

Mountain Valley Pipeline Project

Docket No. CP16-10-000

Attachment DR4 General 2a

**APPLICATION FOR TRANSPORTATION AND
 UTILITY SYSTEMS AND FACILITIES
 ON FEDERAL LANDS**

FORM APPROVED
 OMB Control Number: 0596-0082
 Expiration Date: 4/30/2017

FOR AGENCY USE ONLY

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

Application Number
Date Filed
3. Telephone (area code)
Applicant 412.395.3931
Authorized Agent 617.443.7565

1. Name and address of applicant (*include zip code*)

 Mountain Valley Pipeline, LLC
 Attn: Shawn Posey
 555 Southpointe Blvd., Suite 200
 Canonsburg, PA 15317

2. Name, title, and address of authorized agent if different from item 1 (*include zip code*)

 Tetra Tech, Inc.
 Attn: Sean Sparks, Project Manager
 160 Federal Street, 3rd Floor
 Boston, MA 02110

4. As applicant are you? (*check one*)
 a. Individual
 b. Corporation*
 c. Partnership/Association*
 d. State Government/State Agency
 e. Local Government
 f. Federal Agency
 * *If checked, complete supplemental page*

5. Specify what application is for: (*check one*)
 a. New authorization
 b. Renewing existing authorization No.
 c. Amend existing authorization No.
 d. Assign existing authorization No.
 e. Existing use for which no authorization has been received *
 f. Other*
 * *If checked, provide details under item 7*

6. If an individual, or partnership are you a citizen s) of the United States? Yes No

7. Project description (describe in detail): (a) Type of system or facility, (*e.g., canal, pipeline, road*); (b) related structures and facilities; (c) physical specifications (*Length, width, grading, etc.*); (d) term of years needed; (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction (*Attach additional sheets, if additional space is needed.*)

See Attachment A for a Project description, and a discussion regarding related structures, physical specification, years needed, expected time of use, volume of product to be transported, duration of construction, and work areas needed. Attachment B contains figures showing the proposed route crossing the Jefferson National Forest, the Weston and Gauley Bridge Turnpike Trail, and Burnsville Lake Flowage Easement.

8. Attach a map covering area and show location of project proposal: See Attachment B.

9. State or Local government approval: Attached Applied for Not Required

10. Nonreturnable application fee: Attached Not required

11. Does project cross international boundary or affect international waterways? Yes No (*if "yes," indicate on map*)

12. Give statement of your technical and financial capability to construct, operate, maintain, and terminate system for which authorization is being requested.

Mountain Valley's partnership has extensive experience building and operating natural gas pipelines and associated facilities. Through its Midstream subsidiaries and related companies, EQT owns and operates over 10,400 miles of natural gas pipeline in Pennsylvania, Kentucky, and West Virginia, providing Appalachian Basin producers with over 3 billion cubic feet per day (Bcf/d) of gathering and transmission capacity with interconnectivity into seven interstate pipelines and multiple distribution companies. EQT's fully integrated midstream engineering and design team has constructed over 1,200 miles of pipeline and installed over 150,000 horsepower (HP) since 2008 and continues to operate one of the largest suites of storage facilities in the Appalachian Basin.

13a. Describe other reasonable alternative routes and modes considered.

See Attachment A.

b. Why were these alternatives not selected?

See Attachment A.

c. Give explanation as to why it is necessary to cross Federal Lands.

There is no potential route to deliver gas from the Project's origination to its terminus without crossing federal lands. The pipeline route runs in a generally southwest direction while federal lands are southwest to northeast with no gaps that would allow for pipeline construction. See Attachment A for a discussion of alternatives.

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. (Specify number, date, code, or name)

Mountain Valley Pipeline, LLC is not aware of any pending applications which may provide information for the authorizing agency. Several projects that are similar facility types are proposing projects that cross U.S. Forest Service and U.S. Army Corps of Engineers lands; however, Mountain Valley Pipeline, LLC is not aware if they have filed an application at this time.

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance); (b) estimated cost of next best alternative; and (c) expected public benefits.

See Attachment A.

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

See Attachment A.

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

See Attachment A.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

See Attachment A.

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

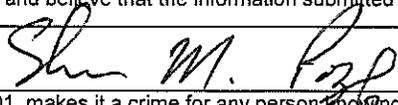
No Hazardous Materials will be used or stored during operation of the pipeline.

20. Name all the Department(s)/Agency(ies) where this application is being filed.

As the lead agency, this application will be filed with the Bureau of Land Management. However, this application will be sent to the U.S. Army Corps of Engineers and the U.S. Forest Service as the land managing agencies for the Project.

I HEREBY CERTIFY, That I am of legal age and authorized to do business in the State and that I have personally examined the information contained in the application and believe that the information submitted is correct to the best of my knowledge.

Signature of Applicant



Date

3-2-17

Title 18, U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

GENERAL INFORMATION
ALASKA NATIONAL INTEREST LANDS

This application will be used when applying for a right-of-way, permit, license, lease, or certificate for the use of Federal lands which lie within conservation system units and National Recreation or Conservation Areas as defined in the Alaska National Interest lands Conservation Act. Conservation system units include the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, and National Forest Monuments.

Transportation and utility systems and facility uses for which the application may be used are:

1. Canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other systems for the transportation of water.
2. Pipelines and other systems for the transportation of liquids other than water, including oil, natural gas, synthetic liquid and gaseous fuels, and any refined product produced therefrom.
3. Pipelines, slurry and emulsion systems, and conveyor belts for transportation of solid materials.
4. Systems for the transmission and distribution of electric energy.
5. Systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communications.
6. Improved right-of-way for snow machines, air cushion vehicles, and all-terrain vehicles.
7. Roads, highways, railroads, tunnels, tramways, airports, landing strips, docks, and other systems of general transportation.

This application must be filed simultaneously with each Federal department or agency requiring authorization to establish and operate your proposal.

In Alaska, the following agencies will help the applicant file an application and identify the other agencies the applicant should contact and possibly file with:

Department of Agriculture
Regional Forester, Forest Service (USFS)
Federal Office Building,
P.O. Box 21628
Juneau, Alaska 99802-1628
Telephone: (907) 586-7847 (or a local Forest Service Office)

Department of the Interior
Bureau of Indian Affairs (BIA)
Juneau Area Office
Federal Building Annex
9109 Mendenhall Mall Road, Suite 5
Juneau, Alaska 99802
Telephone: (907) 586-7177

Department of the Interior
Bureau of Land Management
222 West 7th Avenue
P.O. Box 13
Anchorage, Alaska 99513-7599
Telephone: (907) 271-5477 (or a local BLM Office)

U.S. Fish & Wildlife Service (FWS) Office of the Regional Director 1011 East Tudor Road Anchorage, Alaska 99503 Telephone: (907) 786-3440	National Park Service (NPA) Alaska Regional Office, 2225 Gambell St., Rm. 107 Anchorage, Alaska 99502-2892 Telephone: (907) 786-3440
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Note - Filings with any Interior agency may be filed with any office noted above or with the Office of the Secretary of the Interior, Regional Environmental Office, P.O. Box 120, 1675 C Street, Anchorage, Alaska 9513.

Department of Transportation
Federal Aviation Administration
Alaska Region AAL-4, 222 West 7th Ave., Box 14
Anchorage, Alaska 99513-7587
Telephone: (907) 271-5285

NOTE - The Department of Transportation has established the above central filing point for agencies within that Department. Affected agencies are: Federal Aviation Administration (FAA), Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA).

OTHER THAN ALASKA NATIONAL INTEREST LANDS

Use of this form is not limited to National Interest Conservation Lands of Alaska.

Individual department/agencies may authorize the use of this form by applicants for transportation and utility systems and facilities on other Federal lands outside those areas described above.

For proposals located outside of Alaska, applications will be filed at the local agency office or at a location specified by the responsible Federal agency.

SPECIFIC INSTRUCTIONS

(Items not listed are self-explanatory)

- 7 Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.
- 8 Generally, the map must show the section(s), township(s), and range(s) within which the project is to be located. Show the proposed location of the project on the map as accurately as possible. Some agencies require detailed survey maps. The responsible agency will provide additional instructions.
- 9, 10, and 12 The responsible agency will provide additional instructions.
- 13 Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.
- 14 The responsible agency will provide instructions.
- 15 Generally, a simple statement of the purpose of the proposal will be sufficient. However, major proposals located in critical or sensitive areas may require a full analysis with additional specific information. The responsible agency will provide additional instructions.
- 16 through 19 Providing this information in as much detail as possible will assist the Federal agency(ies) in processing the application and reaching a decision. When completing these items, you should use a sound judgment in furnishing relevant information. For example, if the project is not near a stream or other body of water, do not address this subject. The responsible agency will provide additional instructions.

Application must be signed by the applicant or applicants authorized representative.

EFFECT OF NOT PROVIDING INFORMATION: Disclosure of the information is voluntary. If all the information is not provided, the application may be rejected.

DATA COLLECTION STATEMENT

The Federal agencies collect this information from applicants requesting right-of-way, permit, license, lease, or certification for the use of Federal lands. The Federal agencies use this information to evaluate the applicants proposal. The public is obligated to submit this form if they wish to obtain permission to use Federal lands.

SUPPLEMENTAL

NOTE: The responsible agency(ies) will provide instructions	CHECK APPROPRIATE BLOCK	
	ATTACHED	FILED*
I - PRIVATE CORPORATIONS		
a. Articles of Incorporation	<input type="checkbox"/>	<input type="checkbox"/>
b. Corporation Bylaws	<input type="checkbox"/>	<input type="checkbox"/>
c. A certification from the State showing the corporation is in good standing and is entitled to operate within the State	<input type="checkbox"/>	<input type="checkbox"/>
d. Copy of resolution authorizing filing	<input type="checkbox"/>	<input type="checkbox"/>
e. The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.	<input type="checkbox"/>	<input type="checkbox"/>
f. If application is for an oil or gas pipeline, describe any related right-of-way or temporary use permit applications, and identify previous applications. Mountain Valley previously filed an SF-299 on April 5, 2016.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. If application is for an oil and gas pipeline, identify all Federal lands by agency impacted by proposal. Federal lands as defined by 30 USC Section 185 (b) that have been identified as being crossed by the Project include lands managed by: <ul style="list-style-type: none"> • U.S. Army Corps of Engineers (USACE), Weston and Gauley Bridge Turnpike Trail. • U.S. Forest Service (USFS): Portions of the Jefferson National Forest 	<input checked="" type="checkbox"/>	<input type="checkbox"/>
II - PUBLIC CORPORATIONS	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a. Copy of law forming corporation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Proof of organization	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Copy of Bylaws	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Copy of resolution authorizing filing	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
III - PARTNERSHIP OR OTHER UNINCORPORATED ENTITY	<input type="checkbox"/>	<input type="checkbox"/>
a. Articles of association, if any	<input type="checkbox"/>	<input type="checkbox"/>
b. If one partner is authorized to sign, resolution authorizing action is	<input type="checkbox"/>	<input type="checkbox"/>
c. Name and address of each participant, partner, association, or other	<input type="checkbox"/>	<input type="checkbox"/>
d. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	<input type="checkbox"/>	<input type="checkbox"/>

*If the required information is already filed with the agency processing this application and is current, check block entitled "Filed." Provide the file identification information (e.g., number, date, code, name). If not on file or current, attach the requested information.

Responses for a. through c. are provided in Attachment E.

NOTICES

Note: This applies to the Department of Agriculture/Forest Service (FS)

This information is needed by the Forest Service to evaluate the requests to use National Forest System lands and manage those lands to protect natural resources, administer the use, and ensure public health and safety. This information is required to obtain or retain a benefit. The authority for that requirement is provided by the Organic Act of 1897 and the Federal Land Policy and Management Act of 1976, which authorize the secretary of Agriculture to promulgate rules and regulations for authorizing and managing National Forest System lands. These statutes, along with the Term Permit Act, National Forest Ski Area Permit Act, Granger-Thye Act, Mineral Leasing Act, Alaska Term Permit Act, Act of September 3, 1954, Wilderness Act, National Forest Roads and Trails Act, Act of November 16, 1973, Archeological Resources Protection Act, and Alaska National Interest Lands Conservation Act, authorize the Secretary of Agriculture to issue authorizations or the use and occupancy of National Forest System lands. The Secretary of Agriculture's regulations at 36 CFR Part 251, Subpart B, establish procedures for issuing those authorizations.

BURDEN AND NONDISCRIMINATION STATEMENTS

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 8 hours hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U. S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an LQGLYLGX1301fp is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact 8617V TARGET Center at 202-720- 2600 (voice and TDD).*

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

Attachment A

Attachment A to Mountain Valley Pipeline, LLC's Form SF-299 Application

Mountain Valley Pipeline, LLC (Mountain Valley or MVP), a joint venture between EQT Midstream Partners, LP and affiliates of NextEra Energy, Inc., Con Edison Gas Midstream LLC, WGL Holdings, Inc., and RGC Midstream, LLC, 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 17 counties in West Virginia and Virginia. Mountain Valley plans to construct an approximately 303-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. Construction is anticipated to begin fourth quarter 2017 and conclude fourth quarter 2018.

The purpose of this application is to provide information to support an issuance of a Right-of-Way ("ROW") Grant pursuant to the Mineral Leasing Act of 1920 ("MLA") by the Bureau of Land Management (BLM) to allow operation of the Project proposed by Mountain Valley across approximately 60 feet of the Weston and Gauley Bridge Turnpike Trail in Braxton County, West Virginia, administered by the United States Army Corps of Engineers (USACE), and approximately 3.5 miles of the Jefferson National Forest (JNF), which is administered by the United States Forest Service (USFS). The MLA authorizes the BLM to grant a pipeline ROW when federal lands are under the jurisdiction of two or more federal agencies. See 30 U.S.C. § 185(a) and 42 C.F.R. § 2881.112. See Attachment B for figures showing the proposed crossing federal lands. Figures 1 and 2 show the proposed route through the JNF, and Figure 3 shows the Weston and Gauley Bridge Turnpike Trail crossing. Attachment C contains bore plans for facilities on these federal lands.

Additionally, the Project crosses a USACE flowage easement on private property in Braxton County, West Virginia. This crossing is approximately 80.6 feet in width. Although this property is not owned by USACE, it is anticipated that, due to the flowage easement, a consent agreement will be required with USACE to construct and operate the pipeline through the easement.

Responses to specific items in SF-299 Document

7. Project description (describe in detail): (a) Type of system or facility, (e.g., canal, pipeline, road); (b) related structures and facilities; (c) physical specifications (Length, width, grading, etc.); (d) term of years needed; (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction (Attach additional sheets, if additional space is needed.)

Project details for the locations within the JNF and across the Weston and Gauley Bridge Turnpike Trail are shown on the bore plans contained in Attachment C. These facilities are also described below:

(a) Type of facility: 42-inch-diameter natural gas pipeline

(b) Related structures and facilities: Mountain Valley plans to use the existing Pocahontas Road (FR #972) and Mystery Ridge Road (FR #11080) within the JNF during construction and operation of the

Project. Pocahontas Road is approximately 6.15 miles in length while Mystery Ridge Road is approximately 3.43 miles in length. Both roads will require improvements such as grading and expansion for the safe passage of construction vehicles. A discussion of anticipated road upgrades and improvements can be found in the Plan of Development and on the alignment sheets in Attachment C. Temporary facilities are discussed in subpart h (below). No aboveground ancillary facilities are proposed on the JNF or USACE-managed lands.

(c) Physical specifications: Mountain Valley will utilize the conventional bore technique bore under the Weston and Gauley Bridge Turnpike Trail. The bore pits will be outside of the USACE-owned approximate 60-foot right-of-way. No disturbance to the surface of the USACE-owned property is anticipated. A bore profile for the Weston and Gauley Bridge Turnpike Trail can be found in Attachment C.

The pipeline, in the JNF, will generally require a 125-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way. MVP will install the pipe via conventional bore under the Appalachian National Scenic Trail, leaving an approximate buffer of 307 feet on the north side and 273 feet on the south side, i.e., a 580-foot buffer around the ANST where tree clearing and land disturbance will not occur. The buffers on each side of the Appalachian National Scenic Trail (ANST) refer to the distance between the safety fence that will be installed in front of the bore pits and the ANST. These temporary safety fences will be installed approximately ten feet in front of each bore pit to provide for the safety of workers and visitors to the ANST during construction activities. The distance between the ANST and the edge of the bore pit to the north and the edge of the bore pit to the south are correctly identified as 283 feet and 317 feet, respectively, for a total of 600 feet. A bore profile for the Appalachian National Scenic Trail can be found in Attachment C.

Both of these crossings are discussed in more detail in the Plan of Development.

(d) Term of years needed: Mountain Valley currently has no plans for future expansion or abandonment of the facilities. Market forces will determine the timing and need for future expansions or abandonment. Mountain Valley will seek the appropriate authorizations from the BLM, FERC, USACE, and USFS, along with other federal and state agencies should facilities need to be expanded or abandoned.

(e) Time of year of use or operation: Year round.

(f) Volume or amount of product: Up to 2.0 million dekatherms per day (MMDth/d) of natural gas.

(g) Duration and timing of construction: Construction is anticipated to begin during the fourth quarter of 2017 with tree-clearing activities and conclude in the fourth quarter of 2018. Construction along the 3.5 miles in the JNF and the conventional boring of the pipeline under the Appalachian National Scenic Trail and the Weston and Gauley Bridge Turnpike Trail will be a much shorter duration within the year timeframe.

(h) Temporary work areas needed for construction on the JNF include four additional temporary work spaces (“ATWS”) totaling 0.80 acre. A fifth additional temporary extra work space is proposed partially on the JNF. Approximately 0.1 acre of that ATWS will impact USFS-managed lands.

No temporary work areas are needed for construction on USACE-managed lands associated with the Weston and Gauley Bridge Turnpike Trail crossing.

13a. Describe other reasonable alternative routes and modes considered.

The identification of alternative routes for the Project as a whole, and for specific Project segments for crossings of the Weston and Gauley Bridge Turnpike Trail and JNF, began with a detailed routing analysis performed in May 2014 that analyzed 94 corridor segments including 2,362 miles of potential pipeline routes that would move gas from Northern West Virginia to Transco Station 165 in Pittsylvania County, Virginia. After selection of the Proposed Route, Mountain Valley continued to identify and evaluate alternatives as issues were raised by stakeholders or located in the field. Two alternatives evaluated (Alternative 1 and Northern Alternative-ACP Collocation Alternative) would avoid crossing the Weston and Gauley Bridge Turnpike Trail and would include alternative crossing locations of the JNF. These are shown on Figure 13a-1 and described below. Mountain Valley identified a third major alternative that would avoid crossing USFS-managed lands entirely, a conceptual Forest Service Avoidance Alternative. This is also described below. Following the discussion of the system alternatives is a discussion of various route variations relevant to the crossing of federal lands that Mountain Valley also analyzed.

SYSTEM ALTERNATIVES

Route Alternative 1

Route Alternative 1 was considered to maximize collocation with existing rights-of-way. Alternative 1 would be collocated primarily with existing electric transmission lines for approximately 101 miles, or about 31 percent of its total length. As with the proposed route, Alternative 1 would begin at the proposed Webster Interconnect in Wetzel County, West Virginia and end at the Transco Station 165 in Pittsylvania County, Virginia. The pipeline could be installed as close as 25 feet away from powerline infrastructure, with temporary workspace located even closer, but other configurations would also be required based on soil type and working conditions where the pipeline would be located much further away from the powerline. For comparison, the October 2016 Proposed Route (revised December 2016) would be collocated with existing rights-of-way for 29 miles, or about 9 percent of its total length (See Table 1).

Alternative 1 crosses approximately one-half less distance of NRHP-designated or eligible Historic Districts and USFS lands (also including less USFS-designated old growth forest, roadless areas, and semi-primitive areas), as well as 898 acres less of interior forest in comparison to the October 2016 Proposed Route. However, Alternative 1 is approximately 20 miles longer and would disturb 336 more acres. The alternative crosses approximately 1,924 feet more of wetlands and 38 more perennial waterbodies compared to the October 2016 Proposed Route. Alternative 1 also crosses the New River twice, as well as Radford University Conservancy property, all of which is avoided by the October 2016 Proposed

Route. Additionally, Alternative 1 crosses about 51 more miles of steep slopes and 7 more miles of severe side slope, which would represent significant construction challenges including the need for extra workspaces to achieve a level working area and an increased risk of future slope instability following restoration. Given consideration of these factors, Alternative 1 does not offer a significant environmental advantage when compared to the corresponding October 2016 Proposed Route.

Table 1
(February 2017)

Comparison of Route Alternative 1 and the Proposed Route

Feature	Route Alternative 1	Proposed Route
General		
Total length (miles)	323.8	303.4
Length adjacent to existing right-of-way (miles)	101.0	29.4
Land disturbed within construction right-of-way (acres) <u>a/</u>	4,892	4,556
Federal Lands and Federally Managed Areas		
National Forest System lands crossed (miles)	1.6	3.5
National Forest Wilderness crossed (miles)	0.0	0.0
Appalachian National Scenic Trail crossings (number)	1	1
Blue Ridge Parkway crossings (number)	1	1
National Forest – US Forest Service-designated old growth forest crossed (feet)	0	1,710
National Forest – US Forest Service-designated old growth forest affected by constr. (acres)	0	4.9
National Forest – trails crossed (number)	15	2
National Forest – inventoried roadless areas crossed (feet)	0	5,030
National Forest – inventoried semi-primitive areas crossed (feet)	8,660	14,170
NRHP designated or eligible historic districts crossed (miles)	5.0	10.0
Human Environment		
Populated areas within 0.5 mile (number) <u>b/</u>	11	8
Landowner parcels crossed (number)	1,424 <u>c/</u>	1,334
Residences within 50 feet of construction workspace (number)	65	66
Resources		
Forested land crossed (miles)	237.6	248.7
Forested land affected during construction (acres)	3,608.7	3,771.9
Forested land affected during operation (acres)	1,441.2	1,507.1
Interior forest crossed (acres)	1,565.2	2,463.6
Wetlands (NWI) crossed (feet) <u>d/</u>	5,525	3,601
Forested wetlands crossed (feet) <u>d/</u>	1,657	1,721
Forested wetlands affected by construction (acres)	2.9	3.0
Forested wetlands affected by operation (acres)	1.9	2.0
Perennial waterbody crossings (number) <u>d/</u>	133	95
Major (>100 feet) waterbodies crossed	7	5
New River crossings (number)	2	0
Shallow bedrock crossed (miles)	217.3	216.4
Steep slope (>20 percent) crossed (miles)	171.4	128.6
Side slope crossed (miles)	165.1	158.2
Landslide potential crossed (miles)	232.2	225.6
Karst area crossed (miles)	56.2	41.7
<u>a/</u> Assuming 125-foot-wide construction right-of-way. <u>b/</u> City or town limits as shown in Environmental Systems Research Institute (ESRI) data. <u>c/</u> Estimated assuming similar size and number of landowner parcels would be crossed by the alternative as those crossed by the corresponding segment of Proposed Route. <u>d/</u> National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD) data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative.		

Northern Alternative – ACP Collocation Alternative

The Northern Pipeline – ACP Collocation Alternative was developed to evaluate a pipeline route that would be collocated with the proposed Atlantic Coast Pipeline (ACP) Project. This alternative has also been called the “two pipelines – one route” alternative. The Northern Pipeline Alternative – ACP Collocation Alternative would involve the installation of a 42-inch-diameter pipeline for the Project adjacent to the pipeline proposed for the ACP Project. Conceptually, this alternative would begin at about milepost (MP) 37 of the October 2016 Proposed Route where it would begin paralleling the proposed ACP at its point of origin. The alternative would then generally be routed parallel to the proposed ACP for about 191 miles in a southeasterly direction before intersecting the existing Transco pipeline. Then it would generally parallel the Transco pipeline corridor to the southwest for about 60 miles to reach Transco Station 165.

The alternative does provide some benefits (See Table 2). Specifically, there would be more collocation with existing and proposed (principally the ACP Project) rights-of-way and less impacts to interior forest (approximately 460 less acres), USFS-designated old growth forest, roadless areas, and semi-primitive areas than the October 2016 Proposed Route. However, the Northern Pipeline – ACP Collocation Alternative would cross more National Forest System lands (approximately 16 more miles) than the corresponding segment of the October 2016 Proposed Route. Both routes are fairly comparable in overall length and land disturbance (the Northern Pipeline – ACP Collocation Alternative would be approximately 7 miles longer and would disturb about 100 acres more during construction than the corresponding segment of the October 2016 Proposed Route). The Northern Pipeline – ACP Collocation Alternative would cross 36 more perennial waterbodies, 9 more major waterbodies, and approximately 1,400 feet more wetlands (including approximately 1,250 feet more forested wetlands), than the corresponding segment of the October 2016 Proposed Route.

However, the major disadvantage of the Northern Pipeline – ACP Collocation Alternative route is the necessity to construct two parallel pipelines along approximately 191 miles of the ACP route, much of which presents significant constructability issues related to topography and space. Based on review of data, aerial photography, and topography, in many areas such as in Lewis and Upshur counties, West Virginia and Augusta and Nelson counties, Virginia, there is insufficient space along the narrow ridgelines to accommodate two parallel 42-inch-diameter parallel pipelines. The amount of right-of-way necessary to construct the two pipelines would be considerable, given the amount space needed to safely accommodate equipment and personnel, as well as spoil storage. The constructability issues alone render this alternative technically infeasible. Also, because the resource impacts for the proposed route and the alternative are similar, the alternative does not provide a significant environmental advantage.

TABLE 2
(February 2017)

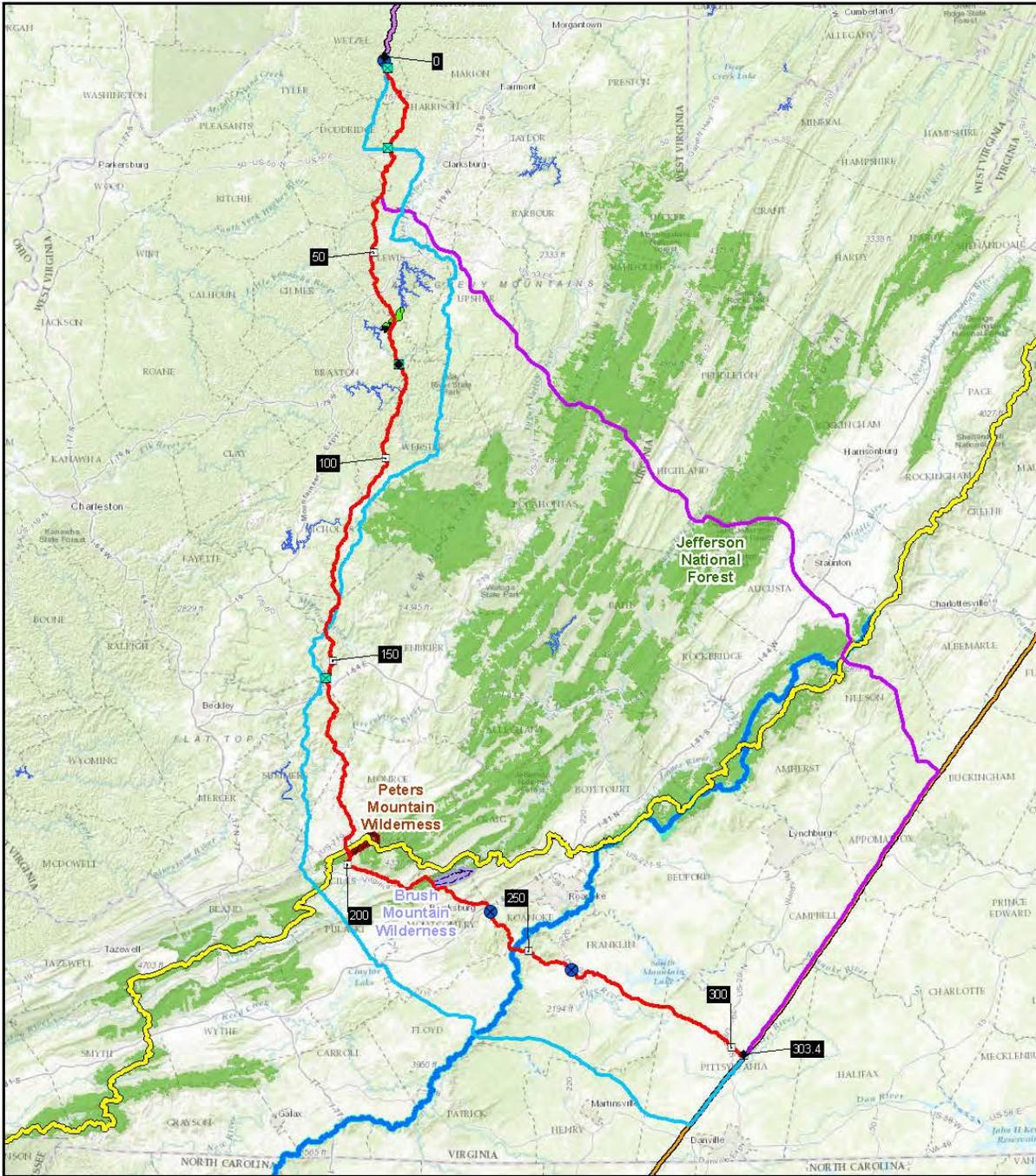
Comparison of the Northern Pipeline Alternative and the Proposed Route

Feature	Northern Pipeline – ACP Collocation Alternative	Proposed Route
General		
Total length (miles)	273.5	267.1
Length adjacent to existing right-of-way (miles)	77.3	25.4
Land disturbed within construction right-of-way (acres) <u>a/</u>	4,144.3	4,043.8
Federal Lands and Federally Managed Areas		
National Forest System lands crossed – Total (miles)	19.1	3.5
Monongahela National Forest (miles)	5.5	0.0
George Washington and Jefferson National Forests	13.6	3.5
National Forest Wilderness crossed (miles)	0.0	0.0
Appalachian National Scenic Trail crossings (number)	1	1
Blue Ridge Parkway crossings (number)	1	1
National Forest – US Forest Service-designated old growth forest crossed (feet)	0	1,710
National Forest – US Forest Service-designated old growth forest affected by constr. (acres)	0	4.9
National Forest – trails crossed (number)	5	2
National Forest – inventoried roadless areas crossed (feet)	0	5,030
National Forest – inventoried semi-primitive areas crossed (feet)	0	14,170
NRHP designated or eligible historic districts crossed (miles)	0.0	10.0
Human Environment		
Populated areas within 0.5 mile (number) <u>b/</u>	9	7
Landowner parcels crossed (number)	1,160 <u>c/</u>	1,132
Residences within 50 feet of construction workspace (number)	47	44
Resources		
Forested land affected during construction (acres)	2,794.8	3,256.9
Forested land affected during operation (acres)	1,117.2	1,301.0
Interior forest crossed (acres)	1,616.2	2,064.5
Wetlands (NWI) crossed (feet) <u>d/</u>	4,941	3,529
Forested wetlands crossed (feet) <u>d/</u>	2,977	1,721
Forested wetlands affected by construction (acres)	5.1	3.0
Forested wetlands affected by operation (acres)	3.4	2.0
Perennial waterbody crossings (number) <u>d/</u>	120	84
Major (> 100 feet) waterbodies crossed	14	5
Karst area crossed (miles)	51.2	41.8

**TABLE 2
(February 2017)**

Comparison of the Northern Pipeline Alternative and the Proposed Route

Feature	Northern Pipeline – ACP Collocation Alternative	Proposed Route
<p><u>a/</u> Assuming a 125-foot-wide construction right-of-way.</p> <p><u>b/</u> City or town limits as shown in ESRI data.</p> <p><u>c/</u> Estimated assuming similar size and number of landowner parcels would be crossed by the alternative as those crossed by the corresponding segment of proposed route.</p> <p><u>d/</u> NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative.</p>		



<p>Mountain Valley Pipeline Project</p> <p>NAD 1983 UTM 17N 1:1,625,000</p> <p>0 25 50 Miles</p>		
<p>Figure 13a-1 Alternative 1 and Northern Pipeline-ACP Collocation Alternatives</p> <p>February 2017</p> <p>Data Sources: ESRI Streaming Data, 2014, Ventyx 2014.</p>	<p>Legend</p> <ul style="list-style-type: none"> ◆ Proposed Interconnect ■ Proposed Compressor Station Location ● Proposed Tap Location □ Milepost — October 2016 Proposed Route — Alternative 1 — Northern Pipeline - ACP Collocation Alternative — Existing Equitrans H-302 Line — Existing Transco Pipeline — Weston Gauley Turnpike Trail — Appalachian National Scenic Trail — Blue Ridge Parkway — Army Corps of Engineers Reservoir — Peters Mountain Wilderness — Brush Mountain Wilderness — US National Forest Service Lands — National Park Service Blue Ridge Parkway 	

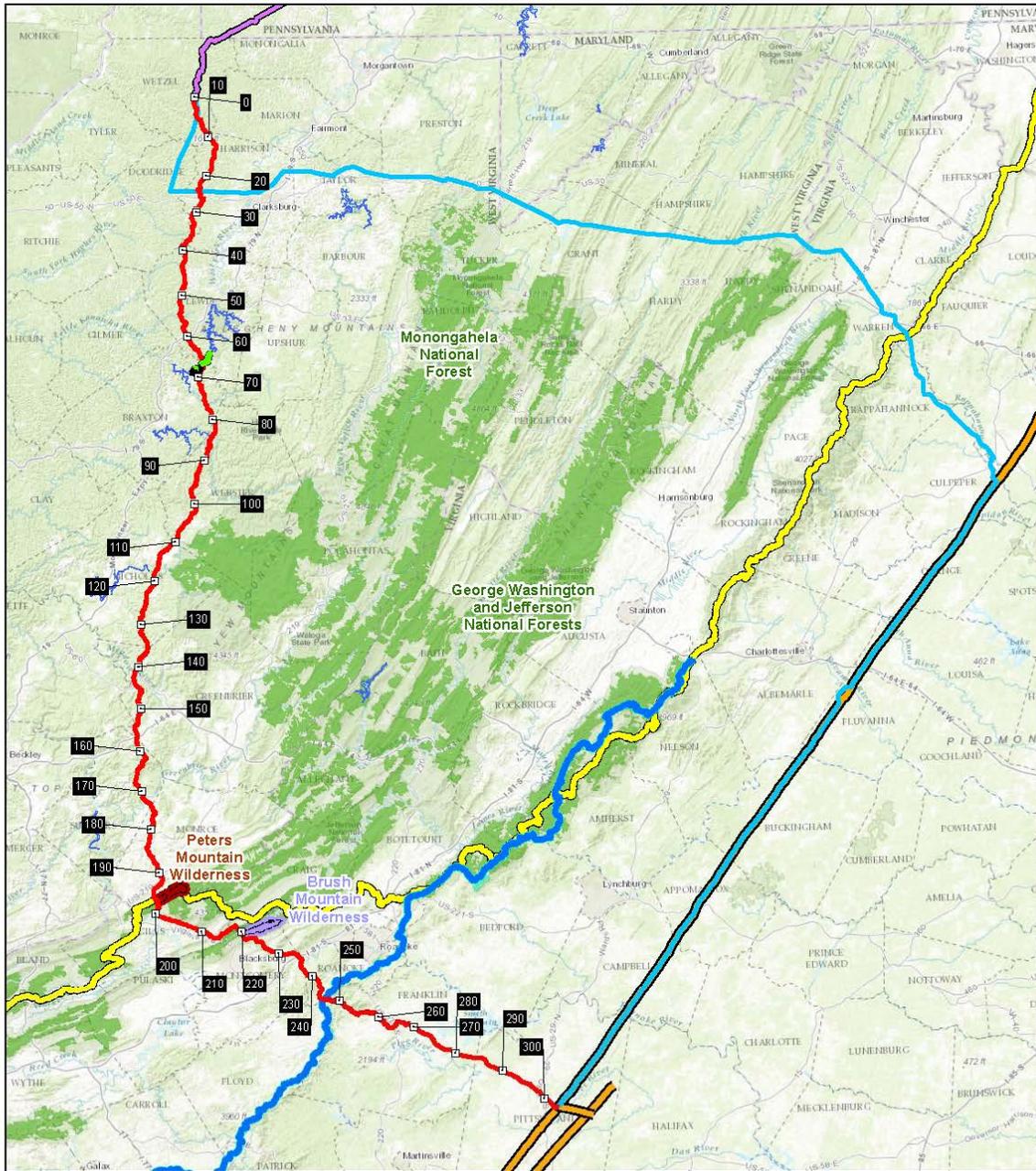
Conceptual Forest Service Avoidance Alternative

On April 8, 2016, Mountain Valley submitted information to the JNF that identified a conceptual route alternative that would entirely avoid any crossing of National Forest System Lands (see Figure 13a-2). The conceptual route would add approximately 50 miles of additional pipeline and approximately 740 additional acres of impact during construction (See Table 3), nearly all of which would be on private lands. In addition, the conceptual route would include approximately 11 additional large waterbody crossings and 15,000 feet of wetland crossings, including approximately 6,000 feet of forested wetlands. Mountain Valley must consider the route that has the least environmental and human impact as possible. By crossing less than 4 miles of the JNF, Mountain Valley has reduced the impact to private landowners to the greatest extent practicable and reduced the overall environmental impact while meeting the purpose and need of the Project.

