



625 Liberty Avenue, Suite 1700 | Pittsburgh, PA 15222  
844-MVP-TALK | mail@mountainvalleypipeline.info  
www.mountainvalleypipeline.info

April 2, 2015

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

Re: Mountain Valley Pipeline, LLC  
Docket No. PF15-3-000  
**Monthly Status Report – March 2015**

Dear Ms. Bose:

Pursuant to the Commission's rules and regulations, Mountain Valley Pipeline, LLC is submitting for filing in the captioned proceeding draft Resource Report Nos. 5, 11 and 12.

A copy of this filing is also being provided to Paul Friedman, OEP and to Lavinia DiSanto, Cardno. Should you have any questions regarding this matter, please contact the undersigned by telephone at (412) 395-5540 or by e-mail at pdiehl@eqt.com.

Respectfully submitted,

Mountain Valley Pipeline, LLC

A handwritten signature in black ink, appearing to read "Paul W. Diehl", is written over a light blue circular stamp.

Paul W. Diehl

Enclosures

cc: Paul Friedman (w/enclosures)  
Lavinia M. DiSanto, Cardno, Inc. (w/enclosures)



Mountain Valley Pipeline Project

Docket No. PF15-3

## **Resource Report 5 – Socioeconomics**

Draft

April 2015

## Mountain Valley Pipeline Project Resource Report 5 – Socioeconomics

<b>Resource Report 5 Filing Requirements</b>	
<b>Information</b>	<b>Location in Resource Report</b>
<b>Minimum Filing Requirements</b>	
1. Describe socioeconomic conditions within the Project area. (§ 380.12(g)(1))	Section 5.2
2. Evaluate impact of any substantial immigration of people on governmental facilities and services and describe plans to reduce the impact on the local infrastructure. (§ 380.12(g)(2))	Sections 5.3.4 and 5.3.5
3. Describe on-site manpower requirements and payroll during construction and operation including number of construction personnel who currently reside within the impact area, would commute daily to the site from outside the impact area, or would relocate temporarily within the impact area. (§ 380.12(g)(3))	Will be provided with Resource Report 5 included with FERC application
4. Determine whether existing housing within the impact area is sufficient to meet the needs of the additional population. (§ 380.12(g)(4))	Section 5.3.2.4
5. Describe number and types of residences and businesses that would be displaced by the Project, procedures to be used to acquire these properties, and types and amounts of relocation assistance payments. (§ 380.12(g)(5))	Section 5.3.2.5
6. Conduct a fiscal impact analysis evaluating incremental local government expenditures in relation to incremental local government revenues that would result from construction of the Project. Incremental expenditures include, but are not limited to, school operating costs, road maintenance and repair, public safety, and public utility costs. (§ 380.12(g)(6))	Will be provided with Resource Report 5 included with FERC application

<b>FERC Environmental Information Request for Resource Report 5 Dated March 13, 2015</b>	
<b>Request</b>	<b>Location in Resource Report</b>
1. Estimate the number of temporary and permanent jobs that would be generated during construction and operation of the Project. Provide a breakdown of temporary Project-related construction jobs by construction spread (and the MPs and counties for each spread).	Will be provided with Resource Report 5 included with FERC application
2. Identify areas along the proposed pipeline route (by census block) that contain populations of ethnic groups or minorities, economically disadvantaged, disabled, non-English speakers, children, or elderly, and evaluate if the Project would have adverse economic, environmental, or health impacts on those populations. Explain if the pipeline route was selected in a manner that would disproportionately affect minority or low-income populations.	Section 5.2.7 (pgs. 5-16 thru 5-23) and Section 5.3.8 (pgs. 5-30 thru 5-31)

## RESOURCE REPORT 5 SOCIOECONOMICS TABLE OF CONTENTS

INTRODUCTION .....	5-1
ENVIRONMENTAL RESOURCE REPORT ORGANIZATION .....	5-2
5.1 ANALYSIS AREA .....	5-2
5.2 AFFECTED ENVIRONMENT .....	5-4
5.2.1 Population .....	5-4
5.2.2 Economic Conditions.....	5-5
5.2.3 Housing.....	5-11
5.2.4 Community Services.....	5-13
5.2.5 Transportation.....	5-15
5.2.6 Tax Revenues.....	5-16
5.2.7 Environmental Justice.....	5-16
5.3 ENVIRONMENTAL EFFECTS .....	5-24
5.3.1 Population.....	5-24
5.3.2 Economic Conditions.....	5-24
5.3.3 Housing.....	5-25
5.3.4 Property Values.....	5-26
5.3.5 Community Services.....	5-27
5.3.6 Transportation.....	5-28
5.3.7 Tax Revenues.....	5-29
5.3.8 Environmental Justice.....	5-30
5.4 REFERENCES .....	5-31

### LIST OF FIGURES

Figure 5.2-1 Total Market Value of Agricultural Products Sold, 2007 .....	5-10
---	------

## LIST OF TABLES

Table 5.1-1	States and Counties Crossed by the Pipeline .....	5-3
Table 5.1-2	Compressor and Meter Stations by Milepost and County .....	5-3
Table 5.1-3	States and Counties Crossed by Construction Spread .....	5-4
Table 5.2-1	Population by State and County.....	5-4
Table 5.2-2	Employment by Sector, West Virginia, 2013 .....	5-6
Table 5.2-3	Employment by Sector, Virginia, 2013 .....	5-7
Table 5.2-4	Employment Overview and Per Capita Income, 2013.....	5-8
Table 5.2-5	Summary of Agriculture by County and State.....	5-9
Table 5.2-6	Travel-Related Economic Impacts by West Virginia County, 2012.....	5-11
Table 5.2-7	Travel-Related Economic Impacts by Virginia County, 2013.....	5-11
Table 5.2-8	Housing by State and County .....	5-12
Table 5.2-9	Summary of Law Enforcement and Fire Departments by County.....	5-13
Table 5.2-10	Medical Facilities by County .....	5-14
Table 5.2-11	Schools by County, 2012-2013.....	5-14
Table 5.2-12	Interstate and U.S. Highways Crossed by the Project.....	5-15
Table 5.2-13	General Revenues by County.....	5-16
Table 5.2-14	Minority, Low-Income, Children, Elderly, and Disabled Populations in West Virginia Project Area Counties .....	5-19
Table 5.2-15	Minority, Low-Income, Children, Elderly, and Disabled Populations in Virginia Project Area Counties .....	5-20
Table 5.2-16	Race and Ethnicity Census Block Comparison – Virginia .....	5-20
Table 5.2-17	Poverty Census Block Group Comparison – West Virginia.....	5-21
Table 5.2-18	Poverty Census Block Group Comparison –Virginia .....	5-22
Table 5.3-1	Estimated State and Local Tax Revenues Generated During Construction.....	5-29
Table 5.3-2	Estimated Annual Ad Valorem Tax Revenues During Operation by County .....	5-30

## RESOURCE REPORT 5 SOCIOECONOMICS

### LIST OF ACRONYMS AND ABBREVIATIONS

Bcf/d	billion cubic feet per day
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
LDC	local distribution company
MVP	Mountain Valley Pipeline, LLC
Project	Mountain Valley Pipeline Project
RV	recreational vehicle
TCO	Columbia Gas Transmission
Transco	Transcontinental Gas Pipe Line Company, LLC
VDOT	Virginia Department of Transportation
WV DOT	West Virginia Department of Transportation

## RESOURCE REPORT 5 SOCIOECONOMICS

### Introduction

Mountain Valley Pipeline, LLC (MVP), a joint venture between affiliates of EQT Corporation, NextEra Energy, Inc., WGL Holdings, Inc. and Vega Energy Partners, Ltd., is seeking a Certificate of Public Convenience and Necessity 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 16 counties in West Virginia and Virginia (see Table 1.2-1). MVP plans to construct an approximately 294.1-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, 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 in Wetzel County, West Virginia to Transcontinental Gas Pipe Line Company, LLC (Transco) Zone 5 Compressor Station 165 in Pittsylvania County, Virginia. In addition to the pipeline, the Project will require approximately 217,200 horsepower of compression at approximately four compressor stations currently planned along the route as well as measurement, regulation, and other ancillary facilities required for the safe operation of the pipeline. The pipeline is designed to transport up to 2.0 billion cubic feet per day (Bcf/d) of natural gas. Draft Resource Report 1 provides a complete summary of the Project facilities (see Tables 1.2-1 and 1.2-2) and a general location map of the Project facilities (Figure 1.2-1).

The natural gas transported via the Project would: (1) support demand growth in the Mid-Atlantic, the Southeast, and Appalachian regions resulting from increased gas usage for power generation, economic development, and residential customer growth; (2) replace natural gas supplies from the Gulf Coast that have historically supplied the Mid-Atlantic and Southeast because Gulf Coast gas would likely stay in the Gulf Coast region and not be delivered to the Northeast due to growing natural gas demand in that region from the petrochemical industry; and (3) supply markets along the pipeline in West Virginia and Virginia that are either underserved by natural gas or would be developed as a result of increased natural gas availability. Section 3 of the Natural Gas Act (NGA) (15 United States Code [USC] § 717b) prohibits the import or export of natural gas from or to a foreign country without prior approval from the U.S. Department of Energy (DOE). Parties who want to enter into natural gas transactions with foreign sellers and buyers must file for an export authorization under the rules and procedures found in (10 Code of Federal Regulations [CFR] Part 590) of DOE's regulations. MVP does not plan to file for this authorization. Further, MVP does not own the natural gas which it transports and has no control over the ultimate destination of the product.

The Project will be an interstate "open access" transmission pipeline, and as such, parties seeking to ship natural gas and parties seeking to receive natural gas have a right to access the pipeline. Furthermore, the ability to ship or receive natural gas is contingent on the economic viability, which is in turn is contingent upon a variety of factors, including location and demand. As a transmission company, it will be necessary for MVP to work with the local distribution company to ultimately provide gas service to communities along the route. In Virginia, for example, the Virginia State Corporation Commission regulates natural gas local distribution companies (LDCs) and establishes service territories for these

companies. As these LDCs have the authority to provide natural gas service, MVP is working with these companies to explore the feasibility of providing gas service along the route in Virginia. We have been working closely with the localities and industrial end users, as well as with LDCs to develop a service solution for the customer through the Project development and construction phase of the proposed pipeline.

The Project would have a positive economic impact on communities across Virginia and West Virginia. Construction of the Project will support thousands of jobs and significant economic activity throughout the region and will generate a significant amount of tax revenue for local governments to support local schools, roads and other important priorities of local government. While some of the construction jobs will be highly specialized and likely need to come from outside the area, there will be numerous job opportunities for local residents and local contractors. Approximately 4,000 to 5,000 temporary jobs will be created during the construction phase of the Project and approximately 25 individuals will be added, on a full-time basis, to operate the pipeline once it is in service. MVP is developing the breakdown of how the temporary and permanent jobs will be distributed by construction spread and construction schedule, and will include this information in Resource Report 5 included with MVP's application to FERC.

## Environmental Resource Report Organization

Draft Resource Report 5 is prepared and organized according to the FERC *Guidance Manual for Environmental Report Preparation* (August 2002). This report is organized into three major sections and a separate section listing the sources used to prepare this report. Section 5.1 describes the analysis area for the socioeconomic assessment. Section 5.2 describes existing socioeconomic conditions, including population, economic conditions, housing, community services, transportation, tax revenues, and environmental justice. Section 5.3 describes how the existing socioeconomic conditions could be affected during construction and operation of the Project. References used in the development of Draft Resource Report 5 are listed in Section 5.4.

### 5.1 ANALYSIS AREA

The proposed pipeline crosses 16 counties in two states: 11 counties in West Virginia, and 5 counties in Virginia (Table 5.1-1). Two-thirds of the pipeline (66 percent, 193 miles) is located in West Virginia. Miles per county in West Virginia ranges from less than 1 mile in Fayette County to 29.6 miles in Webster County. In Virginia, miles per county ranges from 9.4 miles (Roanoke County) to 36 miles (Franklin County) (Table 5.1-1).

The Project also involves construction of four new compressor stations located along the proposed pipeline route, three in West Virginia and one in Virginia (Table 5.1-2). Mainline block valves and meter stations would also be installed at various locations along the pipeline route (Table 5.1-2).



State/County <u>a/</u>	Miles <u>b/</u>	Percent of Total
<b>West Virginia</b>		
Wetzel	9.6	3%
Harrison	22.9	8%
Doddridge	4.7	2%
Lewis	28.0	10%
Braxton	14.7	5%
Webster	29.6	10%
Nicholas	24.3	8%
Greenbrier	20.9	7%
Fayette	0.4	0%
Summers	16.3	6%
Monroe	21.8	7%
<b>Subtotal</b>	<b>193.2</b>	<b>66%</b>
<b>Virginia</b>		
Giles	17.1	6%
Montgomery	16.7	6%
Roanoke	9.4	3%
Franklin	36.0	12%
Pittsylvania	19.3	7%
<b>Subtotal</b>	<b>98.5</b>	<b>34%</b>
<b>Total</b>	<b>291.7</b>	<b>100%</b>
<p><u>a/</u> Counties are listed in the order crossed starting at the existing transmission system in Wetzel County, West Virginia and ending at the Transco Zone 5 compressor station 165 in Pittsylvania County, Virginia.</p> <p><u>b/</u> Total length of pipeline is 294.1 miles; however, sum for length of counties crossed shows a difference of 2.4 miles due to rounding.</p>		

Facility	Approx. Milepost	County	State
<b>Compressor Stations</b>			
Bradshaw Station	2.7	Wetzel	WV
Harris Station	77.9	Braxton	WV
Stallworth Station	154.4	Fayette	WV
Swann Station	220.5	Montgomery	VA
<b>Meter Stations</b>			
Equitrans Mobley Interconnect receipt	0.0	Wetzel	WV
MarkWest Interconnect receipt	23.7	Harrison	WV
TCO WB Interconnect delivery	77.9	Braxton	WV
Transco Interconnect delivery	294.1	Pittsylvania	VA

Pipeline construction would be divided into five spreads, ranging in length from 42 miles (Spread 4) to 69.5 miles (Spread 3) (Table 5.1-3).

Construction Spread	State	County	Milepost		Miles
			From	To	
1	West Virginia	Wetzel, Harrison, Doddridge, Lewis <u>a/</u>	0.0	61.2	61.2
2	West Virginia	Lewis <u>a/</u> , Braxton, Webster, Nicholas <u>a/</u>	61.2	119.5	58.3
3	West Virginia	Nicholas <u>a/</u> , Greenbrier, Fayette, Summers, Monroe	119.5	189.0	69.5
4	Virginia	Giles, Montgomery, Roanoke	189.0	231.0	42.0
5	Virginia	Franklin, Pittsylvania	231.0	294.1	63.1
		<b>Total</b>	<b>na</b>	<b>na</b>	<b>294.1</b>

Note:  
a/ Counties crossed by more than one spread.

## 5.2 AFFECTED ENVIRONMENT

### 5.2.1 Population

The 16 counties in the analysis area had a total combined population of 593,038 in 2013, with 45.1 percent of this total located in the 11 West Virginia counties, and the remaining 54.9 percent located in the five Virginia counties (Table 5.2-1). Population by county in West Virginia ranged from 8,344 in Doddridge County to 68,972 in Harrison County. In Virginia, population by county ranged from 16,925 in Giles County to 96,207 in Montgomery County (Table 5.2-1).

Population densities by county in West Virginia in 2013 ranged from 16.1 persons per square mile (persons/square mile) in Webster County to 165.8 persons/square mile in Harrison County. Population densities in the affected Virginia counties ranged from 47.6 persons/square mile in Giles County to 373.3 persons/square mile in Roanoke County (Table 5.2-1). The corresponding statewide densities were 77.1 in West Virginia and 209.2 in Virginia, compared to the national average density of 89.5 (U.S.) persons/square mile.

Geographic Area	2013 Population	2013 Population Density (persons/square mile)	Population Change (Percent)		Projected Population Change (Percent)	
			2000 to 2010	2010 to 2013	2010 to 2020	2020 to 2030
<b>West Virginia</b>	<b>1,854,304</b>	<b>77.1</b>	<b>2.5</b>	<b>0.1</b>	<b>0.3</b>	<b>-1.3</b>
Braxton	14,502	28.4	-1.2	-0.1	-2.8	-6.3
Doddridge	8,344	26.1	10.8	1.7	4.9	3.0
Fayette	45,599	68.9	-3.2	-1.0	-3.1	-4.1
Greenbrier	35,644	35.0	3.0	0.5	1.1	-1.7
Harrison	68,972	165.8	0.7	-0.2	-2.3	-4.7
Lewis	16,452	42.7	-3.2	0.5	-3.5	-6.8

Geographic Area	2013 Population	2013 Population Density (persons/square mile)	Population Change (Percent)		Projected Population Change (Percent)	
			2000 to 2010	2010 to 2013	2010 to 2020	2020 to 2030
Monroe	13,483	28.5	-7.4	-0.1	-1.1	-5.8
Nicholas	25,965	40.1	-1.2	-1.0	-1.4	-5.4
Summers	13,563	37.6	7.1	-2.6	-1.2	-3.6
Webster	8,893	16.1	-5.8	-2.9	-5.8	-9.6
Wetzel	16,204	45.3	-6.3	-2.3	-7.5	-10.8
<b>Virginia</b>	<b>8,260,405</b>	<b>209.2</b>	<b>13.0</b>	<b>3.2</b>	<b>10.1</b>	<b>9.5</b>
Franklin	56,335	81.6	18.8	0.3	11.1	9.7
Giles	16,925	47.6	3.8	-2.1	3.1	2.6
Montgomery	96,207	248.6	12.9	1.9	11.5	10.4
Pittsylvania	62,426	64.4	2.9	-1.7	0.4	0.0
Roanoke	93,524	373.3	7.7	1.2	6.5	5.7
<b>Project County Total</b>	<b>593,038</b>	<b>71.0</b>	<b>4.7</b>	<b>0.0</b>	<b>3.1</b>	<b>1.7</b>

Sources: U.S. Census Bureau 2000, 2010, 2014a, University of Virginia 2012, West Virginia University 2014

Population in West Virginia increased by 2.5 percent between 2000 and 2010, with population declining in seven of the 11 affected West Virginia counties over this period, and just one county (Doddridge County) experiencing more than a double digit increase (10.8 percent) (Table 5.2-1). Total population in West Virginia is projected to increase by just 0.3 percent between 2010 and 2020, with a net decrease of 1.3 percent projected from 2020 to 2030. Population decline is expected to continue in the seven affected West Virginia counties that lost population from 2000 to 2010. Population is also expected to decline in Harrison and Summers counties while modest growth is projected for Doddridge and Greenbrier counties.

