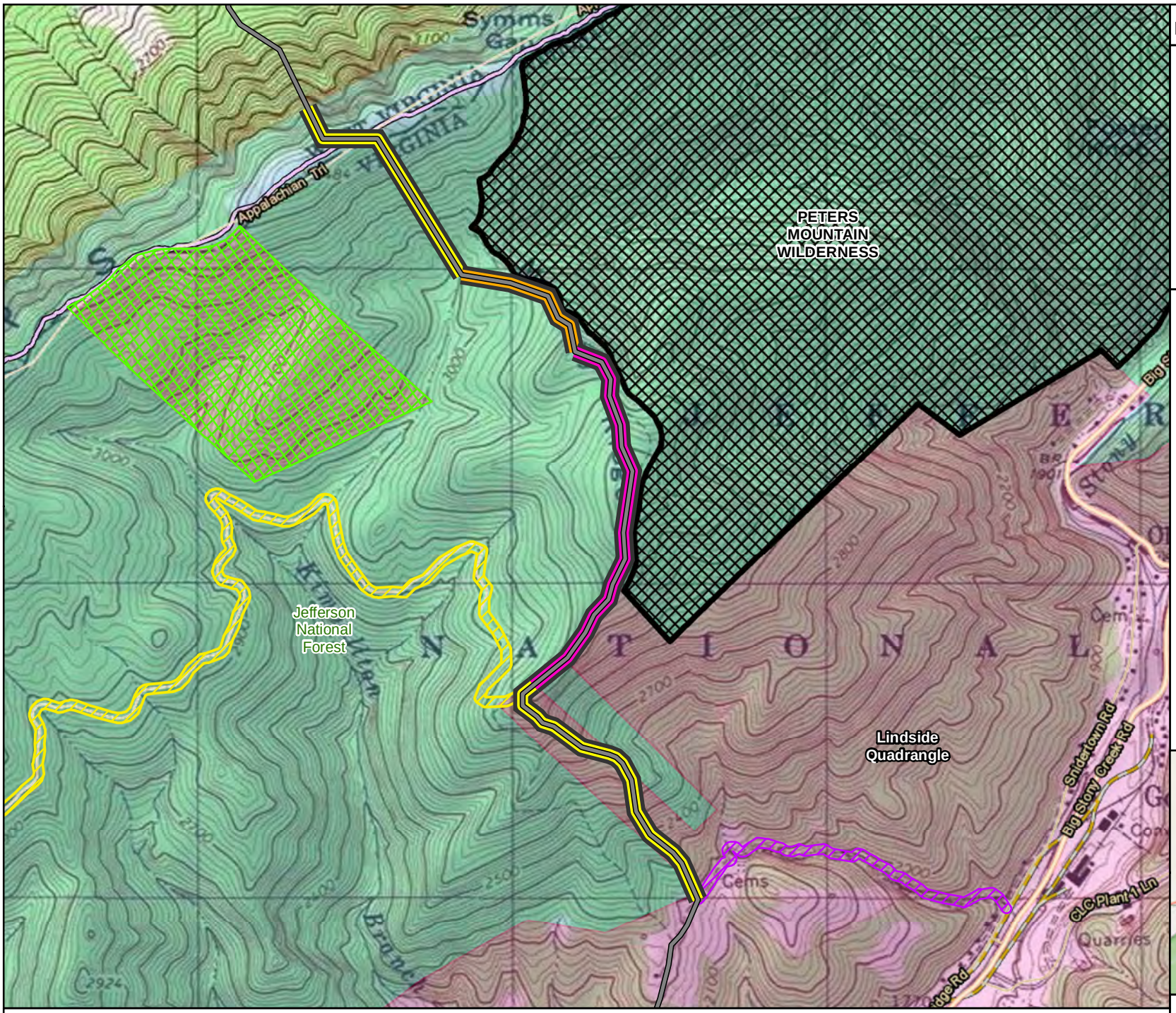
Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

Attachment USFS-6a



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

FIGURE 1.11-1
Construction Techniques within Jefferson National Forest

September 2015
(Revised April 2016)

Legend

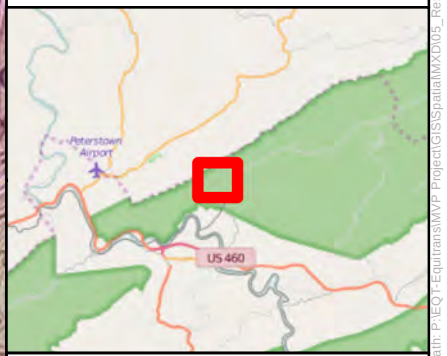
- Proposed Pipeline Route

Construction Method

- Down Slope with Winch
- Down Slope without Winch
- Typical Overland Construction
- Proposed Access Road
- Proposed Pocahontas Road 100ft Survey Corridor
- Newly Acquired USFS Property
- Appalachian Trail
- Peters Mountain Wilderness

USDA Forest Service Ownership

- NON-FOREST SERVICE
- USDA FOREST SERVICE



Data Sources: Appalachian Trail Conservancy, VA DCR, USDA, ESRI Streaming Data.

N

1:17,000

NAD 1983 UTM 17N

0 0.25 0.5 1 Miles

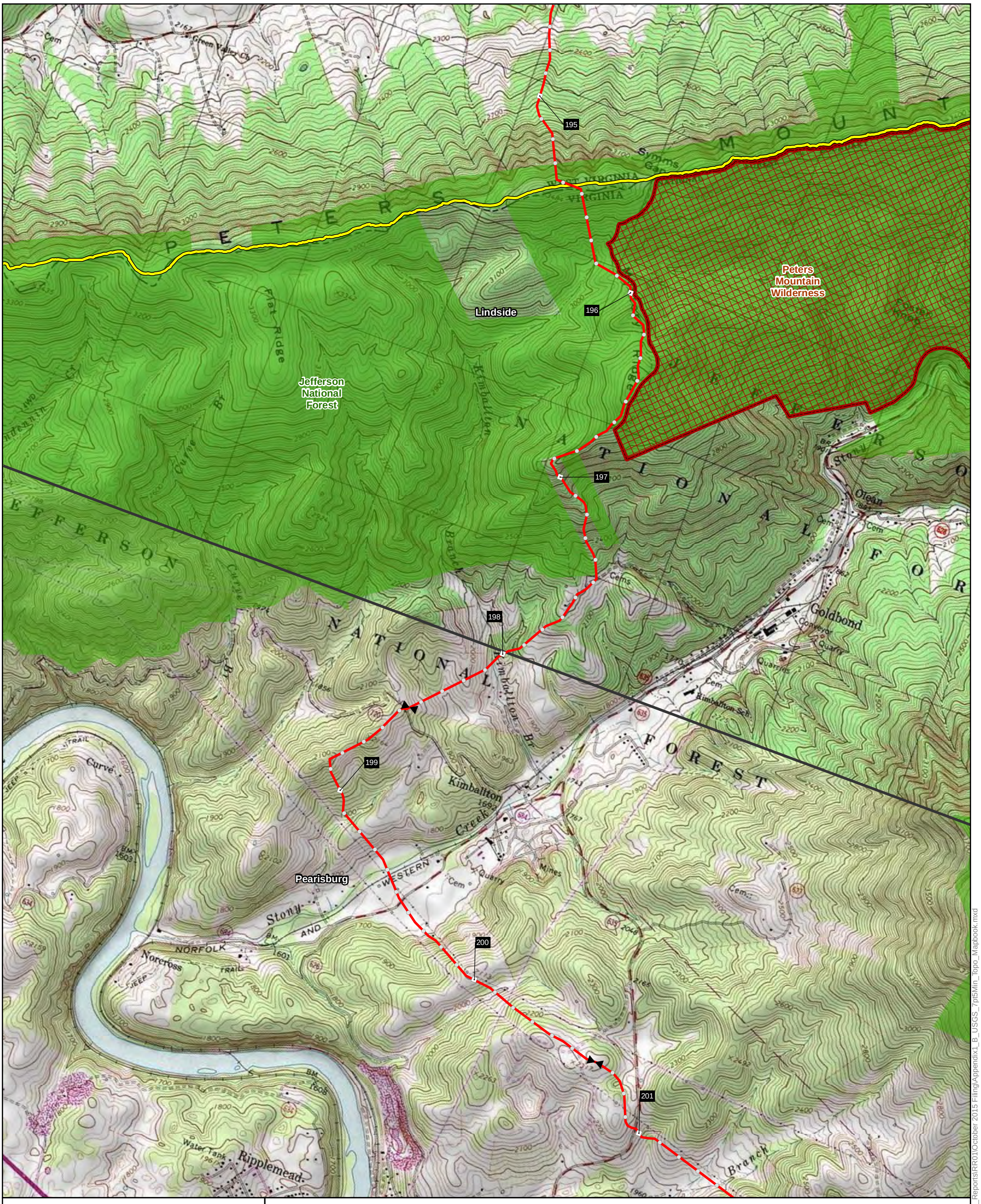
Document Path: P:\EQT Equitrans\MVP Project\GIS\Spatial\MXD\05_Resource_Reports\RR01\March 2016 Data Request\USFS FERC Updates\Fig_1_11_1_Construction_Techniques_Crossing_1.mxd

Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

Attachment USFS-6b



Mountain Valley Pipeline Project

NAD 1983 UTM 17N

1:24,000

0 0.5 1 Miles

Mountain Valley PIPELINE

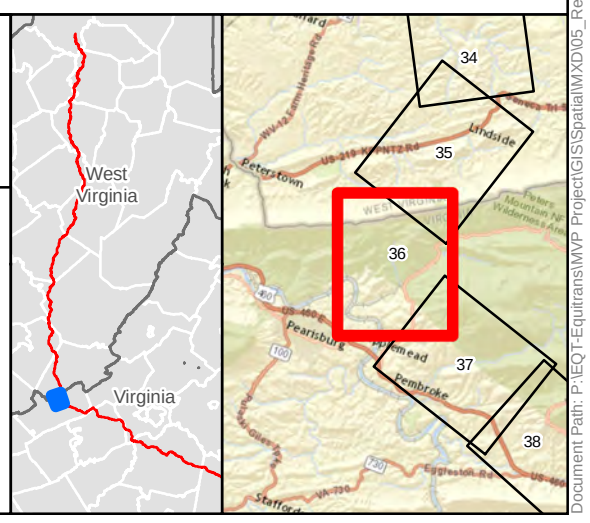
Appendix 1-B
USGS 7.5 Minute
Topographic Maps

October 2015
(Revised April 2016)

Data Sources: ESRI Streaming Data, 2014, ESRI, 2014, Ventyx, 2014.

Legend

- Mainline Block Valve
- Milepost
- Tenth-Mile
- Proposed Route
- Appalachian Trail
- Peters Mountain Wilderness
- USGS 7.5 Minute Topographic Map Boundary
- US National Forest Service Boundary



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Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

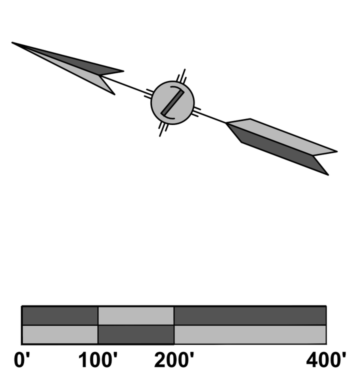
ATTACHMENTS

Attachment USFS-6c

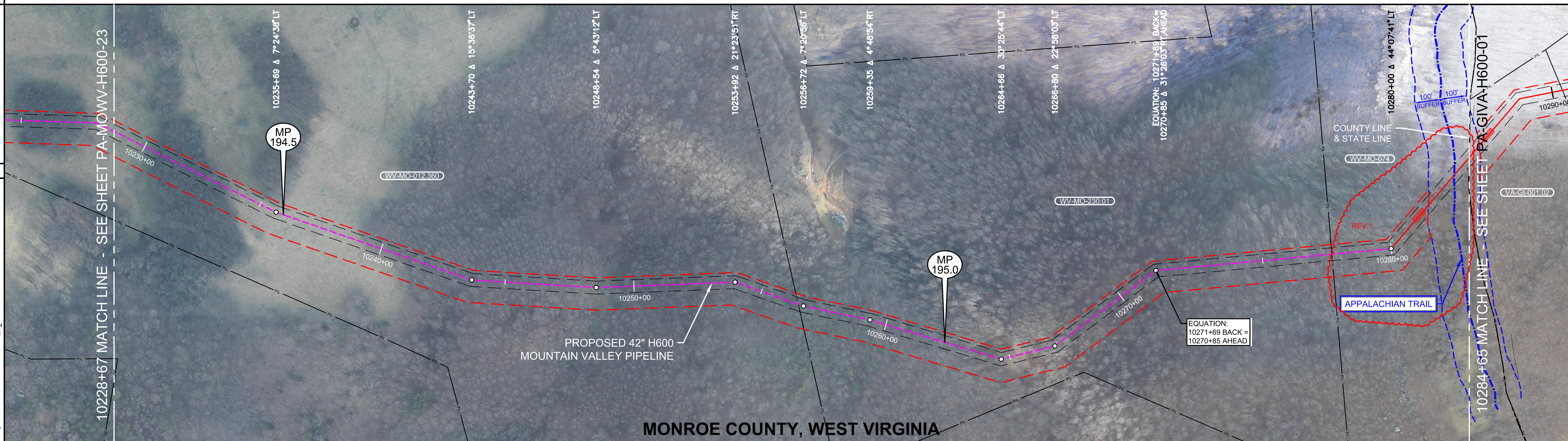
RIGHT-OF-WAY & OWNERSHIP DATA	10228+67	WV-MO-012.360 2761 LF 2811 SLOPE	10256+28	WV-MO-012.360 / WV-MO-230.01 65 LF 68 SLOPE	10256+93	WV-MO-230.01 2160 LF 2293 SLOPE	EQUATION: 10271+69 BACK= 10270+85 AHEAD	10277+69	WV-MO-074 665 LF 703 SLOPE	10284+34	WV-MO-074 / VA-GI-001.02 31 LF 31 SLOPE	10284+65

DESIGN				
PIPE / COATING	10228+67	1	10281+92	4	10284+65
SLOPE DISTANCE		5632'		273'	
CLASS LOCATION / HCA		1			

ENVIRONMENTAL	
CONSTRUCTION EXCLUSION	
WETLAND / STREAM	
.	
.	



PLAN VIEW



AERIAL PHOTOGRAPHY DATE: APRIL 2015 & JANUARY 2016

LEGEND

- STUDY CORRIDOR
- PROPOSED 42"PIPELINE
- NON-SURVEYED C/L
- 500' TICK MARK
- EXISTING PIPELINE
- PERMANENT EASEMENT
- WORK SPACE LIMITS
- PERMANENT ACCESS RD
- TEMPORARY ACCESS RD
- ANCILLARY SITE
- COUNTY LINE
- PROPERTY LINE
- ROAD RIGHT-OF-WAY
- FENCE LINE
- OVERHEAD POWER
- OVERHEAD TELEPHONE
- C/L ROAD
- C/L RAILROAD
- DELINEATED STREAM
- DELINEATED WETLAND
- BARRACADE FENCE
- PI SYMBOL
- PROPOSED TEST STATION
- MAILBOX
- LINE MARKER - VENT PIPE
- POWER/TELE POLE
- SIGN
- TOWER LEG
- TREE
- GUY ANCHOR
- TANK
- GAS VALVE
- WELL - GAS/OIL/WATER/ MONITORING
- POST - GATE/FENCE
- ELEC/GAS/WTR METER
- PEDESTAL - UTILITY
- MH - SANITARY/WATER
- CATCH BASIN - CULVERT
- ADDITIONAL TEMPORARY WORK SPACE(ATWS)
- ABOVE GROUND FACILITY
- LIMITS OF DISTURBANCE

REFERENCE DRAWINGS

DRAWING NO.	DESCRIPTION

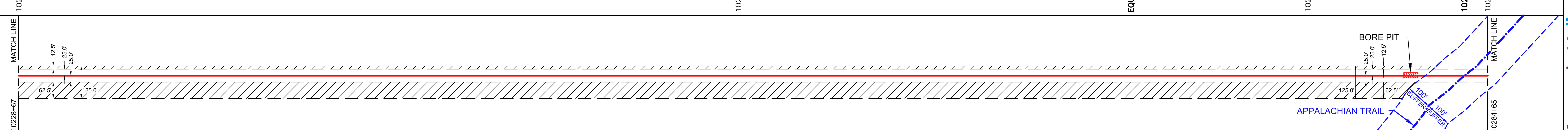
REV 4.0.0 - ISSUED TO FERC

HORIZONTAL STATIONING

- 10228+67 MATCH LINE
- 10257+03 PROPERTY LINE
- EQUATION: 10271+69 BACK= 10270+85 AHEAD
- 10277+69 PROPERTY LINE
- 10283+75 ℄ APPALACHIAN TRAIL
- 10284+65 MATCH LINE,END MONROE CO.,W.V., BEGIN GILES CO.,VA.,

WORK SPACE

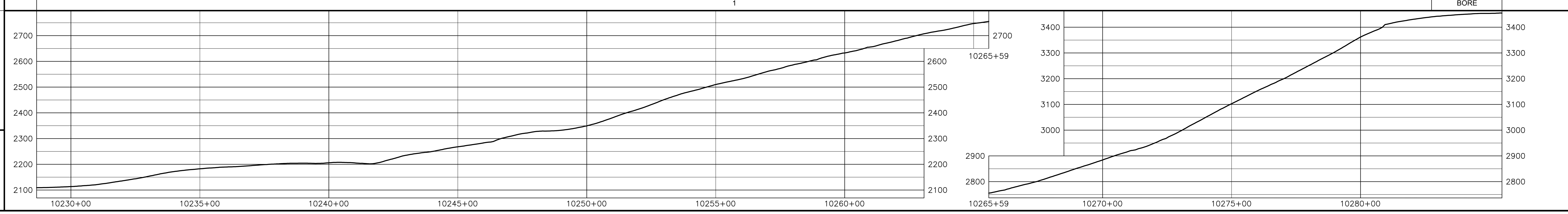
- PROPOSED PIPELINE
- EXISTING PIPELINE
- ACCESS ROAD TEMPORARY WORK SPACE
- PERMANENT EASEMENT
- TEMPORARY WORK SPACE(TWS)
- ADD. TEMPORARY WORK SPACE(ATWS)



CONSTRUCTION METHOD: 1 | BORE

CONSTRUCTION METHOD KEY
1 - TYPICAL R/W CONFIGURATION
2 - TYPICAL R/W CONFIGURATION
3 - TYPICAL "SKINNEY" FOR WATER BODY
4 -
5 -
6 -
7 -
8 -
9 -
10 -
11 -
12 -
13 -
14 -
15 -
16 -

PROFILE



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REVISIONS

REV.	BY	DATE	DESCRIPTION
0	HEI	10-15-15	REV. 4.0.0 ISSUED TO FERC
1	HEI	3-17-16	ROUTE ADJUSTMENT AT APPALACHIAN TRAIL

MATERIAL SUMMARY

MK. NO.	QTY.	DESCRIPTION
1	5632	42"O.D. X 0.617"W.T., X-70, FUSION BONDED EPOXY
4	273	42"O.D. X 0.740"W.T., X-70, FBE & ARO
		TYPE 1 TEST STATION - PIPELINE
		TYPE 4 TEST STATION - FOREIGN CROSSING

APPROVED FOR CONSTRUCTION

REV.	BY	DATE
.	.	.

APPROVED FOR BIDDING

REV.	BY	DATE
.	.	.

APPROVED FOR FERC

REV.	BY	DATE
0	RRR	10-15-15

Mountain Valley PIPELINE

PIPELINE ALIGNMENT
MOUNTAIN VALLEY PROJECT - H600 LINE
RED SULPHUR DIST., MONROE CO.,W.V.
STA. 10228+67 TO STA. 10284+65

HORZ. SCALE: 1" = 200'	
DRAWN BY: HEI(DRF)	02/17/15
DRAFTING CK:	.
ENGINEERING CK:	.
CONSTRUCTION CK:	.
ENVIRONMENTAL CK:.	.
AFE/P.O.NO.:	
HEI PROJECT NO.: 14-10-052	
DRAWING NO.: PA-MOWV-H600-24	
SHEET 215 OF 326	REV. 1
DATE OF PLOT: 03/18/16 12:20 PM	

RIGHT-OF-WAY & OWNERSHIP DATA

Station	Tract	Length
10284+65 – 10284+96	WV-MO-074 / VA-GI-001.02	31 LF / 31 SLOPE
10284+96 – 10290+41	VA-GI-001.02	439 LF / 458 SLOPE
10290+41 – 10329+76	VA-GI-002	3935 LF / 4033 SLOPE

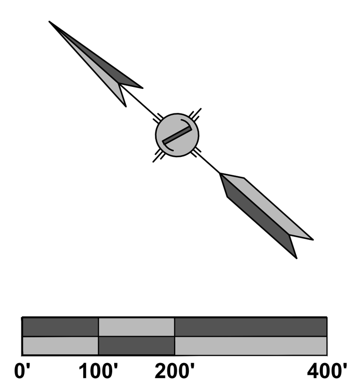
DESIGN

Item	10284+65 – 10285+52	10285+52 – 10329+76
PIPE / COATING	4	1
SLOPE DISTANCE	87'	4436'
CLASS LOCATION / HCA		1

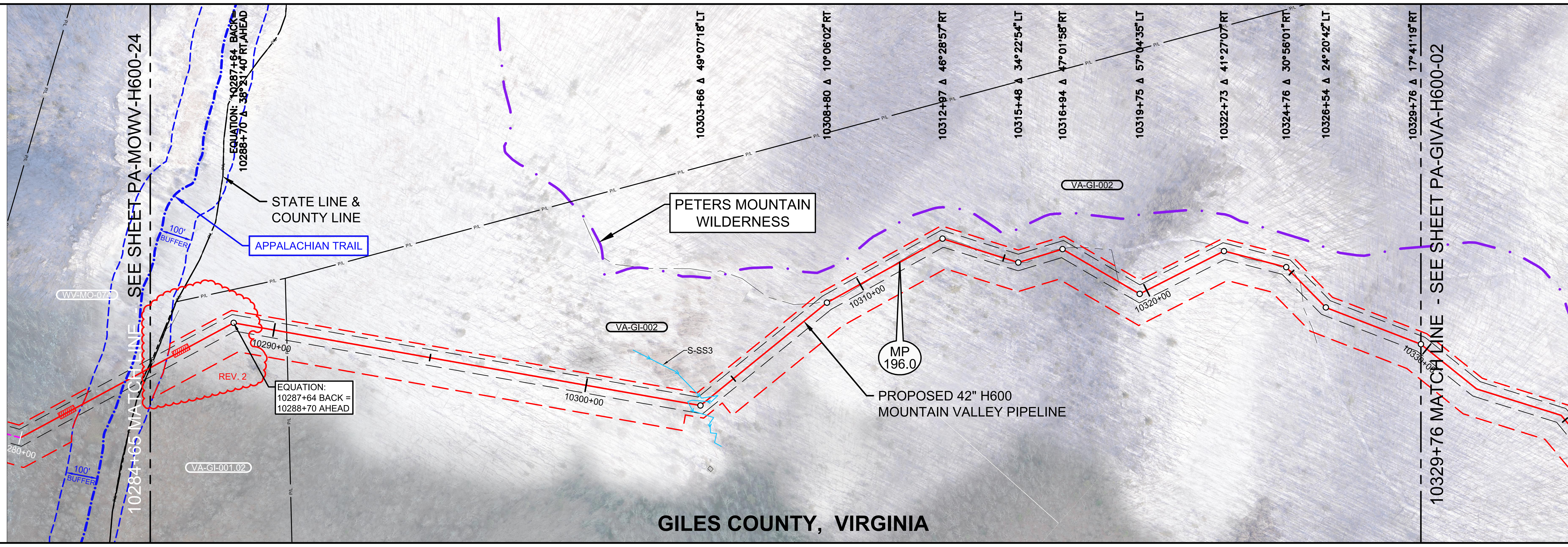
EQUATION: 10287+64 BK= 10288+70 AHD

ENVIRONMENTAL

Item	
CONSTRUCTION EXCLUSION	
WETLAND / STREAM	
.	
.	



PLAN VIEW



LEGEND

- STUDY CORRIDOR
- PROPOSED 42"PIPELINE
- NON-SURVEYED C/L
- 500' TICK MARK
- EXISTING PIPELINE
- PERMANENT EASEMENT
- WORK SPACE LIMITS
- PERMANENT ACCESS RD
- TEMPORARY ACCESS RD
- ANCILLARY SITE
- COUNTY LINE
- PROPERTY LINE
- ROAD RIGHT-OF-WAY
- FENCE LINE
- OVERHEAD POWER
- OVERHEAD TELEPHONE
- C/L ROAD
- C/L RAILROAD
- DELINEATED STREAM
- DELINEATED WETLAND
- BARRACADE FENCE
- PI SYMBOL
- PROPOSED TEST STATION
- MAILBOX
- LINE MARKER - VENT PIPE
- POWER/TELE POLE
- SIGN
- TOWER LEG
- TREE
- GUY ANCHOR
- TANK
- GAS VALVE
- WELL - GAS/OIL/WATER/ MONITORING
- POST - GATE/FENCE
- ELEC/GAS/WTR METER
- PEDESTAL - UTILITY
- MH - SANITARY/WATER
- CATCH BASIN - CULVERT
- ADDITIONAL TEMPORARY WORK SPACE(ATWS)
- ABOVE GROUND FACILITY
- LIMITS OF DISTURBANCE

REFERENCE DRAWINGS

DRAWING NO.	DESCRIPTION

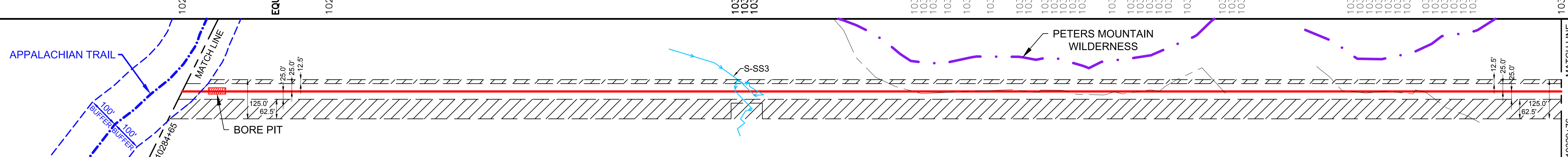
REV 4.0.0 - ISSUED TO FERC

HORIZONTAL STATIONING

- 10284+65 MATCH LINE, END MONORE CO.,W.V., BEGIN GILES COUNTY,VIRGINIA
- **EQUATION: 10287+64 BACK= 10288+70 AHEAD**
- 10290+41 PROPERTY LINE
- 10303+28 ℄ STREAM(S-SS3)
- 10303+86 ℄ STREAM(S-SS3)
- 10304+10 ℄ STREAM(S-SS3)
- 10308+95 EDGE OF DIRT
- 10309+07 ℄ TRAIL(DIRT)
- 10309+19 EDGE OF DIRT
- 10310+16 EDGE OF DIRT
- 10310+78 ℄ TRAIL(DIRT)
- 10311+53 EDGE OF DIRT
- 10312+47 EDGE OF DIRT
- 10312+75 ℄ TRAIL(DIRT)
- 10313+01 ℄ TRAIL(DIRT)
- 10313+05 EDGE OF DIRT
- 10313+86 EDGE OF DIRT
- 10313+97 ℄ TRAIL(DIRT)
- 10314+07 EDGE OF DIRT
- 10315+41 EDGE OF DIRT
- 10315+56 EDGE OF DIRT
- 10316+09 EDGE OF DIRT
- 10316+30 ℄ TRAIL(DIRT)
- 10316+50 EDGE OF DIRT
- 10316+78 EDGE OF DIRT
- 10316+97 EDGE OF DIRT
- 10318+94 EDGE OF DIRT
- 10318+98 ℄ TRAIL(DIRT)
- 10319+02 EDGE OF DIRT
- 10322+78 EDGE OF DIRT
- 10323+07 ℄ TRAIL(DIRT)
- 10323+33 EDGE OF DIRT
- 10323+77 EDGE OF DIRT
- 10324+11 ℄ TRAIL(DIRT)
- 10324+21 ℄ TRAIL(DIRT)
- 10324+52 EDGE OF DIRT
- 10324+82 EDGE OF DIRT
- 10324+89 ℄ TRAIL(DIRT)
- 10324+96 EDGE OF DIRT
- 10325+17 EDGE OF DIRT
- 10325+30 ℄ TRAIL(DIRT)
- 10325+42 EDGE OF DIRT
- 10329+76 MATCH LINE

WORK SPACE

- PROPOSED PIPELINE
- EXISTING PIPELINE
- ACCESS ROAD TEMPORARY WORK SPACE
- PERMANENT EASEMENT
- TEMPORARY WORK SPACE(TWS)
- ADD. TEMPORARY WORK SPACE(ATWS)



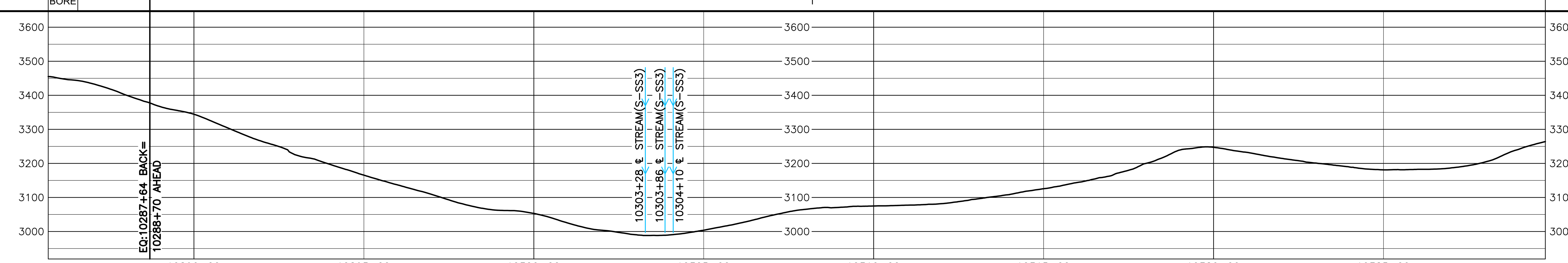
CONSTRUCTION METHOD

BORE | 1

CONSTRUCTION METHOD KEY

1 - TYPICAL R/W CONFIGURATION
2 - TYPICAL R/W CONFIGURATION
3 - TYPICAL "SKINNEY" FOR WATER BODY
4 -
5 -
6 -
7 -
8 -
9 -
10 -
11 -
12 -
13 -
14 -
15 -
16 -

PROFILE



AERIAL PHOTOGRAPHY DATE: APRIL 2015 & JANUARY 2016

MATERIAL SUMMARY

MK. NO.	QTY.	DESCRIPTION
1	4436	42"O.D. X 0.617"W.T., X-70, FUSION BONDED EPOXY
4	273	42"O.D. X 0.740"W.T., X-70, FBE & ARO
		TYPE 1 TEST STATION - PIPELINE
		TYPE 4 TEST STATION - FOREIGN CROSSING

REVISIONS

REV.	BY	DATE	DESCRIPTION
0	HEI	10-15-15	REV. 4.0.0 ISSUED TO FERC
1	HEI	01-12-16	FERC DATA REQUEST 21 - ADDED NHD WATERBODY
2	HEI	03-17-16	ROUTE ADJUSTMENT AT APPALACHIAN TRAIL

APPROVED FOR CONSTRUCTION

REV.	BY	DATE
.	.	.