Table 3 (February 2017)		
Comparison of a Conceptual Forest Service Avoidance Route and the Proposed Route		
Feature	Conceptual Forest Service Avoidance Route	Proposed Route
General		
Total length (miles)	351	303.0
Length adjacent to existing ROW (miles)	332	22
Land disturbed within construction ROW (acres) <u>a/</u>	5,301	4,556
Land Use		
Populated areas <u>b/</u> within ½ mile (number)	31	8
National Forest System lands crossed (miles)	0	3.4
National Forest Wilderness crossed (miles)	0	0
Appalachian National Scenic Trail crossings (number)	1	1
Blue Ridge Parkway crossings (number)	0	1
NRHP designated or eligible historic districts crossed (miles)	0.1	10.1
Landowner parcels crossed (number)	1,743 <u>c/</u>	1,495
Residences within 50 feet of construction work space (number)	168	63
Resources		
Forested land crossed (miles)	206.0	245.2
Forested land affected during construction (acres)	3,121.2	3,720.0
Forested land affected during operation (acres)	1,248.5	1,486.0
Interior forest crossed (miles)	41.1	129.8
Wetlands (NWI) crossed (feet) <u>d/</u>	18,918	3,299
Forested wetlands crossed (feet) <u>d</u>	7,761	1,721
Forested wetlands affected by construction (acres)	13.4	3.0
Forested wetlands affected by operation (acres)	8.9	2.0
Perennial waterbody crossings (number) <u>d/</u>	206	97

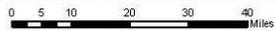
**Table 3
(February 2017)**

Comparison of a Conceptual Forest Service Avoidance Route and the Proposed Route		
Feature	Conceptual Forest Service Avoidance Route	Proposed Route
Major (> 100 feet) waterbodies crossed (number)	16	5
Shallow bedrock crossed (miles) <u>e/</u>	80.9	214.9
Steep slope (>20 percent) crossed (miles)	86.3	120.0
Side slope crossed (miles)	133.8	122.8
Landslide potential crossed (miles) <u>f/</u>	249.2	199.7
Karst area crossed (miles)	98.5	53.3
<p><u>a/</u> Assuming 125-foot-wide construction ROW. <u>b/</u> City or town limits as shown in Environmental Systems Research Institute (ESRI) data. <u>c/</u> estimated assuming similar size and number of landowner parcels would be crossed by the alternative as those crossed by the corresponding segment of Proposed Route. Does not account for fact that number of parcels crossed would be greatly reduced if alternative were constructed entirely within highway rights-of-way. <u>d/</u> NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative. Public data on waters with drinking water designation not available. <u>e/</u> Based on data available for only about 68 percent of the route. <u>f/</u> areas mapped as High Incidence and/or High Susceptibility from Radbruch-Hall et. al 1982.</p> <p>ROW = right-of-way NRHP = National Register of Historic Places NHD = U.S. Geological Survey National Hydrography Dataset NWI = U.S. Fish and Wildlife Service National Wetland Inventory</p>		



Mountain Valley Pipeline

NAD 1983 UTM 17N 1:1,600,000



- Legend**
- Milepost
 - Weston Gauley Tumpke Trail
 - October 2016 Proposed Route Revised December 2016
 - Conceptual Forest Service Avoidance Route
 - Existing Equitrans H-302 Line
 - Existing Transco Pipeline
 - Peters Mountain Wilderness
 - Brush Mountain Wilderness
 - Blue Ridge Parkway
 - Appalachian National Scenic Trail
 - Army Corps of Engineers Reservoir
 - U.S. Forest Service (National Forest) Lands
 - Blue Ridge Parkway National Park Boundary

Figure 13a-2
Conceptual Forest Service
Avoidance Route

April 2016
(Revised February 2017)

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



Route Variations

Burnsville Lake Wildlife Management Area Variation

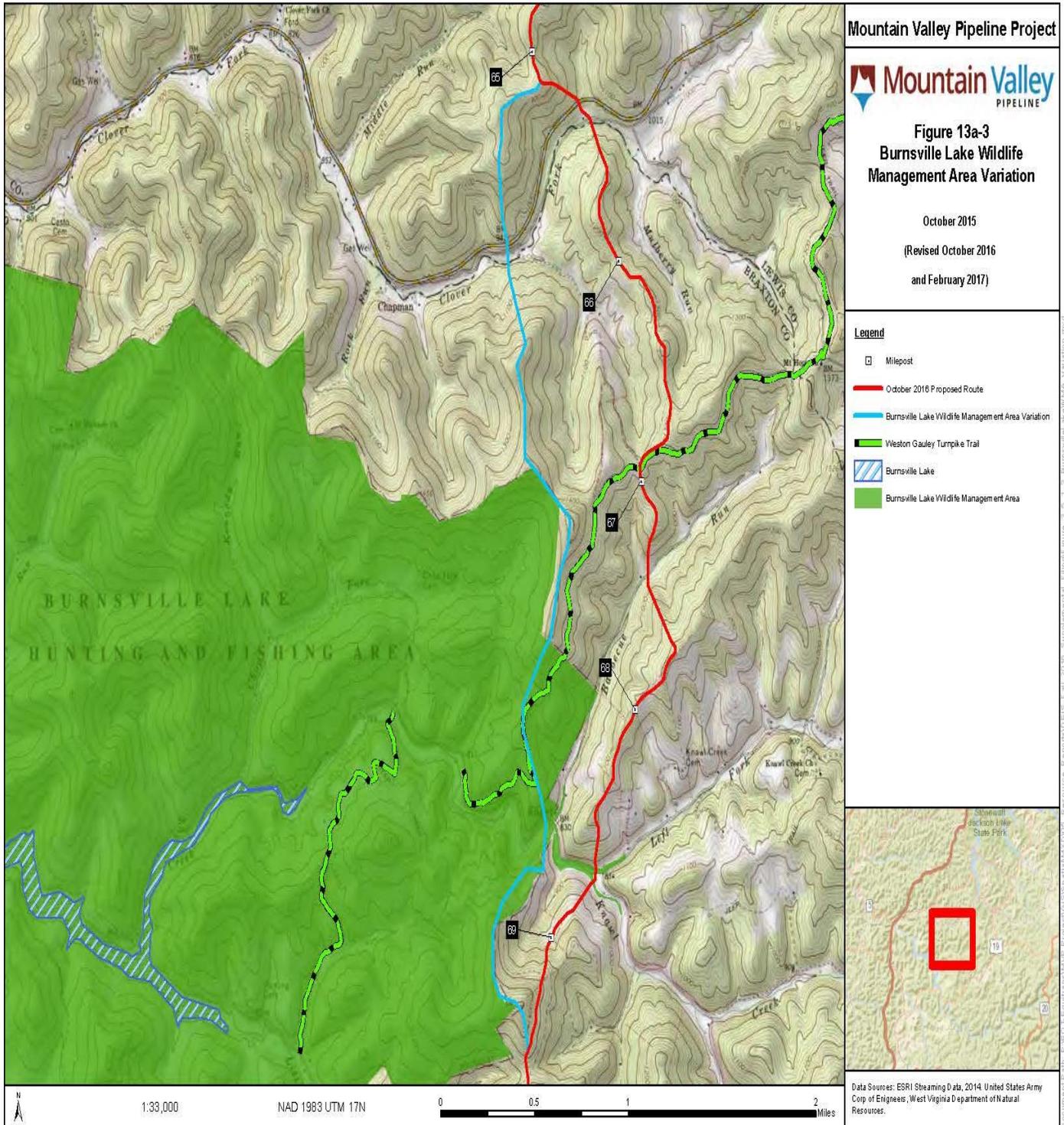
The Burnsville Lake Wildlife Management Area Variation would include an alternative crossing location of the Weston and Gauley Bridge Turnpike Trail. Mountain Valley initially identified this variation as the original route through the Burnsville Lake Wildlife Management Area (WMA) in Braxton County, West Virginia. In its October 2015 application to the FERC, Mountain Valley revised the originally considered route in this area in order to avoid the Burnsville Lake WMA. The Burnsville Lake WMA Variation would begin at MP 65.3, would turn southwest from the proposed route for approximately 0.2 mile, would then turn south for about 3.5 miles, would cross the eastern portion of the Burnsville Lake WMA, and would rejoin the proposed route at MP 69.6 (see Figure 13a-3).

The Burnsville Lake WMA Variation would be about 0.2 mile shorter than the comparable segment of the proposed route (See Table 4), disturb less land, affect fewer parcels, and cross one fewer perennial waterbody. The variation would affect the same amount of forest but cross more steep terrain. The variation would cross 1.8 miles of the Burnsville Lake WMA, while the October 2016 Proposed Route would avoid this WMA. Because the Burnsville Lake WMA Variation would affect high-quality habitat managed by the WVDNR, it would not offer significant environmental advantages over the corresponding segment of proposed route.

Table 4
(February 2017)

Comparison of the Burnsville Lake Wildlife Management Area Variation and the Proposed Route

Feature	Burnsville Lake WMA Variation	Proposed Route
General		
Total length (miles)	4.1	4.3
Length adjacent to existing right-of-way (miles)	0.0	0.0
Land disturbed within construction right-of-way (acres) <u>a/</u>	61.7	65.2
Land Use		
Populated areas within 0.5 mile (number) <u>b/</u>	0	0
National Forest System lands crossed (miles)	0.0	0.0
National Forest Wilderness crossed (miles)	0.0	0.0
Appalachian National Scenic Trail crossings (number)	0	0
Blue Ridge Parkway crossings (number)	0	0
NRHP designated or eligible historic districts crossed (miles)	0.0	0.0
Landowner parcels crossed (number)	15	20
Residences within 50 feet of construction workspace (number)	0	0
WMA lands crossed (miles)	1.8	0.0
Resources		
Forested land crossed (miles)	4.0	4.0
Forested land affected during construction (acres)	61.1	60.9
Forested land affected during operation (acres)	24.5	24.3
Interior forest crossed (acres)	56.1	48.5
Wetlands (NWI) crossed (feet) <u>c/</u>	0	0
Forested wetlands crossed (feet)	0	0
Forested wetlands affected by construction (acres)	0.0	0.0
Forested wetlands affected by operation (acres)	0.0	0.0
Perennial waterbody crossings (number)	2	3
Major (> 100 feet) waterbodies crossed	0	0
Shallow bedrock crossed (miles)	4.0	3.9
Steep slope (>20 percent) crossed (miles)	2.9	2.2
Side slope crossed (miles)	2.8	2.7
Landslide potential crossed (miles)	4.1	4.3
Karst area crossed (miles)	0.0	0.0
<u>a/</u> Assuming 125-foot-wide construction right-of-way. <u>b/</u> City or town limits as shown in ESRI data. <u>c/</u> NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative.		



Burnsville Weston Gauley Alternative

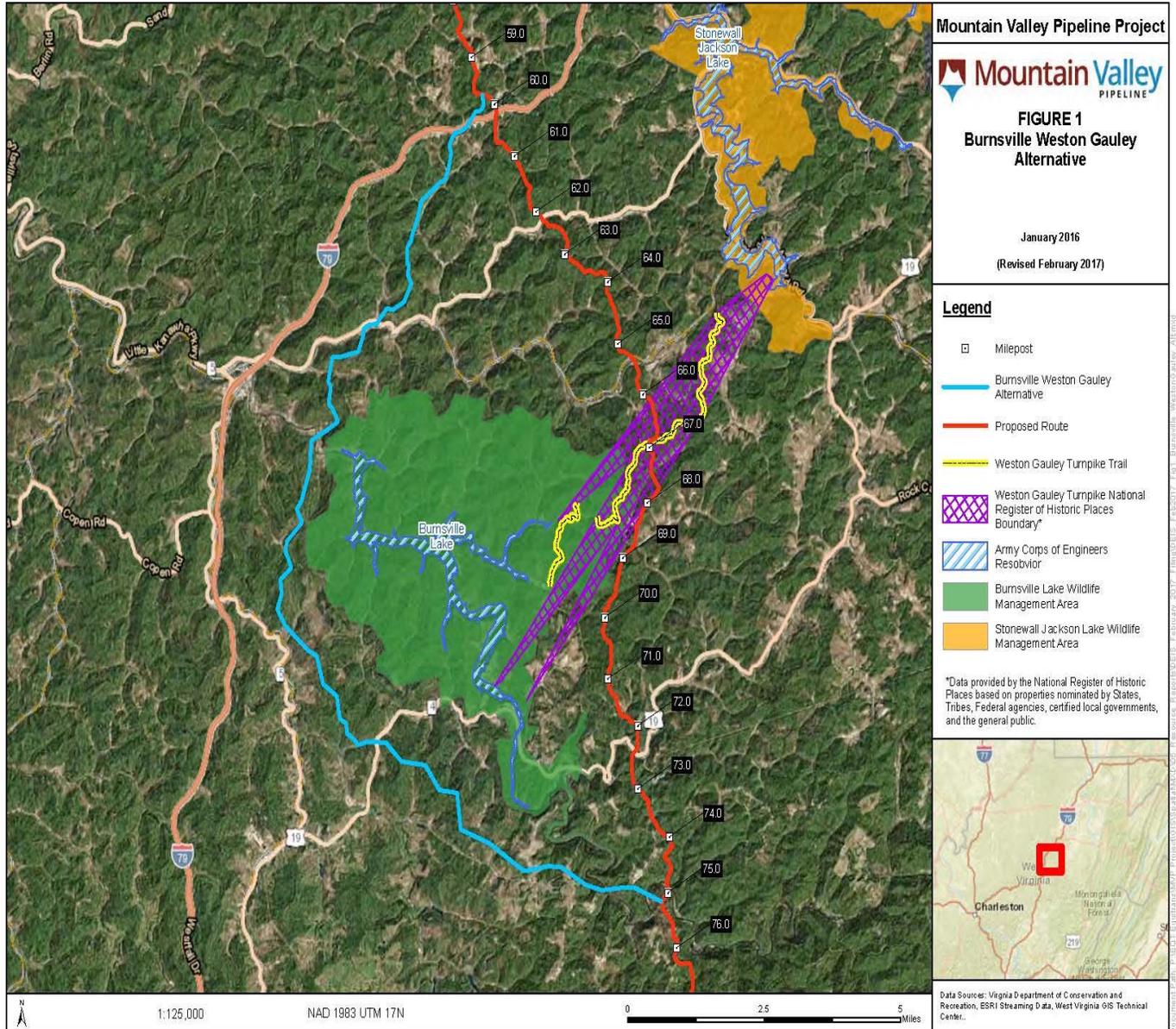
Burnsville Weston Gauley Alternative, deviates from the proposed route alignment approximately 2 miles southeast of the Burnsville Lake WMA and continues west around the western boundary of the Burnsville Lake WMA and Weston and Gauley Bridge Turnpike Trail and converges with the proposed route alignment just north of I-79 (See Figure13a-3.5). This alternative is approximately 19.2 miles long and would parallel an existing natural gas gathering pipeline for approximately 6 miles.

This proposed route was selected because it was the most direct route to get from the origination of the Project to its terminus. The proposed route was also selected due to constructability of the pipeline and constraints identified along the proposed route paralleling the natural gas pipeline. The proposed route is also 3.7 miles shorter than the Burnsville Weston Gauley alternative and would disturb approximately 57 less acres. The Burnsville Weston Gauley Alternative would cross more private landowners, be closer to three additional homes, impact more forested land, and cross more steep slope and landslide prone areas. Other crossing locations, including the Weston and Gauley Bridge Turnpike Trail and the Burnsville Weston Gauley alternatives, were evaluated and found prohibitive due to the steep terrain, previously existing utilities, other environmental concerns and proximity to residences and/or populated areas. In addition, the Interstate 79 cannot be crossed at this location due to United States Department of Transportation controlled access and fill placed to support the Interstate.

Figure 5
(February 2017)

Comparison of the Burnsville Weston Gauley Alternative and the Proposed Route

Feature	Burnsville Weston Gauley Alternative	Proposed Route
General		
Total length (miles)	19.2	15.5
Length adjacent to existing right-of-way (miles)	3.7	0.3
Land disturbed within construction right-of-way (acres) <u>a/</u>	290.7	233.9
Federal Lands and Federally Managed Areas		
U.S. Army Corp of Engineers lands crossed (feet)	0	60
National Forest System lands crossed (feet)	0	0
NRHP designated or eligible historic districts crossed (miles)	0	1.8
Human Environment		
Populated areas within 0.5 mile (number) <u>b/</u>	0	0
Landowner parcels crossed (number)	109	65
Residences within 50 feet of construction workspace (number)	4	1
Resources		
Forested land affected during construction (acres)	269.7	222.1
Forested land affected during operation (acres)	108.1	88.9
Interior forest affected during construction (acres)	179.0	185.1
Wetlands (NWI) crossed (feet) <u>d/</u>	0	0
Forested wetlands crossed (feet) <u>d/</u>	0	0
Forested wetlands affected by construction (acres)	0	0
Forested wetlands affected by operation (acres)	0	0
Perennial waterbody crossings (number) <u>d/</u>	4	5
Major (> 100 feet) waterbodies crossed	0	0
Steep Slope (miles)	15.2	8.2
Landslide Potential (miles)	19.2	15.5
Karst area crossed (miles)	0	0
Notes: <u>a/</u> Assuming a 125-foot-wide construction right-of-way. <u>b/</u> City or town limits as shown in ESRI data. <u>c/</u> Estimated assuming similar size and number of landowner parcels would be crossed by the alternative as those crossed by the corresponding segment of proposed route. <u>d/</u> NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative.		



Variation 110, Variation 110J, Variation 110R

Variation 110 and modifications to this variation called Variation 110R and Variation 110J were developed by Mountain Valley as alternatives that include different crossing locations of the Appalachian National Scenic Trail (ANST) and JNF (see Figure 13a-4). Additionally, these variations would avoid specific resources and areas of concern raised by stakeholders. Some of the concerns that Mountain Valley sought to avoid through exploration of Variations 110, 110R, and 110J included:

- karst terrain in the Pembroke and Newport areas;
- mapped caves (including Pig Hole Cave, Smoke Hole Cave, and Tawney Cave);
- the Greater Newport Rural Historic District and North Fork Valley Rural Historic District;
- the Nature Conservancy's Blake Preserve;
- the Mercer Angler's Club;
- the Red Sulfur Public Utility District watershed;
- Big Stony Creek Road (Virginia Scenic Byway); and
- Peters Mountain and Mountain Lake Wilderness Areas.

Variation 110 is about 43.4 miles long. It would leave the proposed route at about MP 176 turning east-southeast passing south of Swoopes Knob, going between Little Mountain and Gap Mountain. It would then cross over Peters Mountain to near Waiteville, West Virginia, through the JNF over John Creek Mountain, Sinking Creek Mountain, and Brush Mountain. It would then cross the Brush Mountain Wilderness Area and the North Fork of the Roanoke River before rejoining the proposed route at about MP 227.5 near I-81, west of Elliston, Virginia.

Variation 110J is about 49.5 miles long and was considered as a modification to Variation 110 to avoid crossing the Brush Mountain Wilderness Area. This variation would leave Variation 110 on the east side of John Creek Mountain, heading northeast, cross State Route 42 (Cumberland Gap Turnpike), and would eventually rejoin Variation 110 on the east side of Brush Mountain. Variation 110J would avoid the Brush Mountain Wilderness.

Variation 110R is about 44.3 miles long and was considered as a modification to Variation 110 to avoid crossing the Brush Mountain Wilderness Area. It would leave Variation 110 at the same place as Variation 110J, but would generally parallel Variation 110, with a jog to the east through a break in the Brush Mountain and Brush Mountain East Wilderness Areas, before rejoining Variation 110 at the same terminus as Variation 110J.

During scoping for the EIS, stakeholders commented on potential impacts from these alternatives, including potential impacts on Brush Mountain East Wilderness, 6C-Old Growth and 8C-Black Bear Habitat management prescription areas on the JNF, the ANST near the Dragon Tooth, cultural attachment, and a federally listed endangered aquatic mussel, the James spiny mussel.

In a letter to FERC dated April 6, 2015, the Virginia Department of Conservation and Recreation (VDCR) provided comments on Variation 110, stating the alternative would cross the Mudlick Branch Woodland

Conservation Site, which has a very high biodiversity ranking (B2). The alternative would also cross the Craig Creek-Johns Creek Stream Conservation Unit, which is ranked as having outstanding biodiversity (B1). Species that inhabit streams in the unit include yellow lance, the state-listed Atlantic pigtoe, the state-listed orangefin madtom, and the federally endangered James spiny mussel. The 110 would cross the Fort Lewis Mountain Slopes Conservation Site, with a biodiversity ranking of B5 (of general biodiversity significance), which contains common snowberry. Additionally, alternative 110 would cross the Sinking Mountain Conservation Site, which has a biodiversity significance ranking of B2, containing Central Appalachian Montane Oak-Hickory Forest and Central Appalachian Xeric Chestnut Oak-Virginia Pine Woodland Forest. The alternative would cross the Lynn Hollow Conservation Site, with a biodiversity ranking of B2, containing box huckleberry.

The VDCR indicated that Alternative 110J would cross the Sinking Creek Mountain Conservation Site, as well as the Trout Creek Barren and Pickles Branch conservation sites. The Trout Creek Barren Conservation Site has a biodiversity ranking of B3 (high significance) and contains the Central Appalachian Xeric Shale Woodland (Chestnut Oak, Mixed Herbs Type). The Pickles Branch Conservation Site has a biodiversity ranking of B4 (moderate significance). Finally, The VDCR indicated that Alternative 110R would cross the Sugar Bottom Hollow Conservation Site, which has a biodiversity ranking of B3.

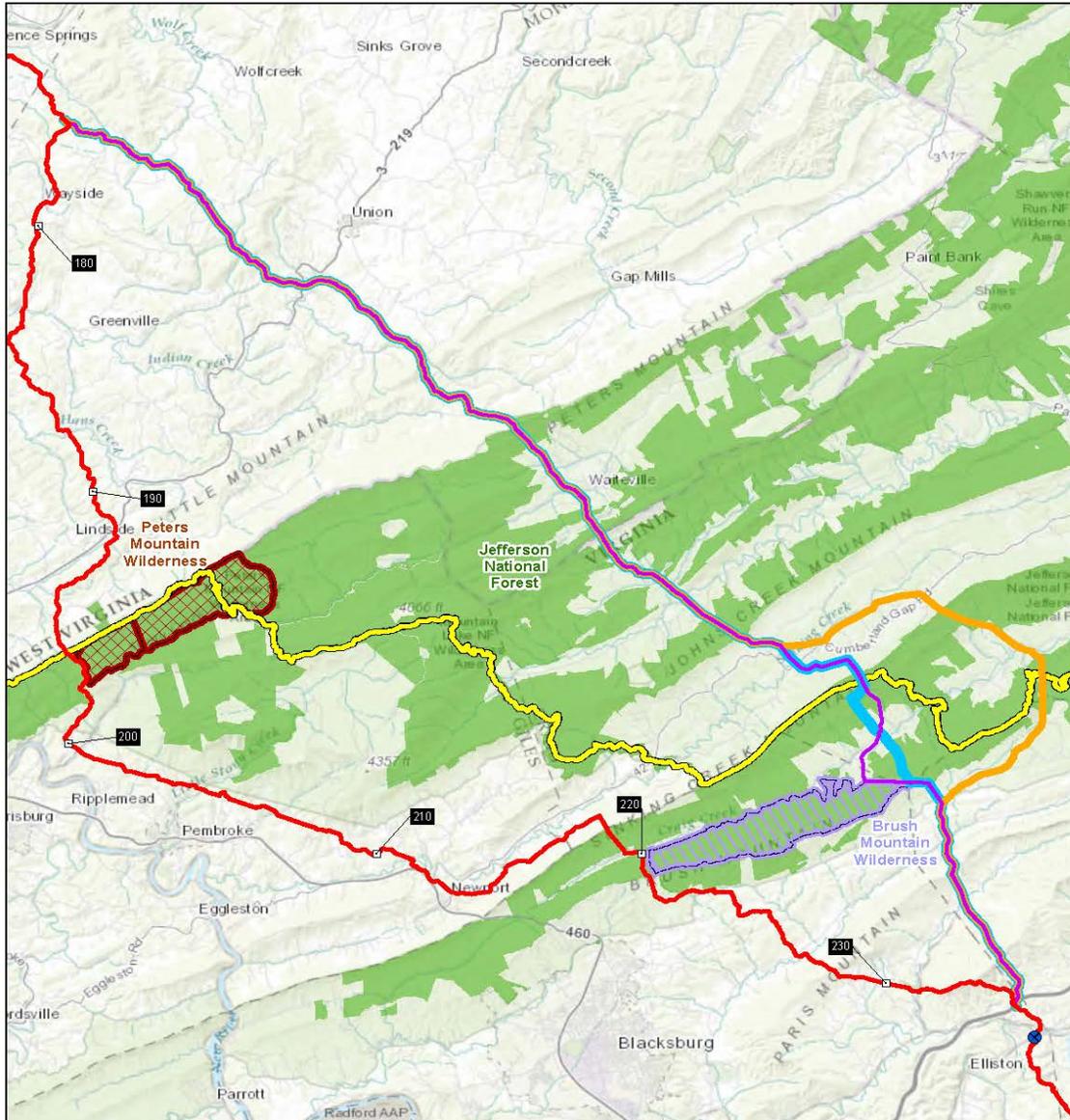
Variation 110 is approximately 15.3 miles shorter than the corresponding segment of the October 2016 Proposed Route and would cross much less USFS-designated semi-primitive areas; however, it crosses about 1.1 miles of designated wilderness that would be avoided by the proposed route (See Table 6). It would cross about 2.7 more miles of national forest and 12 fewer miles of side slopes compared to the proposed route. This variation would also cross the only known population of the federally endangered James spiny mussel in West Virginia at the South Fork of Potts Creek. Additionally, this variation would cross about three times more distance of mapped old growth forest within the JNF (including designated black bear habitat management areas) and three more USFS-designated trails and more roadless areas compared to the proposed route. During site surveys, two USFS-designated sensitive plants, American barberry and rock skullcap, were found within the route of this variation. This alternative would also cross the Alleghany Trail, which is a 330-mile-long hiking trail, that would not be crossed by the October 2016 Proposed Route. Variation 110 would cross the Mudlick Branch Woodland, Craig Creek-Johns Creek, Sinking Creek Mountain, Lynn Hollow, and Fort Lewis Mountain conservation sites. Mountain Valley believes that Variation 110 does not provide a significant environmental advantage over the October 2016 Proposed Route.

Variation 110R is about 14.4 miles shorter than the corresponding segment of the October 2016 Proposed Route; however, it crosses approximately 2.7 more miles of the JNF (including designated black bear habitat management areas). This variation would also cross about 0.5 mile more of USFS-designated old growth forest and three more USFS-designated trails than the corresponding segment of the proposed route as well about 1.2 more miles of landslide-prone areas. Variation 110R would cross substantially less USFS-designated roadless and semi-primitive areas. However, alternative 110R would cross the Sugar Bottom Hollow Conservation Site. Mountain Valley believes that Variation 110R does not provide a significant environmental advantage over the October 2016 Proposed Route.

Variation 110J is approximately 9.2 miles shorter than the corresponding segment of the proposed route; however, it would cross about 1.8 more miles of the JNF (including designated black bear habitat management areas). This variation would also cross about 0.5 mile more of USFS-designated old growth forest than the corresponding segment of the October 2016 Proposed Route as well as about 5 more miles of landslide-prone areas. Variation 110J would cross substantially fewer USFS-designated roadless areas and semi-primitive areas. Variation 110J would cross the Sinking Creek Mountain, Trout Creek Barren, and Pickles Branch conservation sites. Given consideration of the potential impacts on all affected resources, Mountain Valley believes that Variation 110J does not provide a significant environmental advantage over the October 2016 Proposed Route.

Feature	Variation 110	Variation 110R	Variation 110J	Proposed Route
General				
Total length (miles)	43.4	44.3	49.5	58.7
Length adjacent to existing right-of-way (miles)	0.6	0.6	1.3	9.7
Land disturbed within construction right-of-way (acres) <u>a/</u>	656.5	670.5	749.6	888.8
Federal Lands and Federally Managed Areas				
National Forest lands crossed (miles)	6.2	6.2	5.3	3.5
National Forest Wilderness crossed (miles)	1.1	0.0	0.0	0.0
Appalachian National Scenic Trail crossings (number)	1	1	1	1
Blue Ridge Parkway crossings (number)	0	0	0	0
National Forest – US Forest Service-designated old growth forest crossed (feet)	4,550	4,240	4,260	1,710
National Forest – US Forest Service-designated old growth forest affected by constr. (acres)	13.0	12.1	12.2	4.9
National Forest – trails crossed (number)	3	3	3	0
National Forest – inventoried roadless areas crossed (feet)	5,900	40	210	5,030
National Forest – inventoried semi-primitive areas crossed (feet)	7,150	7,100	210	14,170
NRHP designated or eligible historic districts crossed (miles)	0.0	0.0	0.0	10.0
Human Environment				
Populated areas within 0.5 mile (number) <u>b/</u>	1	1	1	1
Landowner parcels crossed (number)	181	198	250	245
Residences within 50 feet of construction workspace (number)	0	3	9	8
Resources				
Forested land crossed (miles)	31.8	32.2	35.3	46.9
Forested land affected during construction (acres)	482.0	487.6	535.2	7,11.9
Forested land affected during operation (acres)	192.9	195.2	214.1	284.5
Interior forest crossed (acres)	368.2	372.7	395.5	478.1
Wetlands (NWI) crossed (feet) <u>c/</u>	446	446	765	44
Forested wetlands crossed (feet)	223	223	223	0
Forested wetlands affected by construction (acres)	0.4	0.4	0.4	0.0
Forested wetlands affected by operation (acres)	0.3	0.3	0.3	0.0
Perennial waterbody crossings (number)	19	19	25	20
Major (> 100 feet) waterbodies crossed	0	0	0	0

Shallow bedrock crossed (miles)	26.6	27.9	28.1	22.4
Steep slope (>20 percent) crossed (miles)	21.3	22.4	24.8	29.1
Side slope crossed (miles)	21.1	22.0	26.2	33.0
Landslide potential crossed (miles)	20.9	21.7	24.6	19.7
Karst area crossed (miles)	26.3	25.8	32.0	29.6
<u>a/</u> Assuming 125-foot-wide construction right-of-way. <u>b/</u> City or town limits as shown in ESRI data. <u>c/</u> NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative.				



Mountain Valley Pipeline Project NAD 1983 UTM 17N 1:250,000 0 2.5 5 10 Miles

Mountain Valley
PIPELINE

Figure 13a-4
Variation 110, 110R & 110J

October 2015
(Revised October 2016
and February 2017)

Data Sources: ESRI Streaming Data, 2014, Verityx 2014, National Park Service, Protected Areas Database.

- Legend**
- Milepost
 - Proposed Tap Location
 - October 2016 Proposed Route
 - Variation 110
 - Variation 110J
 - Variation 110R
 - Appalachian National Scenic Trail
 - Peters Mountain Wilderness
 - Brush Mountain Wilderness
 - National Forest System Lands



State Route 635-Appalachian Trail Variation

The State Route (SR) 635-Appalachian National Scenic Trail Variation was evaluated as an alternative crossing of the ANST. The SR 635-ANST Variation would deviate from Mountain Valley's October 2016 Proposed Route near MP 190.8 and proceed east before turning south (avoiding the Peters Mountain Wilderness located to the west) on NFS land, crossing the ANST at SR 635/Big Stony Creek Road, and then continuing south crossing NFS land and rejoining the proposed route near MP 206.8. SR 635 is the nearest (about 7 miles away) utility or road crossing of the ANST located to the east of Mountain Valley's proposed route (see Figure 13a-5).

The SR 635-ANST Variation would be about 1.5 miles shorter than the corresponding segment of the proposed route and would affect fewer residences and side slopes (See Table 7). The SR 635-ANST Variation does collocate the ANST crossing with an existing corridor (SR 635/Big Stony Creek Road); however, the crossing location would also be adjacent to the Big Stony Creek trailhead and foot bridge. The proposed route would, overall, be more collocated with existing corridors by about 4 miles and would cross less of the JNF (approximately 3 less miles), USFS-designated old growth forest, trails, and roadless areas, and shallow bedrock, and fewer wetlands.

The location of the ANST and SR 635 crossing by the variation is at the lowest point in this area, making it extremely difficult and dangerous to perform a long conventional bore of the road and trail. The elevation variance from the bore launch pit to the bore receiving pit is approximately 46 feet. That elevation difference is anticipated to require a bore receiving pit that would need to be approximately 45-50' in depth, which would require significant space to access the bore pit and create hazardous conditions for workers in the bore pit. The alternative alignment would also generally parallel the ANST for about one mile after crossing the trail and SR 635, increasing the possibility the pipeline right-of-way would be visible from locations along the trail. In addition, the SR 635-ANST Variation would move the pipeline crossing of Peters Mountain about 6 miles northeast of the proposed crossing, moving the ANST crossing to about 3.5 miles of the Wind Rock overlook on the ANST, compared to over 8 miles from the October 2016 Proposed Route. The variation would result in a significantly greater length of pipeline right-of-way visible from Wind Rock, and from a closer distance, than compared to the October 2016 Proposed Route, and would therefore have a greater visual impact.

For the reasons described above, Mountain Valley believes the SR 635-ANST Variation would not offer an environmental or constructible advantage over the October 2016 Proposed Route.

AEP-ANST Variation

The AEP-ANST Variation was also evaluated as an alternative crossing of the ANST. The AEP-ANST Variation would deviate from Mountain Valley's proposed route near MP 194.4 and proceed southwest along CR 219/24, turning southeast and entering the JNF and crossing the ANST at a point where it would be collocated with an AEP electrical powerline. The AEP-ANST Variation continues southeast, exiting the JNF near Gravely Hill Road and rejoining the proposed route near MP 199. The AEP electrical powerline is the nearest (about 3.3 miles away) utility or road crossing of the ANST located to the west of Mountain Valley's October 2016 Proposed Route (see Figure 13a-5).

The AEP-ANST variation would be about 3.2 miles longer than the proposed route, would result in approximately 70 acres more disturbance during construction than the corresponding segment of proposed route (See Table 7). The variation would also increase the length of the pipeline within the JNF by about 1.0 mile. The variation would pass through the Red Sulphur Public Service District (PSD) Protection Watershed for about 4.1 miles versus about 1.2 miles for the proposed route. The variation also passes within 100 feet of the Red Sulphur PSD Zone of Critical Concern. A portion of the variation also passes near known karst features including a cave and sinkholes. The variation would be about 950 feet upslope of Rich Creek Cave and Rich Creek Wilson Spring. The variation would affect 12.3 acres more forested land and would be near two fewer residences.

The location of the pipeline crossing of ANST would be on the southern down slope, and the southern bore pit would likely be shielded from view by trail users at the crossing itself by a buffer of trees. However, the terrain alone at the crossing location would likely not shield the pipeline right-of-way from view. While a conventional bore of the ANST at this location is possible, lengthy segments of the cleared pipeline right-of-way south of the trail crossing would be visible from the trail where the trail crests the ridge within the cleared AEP right-of-way. Based on initial desktop analysis, Mountain Valley believes use of the existing AEP right-of-way crossing of the ANST would likely not meet the scenic integrity objectives (SIOs) of the 2004 JNF Revised Land and Resource Management Plan (Forest Plan). Even though the variation would place the pipeline adjacent to an existing cleared right-of-way, the visual impact on ANST users would likely be greater because of the open view that trail users have when within the AEP right-of-way.

In addition to visual impacts on the ANST at the pipeline crossing itself, this variation would have a higher visual impact from the Angels Rest overlook than the October 2016 Proposed Route. The variation would move the pipeline crossing of Peters Mountain about 3 miles closer to the Angels Rest overlook (4 miles away, compared to about 7 miles by the October 2016 Proposed Route). Mountain Valley has prepared a viewshed map from the Angels Rest overlook, which shows that about 2.5 miles of the variation, beginning at the crest of Peters Mountain, would be within the direct viewshed from Angels Rest. While other disturbances and linear features are within this same viewshed, including the existing AEP right-of-way, the pipeline right-of-way would be a new and clearly visible linear feature codominant with the AEP right-of-way. Because the variation would be 3 miles closer to Angels Rest, it is expected that the variation would result in a greater visual impact on the Angel's Rest viewshed than compared to the October 2016 Proposed Route.

For the reasons described above, Mountain Valley believes the AEP-ANST Variation would not offer an environmental or constructible advantage over the proposed route.