Statewide, population in Virginia increased by 13 percent between 2000 and 2010, with all five affected counties experiencing net increases in population, ranging from 3 percent (Pittsylvania County) to 13 percent (Montgomery County) (Table 5.2-1). Population in Virginia is expected to continue to grow between 2010 and 2020, and over the following decade (2020 to 2030), with projected increases of 10.1 percent and 9.5 percent (Table 5.2-1). Population is projected to grow in four of the five affected Virginia counties over both time periods, with increases slightly higher than the statewide averages expected for Franklin and Montgomery counties. Population in the remaining Virginia county, Pittsylvania County, is expected to remain constant (Table 5.2-1).

## 5.2.2 Economic Conditions

### 5.2.2.1 Employment and the Economy

Employment data by sector are presented by state and county in Tables 5.2-2 and 5.3-3. Location quotients, which compare the share of a county's employment with a benchmark region, in this case the corresponding states (West Virginia and Virginia), may be used to provide a broad measure of economic specialization.

**Table 5.2-2**

**Employment by Sector, West Virginia, 2013**

<b>Economic Sector</b>	<b>Braxton</b>	<b>Doddridge</b>	<b>Fayette</b>	<b>Greenbrier</b>	<b>Harrison</b>	<b>Lewis</b>	<b>Monroe</b>	<b>Nicholas</b>	<b>Summers</b>	<b>Webster</b>	<b>Wetzel</b>	<b>West Virginia</b>
Total Employment <u>a/</u>	5,422	3,008	15,726	18,781	45,788	9,505	4,110	10,434	3,701	2,984	6,244	915,638
<b>Percent of Total <u>b/</u></b>												
Farming	6.1	14.0	1.5	4.4	1.5	4.7	15.9	3.6	9.8	3.5	4.8	2.3
Forestry, fishing, related activities, and other	1.1	(D)	0.3	1.3	0.1	0.6	2.5	0.9	0.8	(D)	0.6	0.3
Mining	2.4	18.7	4.7	1.3	5.9	21.5	3.8	7.1	4.2	(D)	2.8	5.0
Utilities	0.6	(L)	0.6	0.3	0.9	0.6	(L)	0.2	(D)	(D)	(D)	0.6
Construction	6.4	(D)	4.3	4.3	5.8	4.4	7.9	3.9	4.8	2.0	9.1	5.3
Manufacturing	6.0	(D)	3.4	4.2	3.9	2.2	11.2	7.3	1.1	6.7	2.4	5.6
Wholesale trade	1.7	(D)	2.4	1.3	3.7	1.5	0.6	2.1	3.7	(D)	(D)	2.7
Retail trade	16.0	7.7	13.3	12.6	12.6	10.7	7.4	15.7	9.3	7.2	18.5	11.7
Transportation and warehousing	2.4	(D)	2.0	2.0	3.1	4.2	2.0	2.5	(D)	5.9	2.5	2.8
Finance and insurance	2.5	2.7	2.8	2.0	2.3	1.4	2.3	2.0	2.2	4.6	3.0	3.0
Real estate	1.9	2.3	2.4	3.6	3.0	3.0	(D)	2.1	2.7	(D)	2.1	2.8
Services (Consumer) <u>c/</u>	13.9	9.4	18.2	21.7	13.3	12.4	10.5	15.0	14.2	4.8	16.9	14.7
Services (Producer) <u>c/</u>	(D)	5.3	(D)	9.2	11.3	6.0	5.3	6.7	(D)	4.2	6.1	10.9
Services (Social) <u>c/</u>	13.6	7.1	(D)	16.7	14.3	(D)	7.5	(D)	11.2	11.1	(D)	14.9
Federal government	2.3	1.7	3.3	1.4	9.8	1.4	6.7	2.2	2.9	1.9	1.9	3.6
State and local government	16.5	17.4	19.8	13.7	8.5	15.1	12.5	16.2	20.0	18.7	17.9	13.7

**Notes:**

a/ Total employment includes self-employed individuals. Employment data are by place of work, not place of residence, and, therefore, include people who work in the area but do not live there. Employment is measured as the average annual number of jobs, both full- and part-time, with each job a person holds counted at full weight.

b/ Percentages for the counties do not sum to 100 because employment counts are not provided for sectors with less than 10 jobs or for sectors where counts would disclose confidential information. These sectors are identified by (D) or (L) in the above table. These numbers are, however, included in the totals.

c/ Nine 2-digit North American Industry Classification System (NAICS) service categories are combined here into these three divisions for ease of presentation.

-- Consumer services consists of: other services; arts, entertainment, and recreation; and accommodation and food services.

-- Producer services consists of: information; finance and insurance; professional and technical services; management of companies and enterprises; and administrative and waste services.

-- Social services consists of: educational services; and health care and social assistance.

Source: U.S. Bureau of Economic Analysis 2015

Seven of the 11 counties in West Virginia have a larger share of total employment in agriculture than the state as a whole, with farm employment as a share of total employment ranging from 1.5 times (Nicholas and Webster counties) to 6.8 times (Monroe County) the state average (Table 5.2-2). Braxton, Greenbrier, Monroe, and Wetzel counties are also relatively specialized in the forestry and fishing sector. Doddridge and Lewis counties have a relatively high concentration of employment in mining.

Three of the five Virginia counties that will be crossed by the Project are specialized in the agricultural sector, with farm employment as a share of total employment ranging from 2.9 times (Pittsylvania County) to 5.1 times (Franklin County) the state average (Table 5.2-3). All five counties are relatively specialized in the manufacturing sector, with employment concentrations ranging from 2 times (Roanoke County) to 3.3 times (Giles County) the state average (Table 5.2-3).

<b>Economic Sector</b>	<b>Franklin</b>	<b>Giles</b>	<b>Montgomery</b>	<b>Pittsylvania</b>	<b>Roanoke</b>	<b>Virginia</b>
Total Employment <u>a/</u>	21,329	6,567	60,620	49,596	78,962	4,899,410
<b>Percent of Total <u>b/</u></b>						
Farming	5.3	5.1	1.0	3.1	0.4	1.0
Forestry, fishing, related activities, and other	(D)	(D)	(D)	(D)	(D)	0.3
Mining	(D)	0.0	0.3	(D)	0.2	0.3
Utilities	(D)	(D)	0.1	(D)	(D)	0.2
Construction	9.7	(D)	(D)	4.4	(D)	5.5
Manufacturing	12.6	16.3	10.3	13.7	10.2	5.0
Wholesale trade	3.6	(D)	1.3	3.2	4.4	2.5
Retail trade	11.6	12.8	10.6	12.2	10.7	10.0
Transportation and warehousing	(D)	3.1	1.0	(D)	(D)	2.9
Finance and insurance	3.0	2.6	2.5	3.0	6.8	4.3
Real estate	4.2	1.9	3.8	2.2	4.8	4.3
Services (Consumer) <u>c/</u>	14.0	7.4	10.5	14.6	13.8	14.9
Services (Producer) <u>c/</u>	9.3	9.5	(D)	10.9	16.1	19.6
Services (Social) <u>c/</u>	(D)	9.1	9.5	15.7	(D)	11.4
Federal government	1.3	1.4	1.2	1.1	3.3	6.8
State and local government	11.0	13.3	27.9	13.2	8.5	10.9
Notes: <u>a/</u> to <u>c/</u> see corresponding notes in Table 5.2-2. Source: U.S. Bureau of Economic Analysis 2015						

Statewide annual unemployment rates in West Virginia and Virginia were 6.5 percent and 5.2 percent in 2013, compared to a national rate of 7.4 percent (Table 5.2-4). Unemployment rates were higher than the state average in seven of the West Virginia counties that will be crossed by the Project, ranging from 7.1 percent (Greenbrier County) to 11.5 percent (Webster County). Unemployment rates in four of the five affected Virginia counties were higher than the state average, ranging from 5.5 percent (Franklin and Montgomery counties) to 6.9 percent (Pittsylvania County), but were still lower than the national average (7.4 percent).

Per capita income in 2013 in West Virginia and Virginia was equivalent to 79 percent and 109 percent of national per capita income, respectively (Table 5.2-4). Per capita income was lower than the state per capita in nine of the 11 affected counties in West Virginia. In Virginia, per capita incomes were lower than the state per capita in all five Virginia counties (Table 5.2-4).

County/State	Civilian Labor Force	Employed	Unemployed	Unemployment Rate (%)	Per Capita Income (\$)	Percent of State Per Capita <sup>a/</sup>
Braxton	5,606	5,106	500	8.9	27,602	78
Doddridge	3,245	3,051	194	6.0	23,704	67
Fayette	17,498	16,123	1,375	7.9	29,945	84
Greenbrier	15,103	14,027	1,076	7.1	34,126	96
Harrison	31,741	30,073	1,668	5.3	43,120	121
Lewis	8,153	7,708	445	5.5	38,491	108
Monroe	5,671	5,350	321	5.7	28,582	80
Nicholas	10,187	9,256	931	9.1	31,989	90
Summers	4,531	4,189	342	7.5	26,620	75
Webster	3,037	2,688	349	11.5	26,139	74
Wetzel	6,544	5,908	636	9.7	33,921	95
<b>West Virginia</b>	<b>790,000</b>	<b>739,000</b>	<b>52,000</b>	<b>6.5</b>	<b>35,533</b>	<b>79</b>
Franklin	28,262	26,714	1,548	5.5	35,374	72
Giles	8,213	7,664	549	6.7	32,119	66
Montgomery	48,601	45,920	2,681	5.5	31,168	64
Pittsylvania	31,676	29,501	2,175	6.9	33,244	68
Roanoke	49,083	46,551	2,532	5.2	43,418	89
<b>Virginia</b>	<b>4,261,000</b>	<b>4,041,000</b>	<b>22,000</b>	<b>5.2</b>	<b>48,838</b>	<b>109</b>
United States	155,389,000	143,929,000	11,460,000	7.4	44,765	na
<sup>a/</sup> County per capita income is shown as a percent of the corresponding state average; state figures are shown as a percent of the national average. Sources: U.S. Bureau of Economic Analysis 2014; U.S. Bureau of Labor Statistics 2014, 2015.						

### 5.2.2.2 Agriculture

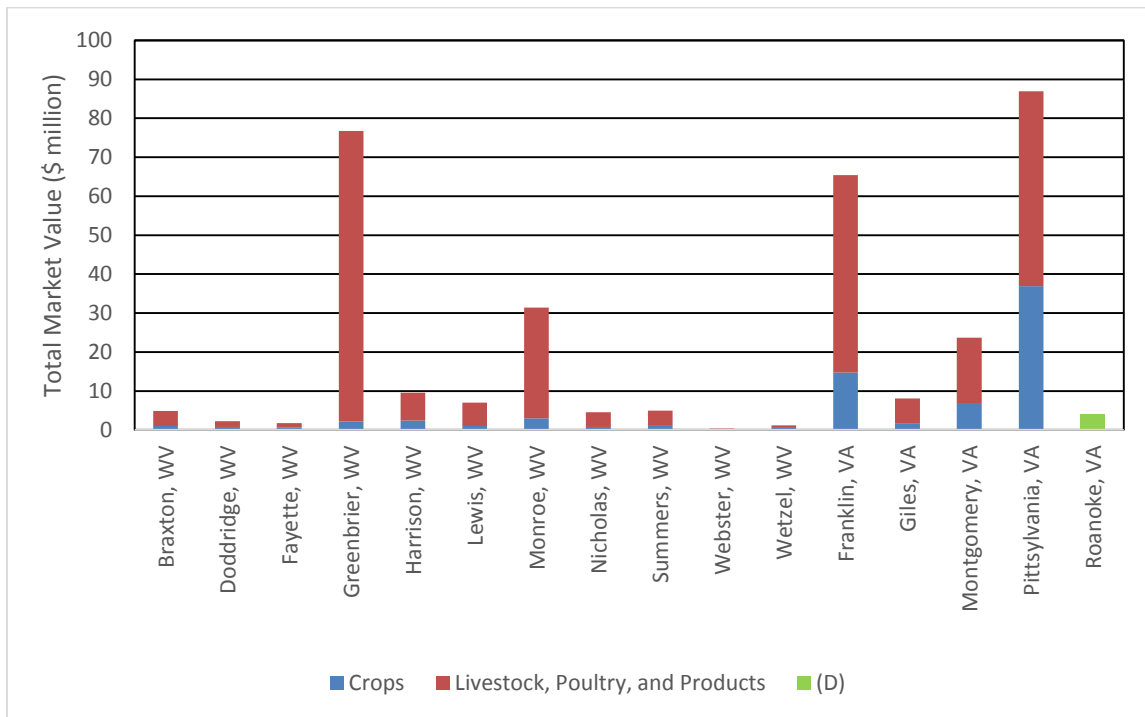
Agriculture is an important part of the local economy in the Project area, with relatively high concentrations of employment in the farm sector in seven of the 11 West Virginia counties and three of the five affected Virginia counties (Tables 5.2-2 and 5.2-3). Land in farms accounted for 29 percent of the total land area in the counties that will be crossed by the Project (1.53 million acres), with a total of 8,534 farms and an average farm size of 179 acres (Table 5.2-5).

Land in farms accounted for 23 percent of the total land area in West Virginia in 2012 and 33 percent of total land area in Virginia (Table 5.2-5). Livestock, poultry, and their products accounted for the majority of agricultural products sold by market value in both states, accounting for 83 percent of the total in West Virginia and 64 percent in Virginia. Average farm sizes were 168 acres in West Virginia and 180 acres in Virginia.

Three counties (Greenbrier, West Virginia and Franklin and Pittsylvania counties, Virginia) accounted for 37 percent of the farms, 42 percent of the land in farms, and 69 percent of agricultural market value for the counties crossed by the Project (Table 5.2-5; Figure 5.2-1).

County/State	Number of Farms	Land in Farms (acres)	Percent of Total Land Area	Average Farm Size (acres)	Market Value of Agriculture Products Sold	Total Market Value of Agriculture Products Sold	
						Crops (%)	Livestock, Poultry, and Products (%)
<b>West Virginia</b>	<b>21,489</b>	<b>3,606,674</b>	<b>23</b>	<b>168</b>	<b>806,775</b>	<b>17</b>	<b>83</b>
Braxton	386	88,911	27	230	4,858	20	80
Doddridge	352	65,364	32	186	2,271	34	66
Fayette	232	23,163	5	100	1,735	41	59
Greenbrier	819	190,178	29	232	76,757	3	97
Harrison	778	117,029	44	150	9,540	25	75
Lewis	476	82,460	33	173	7,014	14	86
Monroe	796	144,630	48	182	31,400	9	91
Nicholas	393	58,093	14	148	4,578	17	83
Summers	345	57,962	25	168	4,956	26	74
Webster	70	7,928	2	113	332	63	37
Wetzel	249	38,103	17	153	1,177	44	56
<b>Virginia</b>	<b>46,030</b>	<b>8,302,444</b>	<b>33</b>	<b>180</b>	<b>3,753,287</b>	<b>36</b>	<b>64</b>
Franklin	1,023	164,564	37	161	65,442	23	77
Giles	378	65,571	29	173	8,090	20	80
Montgomery	603	107,260	43	178	23,707	28	72
Pittsylvania	1,354	287,262	46	212	86,942	42	58
Roanoke	280	31,486	20	112	4,140	(D)	(D)
<b>County Total</b>	<b>8,534</b>	<b>1,529,964</b>	<b>29</b>	<b>179</b>	<b>332,939</b>	<b>22</b>	<b>77</b>

(D) Data suppressed by the Census to prevent disclosure of an individual respondent's data.  
Numbers may not sum exactly due to rounding.  
Source: U.S. Department of Agriculture 2014



**Figure 5.2-1 Total Market Value of Agricultural Products Sold, 2007**

Source: U.S. Department of Agriculture 2014

(D) Data on type of product suppressed by the Census to prevent disclosure of an individual respondent's data

### 5.2.2.3 Recreation and Tourism

Recreation and tourism is not classified or measured as a standard industrial category and employment and income data are not specifically collected for this sector. Components of recreation and tourism activities are instead captured in other industrial sectors, primarily the retail sales and services sectors. Estimates of travel-related spending and associated employment in West Virginia for 2012 found that statewide, travel-related employment accounted for about 5 percent of total employment (Table 5.2-6). Viewed by county, travel-related employment ranged from about 1.6 percent to 10.8 percent of total employment, accounting for a larger share than the statewide average in five of the affected counties (Table 5.2-6).

