

Attachment RFI-2

Table 15 summarizes Mountain Valley's analysis of alternative methods of installing the pipeline under stream and wetland resources (i.e., open-cut or trenchless methods). Unavoidable impacts that do not involve installation of the pipeline, such as access roads, equipment crossings, and temporary workspaces, are not included in the Table 15's evaluation of alternative crossing methods.

As documented in Section 5 of the application and subsequent information submissions, including the revised Cumulative Impacts Analysis, Mountain Valley avoided impacts to aquatic resources to the extent practicable by adjusting the alignment of the right-of-way to sidestep resources and by reducing its width from 125 feet to 75 feet in the vicinity resources. However, it was not always practicable to "thread the needle" between resources with the wide, linear construction right-of-way, even with the reduced 75-foot width. To minimize such unavoidable impacts, Mountain Valley aligned the pipeline to avoid crossing under the resource where practicable.

Twelve of the 16 streams listed in this request involve minor, temporary, unavoidable impacts below the ordinary highwater mark that are necessary to install the pipeline adjacent to, but not under, the resource. Although the summary tables identify the Project Activity as "Pipeline ROW," these streams are avoided by the pipeline trench and are only located within the temporary or permanent easement of the pipeline. Three of the streams (S-NN16-Braid, S-D1-INT, and Stream S-DD4-Braid-1) are associated with other crossings that are included in Table 15, and one stream (Stream S-G17) was already complete at the time of the application. A more detailed explanation for each stream is provided below.

In addition to the 16 streams discussed above, Mountain Valley has identified one other stream, S-H103, that is identified as "Pipeline ROW" but was avoided during construction. Mountain Valley also has identified an additional stream, S-N13 Braid, that is associated with another crossing that is included in Table 15. These streams are also described below.

Stream S-K46 (ephemeral) – This ephemeral stream is in Lewis County, near County Road 9 (Churchville Road). Mountain Valley avoided installing the pipeline below the stream by aligning the pipeline to the east of the stream. However, a portion of the stream is in the temporary and permanent construction right-of-way immediately adjacent to the trench. The alignment was constrained by the need to cross the county road at a perpendicular angle. Shifting the pipeline farther east to wholly avoid any impact S-K46 would increase the area of impacts to wetlands W-K32 and W-B47 and the linear feet of impact to perennial stream S-B67.

Stream S-E74 (perennial) – The stream is in Webster County, near milepost (MP) 81.95. The stream is located within the temporary and permanent easement but is not directly over the pipeline, avoiding an open-cut crossing. In addition to avoiding an installation below the stream, Mountain Valley has minimized impacts by reducing the limits of disturbance (LOD) to 75 feet at this location to minimize impacts to two smaller tributaries of this stream, S-KK4b and S-KK2. The ability to shift the alignment to the southeast to avoid S-E74 is constrained by a steep side slope.

Stream S-S1 (ephemeral) – The stream is in Webster County, near MP 82.35. Like stream S-E74, the stream is in the temporary and permanent easement but is not directly over the pipeline – avoiding the more intrusive impact of an open-cut crossing. The pipeline LOD in this area has also been reduced to 75 feet. Shifting the pipeline to the west would increase impacts to S-S1 and would necessitate installing the

pipeline below the stream. Shifting the pipeline to the east would increase impacts on stream S-F40, Oldlick Creek, which is a larger perennial stream.

Stream S-A64 (ephemeral) – The stream is in Nicholas County, near MP 116.5. Mountain Valley has installed the pipeline on the coming-in side (approaching) and going-away side (leaving) of the stream. In order to complete the crossing, these two ends must be connected. The crossing had originally been approved as an open cut in 2018. However, the site-specific reevaluation conducted in preparation for submitting the pending application determined that the open-cut impact could be avoided by shifting the alignment slightly to the east. In addition to avoiding the open-cut crossing, Mountain Valley has minimized the temporary impact to this resource by reducing the LOD to 75 feet.

Stream S-NN16-Braid (perennial) – The stream in Montgomery County is adjacent to the Roanoke River (S-NN16) and would be crossed via microtunnel simultaneously with the river. There are no impacts identified in the Individual Permit application, and none are anticipated. The supporting information for the crossing of stream S-NN16 can be found in Table 15, crossing number H-019.

Stream S-D18 (ephemeral) – The stream is in Franklin County, near MP 261.3. The stream is located within the temporary and permanent easement but is not directly over the pipeline – avoiding an open cut. In addition, the LOD has also been reduced from 125 feet to 75 feet to reduce impacts on stream S-D20, a larger, unnamed intermittent tributary to Teels Creek. The need for workspace within the reduced right-of-way necessitates the temporary impact to S-D18. To avoid impacts to S-D18, the pipeline would need to be shifted to the south, which would then place the pipeline on an even steeper slope, complicating the construction procedure and increasing the safety risks.