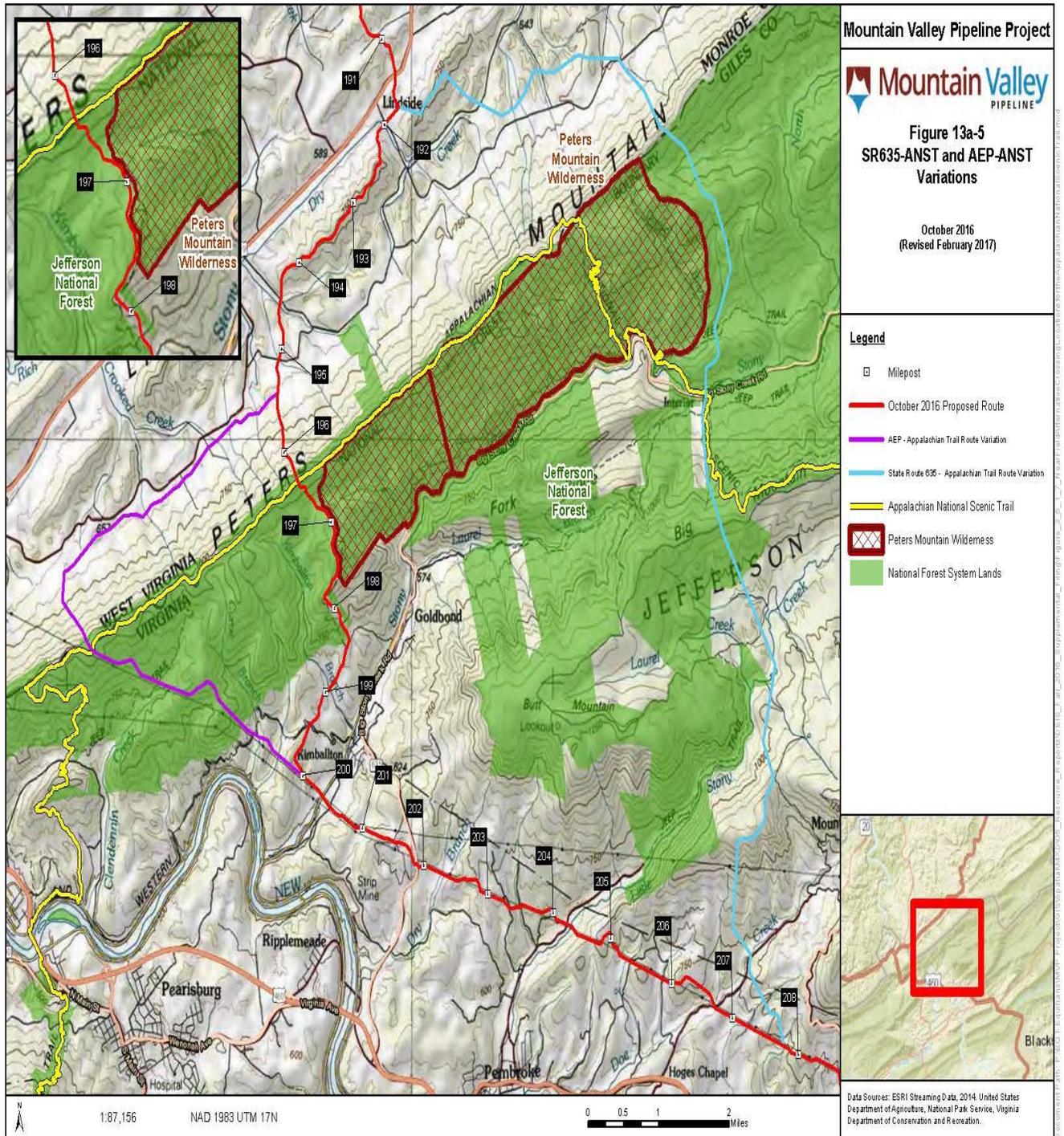
Table 7
(February 2017)

Comparison of the SR 635-ANST and the AEP-ANST Variations and the Proposed Route

Feature	SR 635-ANST Variation	Proposed Route	AEP-ANST Variation	Proposed Route
General				
Total length (miles)	14.6	16.1	7.9	4.7
Length adjacent to existing right-of-way (miles)	0.0	4.3	1.8	0
Land disturbed within construction (acres) <u>a/</u>	221.6	2244.79	120.0	71.1
Federal Lands and Federally Managed Areas				
National Forest System lands crossed (miles)	4.6	1.7	2.6	1.7
Appalachian National Scenic Trail crossings (number)	1	1	1	1
National Forest – US Forest Service-designated old growth forest crossed (feet)	490	0	0	0
National Forest – US Forest Service-designated old growth forest affected by constr. (acres)	1.4	0	0	0
National Forest – trails crossed (number)	6	0	0	0
National Forest – inventoried roadless areas crossed (feet)	8,420	120	0	120
National Forest – inventoried semi-primitive areas crossed (feet)	8,420	9,130	0	9,130
NRHP designated or eligible historic districts crossed (miles)	0.7	0.6	0	0
Human Environment				
Landowner parcels crossed (number)	50	71	26	16
Residences within 50 feet of construction workspace (number)	3	7	2	4
Resources				
Forested land crossed (miles)	13.6	13.3	5.2	4.5
Forested land affected during construction (acres)	206.3	202.1	79.3	67.0
Forested land affected during operation (acres)	82.6	80.8	31.7	27.1
Interior forest crossed (acres)	59.1	148.3	39.4	104.6
Wetlands (NWI) crossed (feet) <u>c/</u>	97	0	0	0
Forested wetlands crossed (feet)	0	0	0	0
Perennial waterbody crossings (number) <u>c/</u>	18	5	17	1
Major (> 100 feet) waterbodies crossed	0	0	0	0
Shallow bedrock crossed (miles)	6.7	5.3	1.5	0.5

Steep slope (>20 percent) crossed (miles)	8.6	9.6	3.9	3.0
Side slope crossed (miles)	7.9	10.0	5.9	2.7
Landslide potential crossed (miles)	14.6	8.4	7.9	0.3
Karst area crossed (miles)	7.8	8.3	2.9	3.4

- a/ Assuming 125-foot-wide construction right-of-way.
- b/ City or town limits as shown in ESRI data.
- c/ NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative.



Columbia Gas of Virginia (CGV) Peters Mountain Variation

Columbia Gas of Virginia (CGV) maintains a 6-inch-diameter pipeline that crosses about 0.8 mile of the JNF across Peters Mountain to provide service to the Celanese Acetate LLC (Celanese) plant near Narrows, Virginia. CGV recently installed an additional 12-inch-diameter natural gas distribution pipeline adjacent to the existing 6-inch pipeline in this area. The CGV pipeline to the Celanese plant is about five miles southwest of where the October 2016 Proposed Route crosses Peters Mountain. MVP evaluated the CGV pipeline route as an alternative to cross the JNF and the ANST adjacent to an existing right-of-way.

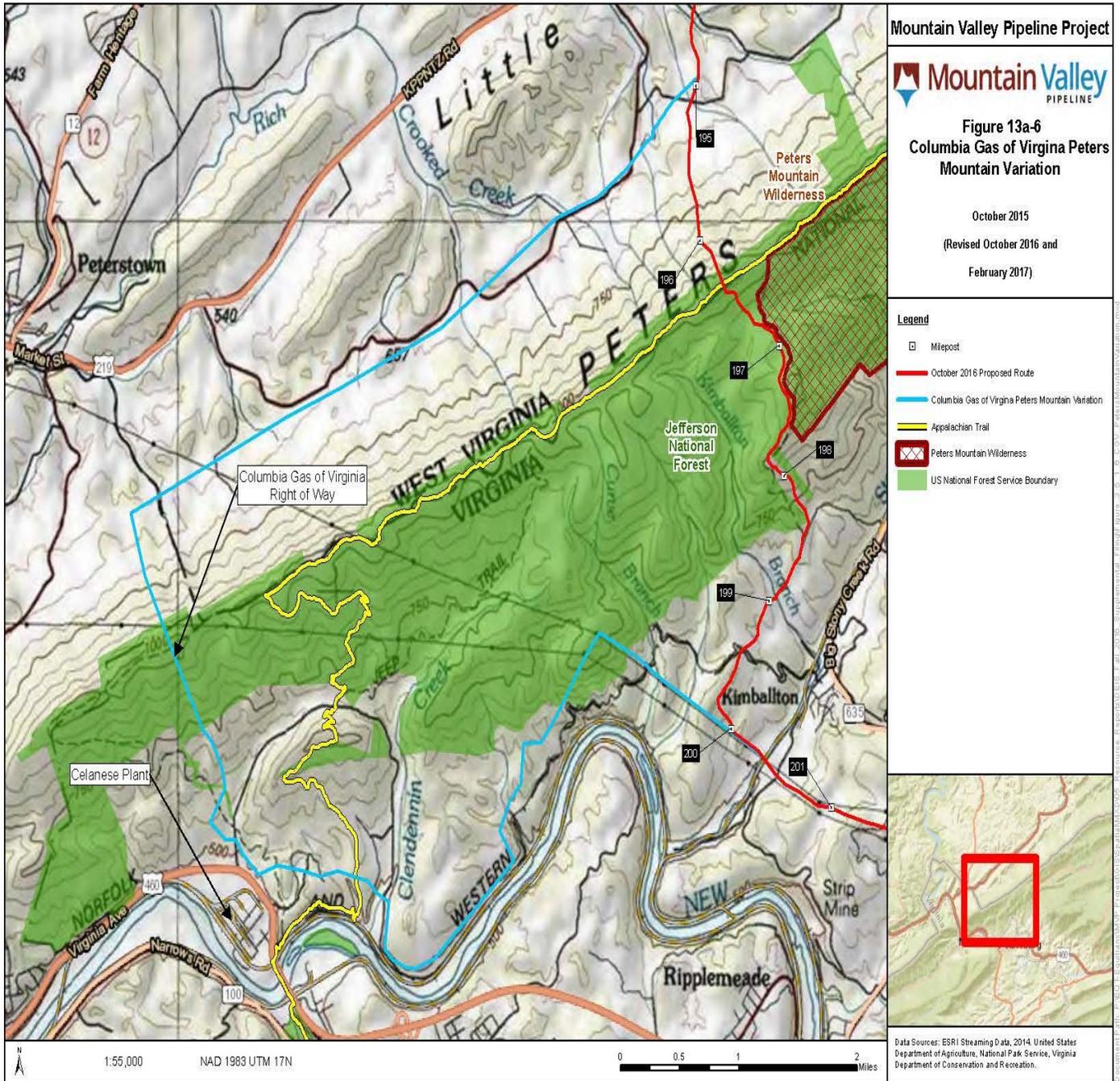
The USFS and Celanese reached an agreement on an easement for a relocation of the ANST to the east of the CGV pipeline. Because of this relocation, following the CGV pipeline route for the Project would avoid crossing the ANST along the Peters Mountain ridge; however, the pipeline would still need to cross the ANST at another location. To avoid crossing the New River two times, from the area of the Celanese plant the pipeline would need to turn east, requiring a crossing of the ANST within the recently relocated segment of the trail east of the Celanese plant. A conceptual route for such a variation is shown on Figure 13a-6. Alternatively, the MVP pipeline could move to the west of the Celanese plant, which would require a crossing of the New River, then cross the ANST within the JNF south of Bluff City, then crossing the New River a second time to return to the Proposed Route. Because neither version of the CGV Peters Mountain Variation would avoid a crossing of the ANST, but would just move the crossing to another location within the JNF, MVP does not believe either of these options are favorable. However, a conceptual route has been identified east of the Celanese plant for comparison to the corresponding segment of October 2016 Proposed Route. In addition, the Proposed Route is approximately 9 miles shorter than the CGV Variation and will disturb approximately 136 less acres during construction (See Table 8).

The variation would pass through the Red Sulphur PSD Protection Watershed for about 6.3 miles versus about 1.2 miles for the proposed route. Within this watershed, the variation passes in close proximity to Rich Creek Spring and Coburn Spring, including crossing about 0.7 mile of the Source Water Protection Area for Coburn Spring and about 0.2 mile of the Red Sulphur PSD Zone of Critical Concern.

The variation would cross the ANST in a wooded area near the closed landfill northeast of the Celanese Plant. Mountain Valley has not conducted a ground-based engineering evaluation of the ANST crossing by the variation, but assumes that a bored crossing of the ANST could be accomplished at this location, similar to the proposed crossing location. Assuming that ANST crossing could be completed by conventional bore and a visual buffer of undisturbed forest vegetation could be left on either side of the crossing, the visual impact on the ANST at the crossing location itself would be minimal. However, the CGV Peters Mountain Variation would move the pipeline crossing of Peters Mountain about 5 miles closer to the Angels Rest overlook on the ANST, moving the pipeline to within 2 miles of Angels Rest compared to 7 miles by the proposed route. While other disturbances and linear features are within this same viewshed, the pipeline would be a new and clearly visible linear feature in the forefront of the viewshed. The variation would result in a significantly greater length of pipeline right-of-way visible from Angels Rest, and from a significantly closer distance, than the proposed route and would have a significantly greater visual impact.

For the reasons described above, Mountain Valley believes that none of the options for the CGV Peters Mountain Variation would offer an environmental or constructible advantage over the October 2016 Proposed Route.

TABLE 8 (February 2017)		
Comparison of the CGV Peters Mountain Variation and the Proposed Route		
Feature	CGV Peters Mountain Variation	Proposed Route
General		
Total length (miles)	14.5	5.5
Length adjacent to existing right-of-way (miles)	1.6	0.0
Land disturbed within construction (acres) <u>a/</u>	219.4	83.1
Federal Lands and Federally Managed Areas		
National Forest System lands crossed (miles)	1.6	1.7
National Forest Wilderness crossed (miles)	0.0	0.0
Appalachian National Scenic Trail crossings (number)	1	1
National Forest – inventoried roadless areas crossed (feet)	0	120
National Forest – inventoried semi-primitive areas crossed (feet)	0	9,130
Human Environment		
Populated areas within 0.5 mile (number) <u>b/</u>	1	0
Landowner parcels crossed (number)	53	20
Residences within 50 feet of construction workspace (number)	2	3
Resources		
Forested land crossed (miles)	8.7	4.8
Forested land affected during construction (acres)	132.4	71.6
Forested land affected during operation (acres)	52.7	28.9
Interior forest crossed (acres)	24.2	104.6
Wetlands (NWI) crossed (feet) <u>c/</u>	103	0
Forested wetlands crossed (feet)	0	0
Perennial waterbody crossings (number) <u>c/</u>	1	1
Major (> 100 feet) waterbodies crossed	0	0
Shallow bedrock crossed (miles)	4.1	1.6
Steep slope (>20 percent) crossed (miles)	7.3	3.2
Side slope crossed (miles)	7.5	2.9
Landslide potential crossed (miles)	1.3	0.8
Karst area crossed (miles)	11.1	3.8
<u>a/</u> Assuming 125-foot-wide construction right-of-way. <u>b/</u> City or town limits as shown in ESRI data. <u>c/</u> NWI and NHD data used in order to provide a common comparison between the two routes since field surveys were not conducted along the alternative.		



Brush Mountain Alternatives

The USFS requested that MVP evaluate alternatives between about MPs 219.5 and 220.0 of the October 2016 Proposed Route to reduce the length of construction work space near Craig Creek and avoid crossing a tributary to Craig Creek. MVP evaluated two alternatives in this area, each following ridge lines to the west of the proposed route. The general location of the alternatives are shown on Figure 13a-7.

Brush Mountain Alternative 1

Brush Mountain Alternative 1 would begin at MP 219.7 where it would turn south and move the pipeline to another ridge about 0.1 mile to the west of the October 2016 Proposed Route. When reaching the top of Brush Mountain, the alternative would turn east and follow JNF Road 188/Brush Mountain Road for about 0.2 mile before rejoining the proposed route at MP 220.7. The alternative would be about 0.1 mile longer than the October 2016 Proposed Route, and both routes would cross primarily forested areas. About 0.2 mile of the proposed route would be adjacent to an existing pipeline right-of-way along the south side of Craig Creek Road, while about 0.2 mile of the alternative would be collocated with FS Road 188/Brush Mountain Road, temporarily disturbing regular recreational and USFS vehicle access in that location.

The alternative would move about 0.2 mile of the pipeline away from the immediate vicinity of Craig Creek and avoid crossing one tributary to Craig Creek that would be crossed by the October 2016 Proposed Route. The alternative would be slightly longer and result in more disturbance, including forest habitat, during construction and operation, than the corresponding segment of October 2016 Proposed Route. The alternative would parallel the same amount (0.2 mile) of existing road or right-of-way as the October 2016 Proposed Route. The alternative would move the pipeline approximately 600 feet further west from the western boundary of the Brush Mountain Wilderness.

Constructability of the Brush Mountain Alternative 1 is similar to the October 2016 Proposed Route with the exception that it involves both steep slope and side slope construction. The slope on this route reaches a grade of 43.64%, more than 12% greater than the steepest section of the Proposed Route. This alternative will require winch construction, which creates a safety risk that would not be present on the Proposed Route or the Brush Mountain Alternative 2 Route. Also, due to the steep terrain in this area, Mountain Valley's contractors would not be able to travel this area with vehicles. Finally, due to the winch construction, Mountain Valley would have to add additional temporary work space at the "winch area end" location creating approximately 0.57 acre of additional disturbance to a private landowner and the USFS. Brush Mountain Alternative 1 would also require extensive steep side-slope construction at the top of Brush Mountain. Side-slope construction creates both a safety concern for MVP workers and also, since it occurs at the top of the mountain, adds the potential for debris slides down towards Craig Creek.

Brush Mountain Alternative 2

Brush Mountain Alternative 2 would begin at MP 219.5 where it would turn south and move the pipeline to another ridge about 0.4 mile west of the October 2016 Proposed Route. When reaching the top of Brush Mountain, the alternative would turn east and follow FS Road 188/Brush Mountain Road for about 0.4 mile before rejoining the proposed route at MP 220.7. The alternative would be about 0.1 mile longer than the October 2016 Proposed Route, and both routes would cross primarily forested areas. None of the corresponding segment of October 2016 Proposed Route would be adjacent to existing right-of-way, while about 0.4 mile of the alternative would be collocated with JNF Road 188/Brush Mountain Road.

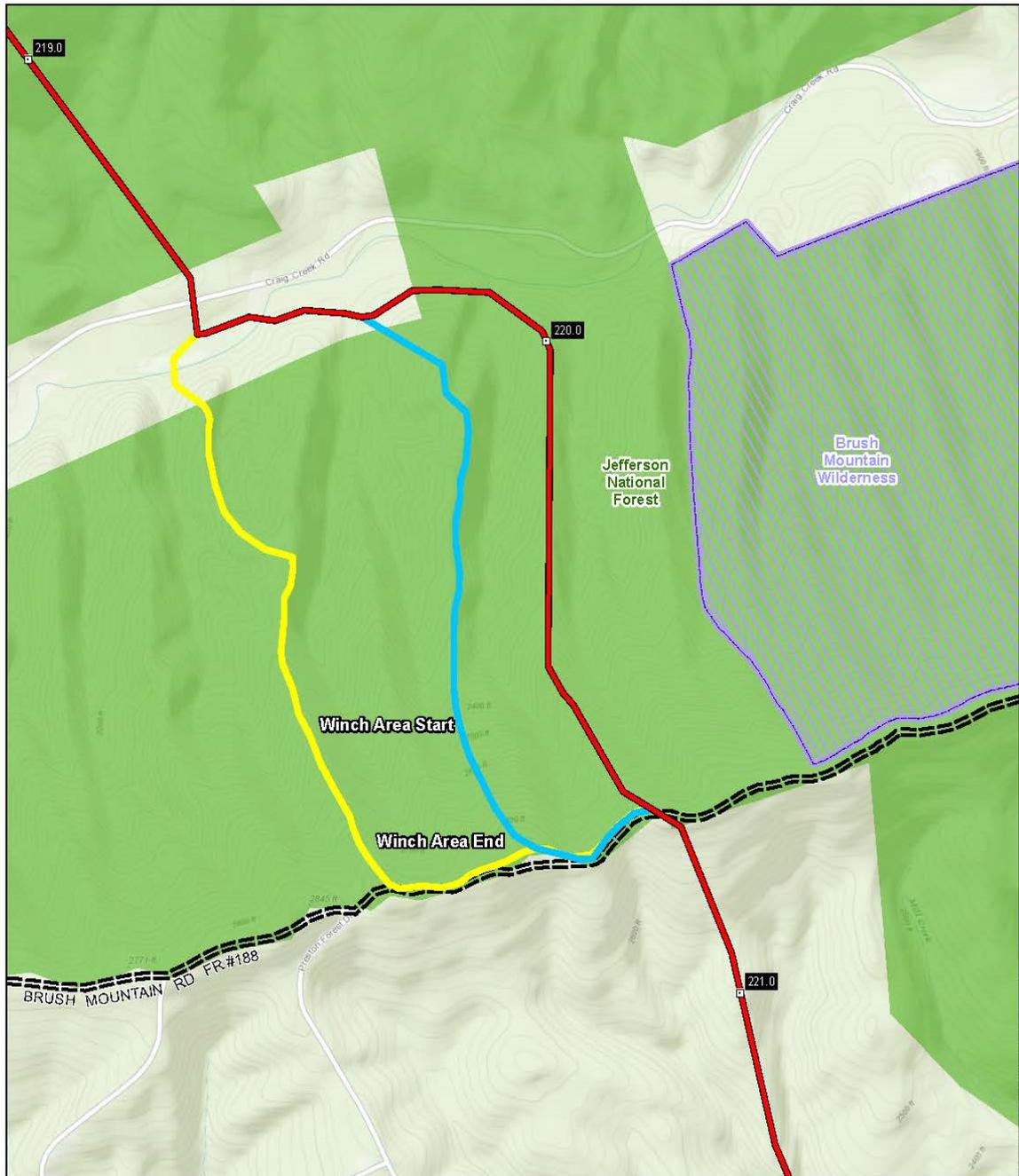
The alternative would move about 0.4 mile of the pipeline away from the immediate vicinity of Craig Creek and avoid crossing two tributaries to Craig Creek that would be crossed by the proposed route. The alternative would cross slightly more NFS lands and would be slightly longer and result in more disturbance, including forest habitat, during construction and operation, than the corresponding segment of October 2016 Proposed Route. The alternative would parallel more (0.4 mile) of existing road as the October 2016 Proposed Route; however, following this road would require closure during construction. The alternative would also move the pipeline within about 370 feet of a residence on Preston Forest Drive, while the corresponding segment of October 2016 Proposed Route would not be adjacent to any residences. The alternative would move the pipeline approximately 2,000 feet further west from the western boundary of the Brush Mountain Wilderness. Constructability of the Brush Mountain Alternative 2 is similar to the October 2016 Proposed Route.

The Brush Mountain Alternative 2 also requires steep slope and side-slope construction. Under this alternative the pipeline route would be on steep slopes for approximately 450 feet that reaches a grade of 32.94% grade. While this is very steep, it is not anticipated that winch construction would be necessary and that vehicles would be able to traverse the right-of-way. Brush Mountain Alternative 2 would also require extensive steep side-slope construction at the top of Brush Mountain. Side-slope construction creates both a safety concern for MVP workers and also, since it occurs at the top of the mountain, adds the potential for debris slides down towards Craig Creek.

Mountain Valley believes that neither Brush Mountain alternative would provide a significant environmental or constructible advantage over the Proposed Route.

Table 9
(February 2017)
Brush Mountain Alternatives and the Proposed Route

Feature	Proposed Route	Brush Mountain Alternative 1	Brush Mountain Alternative 2
General			
Total length (miles)	1.0	1.1	1.3
Length adjacent to existing right-of-way (miles)	0.2	0.2	0.4
Land disturbed within construction ROW (acres) ^{a/}	15.5	16.4	20.5
Land Use			
Residences within 0.5 mile (number)	10	13	26
NRHP-designated or eligible historic districts crossed (miles)	0	0	0
National Forest System lands crossed (miles)	1.0	1.0	1.3
National Forest Wilderness Area crossed (miles)	0	0	0
Distance to Brush Mountain Wilderness at closest point (feet)	1,030	1,670	3,040
Length adjacent to Brush Mountain Wilderness (miles)	0.7	0.7	0.7
Residences within 50 feet of construction workspace (number)	0	0	0
Landowner parcels crossed (number)	2	2	2
Resources			
Forested land crossed (miles)	1.0	1.1	1.1
Forested land affected during construction (acres)	15.2	16.4	17.4
Forested land affected during operation (acres)	6.1	6.5	6.9
Interior forest crossed (acres)	1.0	0.9	1.3
Forested wetlands crossed (feet)	0	0	0
Wetlands (NWI) crossed (feet) ^{b/}	0	0	0
Perennial waterbody crossings (number) ^{b/}	1	1	1
All streams crossed (number)	3	2	2
Shallow bedrock crossed (miles)	1.0	1.1	1.2
Steep slope (> 20 percent) crossed (miles)	0.7	0.7	0.8
Side slope crossed (miles)	0.6	0.7	1.0
Landslide potential crossed (miles) ^{c/}	0.3	0.5	0.6
Karst area crossed (miles)	0	0	0



<p>Mountain Valley Pipeline Project</p>		<p>NAD 1983 UTM 17N</p>	<p>1:12,000</p>	<p>0 500 1,000 2,000 Feet</p>
<p>Mountain Valley PIPELINE</p> <p>Figure 13a-7 Brush Mountain Alternatives</p> <p>February 2017</p>		<p>Legend</p> <ul style="list-style-type: none"> Milepost October 2016 Proposed Route Revised December 2016 Brush Mountain Alternative 1 Brush Mountain Alternative 2 U.S. Forest Service Road Brush Mountain Wilderness U.S. Forest Service (National Forest) Lands 		
<p><small>Data Sources: ESRI Streaming Data, 2014, Vertlyx 2014, Virginia Department of Recreation and Conservation, 2015, Protected Areas Database, 2015.</small></p>				

Alternative Modes of Transporting Natural Gas

In addition to alternative pipeline routes, Mountain Valley evaluated alternative modes of transporting natural gas to meet the Project objectives. As required by FERC, Mountain Valley evaluated alternative pipeline systems, including existing pipelines and other proposed pipelines that could potentially meet the Project objectives. Potential existing alternative pipeline systems evaluated include the Texas Eastern, Columbia, East Tennessee, and Transco pipelines, and potential proposed alternative pipelines evaluated include the Atlantic Coast and the WB XPress pipelines. None of the potential system alternatives could meet the project objectives without construction of significant new pipeline facilities and/or compressor stations, resulting in similar environmental impacts as the proposed Project, and are therefore not considered reasonable alternatives.

13b. Why were these alternatives not selected

The reasons that each alternative was not selected is described in section 13a above. As described for each alternative in section 13a, considering all the environmental and constructability factors compared, none of the alternatives was found to significantly reduce environmental impacts over the October 2016 Proposed Route and many posed significant constructability concerns.

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance); (b) estimated cost of next best alternative; and (c) expected public benefits.

The Project's purpose is to initially transport up to 2.0 MMDth/d of natural gas from the Marcellus and Utica regions to growing markets in the mid-Atlantic and southeastern U.S. The Project will provide timely, cost-effective access to the growing demand for natural gas for use by local distribution companies, industrial users, and power generation facilities in the Appalachian, mid-Atlantic and southeastern markets costing approximately \$3.5 billion.

Mountain Valley considered various alternatives and route variations to avoid and/or minimize crossing of federal lands. Pipeline construction costs are determined by the length, landscape and terrain. As such the costs of the alternatives considered will vary based on how these features compare with the proposed route.

In recent years the North American natural gas market has seen enormous growth in production and demand. The Energy Information Agency projects that U.S. total natural gas consumption will increase from 25.6 trillion cubic feet (TCF) in 2012 to 31.6 TCF in 2040, with a large portion of this increased demand occurring in the electric generation sector. A sizable portion of this growth in production is occurring in the Marcellus and Utica regions, with Marcellus production alone increasing from 2 billion cubic feet per day (Bcf/d) in 2010 to over 15 Bcf/d in July 2014. Likewise, the increased demand for natural gas is expected to be especially high in the southeastern U.S., as new environmental regulations result in coal-fired generation plants being converted or replaced by natural-gas-fired generation plants. The infrastructure design of the Mountain Valley Project is expected to benefit these regions by connecting the production supply to the market demand. In doing so, Mountain Valley will bring clean-burning, domestic-produced natural gas supplies from the Marcellus and Utica shale regions and

connect it to the demand markets to increase from the prolific Marcellus and Utica shale plays in order to support the growing demand for clean-burning natural gas, provide increased supply diversity, and improve supply reliability to these growing markets. Mountain Valley may also allow for additional uses of natural gas in south central West Virginia and southwest Virginia to develop by providing an open-access pipeline that will allow interconnects and subsequent economic development associated with having access to affordable gas supplies, as these areas currently have limited interstate pipeline capacity.

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

Lands managed as part of the JNF are located in more than 20 counties in three states: Virginia, West Virginia, and Kentucky. The USFS estimated that management activities on the JNF supported more than 3,400 jobs and \$86 million in labor income in the counties and cities that contain Forest acreage, about 1 percent of total employment and labor income in the affected area. The Project would impact a small portion of the JNF. Though minor impacts during construction are anticipated, no impacts to social uses or economic aspects are expected after construction is complete and the pipeline is in operation.

The Weston and Gauley Bridge Turnpike Trail extends from Burnsville Lake to Stonewall Jackson Lake. The population in the vicinity of the crossing is sparse, and no impacts will occur to the surface of USACE-owned lands. Therefore, impacts on population and rural lifestyle are not anticipated.

MVP conducted a detailed economic market analysis of the Project impacts in West Virginia and Virginia. These reports are included in Attachment D.

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

(a): No compressor stations are proposed within the JNF or on USACE-owned lands, and air quality impacts will be temporary and limited to pipeline construction. Air quality impacts from pipeline construction will be minimal and temporary in nature.

The JNF is managed under the Forest Plan, which includes specific goals, objectives, and standards related to resources. The Forest Plan includes one standard specific to air quality (FW-11). Because the federal and state air quality standards will be met, the Project will comply with this standard. In addition, no permanent air emitting sources will be located on the JNF. Air emitting sources, such as construction equipment, will be located on-site only temporarily. Mountain Valley has prepared a Forest Plan Consistency analysis for the portion of the proposed Mountain Valley Project that crosses the JNF. The Forest Plan Consistency Analysis was filed with the USFS on April 8, 2016, as Attachment USFS-151.

(b): Visual impacts associated with the Project crossing of the JNF would include temporary construction activities such as vegetation clearing; color contrast of soil in the cleared right-of-way (ROW) or other ancillary structures such as roads; and the presence of vehicles and workers. Long-term impacts, which would exist for the life of the Project, would result from the existence of a cleared ROW

and associated maintained access roads as well as pipeline marking. Short-term impacts, which would occur at regular intervals during the life of the Project, would include maintenance activities and the presence of workers and maintenance vehicles.

However, Mountain Valley prepared a Visual Impact Assessment (VIA) for the JNF, which analyzed visual impacts to 14 key observation points (KOPs) from the ANST and other locations within the JNF that Mountain Valley selected in consultation with the USFS. The VIA identifies the potential visual impacts at these 14 KOPs and compares them to the SIOs for the various management prescription areas within the JNF that will be crossed by the pipeline. Determining consistency with SIOs involves the comparison of existing landscape integrity with integrity that would occur after construction of the pipeline. Impacts to landscape scenery were determined by measuring the extent of effects of the pipeline route on the scenic landscape through USFS scenic attractiveness ratings and scenic quality. The results of the VIA indicate that construction and operation of the Project will have mostly low or no significant visual impacts to the ANST, including from managed vistas, and will comply with existing SIOs. Please see the Jefferson National Forest VIA for further discussion of visual impacts.

For the Weston and Gauley Bridge Turnpike Trail, visual impacts will include vegetation clearing outside the limits of the USACE-owned tracts and pipeline marking. The pipeline route approaches the Trail from the north, parallels the northern side of the Trail for approximately 0.15 mile, then turns 90 degrees and crosses the Trail to the southern side and continues south away from the Trail. The edge of the pipeline ROW is approximately 50 feet from the edge of the Trail where the two run parallel.

Mountain Valley also prepared a VIA for the Weston and Gauley Bridge Turnpike Trail, which concludes that, overall, views are relatively short due to the length of the right-of-way paralleling the Weston and Gauley Bridge Turnpike Trail, which would result in the Project only being visible for as long as it takes to walk 0.15 mile. Most visual impacts will occur during construction, and the landscape will largely appear undisturbed following restoration. See the Weston and Gauley Bridge Turnpike Trail VIA for further discussion of visual impacts.

(c) and (d): Construction methods, impacts, and measures to avoid or minimize impacts on waterbodies crossed within JNF will include following time-of-year restrictions and necking down the temporary right-of-way to 75 feet wide. There will be no waterbodies affected by construction at the Weston and Gauley Bridge Turnpike Trail crossing. Several waterbodies will be crossed within the JNF; a discussion of typical waterbody crossing techniques is provided in the Plan of Development. For the route within the JNF, wetlands were delineated according to the USACE publications including the USACE Wetland Delineation Manual (1987) and the Eastern Mountains and Piedmont Regional Supplement.

To date, Mountain Valley did not conduct any water quantity, quality or Macroinvertebrate studies on USFS property. After reviewing EPA Storet and other publically available data, none of the streams have been classified as impaired (Category 4 or 5) or assessed for water quality in 303(d) assessments. In 2002, according to EPA Storet, these streams were assessed for Aquatic Life Support (Fish, Shellfish, wildlife Protection and Propagation, Fish Consumption (Aquatic Life Harvesting)). The streams were assessed as Good in both categories. Tier 1 and Tier 2 information was unavailable but MVP was able to determine from available Virginia Department of Environmental Quality data that no Tier 3 designated

streams are crossed by the Project within NFS lands. Following construction, Mountain Valley will reclaim and restore the stream bed and banks as close to original conditions as possible. No control or structural stream changes are anticipated.

(e): Noise impacts on the JNF and USACE-managed lands will be temporary and limited to Project construction and the conventional bore.

The pipeline will cross the ANST within the JNF, where the pipeline crosses over Peters Mountain, and the Weston and Gauley Bridge Turnpike Trail via conventional bore. Noise from pipeline construction activities would be audible to hikers along the trail; however, this impact would be temporary. There are no noise impacts anticipated to users of the ANST or the Weston and Gauley Bridge Turnpike Trail during operation of the pipeline.

(f): There are approximately 15 Natural Resources Conservation Service (NRCS) soil types described within the Mountain Valley Route on USFS-managed lands. These 15 soil types soils are similar in texture (sandy loams) and drainage (all well drained), with the bedrock either outcrop (at or above the surface) or relatively shallow. Some of the soil is susceptible to water erosion but none to wind erosion and much of it has good revegetation potential. Slopes in the JNF are steep and range from 11 to 70 percent. A table that indicates the soil limitations in acres within the JNF is included as Table 2 for each proposed land use.

Representatives of the USFS have indicated that much of this area was mapped only by aerial photography and that, because of slope, the NRCS soil mapping in this type of terrain was not well documented by “on the ground” soil evaluators. This is mainly because these areas do not tend to be good farmland where soil type is more important. Mountain Valley presented a plan to the USFS to ground-truth the NRCS soil and geologic mapping of the portion of the Project that will cross USFS land. Soil pits were excavated and soil profiles were described at a total of 13 locations from November 3 through November 6, 2015. The soil pits were excavated to vertical depths ranging from 14 inches to 40 inches from the soil surface depending on site conditions (e.g., bedrock). The soil profiles were described at each location based on USDA soil classification terminology (National Soil Information System) using the reference *Field Book for Describing and Sampling Soils, Version 3.0*. The results of this effort can be found in the Jefferson National Forest Soil Survey Report submitted in April 2016.

Permafrost, (soil, rock, or sediment that is frozen for more than two consecutive years) is not present in the area of the Project.

TABLE 2
(Revised February 2017)

Soil Limitations by Facility along the Mountain Valley Project in the JNF (in Acres)

Facility	Water Erosion Potential <u>a/</u>		Wind Erosion Potential <u>b/</u>		Prime Farmland <u>c/</u>		Hydric Soils <u>d/</u>		Compaction Potential <u>e/</u>		Stony/Rocky Soils <u>f/</u>		Revegetation Potential <u>g/</u>		Poor Drainage Potential <u>h/</u>	
	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp
Pipeline Right-of-Way	--	48.9	--	0	--	1.9	--	0	--	0	--	0	--	0.7	--	0
Temporary and Permanent Access Roads	18.1	27.5	0	0	0.5	0.9	0	0	0	0	8.2	11.7	0	0	0	0
Additional Temporary Workspace	0	0.8	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
Subtotal	18.1	77.2	0	0	0.5	2.8	0	0	0	0	8.2	11.8	0	0.7	0	0
Project Total	95.3		0		3.3		0		0		20.0		0.7		0	

Source: USDA, 2016
 Note: Totals may not sum correctly due to rounding.

a/ Areas identified as highly water erodible soils are ranked as "very severe" or "severe" by SSURGO erosion hazard (Off-Road, Off-Trail) criteria.
b/ Areas identified as highly wind erodible soils have a wind erodibility index of 1 or 2 as determined by SSURGO.
c/ Areas identified as prime farmland are identified as lands that meet the "all prime farmland" or "farmland of statewide and local importance" criteria as determined by NRCS, SSURGO.
d/ Areas identified to have a hydric rating include the "all" and "partial" criteria as determined by SSURGO.
e/ Areas identified to have a severe compaction potential are limited to silt loam or finer based on particle size and ranked "somewhat poor," "poor," and "very poor" drainage as determined by SSURGO.
f/ Areas identified to have stony/rocky soils are soils that as determined by SSURGO include stone, rocky, or cobbles in the soil name (does not include rock outcrops).
g/ Areas identified to have poor revegetation potential are lands that have a Capability Class 3 or greater, a low available water capacity and slopes greater than 8 percent as determined by SSURGO.
h/ Areas identified to have poor drainage potential are ranked as "poor" or "very poor" as determined by SSURGO.

Soil stability on the JNF. MVP has performed a preliminary inventory of potential areas of soil stability concern along the pipeline alignment including within the JNF. This evaluation was completed through review of available historic aerial photographs, soils, and topographic data to identify indications of potential landslide hazards. MVP also has completed field observations of the steep hill slope sites where there were potential stability issues at all sites where property access had been granted, including three sites within the JNF identified by JNF personnel. Slopes in the JNF are steep and range from 11 to 70 percent. The field observations for these sites included slope characteristics, locations of scarps, geotropically affected trees, drainage features, gullying, and GPS mapping of observed slope slides, slumps, and rockfall. These investigations were conducted by a geotechnical engineer with experience in landslide evaluation. Mountain Valley's Landslide Mitigation Plan and Site-Specific Design of Stabilizations Measures in Selected High-Hazard Portions of the Proposed Route in the JNF address impacts to the pipeline from these field observations and outlines the special procedures and best management practices that will be implemented during the pipeline installation and post-construction periods to mitigate landslide occurrence. It also evaluates post-construction conditions and recommends long-term methods to protect the pipeline from landslides.

Vegetation on the JNF. Based on geospatial data provided by the USFS, the Project crosses several Major Forest Community Types, including Mixed Mesophytic Forest, Conifer-Northern Hardwood Forest, Dry-Mesic Oak Forest, Dry and Dry-Mesic Oak-Pine Forest, Dry and Xeric Oak Forest, Woodland, and Savanna, and Xeric Pine and Pine-Oak Forest and Woodland. Common dominant canopy species observed within the Major Forest Community Types during field surveys included white pine, chestnut oak, black oak, scarlet oak, red oak, white oak, tulip poplar, mockernut hickory, and pignut hickory. Based on available geospatial information provided by JNF, impacts to existing old-growth forest communities associated with disturbance (management prescription 6C) during construction of the Project are approximately 7.4 acres. In upland areas, trees or deep-rooted shrubs will be removed from the construction right-of-way and will not be permitted to grow within the 50-foot-wide permanent right-of-way. The USFS has requested that consideration be given to providing shrub vegetation on the outer edges of the permanently maintained pipeline right-of-way to reduce the sharp edge effect of the maintained pipeline right-of-way and provide as much escape cover as possible for species like small mammals, reptiles, and amphibians needing to cross the maintained right-of-way. This effect will result naturally on one side of the right-of-way because shrub-like vegetation will be permitted to grow between the maintained permanent right-of-way and the naturally regenerating temporary workspaces used along the edge of the construction right-of-way. Mountain Valley will utilize the seeding recommendations and methods requested by the USFS. The Plan of Development discusses seeding specifications within the JNF.