Similar estimates developed for the Virginia Tourism Authority in 2013 found that travel-related employment accounted for about 5.3 percent of total statewide employment (Table 5.2-7). Travel-related employment accounted for a smaller share of total employment than the statewide average in all five of the affected Virginia counties, ranging from about 2.1 percent to 4.5 percent (Table 5.2-7).



<b>Geographic Area</b>	<b>Travel Spending (\$ million)</b>	<b>Travel-Related Earnings (\$ million)</b>	<b>Travel-Related Employment</b>	<b>Percent of Total Employment</b>
Braxton	40.2	7.8	328	6.0
Doddridge	6.7	1.2	50	1.6
Fayette	8.4	15.5	792	4.8
Greenbrier	243.7	83.2	2,064	10.8
Harrison	142.4	37.2	1,531	3.4
Lewis	47.3	12.1	539	5.5
Monroe	10.4	2.3	158	3.7
Nicholas	66.5	10.2	587	5.4
Summers	20.6	4.6	295	7.6
Webster	10.4	1.1	73	2.4
Wetzel	27.5	4.7	267	4.1
<b>West Virginia</b>	<b>5,103.0</b>	<b>1,075.0</b>	<b>46,421</b>	<b>5.0</b>

Source: Dean Runyan Associates 2013

<b>Geographic Area</b>	<b>Travel Spending (\$ million)</b>	<b>Travel-Related Earnings (\$ million)</b>	<b>Travel-Related Employment</b>	<b>Percent of Total Employment <sup>a/</sup></b>
Franklin	96.59	20.99	1,190	4.5
Giles	24.76	4.34	230	3.0
Montgomery	132.67	24.80	1,320	2.9
Pittsylvania	67.89	12.49	620	2.1
Roanoke	156.35	29.20	1,500	3.2
<b>Virginia</b>	<b>21,511.98</b>	<b>4,894.57</b>	<b>213,000</b>	<b>5.3</b>

<sup>a/</sup> Percent of total employment was estimated by comparing the travel-related employment estimate presented here with the number of people employed in each county in 2013 (U.S. Bureau of Labor Statistics 2014).  
Source: U.S. Travel Association 2014

### 5.2.3 Housing

Housing resources are summarized by county and state in Table 5.2-8. Data on housing units are estimates for 2013 prepared by the U.S. Census Bureau (2014b, 2014c). The Census Bureau defines a housing unit as a house, apartment, mobile home or trailer, group of rooms, or single room occupied or intended to be occupied as separate living quarters. Viewed by county, these estimates suggest that limited rental housing is available in a number of the affected counties in West Virginia, with less than 100 units available in five counties, and just eight available units identified in Doddridge County (Table 5.2-8).

Data on hotels and motels are also presented by affected county in Table 5.2-8. These data, compiled by STR, a travel research firm, are for hotels, motels, and bed and breakfast inns with 15 or more rooms.

The data suggest there is limited hotel and motel accommodation available in a number of the affected counties. No hotels or motels with 15 or more rooms were identified in Doddridge or Monroe counties, West Virginia (Table 5.2-8).

The availability of temporary housing varies seasonally and geographically within the counties that are crossed by the proposed Project. Demand for temporary housing is generally greatest during the tourism season in the summer months. In West Virginia, the statewide average hotel and motel occupancy rate was 63.8 percent during the first six months of 2012 (West Virginia Division of Tourism 2013). In Virginia, the statewide occupancy rate in February 2015 was 47.7 percent. Occupancy rate information provided for geographic areas in Virginia indicate that occupancy rates for the two areas crossed by the Project (the Virginia and Blacksburg/Wytheville areas) were 37.8 percent and 41.1 percent in January 2015 (Virginia Tourism Corporation 2015).

County/State	Housing Units 2013			Hotels and Motels	
	Total	Rental Vacancy Rate	Units Available for Rent	Number of Facilities	Number of Rooms
Braxton	7,387	11.2	169	5	360
Doddridge	3,932	1.6	8	na	na
Fayette	21,544	8.7	389	8	531
Greenbrier	18,991	8.7	374	13	1,326
Harrison	31,443	7.1	548	16	1,475
Lewis	7,928	3.2	61	5	441
Monroe	7,576	8.6	94	na	na
Nicholas	13,009	8.8	201	9	667
Summers	7,657	6.4	76	3	191
Webster	5,417	2.8	25	1	23
Wetzel	8,152	11.4	184	4	188
<b>West Virginia</b>	<b>880,951</b>	<b>7.8</b>	<b>17,009</b>	<b>NA</b>	<b>NA</b>
Franklin	29,246	10.6	611	2	124
Giles	8,305	7.6	142	4	181
Montgomery	38,625	3.5	601	27	2,145
Pittsylvania	31,221	5.5	317	17	1,101
Roanoke	40,170	6.3	596	35	2,997
<b>Virginia</b>	<b>3,381,332</b>	<b>6.7</b>	<b>72,738</b>	<b>NA</b>	<b>NA</b>

Note:  
 na – STR did not identify any hotels or motels in these counties.  
 NA – Data were not compiled for hotel rooms at the state level.  
 Source: STR 2015, U.S. Census Bureau 2014b, 2014c

The data presented in Table 5.2-8 are for those counties that will be crossed by the Project. Additional housing resources within daily commuting distance are available in larger communities in adjacent and nearby communities along parts of the route. Temporary accommodation is also available in the form of recreational vehicle (RV) and other types of campsites in the Project vicinity. Comprehensive data are not available for these types of resources, but information from rvparking.com suggests that RV facilities

are located within commuting distance of the proposed pipeline route. See additional discussion in Section 5.3.3.

## 5.2.4 Community Services

### 5.2.4.1 Police and Fire Services

Summary data for law enforcement and fire departments are presented by county and region in Table 5.2-9. These data provide a general overview of resources available in each county. In general, the number of police and fire departments is directly related to the overall size and population of the county, as well as the number of communities. Multiple law enforcement agencies and providers exist in the potentially affected counties, including state patrol, county sheriffs, and local police departments. In many cases, mutual aid agreements allow agencies to support one another in emergency situations. Multiple fire departments and districts also provide fire protection and suppression services in the affected counties. Many of these fire departments and districts are at least partially staffed by volunteers and tend to be housed in stations and fire houses in the larger communities.

<b>County</b>	<b>Police Departments</b>	<b>Fire Departments</b>
<b>West Virginia</b>		
Braxton	4	5
Doddridge	2	3
Fayette	9	11
Greenbrier	6	11
Harrison	9	14
Lewis	2	6
Monroe	1	4
Nicholas	3	7
Summers	3	6
Webster	3	4
Wetzel	5	10
<b>Virginia</b>		
Franklin	2	8
Giles	6	10
Montgomery	5	5
Pittsylvania	4	11
Roanoke	3	4
Source: Capitol Impact 2015		

### 5.2.4.2 Medical Facilities

Medical facilities in the counties crossed by the proposed pipeline are identified in Table 5.2-10. Minor Project-related injuries would be treated at local medical facilities or emergency rooms. Workers with more serious injuries would be transported to one of the larger hospitals in the general vicinity.

Hospital	County / City	Number of Beds
<b>West Virginia</b>		
Greenbrier Valley Medical Center	Greenbrier / Ronceverte	116
United Hospital Center	Harrison / Bridgeport	264
Louis A. Johnson VA Medical Center	Harrison / Clarksburg	na
Stonewall Jackson Memorial Hospital	Lewis / Weston	70
Summersville Memorial Hospital	Nicholas / Summersville	101
Wetzel County Hospital	Wetzel / New Martinsville	48
<b>Virginia</b>		
Carillion Franklin Memorial Hospital	Franklin / Rocky Mount	37
LewisGale Hospital - Montgomery	Montgomery / Blacksburg	88
Carillion New River Valley Medical Center	Montgomery / Christiansburg	146
Danville Regional Medical Center	Pittsylvania / Danville	250
Catawba Hospital	Roanoke / Catawba	270
Carillion Roanoke Memorial Hospital	Roanoke / Roanoke	740
LewisGale Medical Center	Roanoke / Salem	363
Salem VA Medical Center	Roanoke / Salem	na
na – not available		
Source: American Hospital Directory 2015		

### 5.2.4.3 Education

The total number of school districts, schools, students, and teachers are summarized by county in Table 5.2-11. Student/teacher ratios are also summarized by county. Student/teacher ratios, calculated by dividing the total number of students by the total number of full-time equivalent teachers, are a common measure used to assess the overall quality of a school. The national average student/teacher ratio for the 2012-2013 school year (the most recent available data) was 15.9. The statewide average ratios in West Virginia and Virginia were 14.3 and 12.3, respectively (National Education Association Research 2014).

Student/teacher ratios by county in West Virginia ranged from 12.7 (Doddridge County) to 14.3 (Lewis County). Student/teacher ratios in the five Virginia counties ranged from 12.8 (Montgomery County) to 13.6 (Giles County) (Table 5.2-11).

County	Number of School Districts	Total Number of Schools	Total Number of Students	Total Number of Teachers	Student/ Teacher Ratio (Average)
<b>West Virginia</b>					
Braxton	1	8	2,156	154.5	14.0
Doddridge	1	4	1,161	91.75	12.7
Fayette	1	20	6,867	498	13.8
Greenbrier	1	13	5,223	385	13.6
Harrison	1	26	10,935	783.04	14.0
Lewis	1	6	2,626	183.5	14.3

<b>County</b>	<b>Number of School Districts</b>	<b>Total Number of Schools</b>	<b>Total Number of Students</b>	<b>Total Number of Teachers</b>	<b>Student/ Teacher Ratio (Average)</b>
Monroe	1	5	1,852	131	14.1
Nicholas	1	17	4,035	296	13.6
Summers	1	5	1,569	111.5	14.1
Webster	1	6	1,493	111.3	13.4
Wetzel	1	9	2,818	215.85	13.1
<b>Virginia</b>					
Franklin	1	16	7,520	580.91	13.0
Giles	1	6	2,448	180.16	13.6
Montgomery	2	21	9,742	763.09	12.8
Pittsylvania	2	20	9,311	652.08	14.3
Roanoke	1	27	14,369	1,063.96	13.5

Source: National Education Association Research 2014

### 5.2.5 Transportation

The pipeline will cross numerous roads, ranging from unnamed four-wheel drive lanes to Interstate highways. A detailed list of the roads crossed by the Project is provided in Draft Resource Report 8. Interstate and U.S. Highways crossed by the Project are identified in Table 5.2-12.

<b>Milepost</b>	<b>Highway</b>	<b>County</b>	<b>State</b>
26.0	US Highway 50	Harrison	West Virginia
47.6	US Highway 33	Lewis	West Virginia
59.8	Interstate 79	Lewis	West Virginia
72.9	US Highway 19	Braxton	West Virginia
156.4	Interstate 64	Greenbrier	West Virginia
227.4	Interstate 81	Montgomery	Virginia
228.7	US Highway 11	Montgomery	Virginia
249.5	US Highway 220 (Virgil H Goode Highway)	Franklin	Virginia
288.8	US Highway 29	Pittsylvania	Virginia

Access to the Project area in West Virginia would be via I-79 and I-64, both of which are crossed by the proposed pipeline route. In addition, I-77 passes near the portion of the proposed route in the southern part of the state. U.S. Highways providing access to the proposed pipeline route in West Virginia include Highways 50, 33, and 19, all of which will be crossed by the Project.

In Virginia, access would be via I-81, which is crossed by the proposed pipeline; I-77 passes near the portion of the Project in the western part of Virginia. U.S. Highways providing access to the proposed pipeline route in Virginia include Highways 11, 220, and 29, all of which will be crossed by the Project.

## 5.2.6 Tax Revenues

### 5.2.6.1 Sales and Use Taxes

The state of West Virginia levies a 6 percent sales and use tax on all retail and rental sales. Municipalities have the option to levy additional sales and use taxes. None of the areas crossed by the Project levies additional sales and use tax (West Virginia State Tax Division 2015).

The general sales and use tax rate for Virginia is 5.3 percent (4.3 percent state tax and 1 percent local tax). Additional state tax is imposed in the Northern Virginia and Hampton Roads regions, neither of which is crossed by the Project.

### 5.2.6.2 Ad Valorem Taxes

Property or ad valorem taxes are an important source of general revenue for counties and municipalities in West Virginia and Virginia, typically providing a large share of general fund revenues. General fund revenues are presented by county in Table 5.2-13.

<b>West Virginia</b>	<b>General Fund Total Revenues (\$1,000s)</b>	<b>Virginia</b>	<b>General Fund Total Revenues (\$1,000s)</b>
Braxton	4,387	Franklin	79,788
Doddridge	5,589	Giles	51,810
Fayette	10,638	Montgomery	43,767
Greenbrier	11,305	Pittsylvania	58,971
Harrison	26,631	Roanoke	198,174
Lewis	10,898	<b>Subtotal</b>	<b>432,510</b>
Monroe	2,809		
Nicholas	8,390		
Summers	3,290		
Webster	2,531		
Wetzel	13,460		
<b>Subtotal</b>	<b>99,928</b>		
Sources: FTI Consulting 2014a, 2014b; West Virginia State Auditor's Office 2015			

## 5.2.7 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The Executive Order further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in them, denying persons the benefits of them, or subjecting persons to discrimination because of their race, color, or national origin.

Identifying whether disproportionately high and adverse impacts on minority and/or low-income populations would occur typically involves two steps: first, identifying whether minority and/or low-income communities are present, and, then, if these types of communities are present, evaluating whether

high and adverse human health or environmental effects would disproportionately affect the identified community or communities.

Guidelines provided by the White House Council on Environmental Quality (CEQ) (1997) and U.S. Environmental Protection Agency (EPA) (1998) indicate that a minority community may be defined as either: 1) where the minority population comprises more than 50 percent of the total population; or 2) where the minority population is meaningfully greater than the minority population in the general population of an appropriate benchmark region used for comparison. Minority communities may consist of a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who experience common conditions of environmental effect. Further, a minority population exists if there is “more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds” (CEQ 1997).

The CEQ and EPA guidelines indicate that low-income populations should be identified based on the annual statistical poverty thresholds established by the U.S. Census Bureau. Like minority populations, low-income communities may consist of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who would be similarly affected by the proposed action or program. The U.S. Census Bureau defines a poverty area as a census tract or other area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau 2013a).

The 16 counties crossed by the proposed pipeline range from approximately 251 square miles to more than 1,020 square miles (U.S. Census Bureau 2010). Larger and more populated geographic areas may have the effect of “masking” or “diluting” the presence of concentrations of minority and/or low-income populations (CEQ 1997; EPA 1998). Data were therefore also reviewed at the census tract, census block group, and census block levels. These levels may be summarized as follows:

**Census Tract:** Census tracts average about 4,000 residents and are designed to be relatively homogenous units with respect to population characteristics, economic status, and living conditions at the time of establishment. Census tracts often follow visible features, but may also follow governmental boundaries and other non-visible features. The proposed pipeline crosses a total of 37 census tracts: 22 in West Virginia and 15 in Virginia.

**Census Block Group:** A census block group is a statistical subdivision of a census tract, generally defined to contain between 600 and 3,000 people and 240 and 1,200 housing units. Census block groups, as the name suggests consist of groups of blocks and are the smallest geographic unit for which the Census Bureau tabulates sample data. The proposed pipeline crosses a total of 60 block groups: 39 in West Virginia and 21 in Virginia.

**Census Block:** The census block is the smallest area for which the census compiles 100 percent data. Many census blocks correspond to individual city blocks bounded by streets, but some blocks, especially those in rural areas, include many square miles. The population of a census block varies greatly. The proposed pipeline crosses a total of 469 blocks: 255 in West Virginia and 214 in Virginia.

The majority of the pipeline primarily crosses undeveloped and agricultural properties. This is reflected in the population of the blocks crossed. Half of the blocks crossed have 9 or fewer people per block (the median population for the blocks crossed is 9 people per block) and more than a quarter (28 percent) of all blocks crossed have no population at all.

### 5.2.7.1 Race and Ethnicity

#### Counties

The population of West Virginia is predominantly White, with White persons comprising 93 percent of the total statewide population in 2010. The percent of the population identified as White in the affected West Virginia counties ranged from 92.2 percent (Summers County) to 98.4 percent (Wetzel County) (Table 5.2-14).

The population in Virginia is more diverse, with White persons comprising slightly less than two thirds (64.8 percent) of the total statewide population. White persons as a percent of the total population were higher than the state average in all of the affected Virginia counties, ranging from 74.4 percent (Pittsylvania County) to 95.9 percent (Giles County) (Table 5.2-15).

#### Census Blocks

None of the census blocks crossed in West Virginia had total minority populations that exceeded 50 percent, and, therefore, the population in these census blocks did not meet the definition of a minority community based on the 50 percent criteria identified by the CEQ (1997) and EPA (1998) guidelines. The minority population in each census block was also compared with its respective county average in 2010 to identify areas where the minority population is potentially “meaningfully greater” than the minority population in the general population. None of the blocks crossed in West Virginia had a total minority population that was 20 percent higher than the respective county average.