APPROVED FOR BIDDING

REV.	BY	DATE
.	.	.

APPROVED FOR FERC

REV.	BY	DATE
0	RRR	10-15-15

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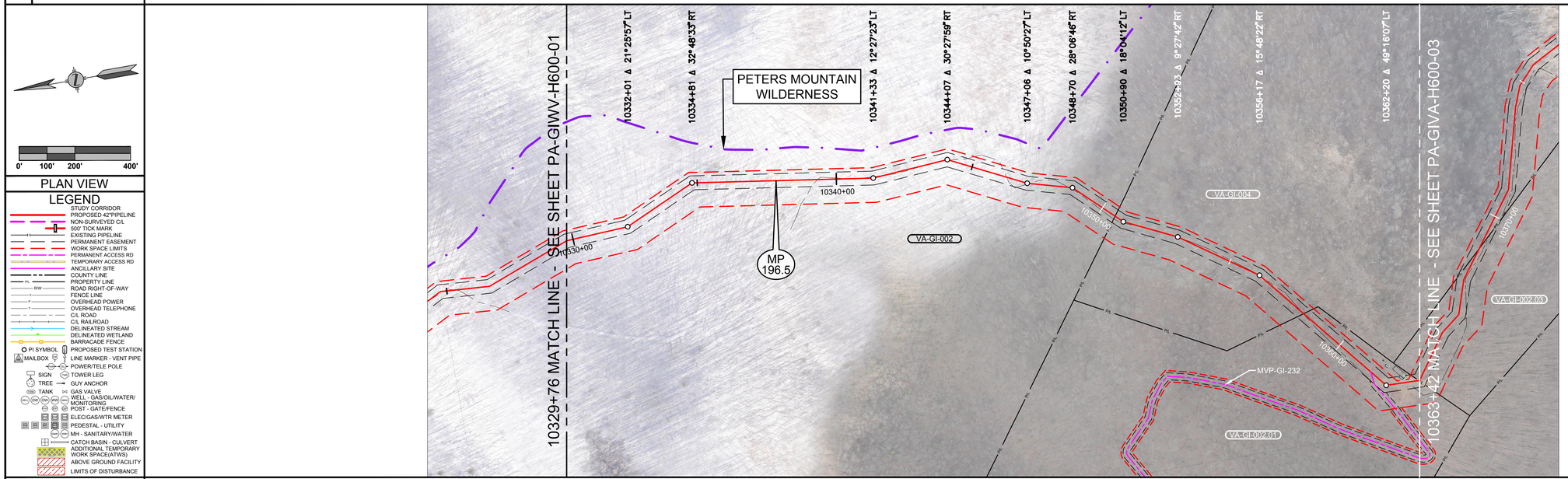
Mountain Valley PIPELINE

PIPELINE ALIGNMENT
MOUNTAIN VALLEY PROJECT - H600 LINE PEMBROKE PRECINCT,GILES CO.,VA. STA. 10284+64 TO STA. 10329+76

HORZ. SCALE: 1" = 200'	
DRAWN BY: HEI(DRF)	02/17/15
DRAFTING CK:	
ENGINEERING CK:	
CONSTRUCTION CK:	
ENVIRONMENTAL CK:	
AFE/P.O.NO.:	
HEI PROJECT NO.: 14-10-052	
DRAWING NO.: PA-GIVA-H600 -01	
SHEET 216 OF 326	REV. 2
DATE OF PLOT: 3/18/16 12:25 PM	

RIGHT-OF-WAY & OWNERSHIP DATA

		10329+76	VA-GI-002 2078 LF 2095 SLOPE	10350+54	VA-GI-004 736 LF 741 SLOPE	10357+90	VA-GI-004 54 LF 54 SLOPE	10359+44	VA-GI-002.01 498 LF 501 SLOPE	10363+42
DESIGN	PIPE / COATING	10329+76	1							10363+42
	SLOPE DISTANCE		3391'							
	CLASS LOCATION / HCA		1							
ENVIRONMENTAL	CONSTRUCTION EXCLUSION									
	WETLAND / STREAM									
	.									
	.									



0' 100' 200' 400'

PLAN VIEW

LEGEND

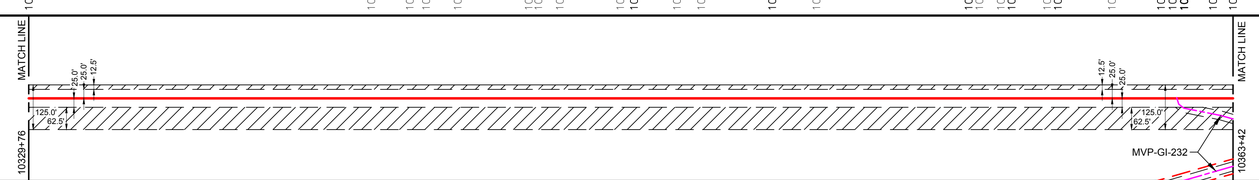
- STUDY CORRIDOR
- PROPOSED 42"PIPELINE
- NON-SURVEYED C/L
- 500' TICK MARK
- EXISTING PIPELINE
- PERMANENT EASEMENT
- WORK SPACE LIMITS
- PERMANENT ACCESS RD
- TEMPORARY ACCESS RD
- ANCILLARY SITE
- COUNTY LINE
- PROPERTY LINE
- ROAD RIGHT-OF-WAY
- FENCE LINE
- OVERHEAD POWER
- OVERHEAD TELEPHONE
- C/L ROAD
- C/L RAILROAD
- DELINEATED STREAM
- DELINEATED WETLAND
- BARRACADE FENCE
- PROPOSED TEST STATION
- LINE MARKER - VENT PIPE
- POWER/TELE POLE
- TOWER LEG
- GUY ANCHOR
- GAS VALVE
- WELL - GAS/OIL/WATER/ MONITORING
- POST - GATE/FENCE
- ELEC/GAS/WTR METER
- PEDESTAL - UTILITY
- MH - SANITARY/WATER
- CATCH BASIN - CULVERT
- ADDITIONAL TEMPORARY WORK SPACE(ATWS)
- ABOVE GROUND FACILITY
- LIMITS OF DISTURBANCE

PI SYMBOL, MAILBOX, SIGN, TREE, TANK

REFERENCE DRAWINGS

DRAWING NO.	DESCRIPTION

HORIZONTAL STATIONING



WORK SPACE

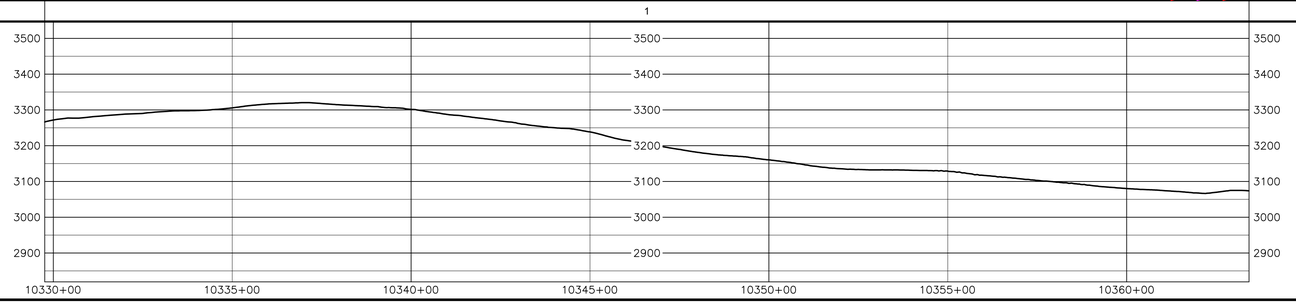
- PROPOSED PIPELINE
- EXISTING PIPELINE
- ACCESS ROAD TEMPORARY WORK SPACE
- PERMANENT EASEMENT
- TEMPORARY WORK SPACE(TWS)
- ADD. TEMPORARY WORK SPACE(ATWS)

CONSTRUCTION METHOD

CONSTRUCTION METHOD KEY

1 - TYPICAL R/W CONFIGURATION
2 - TYPICAL R/W CONFIGURATION
3 - TYPICAL "SKINNEY" FOR WATER BODY
4 -
5 -
6 -
7 -
8 -
9 -
10 -
11 -
12 -
13 -
14 -
15 -
16 -

PROFILE



REV 4.0.0 - ISSUED TO FERC

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Holland, Michigan 49423-3786 | Southfield, Michigan 48076
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www.hollandengineering.com

REVISIONS

REV.	BY	DATE	DESCRIPTION
4.0	HEI	10-15-15	REV. 4.0.0 ISSUED TO FERC
1	HEI	03-16-16	REVISED SHEET NUMBER TO 217

AERIAL PHOTOGRAPHY DATE: APRIL 2015 & JANUARY 2016

MATERIAL SUMMARY

MK. NO.	QTY.	DESCRIPTION
	3391	42"O.D. X 0.617"W.T. X70 KSI FBE BONDED EPOXY
1		TYPE 1 TEST STATION - PIPELINE
4		TYPE 4 TEST STATION - FOREIGN CROSSING

APPROVED FOR CONSTRUCTION

REV.	BY	DATE
-	-	-

APPROVED FOR BIDDING

REV.	BY	DATE
-	-	-

APPROVED FOR FERC

REV.	BY	DATE
0	HRR	10-15-15

Mountain Valley PIPELINE

PIPELINE ALIGNMENT

MOUNTAIN VALLEY PROJECT - H600 LINE
PEMBROKE PRECINCT.,GILES CO.,VA.
STA. 10329+76 TO STA. 10363+42

HORZ. SCALE: 1" = 200'	
DRAWN BY: HEI(DRF)	02/17/15
DRAFTING CK:	
ENGINEERING CK:	
CONSTRUCTION CK:	
ENVIRONMENTAL CK:	
AFE/P.O.NO.:	
HEI PROJECT NO.: 14-10-052	
DRAWING NO.: **PA-GIVA-H600 -02**	
SHEET 217 OF 326	REV. 1
DATE OF PLOT: 3/18/16 12:10 PM	

Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

Attachment USFS-6d

RIGHT-OF-WAY & OWNERSHIP DATA		
DESIGN	PIPE / COATING	
	SLOPE DISTANCE	
	CLASS LOCATION / HCA	
ENVIRONMENTAL	CONSTRUCTION EXCLUSION	
	WETLAND / STREAM	
	SEDIMENT BARRIER LEFT	
	SEDIMENT BARRIER RIGHT	

APPALACHIAN TRAIL - BORE (OPTION #2)

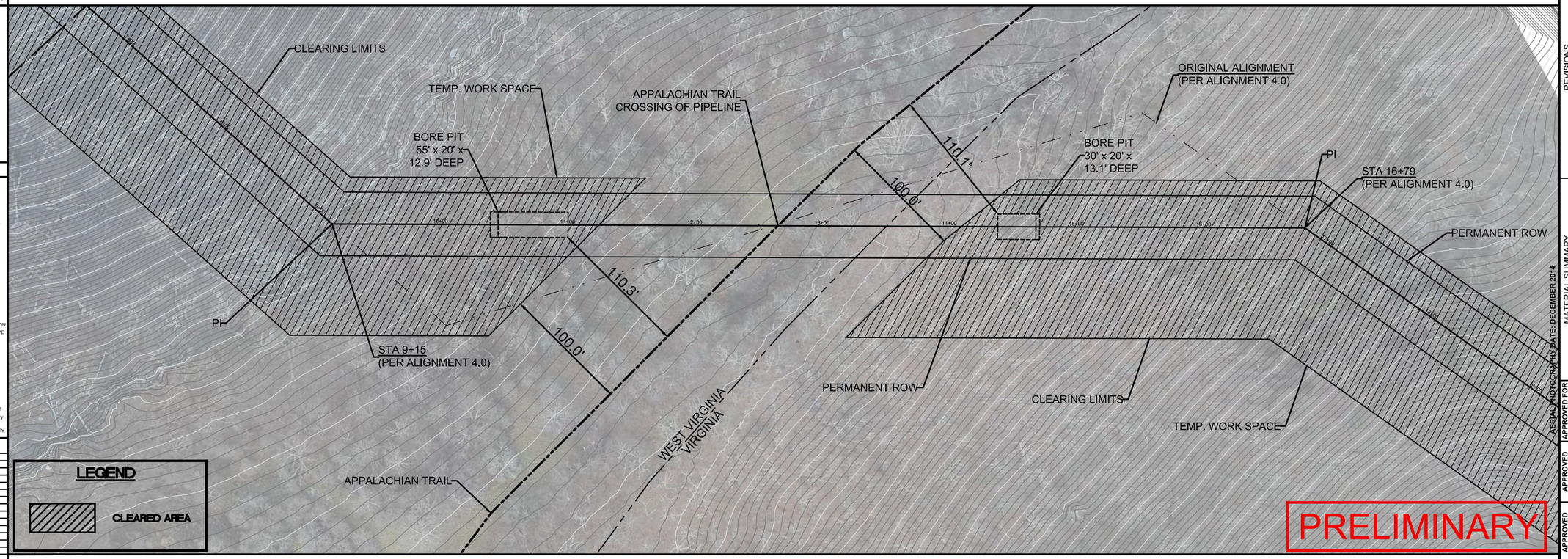
PLAN VIEW

LEGEND

- PROPOSED 42"PIPELINE
- NON-SURVEYED C/L
- 500' TICK MARK
- EXISTING PIPELINE
- PERMANENT EASEMENT
- WORK SPACE LIMITS
- PERMANENT ACCESS RD
- TEMPORARY ACCESS RD
- ANCILLARY SITE
- PROPERTY LINE
- ROAD RIGHT-OF-WAY
- FENCE LINE
- OVERHEAD POWER
- OVERHEAD TELEPHONE
- C/L ROAD
- C/L RAILROAD
- DELINEATED STREAM
- DELINEATED WETLAND
- PI SYMBOL: PROPOSED TEST STATION
- MAILBOX: LINE MARKER - VENT PIPE
- POWER/TELE POLE
- SIGN: TOWER LEG
- TREE: GUY ANCHOR
- TANK: GAS VALVE
- WELL - GAS/OIL/WATER/ MONITORING
- POST - GATE/FENCE
- ELEC/GAS/WTR METER
- PEDESTAL - UTILITY
- MH - SANITARY/WATER
- CATCH BASIN - CULVERT
- ADDITIONAL TEMPORARY WORK SPACE(ATWS)
- ABOVE GROUND FACILITY

REFERENCE DRAWINGS

DRAWING NO.	DESCRIPTION



WORK SPACE

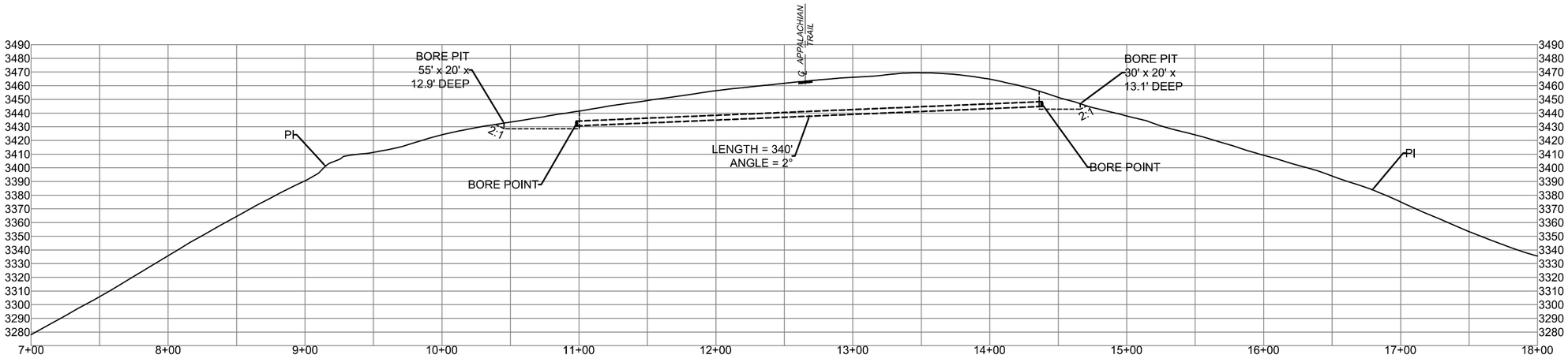
- PROPOSED PIPELINE
- EXISTING PIPELINE
- WORK SPACE LIMITS
- PERMANENT EASEMENT
- TEMPORARY WORK SPACE(TWS)
- ADD. TEMPORARY WORK SPACE(ATWS)

CONSTRUCTION METHOD

CONSTRUCTION METHOD KEY

1 -
2 -
3 -
4 -
5 -
6 -
7 -
8 -
9 -
10 -
11 -
12 -
13 -
14 -
15 -
16 -

PROFILE



REVISIONS

REV.	BY	DATE	DESCRIPTION

MATERIAL SUMMARY

MK. NO.	QTY.	DESCRIPTION

AERIAL PHOTOGRAPHY DATE: DECEMBER 2014

APPROVED FOR BIDDING

REV.	BY	DATE

APPROVED FOR CONSTRUCTION

REV.	BY	DATE

APPROVED AS-BUILT

REV.	BY	DATE
0		

Mountain Valley PIPELINE

PIPELINE ALIGNMENT

MOUNTAIN VALLEY PROJECT - H600 LINE

RE□ S□LPH□R □IST., MONROE CO., □.V.

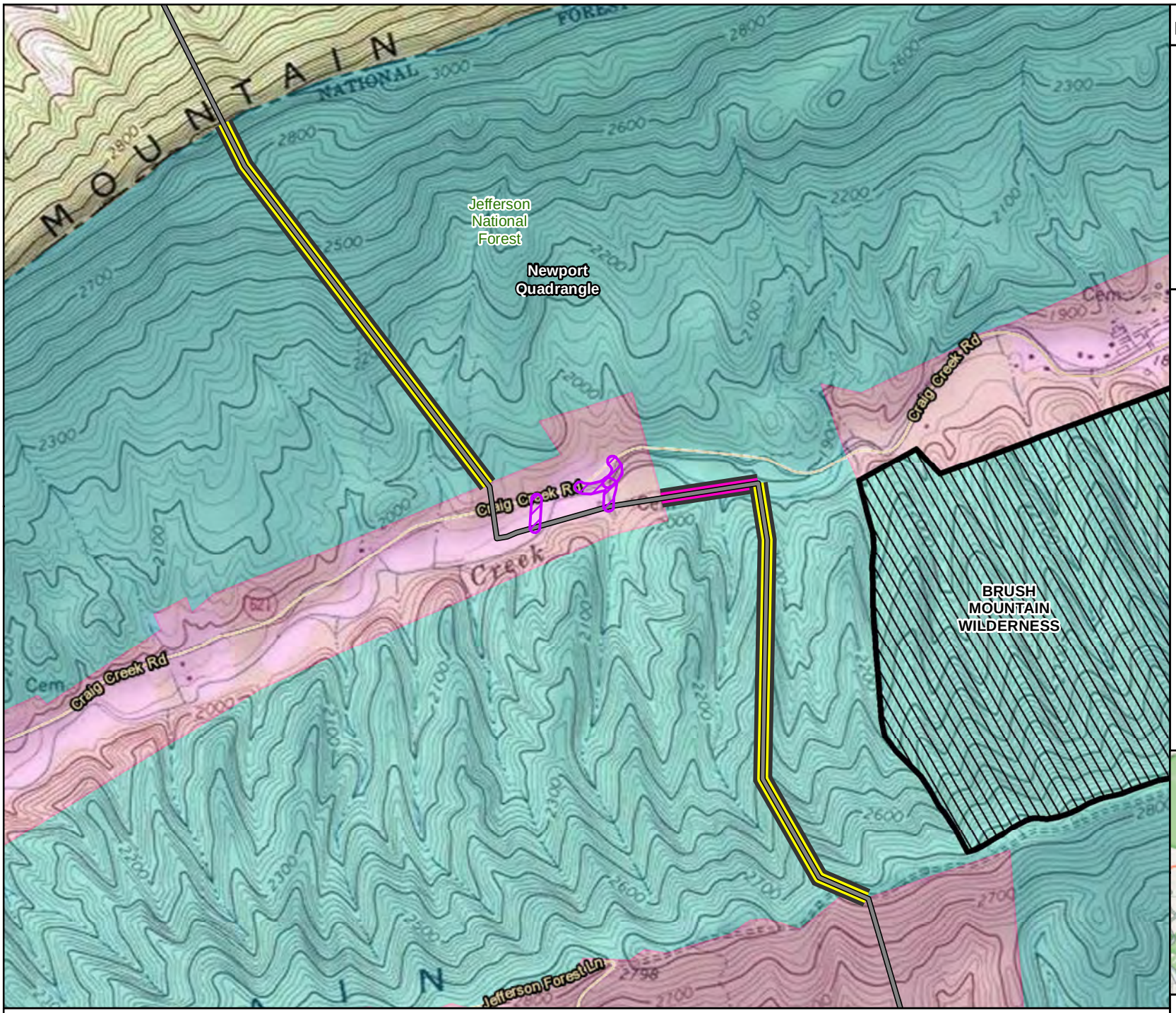
HORZ. SCALE: NTS	
DRAWN BY: HEI(DRF)	9/28/2015
DRAFTING CK:	
ENGINEERING CK:	
CONSTRUCTION CK:	
ENVIRONMENTAL CK:	
AFE/P.O.NO.:	
HEI PROJECT NO.: 14-10-052	
DRAWING NO.: PA-GIVA-H600	
SHEET XX OF XX	REV. -
DATE OF PLOT: 10/5/2015 2:08:55 PM	

Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

Attachment USFS-10



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

FIGURE 1.11-2
Construction Techniques within Jefferson National Forest

September 2015
(Revised April 2016)

Legend

- Proposed Pipeline Route
- Proposed Access Road

Construction Method

- Down Slope with Winch
- Typical Overland Construction
- Brush Mountain Wilderness

USDA Forest Service Ownership

- NON-FOREST SERVICE
- USDA FOREST SERVICE

N

1:16,000

NAD 1983 UTM 17N

0 0.25 0.5 1 Miles

Data Sources: Appalachian Trail Conservancy, VA DCR, USDA, ESRI Streaming Data.

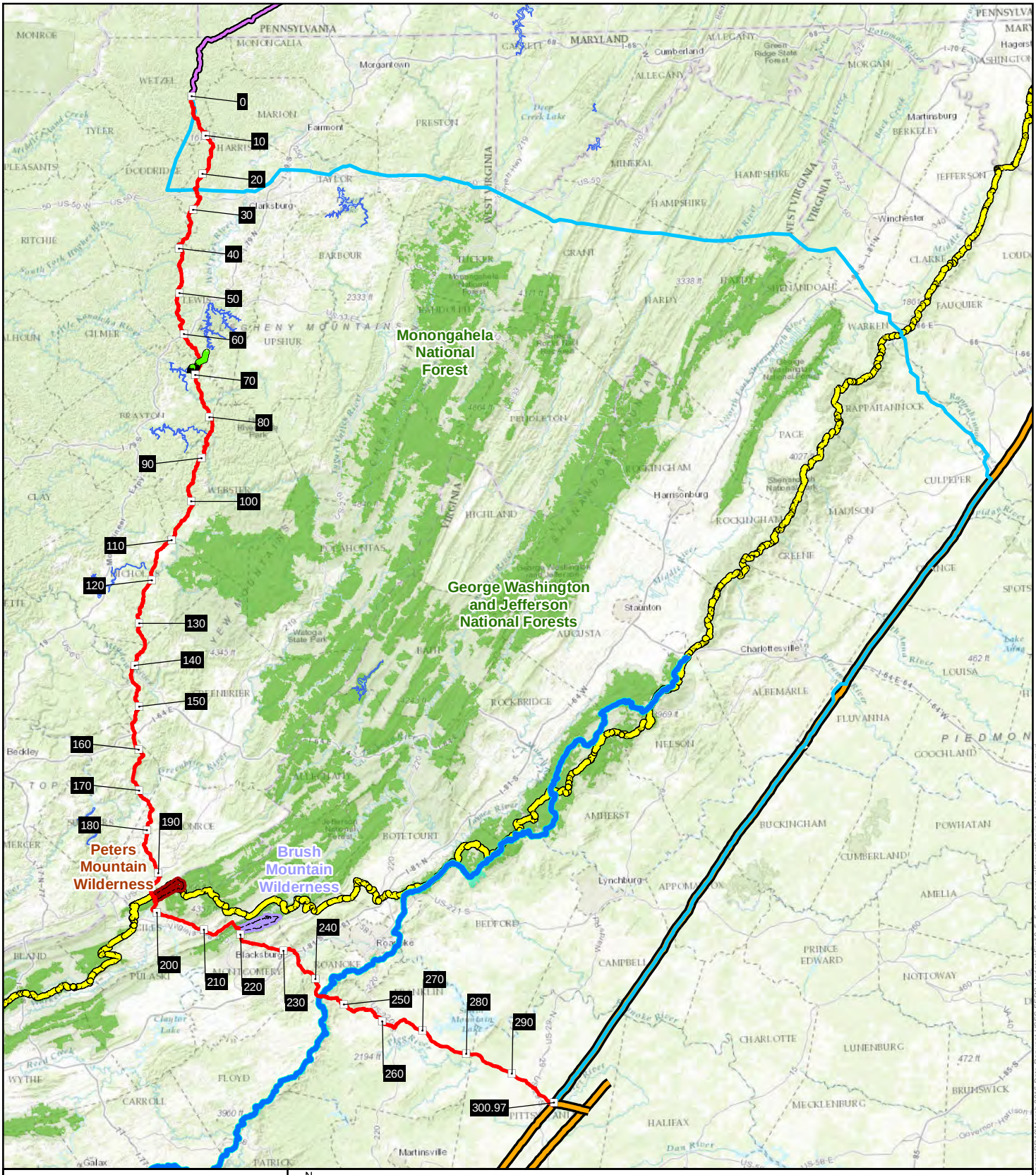
Document Path: P:\EQT-EquitransMVP Project\GIS\Spatial\MXD\05_Resource_Reports\RR01\March 2016 Data Request\USFS FERC Updates\Fig_1_11_2_Construction_Techniques_Crossing_2.mxd

Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

Attachment USFS-19a



Mountain Valley Pipeline

N

NAD 1983 UTM 17N

1:1,600,000

0 5 10 20 30 40 Miles

Mountain Valley PIPELINE

Figure 10.5-5
Conceptual Forest Service Avoidance Route

April 2016

Data Sources: ESRI Streaming Data, 2014, Ventyx 2014.