Weston and Gauley Turnpike Trail. The Weston and Gauley Turnpike Trail is underlain by the Gilpin-Upshur silt loam soil series. This soil series consists of well-drained silt loams on slopes from 15 to 25 percent and depths to bedrock of approximately 30 inches. The vegetation in this area is uniform hardwood stands of vegetation except for a few open pasture areas adjacent to the crossing location and a grassed existing ROW that crosses the trail, which is seeded in grass. The Trail will be crossed by conventional bore; therefore, the Project will not have any impacts on the surface of the land.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

(a): The USFS coordinates with the USFWS to avoid negative effects and to assist with recovery of federally listed species found within the JNF. The JNF contains, or may influence, suitable habitat with the potential to support 50 federally listed species including 24 mussels, 6 fish, 5 mammals, 1 amphibian, 1 spider, 1 isopod, 1 crayfish, 10 plants, and 1 bumblebee. Mountain Valley continues to coordinate with the USFWS and the USFS regarding the potential for presence of federally listed species within the Project area.

The current range of four federally listed bats (Indiana bat (*Myotis sodalists*), northern long-eared bat (*Myotis septentrionalis*), gray bat (*Myotis grisescens*), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*)) overlaps with the JNF. Mist net surveys for federally listed bats began in May 2015 and concluded in August 2015. Additional mist net surveys were conducted in May 2016. No federally listed bats were captured within the JNF during these surveys. Searches for suitable bat hibernacula (caves and mines) on the JNF land were conducted concurrent with mist net surveys. No hibernacula were discovered during these searches. Effects to these species on JNF are expected to be minor. Small amounts of potential summer roosting and foraging habitat for Indiana and northern long-eared bats may be removed due to construction of the Project; however, an abundance of suitable habitat occurs outside of the Project area. Gray and Virginia big-eared bats reside in caves year round. No potentially suitable roosting features for these two species were identified on JNF. Gray bats are not expected to forage in the vicinity of the Project on JNF; therefore, no effect on this species is expected. Virginia big-eared bats typically forage within 6 miles of their summer caves; therefore, the Project is not expected to impact foraging habitat for this species as no occupied caves are currently known on JNF.

The Roanoke logperch (*Percina rex*) and James spiny mussel (*Pleurobema collina*) are two aquatic species known or suspected downstream of the Project area and inside identified geographic bounds of the water resource cumulative effects analysis area. The Project crosses a portion of Craig Creek within the JNF, and an abbreviated mussel survey was completed on October 20, 2015. Fourteen hours and 20 minutes of search time was expended along 1,553 meters (5,095 feet) of stream reach at the Project crossing. No signs of mussels (live or deadshell) were observed. Due to avoidance of suitable habitats and implementation of erosion and sediment control measures during construction, downstream populations of James spiny mussel are not likely to be affected. Neither suitable habitats for Roanoke logperch nor occurrences are known to occur on JNF. Project-related activities on JNF lands are not likely to affect the species.

Four eastern small-footed bats (*Myotis leibii*) (three adult males and one pregnant female) were captured during mist net surveys in the JNF (Pocahontas Road) in Giles County, Virginia. All individuals were healthy and released at their capture sites. No potentially suitable roosting habitat for this species was observed within the Project area. The Project may remove small amounts of potentially suitable foraging habitat; however, this species forages widely in all forested and open habitat types.

A single population (approximately 10,000 individuals) of rock skullcap (*Scutellaria saxatilis*) (a USFS sensitive species) was identified during plant surveys on JNF along the proposed route. The population

spans approximately 1.45 hectares (3.58 ac); however, only an approximate 0.78 hectare (1.94 ac) is within the proposed construction ROW. While Mountain Valley has shifted the route and necked the construction right-of-way down to 75 feet, there will be some loss of rock skullcap (a USFS sensitive species) in this area.

Recent Allegheny woodrat (*Neotoma magister*) activity (midden and latrine) within a boulder field was documented 1,600 feet west of the proposed Project's construction right-of-way. Mountain Valley does not anticipate having an adverse effect on the Allegheny woodrat.

The Western and Gauley Bridge Turnpike Trail is an active trail, and no habitat for sensitive species is contained within its limits. Moreover, the Weston and Gauley Bridge Turnpike Trail will be crossed by conventional bore and impacts to species will be minimal and temporary and related only to construction noise.

(b): No marine mammals are anticipated to be impacted by this Project.

Attachment B



**Figure 1
Proposed Route
Jefferson National Forest
Crossing 1**

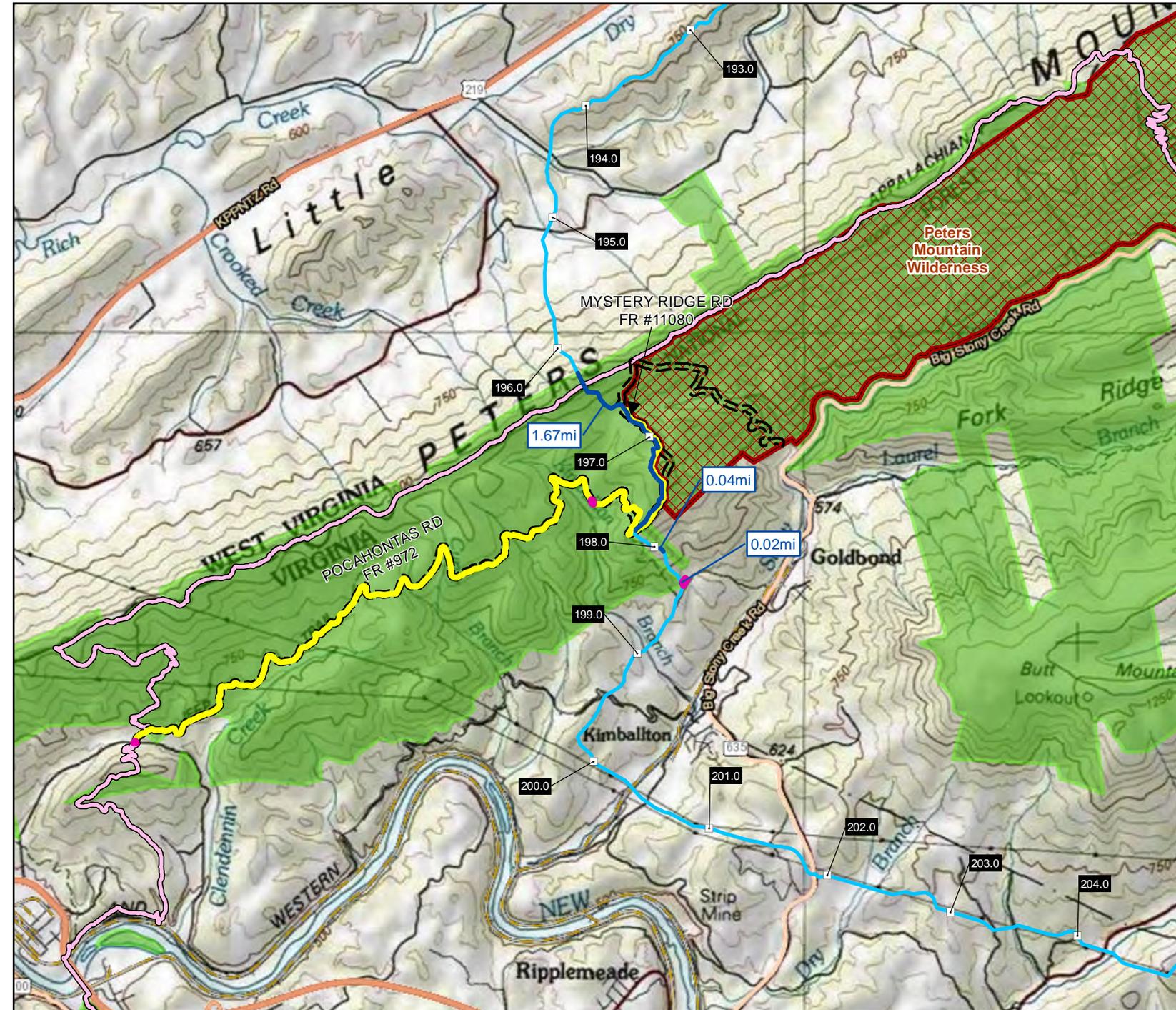
February 2017

Legend

-  Milepost
-  Access Road
-  Proposed Route Crossing USFS Land
-  Proposed Route
-  U.S Forest Service Road
-  Appalachian National Scenic Trail
-  Additional Temporary Workspace
-  Peters Mountain Wilderness
-  U.S. Forest Service (National Forest) Lands

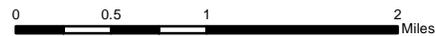


Data Sources: Appalachian Trail Conservancy, VA DCR, USDA, ESRI Streaming Data, NPS.



1:63,360

NAD 1983 UTM 17N



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Mountain Valley Pipeline Project

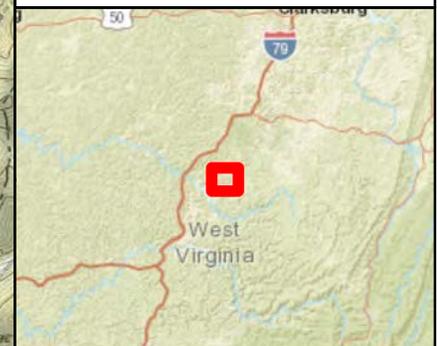


Figure 3 Proposed Route Weston and Gauley Bridge Turnpike Trail Crossing

February 2017

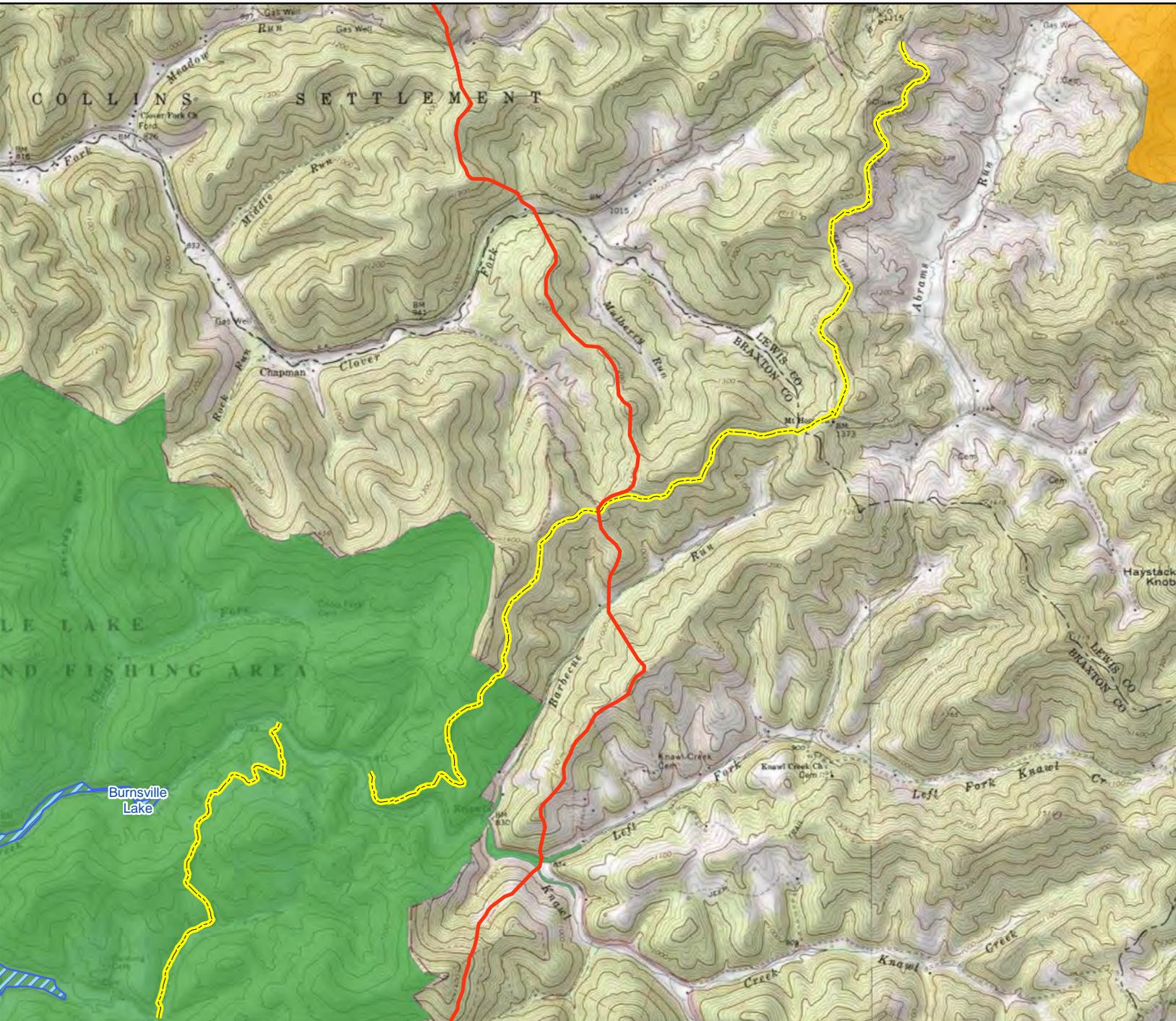
Legend

- Proposed Route
- Weston Gauley Turnpike Trail
- Army Corps of Engineers Reservoir
- Burnsville Lake Wildlife Management Area
- Stonewall Jackson Lake Wildlife Management Area



Data Sources: Virginia Department of Conservation and Recreation, ESRI Streaming Data, West Virginia GIS Technical Center.

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Attachment C - Conventional Bore Plans

Attachment D

OCTOBER 2, 2015



ECONOMIC BENEFITS OF THE MOUNTAIN VALLEY PIPELINE PROJECT IN WEST VIRGINIA

CRITICAL THINKING
AT THE CRITICAL TIME™

DISCLAIMER

The information contained herein has been prepared based upon financial and other data provided to FTI from the management and staff of EQT Corporation and from public sources. There is no assurance by anyone that this information is accurate or complete. FTI has not subjected the information contained herein to an audit in accordance with generally accepted auditing standards. Accordingly, FTI cannot express an opinion or any other form of assurance on, and assumes no responsibility for, the accuracy or correctness of the historical information or the completeness and achievability of the projected financial data, information and assessments upon which the enclosed report is presented.

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**Special thanks to the research and analytical contributions of Drew Ernest and
Patricia Hogan**

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Executive Summary

EQT Corporation retained FTI Consulting (“FTI”) to examine the potential economic benefits of the Mountain Valley Pipeline (“MVP”) project to the State of West Virginia and the ten eleven counties through which the project is proposed. The MVP is a natural gas pipeline that will traverse approximately 300 miles across West Virginia and Virginia, including the West Virginia counties of Wetzel, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe, as shown in Figure 1.

Three types of economic benefits would occur from the construction and operation of the MVP project. These benefits include:

- **Construction Spending Benefits:** Expenditures on goods and services in the State would translate into job creation; economic benefits to West Virginia suppliers, their employees, and the overall economy; and new tax revenues.
- **Operational Benefits:** Once in service, the project would require a skilled workforce to operate and maintain the pipeline. Also, it would generate annual property tax revenues for the counties, providing an additional stream of funds.
- **Direct-Use Benefits:** The State and counties would benefit from the potential direct use of gas from the MVP project. The project would enhance gas service already available, help enable new gas service, and expand opportunities for commercial and manufacturing activities.

Construction Spending Benefits

From 2015 to 2018, the MVP project owners plan to spend \$811 million directly on resources (equipment, materials, labor, and services) in West Virginia. This direct spending would translate into \$594 million in cumulative Gross Regional Product over the four-year period, as summarized in Figure 2.

Figure 1 – Proposed MVP Path through West Virginia

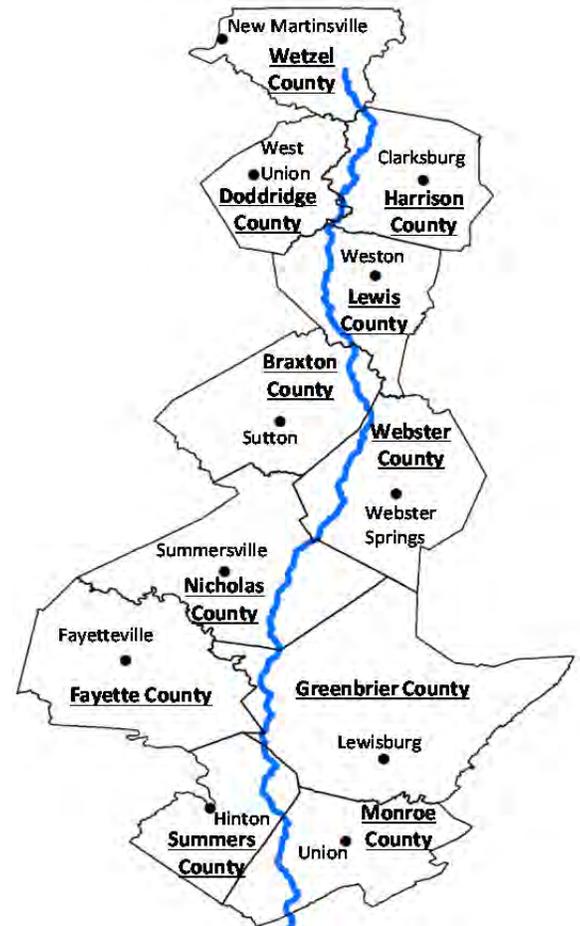
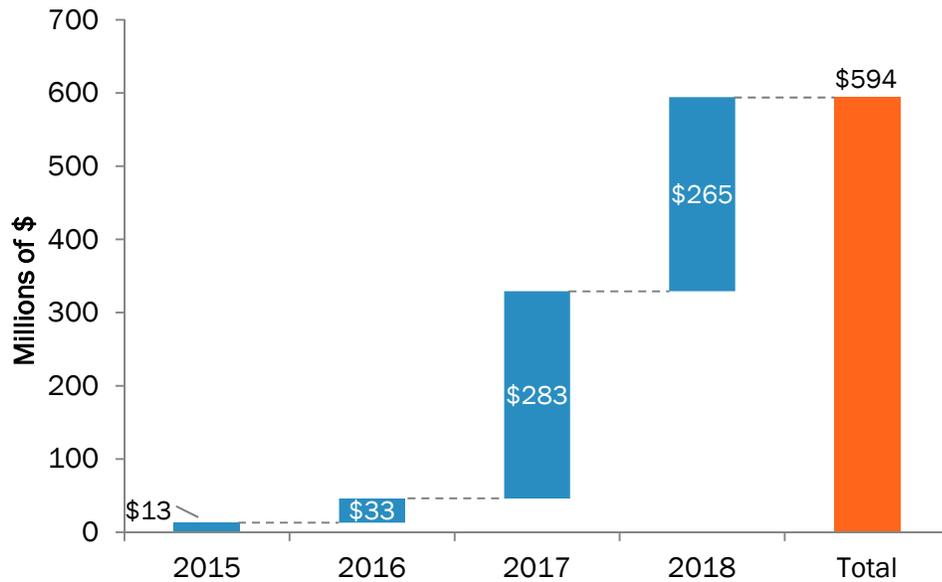
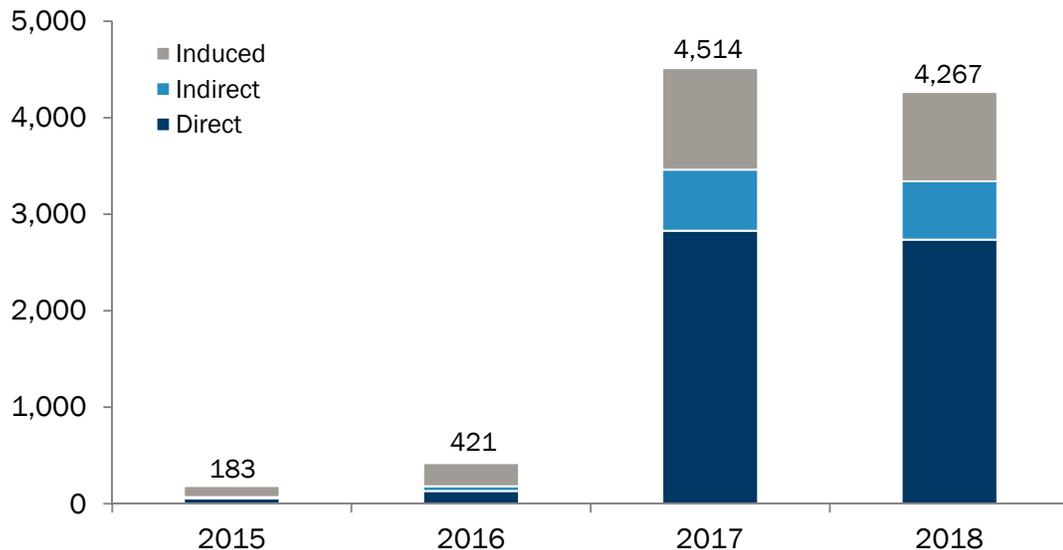


Figure 2 – MVP Additions to West Virginia’s Gross Regional Product



The MVP project would create more than 4,500 jobs at the peak of construction in 2017. 2,829 of these jobs would be directly associated with the project (labeled “direct” in Figure 3); 633 jobs would be created along the supply-chain (“indirect”); and 1,052 jobs would be created in the general economy.

Figure 3 – MVP Jobs Created in West Virginia by Year¹

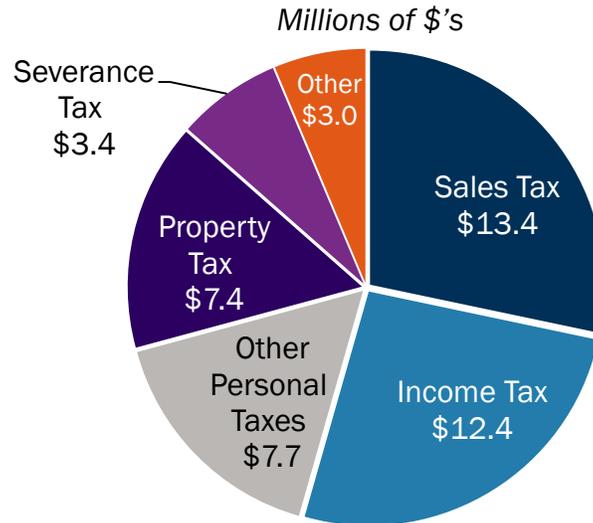


¹ The jobs shown in the figure are annual, full-time equivalent jobs (or job-years) that the MVP project contributes to the West Virginia economy from 2015-2018.

Cumulatively, the MVP project would create 9,384 job-years over the course of construction.

Another benefit of the MVP project is the increased state and local tax revenues that result from the economic ripple effect of construction expenditures. As shown in Figure 4, the project would generate \$47 million in aggregate tax revenues from 2015 to 2018.

Figure 4 – West Virginia State and Local Tax Revenues Generated during Construction, 2015–2018



Operational Benefits

Once in service, the MVP project would continue to benefit West Virginia's economy in three main areas. The first is in operational employment and spending. Ongoing operation and maintenance of the pipeline would support a total of 54 jobs across the state with average annual wages and benefits of almost \$65,000.

Annual tax revenues through ad valorem taxes (property taxes) represent the second area of operational benefits. Based on the estimated pipeline investments and county property tax rates, the MVP project owners would pay up to \$17 million in taxes annually. This amounts to 17% of the total 2013 combined budgets for the eleven counties.

Direct-use benefits of the pipeline's natural gas represent the third area where West Virginia and the counties potentially could benefit from the project and are discussed in further detail below.

Direct-Use Benefits

Residential, Commercial, and Municipal Buildings

In terms of direct gas-use benefits, the MVP project could provide significant fuel cost savings to the residential, commercial, and municipal sectors of Monroe, Summers, and Webster counties through fuel switching (i.e., switching fuels used for space heating and water heating from propane, fuel oil, diesel, and electricity to natural gas). These three counties have limited gas access compared to the

remaining eight counties along the proposed pipeline in West Virginia. The MVP proposed route will pass near the major towns in these counties (see Table 1).

Table 1 – Distance to MVP Proposed Route from Towns and Areas in Monroe, Summers, and Webster Counties

County	Major Towns	Distance from MVP Proposed Route
Monroe	• Union	8.2 mi.
	• Alderson	5.5 mi.
	• Peterstown	5.5 mi.
Summers	• Hinton	7.8 mi.
Webster	• Webster Springs	7.2 mi.
	• Cowen	1.2 mi.

Transportation Sector

The transportation sector in the eleven counties represents the largest opportunity for fuel switching. Conversion of the eleven counties’ fleet vehicles such as school buses, sanitary waste vehicles, and county vehicles could result in approximately \$500,000 in annual fuel switching savings. This amount includes the full cost of the delivered gas and CNG infrastructure required. Further savings, and thus disposable income, could be realized across the counties if the CNG stations were made available for public consumption. Furthermore, this amount is based on current low fuel prices. Savings would be significant higher if fuel prices were to increase.

Transitioning vehicles to natural gas (i.e., fuel switching) has become an increasing priority in West Virginia. In 2012, the Governor issued an executive order to create a Natural Gas Vehicle Task Force.² The State also has provided helpful tax credits to enable compressed natural gas (CNG) vehicle deployment.³ Using these credits, IGS Energy CNG Services (IGS) constructed and placed into operation three large-scale, public CNG refueling stations along Interstate 79 in the last two years (see Figure

Figure 5 - Locations of IGS's Three CNG Stations Along I-79



² *Natural Gas Vehicle Task Force Report*, February 2013.

³ See <http://www.afdc.energy.gov/laws/all?state=WV>

5). One of these stations is located in Jane Lew in Lewis County and another in Bridgeport in Harrison County. Braxton County is one of the eleven counties along the proposed MVP route and could be another potential site for a CNG station along the I-79 corridor.

Interstate 64 represents another major corridor for potential CNG refueling stations in West Virginia. The interstate runs from St. Louis, MO, to the Virginia coast, and it intersects with Charleston near the IGS station along I-79. Summers and Greenbrier counties could be worthy candidates for future Interstate 64 CNG stations, especially as they are along the proposed MVP project path.

Future Benefits

The MVP project would provide manufacturing investment opportunities within the state and the counties. FTI interviews with county leaders indicate that natural gas access can be a major factor in businesses deciding to expand and locate operations in a county, particularly energy-intensive and advanced technology manufacturing. These businesses provide large economic benefits to communities from an employment, wage, and tax revenue perspective. Harrison County serves as an example. It has a thriving aerospace services industry in which the average annual wage is \$72,000. Harrison County also has an unemployment rate of only 5.2%.

Altogether, the proposed MVP project would provide a number of economic and employment benefits to West Virginia and the counties through which the project is planned. During construction, these benefits would result from capital spent directly within West Virginia and the counties. Once in service, MVP will employ people within the state to help operate and maintain the pipeline. Also, counties will collect property taxes from the pipeline. Finally, the pipeline will provide sizable opportunities for direct gas use in areas with and without gas access. These opportunities include additional supply reliability, fuel switching savings, and new energy-intensive and advanced technology businesses started in West Virginia.

1. Introduction

1.1. Project Background

The proposed MVP project is a FERC-regulated natural gas pipeline system that would span approximately 300 miles from the northern part of West Virginia to the southwestern part of Virginia.⁴ It is expected to provide at least two billion cubic feet per day or 3% of current U.S. gas demand to markets in the Mid- and South- Atlantic regions. The pipeline as proposed would pass through eleven West Virginia counties.

EQT Corporation has retained FTI Consulting (“FTI”) to examine the MVP project’s potential economic benefits along three areas – economic growth and employment resulting from construction expenditures, operational benefits in terms of jobs created and ad valorem taxes paid by the MVP project owners, and direct gas-use opportunities that would result within the counties.

1.2. Approach

Below we summarize the approaches taken for determining the economic benefits in the three areas.

Construction Economic Impacts and Job Creation Benefits

FTI applied the IMPLAN model to estimate the economic impact and jobs created from construction activities in West Virginia. The IMPLAN model is a general input-output modeling software and data system that tracks the movement of money through an economy, looking at linkages between industries along the supply chain, to measure the cumulative effect of spending in terms of job creation, income, production, and taxes. The IMPLAN data sets represent all industries within the regional economy – rather than extrapolating from national averages – and are derived primarily from data collected by federal agencies.⁵

The economic impacts that IMPLAN calculates can be broken into direct impacts, indirect impacts, and induced impacts, defined as follows:

- **Direct impacts:** the economic activity resulting from the MVP capital costs spent on industries residing in West Virginia. These are the industries that provide the ‘direct’ materials, construction labor, construction management, and technical services (e.g., engineering and

⁴ The MVP would be constructed and owned by Mountain Valley Pipeline, LLC, a joint venture of EQT Corporation (NYSE: EQT) and NextEra US Gas Assets, LLC, an indirect, wholly owned subsidiary of NextEra Energy, Inc (NYSE: NEE).

⁵ The 2012 IMPLAN Dataset includes data from the U.S. Bureau of Labor Statistics (BLS) Covered Employment and Wages (CEW) program; U.S. Bureau of Economic Analysis (BEA) Regional Economic Information System (REA) program; U.S. BEA Benchmark I/O Accounts of the U.S.; BEA Output estimates; BLS Consumer Expenditure Survey; U.S. Census Bureau County Business Patterns (CBP) Program; U.S. Census Bureau Decennial Census and Population Surveys; U.S. Census Bureau Censuses and Surveys; and U.S. Dept. of Agriculture Census.

design, surveying, and permitting) for the project. This is the first order impact of the MVP expenditures within the state.

- **Indirect impacts:** the economic activity resulting from the ‘direct’ industries spending a portion of their revenues on goods and services provided by their supply chain in West Virginia. These supply chain industries represent the second order or ‘indirect’ impacts of the original MVP expenditures in West Virginia.
- **Induced impacts:** the economic activity resulting from the spending of the income earned by employees within the ‘directly’ and ‘indirectly’ affected industries. The benefactors of induced impact are primarily consumer-related businesses such as retail stores, restaurants, and personal service industries. These ‘induced’ impacts represent the third order impact.

Through the direct, indirect, and induced impact calculations, IMPLAN provides the economic ripple effect, or multiplier, that tracks how each dollar of input, or direct spending, cycles through the economy to suppliers and ultimately to households.

The first step of the IMPLAN process was to collect the estimate for state-only spending for each of the major project cost categories. These categories included the following:

- Pipeline Materials
- Compressor materials
- Meters and regulator devices
- Technical services such as engineering design, survey, and permitting
- Construction and commissioning services
- Land and right of way acquisitions

Of the \$3.5 billion that the MVP project owners plan to spend, \$811 million is planned to be spent *directly* in West Virginia, with the difference being spent in Virginia and outside the two states.

FTI then assigned these cost categories to one of the 440 IMPLAN economic sectors as inputs to the model. The model was then run from 2015 to 2018 to provide the following direct, indirect, and induced economic impacts:

- **Gross Regional Product (GRP):** an industry’s value of production over the cost of its purchasing the goods and services required to make its products. GRP includes wages and benefits paid to wage and salary employees and profits earned by self-employed individuals (labor income), monies collected by industry that are not paid into operations (profits, capital consumption allowance, payments for rent, royalties and interest income), and all payments to government (excise taxes, sales taxes, customs duties) with the exception of payroll and income taxes.
- **Employment Contributions:** direct, indirect, and induced annual average jobs for full-time, part-time, and seasonal employees and self-employed workers.

- **State, Local, and Federal Taxes:** payments to government that represent employer collected and paid social security taxes on wages, excise taxes, sales taxes, customs duties, property taxes, severance taxes, personal income taxes, corporate profits taxes, and other taxes.
- **Labor Income:** the wages and benefits paid to wage and salary employees and profits earned by self-employed individuals. Labor income demonstrates a complete picture of the income paid to the entire labor force within the model.

Section 2.1 provides the results of the IMPLAN construction and employment benefits analysis.

Operational Job Creation and Ad Valorem Tax Benefits

The MVP project would create jobs within the state to operate and maintain the pipeline and would generate ad valorem tax (property tax) revenues for the counties along the proposed route. To estimate the job benefits of ongoing operations, FTI collected data from EQT on the annual direct employment required within the state to support the pipeline. We then applied the data within the IMPLAN framework described above to determine the total state-wide direct, indirect, and induced employment numbers and average wages.

For ad valorem taxes, FTI performed an analysis in conjunction with EQT utilizing a combination of gross cost and capitalized income approaches. To arrive at the project's gross cost-basis, FTI and EQT segmented the MVP cost budget into county-level cost budgets by allocating the materials, construction, commissioning, and related services costs for pipeline, meters, and regulators on a per mile basis. We then added in the materials, construction, and commissioning costs for materials specific to a county.⁶

The capitalized income approach was developed by creating a pro-forma financial analysis⁷, generating the necessary revenues to set the net present value of the project to zero, and then capitalizing the income stream. The gross cost and capitalized income approaches were given weightings of 40% and 60%, respectively, based on FTI conversations with West Virginia tax officials and tax attorneys. We next determined each county's ad valorem tax revenues by multiplying the weighted average tax basis by the assessment ratio of 60% and then by the county property tax rate.⁸ Section 2.2 provides the outcome of the operational benefits of the proposed MVP project.

Direct-Use Benefits

Direct-use benefits represent the third area of economic benefits from the proposed project. These benefits include fuel switching savings (e.g., replacing electricity, propane or fuel oil with gas) across

⁶ The MVP project plans to locate compressor stations in four counties along the proposed route.

⁷ The pro-forma was developed using a set of proxy assumptions for operational and maintenance costs, selling, general, and administrative costs, cost of capital, debt/equity ratio, construction and long-term interest rates, and depreciation method and period.

⁸ For oil and gas property in West Virginia, only 60% of the property tax rate is applied.

all economic sectors along with commercial and manufacturing expansions enabled by gas supply and access. As part of this assessment, FTI conducted reviewed press statements, conducted interviews with private and public entities in the counties and states, and interviewed local distribution companies and municipal agencies to gauge the fuel switching and manufacturing expansion potential in the counties.

Because eight of the eleven counties assessed in this analysis have gas access in major towns and areas and because the manufacturing sector representation is low in most of the counties, FTI's direct-use benefits analysis is mostly qualitative. The quantitative exception involved estimating the potential savings if municipal and private fleet vehicles in the counties were to switch to natural gas from gasoline and diesel. Based on public sources and interviews with county officials, we were able to approximate the number of fleet vehicles and their annual fuel consumption to develop a fuel savings estimate. We then applied costs for infrastructure development needed to support the fuel switching in order to calculate the net annual savings.

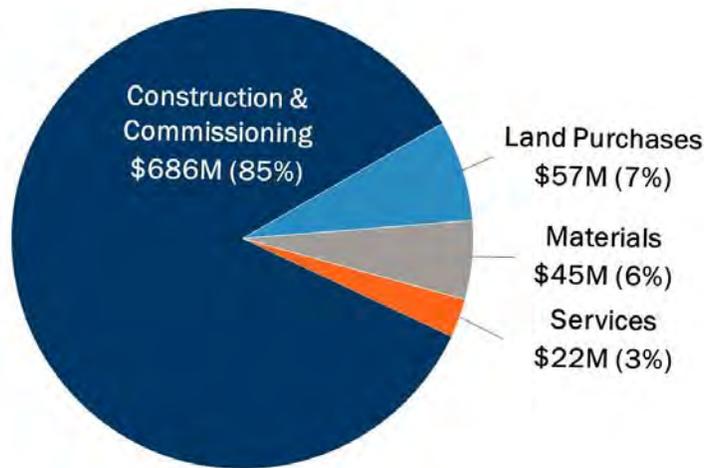
In addition to highlighting the current opportunities for fuel switching, we reviewed the potential for future opportunities that could result from having access to abundant natural gas supplies. We profiled several case studies in West Virginia of future manufacturing expansion potential that could occur with access to the MVP project. Section 2.3 provides the results from the direct-use benefits analysis.

2. Economic Benefits of the Mountain Valley Pipeline

2.1. Construction Economic Impacts and Job Creation

The MVP project owners estimate construction expenditures within the state to be \$811 million from 2015 to 2019, and these expenditures would translate into job creation and economic growth for the State and the counties. Figure 6 provides a breakdown of the cumulative MVP expenditures by major spending category in West Virginia.

Figure 6 – MVP Capital Expenditures in West Virginia Construction by Major Spending Category



This spending would result in construction peak year value-added or Gross Regional Product (“GRP”) of \$283 million in West Virginia. Over the course of the project construction, the project would generate \$594 million in cumulative GRP as shown in Figure 7.