Six of the 214 census blocks crossed in Virginia had total minority populations that exceeded 50 percent of the total population; however, the population in each of these blocks was very small, ranging from one to seven people per block. Five census blocks were identified that had at least 15 people and a total minority population at least 20 percent higher than the respective county average (Table 5.2-16).

### 5.2.7.2 Income and Poverty

#### Counties

Median household income in West Virginia and Virginia was equivalent to 77 percent and 120 percent, respectively, of the national median (\$53,046) in 2013. Median household income in the potentially affected counties in West Virginia was below the state median in nine of the 11 affected counties, ranging from 67 percent (Webster County) to 98 percent (Nicholas County) of the state median. Median household income in the other two counties (Monroe and Harrison counties) was slightly above the state median, but still below the national median (Table 5.2-14). Median household income was below the state median in all the potentially affected Virginia counties and below the national median in four of the five counties (Table 5.2-15).

The estimated percent of households in West Virginia below the poverty level in 2013 was higher than the national average (17.5 percent versus 14.2 percent). The estimated percent of households below the poverty level in the potentially affected West Virginia counties exceeded the state average in eight of the 11 counties. The percent of households in poverty was equal to or exceeded 20 percent in five of the counties (Braxton, Fayette, Greenbrier, Summers, and Webster counties) (Table 5.2-14).



**Table 5.2-14**

**Minority, Low-Income, Children, Elderly, and Disabled Populations in West Virginia Project Area Counties**

Population Variable	Braxton	Doddridge	Fayette	Green-brier	Harrison	Lewis	Monroe	Nicholas	Summers	Webster	Wetzel	West Virginia
<b>MVP miles</b>	14.76	4.70	0.48	21.07	23.43	28.19	21.90	24.70	16.48	29.86	9.62	195.20
Population (2010)	14,523	8,202	46,039	35,480	69,099	16,372	13,502	26,233	13,927	9,154	16,583	1,852,994
Median Household Income (2013)	31,848	34,817	33,771	37,895	43,183	36,199	41,234	40,064	33,784	27,645	37,969	41,043
<b>Population Category as Percent of Total Population/Households <u>c/</u></b>												
White <u>a/</u>	97.8	96.6	92.9	93.9	95.0	97.5	97.1	97.9	92.2	98.2	98.4	93.2
African American/Black <u>a/</u>	0.4	1.4	4.6	2.7	1.6	0.4	0.7	0.2	4.6	0.2	0.1	3.4
American Indian/Alaska Native <u>a/</u>	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.2
Asian <u>a/</u>	0.2	0.2	0.2	0.4	0.5	0.3	0.1	0.3	0.2	0.1	0.2	0.7
Native HI & Other Pacific Islander <u>a/</u>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Some Other Race <u>a/</u>	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1
Two or More Races <u>a/</u>	0.8	1.0	1.2	1.4	1.4	0.9	1.2	0.9	1.3	1.0	0.6	1.3
Hispanic Origin (any race) <u>a/</u>	0.5	0.5	0.9	1.2	1.3	0.6	0.6	0.6	1.4	0.5	0.5	1.2
Total Minority Populations <u>a/</u>	2.2	3.4	7.1	6.1	5.0	2.5	2.9	2.1	7.8	1.8	1.6	6.8
Households in Poverty <u>b/</u>	20.4	14.4	20.2	20.0	17.2	19.5	14.6	18.2	22.3	25.3	19.3	17.5
Disability <u>c/</u>	19.6	15.1	26.3	19.0	19.7	17.7	22.2	22.4	28.4	21.1	15.7	19.1
Children (under 18 years of age) <u>a/</u>	20.7	20.4	20.5	20.1	22.0	20.7	21.0	21.2	18.1	21.6	20.9	20.9
Elderly (over 64 years of age) <u>a/</u>	17.5	16.2	16.9	19.3	16.5	17.9	19.6	17.1	19.3	17.5	19.5	9.1
Non-English Speakers at Home <u>b/</u>	0.1	0.0	0.2	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.3

a/ Percent of total population

b/ Percent of total households

c/ Percent of total civilian noninstitutionalized population

Sources: U.S. Census Bureau 2013b, 2013c, 2014d, 2014e, 2014f, 2014g



Table 5.2-15

**Minority, Low-Income, Children, Elderly, and Disabled Populations in Virginia Project Area Counties**

Population Variable	Franklin	Giles	Montgomery	Pittsylvania	Roanoke	Virginia
<b>MVP miles</b>	36.08	17.47	17.06	18.87	9.61	99.10
Population (2010)	56,159	17,286	94,392	63,506	92,376	8,001,024
Median Household Income (2013)	45,624	45,141	45,543	42,143	60,795	63,907
<b>Population Category as Percent of Total Population/Households</b>						
White <u>a/</u>	87.4	95.9	85.9	74.4	88.6	64.8
African American/Black <u>a/</u>	8.1	1.5	3.8	22.0	5.0	19.0
American Indian/Alaska Native <u>a/</u>	0.2	0.1	0.2	0.2	0.1	0.3
Asian <u>a/</u>	0.4	0.3	5.4	0.3	2.7	5.5
Native HI & Other Pacific Islander <u>a/</u>	0.0	0.0	0.0	0.0	0.0	0.1
Some Other Race <u>a/</u>	0.3	0.0	0.1	0.1	0.1	0.2
Two or More Races <u>a/</u>	1.1	0.9	1.9	0.9	1.4	2.3
Hispanic Origin (any race) <u>a/</u>	2.5	1.2	2.7	2.1	2.1	7.9
Total Minority Populations <u>a/</u>	12.6	4.1	14.1	25.6	11.4	35.2
Households in Poverty <u>b/</u>	12.9	14.7	22.4	14.9	6.8	10.8
Disability <u>c/</u>	15	21	9	17	11	11
Children (under 18 years of age) <u>a/</u>	20.8	21.7	16.0	21.2	21.8	23.2
Elderly (over 64 years of age) <u>a/</u>	17.6	18.0	9.8	17.2	17.2	6.9
Non-English Speakers at Home <u>b/</u>	0.5	0.1	2.0	0.6	1.6	3
<u>a/</u> Percent of total population						
<u>b/</u> Percent of total households						
<u>c/</u> Percent of total civilian noninstitutionalized population						
Sources: U.S. Census Bureau 2013b, 2013c, 2014d, 2014e, 2014f, 2014g						

Table 5.2-16

**Race and Ethnicity Census Block Comparison – Virginia**

Virginia County/ Census Block	Percent of Total Population 2010					
	Total Population 2010 <u>a/</u>	White <u>b/</u>	Hispanic or Latino	Black or African American	Other Race <u>b/, c/</u>	Two or More Races <u>b/</u>
<b>Franklin County</b>	<b>56,159</b>	<b>87.4</b>	<b>2.5</b>	<b>8.1</b>	<b>0.9</b>	<b>1.1</b>
Block 1032, Census Tract 201.02	55	65.5	0	29.1	0	5.5
Block 1000, Census Tract 209	103	66.0	4.9	26.2	0	2.9
Block 1067, Census Tract 209	25	36.0	0.0	64.0	0.0	0.0
<b>Pittsylvania County</b>	<b>63,506</b>	<b>74.4</b>	<b>2.1</b>	<b>22.0</b>	<b>0.6</b>	<b>0.9</b>
Block 1004, Census Tract 105	42	35.7	0.0	57.1	0.0	4.8
Block 3049, Census Tract 105	30	50.0	3.3	46.7	0.0	0.0
<u>a/</u> Data are presented for blocks with at least 15 people and a total minority population that is at least 20 percent higher than the respective county average.						
<u>b/</u> Non-Hispanic only. The federal government considers race and Hispanic/Latino origin to be two separate and distinct concepts. People identifying Hispanic or Latino origin may be of any race. The data summarized in this table present Hispanic/Latino as a separate category.						
<u>c/</u> The "Other Race" category presented here includes census respondents identifying as "Asian," "Native Hawaiian and Other Pacific Islander," "American Indian and Alaska Native," or "Some Other Race."						
Source: U.S. Census Bureau 2013b						

The estimated percent of households below the poverty level in Virginia in 2013 was lower than the national average (10.8 percent versus 14.2 percent). At the county level, estimated household poverty rates ranged from 6.8 percent (Roanoke County) to 22.4 percent (Montgomery County). Montgomery County was the only county where the number of households below the poverty level exceed 20 percent of all households (Table 5.2-15).

### Census Block Groups

Household poverty data compiled as part of the U.S. Census Bureau's American Community Survey are presented for 2013 by county and census block group for West Virginia and Virginia in Tables 5.2-17 and 5.2-18, respectively. These data are 5 year estimates based on data compiled from 2009 to 2013. The block group is the smallest geographic unit that these and other sample data are available. These tables identify block groups where at least 20 percent of the households are below the poverty level.

At least 20 percent of households were below the poverty level in 16 of the 39 census block groups crossed by the proposed pipeline in West Virginia (Table 5.2-17). These block groups were distributed along the pipeline route in nine of the 11 counties that will be crossed. In Virginia, at least 20 percent of households were below the poverty level in five of the census block groups that will be crossed (Table 5.2-18).

<b>County/Block Group <sup>a/</sup></b>	<b>Number of Households</b>	<b>Percent of Households Below Poverty</b>
<b>Braxton County</b>	<b>5,780</b>	<b>20.4</b>
Block Group 1, Census Tract 9679	142	28.4
<b>Fayette County</b>	<b>17,250</b>	<b>20.2</b>
Block Group 3, Census Tract 211	363	22.0
<b>Greenbrier County</b>	<b>15,409</b>	<b>20.0</b>
Block Group 1, Census Tract 9503	314	22.3
Block Group 3, Census Tract 9503	580	29.3
<b>Harrison County</b>	<b>27,599</b>	<b>17.2</b>
Block Group 1, Census Tract 317	430	29.8
Block Group 2, Census Tract 317	371	22.6
<b>Lewis County</b>	<b>6,451</b>	<b>19.5</b>
Block Group 1, Census Tract 9672	428	24.8
Block Group 2, Census Tract 9672	240	26.3
Block Group 3, Census Tract 9676	582	23.5
<b>Monroe County</b>	<b>5,648</b>	<b>14.6</b>
Block Group 1, Census Tract 9502	502	25.7
<b>Nicholas County</b>	<b>10,657</b>	<b>18.2</b>
Block Group 2, Census Tract 9504	315	35.2
Block Group 3, Census Tract 9504	761	30.0
<b>Summers County</b>	<b>5,350</b>	<b>22.3</b>
Block Group 1, Census Tract 5	479	25.5
<b>Webster County</b>	<b>3,928</b>	<b>25.3</b>
Block Group 2, Census Tract 9701	425	22.6
Block Group 4, Census Tract 9701	589	33.8
Block Group 1, Census Tract 9703	857	20.0

<sup>a/</sup> Data are only shown for those census block groups with more than 20 percent of households below the poverty level.  
Source: U.S. Census Bureau 2014e



County/Block Group <sup>a/</sup>	Number of Households	Percent of Households Below Poverty
<b>Franklin County</b>	<b>23,358</b>	<b>12.9</b>
Block Group 2, Census Tract 204	988	20.0
Block Group 1, Census Tract 209	586	24.2
<b>Montgomery County</b>	<b>34,789</b>	<b>22.4</b>
Block Group 1, Census Tract 214	390	32.1
<b>Pittsylvania County</b>	<b>26,092</b>	<b>14.9</b>
Block Group 4, Census Tract 103	369	29.3
Block Group 1, Census Tract 105	420	<b>20.5</b>
Notes: <sup>a/</sup> Data are only shown for those census block groups with more than 20 percent of households below the poverty level. Source: U.S. Census Bureau 2014e		

### 5.2.7.3 Other Populations of Concern

The below discussion addresses populations of disabled, non-English speakers, children, and elderly people.

#### Disabled Populations

##### Counties

According to the U.S. Census, an estimated 12.1 percent of the total civilian noninstitutionalized population in the United States had a disability in 2013 (U.S. Census Bureau 2014g). The corresponding figures for West Virginia and Virginia were 19.1 percent and 11 percent, respectively (Tables 5.2-14 and 5.2-15). The share of the population with a disability in the affected West Virginia counties exceeded the state average in seven of the affected counties, with all of the counties exceeding the national average (Table 5.2-14). In the Virginia counties, the share of the population with a disability exceeded the state and national averages in three of the potentially affected counties (Table 5.2-15).

##### Census Tracts

The census tract is the smallest geographic unit for which comprehensive data on disability are available. The share of the population with a disability in each census tract crossed by the proposed pipeline was compared to the share in the corresponding county. In West Virginia, the share of the population with a disability in the census tracts crossed was lower than the share in the corresponding county in five tracts, the same in two, and higher in the remaining 11, with the net difference where the share is higher ranging from 0.7 percent to 10.8 percent (U.S. Census Bureau 2014g).

In Virginia, the share of the population with a disability in the census tracts crossed was lower than the share in the corresponding county in five tracts, the same in one, and higher in the remaining eight, with the net difference where the share is higher ranging from 0.4 percent to 6.7 percent (U.S. Census Bureau 2014g).




---

## Non-English Speakers

### Counties

An estimated 5 percent of total households in the United States were identified as limited English-speaking households in 2013 (U.S. Census Bureau 2014f). The corresponding figures for West Virginia and Virginia were 0.3 percent and 3 percent, respectively (Tables 5.2-14 and 5.2-15). Limited English-speaking households as a share of total households in the affected West Virginia counties was lower than the state average in all of the counties with the exception of Harrison County, where 0.6 percent of households were identified as limited-English speaking (Table 5.2-14). In the Virginia counties, the share of total households identified as limited English-speaking was lower than the state average in all five counties (Table 5.2-15).

### Census Block Groups

The census block group is the smallest geographic unit for which comprehensive data on non-English speakers are available. The share of total households identified as limited English-speaking in the affected census block groups in West Virginia ranges from 0 to 1.5 percent and is very similar to the county level. In Virginia, the percentage of households identified as limited English-speaking ranges from 0 to 8.1 percent within crossed census block groups (U.S. Census Bureau 2014f).

## Children and Elderly

### Counties

In 2010, almost one-quarter (24 percent) of the U.S. population was under 18 years of age (U.S. Census Bureau 2013c). The corresponding figures for West Virginia and Virginia were 20.9 percent and 23.2 percent, respectively (Tables 5.2-14 and 5.2-15). In the West Virginia counties, children under 18 years of age as a share of total population ranged from 18.1 percent (Summers County) to 22 percent (Harrison County) (Table 5.2-14). In the Virginia counties, children as a share of total population was lower than the state average in all five counties, ranging from 16 percent (Montgomery County) to 21.8 percent (Roanoke County) (Table 5.2-15).

The share of the U.S. population over 64 years of age in 2010 was 7.4 percent (U.S. Census Bureau 2013c). In West Virginia and Virginia, the corresponding shares were 9.1 percent and 6.9 percent, respectively (Tables 5.2-14 and 5.2-15). The elderly share of total population in the affected West Virginia counties was much larger than the state average in all 11 counties, ranging from 16.2 percent (Doddridge County) to 19.6 percent (Monroe County) (Table 5.2-14). The elderly share of total population was also higher than the corresponding state average in all five Virginia counties, ranging from 9.8 percent (Montgomery County) to 18 percent (Giles County) (Table 5.2-15).

### Blocks

In West Virginia, the share of children or elderly as a percent of total population was more than 20 percent higher than the corresponding county average in 20 census blocks out of 255 crossed (17 census blocks with a larger elderly population, 3 with more children). However, none of these blocks contained more than 15 people, and in most cases had populations of 5 people or less.

In Virginia, the share of children or elderly as a percent of total population was more than 20 percent higher than the corresponding county average in 22 census blocks out of 214 crossed (18 census blocks with a larger elderly population, 4 with more children). Two of these blocks had more than 15 people



---

(Blocks 1002 and 1004 in Census Tract 105, Pittsylvania County). The elderly population of Block 1002 was 42.4 percent of the total (or 25 individuals) and for Block 1004 was 40.5 percent (or 17 individuals), as compared to 17.2 percent of Pittsylvania County as a whole (U.S. Census Bureau 2013c).

## **5.3 ENVIRONMENTAL EFFECTS**

### **5.3.1 Population**

Overall construction of the pipeline and associated facilities is expected to take 24 months, with a proposed construction start date in January 2017.

Local workers are expected to account for 10 percent of construction jobs for each spread for the duration of the Project. The remaining 90 percent of the construction workforce would consist of non-local workers. Local workers are those who normally reside within commuting distance of the work sites. Non-local workers would temporarily relocate to the Project vicinity for the duration of their employment; some workers would possibly commute home on weekends, depending on the location of their primary residence. Individual non-local workers may also relocate along the length of the Project and between segments depending on their assignment. Very few, if any, of the non-local workers employed during the construction phase of each segment would be expected to permanently relocate to the affected areas.

MVP is currently preparing detailed estimates of construction workers by construction spread and project component. This information will be included with Resource Report 5 in MVP's application to FERC.

Existing EQT Corporation staff would be primarily responsible for operations and maintenance of the new pipeline and associated facilities, however approximately 25 new jobs will also be required for operations and maintenance of the MVP Project facilities.

