia	Harrison	15.4	15.2	Western-Plateaus Region	938	3479	2	0.1	1.5	2.7	2.7	0.0	0.0	NA	NA	0.0	3.3	6.7	C	5
Little Rockcamp Run	Intermediate	West Virginia	Harrison	17.8	1.5	Western-Plateaus Region	176	744	47	0.4	NA	NA	0.4	0.0	NA	NA	NA	0.0	0.5	6.7	NA	3
Rockcamp Run	Intermediate	West Virginia	Harrison	18.7	5.3	Western-Plateaus Region	437	1720	21	0.4	NA	NA	0.4	0.0	NA	NA	NA	0.0	0.4	6.7	NA	3
Grass Run	Intermediate	West Virginia	Harrison	20.8	2.3	Western-Plateaus Region	236	972	1	NA	1.1	2.0	2.0	0.0	0.0	NA	NA	0.0	2.5	6.7	B	4
UNT to Grass Run	Intermediate	West Virginia	Harrison	21.6	1.4	Western-Plateaus Region	169	715	1	NA	1.0	2.0	2.0	0.0	0.2	NA	NA	0.2	2.4	6.7	B	4
Indian Run	Intermediate	West Virginia	Harrison	23.0	2.5	Western-Plateaus Region	254	1040	30	0.3	NA	NA	0.3	0.0	NA	NA	NA	0.0	0.4	6.7	NA	3
Salem Fork	Intermediate	West Virginia	Harrison	25.9	14.6	Western-Plateaus Region	915	3401	1	NA	1.6	2.4	2.4	0.0	0.0	NA	NA	0.0	2.9	6.7	B	4
Laural Run	Intermediate	West Virginia	Doddridge	34.8	2.0	Western-Plateaus Region	212	881	43	2.0	NA	NA	2.0	0.0	NA	NA	NA	0.0	2.4	6.7	B	4
Right Fork Freemans Creek	Intermediate	West Virginia	Lewis	42.5	3.2	Western-Plateaus Region	303	1224	38	1.1	NA	NA	1.1	0.0	NA	NA	NA	0.0	1.3	6.7	NA	3
Fink Creek	Intermediate	West Virginia	Lewis	44.7	1.7	Western-Plateaus Region	187	786	1	NA	1.0	1.4	1.4	0.0	0.0	NA	NA	0.0	1.6	6.7	A	3 (4 if Navigable Waterbody)
Left Fork Freemans Creek	Intermediate	West Virginia	Lewis	45.8	1.5	Western-Plateaus Region	173	732	34	0.5	NA	NA	0.5	2.3	NA	NA	NA	2.3	2.8	6.7	B	4
Sand Fork	Intermediate	West Virginia	Lewis	55.1	12.5	Western-Plateaus Region	816	3059	26	0.5	NA	NA	0.5	2.4	NA	NA	NA	2.4	2.9	8.7	B	4
Indian Fork	Intermediate	West Virginia	Lewis	58.5	5.1	Western-Plateaus Region	426	1677	42	0.5	NA	NA	0.5	0.0	NA	NA	NA	0.0	0.6	6.7	NA	3
UNT to Bens Run	Intermediate	West Virginia	Lewis	59.4	0.7	Western-Plateaus Region	99	435	2	3.1	1.5	2.6	3.1	0.4	0.0	NA	NA	0.4	3.7	2.5	C	2.5
UNT to Indian Fork	Intermediate	West Virginia	Lewis	59.9	0.2	Western-Plateaus Region	36	173	152	10.5	NA	NA	10.5	0.2	NA	NA	NA	0.2	12.6	5.0	F	5
Second Big Run	Intermediate	West Virginia	Lewis	61.2	0.4	Western-Plateaus Region	70	315	164	7.5	NA	NA	7.5	0.3	NA	NA	NA	0.3	9.0	8.7	F	Alternative Mitigation
UNT to Second Big Run	Intermediate	West Virginia	Lewis	61.3	0.4	Western-Plateaus Region	70	319	164	7.5	NA	NA	7.5	0.3	NA	NA	NA	0.3	9.0	8.7	F	Alternative Mitigation
Clover Fork	Intermediate	West Virginia	Lewis	65.4	2.2	Western-Plateaus Region	228	943	11	1.3	NA	NA	1.3	0.0	NA	NA	NA	0.0	1.5	6.7	A	3 (4 if Navigable Waterbody)
Barbecue Run	Intermediate	West Virginia	Braxton	67.4	0.7	Western-Plateaus Region	99	437	79	1.9	NA	NA	1.9	0.0	NA	NA	NA	0.0	2.2	6.7	A	3 (4 if Navigable Waterbody)
Left Fork Knawl Creek	Intermediate	West Virginia	Braxton	68.7	2.6	Western-Plateaus Region	262	1072	47	1.2	NA	NA	1.2	0.0	NA	NA	NA	0.0	1.4	6.7	NA	3
Knawl Creek	Intermediate	West Virginia	Braxton	68.7	3.8	Western-Plateaus Region	340	1364	39	1.2	NA	NA	1.2	2.0	NA	NA	NA	2.0	2.4	6.7	B	4
UNT to Falls Run	Intermediate	West Virginia	Braxton	71.6	0.4	Western-Plateaus Region	72	324	69	2.7	NA	NA	2.7	0.0	NA	NA	NA	0.0	3.2	11.0	C	5
Falls Run	Intermediate	West Virginia	Braxton	72.4	8.0	Western-Plateaus Region	590	2267	51	1.2	NA	NA	1.2	2.2	NA	NA	NA	2.2	2.6	11.0	B	4
Little Kanawha River	Major	West Virginia	Braxton	74.8	110.5	Western-Plateaus Region	4002	13277	78	0.1	NA	NA	0.1	2.7	NA	NA	NA	2.7	3.2	6.6	C	5
Stonecoal Run	Intermediate	West Virginia	Braxton	76.7	0.4	Western-Plateaus Region	66	299	170	9.7	NA	NA	9.7	1.3	NA	NA	NA	1.3	11.6	2.9	F	2.9
UNT to Little Kanawha River	Intermediate	West Virginia	Braxton	77.6	0.7	Western-Plateaus Region	97	428	135	4.6	NA	NA	4.6	0.0	NA	NA	NA	0.0	5.5	2.9	F	2.9
UNT to Left Fork Holly River	Intermediate	West Virginia	Braxton	79.7	1.2	Central-Mountains Region	82	345	98	3.9	NA	NA	3.9	2.0	NA	NA	NA	2.0	4.7	2.9	E	2.9
Left Fork Holly River	Intermediate	West Virginia	Webster	81.6	55.4	Central-Mountains Region	2308	7368	96	2.1	NA	NA	2.1	0.0	NA	NA	NA	0.0	2.6	6.7	B	4
Oldlick Creek	Intermediate	West Virginia	Webster	82.3	10.9	Central-Mountains Region	559	2011	103	3.2	NA	NA	3.2	2.2	NA	NA	NA	2.2	3.8	3.3	D	3.3
Right Fork Holly Creek	Intermediate	West Virginia	Webster	84.1	56.6	Central-Mountains Region	2352	7498	86	3.0	NA	NA	3.0	0.0	NA	NA	NA	0.0	3.6	5.1	C	5