Figure 7 – MVP Contributions to Gross Regional Product

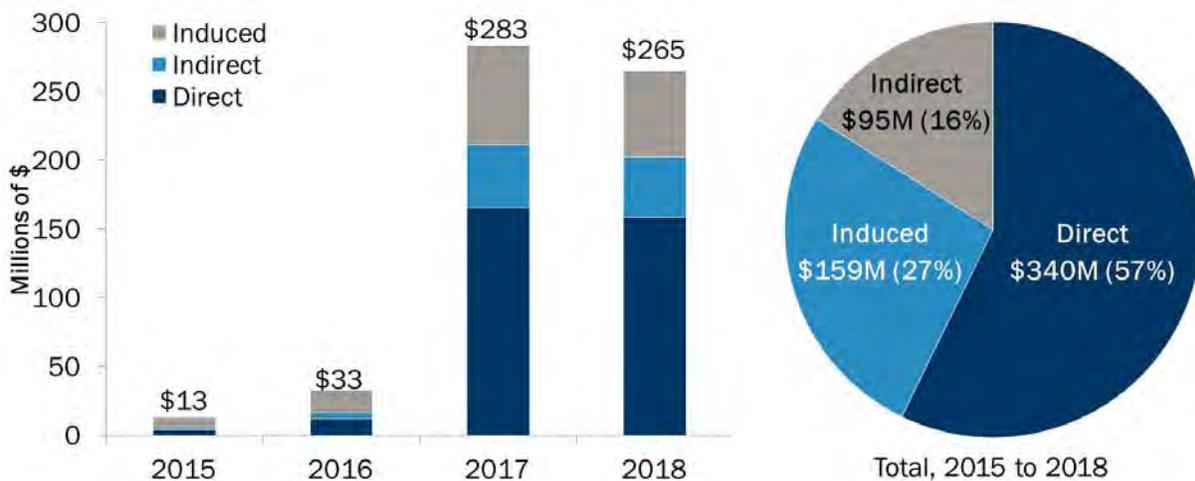
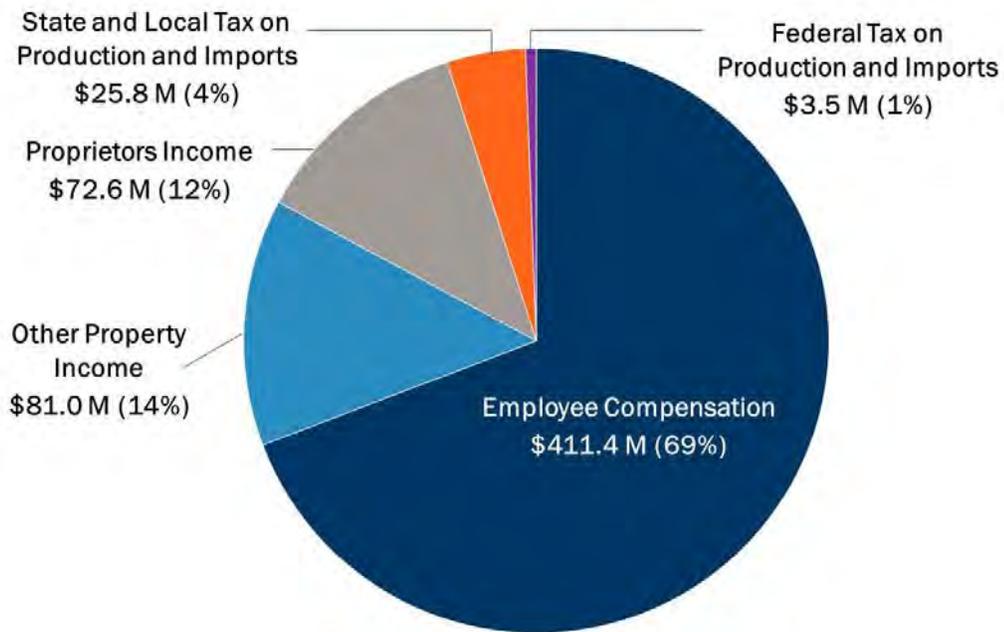


Figure 7 shows GDP segmented into direct, indirect, and induced GRP. As previously mentioned, ‘direct’ refers to the GRP occurring from the capital expenditures within the industry sectors immediately impacted. ‘Indirect’ represents the GRP impacts from suppliers to the directly impacted industries. ‘Induced’ GRP reflects the local spending of employee’s wages and salaries of directly and indirectly affected industries.

GRP is defined as the summation of employee compensation, proprietor’s income, other property income, and Federal, State, and local taxes on production and imports. Figure 8 shows that \$29 million in cumulative Federal, State, and local taxes would be generated from the MVP project construction.

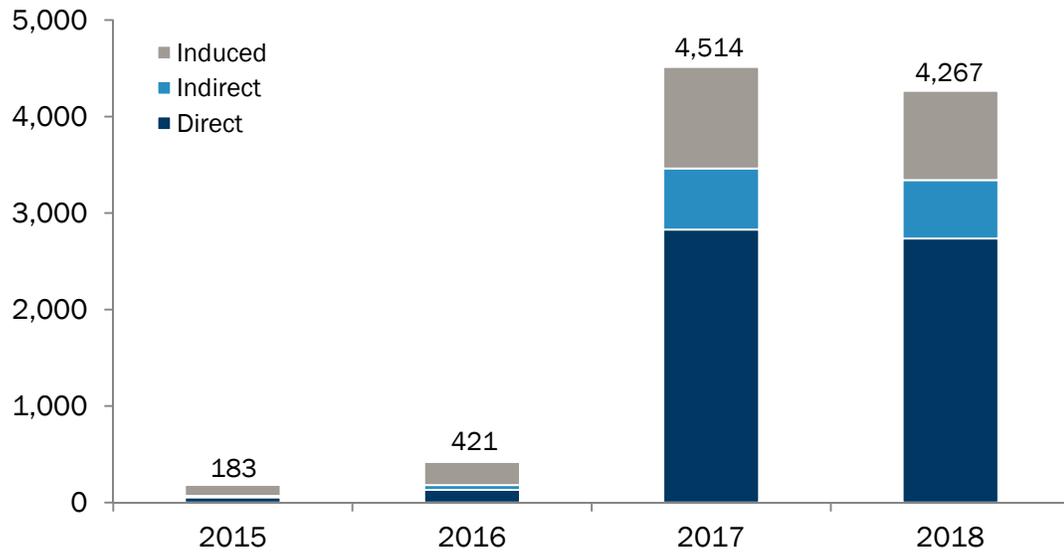
Figure 8 – Composition of MVP’s Cumulative Gross Regional Product Contributions



In addition to the GRP benefits, the project will create 4,200 to 4,500 jobs within the state during peak construction activity (2017 and 2018). These jobs include construction jobs, indirect jobs (i.e., jobs created in the state by suppliers to the direct industries impacted), and induced jobs (i.e., jobs created in the state via the spending of construction workers and employees of businesses hired to supply materials and services in constructing the pipeline). Cumulatively, the MVP project would create nearly 9,400 job-years over the course of construction as shown in Figure 9.⁹

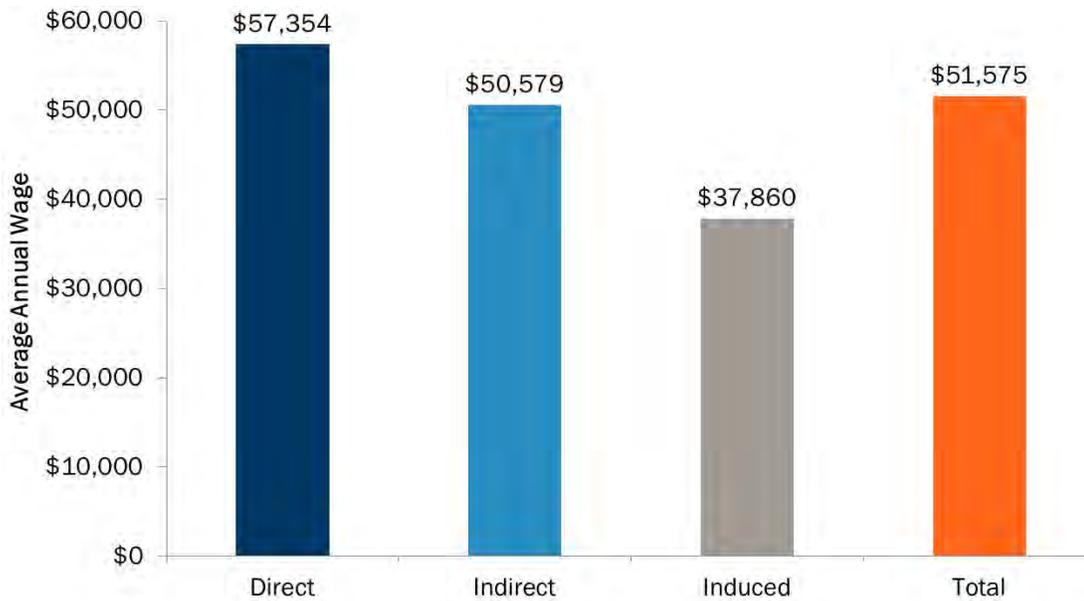
⁹ The MVP employment contributions are directly tied to the capital spending in each year and are best expressed in ‘job-years’. A job-year is the equivalent of one full-time job lasting a single year.

Figure 9 – MVP Employment Contributions



The MVP employment contribution also would have a positive impact on West Virginia labor income. Figure 10 shows the average labor income per employee for direct, indirect, and induced jobs contributed by the MVP project.

Figure 10 – MVP West Virginia Average Employee Labor Income



2.2. Operational Benefits

The MVP project would contribute employment and generate county property or ad valorem taxes during operation. Once in service, operation and maintenance activities on the pipeline would

support a total of 54 jobs across the state with average annual wages and benefits of almost \$65,000 per job contributed.

In terms of property tax benefits, Table 2 shows the estimated ad valorem taxes generated by county once the pipeline is in service and compares these taxes to the counties' general fund budget.

Table 2 – Estimated Annual MVP Ad Valorem Taxes during Operation¹⁰

County	General Fund Total Revenues	Annual MVP Ad Valorem Taxes	Percent of General Fund Total Revenues
Braxton	\$ 4,387,000	\$ 1,500,000	34%
Doddridge	\$ 5,589,000	\$ 470,000	8%
Fayette	\$ 11,333,000	\$ 840,000	7%
Greenbrier	\$ 11,305,000	\$ 1,730,000	15%
Harrison	\$ 26,631,000	\$ 2,120,000	8%
Lewis	\$ 10,898,000	\$ 1,980,000	18%
Monroe	\$ 2,809,000	\$ 1,840,000	66%
Nicholas	\$ 8,390,000	\$ 2,240,000	27%
Summers	\$ 3,290,000	\$ 890,000	27%
Webster	\$ 2,531,000	\$ 1,610,000	64%
Wetzel	\$ 13,460,000	\$ 1,740,000	13%
Total 10 Counties	\$ 100,625,000	\$ 16,980,000	17%

Source: West Virginia State Auditors Office; FTI and EQT Calculations

In total, the ad valorem taxes generated during operation could represent up to 17% of the general fund revenues among all eleven West Virginia counties. In Monroe and Webster counties, the ad valorem taxes could represent approximately two-thirds of the general fund revenues.

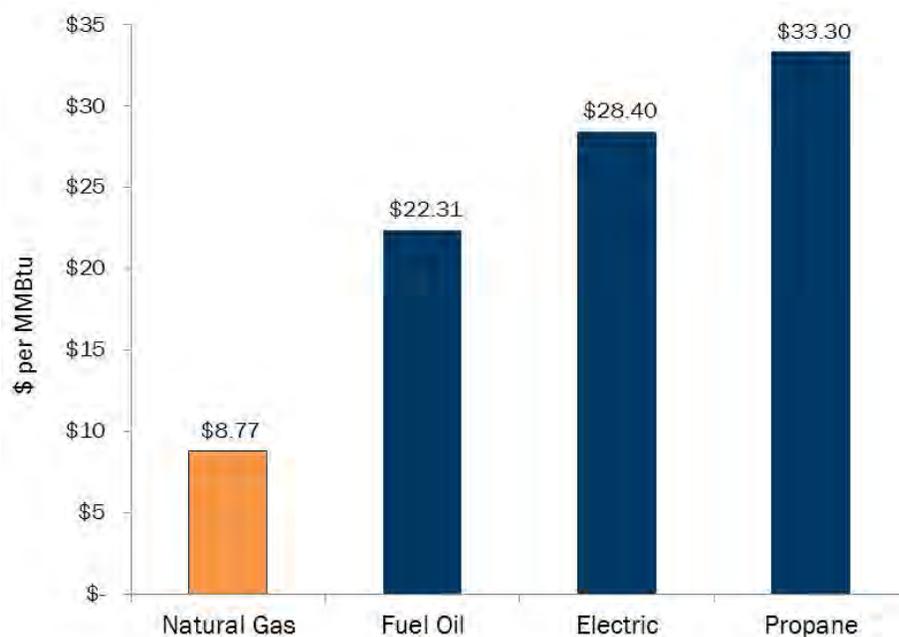
¹⁰ Dollars have been rounded to the nearest \$1,000. General Fund figures reflect the latest data available at https://www.wvsao.gov/LocalGovernment/ConBud_14-15.aspx

2.3. Direct-Use Benefits – Existing Opportunities

The shale gas revolution has helped lower natural gas prices almost 60% since 2008, which in turn has created a number of opportunities for greater investment, job creation and economic growth throughout the U.S. economy. Shale also has increased supply of natural gas, which has led to more price stability.

In West Virginia, natural gas prices have been more than 50% lower than other primary fuel sources as shown in Figure 11, making natural gas an economically attractive alternative to the residential, commercial, and municipal sectors.

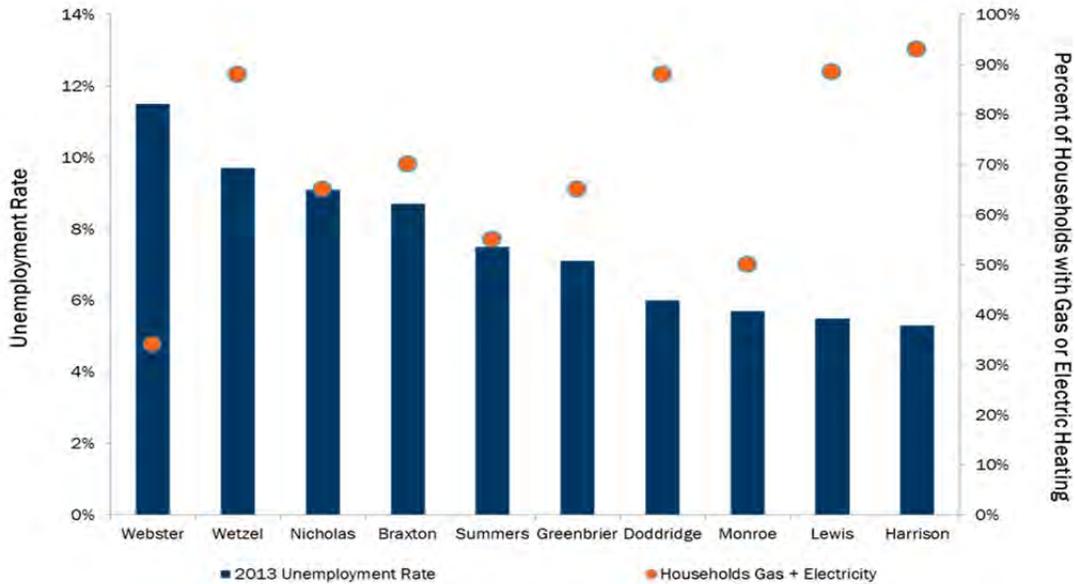
Figure 11 – 2014 Average Residential Winter Fuel Costs in West Virginia¹¹



The benefits of natural gas access go beyond consumer fuel cost savings. Natural gas Infrastructure is vital to the overall health of a local economy. For example, Figure 12 shows the unemployment rates in the eleven counties versus the percentage of households using natural gas or electric for space heating. While there are many factors involved in the health of a local economy, the general trend shows that infrastructure access can be correlated to economic performance.

¹¹ Used EIA residential prices for fuel oil and propane; used average Monongahela Power Co. residential price from EIA for electricity; used Dominion Hope industrial tariff for natural gas.

Figure 12 – Unemployment by County vs. Percent of Households Using Natural Gas or Electricity for Space Heating



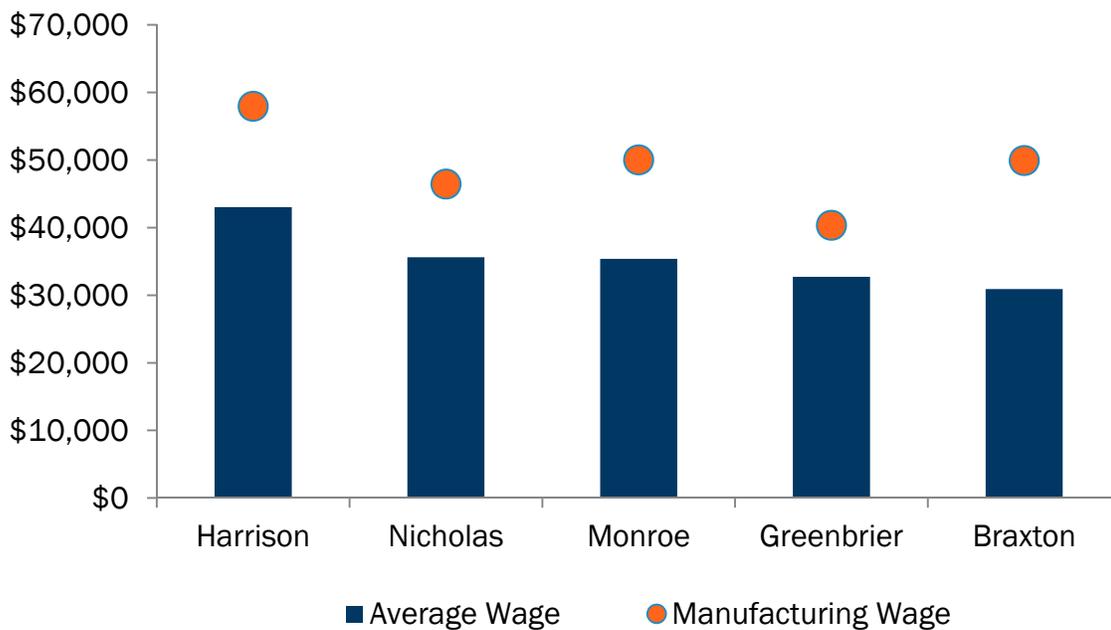
This is economic common sense – counties with extensive infrastructure access (rail, water, electricity, natural gas, interstates, broadband, etc.) are simply provided more opportunities to grow their economy. The contrast between Harrison and Webster counties – two counties along the proposed route – illustrates this point as highlighted in Table 3.

Table 3 – Comparison of Harrison and Webster County Economic Performance

	Harrison	Webster	
Infrastructure Access	Electric utility	County-wide	County-wide
	Gas access	79% of households	1% of households
	Water utility	All major towns	Limited to 8 mi. stretch along Rt. 20
	Interstate transport	I-79	N/A
	Rail transport	Clarksburg, Wallace, Shinnston, Bridgeport	Cowen
	Broadband	All major towns	Very limited
Economic Metrics	GDP per Capita (2014)	\$61,000	\$33,000
	Average Annual Wage (2013)	\$43,036	\$37,199
	Unemployment Rate (2014)	5.2%	11.3%

Infrastructure capacity and access also present opportunities for higher wages. As shown Figure 13, counties with energy-intensive and advanced technology manufacturing offer a significantly higher wage relative to other sectors. Manufacturing is an important growth engine to a community because manufacturing produces a multiplier effect by providing employees with more disposable income relative to other sectors as well as promoting growth in other industries that support manufacturing as part of the supply chain. Natural gas access also is important to retaining existing manufacturers who are searching for ways to reduce costs given natural gas' attractive costs relative to electricity, propane, and fuel oil.

Figure 13 – Employee Wage Comparison in Counties with Energy Intensive and Advanced Technology Manufacturing



In this section we review fuel switching and business expansion opportunities as they relate to the eleven counties along the proposed MVP route.

2.3.1. Fuel Switching Opportunities

Natural gas access is abundant in many parts of West Virginia due to the state's long history of natural gas production. Eight of the eleven counties along the proposed MVP route have natural gas access in the major towns and areas. The MVP project could provide additional access and reliability to the residential, commercial, and municipal customers in these counties.

Three counties with limited gas access along the proposed route – Monroe, Summers, and Webster – could benefit significantly from the MVP project if they were to switch a sizable portion of their residential, commercial, and municipal energy users over to natural gas. Table 4 provides the location of the MVP project relative to major towns and other natural gas pipelines in these counties.

Table 4 – MVP Proximity to Major Towns and Other Pipelines in Counties with Limited Natural Gas Access

County	Proximity to Major Towns	Major Pipelines Intersecting MVP
Monroe	<ul style="list-style-type: none"> • Union – 8.2 mi. • Alderson – 5.5 mi. • Peterstown – 5.5 mi. 	Columbia Gas
Summers	<ul style="list-style-type: none"> • Hinton – 7.8 mi. 	Columbia Gas
Webster	<ul style="list-style-type: none"> • Webster Springs – 7.2 mi. • Cowen – 1.2 mi. 	N/A

Below we discuss the fuel switching potential for each of these counties in further detail.

Monroe County

Monroe County is a 474 square-mile county located in West Virginia with a population of 13,483. It is primarily a farming county, with a mix of livestock (cattle, dairy, and sheep) and crop farming (hay, corn, oats, wheat, and tobacco). Timber is also a major contributor to the economy.¹² Monroe County's nominal GDP in 2014 was \$190 million or \$14,107 per person.¹³ The county's economy has grown below the national average (-1.2% vs. 2.4%), but its unemployment has remained low relative to West Virginia and the national average (5.6% vs. 6.5% in West Virginia and 6.2% nationally)

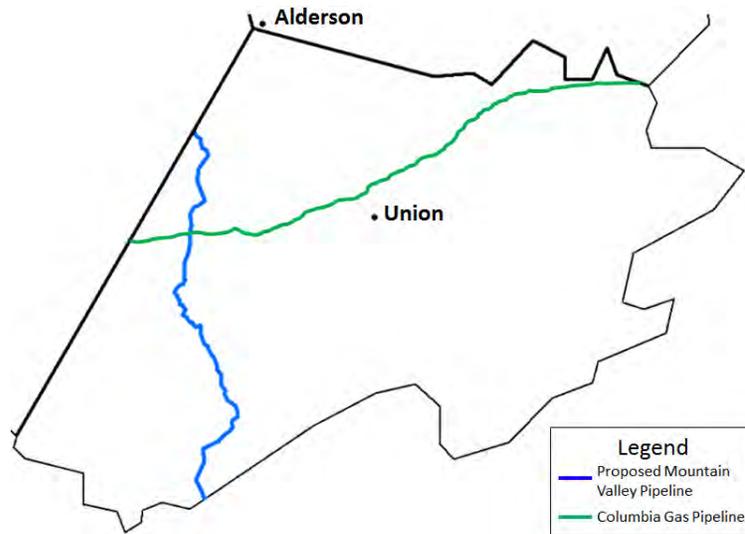
Union is the county seat and has a population of 565, Alderson, which is 40 miles from Union, is the largest town with a population of 1,184. Peterstown, 25 miles from Union, has a population of 653. Together these three towns represent 18% of the county's population.

In Monroe County, the MVP project would provide a vital north-south corridor as the Columbia Gas pipeline runs east-west (see Figure 14).

¹² <http://www.wvencyclopedia.org/articles/2024>

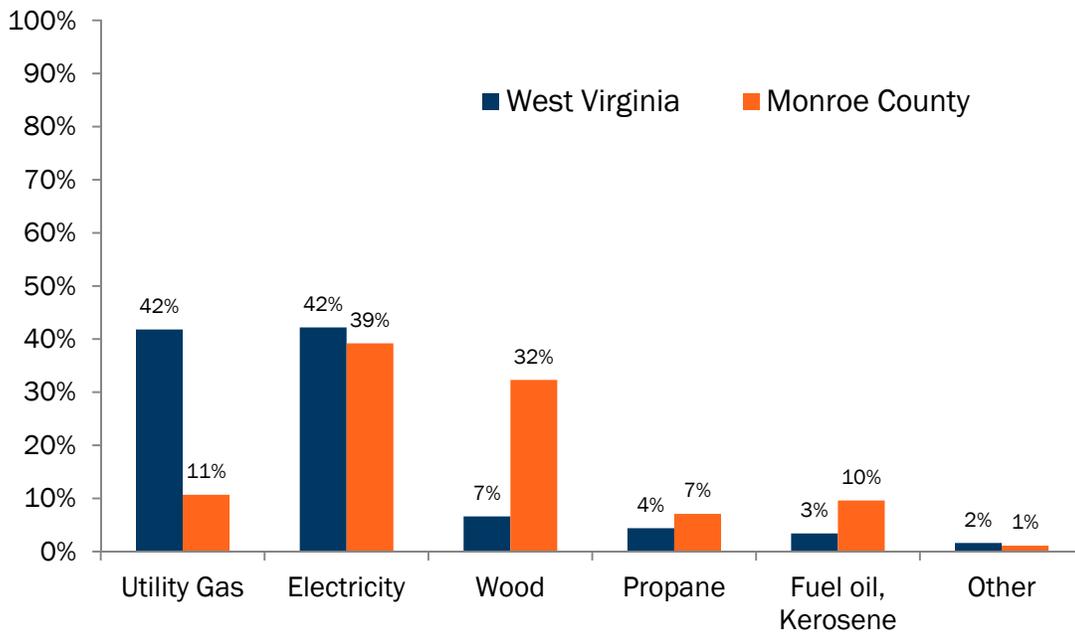
¹³ National Association of Counties. <http://www.uscounties.forg/countyTracker/index.html>

Figure 14 – Monroe County Pipelines – Existing and Proposed



The MVP project could offer fuel switching access opportunities to residential, commercial, municipal, and manufacturing customers in Monroe County. On the residential side, a relatively small percentage (11%) of homes in the county is heated with natural gas (see Figure 15). Commercial and municipal gas usage typically follows suit as gas consumption typically is driven by accessibility.

Figure 15 – Primary Space Heating Fuel Used in Monroe County versus the State, Percentage of Housing Units¹⁴



¹⁴ 2013 US Census Bureau 5 Year American Community Survey

There are two specific municipal opportunities in the county. Two schools located in Peterstown are heated using electricity that could be switched to gas.

The MVP project also could provide additional access to existing manufacturers if connected to the Columbia Gas pipeline. Below are the two main manufacturers in the county:

- **UTC Corporation:** UTC, formerly Goodrich, is a global supplier of systems and services for the aerospace and defense industries. The company employs 400 people at its Sensors and Integrated Systems plant in Union, WV. The facility is 140,000 square feet, and it is powered by a combination of electricity and natural gas.
- **M-Rock:** The company is a stone and brick designer and manufacturer in Peterstown, WV, and employs 25 people and has annual revenue of \$1M.

Summers

Summers County is a 368 square-mile county located in south-east West Virginia with a population of approximately 13,500 and has a household count of approximately 5,500. Summers County's economy has had challenges. Its nominal GDP in 2014 was \$221 million or \$16,316 per person.¹⁵ The real GDP shrunk by 1.9% from 2013 to 2014¹⁶ compared to the U.S. GDP real growth of 2.4%¹⁷ during the same time period. Additionally, the county unemployment rate was 7.4% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Hinton is the county seat and largest city with a population of 2,676 and represents 20% of the county population. Hinton has gas access.

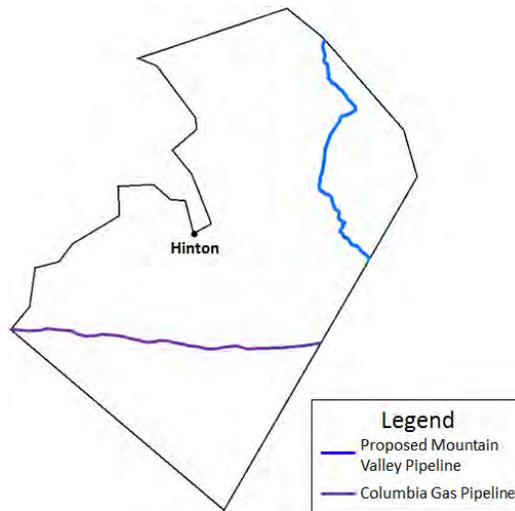
Like Monroe County, Summers County has the Columbia Gas pipeline running east-west through the county, and the MVP project would provide a vital north-south natural gas corridor (see Figure 16).

¹⁵ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

¹⁶ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

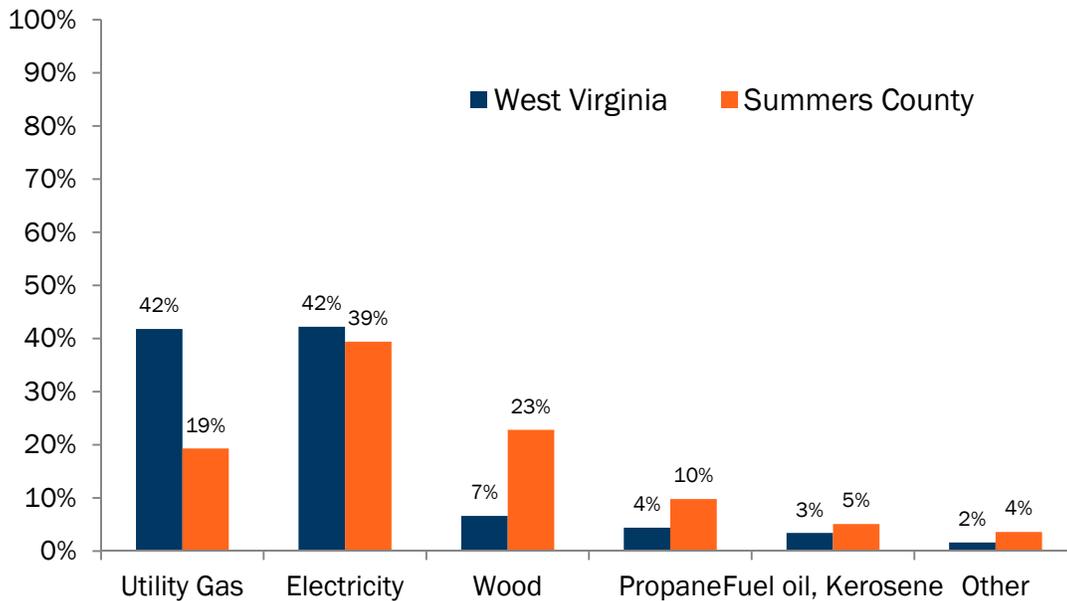
¹⁷ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

Figure 16 – Summers County Natural Gas Pipeline Map



The MVP project could offer fuel switching opportunities across all economic sectors. On the residential side, a relatively small percentage (19%) of homes in Summers County is heated with natural gas (see Figure 17). These are mainly homes in Hinton. Commercial and municipal natural gas customers have access in Hinton as natural gas consumption typically is driven by accessibility.

Figure 17 – Primary Space Heating Fuel Used in Summers County versus the State, Percentage of Housing Units¹⁸



¹⁸ 2013 US Census Bureau 5 Year American Community Survey

The planned route of the MVP pipeline would run through the northeastern portion of Summers County. The route would be near Alderson (5.5 miles away), which is just outside the county on the border of Monroe and Greenbrier counties. Alderson is an important economic center for this portion of Summers County. As such, the community in Summers County area near Alderson could benefit from having gas access for fuel switching purposes.

Webster

Webster County is a 556 square-mile county located in the center of West Virginia. It has a population of approximately 8,900 and has a household count of approximately 4,000. The county's economy has had some challenges. Its nominal GDP in 2014 was \$294 million or \$33,000 per person.¹⁹ While the county's GDP grew by 2.8% from 2013 to 2014²⁰ compared to the U.S. GDP real growth of 2.4%²¹ during the same time period, the county's unemployment rate has been high – 11.3% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

Webster Springs is the largest town with a population of 776 and is also the county seat. Cowen is the second largest town in the county with a population of 541. Together these towns represent approximately 15% of the county's population.

Overall, the economic development in the county has been scattered mainly due to a lack of infrastructure. There is no major interstate that runs through the county. As such, infrastructure is primarily available along the Route 20 corridor, which runs from Camden-on-Gauley in the southern part of the county through, Cowen, Webster Springs, nearby Diana, and Cleveland on the northern part of the county.

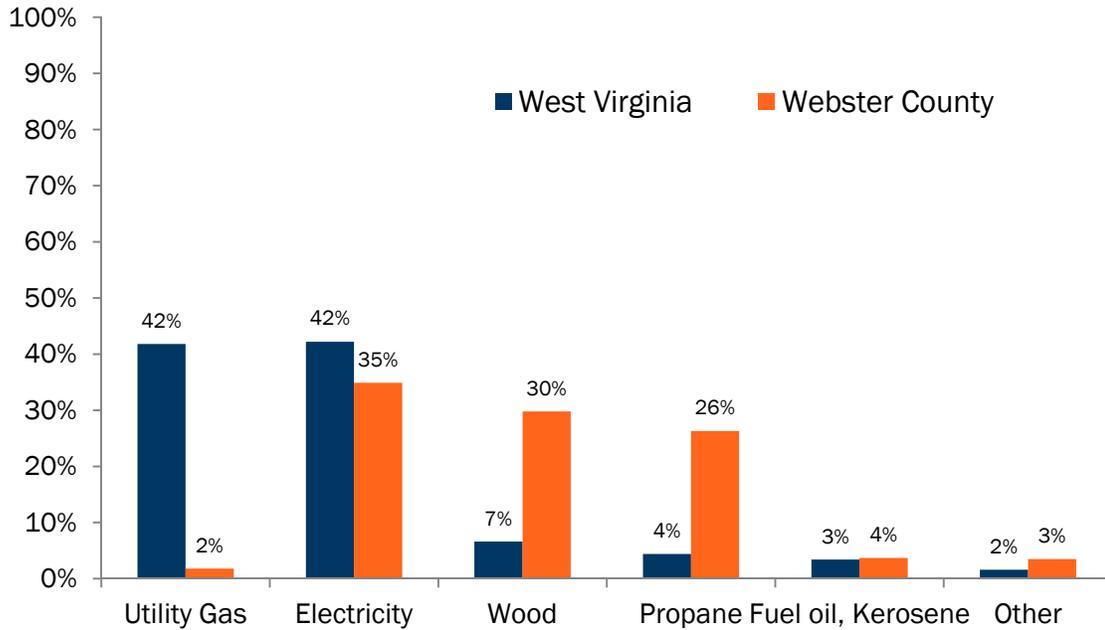
Currently there is no gas service in the county. Electricity, wood, and propane are the main residential home heating sources for the county as shown in Figure 18.

¹⁹ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

²⁰ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

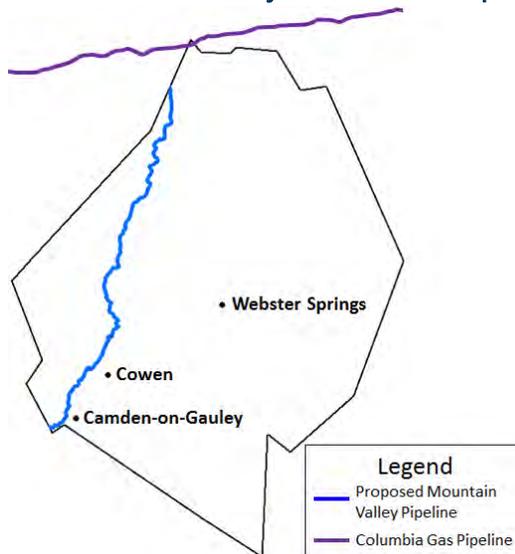
²¹ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

Figure 18 - Primary Space Heating Fuel Used in Webster County versus the State, Percentage of Housing Units²²



The residential, commercial, and municipal sectors, particularly in Cowen and Camden-on-Gauly, could benefit from the MVP pipeline as it would run through the western part of the county as shown in Figure 19.

Figure 19 - Webster County Natural Gas Pipeline Map



²² 2013 US Census Bureau 5 Year American Community Survey

Within Webster County, Cowen represents the best opportunity for fuel switching as the MVP project would run within 1.2 miles of the town. Cowen has a population of 541, and it does not have gas access. Furthermore, Cowen offers the best opportunities for business expansion due to its flat terrain and rail access.

2.3.2. Business Expansion Opportunities

A major natural gas pipeline, such as the proposed MVP project, can draw new businesses that require high volumes of natural gas, particularly energy-intensive and advanced technology manufacturers. These businesses can provide large economic benefits to communities from an employment, wage, and tax revenue perspective as their multiplier effects (the amount of indirect and induced GRP and employment created per dollar of investment) is large. For example, for each job created within the petrochemical industry 12 other jobs are created along the supply chain and from general economic spending.²³ The multiplier or ripple effects for the petrochemical industry are large because the industry has an above average capital investment to direct employment ratio.

In this section we discuss existing, business expansion opportunities in select counties along the proposed MVP route. These opportunities mainly center on West Virginia's gas sector as a number of counties along the proposed route have sizable natural gas operations. The MVP pipeline offers an opportunity for developers to move their natural gas via the pipeline to ten other counties in West Virginia, six counties in Virginia, and a large portion of the U.S. Southeast

Doddridge

The primary growth sector for Doddridge County in recent years has been the oil and gas sector. Mark West in 2013 opened a new gas processing facility outside West Union that employs approximately 25 people. The company plans to triple its capacity in the near future. During the construction of the facility, Mark West employed about 200 local electricians, pipefitters, welders, carpenters and other tradespeople.²⁴ The Mark West facility, along with other parts of natural gas industry, provides on average wages that are 2.5 times higher than the county average as shown in Table 5 in the Resources and Mining sector.

²³ IMPLAN, 2012

²⁴ <http://www.wvillustrated.com/story/20280391/new-markwest-natural-gas-processing-online-in-doddridge-co>

Table 5 – Annual Average Wages in Doddridge County by Sector²⁵

Sector	Average Annual Wage
Resources and Mining	\$104,946
Construction	\$40,780
Government	\$32,216
Commercial	\$25,549
Manufacturing	N/A
Weighted Average	\$39,016

Table 5 illustrates that the natural gas industry is an important near-term driver for Doddridge County's economic performance.

Lewis

Existing manufacturing expansion opportunities in Lewis County are limited. Viking Pools, which manufactures hot tubs, spas and whirlpool baths, and Tamarack Log Homes, which manufactures log homes, are large employers but likely have few needs for additional gas supplies. Both are located at the industrial park near the Jane Lew exit of I-79.

The primary growth sector for Lewis County in recent years has been the natural gas industry. The county has become an operational hub for many companies involved in Marcellus Shale development. Companies such as Nexus Drilling, Chesapeake Energy, and Superior Well Services have expanded operations significantly, employing approximately 1,500 people or 20% of the workforce in the county. The average wage for oil and gas extraction employees in Lewis County has been ~\$77,300. It is worth noting that Lewis County now has the third lowest unemployment in the state after Monongalia and Jefferson counties.

This boon has been helpful in offsetting manufacturing decline. In 2013 Halliburton shut down their cement plant operations in Weston, WV, and moved it 150 miles away to Zanesville, OH. The company had employed approximately 75 people.

Wetzel

The primary growth sector for Lewis County in recent years has been the oil and gas sub-sector under Resources and Mining. The drilling activity in Wetzel has led to a boom in government revenue with a large increase in tax revenue. Local property tax revenue has nearly tripled since 2005 with

²⁵ Workforce WV. http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

significant increases to severance tax revenue as well.²⁶ The average wage for oil and gas extraction employees in Wetzel County has been ~\$73,800.

FTI has found that gas development represents the near-term economic growth opportunity for the county. Wetzel County could benefit further from natural developments in the county by training more county residents to work in the field and exploring approaches for transitioning out-of-state workers to be re-located within the county. This would provide additional disposable income within the counties borders.

2.4. Direct-Use Benefits – Future Opportunities

The shale gas revolution in the last few years has created a manufacturing renaissance in the United States. The increased supply of natural gas has stabilized prices leading to greater investment, job creation and economic growth. Manufacturing is an important growth engine to a community because manufacturing produces a multiplier effect that promotes growth in other industries.