Legend

- Milepost
- Weston Gauley Turnpike Trail
- Proposed Route
- Conceptual Forest Service Avoidance Route
- Existing Equitrans H-302 Line
- Existing Transco Pipeline
- Brush Mountain Wilderness
- Peters Mountain Wilderness
- Blue Ridge Parkway
- Appalachian Trail
- Army Corps of Engineers Reservoir
- US National Forest Service Boundary
- Blue Ridge Parkway National Park Boundary

Document Path: P:\EQT-Equitrans\MVP Project\GIS\Spatial\MXD\05_Resource_Reports\RR10\March 2016 Data Request USFS FERC Updates\Fig10_5_5_ConceptualForestServiceAvoidanceRoute.mxd

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FERC Docket No. CP16-10-000

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Dated March 9, 2016

ATTACHMENTS

Attachment USFS-19b

Attachment USFS-19b

Comparison of a Conceptual Forest Service Avoidance Route and the Proposed Route

Feature	Conceptual Forest Service Avoidance Route	Proposed Route
General		
Total length (miles)	351	301.0
Length adjacent to existing ROW (miles)	332	22
Land disturbed within construction ROW (acres) a/	5,301	4,556
Land Use		
Populated areas b/ within ½ mile (number)	31	8
National Forest System lands crossed (miles)	0	3.4
National Forest Wilderness crossed (miles)	0	0
Appalachian National Scenic Trail crossings (number)	1	1
Blue Ridge Parkway crossings (number)	0	1
NRHP designated or eligible historic districts crossed (miles)	0.1	10.1
Landowner parcels crossed (number)	1,743 c/	1,495
Residences within 50 feet of construction work space (number)	168	63
Resources		
Forested land crossed (miles)	206.0	245.2
Forested land affected during construction (acres)	3,121.2	3,720.0
Forested land affected during operation (acres)	1,248.5	1,486.0
Interior forest crossed (miles)	41.1	129.8
Wetlands (NWI) crossed (feet) d/	18,918	3,299
Forested wetlands crossed (feet) d	7,761	1,721
Forested wetlands affected by construction (acres)	13.4	3.0
Forested wetlands affected by operation (acres)	8.9	2.0
Perennial waterbody crossings (number) d/	206	97
Major (> 100 feet) waterbodies crossed (number)	16	5
Shallow bedrock crossed (miles) e/	80.9	214.9
Steep slope (>20 percent) crossed (miles)	86.3	120.0
Side slope crossed (miles)	133.8	122.8
Landslide potential crossed (miles) f/	249.2	199.7
Karst area crossed (miles)	98.5	53.3

a/ Assuming 125-foot-wide construction ROW.
b/ City or town limits as shown in Environmental Systems Research Institute (ESRI) data.
c/ estimated assuming similar size and number of landowner parcels would be crossed by the alternative as those crossed by the corresponding segment of Proposed Route. Does not account for fact that number of parcels crossed would be greatly reduced if alternative were constructed entirely within highway rights-of-way.
d/ NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative. Public data on waters with drinking water designation not available.
e/ Based on data available for only about 68 percent of the route.
f/ areas mapped as High Incidence and/or High Susceptibility from Radbruch-Hall et. al 1982.

ROW = right-of-way
NRHP = National Register of Historic Places
NHD = U.S. Geological Survey National Hydrography Dataset
NWI = U.S. Fish and Wildlife Service National Wetland Inventory

Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

Attachment USFS-20

Preliminary
Plan of Development

Mountain Valley Pipeline Project

Prepared by:

Mountain Valley PIPELINE LLC

January 26, 2016 (Revised April 2016)

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Note: The following is a preliminary list of attachments; no attachments are included with this current preliminary draft.

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Appendix B Details Appendix
Appendix C Environmental Compliance Management Plan
Appendix D Restoration Plan
Appendix E Exotic and Invasive Species Control Plan
Appendix F Stormwater Pollution Prevention Plan
Appendix G Spill Prevention, Containment, and Countermeasures Plan
Appendix H Plant and Wildlife Conservation Measures Plan
Appendix I Blasting Plan
Appendix J Fugitive Dust Control Plan
Appendix K Fire Prevention and Suppression Plan
Appendix L Hazardous Materials Management Plan
Appendix M Construction Emergency Preparedness and Response Plan
Appendix N Operations, Maintenance, and Emergency Response Plan
Appendix O Plan for Unanticipated Historic Properties and Human Remains
Appendix P Framework Flagging, Fencing, and Signage Plan

ACRONYMS AND ABBREVIATIONS

API	American Petroleum Institute
ATWS	additional temporary workspace
Bcf/d	billion cubic feet per day
BE	biological evaluation
BLM	U.S. Department of the Interior, Bureau of Land Management
BMP	best management practice
CC	construction contractor
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CIC	Compliance Inspection Contractor
E&SCP	Erosion and Sediment Control Plan
EI	Environmental Inspector
EIA	Energy Information Administration
EIC	environmental inspection contractor
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
FERC	Federal Energy Regulatory Commission
Forest Plan	Land and Resource Management Plan
hp	horsepower
JNF	Jefferson National Forest
LDC	local distribution company
MA	management area
MLV	mainline block valve
MP	milepost
MVP	Mountain Valley Pipeline, LLC
NDE	non-destructive examination
NFS	National Forest System
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PHMSA	U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration
PL	Public Law
Plan	FERC's May 2013 version of the Upland Erosion Control, Revegetation, and Maintenance Plan
POD	Plan of Development

ppm	part per million
Procedures	FERC's May 2013 version of the Wetland and Waterbody Construction and Mitigation Procedures
Project	Mountain Valley Pipeline Project
SHPO	State Historic Preservation Office
SIO	Scenic Integrity Objective
SUA	Special Use Authorization
Tcf	trillion cubic feet
Transco	Transcontinental Gas Pipe Line Company, LLC
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Fish and Wildlife Service
VDEQ	Virginia Department of Environmental Quality
WVDEP	West Virginia Department of Environmental Protection

1.0 INTRODUCTION

1.1 Introduction

Mountain Valley Pipeline, LLC (MVP), a joint venture between EQT Midstream Partners, LP and affiliates of NextEra Energy, Inc., WGL Holdings, Inc., Vega Energy Partners, Ltd., and RGC Midstream, LLC, is seeking a Certificate of Public Convenience and Necessity (Certificate) from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act authorizing it to construct and operate the proposed Mountain Valley Pipeline Project (Project) located in 17 counties in West Virginia and Virginia. MVP plans to construct an approximately 301-mile, 42-inch-diameter natural gas pipeline to provide timely, cost-effective access to the growing demand for natural gas for use by local distribution companies (LDCs), industrial users and power generation in the Mid-Atlantic and southeastern markets, as well as potential markets in the Appalachian region.

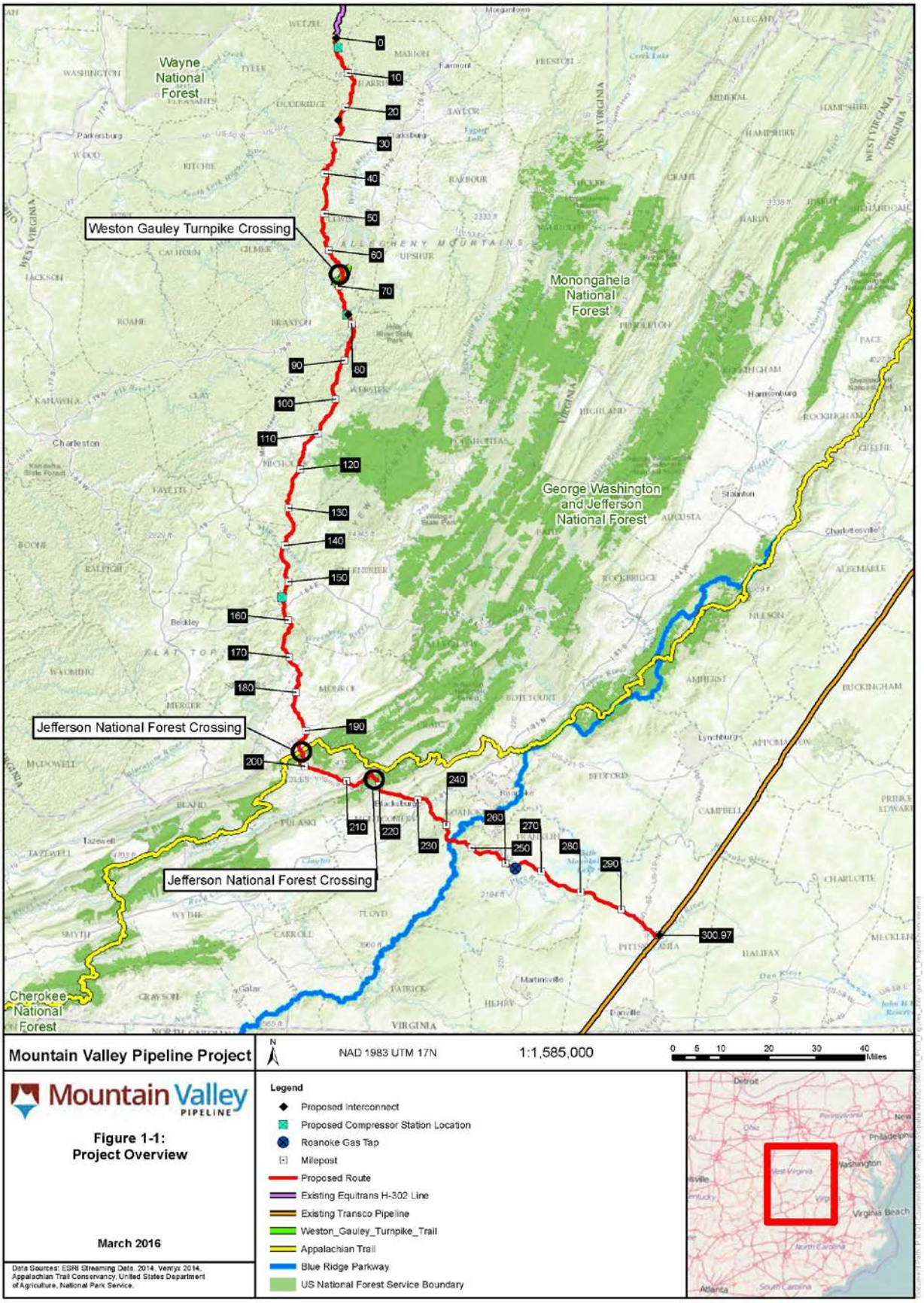
The proposed pipeline will extend from the existing Equitrans, L.P. transmission system and other natural gas facilities in Wetzel County, West Virginia to Transcontinental Gas Pipe Line Company, LLC's (Transco) Zone 5 compressor station 165 in Pittsylvania County, Virginia. In addition to the pipeline, the Project will include approximately 171,600 horsepower (hp) of compression at three compressor stations currently planned along the route, as well as measurement, regulation, and other ancillary facilities required for the safe and reliable operation of the pipeline. The pipeline is designed to transport up to 2.0 million dekatherms per day of natural gas.

A portion of the Project will cross the Jefferson National Forest (JNF) in the border area of Virginia and West Virginia managed by the U.S. Department of Agriculture, Forest Service (USFS). Another portion will cross the Weston Gauley Bridge Turnpike Trail (Weston Gauley Turnpike) in Braxton County, West Virginia, administered by the U.S. Army Corps of Engineers (USACE). (Figure 1-1). Approval to cross land managed by two or more federal agencies is the responsibility of the U.S. Department of the Interior, Bureau of Land Management (BLM) through issuance of a Right-of-Way Grant. This Plan of Development (POD) outlines the steps that must be followed by the Project during construction and operation on federal lands. When finalized, it is expected that compliance with this POD containing substantive requirements for construction and operation of the Project will be a condition of the Right-of-Way Grant and be appended to the Notices to Proceed issued by the USFS and USACE.

1.2 Purpose and Applicability of the Plan of Development

The FERC is the National Environmental Policy Act lead for this Project and is developing an Environmental Impact Statement (EIS) that will contain stipulations and mitigation measures that must be followed during construction, operation, and maintenance of the Project. The USFS and USACE, as cooperating federal agencies, are participating in aspects of the environmental analysis performed by FERC for the EIS. The POD is intended to be used on National Forest System (NFS) lands and the

1


Wayne National Forest
Weston Gauley Turnpike Crossing
Monongahela National Forest
George Washington and Jefferson National Forest
Jefferson National Forest Crossing
Jefferson National Forest Crossing
Cherokee National Forest
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Mountain Valley Pipeline Project
NAD 1983 UTM 17N
1:1,585,000
0 5 10 20 30 40 Miles
Mountain Valley PIPELINE
Figure 1-1:
Project Overview
March 2016
Data Sources: ESRI Streaming Data, 2014, Ventyx 2014, Appalachian Trail Conservancy, United States Department of Agriculture, National Park Service.
Legend
Proposed Interconnect
Proposed Compressor Station Location
Roanoke Gas Tap
Milepost
Proposed Route
Existing Equitrans H-302 Line
Existing Transco Pipeline
Weston_Gauley_Turnpike_Trail
Appalachian Trail
Blue Ridge Parkway
US National Forest Service Boundary
Detroit
Philadelphia
Washington
Virginia Beach
Atlanta

crossing of the Weston Gauley Turnpike. The POD incorporates USFS, USACE, and FERC requirements. Included in the POD are (1) a summary of Project environmental requirements and protection measures, and (2) a description of the processes and procedures that will be used to ensure compliance as appropriate.

FERC is the lead federal agency for the Project and is expected to employ compliance monitors independent of MVP's inspection staff. MVP will employ environmental inspectors and monitors during construction. These two teams will coordinate closely with each other and with the field representatives of the USFS, USACE, and other agencies during construction. Section 3.0 describes the roles and responsibilities of the various parties involved with the construction of the Project.

1.3 Organization of the Plan of Development

The POD is intended to be developed in phases as more detailed information becomes available. Three POD submittals are envisioned:

- The preliminary POD as presented herein is intended to describe the Project in sufficient detail to allow for reviewing agencies to understand the nature of the Project and how resources might be affected.
- The initial POD will include environmental protection plans based on the resources affected and incorporating field survey results.
- The final POD will include detailed plans addressing site-specific resource issues and the construction contractor's proposed solutions.

Sections 1 through 6 provide a general overview of the Project and key elements of the POD. The Appendices described in Section 6 provide detailed information regarding temporary and permanent facility locations, protocols, and procedures for the construction, operation, and maintenance of the pipeline and ancillary facilities and required mitigation measures. The Appendices will be designed to serve as stand-alone documents that may be readily updated and refined. Following, is a summary of the information and materials presented in this preliminary POD.

Sections 1 through 6 will include the following information:

Section 1 – Introduction: Section 1 introduces the Project; discusses the purpose and organization of the POD; explains the POD's relationship to other documents; and lists required authorizations, permits, and approvals required for construction.

Section 2 – Purpose and Need: Section 2 describes the purpose and need for the Project.

Section 3 – Roles and Responsibilities: Section 3 introduces the roles and responsibilities of the Project team and discusses Project communications and notification procedures during construction and operation of the pipeline.

Section 4 – Project Description: Section 4 describes the Project facilities (right-of-way requirements, ancillary facilities, access roads, etc.), land requirements,

construction disturbance, and information related to the maintenance and operation of the Project once construction is complete.

Section 5 – Potential Environmental Effects: Section 5 describes the potential Project environmental effects on 11 resource areas.

Section 6 – Environmental Protection Plans and Documents: Section 6 describes the Environmental Protection Plans (EPPs) and documents that will be included as appendices to the initial and final PODs that MVP will use to ensure environmental protection during construction, operation, and maintenance. Table 6-1 describes the purpose of each plan and document.

Section 7 – Literature Cited: Section 7 provides the literature cited in preparing the POD.

1.4 Relationship to Other Environmental Documents

The final POD will include measures for avoidance, minimization, and mitigation, as necessary, of environmental impacts resulting from the implementation of this Project. These impacts will be identified in the EIS and outlined in the FERC Certificate and USFS, USACE, and BLM decision documents. The final POD will incorporate the various regulatory approvals, permits, and other authorizations that pertain to environmental regulations stipulated in the JNF Land and Resource Management Plan (Forest Plan).

The POD will be developed for the selected route and will be an enforceable stipulation of the Right-of-Way Grant.

1.5 Federal, State, and Local Permits

Section 4.6, Table 4-5 – Permits, Approvals, and Consultations for the Project, lists the major federal, state, and local permits and approvals that could be required for the duration of the Project applicable to the crossing of federal lands.

2.0 PURPOSE AND NEED OF THE PROJECT

The Project is a new pipeline designed to transport up to 2.0 million dekatherms per day of natural gas from the Appalachian Basin to growing markets in the mid-Atlantic and southeastern United States. The purpose of the Project is to provide timely, cost-effective access to supplies to meet the growing demand for natural gas for 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 southwest Virginia 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 MVP's purpose and need to provide opportunities for economic growth and development along the route of the Project.

In recent years, the North American natural gas market has seen enormous growth in production and demand. The United States Energy Information Administration (EIA) estimates that total natural gas consumption in the United States will increase from 26.2 trillion cubic feet (Tcf) in 2013 to between 29.7 Tcf and 37.4 Tcf in 2040 (EIA 2015). The largest portion of this growth in gas demand is expected to occur in the electric generation sector, where natural gas consumption is expected to increase from 8.2 Tcf in 2013 to 9.4 Tcf in 2040 (EIA 2015). In addition to increased demand for electricity due to steady population growth, a major driver behind this increase is the retirement of 40.1 gigawatts of coal-fired electric generation by 2025 due to stricter environmental rules (EIA 2015). On August 3, 2015, the U.S. Environmental Protection Agency (EPA) announced the *Clean Power Plan*, which is designed to reduce carbon pollution from power plants (EPA 2015). Additionally, the EPA issued its *Final Carbon Pollution Standards for New, Modified, and Reconstructed Power Plants*, and proposed a Federal Plan and model rule to assist states in implementing the *Clean Power Plan*. In the final *Clean Power Plan*, the EPA identifies substituting increased electricity generation from lower-emitting existing natural gas plants for reduced generation from higher-emitting coal-fired power plants as one of the building blocks necessary to achieve the required emission reductions for affected power plants. In particular, it is expected that replacing coal-fired electric generation with natural gas-fired generation will be higher in the southeast because southeastern power markets include some of the most expensive delivered coal prices in the United States. The Project will provide the Mid-Atlantic and southeastern markets with direct access to new gas supplies to meet this increased demand for natural gas and thereby help lower emissions.

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 15 Bcf/d in July 2014. 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 for use by LDCs, industrial users, and power generation facilities all along the Eastern seaboard.

3.0 ROLES AND RESPONSIBILITIES

The various parties involved with the construction, operation, and maintenance of the Project include FERC, the USFS, the third-party compliance inspection contractor (CIC), MVP, MVP's construction contractor (CC), and the environmental inspection contractors (EIC). Other subcontractors may be engaged, as needed.

3.1 Roles and Responsibilities

This section describes the roles and responsibilities of each party.

3.1.1 Federal Energy Regulatory Commission

FERC has jurisdiction for the construction and operation of the Project pursuant to Section 7(c) of the Natural Gas Act, 15 United States Code (U.S.C.) § 717f(c), and 18 Code of Federal Regulations (CFR) Parts 157 and 284 (2015). If authorized the FERC will issue the Certificate and oversee the construction and operation of approximately 301 miles of new interstate natural gas pipeline, three new compressor stations, and other facilities located in 17 counties in West Virginia and Virginia. MVP will be required to comply with the environmental conditions contained in the FERC Order. FERC will assign a project manager to oversee construction of the Project. The project manager will rely on the CIC for day-to-day compliance review.

3.1.2 U.S. Department of Agriculture, Forest Service and U.S. Army Corps of Engineers

There are 3.4 miles of the pipeline route that cross the JNF managed by the USFS and 60 feet that cross the Weston Gauley Turnpike administered by the USACE. The agency designated Authorized Officers will provide oversight for the Project on USFS and USACE lands. The Authorized Officers will be responsible for administering and enforcing Right-of-Way Grant provisions. The Authorized Officers also will be responsible to ensure stipulations and mitigation measures included in the POD are adhered to during Project construction, operation, and maintenance. The Authorized Officers also will be responsible for written stop- and resume-work orders, as applicable, and resolving any conflicts that arise relating to the Project.. Compliance will be monitored by the appropriate designees of the Authorized Officers and resource specialists in conjunction with FERC's third-party CIC.

3.1.3 Construction Inspection Contractor

The CIC will represent the FERC, USFS, and USACE, unless other agency representatives are designated, during the construction and restoration phases of the Project to ensure (1) compliance with permit requirements and (2) environmental impacts associated with the Project do not exceed estimates disclosed in the EIS and approved by the FERC and BLM in their authorizing documents.

The CIC shall work under the direct supervision and control of the FERC. The FERC will coordinate with other agencies with jurisdiction, where appropriate. The CIC shall not take any direction with respect to the manner of conducting monitoring from MVP or

their CC or EIC. The CIC's primary role is to observe work activities; verify, document, and monitor compliance; and bring non-compliant situations to the attention of the appropriate party and offer recommendations on how to prevent non-compliance prior to commencement of work.

3.1.4 Mountain Valley Pipeline

MVP is responsible for the administration of the right-of-way and coordination between the Project engineer and CC. MVP and their CC will be responsible for all activities associated with the construction, operation, and maintenance of the pipeline and ancillary facilities in a manner that complies with the conditions outlined in the FERC Certificate, BLM Right-of-Way Grant, and other permits listed in Table 4-5, as applicable. MVP will be the ultimate authority for their contractors.

To help ensure construction activities are conducted in a manner that complies with all federal, state, and local regulations, MVP will contract a multidisciplinary team of environmental inspectors and specialists (i.e., the EIC) to work jointly and cooperatively with the CC and CIC.

3.1.5 Construction Contractor(s)

MVP will retain one or more CCs who will be responsible for the final construction, testing, and restoration of the pipeline and ancillary facilities. They will construct the pipeline, improvements on Pocahontas Road, and temporary work areas associated with construction activities. The Construction Contractor also will be responsible for addressing restoration activities, as well as agreed upon environmental protection stipulations.

MVP and the CC will be contractually bound to comply with all environmental laws and regulations, including all Project-specific permitting documents and landowner agreements, during the construction of the Project.

3.1.6 Environmental Inspection Contractor

The EIC will work under the direction of MVP's environmental coordinator to ensure compliance with all environmental permits, approvals, and conditions. Environmental Inspectors shall have the authority to stop activities that violate the environmental conditions of the applicable permit stipulations or landowner easement agreements; and to order appropriate corrective action. The EIC will be supported in the field by cultural and biological resource specialists as necessary to ensure compliance with permit conditions related to protected and sensitive biological resources and cultural resources.

The relationship of roles and responsibilities of the various parties involved in the construction, operation, and maintenance of the Project is summarized in Table 3-1.

Table 3-1. Relationship of Roles and Responsibilities of Various Parties

Role	Responsibilities
FERC/BLM	Authorizing agencies: Compliance with the provisions of the FERC Certificate and BLM Right-of-Way Grant
CIC	On-site compliance inspection and monitoring for the authorizing agencies
USFS and USACE Authorized Officers	Administering and enforcing Special Use Authorization provisions
MVP	MVP through their contractor will uphold, document, and manage environmental compliance with the terms specified in the Certificate and SUA; the POD; landowner agreements; and all federal, state, and local permits
CC	Implementation and compliance of the POD during construction and restoration
EIC	Performs under the direction of MVP to ensure permit compliance, order corrective actions, and protect sensitive biological and cultural resources

3.2 Communication Procedures and Notification Protocols

This section introduces the approach to communication procedures and notification protocols. Timely, clear, and effective communication between all parties mentioned above is a critical component to the success of the Project. Communication protocols related to environmental inspection, compliance monitoring, reporting requirements, and Project variance requests will be described further in Appendix C – Environmental Compliance Management Plan to be included in the initial POD (see Section 6.0).

4.0 PROJECT DESCRIPTION

4.1 Location and Description of Facilities

The pipeline and aboveground facilities described in this preliminary POD will be designed, constructed, tested, operated, and maintained in accordance with the requirements of 49 CFR, Part 192, Transportation of Natural Gas and Other Gas by Pipeline; Minimum Safety Standards; 18 CFR § 380.15, Site and Maintenance Requirements; and other applicable federal and state regulations.