**Vertical Scour and Lateral Channel Erosion Analyses  
Mountain Valley Pipeline**

Waterbody Name	FERC Classification	Location			Drainage Basin		Estimated Peak-Flow Discharge (RI)		Particle Size Estimated D50 (mm)	General Scour Estimates (ft)				Component Scour Estimates (ft)					Maximum Vertical Scour Estimate with 20% FS	Estimated Bedrock Depth (ft) <sup>1</sup>	Proposed Vertical Scour Mitigation Method (ID) <sup>2</sup>	Proposed Pipeline Burial Depth (ft) <sup>3</sup>
		State	County	MP	Drainage Area (sq. mi.)	Regression Region	2-year (cfs)	100-year (cfs)		Borah	Lacey	Blench	Maximum General	Bend	Bedform	Contraction	Local	Total Component				
Elk River	Major	West Virginia	Webster	87.3	269.2	Central-Mountains Region	9180	26112	95	0.1	NA	NA	0.1	0.0	NA	NA	NA	0.0	0.1	4.9	NA	3
UNT to Elk River	Intermediate	West Virginia	Webster	87.6	0.3	Central-Mountains Region	27	126	173	10.6	NA	NA	10.6	0.0	NA	NA	NA	0.0	12.8	6.7	F	6.7
UNT to Camp Creek	Intermediate	West Virginia	Webster	92.4	0.6	Central-Mountains Region	45	198	136	7.9	NA	NA	7.9	0.0	NA	NA	NA	0.0	9.5	6.7	F	6.7
UNT to Camp Creek	Intermediate	West Virginia	Webster	93.0	0.8	Central-Mountains Region	59	257	131	4.3	NA	NA	4.3	0.0	NA	NA	NA	0.0	5.2	6.7	E	7
Camp Creek	Intermediate	West Virginia	Webster	93.1	2.8	Central-Mountains Region	169	673	65	0.5	NA	NA	0.5	0.0	NA	NA	NA	0.0	0.6	8.7	NA	3
Amos Run	Intermediate	West Virginia	Webster	97.7	7.2	Central-Mountains Region	389	1441	76	0.7	NA	NA	0.7	0.8	NA	NA	NA	0.8	1.0	4.1	NA	3
Lost Run	Intermediate	West Virginia	Webster	98.6	2.8	Central-Mountains Region	169	673	61	1.9	NA	NA	1.9	0.0	NA	NA	NA	0.0	2.3	6.7	B	4
Laurel Creek	Intermediate	West Virginia	Webster	98.8	15.8	Central-Mountains Region	770	2695	88	3.5	NA	NA	3.5	0.0	NA	NA	NA	0.0	4.2	6.7	D	6
UNT to Birch River	Intermediate	West Virginia	Webster	104.9	0.7	Central-Mountains Region	50	218	98	4.7	NA	NA	4.7	0.0	NA	NA	NA	0.0	5.7	8.0	F	Alternative Mitigation
UNT to Strouds Creek	Intermediate	West Virginia	Webster	110.1	8.5	Central-Mountains Region	447	1638	85	0.9	NA	NA	0.9	4.1	NA	NA	NA	4.1	4.9	6.7	E	7
UNT to Barn Run	Intermediate	West Virginia	Nicholas	111.8	0.2	Central-Mountains Region	17	83	171	8.1	NA	NA	8.1	0.0	NA	NA	NA	0.0	9.7	6.7	F	6.7
Big Beaver Creek	Intermediate	West Virginia	Nicholas	114.3	29.0	Central-Mountains Region	1314	4397	113	3.6	NA	NA	3.6	0.0	NA	NA	NA	0.0	4.3	6.7	D	6
Big Beaver Creek	Intermediate	West Virginia	Nicholas	116.2	33.7	Central-Mountains Region	1496	4952	110	2.3	NA	NA	2.3	0.0	NA	NA	NA	0.0	2.8	2.0	B	2
Gauley River	Major	West Virginia	Nicholas	118.9	557.4	Central-Mountains Region	17329	46742	100	4.8	NA	NA	4.8	0.0	NA	NA	NA	0.0	5.7	12.1	F	Alternative Mitigation
UNT to Little Laurel Creek	Intermediate	West Virginia	Nicholas	120.3	1.0	Central-Mountains Region	67	289	136	7.1	NA	NA	7.1	0.0	NA	NA	NA	0.0	8.5	7.8	F	Alternative Mitigation
UNT to Little Laurel Creek	Intermediate	West Virginia	Nicholas	120.3	1.0	Central-Mountains Region	67	289	136	3.4	NA	NA	3.4	0.0	NA	NA	NA	0.0	4.0	4.6	D	6
Jims Creek	Intermediate	West Virginia	Nicholas	123.4	3.6	Central-Mountains Region	210	820	134	3.8	NA	NA	3.8	0.0	NA	NA	NA	0.0	4.6	7.1	E	7