Our interviews with county representatives, regional partnership leaders, and manufacturers inside and outside the county identified that businesses value abundant and reliable gas service, and that access to natural gas is a primary criterion for determining where to locate new manufacturing facilities. Anecdotal evidence from these interviews place lost manufacturing opportunities at 50% for counties without gas access. Clearly, access to a pipeline could have considerable impacts on the local economy in terms of jobs, economic output, and tax revenues.

Below we highlight the major manufacturing employers in eight of the eleven counties along the proposed route. Additional gas access to these manufacturers could help enable expansions by providing a low-cost resource to their operations.

²⁶ <http://www.wvpolicy.org/wp-content/uploads/2014/04/Impacts-of-Drilling-in-Wetzel-County.pdf>

Table 6 – Major Manufacturing and Oil & Gas Employers by County

County	Major Manufacturing and Oil & Gas Employers	Products	Est. Employees
Braxton	Weyerhaeuser	Oriented strand board	140
	Appalachian Timber Services	Rail ties	80
	Braxton Lumber	Lumber Mill	20
Doddridge	Mark West	Natural Gas Processing	
Greenbrier	ABB	Industrial motors	160
	Mullican Flooring	Hardwood flooring	120
Harrison	Aurora Flight Services	Aerospace vehicles	160
	Bombardier Services	Airline maintenance	400
	Europtec	Glass fabrication	60
	Graftech	Graphite products	175
	Pratt & Whitney	Airline repair/engine manufacturing	400
	Stockmeier Urethanes	Chemicals products	15
Lewis	Viking Pools	Bathtub and spas	75
	Tamarack Log Homes	Log homes	7
Monroe	UTC Aerospace Systems	Aerospace products	400
	M-Rock	Stone/brick design	25
Nicholas	B/E Aerospace	Aircraft cabin products	160
	Columbia Wood Products	Hardwood products	380
Webster	Allegheny Wood Products	Hardwood products	175
	Jim C. Hamer Company	Hardwood products	75
	Northwest Hardwoods	Hardwood products	

Beyond these existing manufacturers, new manufacturers could emerge with the development of the MVP project. The Marcellus and Utica shale gas formations have created a number of manufacturing opportunities for West Virginia, Pennsylvania, and Ohio. Together, these two gas formations account for 16.6 Bcf/d or more than 20% of U.S. production²⁷ and are enticing companies to build massive chemical projects in these states. Several projects to build ethane crackers are being considered, and the MVP project along with other oil and gas infrastructure project may attract these and similar manufacturing investments to West Virginia, spurring economic growth, high-paying jobs, and additional tax revenues for the counties and State.

²⁷ EIA Drilling Productivity Report, October 14, 2014.

Below we present four case studies on proposed projects that, if built, would have significant economic benefits to West Virginia and surrounding areas.

1. Odebrecht

Odebrecht is a Brazilian conglomerate consisting of businesses in the fields of engineering, construction, chemicals and petrochemicals. It has proposed the construction and operation of a world-scale ethane cracker and three polyethylene manufacturing plants in Parkersburg, WV, along with water treatment and energy co-generation facilities.²⁸ Odebrecht estimates the plant to cost \$3.8 billion. Typically, ethane project investments of this magnitude employ more than 2,000 construction workers at their peak and 200-300 full-time employees during operation. The facility would be supplied by ethane and natural gas from the Marcellus and Utica shales.

This proposal is an example of how West Virginia could move further down the value chain from a fuels producer to a producer of value added petrochemical products. As Kevin DiGregorio, Executive Director of West Virginia-based Chemical Alliance Zone, stated, “[a] cracker in West Virginia just makes sense. The chemical industry historically follows abundant raw materials, and the vast amount of ethane in the Marcellus Shale provides a great foundation for new chemical manufacturing investments.”²⁹

Odebrecht has stated that a final investment decision will be made by the end of 2015.

2. Aither

Aither Chemical is evaluating locations in OH, PA, and WV to build a plant that would produce ethylene and related products.³⁰ Aither estimates the plant would cost \$200 to \$750 million and create 200 permanent jobs and 2,000 temporary construction jobs, with indirect job creation from the project resulting in as many as 1,400 more permanent jobs.³¹ The plant would produce up to 600 million pounds of ethylene, 300 million pounds of acetic acid, 80 million pounds of carbon dioxide, and 40 million pounds of carbon monoxide each year, generating \$450 million in annual revenues. The plant would use natural gas and ethane from the Marcellus Shale.

The Aither plant is another example of the manufacturing potential in the Marcellus and Utica areas. The economic benefits of these facilities are highly multiplicative, with 7– 10 times the indirect jobs (jobs related to supplier to these facilities) being created. The supply chain economic benefits are recognized by state governments. For example, West Virginia Governor Earl Ray Tomblin signed into

²⁸ “Odebrecht Moves Forward with WV Cracker Plant Plans.” Marcellus Drilling News. Sep. 2, 2014.

<http://marcellusdrilling.com/2014/09/odebrecht-moves-forward-with-wv-cracker-plant-plans>

²⁹ “Industry Leaders Speak on Cracker.” The Weirton Daily Times. Dec. 2, 2013.

<http://www.weirtondailytimes.com/page/content.detail/id/607182/Industry-leaders-speak-on-cracker.html?nav=5006>

³⁰ “Aither Chemicals Mulls Plans for Cracker and PE plant in Marcellus Shale region.” Plastics News. April 18, 2013.

<http://www.plasticsnews.com/article/20130418/NEWS/130419906/aither-chemicals-mulls-plans-for-cracker-and-pe-plant-in-marcellus-shale-region>

³¹ <http://www.plasticsnews.com/article/20130418/NEWS/130419906/aither-chemicals-mulls-plans-for-cracker-and-pe-plant-in-marcellus-shale-region>

law in 2012 a tax incentive plan designed to lure an ethane cracker plant to West Virginia. The law gives a 25-year property tax break to companies that spend more than \$2 billion on such a facility.

3. Other Opportunities in the Region

Other similar investments reflect the potential for West Virginia counties to attract these types of manufacturing opportunities.

Shell has proposed the construction of an ethane cracker in Monaca, PA, in Beaver County, 35 miles northwest of Pittsburgh. The facility would be capable of producing 1.5 million tons of ethylene and 1.6 million tons of polyethylene annually and employ 400 people. Supporting the plant's operations would be three on-site natural gas-fired turbines, four emergency diesel generators, two cooling towers, and a water treatment facility.³²

A partnership of PTT Global Chemical and Marubeni Corp is evaluating the construction of an ethane cracker on a 400-acre site at Mon River Industrial Park in Allenport, PA, as well as two undisclosed locations in Ohio and West Virginia, to take advantage of the natural gas supply from the Marcellus and Utica formations.³³

Appalachian Resins plans to construct a \$1 billion ethane cracker plant on a 50-acre site in Monroe County, OH, 130 miles east of Columbus. The project, which had initially been planned for West Virginia, is expected to bring 150 to 200 full-time jobs once the plant is running. The plant would be about one-third the size of the Shell and Odebrecht plants and could open in late 2018 or early 2019.³⁴

³² Natural Gas Intelligence. "Shell Chemical Details Plans for PA Cracker in First Permit Application." Aug 5, 2014. <http://www.naturalgasintel.com/articles/99275-shell-chemical-details-plans-for-pa-cracker-in-first-permit-application>

³³ "Thai-Japanese Duo Angling for Another Marcellus Ethane Cracker." PowerSource. Sep. 28, 2014. <http://powersource.post-gazette.com/powersource/companies-powersource/2014/10/16/Brazil-group-visits-to-learn-more-about-shale/stories/201410150210>

³⁴ "Cracker Plant in the Works for Monroe County." The Columbus Dispatch. Oct. 16, 2014. <http://www.dispatch.com/content/stories/business/2014/08/29/cracker-plant-in-the-works-for-monroe-county.html>

3. Summary

The proposed MVP pipeline would provide a number of direct-use benefits to the eleven counties in West Virginia through which the pipeline would run. First, the pipeline would benefit existing customers as it would help ensure future access to a reliable supply of natural gas. Natural gas is already abundant in many parts of West Virginia due to the state's long history of gas operations. Eight of the eleven counties along the proposed MVP route have natural gas access in the major towns and areas. The MVP project could provide additional access and reliability for the residential, commercial, and municipal customers in these counties.

Second, the shale gas revolution has helped lower natural gas prices, making natural gas an economically attractive alternative to existing fuel sources. Counties with limited access to natural gas could realize significant benefits from the MVP pipeline if they were to switch a sizeable portion of their residential, commercial, municipal, and manufacturing customers from the existing fuel source over to natural gas. In Monroe County and Summers County, which both have limited access to natural gas, the MVP project would provide a north to south corridor to complement the Columbia Gas pipeline that runs east to west. In Webster County, which does not currently have access to natural gas, the MVP pipeline would run through the western part of the county and within 1.2 miles of the town of Cowen, the second-largest town in the county.

Third, a major natural gas pipeline like the MVP could draw new businesses that require high volumes of natural gas, particularly energy-intensive and advanced technology manufacturers that pay high wages. An example is Harrison County, which has a thriving aerospace industry, an average annual wage of \$72,000, and an unemployment rate of 5.2%. Mark West in Doddridge County serves as another example of manufacturing benefits. The company plans to triple the capacity of its gas processing facility in Doddridge County, which provides wages 2.5 times higher than the county's average. Further evidence of the potential for natural gas to attract major investments in manufacturing is illustrated from investments in ethane cracker plants that are being considered. These include several plants being considered by Odebrecht, Aither, Shell, PTT Global/Marubeni, and Appalachian Resins.

These types of investments can provide large economic benefits to communities from an employment, wage, and tax revenue perspective. Input-output modeling software such as IMPLAN can help to estimate the magnitude of these impacts. In addition to the initial economic impact of the investment, businesses along the supply chain benefit through ripple, or multiplier, effects, as do households in the form of higher wages and disposable income.

Appendix: County Economic and Energy Profiles

1. Braxton

Economic Profile

Braxton County is a 517 square-mile county located in the center of West Virginia. It has a population of approximately 14,500 and has a household count of approximately 5,800. The county has had an underperforming economy. Its nominal GDP in 2014 was \$371 billion or \$25,600 per person.³⁵ The real GDP declined by 1.2% from 2013 to 2014³⁶ compared to the U.S. GDP real growth of 2.4%³⁷ during the same time period. Additionally, the county unemployment rate has been high – 8.8% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.³⁸

Sutton is the largest town with a population of 1,030 and is also the county seat. Gassaway is the second largest town in the county with a population of more than 900. Together these towns represent approximately 13% of the county’s population. The vast majority of the population lives in rural parts of the county that does not have access to natural gas.

The county counted 343 employers in 2013 with total employment of 3,814 or 11.1 employees per employer.³⁹ Approximately 9% of the County residents work in manufacturing as shown in Table 7.

Table 7 – Employment in Braxton County by Sector⁴⁰

Sector	Employment	Percent of Total Employment
Commercial	2,293	60%
Government	938	25%
Manufacturing	330	9%
Construction	206	5%
Resources and Mining	47	1%
Total	3,814	100%

³⁵ NACO County Tracker, 2013.

³⁶ Ibid.

³⁷ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2nd.xls” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

³⁸ Bureau of Labor Statistics

³⁹ Workforce WV. http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

⁴⁰ Ibid.

While the commercial sector represents a large portion of the Braxton County economy, manufacturing is also an important sector. Manufacturing employs 330 workers, representing 9% of the jobs in the county. Below are some of the largest manufacturers:

- **Weyerhaeuser:** A public company, located in Heaters, that produces oriented strand board for the construction industry. The facility can produce approximately 500 million square feet of OSB per year, and it employs 140 people.
- **Appalachian Timber Services:** A privately-owned company that produces cross ties, switch ties, bridge ties, timber crossings, and custom wood products for the rail industry. It employs approximately 80 people.
- **Braxton Lumber:** A privately-owned lumber mill in Heaters. It employs approximately 20 people with annual revenue of \$100K.

All three companies are closely situated nearby the I-79 corridor. These facilities mainly use electricity to drive their operations. For Weyerhaeuser, natural gas is used for process heating.

In Braxton County, the economic impact of manufacturing jobs is clear. As Table 8 shows, manufacturing wages are the second highest across all job sectors in the county (\$57,944 per year) and are 35% higher than the average wage in the County.

Table 8 – Annual Average Wages in Braxton County by Sector⁴¹

Sector	Average Annual Wage
Resources and Mining	\$83,048
Manufacturing	\$57,944
Government	\$54,172
Construction	\$52,844
Commercial	\$34,899
Weighted Average	\$43,036

Energy Profile

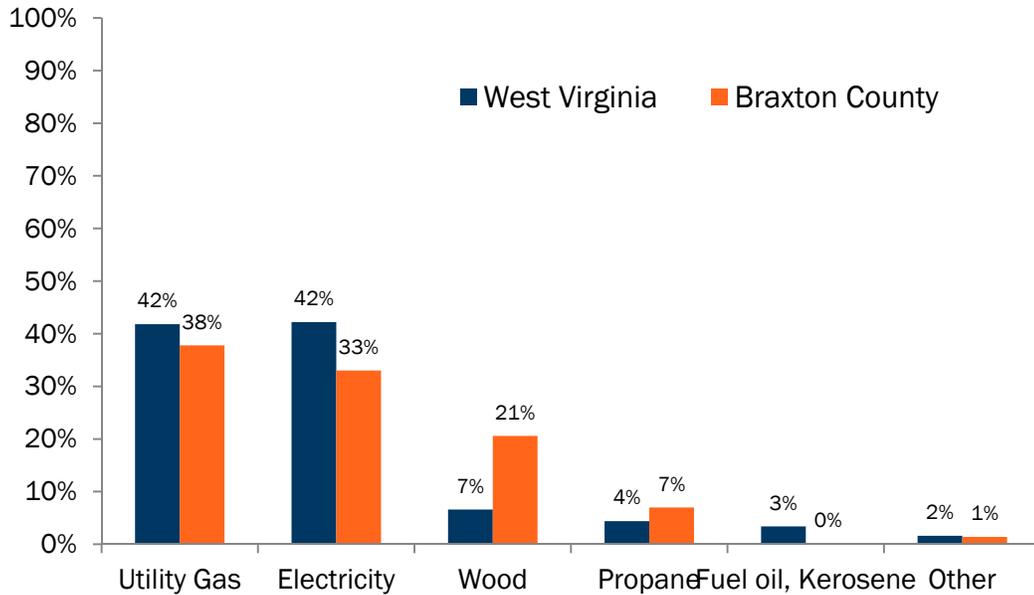
There is a surprising amount of gas accessibility in Braxton County given its low population density. The gas source for Sutton and Gassaway is from West Virginia gas productions wells (native supply).

Natural gas and electricity are the main residential home heating sources for the county as shown in Figure 20. A large portion of households in the county's towns use natural gas as their primary fuel

⁴¹ Workforce WV. <http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html>.

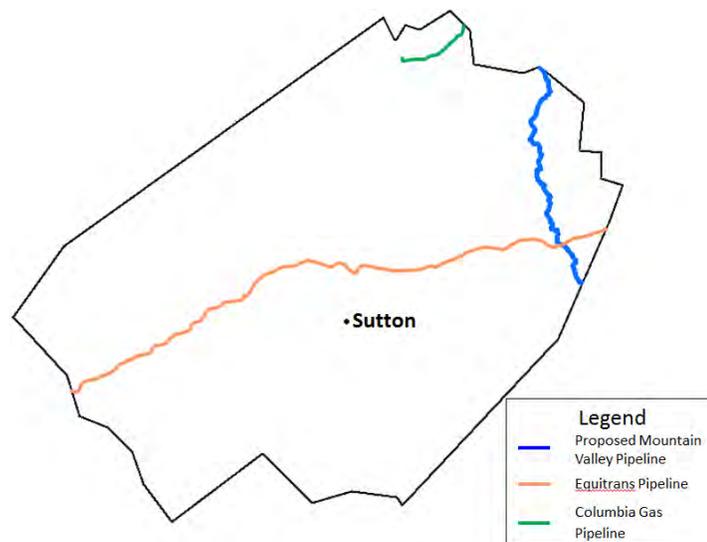
source for home and water heating. Typically, commercial and municipal buildings follow the same pattern since natural gas use often is driven by accessibility. Dominion Hope serves these towns.

Figure 20 - Primary Space Heating Fuel Used in Braxton County versus the State, Percentage of Housing Units⁴²



The residential, commercial, and municipal sectors could benefit significantly from the proposed MVP pipeline as it would intersect on the east side of the county with the Columbia Gas Transmission Corporation’s pipelines as shown in Figure 21. The MVP pipeline, if connected to this pipeline, could provide gas supply to Braxton County consumers as native production declines.

Figure 21 – Braxton County Natural Gas Pipeline Map



⁴² 2013 US Census Bureau 5 Year American Community Survey

2. Doddridge

Economic Profile

Doddridge County is a 320 square-mile county located in the northwest part of West Virginia with a population of approximately 8,300 and has a household count of approximately 3,000. The county has a growing economy. Its nominal GDP in 2014 was \$174 million or \$20,877 per person.⁴³ The real GDP grew by 3.3% from 2013 to 2014, after growing nearly 20% the previous year,⁴⁴ compared to the U.S. GDP real growth of 2.4%⁴⁵ during the same time period. Additionally, the county unemployment rate was 5.9% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

West Union is the county seat and is the largest town with a population of 825. The Route 23 corridor in the northern part of the county is considered the population center of the county.

Doddridge County has experienced economic development challenges because of a lack of infrastructure. There is no interstate and mainline water access is restricted to an approximately eight-mile stretch along Route 23. There is also limited 3-phase electricity, which is required for large manufacturing and commercial facilities, and limited broadband.

In 2013, the county counted 110 employers with total employment of 1,246 or 11.3 employees per employer.⁴⁶ A majority of the county employment is in the commercial and government sectors (79%) as shown in Table 9.

Table 9 – Employment in Doddridge County by Sector⁴⁷

Sector	Employment	Percent of Total Employment
Commercial	455	36%
Government	530	43%
Resources and Mining	144	12%
Construction	119	10%
Manufacturing	0	0%
Total	1,248	100%

⁴³ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁴⁴ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁴⁵ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2nd.xls” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁴⁶ WorkForce WV: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html

⁴⁷ WorkForce WV: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html

Resource and mining represents 12 % of the county employment and is composed entirely of oil and gas production. This sub-sector has grown in recent years.⁴⁸ As evidence, Mark West in 2013 opened a new gas processing facility outside West Union that employs approximately 25 people. The company plans to triple its capacity in the near future. During the construction of the facility, Mark West employed about 200 local electricians, pipefitters, welders, carpenters and other tradespeople.⁴⁹

As Table 10 shows, the resources and mining industry, which includes the Mark West facility, has significantly higher wages, on average, than the other major sectors.

Table 10 – Annual Average Wages in Doddridge County by Sector⁵⁰

Sector	Average Annual Wage
Resources and Mining	\$104,946
Construction	\$40,780
Government	\$32,216
Commercial	\$25,549
Manufacturing	N/A
Weighted Average	\$39,016

Natural gas is important to the county's economic growth. FTI found that oil and gas development represents the near-term economic growth driver for the county. The MVP pipeline offers an opportunity for developers to move their natural gas via the pipeline to ten other counties in West Virginia, six counties in Virginia, and a large portion of the U.S. Southeast, which could translate into significant impacts to the county's economy. In Lewis County, for example, the oil and gas sector comprises approximately 20% of the workforce and the average wages for the sector lead all other sectors. Coincidentally, Lewis County has the third lowest county unemployment rate in the State.

While having good timber resources, the timber industry currently is not very active due to economics. This is partially due to infrastructure constraints as timber companies are challenged to get timber out of the county via the existing road infrastructure.

There are no major manufacturers in Doddridge County; however, Simonton Windows in neighboring Ritchie County is a large employer of county residents.

⁴⁸ <http://www.drillingedge.com/west-virginia/doddridge-county>

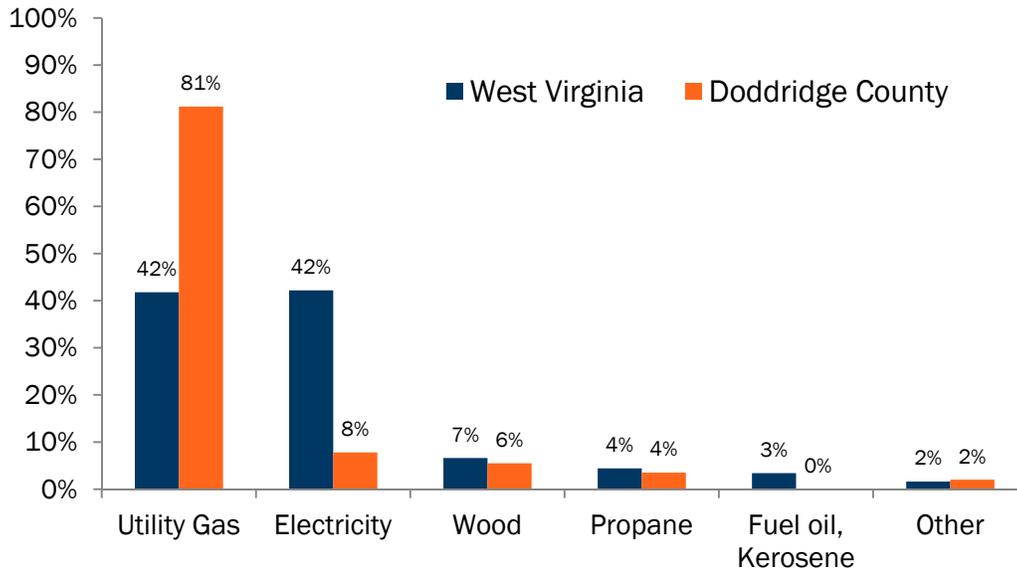
⁴⁹ <http://www.wvillustrated.com/story/20280391/new-markwest-natural-gas-processing-online-in-doddridge-co>

⁵⁰ WorkForce WV: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html

Energy Profile

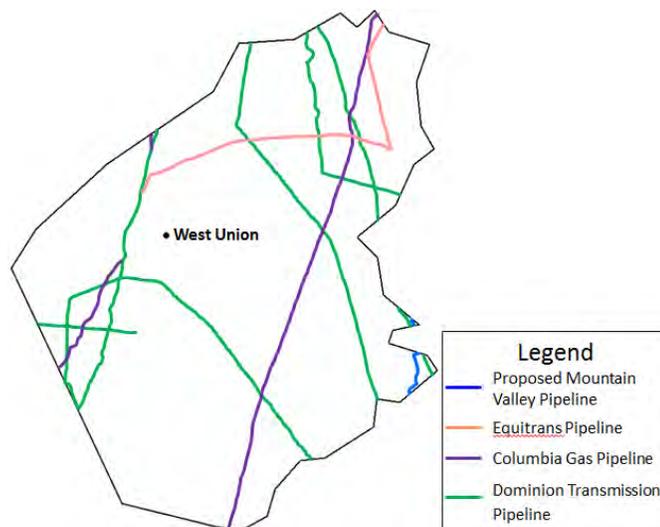
Due to native natural gas production, gas is the primary residential home heating source for the county as shown in Figure 22. Typically commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Peoples Gas serves West Union.

Figure 22 – Primary Space Heating Fuel Used in Doddridge County versus the State, Percentage of Housing Units⁵¹



All sectors could benefit significantly from the MVP pipeline as it would intersect the Dominion pipeline on the east side of the county (Figure 23). If connected with this pipeline, MVP could provide gas supply as native production declines.

Figure 23 – Doddridge County Natural Gas Pipeline Map



⁵¹ 2013 US Census Bureau 5 Year American Community Survey

3. Greenbrier

Economic Profile

Greenbrier County in West Virginia covers 1,025 square miles and is home to 35,644 residents. The county has a relatively strong economy. Its nominal GDP in 2014 was \$1.3 billion or \$36,472 per person.⁵² The real GDP declined by 1.5% from 2013 to 2014⁵³ compared to the U.S. GDP real growth of 2.4%⁵⁴ during the same period. Additionally, the county unemployment rate was 7.0% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Lewisburg is the county seat and with 3,330 residents is the most populous city. Other cities include Ronceverte (pop. 1,765; five miles from Lewisburg), White Sulphur Springs (pop. 2,444; 10 miles from Lewisburg), and Fairlea (pop. 1,747; 2 miles from Lewisburg). The community of Maxwellton is home to the Rahall Technology and Business Center, a 137,000 square foot facility adjacent to the Greenbrier Valley Airport, and which the Greenbrier Chamber of Commerce describes as the eastern anchor of the I-64 technology corridor between Lewisburg, White Sulphur Springs, and Beckley. The Greenbrier Valley Economic Development Corporation (GVEDC) owns the facility in addition to the Fountain Springs business park in Monroe County and the Edray business park in Pocahontas County.

The county counted 1,108 employers in 2013 with total employment of 13,524 or 12.2 employees per employer.⁵⁵ Approximately 6% of the County residents work in manufacturing (see Table 11).

Table 11– Employment in Greenbrier County by Sector⁵⁶

Sector	Employment	Percent of Total Employment
Commercial	9,566	71%
Government	2,478	18%
Manufacturing	768	6%
Construction	368	3%
Resources and Mining	344	3%
Total	13,524	100%

⁵² National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁵³ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁵⁴ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2nd.xls” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁵⁵ Workforce WV. http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

⁵⁶ Ibid.

In Greenbrier County, manufacturing employs over 700 workers, representing 6% of the jobs in the county. Below are some of the largest manufacturers in the county:

- **ABB:** ABB is a large supplier of industrial motors and drives, generators for the wind industry, and power grids, with 145,000 employees worldwide. Its Lewisburg manufacturing center produces process automation instrumentation. The plant is 95,000 square feet and employs 160 people.
- **Mullican Flooring:** Mullican is a manufacturer of hardwood flooring products in Ronceverte, WV, with approximately 120 employees.

In Greenbrier County, the manufacturing sector provides a significant economic impact as shown in Table 12. Manufacturing wages are the second highest across all job sectors in the county (\$40,323 per year) and are 23% higher than the average wage in the county.

Table 12 – Annual Average Wages in Greenbrier County by Sector⁵⁷

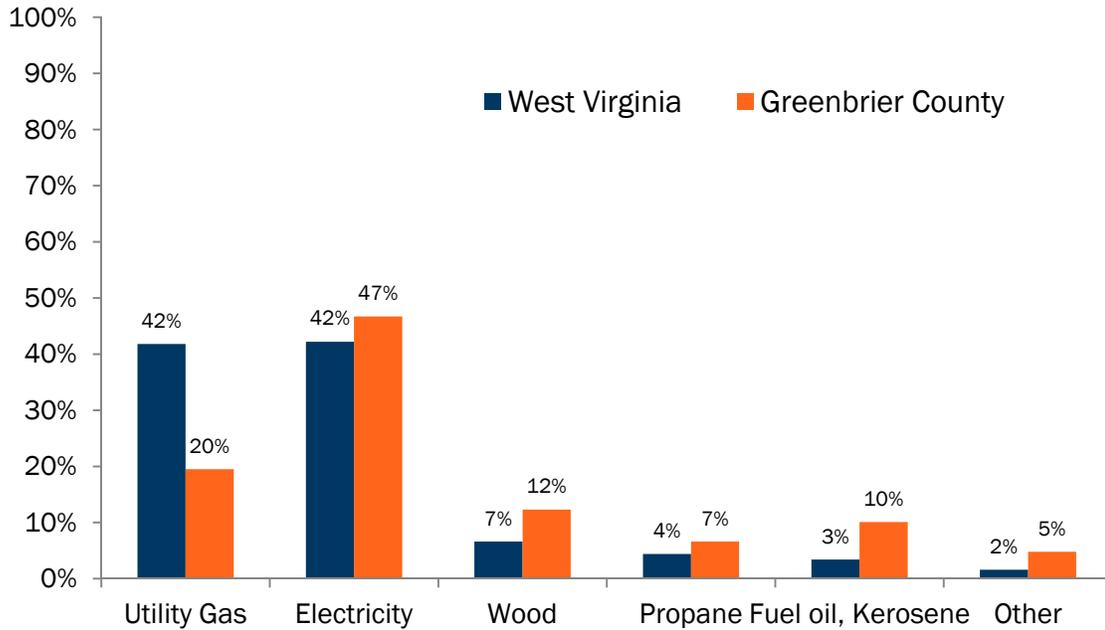
Sector	Average Annual Wage
Resources and Mining	\$59,974
Manufacturing	\$40,323
Government	\$35,973
Commercial	\$30,416
Construction	\$29,282
Weighted Average	\$32,718

Energy Profile

Residential, commercial, and municipal access to natural gas also is available in the larger towns. Homes in rural areas rely on wood, propane and fuel oil for heat. Overall residential natural gas usage in Greenbrier County is significantly lower than the rest of the state (See Figure 24).

⁵⁷ WorkForce WV. http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html

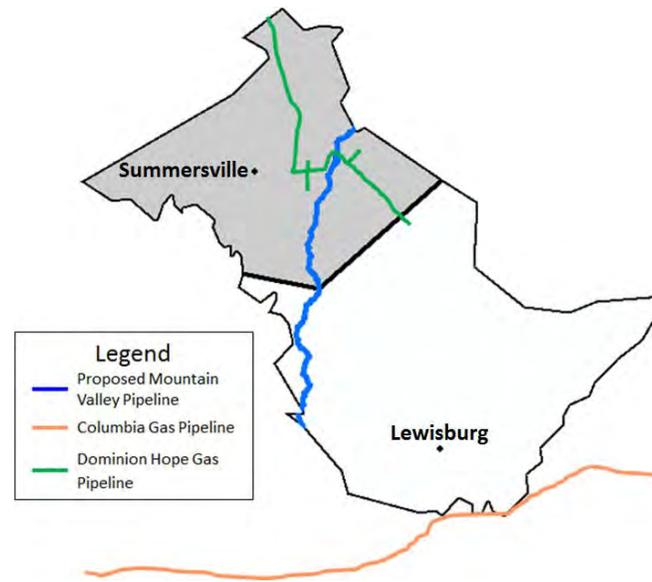
Figure 24 - Primary Space Heating Fuel Used in Greenbrier County versus the State, Percentage of Housing Units⁵⁸



The Mountain Valley pipeline is currently planned to traverse the western section of the county. Most the towns and businesses are in the Lewisburg area and toward the eastern border. The pipeline could bring natural gas supply to the western portion of the county, which could enable economic growth. See Figure 25 below.

⁵⁸ 2013 US Census Bureau 5 Year American Community Survey.

Figure 25 – Greenbrier County Natural Gas Pipeline Map



Outside of Lewisburg, The Greenbrier resort in White Sulphur Springs is one of the largest commercial consumers of electricity and natural gas in the county and the state. The complex includes 710 bedrooms, 9 restaurants and a casino. Due to its size, the resort buys its natural gas from wholesale marketing company. It then pays a transport charge to deliver the gas. Additional gas supply in Greenbrier County would be welcomed by the resort.

For the manufacturing sector in Greenbrier County, the primary fuel sources are electricity and natural gas. Natural gas is used mainly for heating. The manufacturing facilities are located where natural gas sources are available, so there is no fuel switching potential.

4. Harrison

Economic Profile

Harrison County is a 417 square-mile county located in north-central West Virginia with a population of approximately 69,000 and has a household count of approximately 27,900. The county has a strong economy. Its nominal GDP in 2013 was \$4.2 billion or \$60,900 per person.⁵⁹ The real GDP declined by 0.3% from 2013 to 2014⁶⁰ compared to the U.S. GDP real growth of 2.4%⁶¹ during the same time period. Additionally, the county unemployment rate was 5.2% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Clarksburg is the largest town with a population of 16,360 and is also the county seat, followed by Bridgeport (pop. 8,149) and then Shinnston (pop. 2,186). Together these three towns and cities represent approximately 40% of the county's population.

The county counted 2,091 employers in 2013 with total employment of 34,881 or 16.7 employees per employer.⁶² A majority of the county employment is in the commercial and government sectors (86%). Approximately 6% of the County residents work in manufacturing as shown in Table 13.

Table 13 – Employment in Harrison County by Sector⁶³

Sector	Employment	Percent of Total Employment
Commercial	22,048	63%
Government	7,965	23%
Manufacturing	2,097	6%
Construction	1,702	5%
Resources and Mining	1,069	3%
Total	34,881	100%

In Harrison County, the economic impact of manufacturing jobs is clear. As Table 14 shows, manufacturing wages are the second highest across all job sectors in the county (\$57,944 per year) and are 35% higher than the average wage in the County.

⁵⁹ "County Tracker 2013 – Harrison County, WV," National Association of Counties, January 2014.

⁶⁰ Ibid.

⁶¹ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁶² WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.

⁶³ Ibid.

Table 14– Annual Average Wages in Harrison County by Sector⁶⁴

Sector	Average Annual Wage
Resources and Mining	\$83,048
Manufacturing	\$57,944
Government	\$54,172
Construction	\$52,844
Commercial	\$34,899
Weighted Average	\$43,036

In Harrison County, manufacturing employs over 2,000 workers, representing 6% of the jobs in the county. The primary fuel sources for Harrison County manufacturers are electricity and natural gas. Below are some of the largest manufacturers in the county:

- **Aurora Flight Services:** the company develops and manufactures advanced unmanned systems and aerospace vehicles. In Bridgeport, the shop fabricates and assembles composites and metal aerostructures.
- **Bombardier Services Corporation:** The privately-held company does business in Bridgeport, WV, as the West Virginia Air Center, a modern, 125,000 square foot facility where it employs 400 people to perform airline maintenance, repair, and overhaul services.
- **EuropTec:** a manufacturer of acid etched anti-glare glass, EagleEtch®, and a specialist in glass processing and fabrication for the display industry. It employs approximately 60 people.
- **Graftech:** The privately-held company has a facility in Anmoore, WV, where it produces specialty carbon and graphite products through a baking process in natural gas-fired, high temperature ovens and electrically heated furnaces from raw materials consisting of petroleum coke and coal tar pitch.
- **Pratt & Whitney Engine Services (PWES):** The company provides aerospace and manufacturing jobs to 400 employees at its overhaul and repair facility in Bridgeport, WV. In 1988 and 1999, PWES expanded its operations by adding 123,000 square feet, bringing the overall size to 200,000 square feet. Additionally, in 1997, the Joint Primary Aircraft Training System (JPATS) Program began in Bridgeport. New JPATS engines are assembled and tested and the overhaul and repair of the engines are completed at the Bridgeport facility. These engines directly support the aircraft that are used to train new U.S. Air Force and Navy pilots.

⁶⁴ WorkForce WP: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html; FTI analysis.

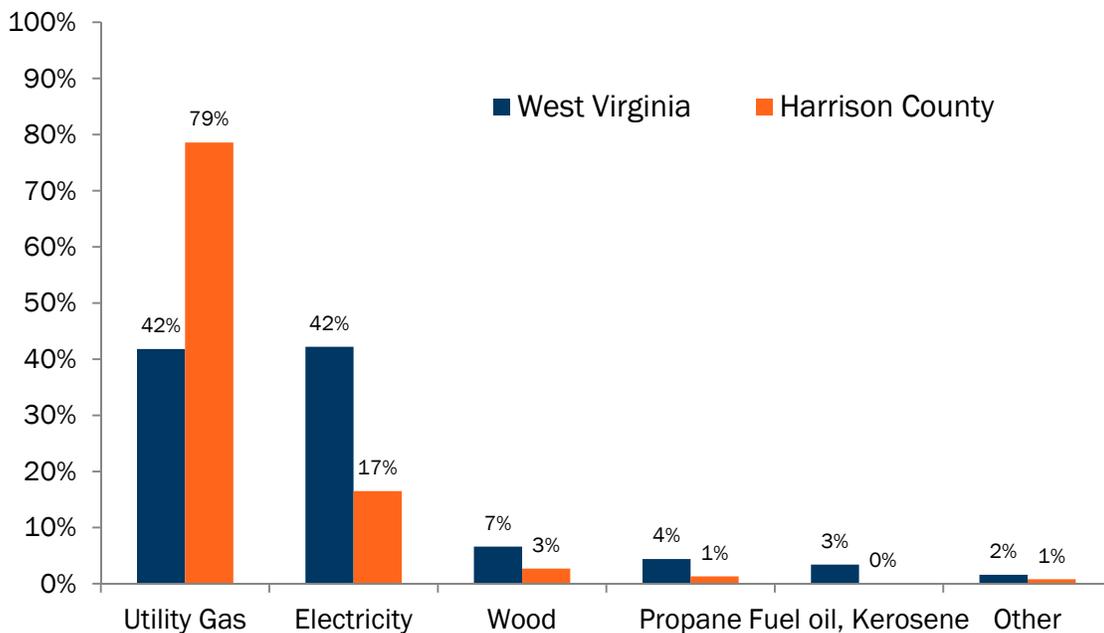
- Stockmeier Urethanes:** a German company that produces polyurethane products such as sport surfaces, weather-resistant elastomers for roofs, parking decks and trucks, structural adhesives, casting resins for cable, electrical and technical applications, and ancillary products such as cleaners and catalysts. The Clarksburg facility is a blending facility that employs approximately 15 people.

PWES, Bombardier, and Aurora are situated at the Mid-Atlantic Aerospace Complex located at the North Central West Virginia Airport, which is adjacent to I-279. The average annual salary for the 650 employees in the aerospace industry in Harrison County is \$72,000. This park has natural gas access provided by Dominion Hope.

Energy Profile

Natural gas is the main residential home heating sources for the county (see Figure 26). We understand that a large portion of households in populated areas use natural gas as their primary fuel source for home and water heating. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. We confirmed that twenty-four schools in the Harrison County system are served by natural gas from Dominion Hope.