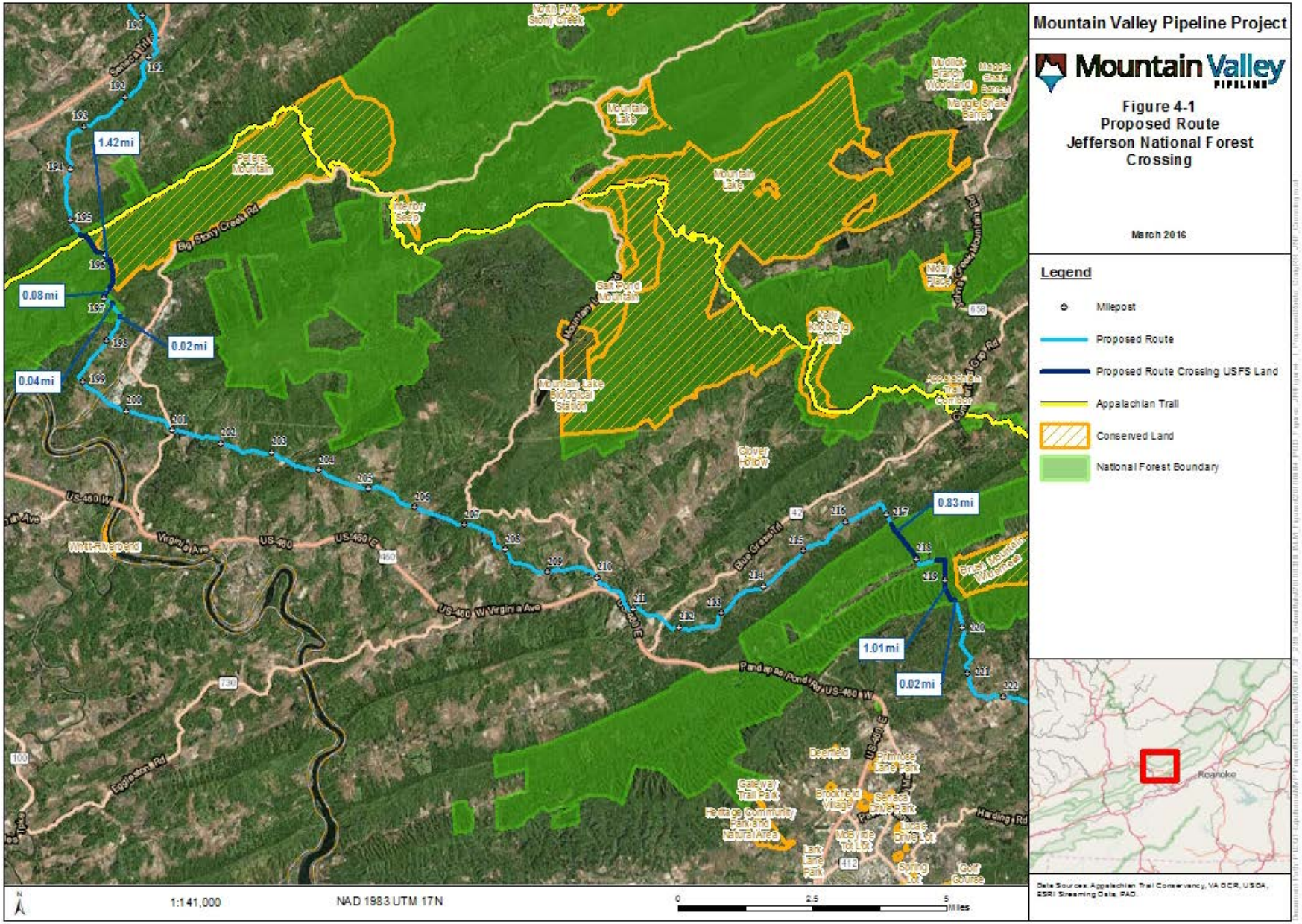
4.1.1 Pipeline Facilities

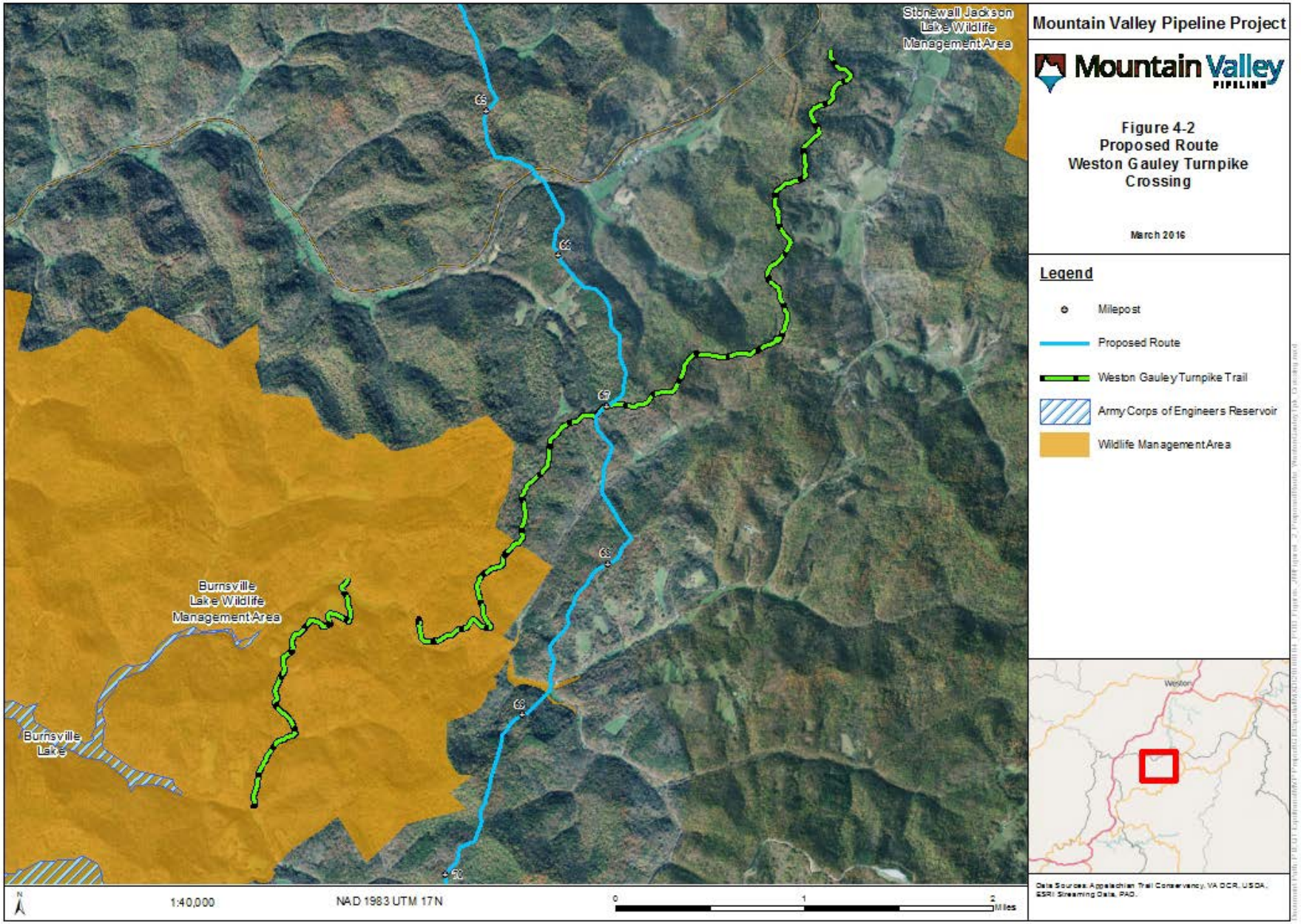
The pipeline first enters the west boundary of the JNF where it crosses Peters Mountain between mileposts (MP) 195.3 to 196.9 (including a bore under the Appalachian National Scenic Trail between MPs 195.4 and 195.5) northwest of the town of Goldbond, Giles County, Virginia (Figure 4-1). At MP 199.1, the pipeline co-locates with an Appalachian Power Company transmission line west of the town of Kimbleton, Giles County, Virginia. The pipeline deviates from the transmission line in several areas to avoid structures and follow topography with a large deviation from MPs 207.5 to 209.6. Northeast of the town of Newport, Giles County, Virginia, the pipeline heads to the northeast to avoid karst terrain, constructability issues with paralleling the transmission line, and residential areas until MP 216.7. Here, the pipeline heads south-southeast and crosses the JNF from approximate MPs 217.2 to 218.0 and MPs 218.4 to 219.5. The pipeline then continues in a southerly direction.

The Weston Gauley Turnpike is crossed at MP 72.9 in Braxton County, West Virginia (Figure 4-2).

4.1.2 Aboveground Facilities

There are no compressor stations, metering stations, pig launcher and receiver sites, or mainline block valve (MLV) sites on the JNF or USACE-administered-lands at the Weston Gauley Turnpike.


Mountain Valley Pipeline Project
Mountain Valley PIPELINE
Figure 4-1
Proposed Route
Jefferson National Forest
Crossing
March 2016
Legend
Milepost
Proposed Route
Proposed Route Crossing USFS Land
Appalachian Trail
Conserved Land
National Forest Boundary
1.42 mi
0.08 mi
0.02 mi
0.04 mi
0.83 mi
1.01 mi
0.02 mi
Peters Mountain
Interior Seep
Mountain Lake
Salt Pond Mountain
Mountain Lake Biological Station
Clover Hollow
Big Stony Creek Rd
US-460 W
US-460 E
Virginia Ave
Blue Grass Trl
Pandapas Pond Rd
Eggleston Rd
Harding Rd
Roanoke
1:141,000
NAD 1983 UTM 17N
0
2.5
5
Miles
Data Sources: Appalachian Trail Conservancy, VA DCR, USDA, ESRI Streaming Data, PAD.


Stonewall Jackson Lake Wildlife Management Area
Burnsville Lake Wildlife Management Area
Burnsville Lake
65
66
67
68
69
70
Mountain Valley Pipeline Project
Mountain Valley Pipeline
Figure 4-2
Proposed Route
Weston Gauley Turnpike
Crossing
March 2016
Legend
Milepost
Proposed Route
Weston Gauley Turnpike Trail
Army Corps of Engineers Reservoir
Wildlife Management Area
Weston
Data Sources: Appalachian Trail Conservancy, VA DCR, USDA, ESRI Streaming Data, PAD.
N
1:40,000
NAD 1983 UTM 17N
0
1
2
Miles

4.2 Land Requirements

This section describes the construction and permanent right-of-way. Appendix A will contain detailed alignment sheets detailing the right-of-way limits.

Table 4-1 identifies impacts of the Project on JNF lands and at the Weston Gauley Turnpike for the 125-foot-wide construction right-of-way and a 50-foot-wide operational right-of-way. No land will be required for contractor yards, compressor stations, measurement stations, pig launcher/receiver sites, or MLVs. For the crossing of the Appalachian National Scenic Trail, MVP will install the pipe via conventional bore leaving an approximate 100-foot buffer on each side of the Appalachian National Scenic Trail where tree clearing and land disturbance will not occur.

The JNF is managed under the 2004 Forest Plan, which includes specific goals, objectives, and standards related to resources, including water resources. MVP prepared a Forest Plan Consistency analysis for the portion of the MVP Project that crosses the JNF. The analysis was submitted to the JNF in October 2015. The results of that consistency analysis are discussed in Section 5.7.2.

Table 4-1. Land Requirements for the Mountain Valley Pipeline Project on Federal Land

Facility	Land Required for Construction (acres)	Land Required for Operation (acres)
JNF Crossing		
Pipeline a/	52.67	20.76
Additional Temporary Workspace	0.48	0.0
Access Roads	27.72	17.34
Weston Gauley Turnpike		
Pipeline b/	0.2	0.07
Additional Temporary Workspace	0.0	0.0
Access Roads	0.0	0.0

a/ Acreage based on 125-foot construction right-of-way and 50-foot permanent right-of-way.
b/ Weston Gauley Turnpike will require an approximately 60-foot bore.

4.3 Construction Procedures

MVP intends to implement the FERC May 2013 version of the Upland Erosion Control, Revegetation, and Maintenance Plan (Plan; FERC 2013a) and May 2013 version of the Wetland and Waterbody Construction and Mitigation Procedures (Procedures; FERC 2013b) as a minimum standard during construction unless otherwise specifically noted in the final POD. MVP will ensure that construction personnel are adequately trained in the environmental restrictions and/or requirements applicable to their particular job duties. Construction management personnel and environmental inspectors will be provided with the appropriate environmental information/materials specific to the Project. It is not anticipated that hazardous waste will be generated or stored during construction of the Project. However, if for any reason hazardous waste is created or

uncovered during construction or operation of the Project, the Spill, Prevention, Control and Countermeasures Plan and the Unanticipated Discovery of Contamination Plan would identify methods for handling the waste. All waste would be disposed of per state and federal requirements.

MVP does not expect that construction activities will occur in frozen ground conditions, but construction could occur during times of snowfall in Virginia, particularly at higher elevations. Section 4.3.1.2 below outlines procedures to handle construction activities during the inclement winter season in the Northeast and measures to secure the right-of-way and protect it from erosion or other damages during the winter months.

MVP anticipates that it will employ the following procedures to construct the Project; however, deviations are possible based on actual field conditions or to comply with regulatory requirements.

For the crossing of the Appalachian National Scenic Trail, MVP will describe pipe installation via conventional bore leaving an approximate 100-foot buffer on each side of the Appalachian National Scenic Trail. The crossing of the Weston Gauley Turnpike will require a 60-foot bore, which will be accomplished within the existing right-of-way.

4.3.1 Pipeline

Construction of the Project will follow industry-accepted practices and procedures, as further described below. Generally, construction of the proposed pipeline will follow a set of sequential operations as shown in Figure 4-3. In this typical pipeline construction scenario, the construction spread proceeds along the pipeline right-of-way in one continuous operation. The entire process will be coordinated in such a manner as to minimize the total time a tract of land is disturbed and therefore exposed to erosion and temporarily precluded from normal use. To minimize the impacts of construction disturbance, MVP will utilize the FERC Plan and Procedures. Equipment problems, terrain and soil conditions, and weather can affect the timing and consistency of the operation. Typical construction details depicting various construction scenarios will be shown in Appendix B. The following sections provide detailed descriptions of each proposed construction method.

4.3.1.1 Standard Construction and Restoration Techniques

Typical Upland Pipeline Construction Procedures

MVP will conduct all construction activities in accordance with applicable federal and state regulations and guidelines, as well as the specific requirements of applicable permits. In addition to adopting the FERC Plan and Procedures, MVP will also consult with the USFS and USACE to develop its own site-specific Erosion and Sediment Control Plan (E&SCP) that will be based on topography and employed in conjunction with the FERC's Plan and Procedures. If deviations from the FERC Plan and Procedures are identified, MVP will request a variance from the specific requirement.

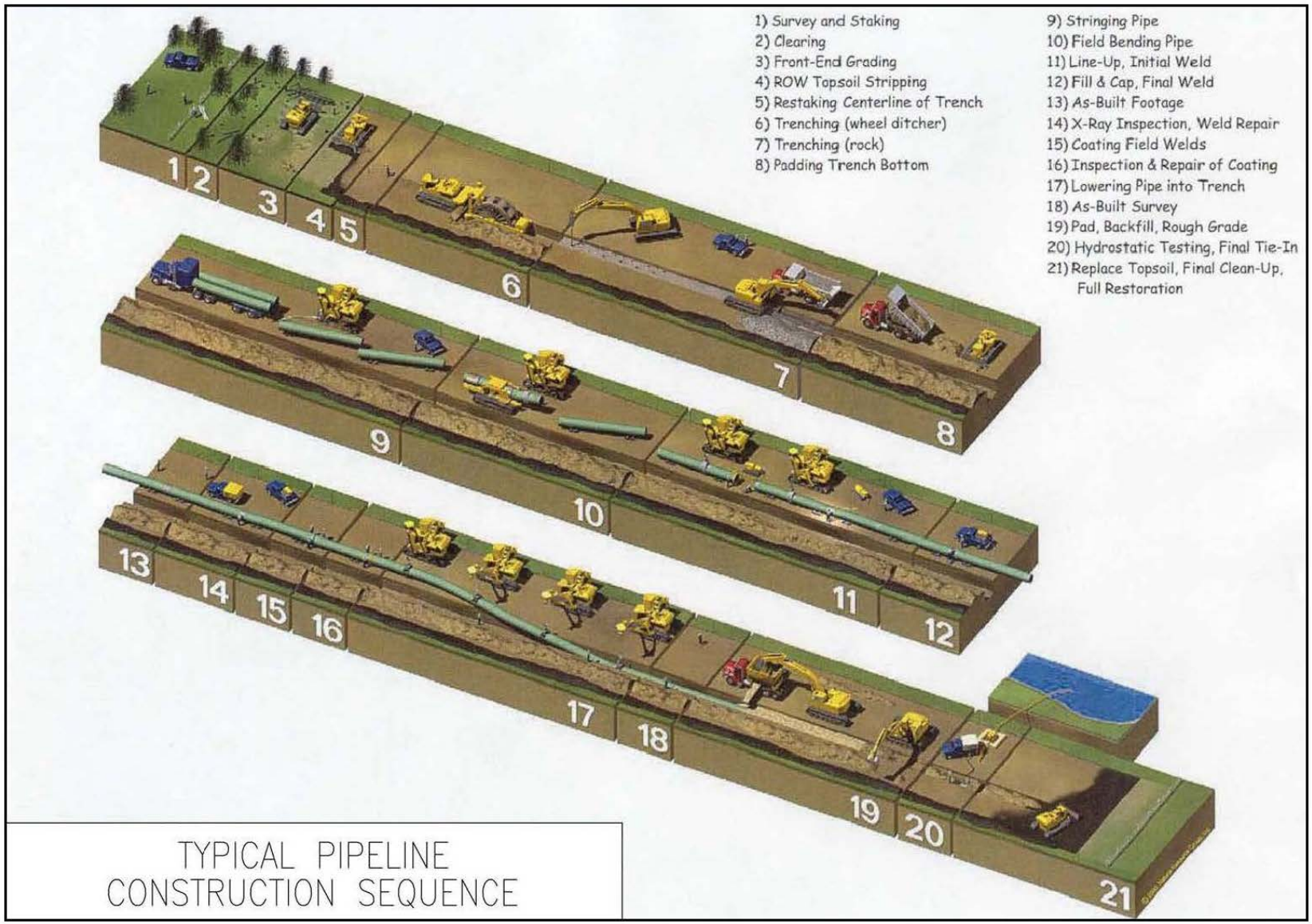


Figure 4-3. Typical Pipeline Construction Sequence

Prior to initializing construction-related activities, MVP will secure right-of-way easements, or other required authorizations, from JNF and USACE. Property will be returned to original contours, and property boundary markers that are removed will be replaced with a civil survey boundary. The ground will be stabilized as outlined in the FERC Plan and Procedures and MVP's site-specific plan; however, plant seed mix components may vary based on site conditions, JNF and USACE requests, and coordination with federal and state agencies.

Those portions of the Project located primarily in upland terrain will employ conventional overland construction techniques for large-diameter pipelines. In the typical pipeline construction scenario, the construction contractor will construct the pipeline along the construction right-of-way using sequential pipeline construction techniques, including survey, staking and fence crossing; clearing and grading; trenching; pipe stringing, bending and welding; lowering-in and backfilling; hydrostatic testing; clean-up and restoration; and commissioning.

MVP will utilize 11 construction spreads to construct the pipeline. Of these, two will be located on JNF lands. Table 4-2 provides the beginning and ending mileposts, length, and construction year for each of these spreads. The majority of the pipeline construction process will be accomplished using conventional open-cut methods, which typically include the steps described in the following paragraphs. The proposed methods for accomplishing pipeline installation across wetlands and waterbodies, as well as other specialized construction procedures, are also described in the following paragraphs describing special construction procedures.

Table 4-2. Proposed Spreads within the JNF for Pipeline Construction and at the Weston Gauley Turnpike Crossing

Spread	Begin Milepost	Ending Milepost	JNF Begin Milepost	JNF End Milepost	Construction Year
3	72.9		Weston Gauley Turnpike Crossing		2017
8	181.8	204.75	195.3	196.9	2018
9	204.75	234.0	217.2, 218.4	218.0, 219.5	2018

(a) Surveying

The initial step in preparing the right-of-way for construction will be the civil survey. A civil survey crew will stake the outside limits of the construction right-of-way, the centerline location of the pipeline, elevations, highway and railroad crossings, access roads, and any temporary extra workspace, such as lay down areas or at stream crossings. The "One Call" system of each state will be contacted, and underground utilities (e.g., cables, conduits, and pipelines) will be located and flagged. Affected landowners will be notified prior to surveying and staking of the proposed route, following applicable state/federal guidelines.

(b) Clearing and Grading

After the right-of-way has been surveyed and easements have been secured (for the permanent and temporary construction right-of-way, and any existing right-of-way if necessary), the right-of-way will be cleared of obstructions (i.e., trees and stumps, brush, logs, and large rocks) according to the FERC Plan and outlined in MVP's Project-specific E&SCP. The right-of-way will be cleared to the width required for construction, but not more than specified on the pipeline alignment sheets. These right-of-way widths indicate the maximum width necessary for construction, operation, and maintenance of the pipeline. At no time will MVP or its contractor clear or alter any areas outside of the boundaries of the pipeline right-of-way area, including additional temporary workspace (ATWS) areas, shown on the pipeline alignment sheets.

Merchantable timber will be cut into lengths and stacked off the edge of the right-of-way. Timber ranging from 4 inches to 8 inches in diameter at the butt end, suitable for fence posts or other uses, will be cut into usable lengths. Timber will be stacked adjacent to the right-of-way in accordance with landowner preferences. If the landowner does not wish to use timber products or any other tree material it will be windrowed, no taller than four feet with wildlife breaks/openings every 200 feet. Brush and slash will be handled according to local permitting and landowner requests. MVP will dispose of brush and slash through burning, windrowing or chipping, in this order. Burning will be on a case-by-case basis and will be done by permit, subject to local ordinances. MVP has developed a Fire Prevention and Suppression Plan, which will be included in Appendix K. The plan was developed based on MVP's experience in working throughout the region; however, it was not developed in consultation with any agencies. The plan identifies best management practices (BMPs) for the burning of brush and slash in the construction right-of-way. MVP will not burn within the JNF. Brush and slash may also be both windrowed permanently and removed depending on the terrain and landowner request. All windrow breaks/openings will allow for landowner passage, per pre-coordination and approval. If removed, trees/brush will be hauled off to an approved location for chipping or burning. If left permanently, the brush/slash windrow can provide habitat for wildlife and will not have any impacts on achieving adequate vegetative cover. If brush and slash is chipped, it shall be blown off right-of-way per landowner pre-coordination and approval. This will ensure the successful revegetation of the right-of-way. Burning is the preferable method for disposing of brush and slash because it minimizes the number of trucks that would be required to remove chips from the right-of-way; it reduces the emissions associated with multiple round trips and also reduces safety hazards of trucks entering the right-of-way in difficult terrain and steep slopes. All stumps will be disposed of to the satisfaction of the property owner and/or company representative in accordance with applicable law including, but not limited to, any anti-pollution law, rule or regulation. When feasible, vegetation will be cut to ground level only, leaving the root systems intact.

If fences (barbed wire, chain link, or other) are encountered along the construction right-of-way, then a fence crew will install temporary gates. The contractor's fence crew will install new posts to brace the areas on either side of the proposed cut to ensure that no damage occurs to other portions of the fence or wall. Temporary gates will be installed,

if necessary, to contain livestock or to prohibit or otherwise control public access across the right-of-way. These temporary fences and/or gates will remain closed at all times except as required for construction purposes.

Where needed for erosion control, the FERC Plan and Project E&SCP will be implemented along the construction right-of-way. BMPs will be properly maintained throughout construction and will remain in place until permanent erosion controls are installed or restoration is completed.

(c) Trenching

To bury the pipeline underground, it will be necessary to excavate a trench. The trench will be excavated with a track-mounted backhoe or similar equipment. Explosives will only be used when necessary in areas where rock substrates are found at depths that interfere with conventional excavation or rock-trenching methods. A Blasting Plan will be included as Appendix I. No actively cultivated agricultural tracts or residential areas are known to exist on JNF lands crossed or at the Weston Gauley Turnpike crossing; therefore, the need for stockpiling subsoil separately from topsoil is not anticipated.

Generally, the trench will be excavated at least 12 inches wider than the diameter of the pipe. The sides of the trench will be sloped with the top of the trench up to 12 feet across, or more, depending upon the stability of the native soils. The trench will be excavated to a sufficient depth to allow a minimum of 3 feet of soil cover between the top of the pipe and the final land surface after backfilling (minimum of 18 inches of cover will be provided in consolidated rock in Class 1 or greater locations or in ditches, where 24 inches of cover is required). Locations such as waterbodies, roads and railroads will include 36 inches of cover per applicable permits.

Excavated soils will typically be stockpiled along the right-of-way on the side of the trench (the “spoil” side) away from the construction traffic and pipe assembly area (the “working” side). Where the route is co-located adjacent to an existing infrastructure, the spoil generally will be placed on the same side of the trench as the existing infrastructure.

(d) Stringing

Steel pipe for the pipeline will be procured in nominal double random and/or triple random lengths, or “joints,” protected with an epoxy coating applied at the factory or at a coating yard (the beveled ends will be left uncoated for welding) and shipped to strategically located materials storage areas, or “pipe yards.” The individual joints will be transported to the right-of-way by truck and placed along the excavated trench in a single, continuous line, easily accessible to the construction personnel on the working side of the trench, typically opposite the spoil side. This will allow the subsequent lineup and welding operations to proceed efficiently. At stream crossings, the amount of pipe required to span the stream will be stockpiled in the ATWS on one or both banks of the stream.

(e) Pipe Bending

The pipe will be delivered to the job site in straight joints. The use of field controlled internal diameter fittings, in addition to the bending of pipe, will be required to allow the pipeline to follow natural grade changes and directional changes of the right-of-way. Prior to welding, selected joints will be bent in the field by track-mounted hydraulic bending machines.

(f) Pipe Assembly and Welding

Following stringing and bending, the joints of pipe will be placed on temporary supports, adjacent to the trench. The ends will be carefully aligned and welded together using multiple passes for a full penetration weld. Only qualified welders will be allowed to perform the welding. Automated welding techniques may be used in flatter areas if the terrain is suitable. Welders and welding procedures will be qualified according to applicable American Society for Mechanical Engineers, American Petroleum Institute (API), and 49 CFR Part 192 Standards.

(g) Non-Destructive Examination and Weld Repair

To ensure that the assembled pipe will meet or exceed the design strength requirements, the completed welds will be visually inspected and tested for integrity using non-destructive examination (NDE) methods such as radiography (X-ray), or ultrasound, in accordance with API standards. Welds displaying unacceptable slag inclusions, void spaces, or other defects will be repaired or cut out and re-welded.

(h) Coating Field Welds, Inspection, and Repair

Following welding, the previously uncoated ends of the pipe at the joints will be sandblasted to a near white finish and epoxy coated. The coating on the completed pipe section will be inspected, and damaged areas will be repaired. Coating will be inspected prior to lowering in accordance with applicable industry standards. Defects discovered in the coating will be repaired prior to lowering.

(i) Pipe Lowering

The completed section of pipe will be lifted off temporary supports and lowered into the trench by side-boom tractors or equivalent equipment. Prior to lowering the pipe, the trench will be inspected to ensure that it is free of rocks and other debris that could damage the pipe or the coating. Before the pipe is lowered into the trench, the pipe and trench will be inspected to ensure that the pipe and trench configurations are compatible. In rocky areas, if the bottom is not smooth, a layer of soil or sand may be placed on the bottom of the trench to protect the pipe using a padding machine or excavator with a “shaker bucket,” which separates rocks from satisfactory padding materials. Concrete-coated pipe or aggregate filled sacks will be used if required for negative buoyancy in areas of saturated soils.

(j) Padding and Backfilling

After the pipe is lowered into the trench, the trench will be backfilled. Previously excavated materials will be pushed back into the trench using equipment or backhoes. 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. Due to concerns about the acidity of fly-ash and its potential impacts on cathodic protection, fly-ash will not be used as backfill material. However, limestone dust or sand, which is typically basic and will often aid in the cathodic protection of the pipeline, may be used as backfill material. The first 12 inches above the top of the pipe will be clean fill free of rocks from the excavation. The remaining fill of the trench will be the aggregate of the excavation material removed at the time of the excavation. If additional fill is brought in, it will be either flowable fill or topsoil. MVP does not plan to have certifications of the fill that is brought in. Topsoil will be segregated per the FERC Plan and Procedures and will be placed after backfilling the trench above the subsoil. Following backfilling in agricultural land, grassland, and open land, a small crown may be left to account for any future soil settling that might occur. In wetlands, a crown will not be left in order to restore hydrology to pre-existing conditions. Excess soil will be distributed evenly on the right-of-way, only in upland areas, while maintaining existing contours and will be in accordance with landowner and agency requirements.

(k) Hydrostatic Test and Final Tie-In

Following backfilling of the trench, the pipeline will be hydrostatically tested to ensure that it is capable of safely operating at the design pressure. Baseline water samples will be taken at the source prior to water-up and prior to discharge. Test segments of the pipeline will be capped with test manifolds and filled with water and pressurized to a minimum of 1.1 to 1.25 times (based on location class) the designed operating pressure for a minimum of eight hours in accordance with the U.S. Department of Transportation (USDOT) requirements identified in 49 CFR Part 192 prior to being placed in service. Loss of pressure that cannot be attributed to other factors, such as temperature changes, will be investigated. Leaks detected will be repaired, and the segment will be retested.

Upon completion of the test, the water may be pumped to the next segment for testing, or the water may be discharged. The test water will be discharged through an energy-dissipating device in compliance with National Pollutant Discharge Elimination System (NPDES) permit conditions. Topography and the availability of test water will influence the length of each test segment. Hydrostatic test water withdrawal and discharge locations are provided in Resource Report 2. Test water will contact only new pipe. If chlorinated water is used for testing, a de-chlorinating agent may be required prior to discharge.

Once a segment of pipe has been successfully tested and dried, the test manifold will be removed, and the pipe will be connected to the remainder of the pipeline. Desiccant will not be used to dry the pipe. MVP will implement Section VII of the FERC Procedures regarding hydrostatic testing, as well as any specifications in individual state permit guidelines. Hydrostatic testing is discussed further in Resource Report 2.