Hominy Creek	Intermediate	West Virginia	Nicholas	126.9	48.2	Central-Mountains Region	2045	6594	131	5.1	NA	NA	5.1	0.0	NA	NA	NA	0.0	6.2	6.7	F	Alternative Mitigation
Sugar Branch	Intermediate	West Virginia	Nicholas	130.5	1.3	Central-Mountains Region	85	359	72	2.1	NA	NA	2.1	0.0	NA	NA	NA	0.0	2.5	6.7	B	4
UNT to Hominy Creek	Intermediate	West Virginia	Nicholas	131.5	1.2	Central-Mountains Region	81	343	1	NA	0.8	2.5	2.5	0.0	0.3	NA	NA	0.3	2.9	6.7	B	4
UNT to Hominy Creek	Intermediate	West Virginia	Nicholas	132.4	0.4	Central-Mountains Region	34	155	61	1.5	NA	NA	1.5	0.0	NA	NA	NA	0.0	1.8	6.7	A	3 (4 if Navigable Waterbody)
UNT to Meadow Creek	Intermediate	West Virginia	Greenbrier	140.4	7.0	Central-Mountains Region	378	1403	1	NA	2.5	4.2	4.2	0.8	0.3	NA	NA	1.1	5.1	6.7	E	7
Meadow River	Intermediate	West Virginia	Greenbrier	144.0	164.3	Central-Mountains Region	5965	17591	1	NA	5.7	4.8	5.7	4.2	0.6	NA	NA	4.8	6.8	6.7	F	6.7
Little Sewell Creek	Intermediate	West Virginia	Greenbrier	147.0	5.1	Central-Mountains Region	289	1097	2	1.1	3.0	1.8	3.0	2.7	0.0	NA	NA	2.7	3.6	6.7	C	5
Buffalo Creek	Intermediate	West Virginia	Greenbrier	154.9	3.7	Central-Mountains Region	217	844	0.06	NA	1.5	1.2	1.5	0.0	NA	NA	NA	0.0	1.8	6.7	A	3 (4 if Navigable Waterbody)
Lick Creek	Intermediate	West Virginia	Summers	162.9	1.0	Central-Mountains Region	70	300	273	18.6	NA	NA	18.6	0.0	NA	NA	NA	0.0	22.3	6.7	F	6.7
Hungard Creek	Intermediate	West Virginia	Summers	169.8	5.1	Central-Mountains Region	288	1094	109	1.0	NA	NA	1.0	1.5	NA	NA	NA	1.5	1.8	6.7	A	3 (4 if Navigable Waterbody)
Hungard Creek	Intermediate	West Virginia	Summers	170.0	11.4	Central-Mountains Region	582	2086	66	1.9	NA	NA	1.9	0.0	NA	NA	NA	0.0	2.2	6.7	A	3 (4 if Navigable Waterbody)
Greenbrier River	Major	West Virginia	Summers	171.4	1557.7	Central-Mountains Region	42501	106351	35	0.3	NA	NA	0.3	10.4	NA	NA	NA	10.4	12.5	6.6	F	6.6
Kelly Creek	Intermediate	West Virginia	Summers	172.7	7.5	Central-Mountains Region	405	1496	48	1.2	NA	NA	1.2	1.8	NA	NA	NA	1.8	2.2	6.7	A	3 (4 if Navigable Waterbody)
Wind Creek	Intermediate	West Virginia	Monroe	176.7	1.1	Central-Mountains Region	74	315	177	7.8	NA	NA	7.8	0.0	NA	NA	NA	0.0	9.4	3.3	F	3.3
UNT to Wind Creek	Intermediate	West Virginia	Monroe	176.7	0.2	Central-Mountains Region	16	79	188	10.2	NA	NA	10.2	0.0	NA	NA	NA	0.0	12.2	3.3	F	3.3
UNT to Stoney Creek	Intermediate	West Virginia	Monroe	177.4	1.6	Central-Mountains Region	105	433	72	2.8	NA	NA	2.8	0.1	NA	NA	NA	0.1	3.4	3.3	C	3.3
Stony Creek	Intermediate	West Virginia	Monroe	179.1	0.6	Central-Mountains Region	47	208	0.06	NA	0.9	1.5	1.5	0.0	NA	NA	NA	0.0	1.8	6.7	A	3 (4 if Navigable Waterbody)
Slate Run	Intermediate	West Virginia	Monroe	182.4	0.6	Central-Mountains Region	44	197	78	2.5	NA	NA	2.5	0.0	NA	NA	NA	0.0	3.0	6.7	C	5
Indian Creek	Intermediate	West Virginia	Monroe	182.8	108.5	Central-Mountains Region	4151	12618	20	0.3	NA	NA	0.3	0.0	NA	NA	NA	0.0	0.4	6.7	NA	3
UNT to Hans Creek	Intermediate	West Virginia	Monroe	184.2	0.8	Central-Mountains Region	55	238	101	3.0	NA	NA	3.0	0.0	NA	NA	NA	0.0	3.6	6.7	C	5
Hans Creek	Intermediate	West Virginia	Monroe	187.6	14.7	Central-Mountains Region	725	2551	106	3.8	NA	NA	3.8	0.2	NA	NA	NA	0.2	4.6	6.7	E	7