Figure 26 – Primary Space Heating Fuel Used in Harrison County versus the State, Percentage of Housing Units⁶⁵

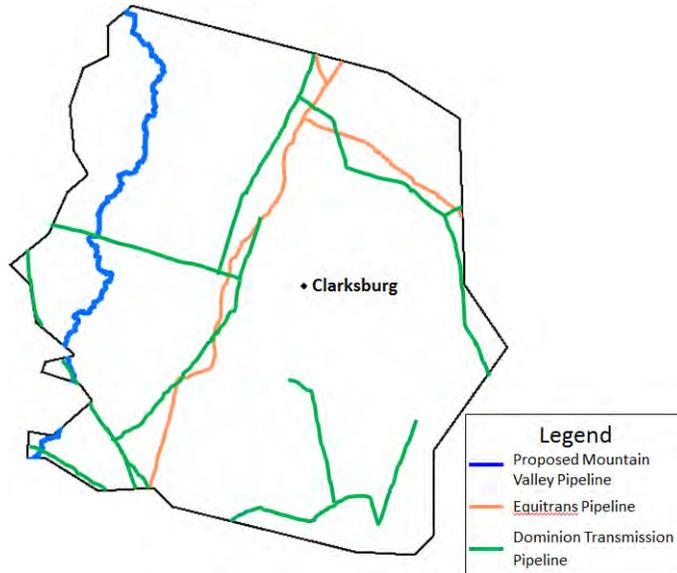


The residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect the Dominion pipelines on the west side of the county as shown in Figure 27.

⁶⁵ 2013 US Census Bureau 5 Year American Community Survey

The MVP pipeline, if connected with this pipeline, could provide gas supply to Harrison County consumers as native production declines.

Figure 27 – Harrison County Natural Gas Pipeline Map



5. Lewis

Economic Profile

Lewis County is a 390 square-mile county located in north-central West Virginia at the crossroads of Interstate 79 and U.S. 33. It has a population of approximately 16,500 with a household count of approximately 6,900. The county has a strong economy. Its nominal GDP in 2014 was \$1.2 billion or \$72,939 per person.⁶⁶ The real GDP grew by 4.6% from 2013 to 2014⁶⁷ compared to the U.S. GDP real growth of 2.4%⁶⁸ during the same time period. Additionally, the county unemployment rate was 5.4% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Weston is the county seat with a population of 4,110. There is also the small town of Jane Lew with a population of around 400. Together these areas represent approximately 27% of the county's population.

The county counted 482 employers in 2013 with total employment of 7,120 or 14.8 employees per employer.⁶⁹ A large portion of the county employment is in the commercial and government sectors (71%). Within Medical care for central West Virginians is today one of the county's chief sources of employment and income.⁷⁰

Resources and mining, the second largest sector, is focused completely on gas development, which has been a growth sector for the county. Approximately 3% of the County residents work in manufacturing as shown in Table 15.

Table 15 – Employment in Lewis County by Sector⁷¹

Sector	Employment	Percent of Total Employment
Commercial	3,647	51%
Resources and Mining	1,530	21%
Government	1,450	20%
Construction	270	4%
Manufacturing	223	3%
Total	7,120	100%

⁶⁶ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁶⁷ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁶⁸ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁶⁹ WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

⁷⁰ <http://www.wvencyclopedia.org/articles/1362>

⁷¹ WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Viking Pools, which manufactures hot tubs, spas and whirlpool baths, represents the primary manufacturing employer in Lewis County. Tamarack Log Homes (which is classified as construction, but could be considered quasi-manufacturing) is another large employer. Both are located at the industrial park near the Jane Lew exit of I-79.

The annual average wages for the construction and manufacturing sectors in Lewis County range from \$41,200 to \$45,100 as shown in Table 16, which is around the average for the county and is well below the annual average salary of \$72,000 at the more high-end manufacturing facilities of Bombardier and Pratt & Whitney in Harrison County.

Table 16– Annual Average Wages in Lewis County by Sector⁷²

Sector	Average Annual Wage
Resources and Mining	\$77,305
Construction	\$45,087
Manufacturing	\$41,174
Government	\$35,641
Commercial	\$33,896
Weighted Average	\$44,231

The primary growth sector for Lewis County in recent years has been the oil and gas sub-sector under Resources and Mining. The county has become an operational hub for many companies involved in Marcellus Shale development. Companies such as Nexus Drilling, Chesapeake Energy, and Superior Well Services have expanded operations significantly, employing approximately 1,500 people or 20% of the workforce in the county. The average wage for oil and gas extraction employees in Lewis County has been ~\$77,300. It is worth noting that Lewis County now has the third lowest unemployment in the state after Monongalia and Jefferson counties.

This boon has been helpful in offsetting manufacturing decline. In 2013 Halliburton shut down their cement plant operations in Weston, WV, and moved it 150 miles away to Zanesville, OH. The company had employed approximately 75 people.

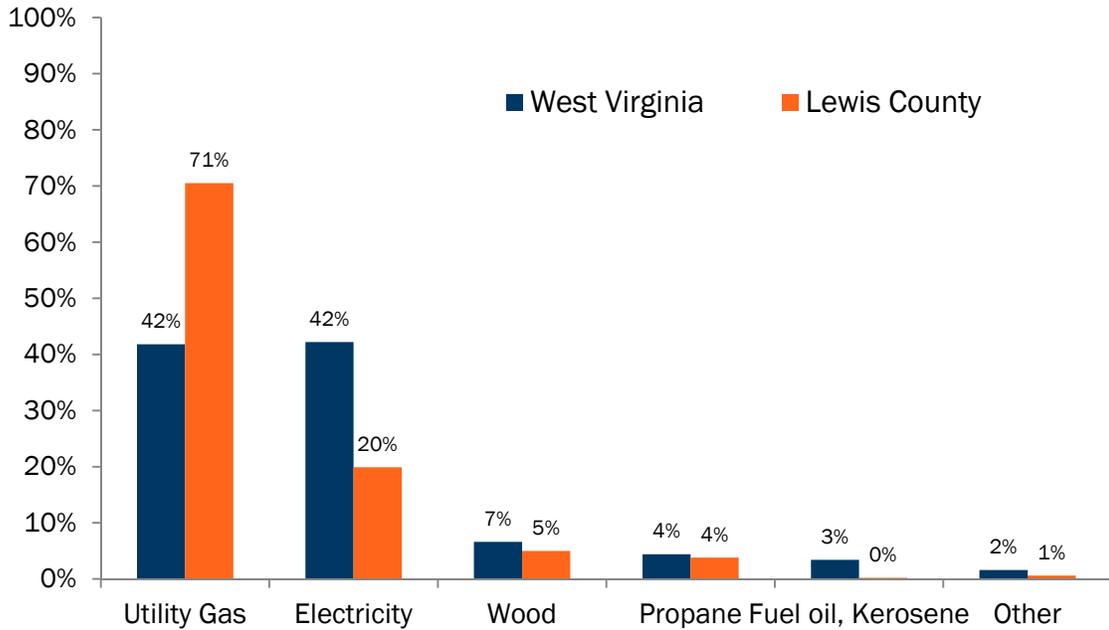
Energy Profile

Large quantities of oil and natural gas were found around 1900 in Lewis County, which created a manufacturing boom. The gas attracted several glass manufacturers to the county. Gas production is still a major part of the county's profile, and production continues in the Weston and Jane Lew areas.

⁷² WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.

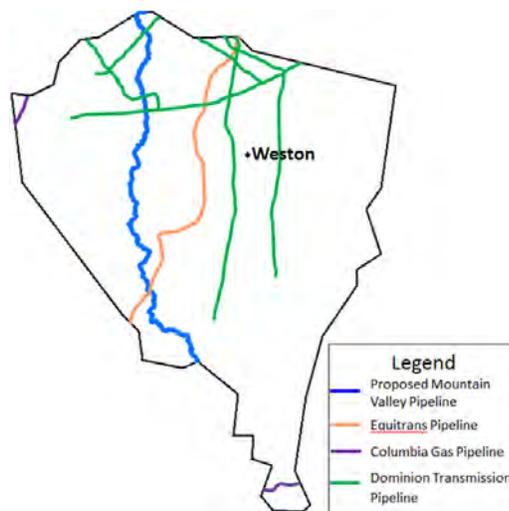
Due to native natural gas production, gas is the primary residential home heating source for the county as shown in Figure 28. Typically commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Dominion Hope serves these towns.

Figure 28 – Primary Space Heating Fuel Used in Lewis County versus the State, Percentage of Housing Units⁷³



All economic sectors could benefit significantly from the MVP pipeline as it would overlap with the Equitrans and Dominion Pipelines as shown in Figure 29. The MVP pipeline, if connected, could provide additional gas supply to Lewis County consumers as native production declines.

Figure 29 – Lewis County Natural Gas Pipeline Map



⁷³ 2013 US Census Bureau 5 Year American Community Survey

6. Monroe

Economic Profile

Monroe County is a 474 square-mile county located in West Virginia with a population of 13,483. Its nominal GDP in 2014 was \$190 million or \$14,107 per person.⁷⁴ The county has had a relatively underperforming economy. The real GDP declined by 1.2% from 2013 to 2014⁷⁵ compared to the U.S. GDP real growth of 2.4%⁷⁶ during the same time period; however, the country unemployment rate was 5.6% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Union is the county seat and has a population of 565, Alderson, which is 40 miles from Union, is the largest town with a population of 1,184. Peterstown, 25 miles from Union, has a population of 653. Together these three towns represent 18% of the county's population.

Monroe County is primarily a farming county, with a mix of livestock (cattle, dairy, and sheep) and crop farming (hay, corn, oats, wheat, and tobacco). Timber is also a major contributor to the economy.⁷⁷

The county counted 230 employers in 2013 with total employment of 1,888 or 8.2 employees per employer.⁷⁸ Monroe only has one major employer, UTC Aerospace, which represents approximately 21% of the jobs in the county (see Table 17).

Table 17 – Employment in Monroe County by Sector⁷⁹

Sector	Employment	Percent of Total Employment
Government	718	38%
Commercial	617	33%
Manufacturing	400	21%
Construction	111	6%
Resources and Mining	42	2%
Total	1,888	100%

⁷⁴ National Association of Counties. <http://www.uscounties.forg/countyTracker/index.html>

⁷⁵ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁷⁶ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁷⁷ <http://www.wvencyclopedia.org/articles/2024>

⁷⁸ Workforce WV. <http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html>.

⁷⁹ Workforce WV. <http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html>.

UTC, formerly Goodrich, is a global supplier of systems and services for the aerospace and defense industries and is located in Union. The facility is 140,000 square feet, and it is powered by a combination of electricity and natural gas. The other major employer in the county is M-Rock, which is a stone and brick designer and manufacturer in Peterstown, WV, and employs 25 people and has annual revenue of \$1M.

The manufacturing sector provides the highest average annual wage in Monroe County (see Table 18).

Table 18 – Annual Average Wages in Monroe County by Sector^{80,81}

Sector	Average Annual Wage
Manufacturing	\$50,000
Government	\$41,120
Construction	\$29,283
Resources and Mining	\$26,426
Commercial	\$20,959
Weighted Average	\$34,573

There are a number of county residents who work outside the county at The Greenbrier resort at White Sulphur Springs, the Celanese plant in Narrows, Virginia, and MeadWestvaco plant in Covington, Virginia.⁸²

Energy Profile

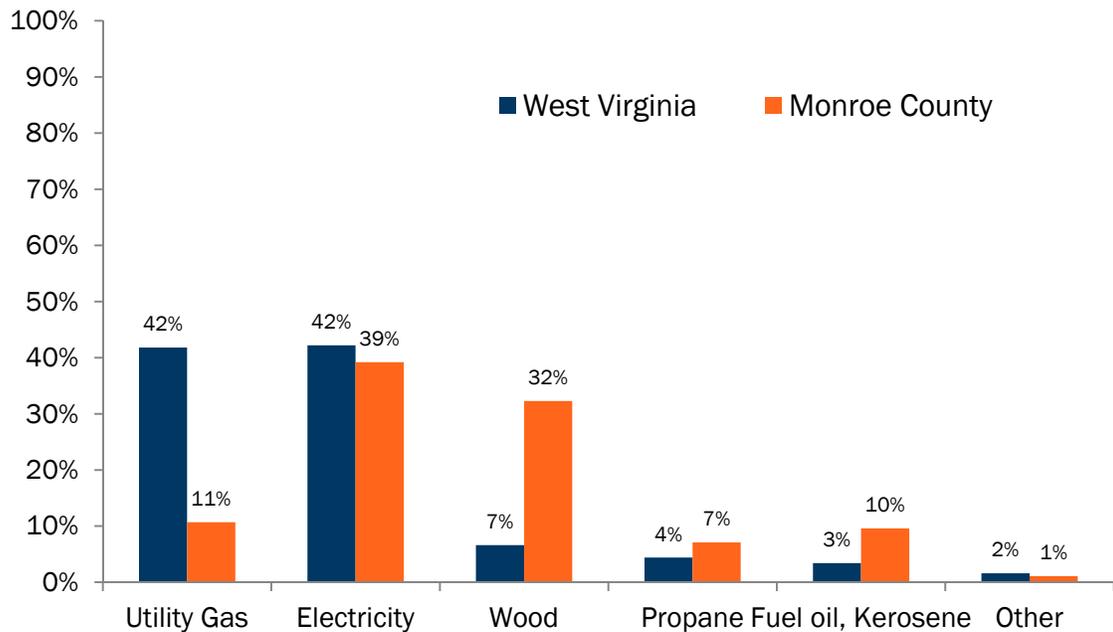
Electricity and wood are the main residential home heating sources for the county (see Figure 30). Typically, commercial and municipal buildings follow the same pattern since fuel choice often is driven by accessibility so there is ample opportunity for switching to natural gas with potential access in the county. Monroe only has natural gas service in the small towns of Union and Petersburg.

⁸⁰ Workforce WV. <http://www.workforcewv.org/Imi/EandWAnnual/ew13cnty025.html>.

⁸¹ We assumed \$50,000 for the UTC manufacturing facility in Monroe that employs approximately 400 people because data for UTC was not available. This is a conservative assumption, relative to the \$72,000 average wage for aerospace jobs in Harrison County.

⁸² <http://www.wvencyclopedia.org/articles/2024>

Figure 30 – Primary Space Heating Fuel Used in Monroe County versus the State, Percentage of Housing Units⁸³



While there is a Columbia Gas pipeline that runs east-west through the county, most of the communities in the county do not have gas access or have very limited gas access.⁸⁴ It is possible that the residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect with the Columbia Gas Pipeline on the west side of the county as shown in Figure 31.

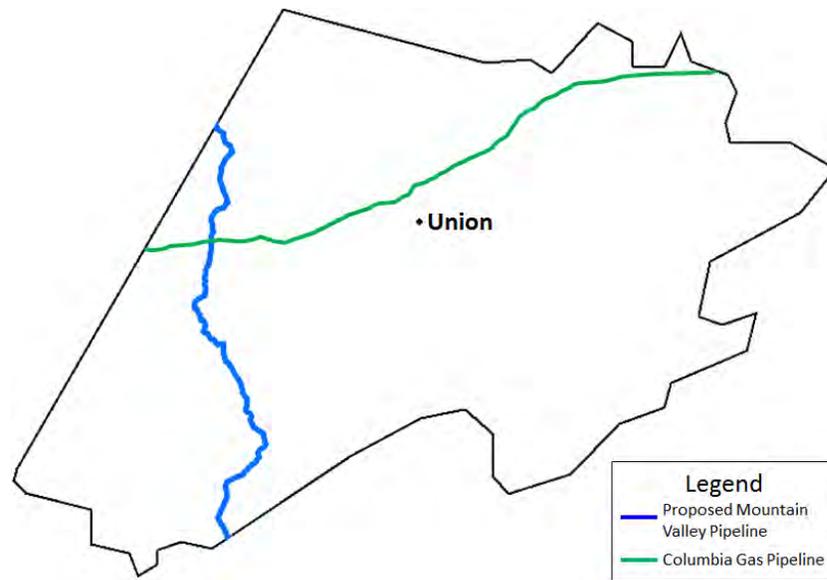
The MVP pipeline could provide access to existing manufacturers if connected to the existing Columbia Gas pipeline.

Two of the schools in the county are heated using natural gas. The other two schools, both located in Peterstown, are heated using electricity. They are within the service area for natural gas, but they are older buildings that have always used electricity.

⁸³ 2013 US Census Bureau 5 Year American Community Survey

⁸⁴ Interviews with Monroe county officials indicated that part of Peterson is served by Mountaineer and that other towns likely do not have gas access.

Figure 31 – Monroe County Pipelines – Existing and Proposed



7. Nicholas

Economic Profile

Nicholas County is a 654 square-mile county located in the center of West Virginia. It has a population of approximately 26,000. The county has had an underperforming economy. Its nominal GDP in 2014 was \$937 million or \$36,072 per person.⁸⁵ The real GDP grew by 1.4% from 2013 to 2014⁸⁶ compared to the U.S. GDP real growth of 2.4%⁸⁷ during the same time period. Additionally, the county unemployment rate has been high – 9.0% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.⁸⁸

Summersville is the largest town with a population of 3,572 and is also the county seat. Richwood, 25 miles to the east, has a population of 2,051. Together these two towns represent approximately 20% of the county's population.

The county counted 711 employers in 2013 with total employment of 7,983 or 11.2 employees per employer.⁸⁹ A large portion of the county employment is in the commercial and government sectors (79%) as shown in Table 19.

Table 19 – Employment in Nicholas County by Sector⁹⁰

Sector	Employment	Percent of Total Employment
Commercial	4,539	57%
Government	1,746	22%
Manufacturing	741	9%
Resources and Mining	700	9%
Construction	257	3%
Total	7,983	100%

Approximately 9% of the County residents work in manufacturing. Below are the largest manufacturers in the county:

⁸⁵ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁸⁶ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁸⁷ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2nd.xls” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁸⁸ Bureau of Labor Statistics

⁸⁹ Workforce WV. <http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html>.

⁹⁰ Workforce WV. <http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html>.

- **B/E Aerospace:** the company is a manufacturer of aircraft cabin interior products and a leading provider of aerospace fasteners, consumables, and logistics services. This is a global company with its De-Icing Systems location in Fenwick, WV. The facility employs approximately 160 people.
- **Columbia Forest Products:** the company is North America’s largest manufacturer of hardwood plywood and hardwood veneer products, with a manufacturing location in Craigsville, WV. The facility employs approximately 380 people.

Together, Columbia Wood Products and B/E Aerospace the companies employ approximately 70% of those employed in the county’s manufacturing sector.

Manufacturing has had a significant economic impact In Nicholas County. As Table 20 shows, manufacturing wages are the second highest across all job sectors in the county (\$46,434 per year) and are 30% higher than the average wage in the County.

Table 20 – Annual Average Wages in Nicholas County by Sector⁹¹

Sector	Average Annual Wage
Resources and Mining	\$70,155
Manufacturing	\$46,434
Government	\$39,355
Construction	\$34,554
Commercial	\$27,133
Weighted Average	\$35,609

Outside of the manufacturing sector, Nicholas County is known for economic resources including bituminous coal, limestone quarries, timber, fruit farms, tobacco, and livestock.⁹²

Within the residential, commercial, and municipal sectors, we identified a few fuel switching opportunities. Two schools use coal boilers for space heating and water heating, and one school uses propane.

⁹¹ Workforce WV. <http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html>.

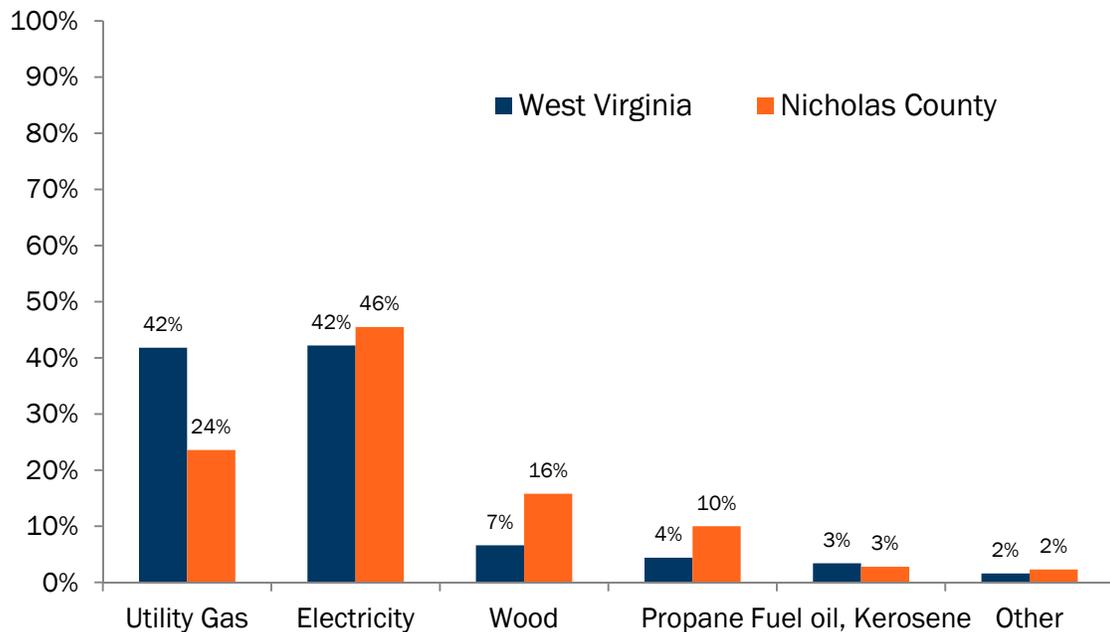
⁹² <http://www.wvencyclopedia.org/articles/1670>

Energy Profile

There is a surprising amount of gas accessibility in Nicholas County given its low population density. The gas source for Summersville and Richwood is from West Virginia gas production wells (native supply).

Electricity is the main residential home heating source for the county as shown in Figure 32, and it is mainly used a heating source outside of Summersville and Richwood. It is worth noting that Nicholas County is home to the Summersville Hydroelectric Project – an 80 MW hydro plant that generates 220 gigawatt hours annually.

Figure 32 – Primary Space Heating Fuel Used in Nicholas County versus the State, Percentage of Housing Units⁹³



Within Summersville and Richwood, a large portion of households use natural gas as their primary fuel source for home and water heating. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Dominion Hope is the utility serving these towns.

The residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect with the Dominion Hope pipeline near the center of the county as shown in Figure 33. The MVP pipeline, if connected with these pipelines, could provide additional gas supply to Nicholas County consumers as native production declines.

⁹³ 2013 US Census Bureau 5 Year American Community Survey.

Figure 33 – Nicholas County Natural Gas Pipeline Map



For the manufacturing sector, the primary fuel source is electricity with some natural gas used for process heat and steam.

8. Summers

Economic Profile

Summers County is a 368 square-mile county located in south-east West Virginia with a population of 13,563 and has a household count of approximately 5,500. Its nominal GDP in 2014 was \$221 million or \$16,316 per person.⁹⁴ The real GDP shrunk by 1.9% from 2013 to 2014⁹⁵ compared to the U.S. GDP real growth of 2.4%⁹⁶ during the same time period. Additionally, the county unemployment rate was 7.4% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Hinton is the county seat and largest city with a population of 2,676 and represents 20% of the county population.

Summers has been challenged with economic growth, starting in the 1950s when a combination of factors led to the decline of the local economy. These factors included technology changes in coal mining, the depletion of older mines, no viable local manufacture of coking coal, and the replacement of the coal-fired locomotives with diesel-fired locomotives.

Other economic challenges in Summers County include terrain and infrastructure. Summers County is a mountainous county. The flat areas, where manufacturers would want to locate, typically are along the rivers and are considered flood plains. For infrastructure, there is no interstate highway that runs through the county, which has limited the county's development. There is, though, the main rail line for CSX that runs from Chicago to Washington, D.C. It runs through Hinton and then Alderson.

The county counted 193 employers in 2013 with total employment of 2,091 or 10.8 employees per employer.⁹⁷ A large portion of the county employment is in the commercial and government sectors (93%). Approximately 1% of the County residents work in manufacturing as shown in Table 21.

Table 21 – Employment in Summers County by Sector⁹⁸

Sector	Employment	Percent of Total Employment
Commercial	1,174	56%
Government	779	37%
Construction	83	4%
Resources and Mining	32	2%
Manufacturing	23	1%
Total	2,091	100%

⁹⁴ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁹⁵ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁹⁶ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁹⁷ WorkForce WV: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html

⁹⁸ WorkForce WV: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html

Summers County has a small manufacturing sector. The annual average wages for the manufacturing sector is \$21,593 as shown in Table 22, which is lower than the average for the county.

Table 22– Annual Average Wages in Summers County by Sector⁹⁹

Sector	Average Annual Wage
Construction	\$39,293
Commercial	\$27,955
Government	\$27,695
Manufacturing	\$21,593
Resources and Mining	\$18,176
Weighted Average	\$28,089

The planned route of the MVP pipeline in the northeastern portion of the county is near Alderson, which is just outside the county on the border of Monroe and Greenbrier counties. Alderson is 5.5 miles from the planned route, and the intersection of the pipeline path and existing rail infrastructure could enable some manufacturing development in the northeastern part of the county.

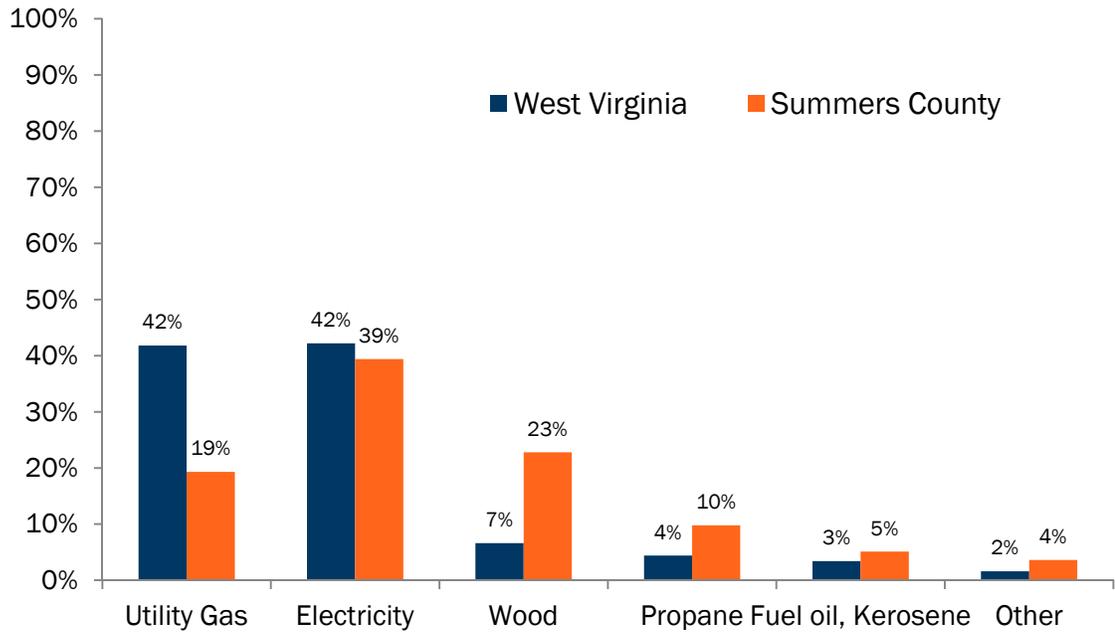
Energy Profile

Summers County has limited amounts of natural gas production and this production has been declining over the years.¹⁰⁰ Electricity is the primary residential home heating source for the county as shown in Figure 34. Mountaineer Gas serves the town of Hinton via the interstate Columbia Gas line, but other parts of the county do not have access to natural gas.

⁹⁹ WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.

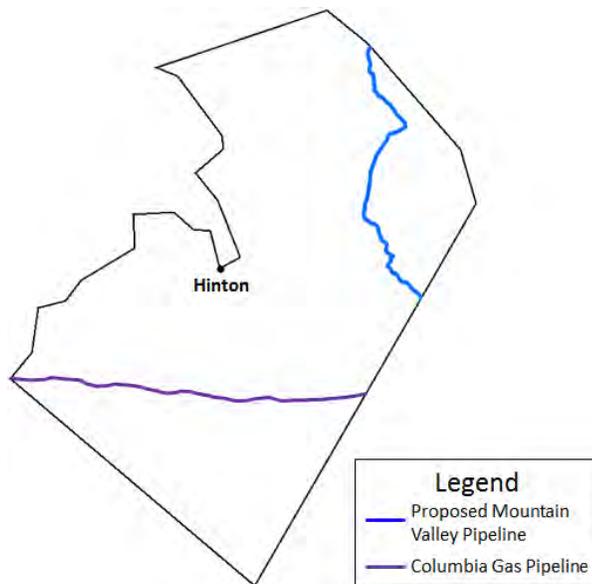
¹⁰⁰ <http://www.drillingedge.com/west-virginia/summers-county>

Figure 34 – Primary Space Heating Fuel Used in Summers County versus the State, Percentage of Housing Units¹⁰¹



All sectors could benefit from the MVP. The pipeline could give access to the developing portions of the northeastern part of the county near Alderson (Figure 35). Alderson sits outside the county and straddles Monroe and Greenbrier Counties. Alderson is provided gas via the Columbia Gas pipeline with which the MVP project would intersect in Monroe County.

Figure 35 – Summers County Natural Gas Pipeline Map



¹⁰¹ 2013 US Census Bureau 5 Year American Community Survey.

9. Webster

Economic Profile

Webster County is a 556 square-mile county located in the center of West Virginia. It has a population of approximately 8,900 and has a household count of approximately 5,200. The county has had an underperforming economy. Its nominal GDP in 2013 was \$297 million or \$33,000 per person.¹⁰² The real GDP increased by 2.8% from 2013 to 2014¹⁰³ compared to the U.S. GDP real growth of 2.4%¹⁰⁴ during the same time period. Additionally, the county unemployment rate has been high – 11.3% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

Webster Springs is the largest town with a population of 776 and is also the county seat. Cowen is the second largest town in the county with a population of 541. Together these towns represent approximately 15% of the county's population.

Overall, the economic development in the county has been scattered. There is no major interstate that runs through the county. As such, infrastructure is primarily available along the Route 20 corridor, which runs from Camden-on-Gauley in the southern part of the county through, Cowen, Webster Springs, nearby Diana, and Cleveland on the northern part of the county.

Webster County has also been limited in terms of usable land for large commercial or manufacturing development. The Monongahela National Forest occupies the southeastern part of the county and Holly River State Park is located in the north of the county. Together, these parks consume about one-third of the county's acreage. The majority of useable raw land is located in the southwestern part of the county where post-mining land sites present possible development opportunities.

The county counted 198 employers in 2013 with total employment of 1,919 or 10 employees per employer.¹⁰⁵ The commercial and government sectors represent 69% of the employment in the county. Tourism represents a large portion of the commercial sector. Another 19% of the employment within the county is in the resources and mining sector, which comprises mainly timber production and coal mining. About 9% of the County residents work in manufacturing (see Table 23).

¹⁰² National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

¹⁰³ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

¹⁰⁴ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

¹⁰⁵ WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Table 23 – Employment in Webster County by Sector¹⁰⁶

Sector	Employment	Percent of Total Employment
Commercial	775	40%
Government	566	29%
Resources and Mining	373	19%
Manufacturing	181	9%
Construction	24	1%
Total	1,919	100%

Wood and lumber product manufacturing has a large presence in Webster. Allegheny Wood Products produces oriented strand board for the construction industry. Other companies include Northwest Hardwoods and the Jim C Hamer Company. Table 24 shows the average annual salary by sector.

Table 24 – Annual Average Wages in Webster County by Sector¹⁰⁷

Sector	Average Annual Wage
Resources and Mining	\$71,228
Government	\$35,894
Manufacturing	\$29,523
Construction	\$29,151
Commercial	\$23,815
Weighted Average	\$37,199

Cowen represents the best opportunity for Webster County to benefit from manufacturing and commercial development derived from the MVP project for the following reasons:

- The proposed MVP pipeline would be nearby (1.2 miles away)
- There are large tracts of usable land for commercial or manufacturing development
- The town has rail service

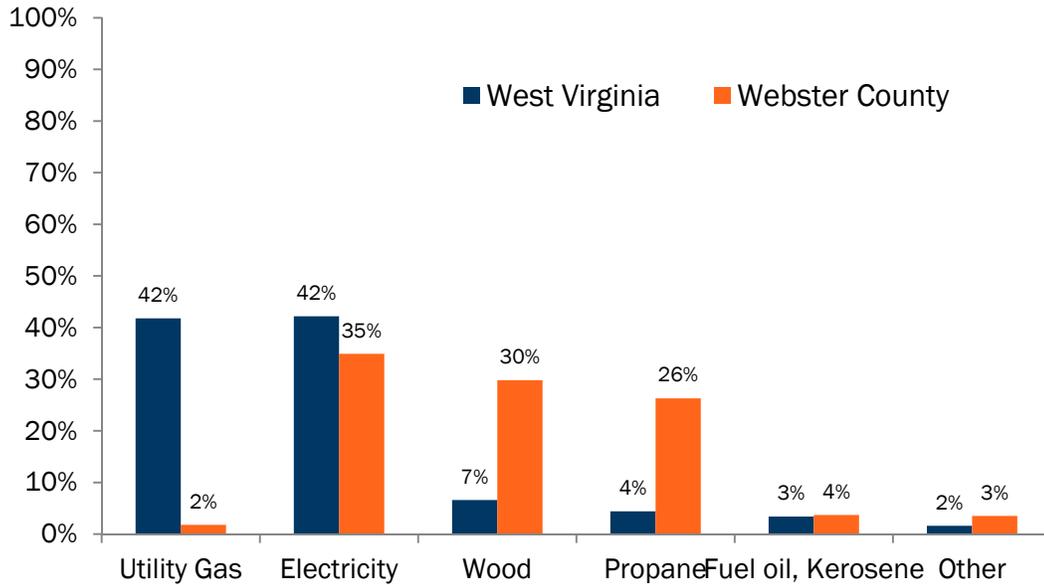
¹⁰⁶ WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

¹⁰⁷ WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.

Energy Profile

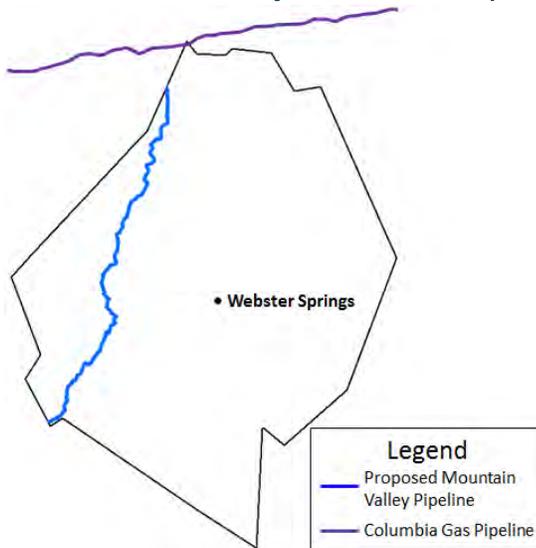
Currently there is no gas service in the county. Electricity, wood, and propane are the main residential home heating sources for the county as shown in Figure 36.

Figure 36 - Primary Space Heating Fuel Used in Webster County versus the State, Percentage of Housing Units¹⁰⁸



All sectors, particularly in Cowen and Camden-on-Gauly, could benefit from the MVP pipeline as it would run through the western part of the county (Figure 37).

Figure 37 - Webster County Natural Gas Pipeline Map



¹⁰⁸ 2013 US Census Bureau 5 Year American Community Survey.

10. Wetzel

Economic Profile

Wetzel County is a 361 square-mile county located in northern West Virginia. It has a population of approximately 16,200 with a household count of approximately 6,900. Its nominal GDP in 2013 was \$435 million or \$26,833 per person.¹⁰⁹ The real GDP declined by 1.4% from 2013 to 2014¹¹⁰ compared to the U.S. GDP real growth of 2.4%¹¹¹ during the same time period, although real GDP in Wetzel had grown by 10% the previous year. Additionally, the county unemployment rate has been high – 9.6% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

New Martinsville is the county seat with a population of 5,300. There is also Paden City with a population of more than 2,500, although the city is split between Wetzel County and Tyler County to the southwest. Together these cities represent approximately 40% of the county's population.

The economic development in the county is diverse. While no large industry is located within the county, many residents work at the nearby Bayer Corporation, PPG Industries (Natrium Plant near New Martinsville) or Ormet Aluminum Corporation. A commerce park is located in New Martinsville which serves as the hub of business activity for the region.

The county counted 419 employers in 2013 with total employment of 4,633 or 11 employees per employer.¹¹² A large portion of the county employment is in the commercial and government sectors (85%). The Wetzel County Board of Education employs more than 450 workers, and is the largest employer in the county. Only 3% of the County residents work in manufacturing (see Table 25).

Table 25 – Employment in Wetzel County by Sector¹¹³

Sector	Employment	Percent of Total Employment
Commercial	2,827	61%
Government	1,129	24%
Construction	424	9%
Manufacturing	130	3%
Resources and Mining	123	3%
Total	4,633	100%

¹⁰⁹ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

¹¹⁰ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>.

¹¹¹ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2nd.xls” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

¹¹² WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

¹¹³ WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Natural gas is important to the county's economic growth. The resources and mining sector (primarily composed of oil and gas sub-sector) has an average annual wage of almost \$74,000 or 2.5 times more than the average county wage rate as shown in Table 26.

Table 26 – Annual Average Wages in Wetzel County by Sector¹¹⁴

Sector	Average Annual Wage
Resources and Mining	\$73,791
Construction	\$47,834
Government	\$34,831
Manufacturing	\$33,630
Commercial	\$23,223
Weighted Average	\$29,939

The drilling activity in Wetzel has led to a boom in government revenue with a large increase in tax revenue. Local property tax revenue has nearly tripled since 2005 with significant increases to severance tax revenue as well.¹¹⁵

Currently, most of the gas development jobs have gone to out-of-state workers where the industry is more developed and workers are more experienced. Wetzel County could benefit significantly by transitioning out-of-state workers to be re-located within the county. This would provide additional disposable income within the counties borders.