(l) Cleanup and Restoration

Post-construction restoration activities will be undertaken in accordance with the measures specified in the FERC Plan and Procedures as applicable. After a segment of pipe has been installed, backfilled, and successfully tested, the right-of-way, temporary

extra workspaces, and other disturbed areas will be finish-graded, and the construction debris will be disposed of properly. The surface of the right-of-way disturbed by construction activities will be graded to match original contours and to be compatible with surrounding drainage patterns, except at those locations where permanent changes in drainage will be required to prevent erosion, scour, and possible exposure of the pipeline. Temporary and permanent erosion and sediment control measures, including silt fencing, diversion terraces, and vegetation, will be installed at that time. Private and public property, such as fences, gates, driveways, and roads that have been disturbed by the pipeline construction will be restored to original or better condition. More information on restoration is provided in Section 4.3.3.

Typical Wetland Pipeline Construction

Crossing of jurisdictional wetlands will be done in accordance with state and federal permits and the FERC Procedures. Pending site conditions, MVP may request variances from these Procedures, and these would require approval by FERC prior to construction in these areas. Based on the currently available information, no wetlands would be affected by the Project within JNF lands.

Typical Waterbody Crossings

Construction across waterbodies will be performed to minimize the time that the trenches for the pipeline crossings of flowing streams and rivers will be left open. The normal trenching operation will skip the waterbody crossing, stopping on each side near the top of bank. The waterbody section of the pipeline will be installed by one of the methods described below. In general, pipe will be bent and fabricated as the work progresses along the right-of-way so that the excavation of the waterbody crossing is only completed immediately prior to pipe installation by the tie-in crew. Locations and methods for waterbody crossings are discussed in Resource Report 2 and will be permitted by the USACE.

Construction methods at waterbody crossings will vary with the characteristics of the waterbody encountered and will be performed consistent with permit conditions outlined in the regulatory approvals.

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. Pipe 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. Trench spoil will be placed on the bank above the high water mark for use as backfill.

A prefabricated segment of pipeline will be laid horizontally across the waterbody bed and continue 10 feet past the high banks on each side of the waterbody before raising in elevation to the normal trench level. If necessary, the pipeline may be weighted with aggregate filled sacks in order to obtain sufficient negative buoyancy of the line.

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.

MVP will follow the FERC Procedures and USACE Nationwide permit conditions 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.

Crossings of minor perennial and intermittent streams will be accomplished in accordance with the FERC Procedures and USACE nationwide permit conditions. Dry-ditch waterbody crossing methods include dam and pump or flume. 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. Milepost crossing locations, the crossing width measured at the time of the environmental survey, the significance for fisheries or other aquatic resources as reported by each state and the proposed crossing method are provided in Resource Report 2. The crossing method is subject to change depending upon the actual conditions encountered at the time of construction. Crossing methods are described below. There are no wetlands that would be affected by the pipeline crossing at the Weston Gauley Turnpike.

(a) Dam and Pump Crossing Method

The dam and pump method involves installation of temporary dams upstream and downstream of the proposed waterbody crossing. The temporary dams will typically be constructed using sandbags and plastic sheeting. Following dam installation, appropriately sized pumps will be used to dewater and transport the stream flow around the construction work area and trench. Intake screens will be installed at the pump inlets to prevent entrainment of aquatic life, and energy dissipating devices will be installed at the pump discharge point to minimize erosion and stream bed scour. Trench excavation and pipeline installation will then commence through the dewatered portion of the waterbody channel. Following completion of pipeline installation, backfill of the trench, and restoration of stream banks, the temporary dams will be removed, and flow through the construction work area will be restored. This method is generally only appropriate for those waterbody crossings where pumps can adequately transfer the stream flow volume around the work area and there are no concerns about the passage of sensitive species.

(b) Flume Crossing Method

The flume crossing method will consist of temporarily directing the flow of water through one or more flume pipes placed over the area to be excavated. This method will allow excavation of the pipe trench across the waterbody completely underneath the flume

pipes without disruption of water flow in the stream. Stream flow will be diverted through the flumes by constructing two bulkheads and using sand bags or plastic dams to direct the stream flow through the flume pipes. Following completion of pipeline installation, backfill of the trench, and restoration of stream banks, the bulkheads and flume pipes will be removed. This crossing method generally minimizes the duration of downstream turbidity by allowing excavation of the pipeline trench under relatively dry conditions.

(c) Conventional Bore Crossing Method

Some waterbodies crossed by the Project are directly associated with or adjacent to roads or railroads. Where these roads or railroads are to be crossed using a horizontal boring machine, the waterbody will typically be included within the length of the bore. Some elevated or channelized waterbodies, such as irrigation ditches, may also be successfully bored, depending upon the groundwater level in the area. To complete a horizontal bore, two pits will be excavated, one on each side of the feature to be bored. A boring machine will be lowered into one pit, and a horizontal hole will be bored to a diameter equal to the diameter of the pipe (or casing, if required) at the depth of the pipeline installation. The pipeline section and/or casing will then be pushed through the bore to the opposite pit. If additional pipeline sections are required to span the length of the bore, they will be welded to the first section of the pipeline in the bore pit before being pushed through the bore.

(d) Open-Cut Crossing Method

An open-cut waterbody crossing will be conducted using methods similar to conventional upland open-cut trenching. The open-cut construction method will involve excavation of the pipeline trench across the waterbody, installation of a prefabricated segment of pipeline, and backfilling of the trench with native material. No effort will be made to isolate the stream flow from the construction activities. Depending upon the width of the crossing and the reach of the excavating equipment, excavation, and backfilling of the trench will generally be accomplished using backhoes or other excavation equipment operating from one or both banks of the waterbody. If necessary for reach, the equipment may operate within the waterbody. Equipment in the waterbody will be limited to that needed to complete the crossing. All other construction equipment will cross the waterbody using equipment bridges, unless otherwise allowed by the FERC Procedures for minor waterbody crossings.

Measures will be implemented to minimize impacts to the aquatic environment during construction as described in the FERC Procedures. Construction activities will be scheduled so that the trench is excavated immediately prior to pipe laying activities. The duration of construction within each waterbody will be limited to 24 hours for minor waterbodies (10 feet wide or less) and 48 hours for intermediate waterbodies (greater than 10 feet wide but less than or equal to 100 feet in width). In accordance with the FERC Procedures, excavated spoil that is stockpiled in the construction right-of-way will be at least 10 feet from the stream bank or in approved additional work areas and will be surrounded by sediment control devices to prevent sediment from returning to the waterbody. The waterbody banks will be returned to as near to pre-construction conditions as possible upon completion of each open-cut crossing.

Typical Road Crossings

Road crossings will be maintained continuously using provisions such as steel plates or alternate access to minimize inconvenience to the public. Construction of the pipeline across hard surface roads will typically be installed through the roadbed by boring, with a pit on either side of the road or railroad to provide a working area for the equipment. At points of access to the right-of-way from hard-surfaced roads, a stone pad will be installed as a construction entrance to control mud and dirt tracking onto the highway. Most of the smaller unpaved roads and drives will be crossed by open trenching, and then restored to pre-construction conditions or better. If an open-cut road requires extensive construction time, provisions will be made for temporary detours or other measures to allow safe traffic flow during construction. The pipeline will be buried to a depth of at least three feet below the road surface, and will be designed to withstand anticipated external loadings.

Typical Topsoil Segregation

MVP will conserve topsoil in actively cultivated and rotated cropland, improved pastureland, and non-saturated wetlands. In residential areas, MVP will either conserve topsoil or import topsoil as an alternative to topsoil segregation and conservation. Based on available information, there are no actively cultivated and rotated cropland, improved pastureland, non-saturated wetlands or residential areas within the area crossed by the Project in the JNF.

4.3.1.2 Special Construction Procedures

Blasting

At this time, the extent of blasting for the Project is unknown. MVP will minimize the amount of blasting required to the extent practicable. Where unrippable subsurface rock is encountered, blasting for ditch excavation may be necessary. In these areas, MVP is committed to taking measures to prevent damage to underground structures (e.g., cables, conduits, and pipelines) or to springs, water wells, or other water sources. Blasting mats or padding will be used as necessary to prevent the scattering of loose rock. All blasting will be conducted during daylight hours and will not begin until occupants of nearby buildings, stores, residences, places of business, and farms have been notified. Where competent sandstone bedrock occurs in the stream bed, blasting may be used to reduce bedrock so that the trench can be excavated. All blasting will be conducted in accordance with the Project Blasting Plan. Pre- and post- blasting structural surveys will be conducted of occupied structures, water supply wells and water supply springs that will be specified in the Blasting Plan. Per Section III of the FERC Plan, MVP has developed a draft Blasting Plan and will finalize the Blasting Plan to be included in Appendix I of the final POD in consultation with the appropriate agencies. Additional information on geologic resources, as well as information on blasting, is provided in Section 5.5 and Resource Report 6.

Rugged Terrain

In mountainous areas where the pipeline will encounter steep side slopes, MVP will employ special construction techniques where the slopes typically exceed 30 to 35 percent. Tables that detail areas of the pipeline that cross lateral and vertical slopes between 15 and 30 percent grade and lateral and vertical slopes greater than 30 percent grade are presented in Resource Report 1, Appendix 1-J. The construction techniques will require expanded workspace areas. The dimensions of these ATWS will vary, depending upon the degree and length of the slope. Land requirements for ATWS are identified in Resource Report 1, Appendix 1-D and Resource Report 8. In rugged terrain, temporary sediment barriers, such as silt sock and reinforced silt fences will be installed during clearing to prevent movement of sediment off of the right-of-way. In addition, temporary slope breakers may be installed during grading in accordance with the E&SCP to reduce water runoff or divert water to vegetated areas. Construction activities on rugged terrain will be similar to the typical construction; however, equipment will be tethered via winch lines to other equipment at the top of the slopes to ensure the safety of the construction personnel and surrounding areas.

Equipment used for the construction activity will be suspended from a series of winch tractors to maintain control of the equipment and provide an additional level of safety. All construction equipment and their winch lines will be inspected prior to operation to ensure the equipment is operable and sound. Spoil piles adjacent to the trench will be protected by temporary sediment barriers to keep excavated soils on the right-of-way. Pipe joints will be stockpiled at the top or bottom of each slope. A side-boom tractor will be suspended from a winch that will carry one joint at a time up or down the slope and place the joint along the trenchline. The joint will then be lowered into the ditch by a tractor. Welders will connect the joint to the previous joint within the trench to assemble the pipeline. Once welding is complete, the welds will be visually and radiographically inspected. The weld joints will be hand coated with fusion bonded epoxy coatings in accordance with required specifications. The coating will be inspected for defects, and repaired, if necessary. Sand trench breakers will be installed in the trench along the pipeline to prevent or slow the movement of water along the trench. The pipeline will be padded and the trench backfilled by equipment tethered to the winch tractors. The surface of the right-of-way will be restored to original contours, and permanent slope breakers will be installed in accordance with the E&SCP. Erosion control blankets or hydroseed, in lieu of mulch, will be installed on steep slopes to provide stabilization for vegetation to help control sediment and water runoff.

In areas where the Project route crosses laterally across the face of a slope or side slope construction, cut-and-fill grading may be required to establish a safe, flat work terrace; this may require ATWS along the construction right-of-way.

MVP will incorporate erosion and sediment control measures such as super silt fence, silt fence, sock filtration, erosion control socks, temporary and permanent water bars, ditch breakers, temporary mulch, and erosion control blankets as per Project design specifications based on slope.

On steep slopes, various measures will be taken in order to properly control erosion and sedimentation on the right-of-way. Spoil piles from trenching operations will be staged along the side of the right-of-way and will be compacted via rolling with dozers on site as additional material is added. Once a soil pile is completed, it will be temporarily mulched to control washouts. Additionally, spoil piles will be separated at intervals of 50 feet by temporary water bars which will serve to slow the flow of runoff down the right-of-way and divert it into straw bales or No. 3 aggregate. Silt fence and super silt fence would be used to stop rocks from rolling off the right-of-way. Other measures such as erosion control blankets, temporary mulching, hydroseeding, and sock filtration may be used.

Within the trench, sand filled sacks will be stacked across the width of the trench as necessary based on field conditions. This will permit water to slowly filter through without carrying large amounts of soil with it. Similarly, permeable trench breakers constructed of sand or aggregate-filled sacks will be installed along the open ditch. Rock fall protection measures such as rock fences, placement of concrete barriers, or creating catchment areas may be added where excavation is planned at the top of steep slopes, as determined by the contractor. Once the area is stabilized, following construction, MVP will remove any temporary stabilization methods. Contours will be returned to pre-existing conditions to the extent practicable.

In addition to the measures taken on slopes to control erosion and sedimentation, trench drains will be installed on side slopes and excessively steep slopes before the pipe is placed in order to channel water away from the ditch and will not be removed after construction is complete. These drains will consist of perforated tile or pipe surrounded with rock (1 inch stone or similar, which may be taken from excavated spoils) that will terminate either at the bottom of a very steep slope into a well vegetated area, near a roadway at the edge of the right-of-way, at the low point along a side cut onto a riprap pad near the edge of the right-of-way, or at a wooded area off the right-of-way.

On sidehill construction tree stumps and other organic material will be removed from backfill material along the right-of-way, since this can lead to soil saturation and eventual slippage. Special attention will be paid to ensure that natural drains alongside slopes are properly restored after construction activities are complete. In order to accomplish this, additional French drains or rock-lined channels may be constructed to efficiently convey water across or around the right-of-way. Where possible, compaction on side cut sections should be completed in 12-inch lifts using a sheep's foot roller.

Karst Area

Based on consultation with MVP's karst experts, Draper Aden, following their local geologic expertise and a preliminary review of mapping from the United States Geological Survey, West Virginia Department of Environmental Protection (WVDEP), and Virginia Department of Mines, Minerals, and Energy, among other sources, it was determined that portions of pipeline will cross areas with the potential to contain karst features. However, karst hazards have not been identified along the pipeline alignment within JNF lands or at the Weston Gauley Turnpike crossing.

Trench Dewatering

In most cases, trench dewatering will be limited to the removal of storm water in the pipe trench excavated in upland locations. In saturated wetlands, it would not be practical to attempt to dewater the trench, since the groundwater level is at or near the ground surface. In those locations, the pipe may be concrete-coated or weighted with aggregate filled sacks to overcome buoyancy in the flooded trench. In uplands, storm water will typically be removed from the trench prior to lowering the pipe into place. The storm water will be pumped from the trench to a location downgradient of the trench. The trench will be dewatered in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any waterbody or wetland. The storm water will be discharged to an energy dissipation/filtration dewatering device, such as a hay bale structure. Heavily silt-laden water may first be passed through a filter bag. The dewatering structure will be removed as soon as possible after completion of the dewatering activities. Trench breakers (ditch plugs) will be used where necessary to separate the upland trench from adjacent wetlands or waterbodies to prevent the inadvertent draining of the wetland or diversion of water from the waterbody into the pipe trench.

Winter Construction

MVP plans is to begin cutting trees and clearing the right-of-way in December 2016. The grading is anticipated to begin in February 2017; however, construction may occur during times of snowfall. MVP has developed a Winter Construction Plan (Resource Report 1, Appendix 1-K), which identifies BMPs for construction activities during snow accumulation.

As necessary during snow accumulation, snow will be removed from construction work areas to expose soils for grading and excavation. Snow removal will be limited to active construction areas and areas needed to maintain access to the construction right-of-way. Snow will be bladed or pushed to the edges of the right-of-way with a motor-grader, snowplow, or bulldozer fitted with a “shoe” to minimize impacts on underlying soils and vegetation, and stockpiled within the right-of-way or an approved ATWS areas. Snow will not be bladed off the right-of-way. Snow removal equipment will access the Project areas from approved access roads, and will operate from within the construction right-of-way or approved ATWS areas. When snow accumulation is more than one foot, it will be removed from both the working and spoil sides of the construction right-of-way prior to topsoil segregation and grading to prevent mixing of snow with excavated spoil. Erosion and sediment control devices and diversion berms will be installed where needed to control snow and melting runoff.

4.3.2 Aboveground Facilities Construction

There are no compressor stations, metering stations, pig launcher and receiver sites, or MLV sites locations on the JNF or at the Weston Gauley Turnpike crossing.

4.3.3 Restoration

Following construction of the Project, the areas disturbed by construction will be restored to their original grades, condition, and use, to the greatest extent practicable. However, aboveground facilities will be fenced.

Restoration will be considered successful if construction debris is removed (unless requested otherwise by the landowner or land managing agency), revegetation is successful, proper drainage has been restored, and the appropriate federal and state agencies approve.

MVP has also enlisted the services of the Wildlife Habitat Council to aid in restoration through the recommendation of seed mixes, of conservation opportunities, and establishing partnership opportunities with agencies to address conservation priorities The Project will be a candidate for a Wildlife Habitat Council Conservation Certification. More information is provided on this work in Resource Report 3.

All restoration activities located on NFS lands shall be completed to accepted federal, state, and local BMPs and to the satisfaction of the Authorizing Officer in charge. In addition, as-built drawings of the segments crossing NFS lands will be provided to the USFS and all National Forest boundaries disturbed or damaged within the project area will be re-established upon completion of installing the pipe and establishing the right-of-way corridor.

4.3.3.1 Pipeline

Upon completion of the pipeline installation, the surface of the right-of-way disturbed by construction activities will be graded to match original contours and to be compatible with surrounding drainage patterns, except at those locations where permanent changes in drainage will be required to prevent erosion, scour, and possible exposure of the pipeline. Segregated topsoil will be replaced, and soils that have been compacted by construction equipment traffic will be decompacted. Permanent erosion control measures will be installed at this time. Temporary construction erosion control measures may be left in place, or replaced with interim erosion control measures, where appropriate, until sufficient vegetative cover is re-established to prevent significant erosion and sedimentation.

Uplands

In most upland locations, excluding actively cultivated cropland, a herbaceous vegetative cover will be re-established by spreading a grass seed and hydro/straw-mulch mixture over the disturbed surface. The type of seed will be selected to match adjacent cover, as recommended by the Wildlife Habitat Council, or as otherwise requested by the landowner or land management agency. Depending upon the time of year a temporary seed mix recommended by the Wildlife Habitat Council may be broadcast or drilled until a more permanent cover can be established. Steep slopes may require erosion control fabric, revetments, or sod. Vegetation success in these areas will be monitored by MVP, and reseeding, fertilizing, and hydroseeding measures will be employed until, based upon visual survey, the density and cover of non-nuisance vegetation is similar that of adjacent undisturbed lands. With approval, temporary and

interim erosion control measures will be removed at that time. An exception to this approach will be made for the permanent right-of-way that must be maintained in herbaceous vegetative cover. Woody vegetation will not be allowed to grow within the permanent right-of-way.

Cropland, Residential, Commercial and Wetland Areas

Based on the currently available information, no cropland, residential, commercial or wetland areas would be affected by the Project within JNF lands or at the Weston Gauley Turnpike crossing.

4.3.3.2 Aboveground Facilities

There are no compressor stations, metering stations, pig launcher and receiver sites, or MLV sites on the JNF.

4.3.3.3 Access Roads and Contractor Yards

Pocahontas Road, a previously existing access road on JNF will be updated and extended during construction. The road will be returned to original or better condition upon completion of the pipeline facilities installation. Temporary erosion control measures will be removed upon final stabilization and approval form applicable federal and state agencies and installation of permanent erosion control measures.

There are no Project contractor yards proposed on the JNF.

4.3.4 Quality Assurance Measures

To ensure that construction of the proposed facilities will comply with measures identified in the Resource Reports, the FERC evaluation of the Project, and the requirements of other federal and state permitting agencies, MVP will include, whenever appropriate, implementation details in its construction drawings and specifications. Selected contractors will receive copies of specifications and a Construction Drawing Package containing, among other things, equipment drawings designated as being approved for construction.

For those measures that address permit conditions from federal and state agencies, copies of permits and related drawings will be added to the Construction Bid Package. For those measures that, in part, address post-construction requirements, instructions and documentation will be provided to operating personnel following the completion of construction.

The selected contractors will install facilities according to company specifications, the Construction Drawing Package, the terms of the negotiated contract, federal and state permits, and the FERC Plan and Procedures. MVP conducts training for all personnel involved on the Project prior to the start of construction or authorization to enter any Project work area. The Project's inspectors will be selected from the industry's inspector pool utilizing only qualified third party contractors. Prior to and during construction, training for field construction personnel and contractor personnel will be conducted. This training will focus on the FERC Plan and Procedures as well as other regulatory

requirements for categories such as endangered species, cultural resources, and wetlands. The training will also cover Project specific construction and mitigation plans, operator qualification, and site-specific safety requirements.

For purposes of quality assurance and compliance with mitigation measures, other applicable regulatory requirements, and company specifications, a Chief Inspector will represent MVP. The Chief Inspector will be assisted by a Lead Inspector (on each spread), one or more craft inspectors, and NDE technicians. In addition, there will be at least one environmental inspector for each spread who will report to the Lead Environmental Inspector (EI), who in turn reports to the Project environmental lead at a level equivalent to the Construction Project Manager. The environmental inspector's duties are consistent with those contained in Section II.B (Responsibilities of the Environmental Inspector) of the FERC Plan and shall be:

- Responsible for monitoring and documenting compliance with all mitigation measures required by the FERC's Order and any other grants, permits, certificates, or other authorizing documents;
- Responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract or any other authorizing document;
- Empowered to order correction of acts that violate the environmental conditions of the FERC's Order, or any other authorizing document (e.g., USACE Section 404 permit), including stop work authority;
- A full-time position separate from all other activity inspectors; and
- Responsible for maintaining status reports and training records.

An ample number of copies of the Construction Drawing Package will be distributed to inspectors and to contractors' supervisory personnel. If a contractor's performance is unsatisfactory, the terms of the contract will allow for work stoppage and will require the contractor to begin remedial work.

The MVP engineering and construction departments are responsible for designing and constructing certificated facilities in compliance with regulatory and contractual requirements and agreements. If technical or management assistance is required, the responsible MVP Construction Manager and/or Chief Inspector will request assistance from the appropriate company department. The operations department will be responsible for long-term Project maintenance and regulatory compliance once the Project has been turned in line.

4.3.4.1 Environmental Training and Inspection

Consistent with the FERC guidelines, environmental training will be given to the MVP personnel and to contractor personnel whose activities may impact the environment during pipeline and aboveground facility construction. The level of training will be commensurate with the type of duties of the personnel. All construction personnel from the Chief Inspector, EI, craft inspectors, and contractor job superintendent to loggers, welders, equipment operators, and laborers will be given the appropriate level of

environmental training. The training will be given prior to the start of construction and throughout the construction process, as needed. The training program will cover job-specific permit conditions, contaminated sediment and groundwater management, health and safety, company policies, cultural resource procedures, threatened and endangered species restrictions, the Spill Prevention Control Plan, NPDES, Stormwater Pollution Prevention Plan, and any other pertinent information related to the job. In addition to the EIs, all other construction personnel will play an important role in maintaining strict compliance with all permit conditions to protect the environment during construction.

At least one EI will be assigned to each construction spread during active construction or restoration. In addition, MVP will participate in the FERC's third-party construction compliance monitoring program. The EI will have peer status with all other activity inspectors and will report directly to the Resident Engineer/Chief Inspector who has overall authority on the construction spread. The EI will have the authority to stop activities that violate the environmental conditions of the FERC certificate (if applicable), other federal and state permits, or landowner requirements, and to order corrective action.

4.3.5 Construction Schedule and Work Force

The order in which each facility will be constructed may vary, depending upon numerous factors, including the receipt of necessary authorizations, the capabilities of each contractor, available work force, and optimized logistics. Clearing is expected to commence in December 2016 and pipeline construction is anticipated to begin February 2017 with a target full in-service date for the Project of December 2018. A Construction Duration Schedule is provided in Table 4-3. Details on workforce required for the Project are presented in Resource Report 5.

Table 4-3. Construction Schedule for Major Components of the Project a/

Component	Commence Activity	Complete Activity
Clearing	December 2016	March 2018
Pipeline Construction	February 2017	October 2018
Compressor Stations	March 2017	October 2018
Restoration	May 2017	December 2018
Hydrostatic Testing	December 2017	October 2018

a/ Anticipated full in-service date of December 2018

4.4 Operations and Maintenance

Following construction of the Project facilities, certain areas along the pipeline alignment (and at aboveground facilities) will comprise permanent right-of-way or facility sites. For pipeline facilities, MVP will maintain a typical permanent right-of-way easement of 50 feet in width. MLVs will be contained within the operational right-of-way. Land requirements for permanent operating right-of-way for pipeline facilities are listed in Table 4-1. In some locations, it will be necessary to retain access roads used for construction to support ongoing pipeline operations. Land requirements for permanent access roads are listed in Resource Report 1, Appendix 1-F.

MVP will operate and maintain the Project and aboveground facilities in compliance with USDOT Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations provided at 49 CFR Part 192, FERC regulations at 18 CFR § 380.15, and maintenance provisions of the FERC Plan and Procedures (FERC 2013a, 2013b). Unless requested by a land management agency, it is MVP policy not to use herbicides or pesticides to maintain the right-of-way or any of its Project facilities. Operations and maintenance considerations for pipeline facilities are described in Resource Report 11.

4.4.1 Pipeline

Operational activity on the pipeline will be limited primarily to maintenance of the right-of-way and inspection, repair, and cleaning of the pipeline. Periodic aerial and ground inspections by pipeline personnel will identify soil erosion that may expose the pipe; dead vegetation that may indicate a leak in the line; conditions of the vegetation cover and erosion control measures; unauthorized encroachment on the right-of-way, such as buildings and other substantial structures; and other conditions that could present a safety hazard or require preventive maintenance or repairs. A schedule for the maximum intervals between inspections/patrols by class area is provided in Table 4-4. The pipeline's cathodic protection system will also be monitored and inspected in accordance with 49 CFR Part 192 requirements to ensure proper and adequate corrosion protection. The pipeline will be designed for internal inspection technology. Appropriate responses to conditions observed during internal inspections will be taken as necessary. In addition, class change studies will also occur to identify areas of development. Vegetation on the permanent right-of-way will be maintained by mowing, cutting, and trimming. The permanent right-of-way will be allowed to revegetate; however, large brush and trees will be periodically removed in accordance with the FERC Plan and Procedures. In uplands, trees or deep-rooted shrubs could damage the pipeline's protective coating, obscure periodic surveillance, or interfere with potential repairs and would not be allowed to grow within the permanent right-of-way. Along the length of the pipeline, including wetlands, a 10-foot-wide strip over the pipeline will be maintained by mowing. Vegetation maintenance will be conducted in accordance with the FERC Plan and Procedures.

Table 4-4. Schedule for Major Components of the Project a/

Pipe Class	Inspection/Patrol Interval
Highway and Railroad Crossings	
Class 1 and 2	7.5 months but at least twice per year
	4.5 months but at least twice per year
All Other Locations	
Class 1 and 2	15 months but at least once per year

a/ Intervals comply with 49 CFR § 192.705. Regulations include intervals for Class 3 and 4 pipe; however, there will be no Class 3 or 4 pipe locations on the MVP Project and it was therefore not included.

Vegetation maintenance normally will not be required in agricultural or grazing areas. Other than preventing tree growth and clearing the 10-foot inspection corridor as described above, vegetation maintenance will also not normally be required in wetlands.

The pipeline facilities will be clearly marked at line-of-sight intervals and at crossings of roads, railroads, waterbodies, and other key points, in accordance with PHMSA regulations. The markers will clearly indicate the presence of the pipeline and provide a telephone number and address where a company representative can be reached in the event of an emergency or prior to any excavation in the area of the pipeline by a third party. MVP will participate in "One Call" systems in West Virginia and Virginia.

4.4.2 Aboveground Facilities

There are no compressor stations, metering stations, pig launcher and receiver sites, or MLV sites on the JNF.

4.5 Future Plans and Abandonment

MVP currently has no plans for either future expansion or abandonment of the facilities. Market forces will determine the timing and need for future expansions. MVP will seek the appropriate authorizations from FERC, the USFS, and other federal and state agencies should facilities need to be expanded or abandoned.

4.6 Permits and Approvals

Various federal and state laws provide protection of resources that may be potentially affected by the Project. For example, cultural resources are protected by the Antiquities Act of 1906 (16 U.S.C. 431-433), the National Historic Preservation Act of 1966 (Public Law [PL] 89-665), as amended, and its regulations (36 CFR 800), the Archaeological and Historical Preservation Act of 1974 (PL 93-291), the Archaeological Resources Protection Act of 1979 (PL 96-95) and its regulations (43 CFR 7), the American Indian Religious Freedom Act (42 U.S.C. 1996), and the Native American Graves Protection and Repatriation Act of 1990.