### **5.3.2 Economic Conditions**

#### **5.3.2.1 Employment and the Economy**

The proposed pipeline would be constructed in five spreads, with overall construction expected to take 24 months. MVP is currently preparing detailed estimates of construction workers by construction spread and project component. This information will be included with Resource Report 5 included with MVP's application to FERC.

MVP estimates that it will spend approximately \$1.1 billion on labor, equipment, materials, and services in West Virginia (\$712 million) and Virginia (\$396 million) during Project construction, with an additional \$2.2 billion spent outside these states. These expenditures would generate economic activity and support employment and income elsewhere in the economy through the multiplier effect, as initial changes in demand "ripple" through the local economy and generate indirect ("supply chain") and induced ("consumption-driven") impacts.

#### **5.3.2.2 Agriculture**

Livestock dominates the agricultural sectors in terms of total market value of agricultural products sold in nearly all of the counties crossed, accounting for more than 50 percent of total value in all cases (Table 5.2-5; Figure 5.2-1). Impacts to agricultural land are discussed in Draft Resource Report 8 and include



---

potential impacts to livestock grazing, crop production, agricultural drainage and irrigation systems, farmland preservation programs, and certified organic farms.

The total estimated disturbance to agricultural operations identified in Draft Resource Report 8 represents a very small share of the 1.5 million acres of land in farms in the 16 potentially affected counties and is unlikely to noticeably affect overall agricultural production and employment in any of the affected counties.

### **5.3.2.3 Recreation and Tourism**

Initial public comments received on the Project included concerns that the proposed pipeline would negatively affect the recreation and tourism industry in the affected areas. Concerns were expressed that right-of-way clearing for the proposed pipeline would affect the natural appearance of the landscape, key scenic views, and important recreation resources, including the Appalachian Trail, Blue Ridge Parkway, and Jefferson National Forest. Recreation and tourism contributes directly to local economies through related expenditures (see Tables 5.2-6 and 5.2-7). Natural landscapes and recreation opportunities also contribute to the quality of life of existing residents and can serve to attract new residents, businesses, and other sources of income to a region.

Potential impacts to recreational resources are addressed in Section 8.3 of Draft Resource Report 8. MVP is consulting with the National Park Service and U.S. Forest Service with regards to crossing locations of the Jefferson National Forest, the Appalachian Trail, and the Blue Ridge Parkway. Visual impacts are also addressed in Draft Resource Report 8 (Section 8.4).

Visual impacts may result from the removal of vegetation, particularly in forested areas, and would likely be most visible where the pipeline parallels or crosses roads and where vegetation is removed between the right-of-way and residences. While there would be some visual impacts from construction and operation of the Project, Project-related changes to the existing landscape and scenic views are not expected to significantly affect the overall recreation and tourism experiences of residents and visitors to the region or discourage people from relocating to or visiting the region. Impacts to important recreation resources on public lands would be minimized through consultation with the appropriate land management agencies.

### **5.3.3 Housing**

An estimated 10 percent of the construction workforce would be hired and/or contracted locally (i.e., within commuting distance) and would likely commute to and from their homes to work each day. The remaining 90 percent of the construction workforce is assumed to permanently reside further than commuting distance from the Project sites and would be expected to temporarily relocate to the Project vicinity for the duration of their employment, possibly commuting home on weekends, depending on the location of their primary residence.

Workers temporarily relocating to the work on the Project are expected to require motel or hotel rooms, rental housing (apartments, houses, or mobile homes), or provide their own housing in the form of RVs or pop-up trailers. Past evaluations of pipeline construction projects have estimated that 30 percent of workers temporarily relocating would provide their own housing (FERC 2014). Construction workers, particularly those working in less populated areas, often commute relatively long distances to job sites depending on the cost and availability of housing and community amenities/services within the vicinity.

MVP is currently preparing detailed estimates of construction workers by construction spread and project component. This information will be included with Resource Report 5 with MVP's application to FERC.



---

During Project operation, existing staff would be primarily responsible for operations and maintenance of the new pipeline and associated facilities, however an estimated 25 new jobs would be created. New employees could be located at various locations along the pipeline or in EQT headquarters, therefore impact on existing housing from these new jobs in any one area would be minimal.

#### **5.3.3.1 Displacement of Residences and Businesses**

MVP has no plans to displace or relocate any businesses as a result of construction or operation of the Project. MVP has identified two residences in close proximity to the proposed site for the Stallworth Compressor Station and to mitigate for potential construction and operation impacts on these residences MVP may purchase these properties. MVP would complete the purchases prior to the start of construction, and would pay fair market value for the properties.

#### **5.3.4 Property Values**

For private and non-federal public lands, MVP will negotiate a mutually agreed upon easement for the pipeline with the affected landowners. The agreement between MVP and the landowner will specify compensation for the easement, compensation for damage to property and loss of use during construction, and loss of renewable and nonrenewable or other resources. The agreement will also specify uses of the permanent right-of-way after construction. In situations where MVP is unable to reach an agreement with a landowner, and the Project is authorized by FERC, MVP will be granted the right of eminent domain under Section 7(h) of the Natural Gas Act and the procedures set forth under the Federal Rules of Civil Procedure (Rule 71A). Under these circumstances, the court determines compensation received by the landowner. MVP is committed to working with landowners to the maximum extent possible to negotiate easement agreements. Only after all avenues of negotiation have been exhausted and as a last resort will MVP utilize the eminent domain process.

The impact a pipeline may have on the value of a tract of land depends on many factors, including the size of the tract, the values of adjacent properties, the presence of other utilities, the current value of the land, and the current land use. Subjective valuation is generally not considered in appraisals, but may affect individual decisions when a property is offered for sale, thus impacting the potential resale value. Purchase decisions are often based on the purchaser's plans for the property, such as use for agriculture, future residential development, a second home, or commercial/industrial development. If the presence of a pipeline interferes with those future plans, the potential buyer may decide against acquiring the property with a pipeline easement. However, each potential purchaser has different criteria and differing capabilities to purchase land.

Initial public comments received on the Project included concerns about the potential impact of the proposed pipeline on property values. The Interstate Natural Gas Association of America conducted a national case study to determine if the presence of a pipeline on a piece of property affected the property value or sales price of the property (Allen, Williford & Seale, Inc. 2001). The study employed paired sales, descriptive statistics, and linear regression analysis to assess impacts to four separate, geographically diverse case study areas. The study found that there was not a significant impact on the sales price of properties located along natural gas pipelines. They further determined that neither the size of the pipeline (diameter) nor the product carried by a pipeline had any significant impact on sales price. The study also concluded that the presence of a pipeline did not impede the development of surrounding properties.





---

Whatcom County, Washington analyzed the impact that the June 1999 Olympic gasoline pipeline explosion had on sales of real estate on or near the pipeline route and determined that the explosion of the pipeline, which transported liquid petroleum fuel, had little effect on property values (Whatcom County 2001).

More recent studies investigating property values near natural gas pipelines are consistent with the findings of this earlier work. Fruits (2008) evaluated the impact of the South Mist Pipeline Extension on residential sales in Clackamas and Washington Counties, Oregon using a hedonic price modeling approach. Based on sales price data for 10,642 single family residential properties located within one mile of the pipeline, the study found that proximity to the pipeline had no statistically or economically significant impact on residential property values. Fruits (2008) noted that these results are consistent with previous studies and suggested that the positive amenity potential associated with pipeline proximity (i.e., the function of the pipeline easement as a greenbelt or buffer) may exceed any perceived costs associated with potential safety or environmental risks (Fruits 2008).

A 2008 market study conducted by PGP Valuation on behalf of Palomar Gas Transmission LLC also assessed the impacts of the South Mist Pipeline Extension on property values (Palmer 2008). Using a sales comparison methodology, the study evaluated sales data for a total of 18 properties encumbered by South Mist Pipeline Extension right-of-way easements and compared these with sales of other comparable unencumbered properties. Based on this analysis, PGP Valuation concluded that high-pressure natural gas pipelines had no measurable long-term impact on property values. The study also concluded that variations in short-term values were either not substantial or non-existent and that residential properties were not impacted by the pipeline easement any more or less than other property types (Palmer 2008).

A third more recent study analyzed sales data from approximately 1,000 residential properties in Arizona to test whether proximity to a natural gas pipeline had an effect on real estate sales prices (Diskin et al. 2011). Using sales price information, the study compared sales prices for properties encumbered by or adjacent to a natural gas transmission pipeline with comparable properties not along a pipeline right-of-way. The study was unable to identify a systematic relationship between proximity to a pipeline and sales price or property value. The researchers cautioned that these results are limited to the dataset examined and should not be generalized to all geographic regions (Diskin et al. 2011).

### **5.3.5 Community Services**

The temporary addition of construction workers and family members to local communities is not expected to affect the levels of service provided by existing law and fire protection personnel. Law enforcement and fire departments within each region are identified by county in Table 5.2-9. Increased demands for local services that could occur from construction workers and family members temporarily relocating to the affected areas would be short term.

Construction of the pipeline could result in increased demand for emergency services. Local police assistance would likely be required to facilitate traffic flows during construction at some road crossings and permits may be required for vehicle load and width limits for some of the vehicles delivering Project materials and supplies. MVP will work directly with local law enforcement, fire departments, and emergency medical services to coordinate for effective emergency response. Further, in accordance with



---

49 CFR 192.615, MVP will prepare an Emergency Plan for the proposed pipeline and associated facilities.

Medical facilities located near the transmission line are identified by location in Table 5.2-10. Construction of the Project is not expected to have significant adverse impacts on local and regional medical facilities and services. The temporary relocation of workers and family members to the counties along the pipeline route is not expected to affect existing levels of health care and medical services. Minor increases in demands for local services that could occur from workers and family members temporarily relocating to the area would be short term.

A small share of non-local workers temporarily relocating to the Project area could be accompanied by their families for the purposes of analysis. The potential addition of a limited number of students along the pipeline route would not be expected to affect existing average student/teacher ratios in any one location (Table 5.2-11).

### **5.3.6 Transportation**

#### **5.3.6.1 Road Crossings**

Major state and federal transportation routes and highways that will be crossed by the proposed pipeline are identified in Table 5.2-12. A detailed listing of all roads that would be crossed by the MVP Project is provided in Appendix 1-F to Draft Resource Report 1. Railroads and most hard surface public roadways will be crossed by boring beneath the road or railroad, where the pipeline is installed horizontally underneath the railroad or roadway with no disruption of the surface and no disruption of traffic flow during pipeline installation. Boring typically requires additional temporary workspace areas on both sides of the crossing for excavating bore pits while the road or railroad remains in operation. Little or no disruption of traffic is expected at road or railroad crossings where boring takes place.

Smaller roadways and drives will be crossed by open cut. Regardless of the method used, MVP will incorporate measures to maintain safety and minimize traffic disruption, and ensure that construction activities will not prevent the passage of emergency vehicles. Measures may include the creation of temporary travel lanes during construction or the placement of steel plate bridges to allow continued traffic flow during open trenching. Traffic lanes and residential access will be maintained, except for the temporary periods essential for pipeline installation. Provisions will be made to allow passage of emergency vehicles at all times. In areas where traffic volumes are high or other circumstances (e.g., congested areas) exist, MVP will employ a police detail to ensure traffic flow and the safety of pedestrians and vehicles. MVP will obtain all necessary permits for public road crossings or work within public road rights-of-way, including from the West Virginia Department of Transportation (WVDOT) and Virginia Department of Transportation (VDOT).

#### **5.3.6.2 Additional Traffic on Local Roads**

In addition to the traffic impacts caused by road crossings, the temporary movement of construction equipment and materials and the daily commuting of employees to and from the construction work areas would add to existing traffic volumes on local roads. Construction activities would be spaced over five construction spreads, with each spread responsible for all construction activities within a specific milepost range along the pipeline (Table 5.1-3). These activities would include grading, trenching, pipe stringing, welding, lowering-in, backfilling, regrading, and restoration described more fully in Draft Resource



Report 1. Construction activities at each spread would proceed in sequence in an assembly-line fashion along the right-of-way, with one crew following the next from clearing until final clean-up. As a result, construction workers and equipment would not only be divided between five spreads, but would also be distributed at different locations within each spread.

Equipment and materials would be transported from various laydown areas and storage yards within the vicinity of the pipeline. Most construction equipment would remain on site during construction. Several construction-related trips would be made each day (to and from the job site) on each of the construction spreads. This level of traffic would remain consistent throughout the construction period and would typically occur during the early morning hours (before 7:00 a.m.) and evening hours (after 6:00 p.m.).

Construction crews would commute to Project work areas in their personal vehicles. Workers would be deployed in various locations along each spread, thereby reducing the potential for congestion in any one area. Pipeline construction work is typically scheduled to take advantage of daylight hours and involves long (at least 10 hour) work days. With typical start and finish times of 7:00 a.m. and 6:00 p.m., most workers would commute to and from the construction right-of-way during off-peak hours. Some discrete activities (e.g. hydrostatic testing, horizontal directional drilling, tie-ins, purge and packing the pipeline facilities, etc.) may occur beyond these timeframes. Because construction would move sequentially along the pipeline route, traffic flow impacts that do arise would be temporary on any given section of roadway.

### 5.3.7 Tax Revenues

#### 5.3.7.1 Construction-Related Tax Revenues

Construction of the Project would generate sales and use tax revenue during the construction period. Local spending by construction workers would also generate sales tax revenues, but the amount and distribution of this type of spending is difficult to accurately forecast. These revenues are not estimated here, but would likely be considerable.

In addition to direct sales and use tax revenues, the Project would result in increases in state and local tax revenues as a result of the economic ripple effect of construction expenditures throughout the affected state and local economies. Estimates of tax revenues from secondary spending are summarized by tax type and state in Table 5.3-1.

<b>Estimated State and Local Tax Revenues Generated During Construction</b>		
<b>Type of Tax</b>	<b>West Virginia (\$ million) <u>a/</u></b>	<b>Virginia (\$ million) <u>a/</u></b>
Sales Tax	11.4	6.2
Use Tax	na	11.2
Income Tax	10.5	6.6
Property Tax	6.3	8.2
Severance	2.8	na
Other	9.1	3.1
<b>Total</b>	<b>40.1</b>	<b>35.3</b>
na – Estimates not provided for this tax category. <u>a/</u> Estimated tax revenues are presented in millions of dollars. Sources: FTC Consulting 2014a, 2014b		



### 5.3.7.2 Ad Valorem Tax Revenues

Estimated ad valorem taxes that would be paid once the pipeline is in service are presented by county and state in Table 5.3-2. Estimated ad valorem tax revenues as a share of general fund total revenues in the affected West Virginia counties would range from 7 percent (Harrison County) to 60 percent (Monroe County). In the affected Virginia counties, estimated ad valorem tax revenues as a share of general fund total revenues would range from 1 percent (Roanoke County) to 3 percent (Montgomery and Pittsylvania counties) (Table 5.3-2).

County/State	General Fund Total Revenues (dollars) <u>a/</u>	Annual Ad Valorem Taxes (dollars) <u>a/</u>	Percent of General Fund Total Revenues
Braxton	4,387	1,160	26%
Doddridge	5,589	450	8%
Fayette	10,638	na	na
Greenbrier	11,305	1,940	17%
Harrison	26,631	1,890	7%
Lewis	10,898	1,860	17%
Monroe	2,809	1,690	60%
Nicholas	8,390	2,080	25%
Summers	3,290	690	21%
Webster	2,531	1,370	54%
Wetzel	13,460	1,450	11%
<b>West Virginia Subtotal</b>	<b>99,928</b>	<b>14,580</b>	<b>15%</b>
Franklin	79,788	1,872	2%
Giles	51,810	919	2%
Montgomery	43,767	1,515	3%
Pittsylvania	58,971	1,772	3%
Roanoke	198,174	1,631	1%
<b>Virginia Subtotal</b>	<b>432,510</b>	<b>7,709</b>	<b>2%</b>
na – Estimates not provided for this county.			
<u>a/</u> Numbers are presented in 1,000s.			
Sources: FTC Consulting 2014a, 2014b			

### 5.3.8 Environmental Justice

#### 5.3.8.1 Disproportionate High and Adverse Effects on Minority or Low Income Populations

Review of census data indicated the potential presence of minority and/or low income populations along the proposed pipeline route (see Section 5.2.7). Construction of the proposed Project is not expected to result in adverse and disproportionate human health or environmental effects to these communities.

Construction of the proposed Project is not expected to have high and adverse human health or environmental effects on any nearby communities. Adverse construction-related impacts would likely include increases in local traffic and noise, as well as dust, and could result in temporary delays at some highway crossings. These impacts would be temporary and localized, and are not expected to be high.



Construction workers temporarily relocating to the Project area would increase demand for local housing resources. Potential impacts on public safety are discussed in Draft Resource Report 11.

Construction-related activities would result in some short-term visual impacts primarily on high-sensitivity viewers with foreground and possibly middleground views. Visual impacts would likely result from the use of construction equipment and temporary lighting, as well as dust from clearing and grading. However, disturbance would be transient and of short duration as construction activities progress along the transmission line route. Visual impacts are discussed in more detail in Draft Resource Report 8.

Construction could also increase demand for education, health care, and municipal services, as well as potentially increase demand for police and fire protection services. However, these impacts, were they to occur, would be expected to be temporary and would not be expected to measurably affect the quality of services currently received by local communities and residents.

Operation of the proposed Project is not expected to have high and adverse human health or environmental effects on any nearby communities, or result in adverse and disproportionate human health or environmental effects to minority or low income communities.