**Vertical Scour and Lateral Channel Erosion Analyses  
Mountain Valley Pipeline**

Waterbody Name	FERC Classification	Location			Drainage Basin		Estimated Peak-Flow Discharge (RI)		Particle Size Estimated D50 (mm)	General Scour Estimates (ft)				Component Scour Estimates (ft)					Maximum Vertical Scour Estimate with 20% FS	Estimated Bedrock Depth (ft) <sup>1</sup>	Proposed Vertical Scour Mitigation Method (ID) <sup>2</sup>	Proposed Pipeline Burial Depth (ft) <sup>3</sup>
		State	County	MP	Drainage Area (sq. mi.)	Regression Region	2-year (cfs)	100-year (cfs)		Borah	Lacey	Blench	Maximum General	Bend	Bedform	Contraction	Local	Total Component				
Dry Creek	Intermediate	West Virginia	Monroe	192.0	4.3	Central-Mountains Region	249	958	87	0.9	NA	NA	0.9	0.0	NA	NA	NA	0.0	1.0	6.7	NA	3
Kimballton Branch	Intermediate	Virginia	Giles	198.9	1.5	Valley and Ridge	151	1169	225	14.1	NA	NA	14.1	0.9	NA	NA	NA	0.9	16.9	6.7	F	6.7
Stony Creek	Intermediate	Virginia	Giles	200.3	47.5	Valley and Ridge	1914	9867	164	6.2	NA	NA	6.2	4.0	NA	NA	NA	4.0	7.5	15.0	F	Alternative Mitigation
Stony Creek	Intermediate	Virginia	Giles	200.3	47.5	Valley and Ridge	1914	9867	164	6.2	NA	NA	6.2	4.0	NA	NA	NA	4.0	7.5	15.0	F	Alternative Mitigation
Stony Creek	Intermediate	Virginia	Giles	200.3	47.5	Valley and Ridge	1914	9867	164	6.2	NA	NA	6.2	4.0	NA	NA	NA	4.0	7.5	15.0	F	Alternative Mitigation
UNT to Little Stony Creek	Intermediate	Virginia	Giles	203.5	1.1	Valley and Ridge	124	990	227	11.3	NA	NA	11.3	0.3	NA	NA	NA	0.3	13.5	7.8	F	Alternative Mitigation
UNT to Little Stony Creek	Intermediate	Virginia	Giles	204.2	0.3	Valley and Ridge	46	429	47	1.7	NA	NA	1.7	0.0	NA	NA	NA	0.0	2.1	6.7	A	3 (4 if Navigable Waterbody)
Little Stony Creek	Intermediate	Virginia	Giles	204.3	19.8	Valley and Ridge	1008	5760	197	10.8	NA	NA	10.8	1.6	NA	NA	NA	1.6	13.0	6.7	F	6.7
UNT to Doe Creek	Intermediate	Virginia	Giles	205.8	0.9	Valley and Ridge	102	843	169	12.3	NA	NA	12.3	0.0	NA	NA	NA	0.0	14.7	6.7	F	6.7
Doe Creek	Intermediate	Virginia	Giles	206.7	3.8	Valley and Ridge	303	2101	128	5.7	NA	NA	5.7	0.0	NA	NA	NA	0.0	6.9	6.7	F	6.7
UNT to Sinking Creek	Intermediate	Virginia	Giles	207.8	0.2	Valley and Ridge	32	320	20	2.5	NA	NA	2.5	0.0	NA	NA	NA	0.0	3.0	6.7	C	5
Sinking Creek	Intermediate	Virginia	Giles	211.1	65.5	Valley and Ridge	2423	12022	58	2.3	NA	NA	2.3	0.0	NA	NA	NA	0.0	2.8	6.7	B	4
Greenbriar Branch	Intermediate	Virginia	Giles	212.9	2.7	Valley and Ridge	231	1672	101	6.8	NA	NA	6.8	0.0	NA	NA	NA	0.0	8.2	6.7	F	6.7
UNT to Sinking Creek	Intermediate	Virginia	Giles	216.6	0.1	Valley and Ridge	21	223	154	12.8	NA	NA	12.8	0.9	NA	NA	NA	0.9	15.4	6.7	F	6.7
Craig Creek	Intermediate	Virginia	Montgomery	219.5	5.1	Valley and Ridge	372	2495	64	2.2	NA	NA	2.2	2.3	NA	NA	NA	2.3	2.8	6.7	B	4
North Fork Roanoke River	Intermediate	Virginia	Montgomery	227.4	23.7	Valley and Ridge	1150	6434	59	0.5	NA	NA	0.5	0.0	NA	NA	NA	0.0	0.7	5.0	NA	3
Bradshaw Creek	Intermediate	Virginia	Montgomery	230.9	17.6	Valley and Ridge	925	5358	46	1.9	NA	NA	1.9	0.0	NA	NA	NA	0.0	2.2	6.7	A	3 (4 if Navigable Waterbody)
Roanoke River	Intermediate	Virginia	Montgomery	235.6	256.0	Valley and Ridge	6580	27801	71	1.8	NA	NA	1.8	6.3	NA	NA	NA	6.3	7.6	5.0	F	5
UNT to Bottom Creek	Intermediate	Virginia	Roanoke	240.8	0.4	Blue Ridge	72	913	11	7.3	NA	NA	7.3	0.0	NA	NA	NA	0.0	8.8	1.7	F	1.7
Bottom Creek	Intermediate	Virginia	Roanoke	242.4	2.9	Blue Ridge	284	2860	63	0.7	NA	NA	0.7	0.5	NA	NA	NA	0.5	0.9	1.7	NA	3
North Fork Blackwater River	Intermediate	Virginia	Franklin	249.8	5.9	Blue Ridge	472	4376	81	2.4	NA	NA	2.4	0.0	NA	NA	NA	0.0	2.9	6.7	B	4
UNT to North Fork Blackwater River	Intermediate	Virginia	Franklin	251.0	2.2	Blue Ridge	231	2405	120	4.6	NA	NA	4.6	0.0	NA	NA	NA	0.0	5.5	6.7	F	Alternative Mitigation
UNT to North Fork Blackwater River	Intermediate	Virginia	Franklin	251.9	1.8	Blue Ridge	206	2186	122	4.2	NA	NA	4.2	0.5	NA	NA	NA	0.5	5.1	6.7	E	7
UNT to Little Creek	Intermediate	Virginia	Franklin	256.0	1.0	Blue Ridge	132	1509	97	3.7	NA	NA	3.7	0.0	NA	NA	NA	0.0	4.4	6.7	D	6
Teels Creek	Intermediate	Virginia	Franklin	258.3	2.2	Blue Ridge	234	2432	50	1.3	NA	NA	1.3	0.0	NA	NA	NA	0.0	1.5	6.7	A	3 (4 if Navigable Waterbody)
Teels Creek	Intermediate	Virginia	Franklin	259.2	3.4	Blue Ridge	319	3156	50	0.5	NA	NA	0.5	2.6	NA	NA	NA	2.6	3.1	6.7	C	5
Teels Creek	Intermediate	Virginia	Franklin	259.4	3.5	Blue Ridge	325	3205	50	2.4	NA	NA	2.4	0.0	NA	NA	NA	0.0	2.9	6.7	B	4
Teels Creek	Intermediate	Virginia	Franklin	260.4	4.5	Blue Ridge	388	3717	53	1.5	NA	NA	1.5	2.7	NA	NA	NA	2.7	3.2	6.7	C	5
UNT to Teels Creek	Intermediate	Virginia	Franklin	260.9	5.0	Blue Ridge	419	3963	44	1.6	NA	NA	1.6	4.1	NA	NA	NA	4.1	4.9	6.7	E	7
Teels Creek	Intermediate	Virginia	Franklin	261.1	5.1	Blue Ridge	423	4000	42	1.1	NA	NA	1.1	2.3	NA	NA	NA	2.3	2.8	6.7	B	4
Teels Creek	Intermediate	Virginia	Franklin	261.9	5.5	Blue Ridge	450	4207	43	1.8	NA	NA	1.8	0.0	NA	NA	NA	0.0	2.1	6.7	A	3 (4 if Navigable Waterbody)
UNT to Teels Creek	Intermediate	Virginia	Franklin	262.1	6.4	Blue Ridge	498	4584	44	2.0	NA	NA	2.0	0.0	NA	NA	NA	0.0	2.5	6.7	B	4
Teels Creek	Intermediate	Virginia	Franklin	262.4	6.6	Blue Ridge	512	4686	45	1.8	NA	NA	1.8	1.9	NA	NA	NA	1.9	2.3	6.7	B	4
Little Creek	Intermediate	Virginia	Franklin	262.7	22.6	Blue Ridge	1222	9705	40	1.2	NA	NA	1.2	2.9	NA	NA	NA	2.9	3.5	6.7	C	5
Little Creek	Intermediate	Virginia	Franklin	263.4	25.1	Blue Ridge	1316	10328	30	0.4	NA	NA	0.4	0.0	NA	NA	NA	0.0	0.5	6.7	NA	3
UNT to Maggodee Creek	Intermediate	Virginia	Franklin	268.6	0.5	Blue Ridge	87	1060	55	3.1	NA	NA	3.1	0.0	NA	NA	NA	0.0	3.7	6.7	C	5
UNT to Maggodee Creek	Intermediate	Virginia	Franklin	269.0	0.8	Blue Ridge	118	1378	58	3.3	NA	NA	3.3	0.6	NA	NA	NA	0.6	3.9	6.7	D	6
Maggodee Creek	Intermediate	Virginia	Franklin	269.5	45.4	Blue Ridge	2004	14677	35	1.5	NA	NA	1.5	2.6	NA	NA	NA	2.6	3.1	6.7	C	5