Threatened and endangered flora and fauna species are protected under the Endangered Species Act of 1973, as amended (PL 94-325). Additionally, the Migratory Bird Treaty Act (16 U.S.C. 703-71 L) and the Bald and Golden Eagle Protection Act (16 U.S.C. 668a-668b) protect other sensitive wildlife species potentially occurring within the Project area.

The states of West Virginia and Virginia maintain a permit program for activities in and around waterbodies. In Virginia, the permit is a nationwide permit with the USACE, which satisfies the requirements of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899, and the respective state agency permit requirements.

At the time of MVP's application to the USACE, U.S. Fish and Wildlife Service (USFWS) and State Historic Preservation Office (SHPO) consultations will not have been completed and therefore the USACE will be unable to determine the application complete. However, MVP has been in coordination with the USACE and received confirmation that they will start their reviews prior to finalization of those consultations. Once the USFWS and SHPO consultations have been completed, the 45-day clock will begin.

Each state has its own NPDES program. The WVDEP Division of Water and Waste Management has issued a State General Water Pollution Control Permit to regulate the discharge of stormwater runoff associated with oil and gas related construction activities. The General Permit authorizes discharges composed entirely of stormwater associated with oil and gas field activities or operations associated with exploration, production, processing or treatment operations or transmission facilities, disturbing one acre or greater of land area, to the waters of the West Virginia. In Virginia, administration of the NPDES under Section 402 of the federal Clean Water Act has been delegated to the Virginia Department of Environmental Quality (VDEQ). General permits are issued for activities that will have a minimal effect and that fall within a class of facilities with similar effluent characteristics; individual permits can be issued if VDEQ determines the project exceeds minimal impact standards. MVP will file the required permit applications with each respective state.

Both West Virginia and Virginia have regulations regarding the burning of brush and slash. In addition to the statewide regulations, each county and municipality may also have specific regulations that pertain to burning. In Virginia, there are statewide burn regulations, along with some additional rules for some counties and municipalities along the pipeline route. The state regulations require that no burning shall occur until after 4:00 p.m. from February 15 through April 30 of each year, if the fire is in or within 300 feet of woodland, brushland, or fields containing dry grass or other flammable material. At the county level, Pittsylvania, Roanoke, and Franklin Counties have their own regulations. At the municipal level, Salem and Rocky Mount have their own rules, and both of those municipalities have a complete ban on open burns. MVP has committed to not burning brush on JNF property.

The applicable federal, state, and local permits and approvals, responsible agencies, and the anticipated schedule for filing applications or documentation for these permits and approvals for the Project are summarized in Table 4-5. Resource Report 1, Appendix 1-L contains agency correspondence.

Table 4-5. Agencies with Relevant Permit or Consultation Requirements

Agency	Permit / Approval/ Consultation a/	Consultation Initiated	Permit Application Filed	Anticipated Permit Receipt Date	Contact Information
Federal					
Federal Energy Regulatory Commission	National Gas Act (NGA) Section 7; Certificate for construction and operation of interstate natural gas pipeline.	October 16, 2014	October 23, 2015	October 15, 2016	Paul Friedman 202-502-8059
U.S. Department of the Interior, Bureau of Land Management (BLM)	Right-of-Way Grant for location across federal lands when more than one federal agency is affected.	1st Quarter 2016	March 2016	1st Quarter 2017	Carol Grundman 414-297-4447
Bureau of Indian Affairs, Eastern Regional Office	Consultation regarding which tribes may have potential interest in project area or presence of traditional cultural properties, and contact tribes as appropriate	October 13, 2014	N/A	N/A	N/A
U.S. Department of Transportation (USDOT), Office of Safety, Energy, and the Environment	Consultation	October 13, 2014	N/A	N/A	N/A
USDOT, Office of Pipeline Safety	Consultation	Prior to the start of construction	4th Quarter 2016	4th Quarter 2016	N/A
National Park Service (NPS), Southeast Region	Consultation regarding potential impacts to Appalachian National Scenic Trail and Blue Ridge Parkway Survey Permission on NPS lands (Blue Ridge Parkway) Right-of-way through NPS lands (Blue Ridge Parkway)	October 13, 2014	N/A April 2015 4th Quarter 2015	N/A February 2016 3rd Quarter 2016	Ryan McCormick 828-348-3441
U.S. Army Corps of Engineers (USACE), Huntington District	Section 404 Permit for impacts on waters of the U.S., including wetlands Section 10 Permit for activities affecting navigation	October 13, 2014	1st Quarter 2016	4th Quarter 2016	Christopher Carson 304-399-5819
USACE, Norfolk District	Same as USACE, Huntington District	October 13, 2014	1st Quarter 2016	4th Quarter 2016	Todd Miller 804-323-3782
USACE, Pittsburgh District	Same as USACE, Huntington District	October 13, 2014	1st Quarter 2016	4th Quarter 2016	John Shaffer 412-395-7121
U.S. Department of Agriculture (USDA), Virginia	Consultation regarding permanent conversion of important farmland	October 13, 2014	N/A	N/A	NA
USDA, West Virginia	Same as USDA, Virginia	October 13, 2014	N/A	N/A	NA
EPA, Region 3 Water Protection Division	National Pollutant Discharge Elimination System (NPDES) stormwater construction permit for stormwater runoff	October 13, 2014	N/A	N/A	NA

Table 4-5. Agencies with Relevant Permit or Consultation Requirements (continued)

Agency	Permit / Approval/ Consultation a/	Consultation Initiated	Permit Application Filed	Anticipated Permit Receipt Date	Contact Information
USDA, Forest Service (USFS)	Consultation regarding potential impacts	September 11, 2014	N/A	N/A	Jennifer Adams 540-265-5114
	Survey Permission on USFS lands (Preferred Route)		November 24, 2014	Received April 2015	
	Survey Permission on USFS lands (Alternate Routes)		March 10, 2015	Received April 2015	
	Survey Permission on USFS lands (Alternate Routes)		August 21, 2015	Received September 2015	
	Special use Authorization for right-of-way through USFS lands and notice to proceed		January 2016	1st Quarter 2017	
U.S. Fish and Wildlife Service (USFWS), Virginia	Consultation under Section 7 of ESA for potential impacts on federally protected species	September 24, 2014	N/A	N/A	Troy Andersen 804-824-2428
	Consultation regarding impacts on migratory birds	March 2015	N/A	N/A	
	Consultation regarding impacts on fish and wildlife	March 2015	N/A	N/A	
	Biological Opinion	December 2015	January 2016	October 2016	
USFWS, West Virginia	Same as USFWS, Virginia	September 24, 2014	N/A	N/A	Tiernan Lennon 304-636-6586 X12
	Biological Opinion	December 2015	January 2016	October 2016	
Virginia					
Virginia Department of Forestry	Consultation regarding potential impacts to state-managed forests	October 13, 2014	N/A	N/A	NA
Virginia Department of Game and Inland Fisheries (VDGIF)	Consultation regarding potential impacts to state-managed lands. Consultation for state threatened and endangered species	October 13, 2014	N/A	N/A	Rick Reynolds 540-248-9360
Virginia Department of Mines, Minerals, and Energy – Division of Gas and Oil	Consultation	October 13, 2014	N/A	N/A	NA
Virginia Department of Transportation (VDOT)	Road bonds and crossing permits	4th Quarter 2015	2nd Quarter 2016	4th Quarter 2016	Ashley Smith 504-387-5423
Virginia Department of Historic Resources (VDHR), Division of Review and Compliance (SHPO)	Consultation and clearance regarding potential impacts on pre-historic and historic resources eligible for listing on the National Register of Historic Places	October 3, 2014	N/A	N/A	Roger Kirchen 804-482-6091

Table 4-5. Agencies with Relevant Permit or Consultation Requirements (continued)

Agency	Permit / Approval/ Consultation a/	Consultation Initiated	Permit Application Filed	Anticipated Permit Receipt Date	Contact Information
Virginia Department of Conservation and Recreation (VDCR), Natural Heritage	Consultation on potential impacts to wildlife species and habitat	October 13, 2014	N/A	N/A	Robbie Rhur 804-371-2594
VDCR, Division of Natural Heritage	Consultation for state-managed lands	October 13, 2014	N/A	N/A	Rene Hypes 804-371-2708
VDCR, Division of Planning and Recreation	Consultation for state parks and managed lands	October 13, 2014	N/A	N/A	NA
VDEQ, Water Division	Water Quality Certification for construction and operation impacts on water and wetlands	October 13, 2014	N/A issued with the NWP from USACE	N/A issued with the NWP from USACE	Larry Gavin (804) 698-4000
VDEQ	General Permit No. VAG83	N/A	1st Quarter 2016	3rd Quarter 2016	Drew Hammond (804) 698-4000
VDEQ, Office of Environmental Impact Review	Consultation	October 13, 2014	N/A	N/A	NA
Virginia Outdoors Foundation	Conversion/Diversion of Open Space Access or Utility Easement Application Access or Utility Easement Application	June 2014 June 2014	January 2016 January 2016	September 2016 September 2016	Martha Little, 804-577-3337 Harry Hibbitts, 504-332-8906
West Virginia					
West Virginia Department of Environmental Protection (WVDEP), Division of Air Quality	Air Quality permit for air emissions	October 10, 2014	4th Quarter 2015	2nd Quarter 2016	Roy Kees 304-926-0499
WVDEP, Division of Water and Waste Management	401 Water Quality Certification for construction and operation impacts on water and wetlands	October 13, 2014	1st Quarter 2016	4th Quarter 2016	Nancy Dickson (304) 926-0440
WVDEP, Division of Water and Waste Management	NPDES Permit – Construction Stormwater General Permit for Oil and Gas Related Construction Activities	October 13, 2014	1st Quarter 2016	4th Quarter 2016	Joseph Cochran (304) 926-0440
WVDEP, Division of Water and Waste Management	NPDES Hydrostatic Test Discharge Permit	October 13, 2014	1st Quarter 2017	2nd Quarter 2017	John Perkins (304) 926-0499
West Virginia Division of Energy	Consultation	October 13, 2014	N/A	N/A	NA

Table 4-5. Agencies with Relevant Permit or Consultation Requirements (continued)

Agency	Permit / Approval/ Consultation a/	Consultation Initiated	Permit Application Filed	Anticipated Permit Receipt Date	Contact Information
West Virginia Department of Transportation (WVDOT)	Road bonds and crossing permits	4th Quarter 2015	2nd Quarter 2016	4th Quarter 2016	Gary Clayton 304-476-4496
West Virginia Division of Culture and History (SHPO)	Consultation and clearance regarding potential impacts on pre-historic and historic resources eligible for listing on the National Register of Historic Places	October 3, 2014	N/A	N/A	Susan Pierce 304-558-0240 x 158
West Virginia Department of Natural Resources (WVDNR), Office of Land and Streams	Stream Activity Permit for construction in or across a stream	October 13, 2014	2nd Quarter 2016	4th Quarter 2016	Joe Scarberry 304-558-2754
West Virginia Division of Forestry	Consultation on potential impacts to state parks and forests	October 13, 2014	N/A	N/A	NA

a/ Consultations will occur continuously throughout the development of the Project.

5.0 POTENTIAL ENVIRONMENTAL EFFECTS

On October 23, 2015, MVP filed an application with the FERC. A copy of the application was provided to the JNF on November 13, 2015. Exhibit F-1 of that application is the Environmental Report comprising 12 resource reports describing the potential environmental effects of the Project including potential effects on the JNF and at the crossing of the Weston Gauley Turnpike. This section describes those potential effects. In some cases, the description below incorporates by reference tables, figures, and appendices contained in the FERC application.

5.1 Water Use and Quality

Waterbodies that would be affected by the pipeline and construction access road along the 3.4 miles within JNF are listed in Table 5-1. Construction methods, impacts, and measures to avoid or minimize impacts on waterbodies crossed within JNF will be identical to those described above, except as may be specified for JNF lands under the terms and conditions included with the Right-of-Way Grant. MVP does not plan to divert or withdraw water from any of the waterbodies listed in Table 5-1 or from any other waterbody on JNF lands for hydrostatic testing or dust control. Accordingly, MVP has no plans to conduct instream flow analyses. MVP will work with the USFS and appropriate agencies to develop a stream monitoring plan to be implemented during operation of the pipeline on JNF, and the monitoring plan will be included in the final POD prepared to support the application for a SUA. No waterbodies would be affected at the crossing of the Weston Gauley Turnpike.

Table 5-1. Waterbodies Crossed on the Jefferson National Forest

State/ County	Waterbody Name	Milepost	Impact Type	Facility	Length of Pipeline Crossing (Feet) a/	Area of Crossing (Acres)
VA / Giles	Kimballton Branch	195.8	Permanent	Access Road		0.007
	Kimballton Branch	195.8	Temporary	Access Road		0.012
	UNT/Kimballton Branch	195.8	Permanent	Access Road		0.004
	UNT/Kimballton Branch	195.8	Temporary	Access Road		0.006
	UNT/Kimballton Branch	195.8	Permanent	Work Space		0.0002
	UNT/Kimballton Branch	195.8	Temporary	Work Space		0.013
	UNT/Kimballton Branch	196.7	Permanent	Access Road		0.005
	UNT/Kimballton Branch	196.7	Temporary	Access Road		0.008
	Curve Branch	196.9	Permanent	Access Road		0.005
	Curve Branch	196.9	Temporary	Access Road		0.009
	UNT/New River	196.9	Permanent	Access Road		0.003
	UNT/New River	196.9	Permanent	Access Road		0.007
	UNT/New River	196.9	Temporary	Access Road		0.005
	UNT/New River	196.9	Temporary	Access Road		0.011

Table 5-1. Waterbodies Crossed on the Jefferson National Forest (continued)

State / County	Waterbody Name	Milepost	Impact Type	Facility	Length of Pipeline Crossing (Feet) a/	Area of Crossing (Acres)
VA / Giles (continued)	UNT/Curve Branch	198.5	Permanent	Access Road		0.009
	UNT/Curve Branch	198.5	Temporary	Access Road		0.015
	Clendennin Creek	198.8	Permanent	Access Road		0.008
	Clendennin Creek	198.8	Temporary	Access Road		0.013
	UNT/Clendennin Creek	198.8	Permanent	Access Road		0.007
	UNT/Clendennin Creek	198.8	Temporary	Access Road		0.012
	UNT/Clendennin Creek	198.9	Permanent	Access Road		0.011
	UNT/Clendennin Creek	198.9	Temporary	Access Road		0.02
VA / Montgomery	UNT/Craig Creek	217.8	Permanent	Pipeline	14.7	0.014
	UNT/Craig Creek	217.8	Temporary	Work Space		0.03
	Craig Creek	218.5	Permanent	Pipeline	22.5	0.03
	Craig Creek	218.5	Temporary	Work Space		0.07
	Craig Creek	218.6	Permanent	Pipeline	12.1	0.014
	Craig Creek	218.6	Temporary	Work Space		0.001
	Craig Creek	218.6	Temporary	Work Space		0.035

a/ If no pipeline crossing length is shown the water would not be crossed by the pipeline centerline, but would be within the construction work space for the pipeline or access roads.

For the route within the JNF, wetlands were delineated according to the USACE publications including the USACE Wetland Delineation Manual, 1987, and the new standards clarified by the Clean Water Rule under the Clean Water Act, finalized by the EPA on May 27, 2015. Although, on October 9, 2015 the United States Court of Appeals for the Sixth Circuit issued a stay against enforcement under the Clean Water Rule. MVP will continue to coordinate with the USACE to determine application requirements, or other requests, to ensure the Project is in compliance with legislation as it develops. Where site access was not yet obtained prior to preparation of this application, wetlands were determined using National Wetlands Inventory data. Based on the currently available information, no wetlands would be affected by the Project within JNF lands.

There will be no hydrostatic test water withdrawals or discharges within the JNF.

The JNF is managed under the 2004 Forest Plan, which includes specific goals, objectives, and standards related to resources, including water resources. MVP has prepared a Forest Plan consistency analysis for the portion of the proposed MVP Project that crosses the JNF, including for water resources. Results of that consistency analysis are included in Resource Report 8, Appendix 8-F.

In comments included with the FERC's August 11, 2015 information request, the USFS requested that MVP include an analysis and monitoring plan of potential water contamination and in-stream effects resulting from long-term operation and maintenance of the proposed pipeline. Long-term operation and maintenance of the

buried natural gas pipeline will not result in water contamination within the waterbodies crossed. The natural gas pipeline will not transport liquids or liquid products, and MVP has committed to not using herbicides or pesticides for routine vegetation maintenance of the pipeline right-of-way, unless specifically requested by a land management agency.

5.2 Fisheries, Vegetation, and Wildlife

MVP has coordinated with the USFS to determine existing resources in the JNF and to what extent those resources will be impacted by the construction and operation of the Project. Fishery, vegetation, and wildlife resources that would be affected at the Weston Gauley Turnpike are limited to clearing that will occur within the construction ROW. No additional clearing will be required.

5.2.1 Vegetative Resources

The West Virginia portion of the Project lies in the Allegheny Plateau, Allegheny Mountains, and Valley and Ridge Physiographic regions. In Virginia, the Project lies in the Valley and Ridge, Blue Ridge, and Piedmont Physiographic regions. All JNF areas crossed by the Project are within the Valley and Ridge Province (Fenneman 1938).

The West Virginia/Virginia border approximately forms the western edge of the Valley and Ridge province, which extends from southeast Tennessee northeast to eastern Pennsylvania in a fairly narrow band. The Valley and Ridge is part of the Oak-Chestnut forest described by Braun (1950). The region was traditionally dominated by oak and chestnut, but chestnut has been replaced in the canopy by oaks and hickories (Braun 1950).

Based on geospatial data provided by the USFS, the Project crosses several Major Forest Community Types, including Mixed Mesophytic Forest, Conifer-Northern Hardwood Forest, Dry-Mesic Oak Forest, Dry and Dry-Mesic Oak-Pine Forest, Dry and Xeric Oak Forest, Woodland, and Savanna, and Xeric Pine and Pine-Oak Forest and Woodland. Common dominant canopy species observed within the Major Forest Community Types during field surveys included white pine, chestnut oak, black oak, scarlet oak, red oak, white oak, tulip poplar, mockernut hickory, and pignut hickory. Temporary and permanent impacts to these forest community types are summarized in Resource Report 3, Table 3.5-1. Impacts to stands more than 40 years old during construction and operation of the Project are approximately 74.40 acres and 34.47 acres, respectively. Impacts to stands more than 100 years old during the construction and operation of the Project are approximately 21.26 acres and 9.32 acre, respectively. Based on available geospatial information provided by JNF, impacts to existing old-growth forest communities associated with disturbance (management prescription 6C) during construction and operation of the Project are approximately 50 acres and 3.3 acres, respectively. Impacts and mitigation for vegetation types on the JNF will be similar to those described in Resource Report 3, Section 3.2.11 for portions of the Project outside of national forest land. In upland areas, trees or deep-rooted shrubs will be removed from the construction right-of-way and will not be permitted to grow within the 50-foot-wide permanent right-of-way. The USFS has requested that consideration

be given to providing shrub vegetation on the outer edges of the permanently maintained pipeline right-of-way to reduce the sharp edge effect of the maintained pipeline right-of-way and provide as much escape cover as possible for species like small mammals, reptiles, and amphibians needing to cross the maintained right-of-way. This effect will result naturally on one side of the right-of-way because shrub-like vegetation will be permitted to grow between the maintained permanent right-of-way and the naturally regenerating temporary workspaces used along the edge of the construction right-of-way. MVP will also consider shrub plantings along the edge of the right-of-way at select locations within the JNF. MVP will further consult with the USFS regarding this recommendation.

The USFS requested that this resource report should include results of an extensive vegetation survey that documents stand age and height and species by 2-inch-diameter class for all areas potentially impacted by the pipeline right-of-way and construction access roads. The USFS also recommended that site index should be measured to be used for estimates of volume and value of potential commercial timber products. MVP will work with the USFS to schedule the requested vegetation survey and site index measurement for the portions of the Project on USFS lands.

5.2.2 Federally Listed Species

The USFS coordinates with the USFWS to avoid negative effects and to assist with recovery of federally listed species found within the JNF. The JNF contains, or may influence, suitable habitat with the potential to support 35 federally-listed species including 19 mussels, 6 fish, 5 vascular plants, 4 mammals, and 1 bird. MVP continues to coordinate with the USFWS and the USFS regarding the potential for presence of federally-listed species within the Project area.

Preliminary desktop analyses and correspondence with the USFS, Eastern Divide Ranger District, indicated four federally listed plants (shale barren rock cress [*Arabis serotina*], northeastern bulrush [*Scirpus ancistrochaetus*], small whorled pogonia [*Isotria medeoloides*], and smooth coneflower [*Echinacea laevigata*]) potentially occur in areas where the proposed route crosses the JNF. Field habitat assessments and surveys for plants began in June 2015 and concluded in August 2015 along two miles of the proposed Project route within JNF. No federally listed plant species were observed within national forest land during these field surveys. Surveys for the additional 1.4 miles will be conducted in 2016 during the species-specific optimal survey windows set forth by the USFWS to cover USFS lands crossed by the currently proposed route.

The current range of three federally listed bats (Indiana bat [*Myotis sodalis*], northern long-eared bat [*Myotis septentrionalis*], and gray bat [*Myotis grisescens]*) overlaps with the JNF. Mist net surveys for federally listed bats began in May 2015 and concluded in August 2015. No federally listed bats were captured within national forest land during these surveys. Searches for suitable bat hibernacula (caves and mines) on national forest land were conducted concurrent with mist net surveys. No hibernacula were discovered during these searches.

The Roanoke logperch (*Percina rex*) and James spinymussel (*Pleurobema collina*) are two aquatic species known or suspected downstream of the Project area and inside identified geographic bounds of the water resource cumulative effects analysis area.

5.2.3 USFS Sensitive Species

USFS Sensitive Species are those with rangewide viability concerns that are designated by the Regional Forester, with the goal of preventing them from becoming federally listed under the ESA. Forty-four USFS Sensitive Species have the potential to occur within the proposed Project area based on a desktop habitat assessment (Resource Report 3, Table 3.5-2). Field habitat assessments and surveys began in May 2015 and are ongoing. Three USFS Sensitive Species were found along the proposed Project route during the 2015 survey efforts.

Four eastern small-footed bats [*Myotis leibii*] (three adult males and one pregnant female) were captured during mist net surveys on the JNF (Pocahontas Road) in Giles County, Virginia. All individuals were healthy and released at their capture sites.

One location of rock skullcap (*Scutellaria saxatilis*) was observed during plant surveys along an alternate route in the JNF in Craig County, Virginia. The individual plant is located more than eight miles from the proposed construction right-of-way. A second location of rock skullcap was observed within the JNF on an alternate route approximately 780 feet west of the currently proposed construction right-of-way near MP 195.4 in Monroe County, West Virginia.

Several locations of American barberry (*Berberis canadensis*) were observed during plant surveys along an alternate route in the JNF in Craig County, Virginia. These plants are located more than eight miles from the proposed construction right-of-way.

These species, proposed survey methods, and results will be discussed in further detail in a biological evaluation (BE) being prepared for the portions of the Project that cross the JNF. The BE is being submitted in conjunction with this POD to the USFS to support review of the Project within the JNF.

5.2.4 USFS Management Indicator Species

The USFS designates Management Indicator Species to aid in setting objectives, analyzing effects of alternatives, and monitoring activities implemented under the USFS Forest Plan for the JNF. Management Indicator Species are chosen because changes in their populations are believed to indicate the effects of USFS management on selected biological components including threatened and endangered species, species with special habitat needs, game or demand species, and non-game species of special interest. Thirteen Management Indicator Species are designated for the JNF, and 11 were observed in the Project area during field surveys conducted on national forest land (Resource Report 3, Table 3.5-3).

5.2.5 USFS Locally Rare Species

Locally rare species, a term used by the USFS, are species for which representation on a particular forest is a concern although the species is secure range-wide. These species are not afforded federal protection under ESA, but the USFS recognizes the

need to properly prescribe management activities on national forest land that serve to benefit, rather than severely impact, these species. The USFS has identified over 350 locally rare species with potential to occur within or near the George Washington and JNF complex. Through coordination with USFS biologists, 151 locally rare species with suitable habitat may potentially occur within portions of the JNF which would be crossed by the Project (Resource Report 3, Table 3.5-4). Field surveys with the Project area are still ongoing, but at the time of this report's submission no locally rare species listed in Table 3.5-4 have been observed. However, recent Allegheny woodrat (*Neotoma magister*) activity (midden and latrine) within a boulder field was documented 1,600 feet west of the proposed Project's construction right-of-way.

5.2.6 Special Biological Areas within Jefferson National Forest

On JNF land, approximately 130 feet of the pipeline crosses the Slussers Chapel Conservation Site at MP 219.4 in Montgomery County, Virginia. According to the VDCR-DNH, Slussers Chapel encompasses one or more biologically significant karst resources and has a high biodiversity ranking. Approximately 0.4 acre of ground disturbance is proposed on Slussers Chapel Conservation Site within JNF during construction of the Project, of which 0.15 acre would be permanently impacted. The land habitat type in this disturbance area is upland deciduous forest. At a minimum, MVP will revegetate temporary and permanent workspace with native seed mixes as recommended by the WHC and in consultation with the USFS. MVP will coordinate with USFS to determine BMP's and avoidance and minimization measures for the crossing of the Slussers Chapel Conservation Site.

5.2.7 Stream Crossings within National Forest System Land

The Project pipeline is proposed to cross two unnamed tributaries to Craig Creek. in the JNF within the Upper James River watershed management area. As shown on Figure 5-1, the currently proposed route eliminates two crossings of Craig Creek that would have occurred with the previously proposed route. The federally endangered James spinymussel and state threatened Atlantic pigtoe are known from this stream. The proposed crossing method for Craig Creek is open-cut, and MVP will adhere to time-of-year restrictions on in-stream construction as set forth by the Virginia Department of Game and Inland Fisheries. Figure 5-1 identifies an alternative pipeline alignment within JNF that would eliminate any crossing of Craig Creek. This alternative is currently under study. Habitat assessments for freshwater mussels and fish are scheduled for late 2015. If live mussels or fish are found during initial field surveys, mussel/fish removal and relocations will occur immediately prior to in-stream construction activities. The Project also crosses the New River watershed management area, but no additional streams within the JNF are crossed. MVP will continue to coordinate with the USFWS and USFS regarding protected resources associated with Craig Creek.