### **5.3.8.2 Pipeline Route Selection**

The route selection process that MVP used for the proposed pipeline is discussed in Draft Resource Reports 1 and 10. MVP planned and sited the proposed pipeline based on engineering and environmental constraints, and attempted to avoid densely populated areas (cities or towns), neighborhoods, and isolated individual residences as much as possible regardless of the population makeup of the areas. Other siting considerations included topography, road crossings, waterbody crossings, and the desire to collocate with existing rights-of-way where feasible.

## **5.4 REFERENCES**

Allen, Williford & Seale Inc. 2001. Natural Gas Pipeline Impact Study, Prepared for the INGAA Foundation.

American Hospital Directory. 2015. Individual Hospital Statistics by State. Available online at: <http://www.ahd.com>

BLM (U.S. Department of the Interior, Bureau of Land Management). 2013. Final Environmental Impact Statement for the Gateway West Transmission Line Project. Wyoming and Idaho. Wyoming State Office. April.

Capitol Impact. 2015. Law Enforcement Agencies and Fire Departments by County. Available online at: [http://www.ciclt.net/sn/clt/capitolimpact/gw\\_default\\_County.aspx](http://www.ciclt.net/sn/clt/capitolimpact/gw_default_County.aspx)

CEQ (Council on Environmental Quality). 1997. Environmental Justice Guidance under the National Environmental Policy Act. Executive Office of the President. Washington, D.C. December 10. Available online at: <http://www.epa.gov/compliance/resources/policies/ej/index.html>

Dean Runyan Associates. 2013. Economic Impact of Travel on West Virginia. 2000-2012 Detailed State and County Estimates. Prepared for the West Virginia Division of Tourism, South Charleston, West Virginia. October.

Diskin, B., Friedman, J., Peppas, S., and Peppas, S. 2011. The Effect of Natural Gas Pipelines on Residential Value. Right of Way. January/February.



- 
- EPA (U.S. Environmental Protection Agency). 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. April. Available online at: <http://www.epa.gov/compliance/resources/policies/ej/index.html>.
- FERC (Federal Energy Regulatory Commission). 2002. Guidance Manual for Environmental Report Preparation. August.
- FERC. 2014. Jordan Cove Energy and Pacific Connector Pipeline Project. Draft Environmental Impact Statement. November. Available online at: <https://www.ferc.gov/industries/gas/enviro/eis/2014/11-07-14-eis.asp>.
- Fruits, E. 2008. The Impact of the Presence of a Natural Gas Pipeline on Residential Property Values. Portland State University. November.
- FTI Consulting. 2014a. Economic Benefits of the Mountain Valley Pipeline Project in West Virginia, December.
- FTI Consulting. 2014b. Economic Benefits of the Mountain Valley Pipeline Project in Virginia, December.
- National Education Association Research. 2014. Rankings & Estimates. Rankings of the States 2013 and Estimates of School Statistics 2014. NEA Research. March. Available online at: <http://nces.ed.gov/ccd/districtsearch/>
- Palmer, D. 2008. Updated Market Analysis: The Impact of Natural Gas Pipelines on Property Values. PGP Valuation. Prepared for Palomar Gas Transmission LLC. February.
- STR. 2015. Hotel Census Counts – Properties and Rooms. Virginia and West Virginia.
- U.S. Bureau of Economic Analysis. 2014. CA04 Personal income summary, 2013. Available online at: <http://www.bea.gov>
- U.S. Bureau of Economic Analysis. 2015. CA25N Total full-time and part-time employment by industry, 2001 and 2011. Available online at: <http://www.bea.gov>
- U.S. Bureau of Labor Statistics. 2014. Labor Force Data by County, 2013 Annual Averages. Available online at: <http://www.bls.gov/home.htm>
- U.S. Bureau of Labor Statistics. 2015. Regional and State Unemployment – 2014 Annual Averages. News Release. March 4.
- U.S. Census Bureau. 2000. P001: Total Population [1] - Universe: Total population. Census 2000 Summary File 1 (SF 1) 100-Percent Data. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. 2010. USA Counties Data File Downloads. Land Area. Available online at: <http://www.census.gov/support/USACdataDownloads.html#LND>
- U.S. Census Bureau. 2013a. Poverty Definitions. Available online at: <http://www.census.gov/hhes/www/poverty/definitions.html>
- U.S. Census Bureau. 2013b. Table P2. Hispanic or Latino, and Not Hispanic or Latino by Race. 2010 Census Redistricting Data (Public Law 94-171) Summary File. Available online at: [www.factfinder2.census.gov](http://www.factfinder2.census.gov)



- 
- U.S. Census Bureau. 2013c. P12: Sex by Age - Universe: Total population. 2010 Census Summary File 1. Available online at: [www.factfinder2.census.gov](http://www.factfinder2.census.gov)
- U.S. Census Bureau. 2014a. Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013. Population Division. December. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. 2014b. DP04: Selected Housing. 2009-2013 American Community Survey 5-Year Estimates. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. 2014c. B25004: Vacancy Status. Universe: Vacant Housing Units. 2009-2013 American Community Survey 5-Year Estimates. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. 2014d. B19013: Median Household Income. 2009-2013 American Community Survey 5-Year Estimates. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. 2014e. B17017: Poverty Status in the Past 12 Months by Household Type by Age of Householder. 2009-2013 American Community Survey 5-Year Estimates. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. 2014f. B16002: Household Language by Household Limited English Speaking Status. 2009-2013 American Community Survey 5-Year Estimates. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. 2014g. DPO2: Selected Social Characteristics. 2009-2013 American Community Survey 5-Year Estimates. Available online at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Department of Agriculture National Agricultural Statistics Service. 2014. 2012 Census of Agriculture. State and County Profiles. Available online at: [http://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Census\\_by\\_State/](http://www.agcensus.usda.gov/Publications/2012/Full_Report/Census_by_State/)
- U.S. Travel Association. 2014. The Economic Impact of Domestic Travel on Virginia Counties 2013. Prepared for Virginia Tourism Authority doing business as Virginia Tourism Corporation. August.
- University of Virginia, Weldon Cooper Center for Public Service. 2012. Total Population Projections for Virginia and its Localities, 2020-2040. Demographics & Workforce Group. November. Available online at: [www.coopercenter.org/demographics/](http://www.coopercenter.org/demographics/)
- West Virginia Division of Tourism. 2013. Marketing Plan 2013. Available online at: [www.wvtourism.com](http://www.wvtourism.com)
- West Virginia State Auditor's Office. 2015. County Budgets 2014-2015 Fiscal Year (updated January 2015). Available online at: [https://www.wvsao.gov/LocalGovernment/ConBud\\_14-15.aspx](https://www.wvsao.gov/LocalGovernment/ConBud_14-15.aspx)
- West Virginia University, Bureau of Business and Economic Research. 2014. Population Trends in West Virginia through 2030. Prepared by Christiadi, Deskins, J. and B. Lego. March. Available online at: [www.bber.wvu.edu](http://www.bber.wvu.edu)
- Virginia Tourism Corporation. 2015. 2015 Year-to-Date February Lodging Report. Available online at: <http://www.vatc.org/research/lodgingreports/>
-



---

West Virginia State Tax Division. 2015. Local Sales and Use Tax. Available online at:  
<http://www.wva.state.wv.us/wvtax/LocalSalesAndUseTax.aspx>

Whatcom County. 2001. Natural Gas and Hazardous Liquid Pipeline Background Report. October.  
Available online at: [www.mrsc.org/govdocs/w47pipelinerpt.pdf](http://www.mrsc.org/govdocs/w47pipelinerpt.pdf).





Mountain Valley Pipeline Project

Docket No. PF15-3

## **Resource Report 11 – Reliability and Safety**

Draft

April 2015

## Mountain Valley Pipeline Project Resource Report 11 – Reliability and Safety

<b>Resource Report 11 Filing Requirements</b>	
<b>Information</b>	<b>Location in Resource Report</b>
<b>Minimum Filing Requirements</b>	
1. Describe how the Project facilities would be designed, constructed, operated, and maintained to minimize potential hazard to the public from the failure of project components as well as a result of accidents or natural catastrophes. (§ 380.12(m))	Section 11.0 through 11.3
2. Describe measures proposed to protect the public from failure of the proposed facilities (including coordination with local agencies). (§ 380.12(m)(1))	Section 11.3
3. Discuss hazards, the environmental impact, and service interruptions which could reasonably ensue from failure of the proposed facilities. (§ 380.12(m)(2))	Section 11.1
4. Discuss design and operational measures to avoid or reduce risk. (§ 380.12(m)(3))	Section 11.3
5. Discuss contingency plans for maintaining service or reducing downtime. (§ 380.12(m)(4))	Section 11.3.11
6. Describe measures used to exclude the public from hazardous areas. Discuss measures used to minimize problems arising from malfunctions and accidents (with estimates of probability of occurrence) and identify standard procedures for protecting services and public safety during maintenance and breakdowns. (§ 380.12(m)(5))	Section 11.1

## RESOURCE REPORT 11 RELIABILITY AND SAFETY TABLE OF CONTENTS

INTRODUCTION .....	11-1
ENVIRONMENTAL RESOURCE REPORT ORGANIZATION .....	11-1
11.1 NATURAL GAS PIPELINE INDUSTRY SAFETY OVERVIEW .....	11-1
11.1.1 Hazards .....	11-1
11.1.2 Safety Standards .....	11-2
11.1.3 High Consequence Areas .....	11-7
11.1.4 Pipeline Accident Data .....	11-9
11.1.5 Impact on Public Safety .....	11-9
11.2 SAFETY OVERVIEW .....	11-11
11.2.1 System Overview .....	11-11
11.2.2 Historical Operating Record .....	11-11
11.3 MEASURES TO PROTECT THE PUBLIC .....	11-12
11.3.1 General Protective Measures and Controls .....	11-12
11.3.2 Public Safety .....	11-14
11.3.3 Emergency Response .....	11-15
11.3.4 Public Awareness Program .....	11-15
11.3.5 One-Call Response .....	11-15
11.3.6 Pipeline Safety Brochures .....	11-15
11.3.7 Interactions with Federal Authorities .....	11-16
11.3.8 Liaison Procedures with Local Authorities .....	11-16
11.3.9 Utility Protection .....	11-17
11.3.10 Equipment Engineering and Design .....	11-17
11.3.11 Operations and Maintenance .....	11-17
11.3.12 Corrosion Control .....	11-18
11.4 REFERENCES .....	11-18

### LIST OF TABLES

Table 11.1-1 MVP Pipeline Class Location .....	11-3
Table 11.1-2 Location of High Consequence Areas .....	11-8
Table 11.1-3 Annual Gas Transmission System Accident Fatalities .....	11-10
Table 11.1-4 National Accidental Death Statistics .....	11-10

---

**RESOURCE REPORT 11  
RELIABILITY AND SAFETY****LIST OF ACRONYMS AND ABBREVIATIONS**

ANSI	American National Standards Institute
ASME	American Society for Mechanical Engineers
Bcf/d	billion cubic feet per day
CFR	Code of Federal Regulations
FERC	Federal Energy Regulatory Commission
HCA	high consequence area
hp	horsepower
IMP	Integrity Management Plan
MAOP	Maximum Allowable Operating Pressure
MLVs	mainline valves
MVP	Mountain Valley Pipeline, LLC
O&M	Operations & Maintenance
PHMSA	Pipeline and Hazardous Materials Safety Administration of the USDOT
Project	Mountain Valley Pipeline Project
psig	pounds per square inch gauge
SCADA	Supervisory Control and Data Acquisition
Transco	Transcontinental Gas Pipe Line Company
USDOT	U.S. Department of Transportation

## RESOURCE REPORT 11 RELIABILITY AND SAFETY

### Introduction

Mountain Valley Pipeline, LLC (MVP), a joint venture between affiliates of EQT Corporation, NextEra Energy, Inc., WGL Holdings, Inc. and Vega Energy Partners, Ltd., is seeking a Certificate of Public Convenience and Necessity 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 16 counties in West Virginia and Virginia. MVP plans to construct an approximately 294.1-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, 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 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 require approximately 217,200 horsepower (hp) of compression at approximately four compressor stations along the route, as well as measurement, regulation, and other ancillary facilities required for the safe operation of the pipeline. The pipeline is designed to transport up to 2.0 billion cubic feet per day (Bcf/d) of natural gas. Resource Report 1 provides a complete summary of the Project facilities (see Tables 1.2-1 and 1.2-2) and a general location map of the Project facilities (Figure 1.2-1).

### Environmental Resource Report Organization

Draft Resource Report 11 includes descriptions of natural gas pipeline industry safety, corporate risk management, and measures to protect the public and is prepared and organized according to the FERC Guidance Manual for Environmental Report Preparation (August 2002). This report is organized into three major sections and a separate section listing the sources used to prepare this report. Section 11.1 includes an overview of natural gas pipeline industry safety. Section 11.2 includes a safety overview. Section 11.3 includes a description of measures to protect the public.

#### 11.1 NATURAL GAS PIPELINE INDUSTRY SAFETY OVERVIEW

Natural gas pipelines present a number of potential safety issues, which are minimized via regulatory standards that have been adopted to prevent accidents, avoid hazards, improve safety, and minimize impacts. This section provides a summary of these hazards, safety standards, high consequence areas, pipeline accident data, and impacts on public safety.

##### 11.1.1 Hazards

For pipelines that transport natural gas, pipeline ruptures that result in a fire or explosion is the greatest hazard, although this risk is very low. According to the United States Department of Transportation's (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA), there are 2.6 million miles of pipelines in the United States and these pipelines are the safest and most cost-efficient way to transport natural gas and hazardous materials. While the traditional measures of risk (population, energy

consumption, pipeline ton-miles) have steadily increased over the past two decades, the risk of pipeline incidents with death or major injury have decreased by about 10 percent every three years and the risks of hazardous liquid pipeline spills that have environmental consequences have decreased by an average of five percent per year (PHMSA 2013).

Methane, the primary component of natural gas, is colorless, odorless and tasteless. It is not toxic, but is classified as an asphyxiant. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane is flammable when concentrations are between 5 and 15 percent with an auto ignition temperature of over 1,100 degrees Fahrenheit. When unconfined, methane is not explosive; however, if confined in a closed space with an ignition source present an explosion may occur.

### 11.1.2 Safety Standards

The USDOT “Minimum Federal Safety Standards” (49 Code of Federal Regulations (CFR) Part 192) provides the standards pursuant to which the Project will be designed, constructed, operated, and maintained. The proposed Project facilities will be designed, constructed, operated and maintained to meet or exceed the safety requirements set forth in 49 CFR Part 192. The intent of the USDOT regulations for pipeline facilities is to provide the public with adequate protection from pipeline failures. Included in 49 CFR Part 192 are specifications for material selection and qualification, minimum design and construction requirements, and protection from internal, external, and atmospheric corrosion.

Areas near a pipeline are defined in 49 CFR §192.5 based on population densities, with the most stringent requirements coinciding with the areas with the highest concentration of people. The definition for “class location unit” is the area that extends 220 yards (660 feet) on either side of the centerline of any continuous one-mile length of pipeline (sliding mile). Areas are broken down into four classifications:

- Class 1 – Class location unit with 10 or fewer buildings intended for human occupancy.
- Class 2 – Class location unit with more than 10 but fewer than 46 buildings intended for human occupancy.
- Class 3 – Class location unit with 46 or more buildings intended for human occupancy, or where the pipeline lies within 100 yards of any building, or small, well-defined outside area (such as a playground or recreation area) occupied by 20 or more people on at least five days a week for 10 weeks in any 12-month period (the days and weeks need not be consecutive).
- Class 4 – Class location unit where buildings with four or more stories aboveground are prevalent.

More stringent pipeline design, wall thickness, testing, and operation characteristics are required in more populated areas. Specifically, for a Class 1 location, pipelines must be installed at a minimum depth of 30 inches in normal soil and 18 inches in rock, whereas Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroads, require a minimum cover of 36 inches in normal soil and 24 inches of coverage in consolidated rock (49 CFR §192.327). Design pressures, wall thickness, maximum allowable operating pressures (MAOPs), hydrostatic test pressures, weld testing and inspection, as well as frequency of leak surveys and patrols of the pipeline, are required to conform to higher standards in areas of greater population density. The Project incorporates these requirements. Table 11.1-1 provides the class locations crossed by the Project.