Waterbody Name	FERC Classification	Location			Drainage Basin		Estimated Peak-Flow Discharge (RI)		Particle Size Estimated D50 (mm)	General Scour Estimates (ft)				Component Scour Estimates (ft)					Maximum Vertical Scour Estimate with 20% FS	Estimated Bedrock Depth (ft) <sup>1</sup>	Proposed Vertical Scour Mitigation Method (ID) <sup>2</sup>	Proposed Pipeline Burial Depth (ft) <sup>3</sup>
		State	County	MP	Drainage Area (sq. mi.)	Regression Region	2-year (cfs)	100-year (cfs)		Borah	Lacey	Blench	Maximum General	Bend	Bedform	Contraction	Local	Total Component				
Blackwater River	Intermediate	Virginia	Franklin	269.8	165.0	Blue Ridge	5003	31548	64	2.8	NA	NA	2.8	8.7	NA	NA	NA	8.7	10.4	6.7	F	6.7
UNT to Blackwater River	Intermediate	Virginia	Franklin	270.3	0.1	Blue Ridge	25	376	64	4.7	NA	NA	4.7	0.0	NA	NA	NA	0.0	5.7	6.7	F	Alternative Mitigation
Foul Ground Creek	Intermediate	Virginia	Franklin	272.4	1.9	Blue Ridge	210	2221	33	0.5	NA	NA	0.5	0.0	NA	NA	NA	0.0	0.5	6.7	NA	3
UNT to Poplar Camp Creek	Intermediate	Virginia	Franklin	274.2	0.3	Blue Ridge	50	671	74	3.8	NA	NA	3.8	1.1	NA	NA	NA	1.1	4.6	6.7	E	7
UNT to Blackwater River	Intermediate	Virginia	Franklin	276.6	0.5	Blue Ridge	81	1001	54	1.7	NA	NA	1.7	0.0	NA	NA	NA	0.0	2.0	6.7	A	3 (4 if Navigable Waterbody)
UNT to Jacks Creek	Intermediate	Virginia	Franklin	277.5	0.1	Blue Ridge	32	456	48	3.8	NA	NA	3.8	0.0	NA	NA	NA	0.0	4.6	6.7	E	7
Strawfield Creek	Intermediate	Virginia	Franklin	282.4	0.8	Blue Ridge	118	1378	58	2.6	NA	NA	2.6	0.0	NA	NA	NA	0.0	3.2	3.3	C	5
Jonnikin Creek	Intermediate	Virginia	Pittsylvania	284.8	1.0	Piedmont	154	1407	59	1.3	NA	NA	1.3	0.0	NA	NA	NA	0.0	1.6	9.6	A	3 (4 if Navigable Waterbody)
UNT to Rocky Creek	Intermediate	Virginia	Pittsylvania	287.2	1.0	Piedmont	160	1456	1	NA	2.5	4.0	4.0	0.9	0.3	NA	NA	1.2	4.8	6.7	E	7
Pigg River	Intermediate	Virginia	Pittsylvania	289.2	340.0	Piedmont	4991	24970	0.06	NA	4.5	12.6	12.6	0.0	NA	NA	NA	0.0	15.1	6.7	F	6.7
Harpen Creek	Intermediate	Virginia	Pittsylvania	290.0	7.8	Piedmont	532	3925	1	NA	3.5	3.4	3.5	0.8	0.4	NA	NA	1.2	4.1	6.7	D	6
Harpen Creek	Intermediate	Virginia	Pittsylvania	290.6	3.1	Piedmont	309	2507	1	NA	1.5	3.5	3.5	0.0	0.3	NA	NA	0.3	4.2	6.7	D	6
Harpen Creek	Intermediate	Virginia	Pittsylvania	292.1	1.6	Piedmont	205	1785	48	2.0	NA	NA	2.0	0.0	NA	NA	NA	0.0	2.4	6.7	B	4
UNT to Harpen Creek	Intermediate	Virginia	Pittsylvania	292.5	0.2	Piedmont	61	652	1	NA	0.9	2.1	2.1	0.0	0.2	NA	NA	0.2	2.6	6.7	B	4
UNT to Cherrystone Creek	Intermediate	Virginia	Pittsylvania	294.3	1.5	Piedmont	203	1768	48	1.8	NA	NA	1.8	1.9	NA	NA	NA	1.9	2.3	6.7	B	4
Cherrystone Creek	Intermediate	Virginia	Pittsylvania	295.3	3.6	Piedmont	338	2696	51	0.6	NA	NA	0.6	0.5	NA	NA	NA	0.5	0.8	7.8	NA	3
UNT to Pole Bridge Branch	Intermediate	Virginia	Pittsylvania	296.7	4.5	Piedmont	382	2987	41	0.4	NA	NA	0.4	0.1	NA	NA	NA	0.1	0.5	6.7	NA	3
UNT to Little Cherrystone Creek	Intermediate	Virginia	Pittsylvania	301.5	1.1	Piedmont	169	1524	53	1.5	NA	NA	1.5	0.0	NA	NA	NA	0.0	1.8	6.7	A	3 (4 if Navigable Waterbody)