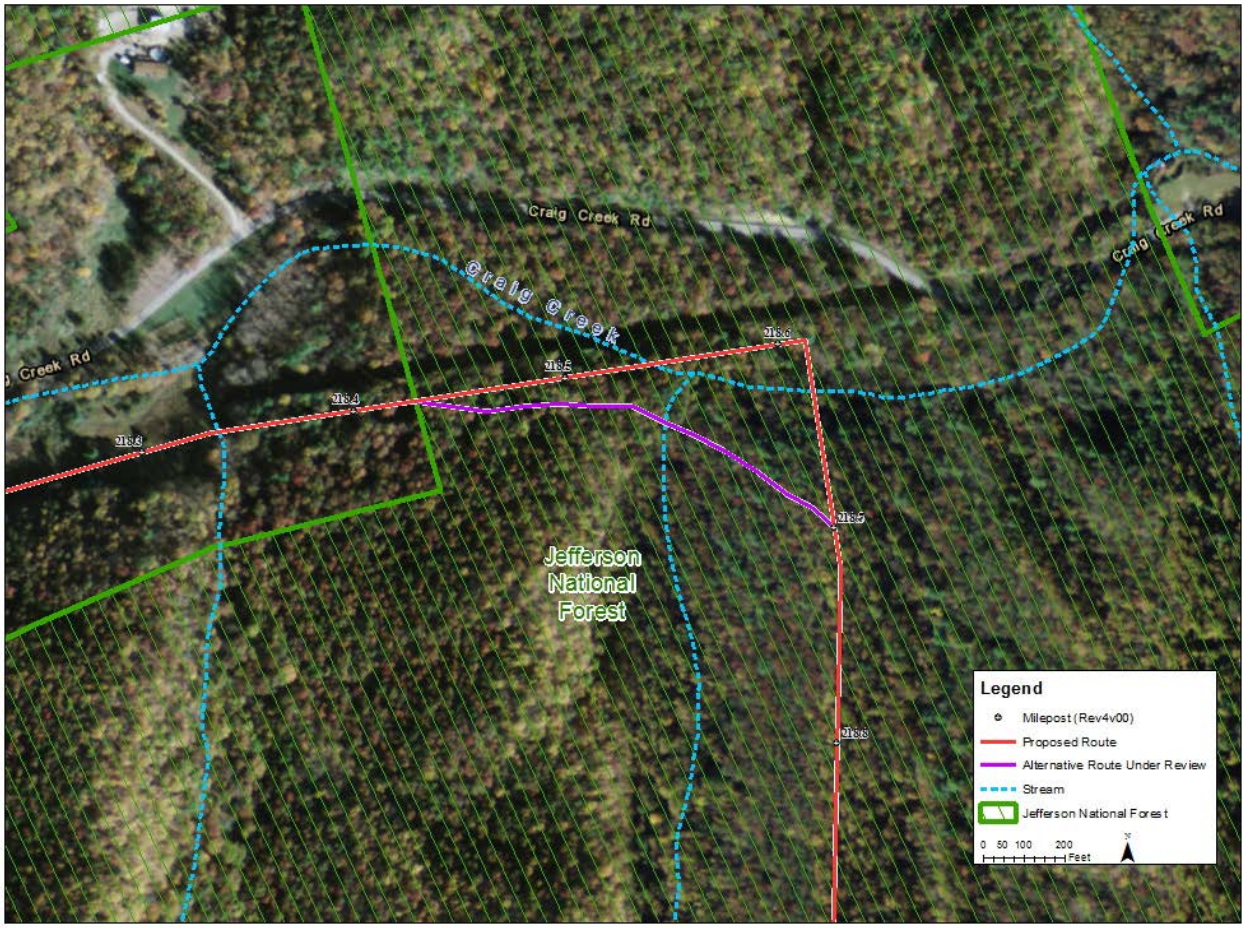


Figure 5-1. Proposed and Alternative Route Crossings of Craig Creek and Tributaries

5.3 Cultural Resources

MVP's discussions with the USFS about the Project's crossing of the JNF began in October 2014. In December 2014, the USFS indicated that USFS will use their own archaeology staff to perform archaeological surveys in the JNF and that USFS will write its own report and provide that report to the Virginia Department of Historic Resources. However, in December 2015, the USFS requested that MVP preform cultural resource investigations in the area of the proposed Project. MVP submitted an ARPA request to the USFS on January 8, 2016. Once the plan for survey is approved, MVP will being surveys on JNF property. Once complete, MVP will prepare a report summarizing the finding to the USFS and Virginia Department of Historic Resources.

The Project is proposed to cross the Appalachian National Scenic Trail within the JNF. While the NPS is the lead federal agency for the entire Appalachian National Scenic Trail, the USFS-JNF is the federal land-managing agency partner for the federal lands specifically protected for the Appalachian National Scenic Trail. Archaeological survey in the area of the Appalachian National Scenic Trail will be conducted as part of MVP's archaeological survey. Additional discussion of the Appalachian National Scenic Trail may be found within Resource Report 8.

A concern brought to the attention of FERC and MVP is possible impact on the cultural attachment local people have to their land in areas of the JNF. USFS defines cultural attachment as the cumulative effect over time of a collection of traditions, attitudes and practices, and stories that tie a person to the land, to physical place, and to kinship patterns (USFS 1996). MVP has added two professional cultural anthropologists onto its team to address the issue of cultural attachment along the proposed pipeline route crossing the JNF. Results of studies performed to address this issue are anticipated to be available in early 2016. These will be filed with the JNF and FERC when completed.

The Weston Gauley Turnpike is listed on the NRHP. Boring under the turnpike will avoid any direct adverse effects to this listed property. Some indirect effects would occur due to right-of-way clearing. As discussed in Section 5.7 an alternative approach to the Weston Gauley Turnpike under study will further reduce any indirect effect.

5.4 Socioeconomic Effects

The Project crosses the JNF for approximately 3.4 miles in Monroe County, West Virginia and Giles, Craig and Montgomery Counties, Virginia. The JNF is administratively combined with the George Washington National Forest. Together, the two forests encompass nearly 1.8 million acres in West Virginia, Virginia, and Kentucky. The JNF is managed for multiple uses including camping, hiking, wildlife conservation, and active management for timber and wood product production. According to the EIS prepared for the current Revised Forest Plan for the JNF, an estimated 1.34 million people visited developed or dispersed recreation sites on the Forest (USFS 2004a). This estimate does not include the millions of people that drive through the Forest.

Lands managed as part of the JNF are located in more than 20 counties in three states: Virginia, West Virginia, and Kentucky. The USFS estimated that management activities on the JNF supported more than 3,400 jobs and $86 million in labor income in the counties and cities that contain Forest acreage, about one percent of total employment and labor income in the affected area (USFS 2004a).

The crossing of the Weston Gauley Turnpike would have no socioeconomic effects.

5.5 Geologic Resources

The JNF is located in the Valley and Ridge province and the Project alignment crosses Lower Devonian and Silurian sandstone and shale through the JNF. Bedrock is reported to be at a depth of greater than seven feet through most of the alignment through the JNF excepting less than 0.5 mile that is less than 3 feet in depth. It is anticipated that minimal blasting would be required through the JNF. The JNF is located in the area with highest seismic hazards, as discussed in Resource Report 6, Section 6.4.1. However, these hazards, including soil liquefaction near water crossings and the potential for landslides and rock falls, are not considered severe and can be mitigated with appropriate construction design. Karst hazards are not present along the pipeline alignment within JNF lands. Construction methods, impacts, and measures to avoid or minimize impacts related to geologic resources and hazards crossed within the JNF will

be identical to that described above, except as may be specified for NFS lands under the terms and conditions included with the SUA.

An estimated 888,000 cubic feet of material will be excavated and temporarily stored along the right-of-way within the 3.4 miles of pipeline that cross the JNF. Only one access road is anticipated to be upgraded and extended on JNF land (Pocahontas Road). Excess excavation from cut slopes will be hauled to an approved location.

5.6 Soils

There are approximately 15 Natural Resources Conservation Service (NRCS) soil types described within the MVP route. These 15 soil types soils are similar in texture (sandy loams), and drainage (all well drained), with the bedrock either outcrop (at or above the surface) or relatively shallow. Slopes in the forest are steep and range from 11 to 70 percent.

Representatives of the USFS have indicated that much of this area was mapped only by aerial photography and that, because of slope, the NRCS soil mapping in this type of terrain was not well documented by “on the ground” soil evaluators. This is mainly because these areas do not tend to be good farmland where soil type is more important. MVP has presented a plan to the USFS to ground truth the NRCS soil and geologic mapping of the portion of the MVP pipeline that will cross USFS land. The field mapping effort will be a combination of test pits to confirm soil taxonomy, with a test hole dug in at least each of the current 15 mapped soil types. The corridor was walked, looking for and examining bedrock outcrops, examining the stratigraphy (overburden and bedrock if exposed) in any road cuts, and looking for signs of shallow bedrock. In addition, this field effort identified historic landslides, seeps or groundwater breakout and areas of bedrock outcrop, rock type, and fracture patterns.

This evaluation will be compared to currently mapped conditions to confirm these conditions or used to revise the mapped conditions. The results of this mapping will be incorporated into the final design and erosion sedimentation control plans which will include methods of determining erosion potential with the NRCS Erosion Hazard rating for soil series found in the corridor, which uses K-factor, slope and rockiness.

Impacts and mitigation due to construction within USFS land will be similar to those described in resource Report 7, Section 7.3.1. In order to meet additional USFS Forest Plan requirements, the Virginia Erosion and Sediment Control Handbook will be incorporated into the final design and erosion control plans for the USFS portion of the Project. These erosion and sediment control plans will be submitted to the USFS for review prior to construction. No hay bales are anticipated to be used on USFS land for sediment and erosion control.

While within the JNF, erosion control plant species, seed, and fertilizer mixtures will be pre-approved by the USFS. See Resource Report 3 for additional discussion of right-of-way revegetation planning, seed mixes, and post-construction revegetation monitoring.

5.7 Land Use Recreation and Aesthetics

During construction, the Project will impact approximately 80.4 acres within the JNF, and during operation approximately 20.8 acres will be required for pipeline operational right-of-way and 17.3 acres for an access road. A summary of the land use and visual impacts specific to USFS lands is included below. No land use or recreation and aesthetics resources would be affected at the Weston Gauley Turnpike. The discussion in Section 8.4.3 of Resource Report 8 assumed an open-cut crossing of this roadway, but MVP has since determined that this roadway would be crossed by conventional bore, which is reflected in the visual simulation submitted in response to a FERC data request (8-31). This would result in reducing the expected level of visual impact from high to moderate. Subsequently, MVP has identified an alternative alignment that would further reduce the visual impact by shifting the northerly approach away from the Weston Gauley Turnpike. Figure 5-2 shows the location of the proposed and alternative pipeline route locations under consideration.

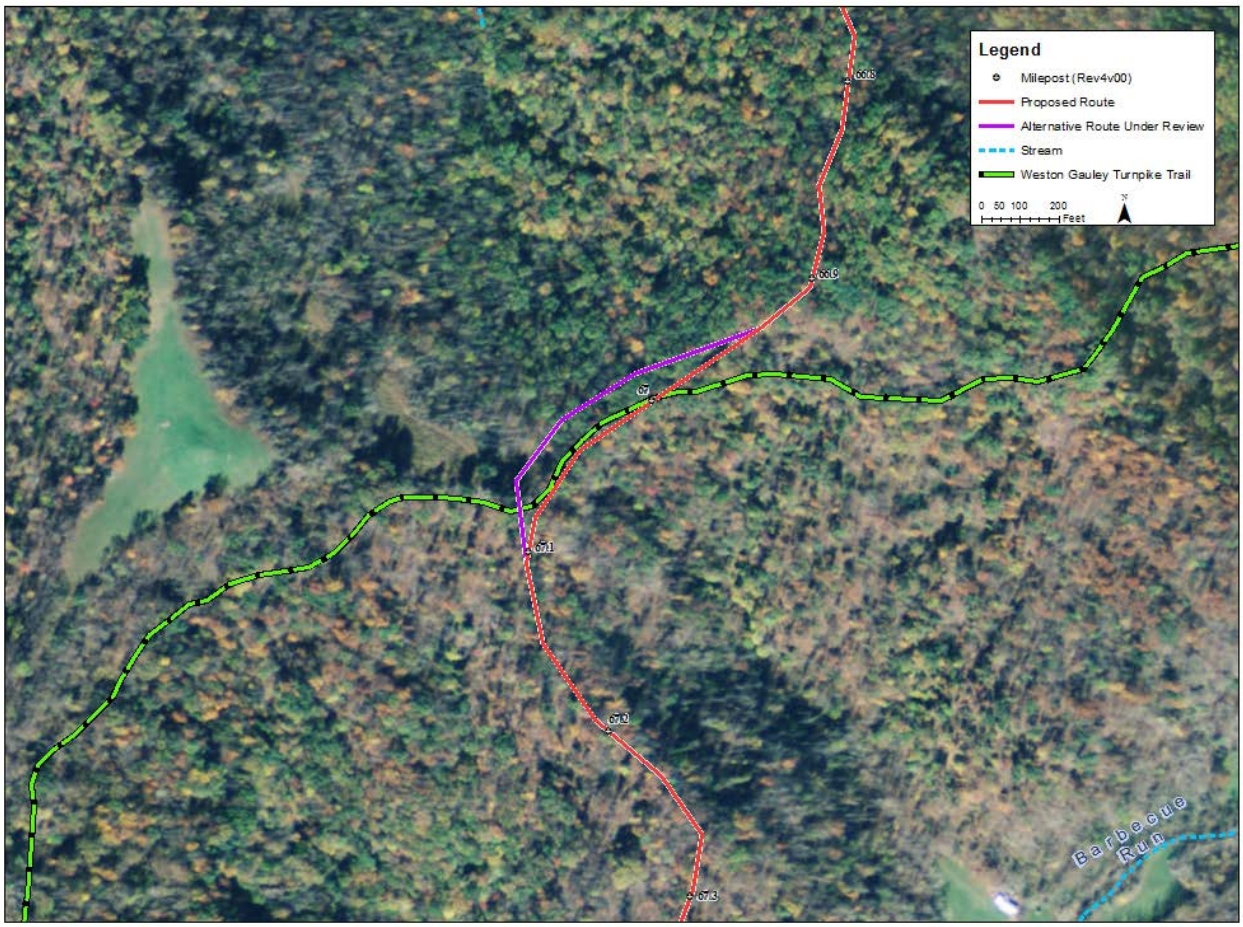


Figure 5-2. Proposed and Alternative Route Crossing of the Weston Gauley Turnpike

5.7.1 Land Use

The JNF extends over 200 miles along the Appalachian Mountains of southwestern Virginia and includes approximately 723,300 acres. The JNF is managed in combination

with the George Washington National Forest in west-central Virginia for multiple uses including recreation opportunities, timber and wood products production, and conservation, research. Land use within the Project vicinity is forested.

5.7.2 Land and Resource Management Plan Consistency

MVP has prepared a review of the Project in comparison to the JNF 2004 Forest Plan (USFS 2004b) to evaluate the consistency of the Project with the standards included in the Forest Plan (Resource Report 8, Appendix 8-E). The intent of this review is to assist the USFS in its assessment of how the Project conforms to the directions contained in the Forest Plan, and if changes in the Forest Plan would be required if the pipeline is authorized across to cross the National Forest.

The JNF is managed under the Forest Plan as required under the Forest and Rangeland Renewable Resources Planning Act, as amended by the National Forest Management Act. The Forest Plan provides direction to assure coordination of multiple-uses (including outdoor recreation, range, timber, watershed, wildlife, fish, and wilderness) and sustained yield of products and services. It fulfills legislative requirements and addresses local, regional, and national issues and concerns. To accomplish this, the Forest Plan includes several measures, including the following:

- Establishes the management direction and associated long-range goals and objectives of the JNF.
- Establishes management areas and management prescriptions.
- Specifies the standards, which set the sideboards for achieving the goals, objectives and desired conditions, as well as provide meaningful direction when implementing projects.
- Identifies lands suitable for various multiple uses.

The Forest Plan includes Forest-Wide Direction, Management Prescriptions, and Management Area Direction. Forest-Wide Direction applies to the entire JNF. This direction includes specific goals, objectives and standards related to each resource. Management Prescriptions identify 50 unique land allocations on the Forest. Each prescription includes an emphasis, desired condition, objectives (if needed) and standards. The Management Areas identify ten unique sections of the Forest based on watersheds as well as social and ecological factors. The management areas have specific prescriptions and applicable standards. The Forest Plan also includes information on the how the Forest Plan will be implemented and updated through monitoring and evaluation.

All projects implemented on the Forest must be consistent with Forest Plan direction. Projects that are not consistent must either be revised to meet Forest Plan direction or a Plan amendment must be approved, modifying the standard, management area allocation, or the management prescription. Therefore, MVP prepared a Forest Plan Consistency analysis for the portion of the Project that crosses the Forest (see Resource Report 8, Appendix 8-E). An assessment of compliance with the Forest Plan Scenery Management System is included below.

5.7.3 Scenery Management System Compliance

The USFS provided MVP with the Scenic Integrity Objectives (SIOs) and the Forest Plan for the JNF. In consultation with the USFS, MVP selected 10 KOPs on USFS lands and used these KOPs to investigate potential visual impacts of the pipeline. For USFS lands, consistency with SIOs involves the comparison of existing landscape integrity with integrity that would occur after construction of the pipeline. Impacts to landscape scenery were determined by measuring the extent of effects of the pipeline route (vegetation clearing, land scarring) on the scenic landscape through USFS scenic attractiveness ratings, and scenic quality on private, state, and other federal lands. The intent of the Forest Plan is to provide a framework for integrated resource management and for guiding all project and activity decision making on USFS lands.

The Forest Plan divides the Forest into management areas (MAs) (USFS 2004b). The purpose of these MAs is to identify allowable uses and opportunities within certain areas on the JNF. The plan states, “The Scenery Management System guides protection and enhancement of scenery on the Jefferson National Forest. The Scenic Class inventory, including Landscape Visibility, Concern Level, and Scenic Attractiveness, is maintained, refined, and updated as a result of site specific project analysis” (USFS 2004b). The proposed alignment for the pipeline would cross five separate MAs, including the Appalachian Trail Corridor (4A), Mix of Successional Habitats in Forested Landscapes (8A1), Designated Utility Corridor (5C), Old Growth Forest Communities-Disturbance Associated (6C), and Urban/Suburban Interface (4J).

The first USFS crossing occurs at Peter’s Mountain where the Appalachian National Scenic Trail is located and is managed as a 4A MA. Lands within the 4A MA consist of those lands mapped as the foreground area visible from the Appalachian National Scenic Trail footpath and are primarily managed to protect the Appalachian National Scenic Trail experience. This prescription area traverses a range of Recreation Opportunity Spectrum classes. Management of the Appalachian National Scenic Trail setting will either be consistent with or complement the semi-primitive non-motorized Recreation Opportunity Spectrum class. The linear nature of this prescription area is recognized in determining the Recreation Opportunity Spectrum class. This prescription area retains a natural, forested or pastoral landscape character shaped by both natural processes and humans. All management activities will meet or exceed a SIO of High.

Lands within the 8A1 prescription area MA are managed for maintenance, enhancement and restoration of native forest communities, particularly southern yellow pine and the wide variety of oak forest communities. The landscape character of this area retains a natural, forested appearance. The portion of the MA crossed by the pipeline is managed to meet Moderate SIOs.

Lands within the 5C prescription area MA are designated 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. They include long linear features like high voltage electric transmission lines and buried pipelines for public drinking water or natural gas. These designated corridors serve uses that require at least a 50 feet wide right-of-way. Vegetation consists predominantly of low grasses,

wildflowers with some native deciduous and evergreen shrubs, low-growing trees like dogwood and redbud, and young, sapling sized trees. The portion of the MA crossed by the pipeline is managed to meet mostly Low SIOs with some areas of Moderate SIOs in Class 1 and 2 inventoried scenic classes.

The crossing at MPs 217.2 and 218.0 crosses lands within the 6C prescription area MA, which is managed to emphasize protection, restoration, and management of old-growth forests and their associated wildlife, botanical, recreational, scientific, educational, cultural, and spiritual values. Within this prescription, most of the area will contain forest communities where no forest management activities or intervention will take place. Most of the area will contain forest canopies that are continuous, interspersed with small gaps from natural causes, with little evidence of past human activity. The landscape character is natural-appearing. The portion of the MA crossed by the pipeline is managed to meet mostly low SIOs with some areas of Moderate SIOs in Class 3, 4, and 5 inventoried scenic classes.

The second crossing location would also cross lands within the 4J prescription area MA north of Blacksburg, Virginia, which emphasizes a “defensible space” that provides a buffer between human developments and forestland, reducing the risk of wildland fire. This prescription recognizes that these areas are people's "backyards" so a long-term goal of high quality, fire-resistant scenery is also emphasized. These landscapes will often appear altered in the short-term while the defensible space is created and a normal fire regime restored. The long-term goal is to maintain a moderate to high scenic integrity. This area is managed with a short-term scenic integrity objective of low until the ecosystem and landscape character are rehabilitated. The portion of the MA crossed by the pipeline is managed to meet mostly moderate SIOs with some areas of High SIOs in Class 1 and 2 inventoried scenic classes.

The primary emphasis for many of these MAs is to restore and maintain a landscape mosaic of open woodland that approximates historical conditions and where applicable protect foreground views from the Appalachian National Scenic Trail. The common purpose for each MA is to provide habitat for associated plants and animals, and to create a setting for recreation that is different, uncommon, visually appealing, and rich in wildlife. MA Standards are mandatory requirements that apply to site-specific activities such as the Project.

Scenic Class 1 (Very High) Areas. The pipeline crosses 0.29 mile consisting of specific areas the JNF inventoried and classified as having Very High public value such as the Appalachian National Scenic Trail. These areas are characterized by mountainous terrain and forested areas within the 4A MA. A few unimproved roads or trails are evident. There are distinctive landscape features. These areas are all classified as scenic Class 1 because they are within the foreground view of the Appalachian National Scenic Trail.

With the introduction of Project elements, which will bore underneath the Appalachian National Scenic Trail corridor, the landform, vegetation patterns, and cultural features would still combine to provide high scenic quality in these areas. Because of the landscape’s ability to absorb visual change and the fact that the pipeline right-of-way will

not be visible from the trail, the overall scenic attractiveness class would not change and, therefore, the total acreage of land classified as Scenic Class 1 would not be affected.

Scenic Class 2 (Very High, High, and Moderate) Areas. The pipeline crosses 2.25 miles consisting of three separate areas the JNF inventoried and classified as having Moderate public value. The areas include the 8A1, 5C, 8C, and 4J MAs. These are typical forested areas as well as cleared rights-of-way and the urban interface north of Blacksburg, Virginia. Roads, trails, water, rock outcrops, or other distinctive landscape features are evident.

With the introduction of Project elements, the landform, vegetation patterns, and cultural features would still combine to provide ordinary or common scenic quality in these areas. Because of the landscape's ability to absorb visual change and in many areas affectively screen views, the overall scenic attractiveness may slightly change and, therefore, the total acreage of land classified as Scenic Class 2 may not be affected.

Scenic Class 3 (Low and Moderate) Areas. The pipeline crosses 0.66 mile consisting of one area of the JNF inventoried and classified as having Moderate public value. The area is inventoried as the 6C MA. These are typical old-growth forested areas. Roads, trails, water, rock outcrops, or other distinctive landscape features may be evident though emphasis is old-growth forest.

With the introduction of Project elements, the landform, vegetation patterns, and cultural features would still combine to provide ordinary or common scenic quality in these areas. Because of the landscape's ability to absorb visual change and in many areas effectively screen views, the overall scenic attractiveness would not change and, therefore, the total acreage of land classified as Scenic Class 3 may not be affected.

SIO Compliance. The pipeline would be buried underground and not visible, although the cleared and maintained pipeline right-of-way would contrast with the landscape character in High, Moderate, and Low SIO areas where there is not existing cleared utility rights-of-way. There would be no aboveground facilities installed within the JNF. The cleared and maintained pipeline right-of-way would create additional lines on the landscape that vary in terms of line, color, and texture from the surrounding visual landscape. These visual deviations would be most evident to viewers from an elevated vantage point or areas where no vegetation is in the immediate foreground. According to the Forest Plan, projects and activities should contribute to the achievement or attainment of desired conditions. The USFS desires for a certain percentage of projects occurring on NFS lands to meet the intended SIO as identified in the Forest Plan over the long term. Pipelines cause visible disruption to the surrounding landscape primarily from right-of-way clearing (visually disruptive through the removal of trees, shrubs, and ground cover, creation of unnatural openings, and abnormal vegetative edges).

The landscape character for High SIO areas should appear unaltered and intact, and any deviations must "repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident" (USFS 2004b). Even with avoidance and minimization measures, the pipeline across the 4J MA would not meet this standard and would degrade the Desired Condition for scenic

resources described in the Forest Plan. The pipeline would cross the Appalachian National Scenic Trail in the 4A MA but would be installed by boring under the trail, without a trench, keeping vegetation adjacent to the trail intact; thus, it is anticipated that the pipeline would comply with the management direction for the 4A MA.

The landscape character for Moderate SIO areas may appear slightly altered, and deviations "must remain visually subordinate to the landscape character being viewed" (USFS 2004b). It may be possible, but is not likely, for Project elements to meet this standard in 100 percent of locations depending on the avoidance and minimization measures employed and local landscape conditions. The MAs crossed by the pipeline include 8A1, 5C, 8C, and 6C. With these measures, the implementation of the proposed route would neither enhance nor degrade the Desired Condition for scenic resources described in the Forest Plan. Due to the Project resulting in moderate visual impacts the proposed route would comply with Moderate SIOs.

The landscape character for Low SIO areas may appear moderately altered, and deviations may "begin to dominate the valued landscape character being viewed" provided they "borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed" (USFS 2004b). Project elements would meet this standard depending on avoidance and minimization measures and local landscape conditions. With these measures, the proposed route would neither enhance nor detract from the Desired Condition for scenic resources described in the Forest Plan. Due to the alternative resulting in moderate visual impacts where visible, the proposed route would comply with Low SIOs.

5.8 Air and Noise Quality

5.8.1 Air Quality

No compressor stations are proposed within the JNF, and air quality impacts will be temporary and limited to pipeline construction. Air quality impacts from pipeline construction within JNF will be identical to that described above, except as may be specified for NFS lands under the terms and conditions included with a Right-of-Way Grant. Additional air quality discussions regarding construction can be found in Resource Report 9.

The JNF is managed under the 2004 Forest Plan, which includes specific goals, objectives, and standards related to resources. The Forest Plan includes one standard specific to air quality (FW-11). MVP has prepared a Forest Plan Consistency analysis for the portion of the proposed MVP Project that crosses the JNF. Results of that consistency analysis is included in Appendix 8-F of Resource Report 8.

The crossing of the Weston Gauley Turnpike will have no permanent effect on air and noise quality.

5.8.2 Noise Quality

No compressor stations are proposed within the JNF, and noise impacts will be temporary and limited to pipeline construction. Noise impacts from pipeline construction

within JNF will be identical to that described above, except as may be specified for NFS lands under the terms and conditions included with the Right-of-Way Grant. Additional noise quality discussions regarding construction can be found in Resource Report 9.

The pipeline will cross the Appalachian National Scenic Trail within the JNF, where the pipeline crosses over Peters Mountain. Noise from pipeline construction activities would be audible to hikers along the trail; however, this impact would be temporary, occurring only during the day during active construction. There are no noise impacts anticipated to users of the Appalachian National Scenic Trail during operation of the pipeline. There are no Forest Plan standards specific to noise or acoustic impact that would apply to Project construction and operation.

5.9 Alternatives

An initial detailed routing analysis was performed in May 2014 that analyzed 94 corridor segments including 2,362 miles of alternative routes including several alternate locations to cross the JNF. There are no routes from the origination of the pipeline to its terminus that would not cross the NFS lands. The proposed location was the shortest crossing distance identified with the least disturbance and an opportunity to co-locate. This alternative was selected because it was the shortest crossing of NFS lands and one of the most direct routes to get from the origination of the Project to its terminus. The proposed alternative route was also selected due to constructability of the pipeline and constraints identified along the proposed route paralleling the transmission line. Other crossing locations were evaluated and found prohibitive due to the steep terrain and other environmental concerns. Resource Report 10, Section 10.5 provides a detailed description of the selection of the overall proposed route.

Since the initial routing analysis, several route variations to avoid or improve site location in relation to specific resources have been analyzed within the JNF including the crossing of the Appalachian National Scenic Trail.

5.9.1 Route Variations

MVP identified Variation 110 and modifications to Variation 110 called Variations 110J and 110R as possible alternatives that include a different crossing location of both the Appalachian National Scenic Trail and JNF. These variations would also avoid a number of resources and areas of concern that are crossed along the Proposed Route in Giles and Montgomery Counties, Virginia that were identified during open houses as well as in comments filed with FERC. Variations 110, 110J, and 110R begin at MP 174.8 of the Proposed Route in Monroe County, West Virginia, where they would turn east and then continue generally southeast crossing the ridgeline of Peters Mountain, passing near the hamlet of Waiteville, West Virginia, then crossing the West Virginia-Virginia state line, John's Creek, then over the ridgeline of John's Creek Mountain to a point just north of Virginia Rt. 42. From this point Variation 110 and 110R would continue south across the valley near Simmonsville, Virginia, cross the Appalachian National Scenic Trail and the ridgeline of Singing Creek Mountain. Variations 110 and 110R would take slightly different routes between Singing Creek Mountain and Brush Mountain, with Variation 110R turning south and then sharply east adjacent to an

existing power line corridor between Brush Mountain East and Brush Mountain West Wilderness Areas, then joining the same route as Variation 110 at Brush Mountain.