<b>Table 11.1-1</b>			
<b>MVP Pipeline Class Location</b>			
<b>State</b>	<b>Class Location</b>	<b>Beginning Milepost</b>	<b>Ending Milepost</b>
WV	1	0.00	11.12
WV	2	11.12	11.45
WV	1	11.45	12.04
WV	2	12.04	12.30
WV	1	12.30	31.60
WV	2	31.60	31.69
WV	1	31.69	31.78
WV	2	31.78	31.83
WV	1	31.83	31.93
WV	2	31.93	32.52
WV	1	32.52	32.56
WV	2	32.56	32.86
WV	1	32.86	33.73
WV	2	33.73	34.25
WV	1	34.25	34.41
WV	2	34.41	34.66
WV	1	34.66	105.94
WV	2	105.94	106.32
WV	1	106.32	106.33
WV	2	106.33	106.60
WV	1	106.60	106.70
WV	2	106.70	107.16
WV	1	107.16	109.36
WV	2	109.36	109.57
WV	1	109.57	109.60
WV	2	109.60	110.18
WV	1	110.18	112.66
WV	2	112.66	113.08
WV	1	113.08	113.40
WV	2	113.40	114.29
WV	1	114.29	114.35
WV	2	114.35	114.81
WV	1	114.81	115.41
WV	2	115.41	115.62
WV	1	115.62	122.26
WV	2	122.26	122.94
WV	1	122.94	136.71



<b>Table 11.1-1</b>			
<b>MVP Pipeline Class Location</b>			
<b>State</b>	<b>Class Location</b>	<b>Beginning Milepost</b>	<b>Ending Milepost</b>
WV	2	136.71	137.47
WV	1	137.47	143.71
WV	2	143.71	144.25
WV	1	144.25	166.31
WV	2	166.31	166.83
WV	1	166.83	166.91
WV	2	166.91	167.01
WV	1	167.01	167.08
WV	2	167.08	167.31
WV	1	167.31	168.88
WV	2	168.88	169.62
WV	1	169.62	169.66
WV	2	169.66	169.69
WV	1	169.69	169.78
WV	2	169.78	170.07
WV	1	170.07	170.20
WV	2	170.20	170.93
WV	1	170.93	189.78
WV	2	189.78	190.30
WV	1	190.30	190.50
WV	2	190.50	190.78
WV	1	190.78	195.15
VA	1	195.15	201.71
VA	2	201.71	203.03
VA	1	203.03	208.88
VA	2	208.88	208.93
VA	1	208.93	209.09
VA	2	209.09	209.59
VA	1	209.59	209.60
VA	2	209.60	210.22
VA	1	210.22	210.69
VA	2	210.69	211.38
VA	1	211.38	213.82
VA	2	213.82	214.36
VA	1	214.36	214.45
VA	2	214.45	216.61
VA	1	216.61	216.90





<b>Table 11.1-1</b>			
<b>MVP Pipeline Class Location</b>			
<b>State</b>	<b>Class Location</b>	<b>Beginning Milepost</b>	<b>Ending Milepost</b>
VA	2	216.90	217.23
VA	1	217.23	222.18
VA	2	222.18	223.36
VA	1	223.36	227.61
VA	2	227.61	227.80
VA	1	227.80	228.20
VA	2	228.20	229.30
VA	1	229.30	235.50
VA	2	235.50	236.14
VA	1	236.14	237.39
VA	2	237.39	238.00
VA	1	238.00	238.05
VA	2	238.05	238.50
VA	1	238.50	249.67
VA	2	249.67	250.05
VA	1	250.05	250.28
VA	2	250.28	250.99
VA	1	250.99	251.10
VA	2	251.10	252.26
VA	1	252.26	252.58
VA	2	252.58	253.38
VA	1	253.38	253.65
VA	2	253.65	254.34
VA	1	254.34	255.09
VA	2	255.09	255.89
VA	1	255.89	255.90
VA	2	255.90	256.38
VA	1	256.38	256.50
VA	2	256.50	256.63
VA	3	256.63	256.68
VA	2	256.68	257.14
VA	1	257.14	257.43
VA	2	257.43	257.98
VA	1	257.98	258.20
VA	2	258.20	258.51
VA	1	258.51	261.05
VA	2	261.05	261.31

<b>Table 11.1-1</b>			
<b>MVP Pipeline Class Location</b>			
<b>State</b>	<b>Class Location</b>	<b>Beginning Milepost</b>	<b>Ending Milepost</b>
VA	1	261.31	261.53
VA	2	261.53	262.66
VA	1	262.66	271.55
VA	2	271.55	272.29
VA	1	272.29	286.26
VA	2	286.26	286.49
VA	1	286.49	286.69
VA	2	286.69	287.36
VA	1	287.36	287.46
VA	2	287.46	287.83
VA	1	287.83	288.52
VA	2	288.52	289.00
VA	1	289.00	289.08
VA	2	289.08	289.64
VA	1	289.64	290.29
VA	2	290.29	290.65
VA	1	290.65	290.78
VA	2	290.78	290.95
VA	1	290.95	294.10

If population densities near the pipeline increase after construction resulting in a change in Class location, 49 CFR §192.609 and §192.611 require confirmation or revision to the MAOP to match the new Class. If revisions are needed, they may be achieved by reducing the operating pressure, by pressure testing the segment of pipe using the applicable Class I location multiplier, or by replacing the segment of pipe for the class change, if required, with one that complies with the USDOT minimum PHMSA code for that Class location.

Additionally, 49 CFR Part 192 provides the minimum standards for operation and maintenance of pipeline facilities, which includes a requirement for a written plan to govern these activities. The pipeline operator must also establish an Emergency Plan with written procedures to minimize the hazards from a natural gas pipeline emergency. The Emergency Plan will include:

- Establishing and maintaining communications with appropriate fire, police, and public officials.
- Prompt and effective response to a notice of each type of emergency.
- Providing for personnel, equipment, tools, and materials available at the scene of an emergency.
- Protection of people first and then property, and making safe any actual or potential hazards to life or property.

- Emergency shutdown and pressure reduction in any section of the system necessary to minimize hazards to life or property.
- Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them during an emergency.
- Safely restoring any service outage.

The operator is also responsible for training appropriate operating personnel, with the goal to ensure that they know about the emergency procedures and to verify that the training is effective. After an emergency, the operator is responsible for reviewing employee activities during the emergency to verify that the procedures were followed. Operators are responsible for establishing and maintaining liaison with the applicable fire, police, and public officials to identify the resources necessary to respond to a pipeline emergency. The operator is also responsible for developing a continuing education program that provides customers, the public, government officials, and those engaged in excavation activities to inform on natural gas pipeline emergencies and to report them to the applicable public officials.

Prior to the pipeline being placed in-service, MVP will develop and implement a Project-specific Emergency Plan in accordance with all requirements of 49 CFR Part 192 and in coordination with local emergency management.

### 11.1.3 High Consequence Areas

A rule for Pipeline Integrity Management in High Consequence Areas (HCAs) for Gas Transmission was promulgated by the USDOT PHMSA, which was incorporated into 49 CFR Part 192, Subpart O. This rule requires that an Integrity Management Plan (IMP) be developed for each facility to provide procedures for monitoring and maintaining pipeline integrity in areas where the pipeline traverses lands or facilities that are considered HCAs as defined in 49 CFR §192.903.

The HCAs may be defined in one of two ways. In the first method, an HCA includes:

- current Class 3 and 4 locations in accordance with 49 CFR §192.5;
- any area in Class 1 or 2 locations where the potential impact radius is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle;  
or
- any area in Class 1 or 2 locations where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate. The potential impact radius as defined by the US DOT PHMSA 49 CFR 192.903 is determined by the following formula:

$$r = 0.69 \times \sqrt{(p \times d^2)}, \text{ where:}$$

r = the radius of a circular area surrounding the point of failure (feet)

p = the MAOP in the pipeline segment (pounds per square inch gauge [psig])

d = the nominal diameter of the pipeline (inches)

The proposed 42-inch diameter pipeline with a MAOP of 1,480 pounds per square inch gauge (psig) would have a potential impact radius of 1,115 feet.

In the second method, an HCA includes any area within a potential impact circle that contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Integrity management is the systematic application of management policies, procedures, resources, and practices to the tasks of analyzing, assessing, and controlling pipeline system integrity in order to protect employees, the general public, and the environment. It includes threat identification measures such as:

- Incorporation of formal risk assessment
- Decision justification record keeping
- Prescribed inspection and testing requirements

MVP has identified HCAs along the proposed pipeline route as listed in Table 11.1-2. HCA analysis was determined (pending final analysis) in accordance with Method 2 described above; therefore, further HCAs may be identified pending the final analysis.

<b>State</b>	<b>Beginning Milepost</b>	<b>Ending Milepost</b>	<b>Length (Mile)</b>
West Virginia	25.55	26.07	0.52
	109.39	110.18	0.79
	111.14	111.73	0.59
	112.72	114.90	2.18
	122.26	122.71	0.45
	143.92	144.55	0.63
Virginia	210.73	211.20	0.47
	228.21	229.42	1.21
	251.22	252.27	1.05
	252.92	253.37	0.45
	253.59	254.10	0.51
	255.89	257.31	1.42
	261.39	262.22	0.83
	288.98	290.55	1.57
290.67	291.11	0.44	

If during the pending analysis, additional HCAs are identified along the proposed pipeline, they will be incorporated into the MVP pipeline IMP as required by 49 CFR Part 192, Subpart O, Pipeline Integrity Management.

#### 11.1.4 Pipeline Accident Data

Since 1984, operators are required to report incidents that involve facility property damage of more than \$50,000 (in 1984 dollars), injury requiring in-patient hospitalization, release of gas, or those incidents considered significant by the operator. For the most recent 20-year period on record (1995-2014) there were 1,604 onshore gas transmission pipeline incidents meeting these criteria reported on the more than 261,000 total miles of onshore natural gas transmission pipelines nationwide (USDOT PHMSA 2015b, 2015). Incident rates during this time period have been relatively flat to trending slightly up.

The category accounting for the most frequent cause of all reportable gas transmission incidents is material failure (approximately 49 percent). Material failure related incidents typically involve pipeline material failure, weld and/or equipment failure or malfunctioning equipment. Corrosion is the cause of approximately 24 percent of the total number of gas transmission incidents since 1995. Corrosion-related incidents usually result from internal corrosion. While pipelines installed since 1950 exhibit a fairly constant frequency of corrosion incidents, pipelines installed before that time have a significantly higher rate. Older pipelines have a higher frequency of corrosion incidents because corrosion is a time-dependent process, and design standards at the time did not mandate certain corrosion controls, such as advanced coatings and cathodic protection. Since July of 1971, new pipelines are required to use both external coating and cathodic protection systems, which significantly reduces the rate of failure when compared to an unprotected or partially protected pipe.

Damage caused by excavation accounts for approximately 17 percent of total reported incidents since 1995. These incidents are a result of heavy construction equipment, such as bulldozers and excavators, encroaching into pipeline rights-of-way. To minimize these types of incidents, pipeline operators have been required to participate in “one-call” public utility programs to help identify where these buried pipelines are located prior to excavation work.

Approximately 12 percent of incidents are caused by natural or other outside forces, such as from soil settlement, washouts, or geologic hazards that may result from weather effects. A discussion of these outside forces will be included in the draft Resource Report 6, Geological Resources.

#### 11.1.5 Impact on Public Safety

Table 11.1-3 provides the number of fatalities annually that were a result of pipeline accidents on natural gas transmission lines from 1995 to 2014. There were an average of two fatalities annually during this time period. There were zero fatalities from natural gas transmission pipeline incidents in 1995, 2004, 2005, 2008, 2009, 2011, 2012, and 2013. The two highest years of fatalities from natural gas transmission pipeline incidents occurred in 2000 and 2010. The majority of fatalities from pipelines involve local distribution pipelines. These are natural gas pipelines that are not regulated by FERC and that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes, often made of plastic or cast iron rather than welded steel, and tend to be older pipelines that are more susceptible to damage. In addition, distribution systems do not have large rights-of-way and pipeline markers common to the FERC-regulated natural gas transmission pipelines.

For comparative purposes, Table 11.1-4 provides accident statistics for the number of deaths by type of accident. The average of two fatalities annually is significantly lower than any other fatal accidents for

which there is recordable data; therefore, the likelihood that the Project will threaten human life is extremely remote.

<b>Table 11.1-3</b>	
<b>Annual Gas Transmission System Accident Fatalities</b>	
<b>Year</b>	<b>Fatalities</b>
1995	0
1996	1
1997	1
1998	1
1999	2
2000	15
2001	2
2002	1
2003	1
2004	0
2005	0
2006	3
2007	2
2008	0
2009	0
2010	10
2011	0
2012	0
2013	0
2014	1
<b>Total</b>	<b>40</b>
Annual Average (1995-2014)	2
Source: USDOT PHMSA 2015a, 2015b. National Gas Transmission: Significant Incidents Summary Statistics, 1995-2014.	

<b>Table 11.1-4</b>	
<b>National Accidental Death Statistics <u>a/</u></b>	
<b>Types of Accidents</b>	<b>Number of Fatalities</b>
All Accidents	127,200
Motor Vehicles	36,300
Public nonwork	34,546
Work	1,554
Home	200
Work	3,695

<b>Table 11.1-4</b>	
<b>National Accidental Death Statistics <sup>a/</sup></b>	
<b>Types of Accidents</b>	<b>Number of Fatalities</b>
Nonmotor-vehicle	2,141
Motor-vehicle	1,554
Home	63,000
Nonmotor-vehicle	62,800
Motor-vehicle	200
Public	26,000
Gas Transmission Pipelines	0
a/ Sources: National Safety Council, Injury Facts 2014 Edition, 2014; USDOT PHMSA 2015b. National Gas Transmission: Significant Incidents Summary Statistics, 1995-2014.	

Public comments have been received regarding the safety and reliability of construction and operation of a 42-inch-diameter, high pressure natural gas pipeline through the rugged topography crossed by much of the proposed Project. MVP is identifying and assessing the risks associated with installation and operation of a 42-inch pipeline in the terrain crossed along the route. The risks will be avoided, if possible, or the pipeline will be designed and installed in a way that minimizes the risks that cannot be avoided.

## 11.2 SAFETY OVERVIEW

MVP is committed to safely operating and maintaining the proposed Project and will instill the existing corporate risk management philosophies of its parent companies to efficiently identify and control or eliminate hazards throughout the life of the pipeline. The Project facilities will fully adhere to Part 192 regulatory requirements pertaining to pipeline safety. These safety regulations will be reinforced by the comprehensive and strictly enforced corporate practices of MVP. The effectiveness of the federal and corporate requirements in ensuring reliability and safety is illustrated by the following operating experience profile of the MVP companies. The empirical information presented illustrates that the potential for public hazard from accidents associated with the operation of the proposed facilities is low.

### 11.2.1 System Overview

MVP's majority partner, EQT Corporation, is an integrated energy company with emphasis on Appalachian area natural gas production, gathering, transmission, and distribution. EQT has been in operation for over 100 years, and together the EQT Corporation companies operate more than 11,400 miles of gathering and transmission pipeline and 63 billion cubic feet of storage capacity. NextEra Energy, Inc., a minority partner in MVP, owns and operates 102 miles of natural gas and oil pipelines and one natural gas compressor station. NextEra has been providing pipeline services since 1978 for oil pipelines and since 1985 for natural gas pipelines.

### 11.2.2 Historical Operating Record

Generally, the natural gas transmission industry has an excellent record of public safety. Pipelines and related facilities are designed and maintained with strict adherence to Part 192 standards to ensure public

safety, reliability, and to minimize the opportunity for system failure. EQT Corporation and NextEra have an excellent record of public safety and an established record operating intrastate oil pipelines as well as natural gas pipelines and will continue to employ proper system design, construction, operation, and maintenance practices to ensure this excellent record is maintained.

### **11.3 MEASURES TO PROTECT THE PUBLIC**

As a new pipeline, and with the continuing advancements in materials and pipeline operating and maintenance practices, the chances of a failure of the proposed Project are extremely low. The safety and reliability of the proposed Project will be based on safe design, appropriate equipment selection, code compliance, thorough review, careful construction, post construction testing and competent maintenance and operation. Measures will be incorporated according to approved design practices and standards that have been developed through industry-wide experience of pipeline construction projects.

Measures to protect the public from inadvertent natural gas releases due to accidents or natural catastrophes can be grouped into three categories: passive protection, active controls, and procedural controls. These measures are described below in Section 11.3.1. Further information on some of the specific measures is provided in Sections 11.3.2 through 11.3.12.

#### **11.3.1 General Protective Measures and Controls**

##### **11.3.1.1 Passive Protection**

Passive protection minimizes the hazards by incorporating process and equipment design features, which will reduce either the frequency or consequence of a hazard without the active functioning of a device. The inherent design of modern pipeline systems affords protection for all but the most severe natural hazard events or inadvertent human actions, such as excavation damage by backhoe. Modern pipelines are made of high carbon steel with full penetration welds, resulting in a system with substantial, inherent strength and ductility. Passive protection will include:

- Pipeline design, construction, commissioning, and operation will be conducted in strict accordance with applicable USDOT regulations found in 49 CFR Part 192.
- In accordance with USDOT regulations, the pipeline design factor, wall thickness, location of mainline valves, and other parameters will be established according to a classification system based on the number, proximity to the pipeline, and occupation levels of buildings intended for human occupancy located along the right-of-way.
- MVP will comply with the applicable sections of the American Society for Mechanical Engineers /American National Standards Institute B31.8, Gas Transmission and Distribution Piping Systems, the most widely used industry Code, for the design, operation, maintenance, and repair of its natural gas transmission pipeline.
- The pipeline will be externally coated with a fusion-bonded epoxy and cathodically protected to protect against external corrosion.
- Temporary erosion controls will be utilized to minimize erosion during construction.
- Upon completion of construction, permanent erosion control measures will be installed and maintained throughout operations.