**Notes:**

- <sup>1</sup> Bedrock depth estimates at major rivers conducted by Tetra Tech via seismic refraction and electrical resistivity.  
Bedrock depth estimates at intermediate rivers conducted by Mountain Valley via desktop review of GIS data and soil resistivity data.
- <sup>2</sup> Proposed Mitigation Measures:  
 NA: None Required; installed per 49 CFR 192.327 (PHMSA & DOT, 2011)  
 A: Pipeline buried with a minimum of 3-foot depth of cover  
 Pipeline buried with a minimum 4-foot depth of cover if considered a navigable waterbody  
 B: Pipeline buried with a minimum of 4-foot depth of cover  
 C: Pipeline buried with a minimum of 5-foot depth of cover  
 D: Pipeline buried with a minimum of 6-foot depth of cover  
 E: Pipeline buried with a minimum of 7-foot depth of cover  
 F: See mitigation options detailed in Sections 5.2 and/or 5.3
- <sup>3</sup> Alternative mitigation option details in Sections 5.1.2 and 5.1.3.

**Acronyms:**

- cfs: cubic feet per second
- FERC: Federal Energy Regulatory Commission
- FS: factor of safety
- ft: feet
- ID: Identification
- LDB: left descending bank
- mm: millimeter
- MP: mile post
- NA: not applicable
- sq. mi.: square mile
- RDB: right descending bank
- RI: recurrence interval
- UNT: Unnamed Tributary

**APPENDIX B: POTENTIAL LATERAL CHANNEL EROSION AND MITIGATION**

Table B-1: Potential Lateral Channel Erosion and Mitigation

Waterbody Name	FERC Classification	Location			Historical Migration Zone (ft) <sup>1</sup>		Factor of Safety (ft) <sup>2</sup>	Proposed Horizontal Setback (ft) <sup>3</sup>	
		State	County	MP	Left Descending Bank	Right Descending Bank		Left Descending Bank	Right Descending Bank
North Fork Fishing Creek	Intermediate	West Virginia	Wetzel	0.7	19	16	7	26	23
Fallen Timber Run	Intermediate	West Virginia	Wetzel	2.3	21	116	27	48	143
Price Run	Intermediate	West Virginia	Wetzel	5.0	96	23	24	120	47
Sams Run	Intermediate	West Virginia	Wetzel	7.9	8	16	5	13	21
Little Tenmile Creek	Intermediate	West Virginia	Harrison	15.4	16	51	13	29	64
Little Rockcamp Run	Intermediate	West Virginia	Harrison	17.8	58	53	22	80	75
Rockcamp Run	Intermediate	West Virginia	Harrison	18.7	30	33	13	43	46
Grass Run	Intermediate	West Virginia	Harrison	20.8	34	49	17	51	66
UNT to Grass Run	Intermediate	West Virginia	Harrison	21.6	15	27	8	23	35
Indian Run	Intermediate	West Virginia	Harrison	23.0	15	32	9	24	41
Salem Fork	Intermediate	West Virginia	Harrison	25.9	35	31	13	48	44
Laural Run	Intermediate	West Virginia	Doddridge	34.8	15	15	6	21	21
Right Fork Freemans Creek	Intermediate	West Virginia	Lewis	42.5	14	25	8	22	33
Fink Creek	Intermediate	West Virginia	Lewis	44.7	16	27	9	25	36
Left Fork Freemans Creek	Intermediate	West Virginia	Lewis	45.8	24	15	8	32	23
Sand Fork	Intermediate	West Virginia	Lewis	55.1	38	19	11	49	30
Indian Fork	Intermediate	West Virginia	Lewis	58.5	20	16	7	27	23
UNT to Bens Run	Intermediate	West Virginia	Lewis	59.4	23	29	10	33	39
UNT to Indian Fork	Intermediate	West Virginia	Lewis	59.9	25	25	10	35	35
Second Big Run	Intermediate	West Virginia	Lewis	61.2	178	344	104	282	448
UNT to Second Big Run	Intermediate	West Virginia	Lewis	61.3	59	463	104	163	567
Clover Fork	Intermediate	West Virginia	Lewis	65.4	27	28	11	38	39
Barbecue Run	Intermediate	West Virginia	Braxton	67.4	8	38	9	17	47
Left Fork Knawl Creek	Intermediate	West Virginia	Braxton	68.7	20	26	9	29	35
Knawl Creek	Intermediate	West Virginia	Braxton	68.7	35	19	11	46	30
UNT to Falls Run	Intermediate	West Virginia	Braxton	71.6	8	34	8	16	42
Falls Run	Intermediate	West Virginia	Braxton	72.4	41	3	9	50	12
Little Kanawha River	Major	West Virginia	Braxton	74.8	58	53	22	80	75
Stonecoal Run	Intermediate	West Virginia	Braxton	76.7	22	13	7	29	20
UNT to Little Kanawha River	Intermediate	West Virginia	Braxton	77.6	31	6	7	38	13
UNT to Left Fork Holly River	Intermediate	West Virginia	Braxton	79.7	19	17	7	26	24
Left Fork Holly River	Intermediate	West Virginia	Webster	81.6	36	56	18	54	74
Oldlick Creek	Intermediate	West Virginia	Webster	82.3	22	64	17	39	81
Right Fork Holly Creek	Intermediate	West Virginia	Webster	84.1	85	34	24	109	58