Stream S-F4 (ephemeral) – The stream is in Franklin County, near MP 267.65. The stream is located along the temporary easement and not directly over the pipeline, which avoids an open-cut crossing. In addition to avoiding an open cut, the LOD in this area has been reduced to 75-feet to reduce impacts to stream S-C8, an unnamed intermittent tributary to the Blackwater River. Shifting the LOD to avoid the stream would place the pipeline at the base of a steep slope. Excavating a trench in this location compromises the integrity of the slope and could create the risk of landslides in this area

Stream S-GH37 (intermittent) – The stream is in Franklin County, near MP 272.9. The stream is located on the edge of the reduced 75-foot temporary easement and is not directly over the pipeline, which avoids an open-cut crossing. Furthermore, this small temporary impact is in a work space needed to complete a trenchless crossing of streams K-KL17 and S-GH38.

Streams S-G21 (intermittent) and S-G23 (intermittent) – Both of these streams are in Franklin County near MP 274.2. Stream S-G21 is located to the east of the pipeline, and stream S-G23 is located to the west; neither stream is directly above the pipeline, which avoids an open-cut crossing. Shifting the pipeline in either direction would increase impacts on the streams. In addition, a shift to the east would create impacts to wetland W-B11, which has been completely avoided. It is also worth noting that the LOD in this area has been reduced to 75-feet to avoid impacts to W-B11 and reduce impacts to these two streams and stream S-G22.

Stream S-G17 (ephemeral) – The stream is in Franklin County, near MP 275.3. The stream crossing was completed as a trenchless crossing; it was included in the list of completed crossings identified in Table 10 of the application. Therefore, it was excluded from the site-specific alternative analysis. An existing

travel lane is located at the crossing, and the temporary fills associated with that crossing were installed under the previously authorized NWP 12. This impact is identified in Table 2 as a “Timber Mat Crossing.”

Stream S-HH1 (ephemeral) – The stream is in Franklin County, near MP 280.4. The stream is located within the temporary and permanent easement but is not directly over the pipeline – avoiding an open-cut crossing. The LOD in this area has also been reduced from 125 feet to 75 feet to further reduce impacts to the stream. An alignment shift farther to the north to wholly avoid the stream is not practicable due to a power line adjacent and parallel to the right-of-way.

Stream S-A11 (ephemeral) – The stream is in Franklin County, near MP 280.75. The stream is located within the temporary and permanent easement but is not directly over the pipeline, which avoids the more intrusive impact of an open cut. To further avoid impacts to the resource, the LOD has been reduced from 125 feet to 75 feet. An alignment shift farther to the south to wholly avoid the stream is not practicable due to a farmstead immediately adjacent to the right-of-way.

Stream S-D1-INT (intermittent) – The stream is in Pittsylvania County, near MP 284.95. The stream is a continuation of stream S-D1-EPH – the ephemeral upstream section. Therefore, the analysis in Table 15 for stream S-D1-EPH (crossing number I-081, open cut) is also applicable to the crossing. To minimize the impact, the pipeline will be installed under the portion of the stream delineated as ephemeral.

Stream S-MM10 (intermittent) – The stream is in Pittsylvania County, near MP 294.8. The stream is located along the edge of the LOD, within the temporary easement, but would not experience an open-cut crossing. The LOD in this area has been reduced to 75 feet to avoid additional impacts on this stream and stream S-CC11, an unnamed perennial tributary to Cherry Creek. An existing travel lane is located at the crossing and the temporary fills associated with that crossing were installed under the previously authorized NWP 12. Shifting the alignment farther to the southwest to eliminate this minor impact to S-MM10 would result in an increased impact (by linear feet) to perennial stream S-CC11.

Stream S-DD4-Braid-1 (intermittent) – The stream is in Pittsylvania County, near MP 298.3. The stream is directly connected to stream S-DD4. The crossing would be completed simultaneously with stream S-DD4. Therefore, the analysis in Table 15 for stream S-DD4 (crossing number I-111) is also applicable to the crossing. The recommended crossing methodology is an open-cut.

Stream S-H103 (intermittent) – The stream is located in Webster County, near MP 93.35. The stream is located along the edge of the LOD, along a ridgeline and within the permanent and temporary easements. The pipeline has already been installed in this section of the Project area, and the temporary fills associated with existing travel lane remains. An open cut of the stream was avoided by shifting the pipeline centerline within the permanent easement.

Stream S-N13 Braid (intermittent) – The stream is located Nicholas County, near MP 122.95. The stream is a braid of the adjacent stream S-N13, and the streams would be crossed simultaneously. The supporting information for the crossing of stream S-N13, which can be found in Table 15, crossing number D-049, is also applicable to S-N13 Braid. In order to completely avoid S-N13 Braid, the right-of-way would need to be shifted approximately 30 feet, which would increase impacts to S-N13.