From the point just north of Virginia Route 42, Variation 110J would turn east then southeast, crossing Sinking Creek Mountain about 3.5 miles northeast of Variation 110 and 110R, where it would continue southeast crossing Brush Mountain and the Appalachian National Scenic Trail, then turn south and southwest to join the same route as Variation 110 and 110R just south of Brush Mountain. South of Brush Mountain, the three variations would share the same route, continuing south across Paris Mountain and rejoin the Proposed Route at MP 227.5 just south of the crossing of Interstate 81 (Resource Report 10, Figure 10.6-4).

Resource Report 10, Table 10.6-4 includes a comparison of environmental features crossed by Variations 110, 110J, 110R, and the corresponding segment of the Proposed Route.

As shown on Figures 5-1 and 5-2, alternative pipeline route locations are under study to reduce the number of crossings of Craig Creek and make a more direct approach to boring under the Weston Gauley Turnpike.

5.9.2 Alternative Crossing Locations of the Appalachian National Scenic Trail

Eight of the pipeline alternatives and variations evaluated by MVP and discussed above include an alternative crossing location of the Appalachian National Scenic Trail. In the sections above the alternative trail crossing locations are compared to the proposed crossing location and evaluated within the context all other environmental and social features and impacts along the various lengths of pipeline for each alternative. As requested in FERC's August 11, 2015 letter to MVP, this section looks at just a single point on each alternative—the crossing of the Appalachian National Scenic Trail—and compares that point to the trail crossing by the Proposed Route. A comparison of impacts on the Appalachian National Scenic Trail between the pipeline alternatives and variations that include a crossing of the trail are summarized below and in Resource Report 10, Table 10.6-17. Topographic maps and aerial photos of the proposed and each alternative crossing location, and ground-based photos of the proposed crossing location, are included in Resource Report 10, Appendix 10-B.

5.9.3 Proposed Route

The Proposed Route crosses the Appalachian National Scenic Trail at MP 194.45 within JNF where the Appalachian National Scenic Trail runs along Peters Mountain, in Monroe County, West Virginia. At the trail crossing the Proposed Route is not adjacent to an existing right-of-way. Land use at the crossing is mixed forested/open land (see photos in Resource Report 10, Appendix 10-B), and the surrounding land use is primarily forested with some scattered scrub and open lands. Where the trail runs along Peters Mountain there are few man-made forest breaks, with the nearest forest break that would be experienced by a trail hiker about 3.4 miles from the proposed crossing. MVP proposes to cross the Appalachian National Scenic Trail using a horizontal bore underneath the trail, leaving about 100 feet of undisturbed vegetation on each side of the trail; therefore, the proposed crossing would not create a new forest break within

this forested section of trail. A visual impact analysis for the Proposed Route crossing of the trail confirms that the proposed crossing method would result in no visual impact to users of the Appalachian National Scenic Trail (see Resource Report 8).

5.10 Reliability and Safety

Pipeline design, construction, and operation for MVP within the JNF and across the Weston Gauley Turnpike will be identical to design, construction, and operation on other lands. The jurisdiction and land ownership of lands crossed by MVP will have no effect on pipeline reliability and safety. Pipeline reliability and safety as described in Resource Report 11 will apply to the MVP pipeline within the JNF and across the Weston Gauley Turnpike.

The pipeline will be designed for USDOT Class 1 locations at both crossings of the JNF (see Resource Report 11, Table 11.1-1), and no high consequence areas are located within the JNF (see Resource Report 11, Table 11.1-2).

5.11 Polychlorinated Biphenyls

The Final Rule for Disposal of Polychlorinated Biphenyls (63 Federal Register 35384) was issued on August 28, 1998. The EPA authorizes use of polychlorinated biphenyls (PCBs) in natural gas pipeline systems at concentrations less than 50 parts per million (ppm). Resource Report 12 is required for filings involving the replacement, abandonment by removal, or abandonment in place of pipeline facilities determined to have PCBs in excess of 50 ppm in pipeline liquids.

MVP is not proposing to replace, abandon by removal, or abandon in place any pipeline facilities known to have PCBs in excess of 50 ppm in pipeline liquid. However, MVP will make certain connections to existing pipeline systems, and the possibility exists that PCBs could be encountered in the other pipeline systems or in soils immediately surrounding those interconnects. No connection to existing pipeline systems are proposed within or in the vicinity of the JNF or at the crossing of the Weston Gauley Turnpike.

6.0 ENVIRONMENTAL PROTECTION PLANS AND DOCUMENTS

This section will describe the EPPs included as appendices to this POD that MVP will use to ensure environmental protection during construction, operation, and maintenance. All EPPs are stand-alone documents that contain complete lists of all EPMs and other specific stipulations and methods for that environmental resource. MVP will be responsible to ensure their contractors and employees implement these measures. The EPPs will be included in the initial POD and developed further in the final POD as described in Section 1.3 .Table 6-1 identifies the draft and final plan approach.

Table 6-1. Environmental Protection Plans and Documents

Description	Appendix Designation	What will be included in Initial and Final Appendices	Source of Information to be Used to Prepare Appendix
The **Map Appendix** will contain overview and detailed maps showing project and facility locations and include • JNF Alignment Sheets • JNF USGS 7.5-Minute Topographic Maps	Appendix A	Maps as described	FERC Resource Report 1 Appendices 1A and 1B
This **Details Appendix** will include information describing the location and configuration of facilities within the JNF and include: • Typical Drawings • Co-Location Table • Access Road Table	Appendix B	Details as described	FERC Resource Report 1 Appendices C-1, C-2, D, E, and F.
The **Environmental Compliance Management Plan** will be the primary guidance document that states how MVP will uphold, document, and manage compliance with the SUA, POD, other easement agreements, and all federal, state, and local permits. It is a centralized Project environmental compliance reference and is thereby intended to facilitate environmental compliance across the entire Project.	Appendix C	Draft Plan subject to JNF Review	Based on previous compliance plans where a third-party compliance contractor has been required by FERC and approach is determined acceptable to the JNF
The **Restoration Plan** will include construction mitigation, restoration, and revegetation measures for each land management area crossed by the right-of-way on National Forest lands. It will combine MVP's best management practices (BMPs) with site-specific mitigation developed in consultation with JNF.	Appendix D	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	Based on FERC Upland Erosion Control, Revegetation, and Maintenance Plan (Plan), Section V as modified by Project-Specific Erosion and Sediment Control Plan (Project-Specific Plan) when completed.

Table 6-1. Environmental Protection Plans and Documents (continued)

Description	Appendix Designation	What will be included in Draft and Final Appendices	Source of Information Used to Prepare Appendix
The **Exotic and Invasive Species Control Plan** will provide methods to control the potential occurrence/infestation of noxious and invasive weeds during and following construction of the Project. The purpose of the plan is to ensure noxious weeds are identified and controlled during the construction of Project facilities and all federal, state, and county requirements are satisfied	Appendix E	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	Based on Resource Report 3, Section 3.2.10 and Appendix 3-C, FERC Plan, Section III, and Project-Specific Plan.
The **Stormwater Pollution Prevention Plan** will describe preventive measures such as personnel training, equipment inspection, and refueling procedures to reduce the likelihood of spills. It will also include mitigation measures to minimize potential impacts if a spill occurs.	Appendix F	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	Based on FERC Plan, Section IV, Project-Specific Plan. Virginia Erosion and Sediment Control Handbook, and RR7, Section 7.4
The **Spill Prevention, Containment, and Countermeasures Plan** will describe preventive measures such as personnel training, equipment inspection, and refueling procedures to reduce the likelihood of spills. It will also include mitigation measures, such as containment and cleanup, to minimize potential impacts if a spill occurs.	Appendix G	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	Based on FERC Plan, Section IV, Project-Specific Plan and Resource Report 2, Sections 2.2.5 and 2.4.
The **Plant and Wildlife Conservation Measures Plan** will present the measures proposed by the MVP for avoidance and minimization of impacts to plant and wildlife species as related to construction activities for the Project and outline specific conservation measures to be implemented in the event that state or federally listed species, USFS special status species or their habitats will be identified within or adjacent to the Project right-of-way.	Appendix H	Draft Plan followed by JNF review.	Resource Report 3, Section 3.5
The **Blasting Plan** will outline methods to prevent adverse impacts to human health and safety, property, and the environment that could potentially result from the use of explosives during Project construction and mitigate risks and potential impacts associated with blasting procedures that may be required for construction.	Appendix I	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	Resource Report 6, Appendix 6-B, Depth to Bedrock by Milepost (Table and Map Set) and Draft Blasting Plan

Table 6-1. Environmental Protection Plans and Documents (continued)

Description	Appendix Designation	What will be included in Draft and Final Appendices	Source of Information Used to Prepare Appendix
The **Fugitive Dust Control Plan** provides measures to ensure protection of the air quality that will be affected by the Project. This plan will be implemented during the construction, operation, and maintenance phases of the Project. These measures are intended to minimize dust and emissions from construction-related activities.	Appendix J	Draft Plan followed by JNF review.	Resource Report 9, Section 9.1.6
The **Fire Prevention and Suppression Plan** will include measures to be taken by the MVP and their contractors to ensure that fire prevention and suppression measures are carried out in accordance with federal, state, and local regulations. The plan will address the specific requirements of the USFS including prescribed fire and provides BMPs for fire management on privately owned lands.	Appendix K	Draft Plan followed by JNF review.	RR1, Appendix 1-H
The **Hazardous Materials Management Plan** will reduce the risks associated with the use, storage, transportation, production, and disposal of hazardous materials (including hazardous substances and wastes). This plan will identify Project-specific mitigation measures and other specific stipulations and methods to address spill prevention, response, and cleanup procedures for the Project.	Appendix L	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	No comparable plan included in FERC filings.
The **Construction Emergency Preparedness and Response Plan** will provide an overview of methods to be implemented if the need for emergency management is imminent. This document will describe the existing support structure, chain of command, and emergency communications protocols.	Appendix M	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	No comparable plan included in FERC filings.
The **Operations, Maintenance, and Emergency Response Pla**n will include measures to be employed while conducting routine, corrective, and emergency operations and maintenance activities. Measures identified will be compliance with applicable state and federal laws and policies allowing for the MVP to access the pipeline right-of-way in a timely, cost-effective, and safe manner.	Appendix N	Draft Plan followed by JNF review.	No comparable plan included in FERC filings. Information to be extracted from Resource Report 11.

Table 6-1. Environmental Protection Plans and Documents (continued)

Description	Appendix Designation	What will be included in Draft and Final Appendices	Source of Information Used to Prepare Appendix
The **Plan for Unanticipated Historic Properties and Human Remains** will identify the protocols MVP will implement if historic properties or human remains (an unanticipated discovery) are discovered during construction activities.	Appendix O	Draft Plan followed by JNF review.	Resource Report 4, Section 4.4.3, Appendix 4-M, Plan for Unanticipated Historic Properties and Human Remains, West Virginia and Virginia.
The **Framework Flagging, Fencing, and Signage Plan** will describe the methods that will be used in the field to delineate limits of disturbance and protect sensitive environmental and cultural resources during Project construction.	Appendix P	Draft Plan followed by JNF review. Final Plan to include input from Construction Contractor.	No comparable plan included in FERC filings.

7.0 LITERATURE CITED

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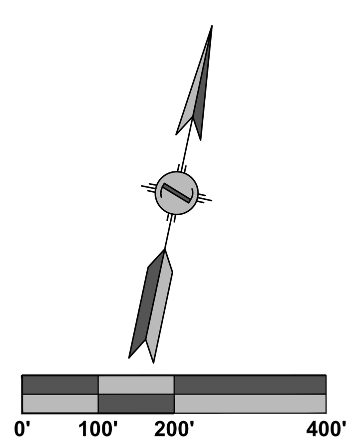
Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

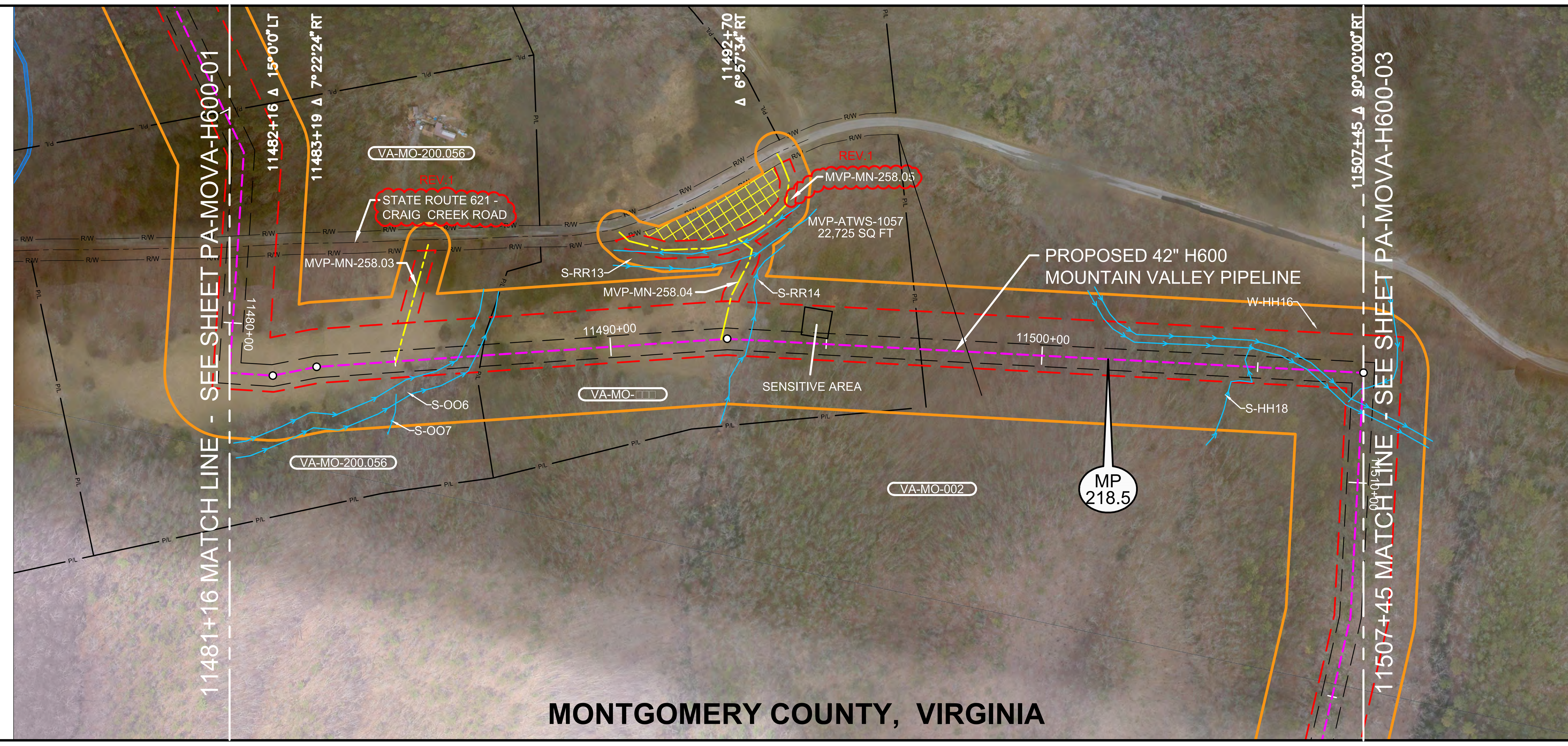
Attachment USFS-22a

RIGHT-OF-WAY & OWNERSHIP DATA	11481+16	VA-MO-200.056 576 LF 576 SLOPE	11486+92	VA-MO-□□□ / VA-MO-□□□ 36 LF 36 SLOPE	11487+28	VA-MO-□□□ 713 LF 715 SLOPE	11494+41	VA-MO-□□□ / VA-MO-□□□ 69 LF 70 SLOPE	11495+10	VA-MO-□□□ 208 LF 208 SLOPE	11497+18	VA-MO-002 1027 LF 1034 SLOPE	11507+45
DESIGN – PIPE / COATING	11481+16	1											11507+45
DESIGN – SLOPE DISTANCE		2632'											
DESIGN – CLASS LOCATION / HCA		1											
ENVIRONMENTAL – CONSTRUCTION EXCLUSION													
ENVIRONMENTAL – WETLAND / STREAM													
ENVIRONMENTAL – .													
ENVIRONMENTAL – .													



PLAN VIEW

LEGEND
- STUDY CORRIDOR
- PROPOSED 42"PIPELINE
- NON-SURVEYED C/L
- 500' TICK MARK
- EXISTING PIPELINE
- PERMANENT EASEMENT
- WORK SPACE LIMITS
- PERMANENT ACCESS RD
- TEMPORARY ACCESS RD
- ANCILLARY SITE
- COUNTY LINE
- PROPERTY LINE
- ROAD RIGHT-OF-WAY
- FENCE LINE
- OVERHEAD POWER
- OVERHEAD TELEPHONE
- C/L ROAD
- C/L RAILROAD
- DELINEATED STREAM
- DELINEATED WETLAND
- BARRACADE FENCE
- PI SYMBOL
- PROPOSED TEST STATION
- MAILBOX
- LINE MARKER - VENT PIPE
- POWER/TELE POLE
- SIGN
- TOWER LEG
- TREE
- GUY ANCHOR
- TANK
- GAS VALVE
- WELL - GAS/OIL/WATER/ MONITORING
- POST - GATE/FENCE
- ELEC/GAS/WTR METER
- PEDESTAL - UTILITY
- MH - SANITARY/WATER
- CATCH BASIN - CULVERT
- ADDITIONAL TEMPORARY WORK SPACE(ATWS)
- ABOVE GROUND FACILITY
- LIMITS OF DISTURBANCE



REV 4.0.0 - ISSUED TO FERC

AERIAL PHOTOGRAPHY DATE: DECEMBER 2014 & JANUARY 2016

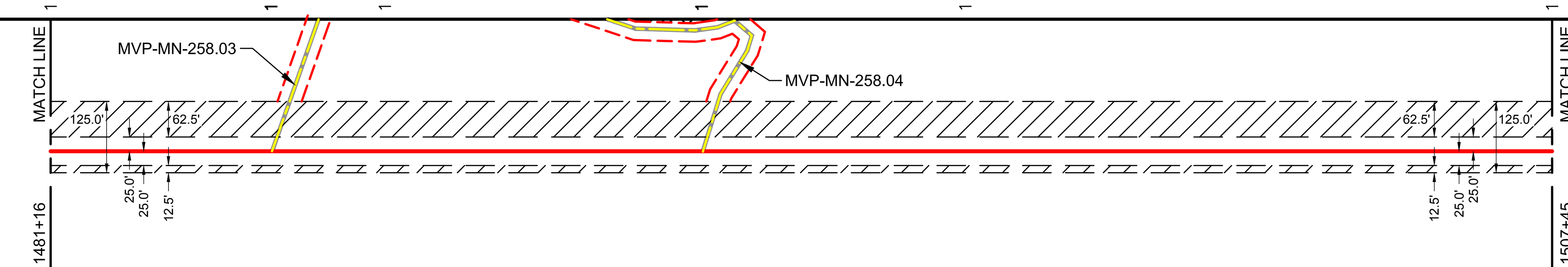
REFERENCE DRAWINGS

DRAWING NO.	DESCRIPTION

HORIZONTAL STATIONING

11481+16 MATCH LINE
11485+02 ACCESS RD – TEMPORARY (MVP–MN–258.03)
11487+01 PROPERTY LINE
11492+56 ACCESS RD – TEMPORARY (MVP–MN–258.04)
11497+18 PROPERTY LINE
11507+45 MATCH LINE

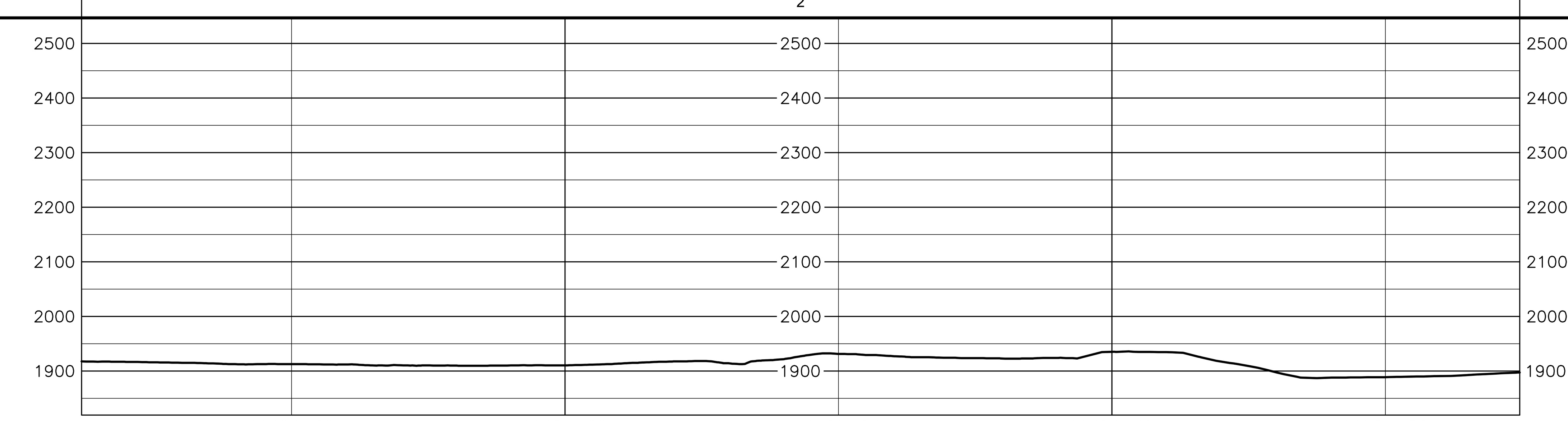
WORK SPACE
- PROPOSED PIPELINE
- EXISTING PIPELINE
- ACCESS ROAD TEMPORARY WORK SPACE
- PERMANENT EASEMENT
- TEMPORARY WORK SPACE(TWS)
- ADD. TEMPORARY WORK SPACE(ATWS)



CONSTRUCTION METHOD: 2

CONSTRUCTION METHOD KEY
1 - TYPICAL R/W CONFIGURATION
2 - TYPICAL R/W CONFIGURATION
3 - TYPICAL "SKINNEY" FOR WATER BODY
4 -
5 -
6 -
7 -
8 -
9 -
10 -
11 -
12 -
13 -
14 -
15 -
16 -

PROFILE



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Holland, Michigan 49423-3766
T 616-392-5938 F 616-392-2116
26555 Evergreen Rd. Suite. 430
Southfield, Michigan 48076
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REVISIONS

REV.	BY	DATE	DESCRIPTION
0	HEI	10-15-15	REV. 4.0.0 ISSUED TO FERC
1	HEI	01-12-16	FERC DATA REQUEST 21 - MVP-MN-258.05, ADDED ROAD NAME AND FERC DATA REQUEST 21 - ADDED NHD WATERBODY

MATERIAL SUMMARY

MK. NO.	QTY.	DESCRIPTION
1	2632	42"O.D. X 0.617"W.T., X-70, FUSION BONDED EPOXY
		TYPE 1 TEST STATION - PIPELINE
		TYPE 4 TEST STATION - FOREIGN CROSSING

APPROVED FOR CONSTRUCTION

REV.	BY	DATE
.	.	.

APPROVED FOR BIDDING

REV.	BY	DATE
.	.	.

APPROVED FOR FERC

REV.	BY	DATE
0	RRR	10-15-15

Mountain Valley PIPELINE

PIPELINE ALIGNMENT

MOUNTAIN VALLEY PROJECT - H600 LINE
A-1 PRECINCT.,MONTGOMERY CO.,VA.
STA. 11481+16 TO STA. 11507+45

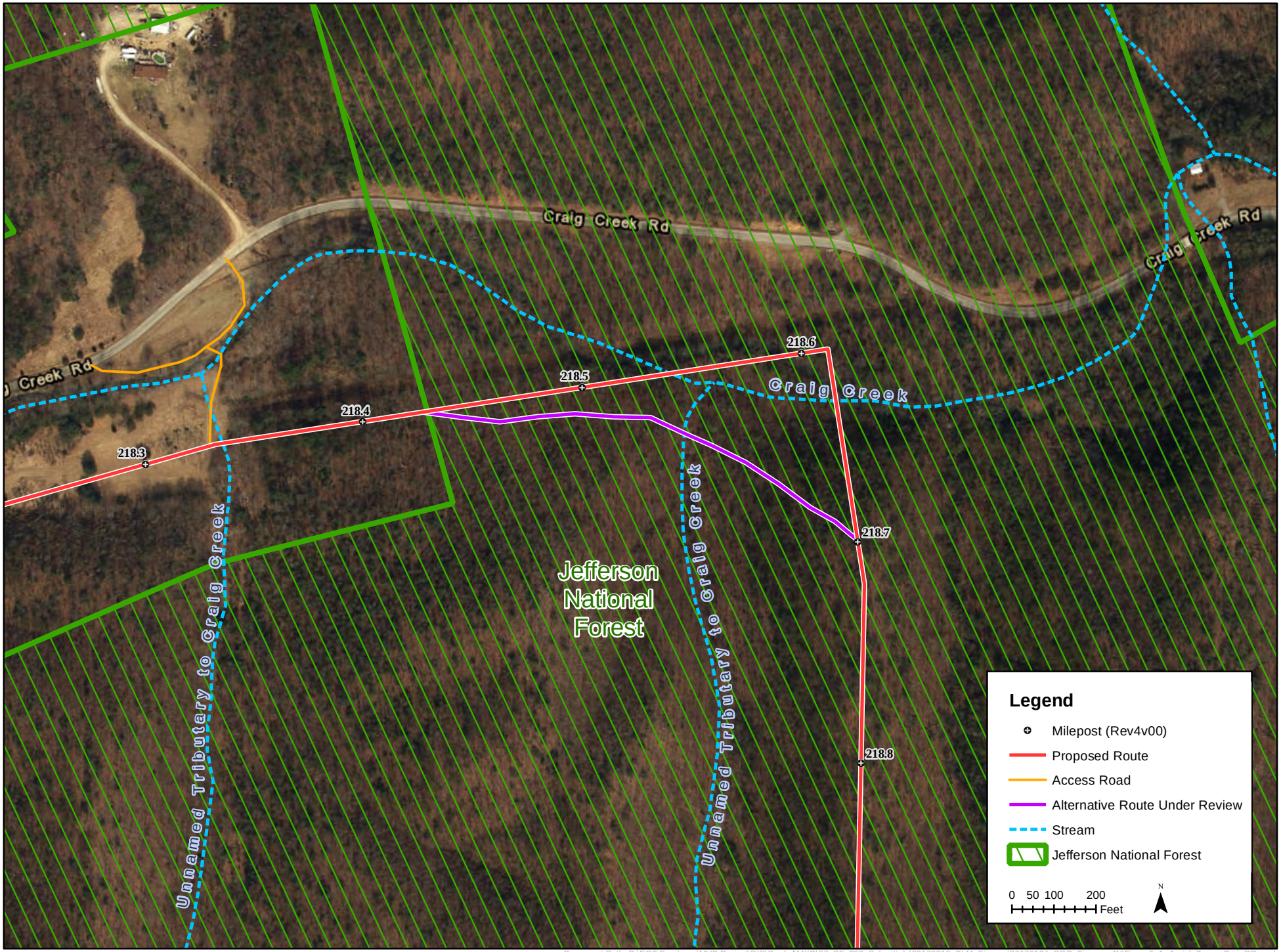
HORZ. SCALE: 1" = 200'	
DRAWN BY: HEI(DRF)	02/11/15
DRAFTING CK:	.
ENGINEERING CK:	.
CONSTRUCTION CK:	.
ENVIRONMENTAL CK:.	.
AFE/P.O.NO.:	
HEI PROJECT NO.: 14-10-052	
DRAWING NO.: PA-MOVA-H600 -02	
SHEET 240 OF 326	REV. 1
DATE OF PLOT: 04/5/16 5:38 PM	

Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket No. CP16-10-000

Responses to Forest Service Comments on Final FERC Resource Reports
Dated March 9, 2016

ATTACHMENTS

Attachment USFS-22b


Craig Creek Rd
Craig Creek Rd
Craig Creek Rd
218.6
218.5
218.4
218.3
218.7
218.8
Craig Creek
Jefferson National Forest
Unnamed Tributary to Craig Creek
Unnamed Tributary to Craig Creek
Legend
Milepost (Rev4v00)
Proposed Route
Access Road
Alternative Route Under Review
Stream
Jefferson National Forest
0 50 100 200
Feet
N