**Vertical Scour and Lateral Channel Erosion Analyses  
Mountain Valley Pipeline**

**October 7, 2016**

Waterbody Name	FERC Classification	Location			Historical Migration Zone (ft) <sup>1</sup>		Factor of Safety (ft) <sup>2</sup>	Proposed Horizontal Setback (ft) <sup>3</sup>	
		State	County	MP	Left Descending Bank	Right Descending Bank		Left Descending Bank	Right Descending Bank
Elk River	Major	West Virginia	Webster	87.3	94	117	42	136	159
UNT to Elk River	Intermediate	West Virginia	Webster	87.6	108	16	25	133	41
UNT to Camp Creek	Intermediate	West Virginia	Webster	92.4	137	12	30	167	42
UNT to Camp Creek	Intermediate	West Virginia	Webster	93.0	273	63	67	340	130
Camp Creek	Intermediate	West Virginia	Webster	93.1	151	14	33	184	47
Amos Run	Intermediate	West Virginia	Webster	97.7	45	168	43	88	211
Lost Run	Intermediate	West Virginia	Webster	98.6	25	21	9	34	30
Laurel Creek	Intermediate	West Virginia	Webster	98.8	33	20	11	44	31
UNT to Birch River	Intermediate	West Virginia	Webster	104.9	18	159	35	53	194
UNT to Strouds Creek	Intermediate	West Virginia	Webster	110.1	16	28	9	25	37
UNT to Barn Run	Intermediate	West Virginia	Nicholas	111.8	23	16	8	31	24
Big Beaver Creek	Intermediate	West Virginia	Nicholas	114.3	33	44	15	48	59
Big Beaver Creek	Intermediate	West Virginia	Nicholas	116.2	36	55	18	54	73
Gauley River	Major	West Virginia	Nicholas	118.9	179	106	57	236	163
UNT to Little Laurel Creek	Intermediate	West Virginia	Nicholas	120.3	158	107	53	211	160
UNT to Little Laurel Creek	Intermediate	West Virginia	Nicholas	120.3	178	87	53	231	140
Jims Creek	Intermediate	West Virginia	Nicholas	123.4	51	237	58	109	295
Hominy Creek	Intermediate	West Virginia	Nicholas	126.9	40	43	17	57	60
Sugar Branch	Intermediate	West Virginia	Nicholas	130.5	34	19	11	45	30
UNT to Hominy Creek	Intermediate	West Virginia	Nicholas	131.5	13	15	6	19	21
UNT to Hominy Creek	Intermediate	West Virginia	Nicholas	132.4	72	6	16	88	22
UNT to Meadow Creek	Intermediate	West Virginia	Greenbrier	140.4	13	31	9	22	40
Meadow River	Intermediate	West Virginia	Greenbrier	144.0	47	49	19	66	68
Little Sewell Creek	Intermediate	West Virginia	Greenbrier	147.0	35	16	10	45	26
Buffalo Creek	Intermediate	West Virginia	Greenbrier	154.9	20	14	7	27	21
Lick Creek	Intermediate	West Virginia	Summers	162.9	23	38	12	35	50
Hungard Creek	Intermediate	West Virginia	Summers	169.8	160	423	117	277	540
Hungard Creek	Intermediate	West Virginia	Summers	170.0	30	163	39	69	202
Greenbrier River	Major	West Virginia	Summers	171.4	220	215	87	307	302
Kelly Creek	Intermediate	West Virginia	Summers	172.7	16	54	14	30	68
Wind Creek	Intermediate	West Virginia	Monroe	176.7	73	68	28	101	96
UNT to Wind Creek	Intermediate	West Virginia	Monroe	176.7	109	32	28	137	60
UNT to Stoney Creek	Intermediate	West Virginia	Monroe	177.4	29	33	12	41	45
Stony Creek	Intermediate	West Virginia	Monroe	179.1	11	8	5	16	13
Slate Run	Intermediate	West Virginia	Monroe	182.4	27	17	9	36	26
Indian Creek	Intermediate	West Virginia	Monroe	182.8	38	41	16	54	57
UNT to Hans Creek	Intermediate	West Virginia	Monroe	184.2	94	35	26	120	61
Hans Creek	Intermediate	West Virginia	Monroe	187.6	70	76	29	99	105