### 11.3.1.2 Active Controls

Active (or engineering) controls use instruments, valves, safety interlocks, and emergency shutdown systems to detect and correct process deviations (e.g., over pressure protection). Active controls will include:

- Applicable over pressure protection systems at receipt / delivery interconnect points where MAOPs differ.
- To protect the integrity of the pipeline system, an impressed current cathodic protection system will be installed as a corrosion control measure.
- A Supervisory Control and Data Acquisition (SCADA) system will provide for and enable continuous pipeline monitoring and the control of key points along the gas pipeline.
- Remote Terminal Units for the SCADA system will be located on every receipt / delivery interconnect manifold at those points on the pipeline.
- MLVs will be installed at regular intervals as specified by 49 CFR Part 192 for classification locations.
- All of the field girth welds will be tested via x-ray or ultrasonic inspection (non-destructive examination).
- The pipeline and associated facilities will be hydrostatically tested for structural integrity before commencing operation.
- The pipeline will be equipped with facilities to accommodate inline inspection tool (smart pigging) operations for the purpose of locating anomalies in the pipeline wall thickness that may indicate corrosion, and out-of-roundness that may indicate the pipe has been subjected to external forces.
- Compressor stations will be equipped with gas detection systems and emergency shutdown systems capable of depressurizing all station piping.

### 11.3.1.3 Procedural Controls

Procedural (or administrative) controls use operating procedures, administrative checks, emergency response, and other management approaches to prevent incidents, or to minimize the effects of an accident (e.g., operating procedures, safe work practices, inspections and testing, and training). The Emergency Plan for the proposed Project will be provided to USDOT and will address the following procedural controls:

- Procedures for testing, start-up, operation, purging, and training of operations and maintenance staff on operational procedures.
- Regularly scheduled preventative maintenance programs to meet government regulations for pipeline segments and metering stations.
- Inline inspection tools (smart pigs) will be installed at each of the compressor stations and used at intervals not exceeding the requirements in the pipeline safety regulations to monitor for corrosion and third-party damage that the system may encounter.

- The Emergency Plan will be developed to respond to hazardous conditions caused by the pipeline. The plan will include measures to ensure an ongoing liaison with the appropriate fire, police, and public officials to coordinate mutual assistance should an emergency occur.
- Procedures for aerial surveillance flights, on-ground leak detection surveys, internal pipeline inspection with smart pigging equipment, and cathodic protection system inspection and maintenance.
- An Integrity Management Plan will be developed to provide procedures for monitoring and maintaining pipeline integrity in areas where the pipeline traverses lands or facilities that are considered HCAs as defined in 49 CFR §192.903 (see Section 11.1.3 above). The IMP will include threat identification measures such as, incorporation of formal risk assessment, decision justification record keeping, and prescribed inspection and testing requirements.
- A Public Awareness Plan will be prepared and implemented to enable customers, the public, government officials, and those engaged in excavation to recognize a natural gas pipeline emergency and report it to appropriate public officials and the company.
- Since April 1982, operators have been required to participate in "One-Call" public utility programs in populated areas to minimize unauthorized excavation activities near pipelines.

### 11.3.2 Public Safety

MVP is committed to safety, protecting the environment and preventing accidents/incidents and maintaining the highest standards for its pipeline operation and maintenance and will accomplish this goal through routine preventative maintenance, pipeline patrols, solid emergency response plans and a strong pipeline integrity management program. MVP will establish and maintain strict operating and maintenance policies and procedures that will be audited periodically by the PHMSA and are in compliance with Part 192.

Trained and qualified pipeline personnel will operate and maintain the pipeline in accordance with Subpart N of Part 192. The training program will ensure all personnel possess the knowledge and competency necessary to efficiently operate and maintain the pipeline in a manner that protects the environment, the public and the health and safety of all employees. More specifically, personnel are trained to: execute normal operating and maintenance procedures; recognize abnormal conditions and take appropriate corrective actions; predict consequences of malfunctions or failures; recognize conditions likely to cause emergencies; respond to emergency situations; control accidental releases of gas; and recognize characteristics and hazards of natural gas.

During construction, special care will be taken in residential and commercial areas to minimize neighborhood and traffic disruption, to control noise and dust to the extent practicable, and to protect the public at large. Measures to be implemented where the pipeline is near residential areas include, but are not limited to: fencing the construction work area boundary to ensure construction equipment, materials, and spoil remain in the construction right-of-way; ensuring piping is installed as quickly as reasonably possible consistent with prudent pipeline construction practices to minimize construction time affecting a neighborhood; backfilling the trench as soon as possible after the pipe is laid; and completing cleanup and installation of permanent erosion control measures as soon as reasonable, weather conditions permitting.

In areas near residences MVP will work to minimize leaving overnight open excavations by backfilling the installed pipeline to near the end of the section, and covering the remaining open trench with temporary steel plating. The work will be accomplished so emergency vehicles will be able to pass at all times and to limit disruption of access to residential driveways. MVP will develop site-specific residential construction plans in areas where residential dwellings are within 50 feet of construction workspace and will file these plans as part of Resource Report 8 included with MVP's FERC application.

### **11.3.3 Emergency Response**

Consistent with 49 CFR §192.615, MVP will establish an emergency response plan that provides written procedures to minimize the hazards from a pipeline emergency. Key features will include:

- Receiving, identifying, verifying and classifying emergency events – leaks, fires, explosions or natural disasters;
- Managing communications with emergency responders and public officials to establish incident command and coordinate response efforts;
- Making personnel, equipment, tools and materials available for emergencies;
- Ensuring that response efforts focus on public safety first; and
- Ensuring emergency shutdown actions are taken in a timely manner.

Should the need arise, MVP will have field service personnel and repair contractors available that are capable of completing emergency repairs and restoration.

### **11.3.4 Public Awareness Program**

MVP will develop a Public Awareness Program as outlined in 49 CFR §192.616, which will provide outreach measures to the affected public, emergency responders, public officials, and excavation businesses. This program will use multi-media channels (direct mail, e-mail, social networking, public service announcements, print advertisement, and public meetings, etc.) to engage these core audiences.

MVP's objective is to educate the public on how to recognize the presence of pipelines; understand the potential hazards and safe actions they should take; recognize and report abnormal conditions; and encourage the safe behavior of calling for buried facility location before digging.

### **11.3.5 One-Call Response**

When MVP receives notification from a one-call center that someone intends to dig near its pipeline facilities, personnel will be dispatched to mark the location of the facilities in the vicinity of proposed digging or other earth disturbance activities and, if necessary, company employees will be on-site when the excavation occurs.

### **11.3.6 Pipeline Safety Brochures**

MVP will mail information brochures to homeowners, businesses, potential excavators, and public officials along the pipeline system each year to inform them of the presence of the pipeline and instruct them on how to recognize and react to unusual activity in the area. These brochures will provide emergency contact phone numbers available 24 hours a day 7 days a week and reinforce the need for excavators to "call before you dig".

In addition to these outreach efforts, MVP will also provide pipeline location information in the National Pipeline Mapping System to inform the public and others as to the general location of our pipeline facilities.

### **11.3.7 Interactions with Federal Authorities**

MVP will maintain frequent contact with the PHMSA. PHMSA routinely exercises its oversight authority to ensure that facilities under its jurisdiction are safely designed, constructed, and operated. With regard to its role in public safety for natural gas pipelines:

- PHMSA develops regulations and other approaches to risk management to assure safety in design, construction, testing, operation, maintenance, and emergency response of pipeline facilities; and
- PHMSA administers a national regulatory program to assure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline. PHMSA will routinely inspect MVP's pipeline facilities and records for compliance with design, construction, testing, operations, maintenance, and integrity regulations.

MVP's procedures and practices will meet or exceed the pipeline safety regulations and related risk management requirements administered by the PHMSA.

### **11.3.8 Liaison Procedures with Local Authorities**

MVP's personnel involved with public awareness will ensure that appropriate liaisons and public education is established and maintained in the communities within which MVP operates. MVP will establish open relationships with local fire, police, and other governmental leaders in order to efficiently respond in a cooperative manner to pipeline emergencies. To accomplish this MVP, on an annual basis, will:

- Have informational meetings and training with local fire and police departments, and other concerned government agencies at their request;
- Conduct periodic emergency response drills and table top exercises to build familiarity with emergency response personnel and response measures to be taken; and
- Provide literature listing emergency contact phone numbers and other pertinent information.

In addition to maintaining contact with local governmental and emergency response agencies along the pipeline, MVP's liaison efforts will allow MVP to:

- Determine how local officials may be able to assist MVP during an emergency with the determination of jurisdiction and resources that may be involved in responding to an emergency;
- Familiarize local officials with how MVP responds to an emergency on its pipeline system;
- Verify notification preferences for pipeline emergencies; and
- Review with local officials the use of incident command system to cooperate and assist with response to an emergency.

Outreach to emergency responders will be conducted by MVP on a periodic basis. MVP's focus with these organizations is to review firefighting methods and techniques for natural gas fires and to conduct periodic emergency drills and exercises.

### **11.3.9 Utility Protection**

Prior to construction, existing utility lines and other sensitive resources, identified in easement agreements or by federal and state agencies, will be located and marked to prevent accidental damage during pipeline construction. MVP's contractors will contact the one-call system to verify and mark all utilities along the Project workspaces to minimize the potential for damage to other buried facilities in the area. Where there is a question as to the location of utilities (i.e. water, cable, oil, gas, product, and sewer lines), they will be located by field instrumentation and/or test pits.

### **11.3.10 Equipment Engineering and Design**

MVP's pipeline system will include many equipment features that are designed to increase the overall safety of the system and protect the public from a potential failure of the system due to accidents or natural catastrophes. Cathodic protection systems will be installed at various points along the pipeline to mitigate corrosion of the pipeline facilities. The cathodic protection system impresses a low voltage DC current to the pipeline to off-set natural soil and groundwater corrosion potential. The functional capability of cathodic protection systems will be inspected bi-monthly to ensure proper operating conditions for corrosion mitigation.

MVP's pipeline, including depth of cover, will be built according to USDOT PHMSA 49 CFR Part 192. Specific site conditions, including earthquakes, are considered in the design of the pipeline. In general, earthquake-induced ground vibrations would not pose a problem for a modern welded-steel pipeline.

MVP's proposed pipeline will be equipped with remote control valves, which will allow the valves to be operated remotely in the event of an emergency, usually evidenced by a sudden loss of pressure or flow on the pipeline. Remotely closing the valve allows the section of pipeline to be isolated from the rest of the pipeline system. Data acquisition systems will be installed at the metering and regulation stations as well as at sectionalizing block valves. If system pressures fall below predetermined ranges, alarms are activated alerting the pipeline operators.

### **11.3.11 Operations and Maintenance**

The pipeline control center for the Project will be staffed continuously by qualified pipeline operators. Operators will monitor all aspects of the pipeline including system pressures, temperatures, flows, and valve positions (open or closed). In case of an emergency at the pipeline control center, a secondary pipeline control center will be available at a second location.

The pipeline will be monitored for leaks continuously using the data acquisition system. Operators will use pressures, flows and rate of change alarms to monitor for leaks or other abnormal operating conditions. In the unlikely case that a shutdown of the pipeline system is needed, the MVP Pipeline system will be equipped with remotely controlled sectionalizing block valves to isolate the affected pipeline segment.

USDOT PHMSA 49 CFR Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the establishment of a written plan governing these activities. MVP will

develop an Operations & Maintenance (O&M) Manual for the facility during the construction phase and this O&M Manual will be in effect prior to initial filling of the pipeline system with natural gas. The O&M Manual will include contingency plans for maintaining service or reducing downtime.

MVP will have field services crews to perform USDOT PHMSA 49 CFR Part 192 required operations, maintenance and inspection tasks along the pipeline. All personnel will have the proper training and qualifications as required by Part 192.

### **11.3.12 Corrosion Control**

The MVP pipeline will have cathodic protection and will be closely monitored and maintained in compliance with USDOT PHMSA 49 CFR Part 192 and NACE International (National Association of Corrosion Engineers) recommended Practice RP-0169-96. The pipeline will have a high quality fusion-bonded epoxy coating systems which will be applied during the pipe manufacturing process. Girth welds will be sandblasted and coated with a field applied epoxy coating. Together, the combination of cathodic protection and fusion-bonded epoxy coating system provide excellent corrosion control.

In addition to the other measures, MVP will also inspect the pipeline using devices known in the industry as “smart pigs” every 7 years, or more frequently if the baseline integrity assessment requires. These devices run inside the pipe and provide indications of internal and external metal loss, deformation, ovalities, dent detection; valve, fitting and casing locations; pipe repairs; casing ovalities; and external metal objects in the vicinity of the pipeline.

## **11.4 REFERENCES**

FERC (Federal Energy Regulatory Commission). 2002. Guidance Manual for Environmental Report Preparation. August.

National Safety Council. 2014. Summary from Injury Facts, 2014 Edition.

USDOT PHMSA (U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration). 2015a. PHMSA Gas Integrity Management Glossary. <https://primis.phmsa.dot.gov/gasimp/fact.htm>. Accessed online March 16, 2015a.

USDOT PHMSA. 2015b. Gas Transmission Pipeline Incident 20 Year Trend. <https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages>. Accessed online March 16, 2015b.

USDOT PHMSA. 2015c. Gas Transmission Pipeline Miles. <http://www.phmsa.dot.gov/pipeline/library/data-stats>. Accessed online March 16, 2015c.



Mountain Valley Pipeline Project

Docket No. PF15-3

## **Resource Report 12 – PCB Contamination**

Draft

April 2015

## Mountain Valley Pipeline Project Resource Report 12 – PCB Contamination

<b>Resource Report 12 Filing Requirements</b>	
<b>Information</b>	<b>Location in Resource Report</b>
<b>Minimum Filing Requirements</b>	
1. For projects involving the replacement or abandonment of facilities determined to have PCBs, provide a statement that activities would comply with an approved EPA disposal permit or with the requirements of the TSCA. (§ 380.12(n)(1)).	Not Applicable
2. For compressor station modification on sites that have been determined to have soils contaminated with PCBs, describe the status of remediation efforts completed to date. (§ 380.12(n)(2))	Not Applicable





---

**RESOURCE REPORT 12  
PCB Contamination  
TABLE OF CONTENTS**

INTRODUCTION ..... 12-1  
ENVIRONMENTAL RESOURCE REPORT ORGANIZATION ..... 12-1  
12.1 PCBS..... 12-1  
12.2 REFERENCE..... 12-2

## RESOURCE REPORT 12 PCB Contamination

### LIST OF ACRONYMS AND ABBREVIATIONS

Agreement	Transmission Interconnect Agreement
Bcf/d	billion cubic feet per day
CERCLA	Comprehensive Environmental Response Compensation Liability Act
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
MVP	Mountain Valley Pipeline, LLC
PCBs	polychlorinated biphenyls
ppm	parts per million
Project	Mountain Valley Pipeline Project
Transco	Transcontinental Gas Pipe Line Company, LLC

## RESOURCE REPORT 12 PCB Contamination

### Introduction

Mountain Valley Pipeline, LLC (MVP), a joint venture between affiliates of EQT Corporation, NextEra Energy, Inc., WGL Holdings, Inc. and Vega Energy Partners, Ltd., is seeking a Certificate of Public Convenience and Necessity 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 16 counties in West Virginia and Virginia. MVP plans to construct an approximately 294.1-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, 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 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 proposed Project will require approximately 217,200 horsepower of compression at approximately four compressor stations along the route, as well as measurement, regulation, and other ancillary facilities required for the safe operation of the pipeline. The pipeline is designed to transport up to 2.0 billion cubic feet per day (Bcf/d) of natural gas. Resource Report 1 provides a complete summary of the Project facilities (see Tables 1.2-1 and 1.2-2) and a general location map of the Project facilities (Figure 1.2-1).

### Environmental Resource Report Organization

Resource Report 12 includes information concerning the potential presence and treatment of polychlorinated biphenyls (PCBs) and is prepared and organized according to the FERC *Guidance Manual for Environmental Report Preparation* (August 2002).

#### 12.1 PCBs

The Final Rule for Disposal of Polychlorinated Biphenyls (63 FR 35384) was issued on August 28, 1998. The U.S. Environmental Protection Agency (EPA) authorizes use of 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. Therefore, MVP will implement the following PCB procedures during construction of the Project.

Prior to making any interconnects with an existing pipeline system, MVP will enter into a Transmission Interconnect Agreement (Agreement). The Agreement will include an Environmental Responsibility clause that will address responsibility in the event that a hazardous substance (as defined in the Federal

Comprehensive Environmental Response Compensation Liability Act [CERCLA]), including PCBs, is encountered at the interconnect site.

If the process of completing pipeline interconnects results in the need for MVP to remove or abandon existing pipeline facilities (e.g., piping, valves, or fittings) that have the potential for PCB contamination, the work will be managed in accordance with EPA regulations in 40 CFR Part 761, which specifically address requirements for removal and abandonment. Removed pipe sections will be sampled for PCBs, and open ends will be sealed with plastic sheeting and tape. If removed facilities are found to be contaminated with PCBs above 50 ppm, the contaminated facilities will be managed in accordance with all applicable laws and regulations, either by cleaning to acceptable levels per federal regulations and sealed at both ends, or filled with grout or foam to 50 percent of the volume and sealed at both ends.

If PCB-contaminated soils are encountered during the process of completing pipeline interconnects, the soils will be managed in accordance with applicable federal and state regulations.

## **12.2 REFERENCE**

FERC (Federal Energy Regulatory Commission). 2002. Guidance Manual for Environmental Report Preparation. August.

Document Content(s)

PF15-3 - Cover letter for draft reports 5 11 and 12.PDF.....1-1

MVP\_RR5\_DRAFT\_04-10-15.PDF.....2-40

MVP Draft RR 11 041015.PDF.....41-62

MVP Draft RR 12\_041015.PDF.....63-68