**Vertical Scour and Lateral Channel Erosion Analyses  
Mountain Valley Pipeline**

**October 7, 2016**

Waterbody Name	FERC Classification	Location			Historical Migration Zone (ft) <sup>1</sup>		Factor of Safety (ft) <sup>2</sup>	Proposed Horizontal Setback (ft) <sup>3</sup>	
		State	County	MP	Left Descending Bank	Right Descending Bank		Left Descending Bank	Right Descending Bank
Dry Creek	Intermediate	West Virginia	Monroe	192.0	11	16	5	16	21
Kimballton Branch	Intermediate	Virginia	Giles	198.9	63	19	16	79	35
Stony Creek	Intermediate	Virginia	Giles	200.3	505	323	166	671	489
Stony Creek	Intermediate	Virginia	Giles	200.3	505	323	166	671	489
Stony Creek	Intermediate	Virginia	Giles	200.3	505	323	166	671	489
UNT to Little Stony Creek	Intermediate	Virginia	Giles	203.5	39	27	13	52	40
UNT to Little Stony Creek	Intermediate	Virginia	Giles	204.2	257	18	55	312	73
Little Stony Creek	Intermediate	Virginia	Giles	204.3	35	240	55	90	295
UNT to Doe Creek	Intermediate	Virginia	Giles	205.8	23	26	10	33	36
Doe Creek	Intermediate	Virginia	Giles	206.7	12	194	41	53	235
UNT to Sinking Creek	Intermediate	Virginia	Giles	207.8	359	25	77	436	102
Sinking Creek	Intermediate	Virginia	Giles	211.1	26	33	12	38	45
Greenbriar Branch	Intermediate	Virginia	Giles	212.9	21	17	8	29	25
UNT to Sinking Creek	Intermediate	Virginia	Giles	216.6	22	88	22	44	110
Craig Creek	Intermediate	Virginia	Montgomery	219.5	30	10	8	38	18
North Fork Roanoke River	Intermediate	Virginia	Montgomery	227.4	28	36	13	41	49
Bradshaw Creek	Intermediate	Virginia	Montgomery	230.9	27	24	10	37	34
Roanoke River	Intermediate	Virginia	Montgomery	235.6	116	51	33	149	84
UNT to Bottom Creek	Intermediate	Virginia	Roanoke	240.8	70	63	27	97	90
Bottom Creek	Intermediate	Virginia	Roanoke	242.4	38	275	63	101	338
North Fork Blackwater River	Intermediate	Virginia	Franklin	249.8	19	22	8	27	30
UNT to North Fork Blackwater River	Intermediate	Virginia	Franklin	251.0	41	56	19	60	75
UNT to North Fork Blackwater River	Intermediate	Virginia	Franklin	251.9	44	36	16	60	52
UNT to Little Creek	Intermediate	Virginia	Franklin	256.0	22	25	9	31	34
Teels Creek	Intermediate	Virginia	Franklin	258.3	19	23	8	27	31
Teels Creek	Intermediate	Virginia	Franklin	259.2	25	31	11	36	42
Teels Creek	Intermediate	Virginia	Franklin	259.4	8	52	12	20	64
Teels Creek	Intermediate	Virginia	Franklin	260.4	58	19	15	73	34
UNT to Teels Creek	Intermediate	Virginia	Franklin	260.9	35	18	11	46	29
Teels Creek	Intermediate	Virginia	Franklin	261.1	44	31	15	59	46
Teels Creek	Intermediate	Virginia	Franklin	261.9	39	27	13	52	40
UNT to Teels Creek	Intermediate	Virginia	Franklin	262.1	30	12	8	38	20
Teels Creek	Intermediate	Virginia	Franklin	262.4	74	35	22	96	57
Little Creek	Intermediate	Virginia	Franklin	262.7	29	30	12	41	42
Little Creek	Intermediate	Virginia	Franklin	263.4	21	195	43	64	238
UNT to Maggodee Creek	Intermediate	Virginia	Franklin	268.6	8	53	12	20	65
UNT to Maggodee Creek	Intermediate	Virginia	Franklin	269.0	12	23	7	19	30
Maggodee Creek	Intermediate	Virginia	Franklin	269.5	33	44	15	48	59



**Vertical Scour and Lateral Channel Erosion Analyses  
Mountain Valley Pipeline**

**October 7, 2016**

Waterbody Name	FERC Classification	Location			Historical Migration Zone (ft) <sup>1</sup>		Factor of Safety (ft) <sup>2</sup>	Proposed Horizontal Setback (ft) <sup>3</sup>	
		State	County	MP	Left Descending Bank	Right Descending Bank		Left Descending Bank	Right Descending Bank
Blackwater River	Intermediate	Virginia	Franklin	269.8	38	49	17	55	66
UNT to Blackwater River	Intermediate	Virginia	Franklin	270.3	23	9	6	29	15
Foul Ground Creek	Intermediate	Virginia	Franklin	272.4	21	14	7	28	21
UNT to Poplar Camp Creek	Intermediate	Virginia	Franklin	274.2	58	12	14	72	26
UNT to Blackwater River	Intermediate	Virginia	Franklin	276.6	27	36	13	40	49
UNT to Jacks Creek	Intermediate	Virginia	Franklin	277.5	5	17	5	10	22
Strawfield Creek	Intermediate	Virginia	Franklin	282.4	16	25	8	24	33
Jonnikin Creek	Intermediate	Virginia	Pittsylvania	284.8	35	18	11	46	29
UNT to Rocky Creek	Intermediate	Virginia	Pittsylvania	287.2	31	51	16	47	67
Pigg River	Intermediate	Virginia	Pittsylvania	289.2	48	86	27	75	113
Harpen Creek	Intermediate	Virginia	Pittsylvania	290.0	67	24	18	85	42
Harpen Creek	Intermediate	Virginia	Pittsylvania	290.6	23	31	11	34	42
Harpen Creek	Intermediate	Virginia	Pittsylvania	292.1	23	89	22	45	111
UNT to Harpen Creek	Intermediate	Virginia	Pittsylvania	292.5	46	110	31	77	141
UNT to Cherrystone Creek	Intermediate	Virginia	Pittsylvania	294.3	30	22	10	40	32
Cherrystone Creek	Intermediate	Virginia	Pittsylvania	295.3	18	16	7	25	23
UNT to Pole Bridge Branch	Intermediate	Virginia	Pittsylvania	296.7	133	18	30	163	48
UNT to Little Cherrystone Creek	Intermediate	Virginia	Pittsylvania	301.5	16	23	8	24	31

**Notes:**

- <sup>1</sup> Measured from current channel centerline.
- <sup>2</sup> Factor of safety added to historical migration zone extent associated with both the left and right descending banks.
- <sup>3</sup> Measured from current channel centerline.

FERC: Federal Energy Regulatory Commission

ft: feet

MP: mile post



## **APPENDIX G**

### **SWVM Packages**