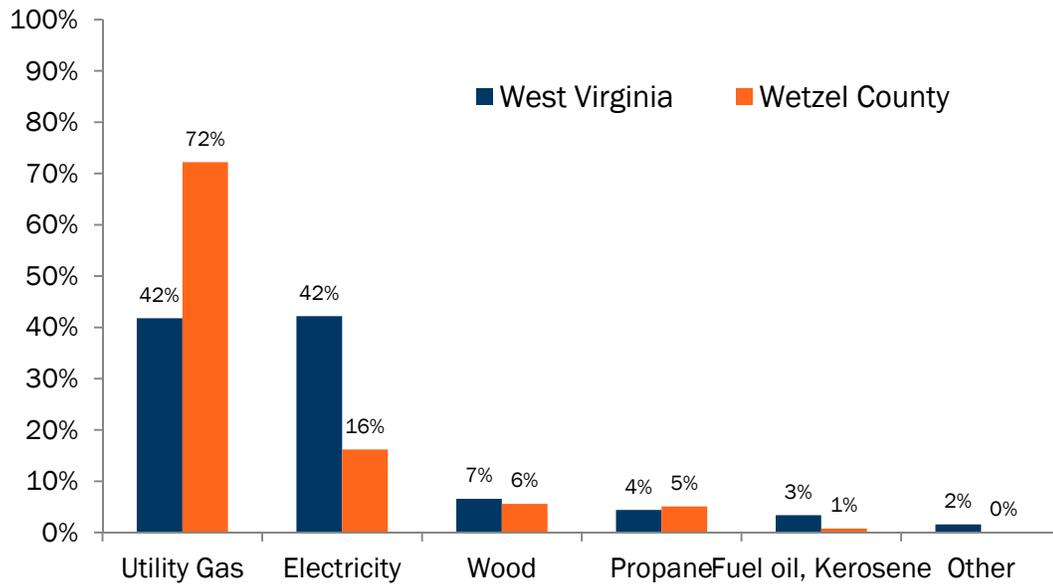
Energy Profile

Oil and gas exploration and development began with the drilling of the first gas well in Hundred in 1886. Oil and gas wells were also developed in Pine Grove, Smithfield, Folsom, and Proctor. Many of these wells continue to be active today. Due to native natural gas production, gas is the primary residential home heating source for the county as shown in Figure 38. Typically commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Mountaineer Gas Company serves New Martinsville while Dominion Hope serves the rest of Wetzel County.

¹¹⁴ WorkForce WP: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html; FTI analysis.

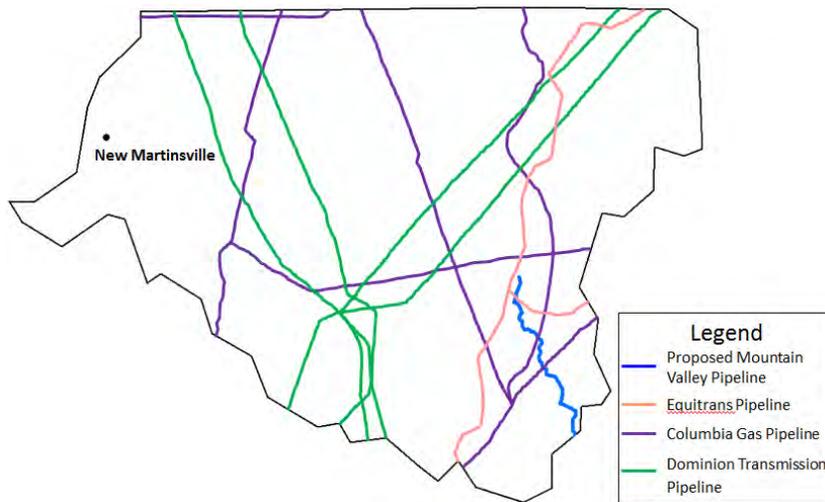
¹¹⁵ <http://www.wvpolicy.org/wp-content/uploads/2014/04/Impacts-of-Drilling-in-Wetzel-County.pdf>

Figure 38 – Primary Space Heating Fuel Used in Wetzel County versus the State, Percentage of Housing Units¹¹⁶



The residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect the Columbia Gas and Equitrans pipelines in the southeastern part of the county, as shown in Figure 39. The MVP pipeline, if connected with these pipelines, could provide gas supply to additional Wetzel County consumers.

Figure 39 – Wetzel County Natural Gas Pipeline Map



It is worth noting that New Martinsville has its own electricity generating plant – the hydroelectric facility at Hannibal locks and dam – which produces 37 megawatts.¹¹⁷

¹¹⁶ 2013 US Census Bureau 5 Year American Community Survey.

11. Fayette

Economic Profile

Fayette County is a 668 square-mile county located in the center of West Virginia. It has a population of approximately 45,600 with a household count of approximately 17,000. Its nominal GDP in 2013 was \$1.3 billion or \$28,500 per person.¹¹⁸ The real GDP grew by 0.9% from 2013 to 2014¹¹⁹ compared to the U.S. GDP real growth of 2.4%¹²⁰ during the same time period. The county unemployment rate is higher than average – 7.7% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

Fayetteville is the county seat with a population of 2,900. Oak Hill is the largest city in the county, with a population of 7,700.

The economy of Fayette is diverse. It historically has been a coal mining area, and Kingston Mining is still one of its largest employers. The largest manufacturer is WVA Manufacturing in Alloy, a joint venture between Globe Specialty Metals and Dow Corning, which produces silicon metals. Fayette County also is home to the state's only maximum security prison, Mount Olive Correctional Complex.

The county counted 1,000 employers in 2013 with total employment of 11,525 or 11.5 employees per employer.¹²¹ A large portion of the county employment is in the commercial and government sectors (87%). The Fayette County Board of Education is the largest employer in the county. Only 4% of the County residents work in manufacturing (Table 27).

Table 27 – Employment in Fayette County by Sector¹²²

Sector	Employment	Percent of Total Employment
Commercial	6,806	59%
Government	3,233	28%
Resources and Mining	663	6%
Manufacturing	478	4%
Construction	345	3%
Total	11,525	100%

¹¹⁷ <http://www.wvencyclopedia.org/articles/1158>

¹¹⁸ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

¹¹⁹ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>.

¹²⁰ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2Nd.xlsx” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

¹²¹ WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

¹²² WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

While the manufacturing sector in Fayette County is relatively small, the average wages are high, As Table 28 shows, manufacturing wages are the second highest across all job sectors in the county (\$55,999 per year) and are 59% higher than the average wage in the County.

Table 28 – Annual Average Wages in Fayette County by Sector¹²³

Sector	Average Annual Wage
Resources and Mining	\$77,720
Manufacturing	\$55,999
Government	\$36,252
Construction	\$32,852
Commercial	\$29,285
Weighted Average	\$35,285

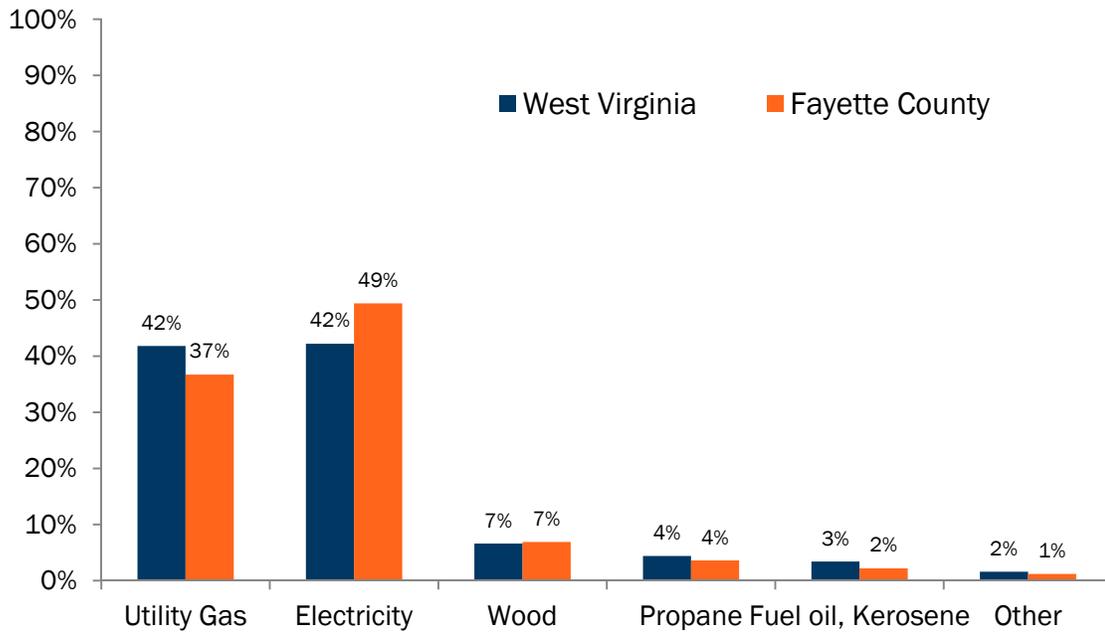
The Resources and Mining sector has the highest wages in the county, representing the historically strong coal mining industry in Fayette.

Energy Profile

There is a significant amount of gas accessibility in Fayette County. Natural gas and electricity are the main residential home heating sources for the county as shown in Figure 40. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Natural gas usage in Fayette County is just below the average for the entire state of West Virginia. Dominion Hope serves the county with natural gas.

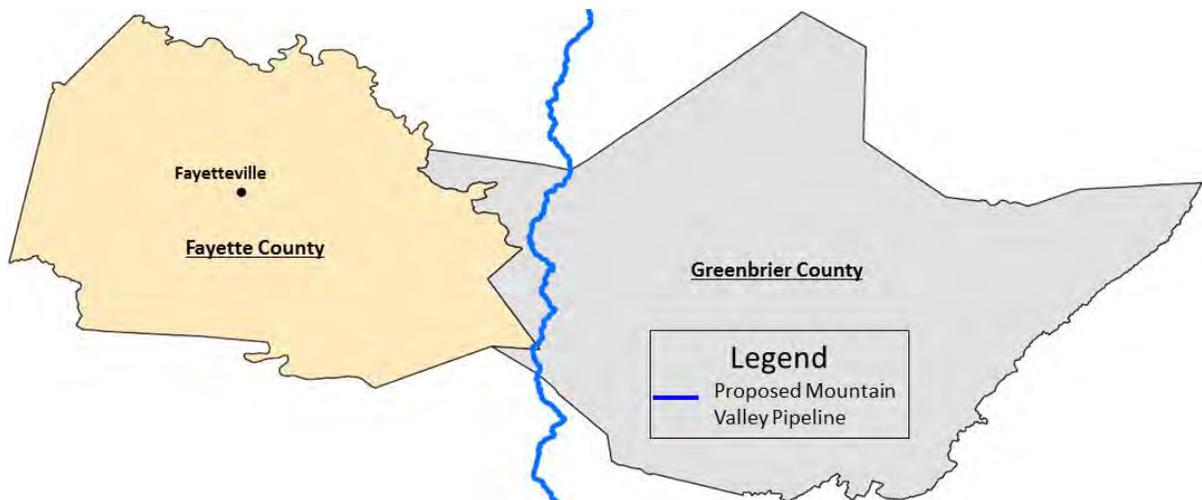
¹²³ WorkForce WP: http://www.workforcewv.org/Imi/Earnings_N_Wages/EnW.html; FTI analysis.

Figure 40 – Primary Space Heating Fuel Used in Fayette County versus the State, Percentage of Housing Units¹²⁴



The Mountain Valley pipeline is currently planned to traverse the eastern border of the county. Most the towns and businesses are in the central part of the county. The pipeline could expand natural gas supply to the eastern portion of the county, which could enable economic growth in that area (Error! Reference source not found.Figure 41).

Figure 41 – Fayette County Natural Gas Pipeline Map



¹²⁴ 2013 US Census Bureau 5 Year American Community Survey.



**CRITICAL THINKING
AT THE CRITICAL TIME™**

About FTI Consulting

FTI Consulting, Inc. is a global business advisory firm dedicated to helping organizations protect and enhance enterprise value in an increasingly complex legal, regulatory and economic environment. FTI Consulting professionals, who are located in all major business centers throughout the world, work closely with clients to anticipate, illuminate and overcome complex business challenges in areas such as investigations, litigation, mergers and acquisitions, regulatory issues, reputation management and restructuring.

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OCTOBER 2, 2015



ECONOMIC BENEFITS OF THE MOUNTAIN VALLEY PIPELINE PROJECT IN VIRGINIA

CRITICAL THINKING
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DISCLAIMER

The information contained herein has been prepared based upon financial and other data provided to FTI from the management and staff of EQT Corporation and from public sources. There is no assurance by anyone that this information is accurate or complete. FTI has not subjected the information contained herein to an audit in accordance with generally accepted auditing standards. Accordingly, FTI cannot express an opinion or any other form of assurance on, and assumes no responsibility for, the accuracy or correctness of the historical information or the completeness and achievability of the projected financial data, information and assessments upon which the enclosed report is presented.

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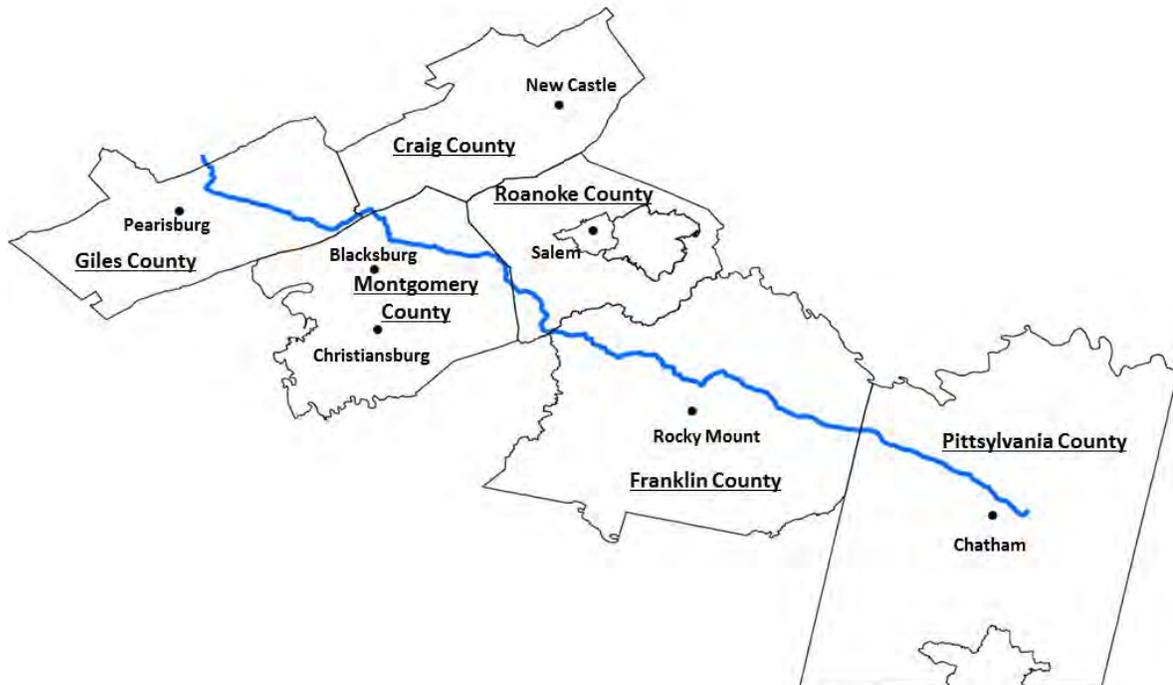
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Executive Summary

EQT Corporation retained FTI Consulting (“FTI”) to examine the potential economic benefits of the Mountain Valley Pipeline (“MVP”) project to the Commonwealth of Virginia and the six counties through which the project is proposed. The MVP is a natural gas pipeline that will traverse approximately 300 miles across West Virginia and Virginia, including the Virginia counties of Craig, Franklin, Giles, Montgomery, Pittsylvania, and Roanoke, as shown below in Figure 1.

Figure 1 – Proposed Mountain Valley Pipeline through Virginia



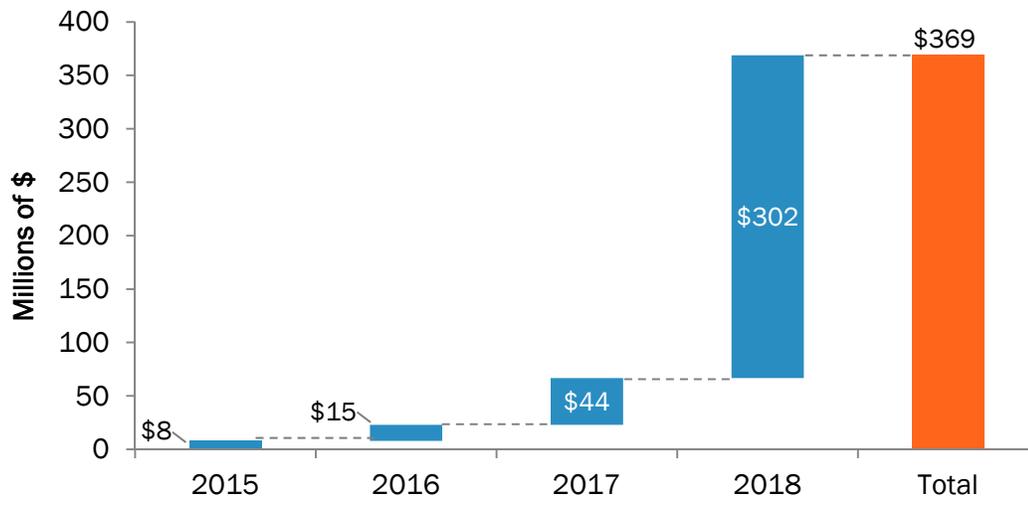
Three types of economic benefits would occur from the construction and operation of the MVP project. These benefits include:

- **Construction Spending Benefits:** Expenditures on goods and services in the Commonwealth would translate into job creation along with economic benefits to Virginia suppliers, their employees, and the overall economy.
- **Operational Benefits:** Once in service, the project would require a skilled workforce to operate and maintain the pipeline. Also, it would generate annual property tax revenues for the counties, providing an additional stream of funds.
- **Direct-Use Benefits:** The Commonwealth and counties would benefit from the potential direct use of gas from the MVP project. The project would enhance gas service already available, help enable new gas service, and expand opportunities for commercial and manufacturing activities.

Construction Spending Benefits

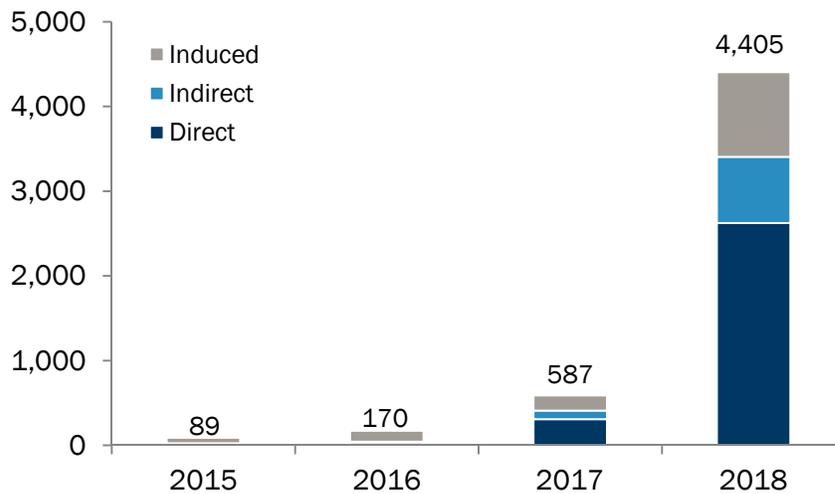
From 2015 to 2018, the MVP project owners plan to spend \$407 million directly on resources (equipment, materials, labor, and services) in Virginia. This direct spending would translate into \$369 million in cumulative Gross Regional Product over the four-year period, as summarized in Figure 2.

Figure 2 – MVP Additions to Virginia’s Gross Regional Product



The MVP project would create approximately 4,400 jobs at the peak of construction in 2018. More than 2,600 of these jobs would be directly associated with the project (labeled “direct” in Figure 3); 780 jobs would be created along the supply-chain (“indirect”); and, just under 1,000 jobs would be created in the general economy.

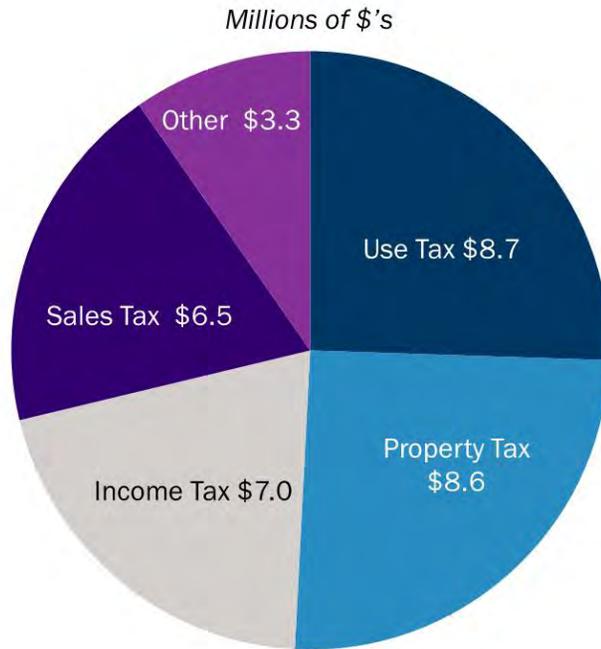
Figure 3 – MVP Jobs Created in Virginia by Year



Cumulatively, the MVP project would create approximately 5,250 job-years over the course of construction.¹

Another benefit of the MVP project is the increased state and local tax revenues that result from the economic ripple effect of construction expenditures. As shown in Figure 4, the project would generate nearly \$34 million in aggregate tax revenues from 2015 to 2018 during construction.

Figure 4 – Virginia State and Local Tax Revenues Generated during Construction, 2015–2018



Operational Benefits

Once in service, the MVP project would continue to benefit Virginia’s economy along three main areas. The first is in operational employment and spending. Ongoing operation and maintenance of the pipeline would support a total of 34 jobs across the state with average annual wages and benefits of almost \$67,000.

Annual tax revenues through ad valorem taxes (property taxes) represent the second area of operational benefits. Based on the estimated pipeline investments and county property tax rates, the MVP project owners would pay up to \$7.4 million in taxes annually.

Direct-use benefits of the pipeline’s natural gas represent the third area where the Commonwealth and counties potentially could benefit from the project and are discussed in further detail below.

¹ The MVP employment contributions are directly tied to the capital spending in each year and are best expressed in ‘job-years’. A job-year is the equivalent of one full-time job lasting a single year.

Direct-Use Benefits

In terms of direct gas-use benefits, the MVP project could provide \$3.6 million in annual savings from fuel switching (i.e., switching from propane, fuel oil, diesel, or electricity to natural gas) across the six counties, with a large portion of this savings occurring in Franklin County. A detailed demand analysis identified \$1.0 million of annual potential savings in the Rocky Mount area of the county (see Table 1) since the area is not served by natural gas. The MVP project represents a unique opportunity as it would run within four miles of Rocky Mount, which is the largest town in Franklin County and serves as the county's manufacturing hub. These benefits are based on current fuel prices and could increase significantly if fuel prices rise.²

Table 1 – Savings from Fuel Switching to Natural Gas in the Rocky Mount Area

Sector	Annual Savings (thousands of \$'s)
Residential & Commercial	\$562
Municipal	\$156
Manufacturing	\$297
Total Annual Savings	\$1,015

Beyond Franklin County, the other four counties currently have varying degrees of natural gas access. Table 2 provides estimates of the potential fuel-switching savings for the residential, commercial, and municipal sectors in these counties, totaling \$2.6 million annually.

Table 2 – Fuel-Switching Opportunities and Savings in Four Other Virginia Counties

County	Fuel-Switching Opportunities	Annual Savings (thousands of \$'s)
Pittsylvania	<ul style="list-style-type: none"> • The Town of Gretna • > 450 municipal and private fleet vehicles • 18 public schools 	\$763
Roanoke	<ul style="list-style-type: none"> • >500 municipal and private fleet vehicles 	\$669
Giles	<ul style="list-style-type: none"> • The Town of Pembroke • Part of the Town of Narrows • 100 municipal and private fleet vehicles • Eastern Elementary 	\$653
Montgomery	<ul style="list-style-type: none"> • >300 municipal and private fleet vehicles 	\$537
Total		\$2,623

² FTI's previous report on December XX, 2014, was based on 2013 average fuel costs.

In addition to the Table 2 savings, the MVP project could provide economic benefits to existing manufacturers. FTI's interviews with county leaders indicated that natural gas access can play a major role in business decisions to expand operations. For example, global technology and specialty materials company Celanese was considering re-locating its Giles County facility due to the impact of EPA regulations. Natural gas access enabled Celanese to retain its operations without moving, by replacing its coal boilers with natural gas boilers and having a 16-mile natural gas pipeline constructed, thereby keeping 600 high-paying jobs.

Access to natural gas also can draw new businesses, particularly energy-intensive and advanced technology manufacturing. These manufacturers can provide significant economic benefits to communities from an employment, wage, and tax revenue perspective. Celanese and industrial and mineral resources company LHoist in Giles County serve as examples. The average annual manufacturing wage in Giles County is \$61,400 or 61% more than the average annual wage of \$38,100 for all jobs in the county in 2013.

Altogether, the proposed MVP project would provide a number of economic and employment benefits to Virginia and the counties along the proposed route. During construction, these benefits would result from capital spent directly within Virginia and the jobs created. Once in service, MVP will employ people within the state to help operate and maintain the pipeline. Also, counties will collect property taxes from the pipeline. Finally, the pipeline would provide sizable opportunities for direct gas-use in areas with and without gas access. These opportunities include additional supply reliability, fuel-switching savings, and new energy-intensive and advanced technology businesses started in Virginia.

1. Introduction

1.1. Project Background

The proposed MVP project is a FERC-regulated natural gas pipeline system that would span approximately 300 miles from the northern part of West Virginia to the southwestern part of Virginia.³ It is expected to provide at least two billion cubic feet per day or approximately 3% of current U.S. gas demand to markets in the Mid- and South Atlantic regions. The pipeline as proposed would pass through six Virginia counties – Giles, Craig, Montgomery, Roanoke, Franklin, and Pittsylvania.

EQT Corporation has retained FTI Consulting (“FTI”) to examine the MVP project’s potential economic benefits along three areas – economic growth and employment resulting from construction expenditures, operational benefits in terms of jobs created and ad valorem taxes paid by the MVP project owners, and direct gas-use opportunities that would result within the counties.

1.2. Approach

Below we summarize the approaches taken for determining the economic benefits in the three areas.

1.2.1. Construction Economic Impacts and Job Creation Benefits

FTI applied the IMPLAN model to estimate the economic impact and jobs created from construction activities in Virginia. The IMPLAN model is a general input-output modeling software and data system that tracks the movement of money through an economy, looking at linkages between industries along the supply chain, to measure the cumulative effect of spending in terms of job creation, income, production, and taxes. The IMPLAN data sets represent all industries within the regional economy – rather than extrapolating from national averages – and are derived primarily from data collected by federal agencies.⁴

The economic impacts that IMPLAN calculates can be broken into direct impacts, indirect impacts, and induced impacts, defined as follows:

- **Direct impacts:** the economic activity resulting from the MVP capital costs spent on industries residing in Virginia. These are the industries that provide the ‘direct’ materials, construction labor, construction management, and technical services (e.g., engineering and design,

³ The MVP would be constructed and owned by Mountain Valley Pipeline, LLC, a joint venture of EQT Corporation (NYSE: EQT) and NextEra US Gas Assets, LLC, an indirect, wholly owned subsidiary of NextEra Energy, Inc (NYSE: NEE).

⁴ The 2012 IMPLAN Dataset includes data from the U.S. Bureau of Labor Statistics (BLS) Covered Employment and Wages (CEW) program; U.S. Bureau of Economic Analysis (BEA) Regional Economic Information System (REA) program; U.S. BEA Benchmark I/O Accounts of the U.S.; BEA Output estimates; BLS Consumer Expenditure Survey; U.S. Census Bureau County Business Patterns (CBP) Program; U.S. Census Bureau Decennial Census and Population Surveys; U.S. Census Bureau Censuses and Surveys; and U.S. Dept. of Agriculture Census.

surveying, and permitting) for the project. This is the first order impact of the MVP expenditures within the state.

- **Indirect impacts:** the economic activity resulting from the ‘direct’ industries spending a portion of their revenues on goods and services provided by their supply chain in Virginia. These supply chain industries represent the second order or ‘indirect’ impacts of the original MVP expenditures in Virginia.
- **Induced impacts:** the economic activity resulting from the spending of the income earned by employees within the ‘directly’ and ‘indirectly’ affected industries. The benefactors of induced impact are primarily consumer-related businesses such as retail stores, restaurants, and personal service industries. These ‘induced’ impacts represent the third order impact.

Through the direct, indirect, and induced impact calculations, IMPLAN provides the economic ripple effect, or multiplier, that tracks how each dollar of input, or direct spending, cycles through the economy to suppliers and ultimately to households.

The first step of the IMPLAN process was to collect the estimate for state-only spending for each of the major project cost categories. These categories included the following:

- Pipeline Materials
- Compressor materials
- Meters and regulator devices
- Technical services such as engineering design, survey, and permitting
- Construction and commissioning services
- Land and right of way acquisitions

Of the \$3.5 billion that the MVP project owners plan to spend, \$407 million is planned to be spent *directly* in Virginia, with the difference being spent in West Virginia and outside the two states.

FTI then assigned these cost categories to one of the 440 IMPLAN economic sectors as inputs to the model. The model was then run from 2015 to 2018 to provide the following direct, indirect, and induced economic impacts:

- **Gross Regional Product (GRP):** an industry’s value of production over the cost of its purchasing the goods and services required to make its products. GRP includes wages and benefits paid to wage and salary employees and profits earned by self-employed individuals (labor income), monies collected by industry that are not paid into operations (profits, capital consumption allowance, payments for rent, royalties and interest income), and all payments to government (excise taxes, sales taxes, customs duties) with the exception of payroll and income taxes.
- **Employment Contributions:** direct, indirect, and induced annual average jobs for full-time, part-time, and seasonal employees and self-employed workers.

- **State, Local, and Federal Taxes:** payments to government that represent employer collected and paid social security taxes on wages, excise taxes, sales taxes, customs duties, property taxes, severance taxes, personal income taxes, corporate profits taxes, and other taxes.
- **Labor Income:** the wages and benefits paid to wage and salary employees and profits earned by self-employed individuals. Labor income demonstrates a complete picture of the income paid to the entire labor force within the model.

Section 2.1 provides the results of the IMPLAN construction and employment benefits analysis.

1.2.2. Operational Job Creation and Ad Valorem Tax Benefits

The MVP project would create jobs within the state to operate and maintain the pipeline and would generate ad valorem tax (property tax) revenues for the counties along the proposed route. To estimate the job benefits of ongoing operations, FTI collected data from EQT on the annual direct employment required within the state to support the pipeline. We then applied the data within the IMPLAN framework described above to determine the total state-wide direct, indirect, and induced employment numbers and average wages.

Our ad valorem tax analysis was developed by using a capitalized income approach. This approach involved creating a pro-forma financial analysis of the entire project⁵, generating the necessary revenues to set the net present value of the project to zero, and then capitalizing the operating income stream. We then allocated the capitalized income between Virginia and West Virginia by each state's share of the gross cost-basis. Next, we took the Virginia capitalized income value and divided it among the counties based on the gross cost value of the project within each county. Finally, we multiplied the each county's allocated capitalized income by the county property tax rate. Section 2.2 provides the outcome of this analysis.

1.2.3. Direct-Use Benefits

Direct-use benefits represent the third area of economic benefits from the proposed project. These benefits include fuel switching savings (e.g., replacing electricity, propane or fuel oil with gas) and commercial and manufacturing expansions enabled by gas supply and access. As part of this assessment, FTI conducted reviewed press statements, conducted interviews with private and public entities in the counties and states, and interviewed local distribution companies and municipal agencies to gauge the fuel switching and manufacturing expansion potential in the counties.

Four of the six counties - Giles, Montgomery, Pittsylvania, and Roanoke – have natural gas access in many of the major cities, towns, and areas. There are portions of these counties, however, with

⁵ The pro-forma was developed using a set of proxy assumptions for operational and maintenance costs, selling, general, and administrative costs, cost of capital, debt/equity ratio, construction and long-term interest rates, and depreciation method and period.

limited or no access. The other two counties, Franklin and Craig, have no natural gas access. FTI conducted a bottom-up, quantitative natural gas fuel switching potential and savings analysis for the areas in Franklin County with limited or no natural gas access. To estimate the potential demand and its associated economics, FTI conducted the following steps:

1. Perform a bottom-up demand potential analysis
2. Determine the consumer savings from switching to natural gas
3. Estimate the switching infrastructure and equipment costs
4. Perform a discounted cash flow analysis

Bottom-up Demand Potential Analysis

FTI conducted an analysis of Franklin County’s bottom-up demand potential by estimating what could be a reasonable amount of existing and future potential. Existing potential is defined as gas consumption made available via switching from a current fuel source, such as No. 2 fuel oil or propane, and from grid electricity consumption. An example of gas switching potential is Ferrum College. The college recently switched approximately two-thirds of its thermal fuel source to biomass from No. 2 fuel oil.⁶ To be reasonable in our existing potential estimate, we assumed that the remaining one-third of No. 2 fuel oil is a candidate for natural gas switching.

For future potential, we examined both expansion opportunities at “existing” and “new” locations. “Existing” expansion opportunities represent prospective extensions of current capacity, while “new” opportunities represent businesses that decide to locate their operations in the county because of new or additional gas service. The “new” opportunities are explained in a more anecdotal, case-study fashion as opposed to being actual, pending opportunities. We do rely on them, however, in a quantitative manner to show how they might improve the economics of adding natural gas service. In some instances, “new” opportunities could be similar to obtaining an “anchor” store in a retail setting. Such a store would enhance the economics of smaller stores in the same setting and form the critical mass needed to make the economics of the entire system attractive.

Consumer Savings from Gas Switching

We define the consumer savings from gas switching to be the following:

Consumer Savings = (Current costs for fuel and grid electricity consumption) – (Costs for natural gas fuel and gas-fired electricity consumption)

The fixed costs of the infrastructure, such as the pipeline connection network and meters to the consumer, and equipment conversion/replacement, such as boilers, hot water heaters, and furnaces, are not included in the consumer savings calculation. Instead those costs are reflected in the next step.

FTI estimates the consumer savings to total \$6.5M for all sectors and conversion of fleet vehicles.

⁶ http://www.ferrum.edu/campus_life/news/Articles/ferrum_college_to_go_greener_with_new_biomass_boiler.html

Infrastructure and Equipment Costs

Infrastructure costs and equipment costs are fixed costs that do not vary with the amount of consumption. They are borne by the consumer at the tariff rate. This rate includes the regulated rate of return that an LDC or other regulated gas distribution entity can earn on its investment.

We assume the following items represent infrastructure costs:

- **Interconnection costs** – either a tee or “hot tap” of a pipeline
- **Metering station** – a pressure reducing valve, meter, valves and associated equipment for “letting” down the pressure from the interstate pipeline to the pressure on the gas distribution system and measuring the amount of gas consumption
- **Lateral** – the pipeline from the metering station to the distribution system or new consumer
- **Distribution system** – the pipeline distribution network that transports the gas to final consumers

In addition to the interconnection costs, there are the costs of new gas equipment. For example, a household, commercial entity, or manufacturing plant would need to upgrade or replace a water heater or boiler to accommodate gas as a fuel.

Discounted Cash Flow Analysis

The discounted cash flow (DCF) analysis shows whether the cost of switching to gas is economic. The DCF of the consumer savings must exceed the DCF of the infrastructure and equipment combined, as shown below:

$$\text{DCF (Consumer Savings)} > \text{DCF (Infrastructure Costs + Equipment Costs)}$$

Both the consumer savings and equipment are discounted at a rate commensurate with the sector or business type, while the infrastructure costs are discounted at the regulated rate of return.

The DCF analysis does not factor in items such as consumer apprehension to high initial equipment cost expenditures and the availability of infrastructure financing. High initial cost expenditures, for example, include a household paying upfront for the gas furnace and installation. Depending on a household’s economics, an upfront payment may not be an option. Utility financing of infrastructure includes the actual financing of infrastructure to meet the demand. If the demand is not fully subscribed, banks may be unwilling to finance a project.

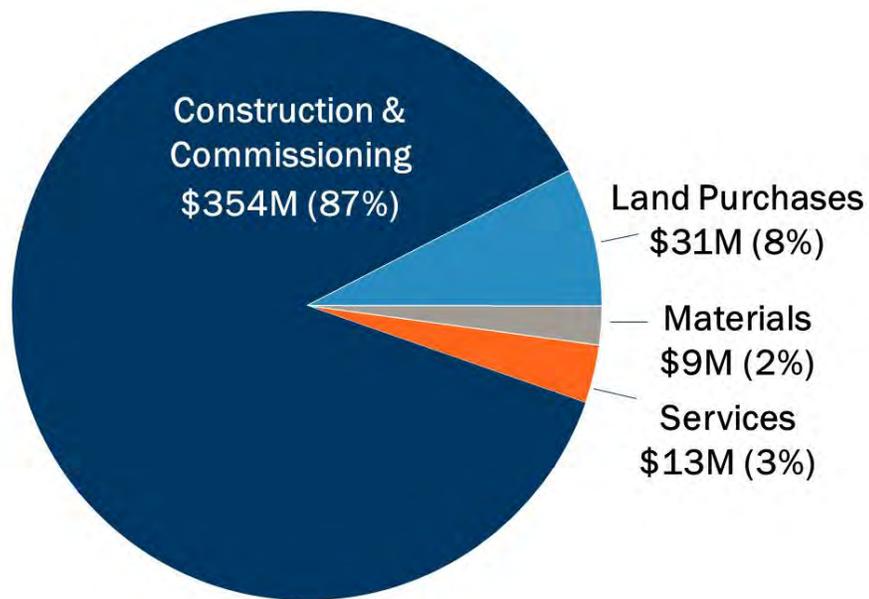
The analysis shows that the economics are favorable for fuel switching and business expansion when natural gas access is available.

2. Economic Benefits of the Mountain Valley Pipeline

2.1. Construction Benefits

The MVP project owners estimate construction expenditures within the state to be \$407 million from 2015 to 2019, and these expenditures would translate into job creation and economic growth for the Commonwealth and the counties. Figure 5 provides a breakdown of the cumulative MVP expenditures by major spending category in Virginia.

Figure 5 – MVP Capital Expenditures in Virginia by Major Spending Category



This spending would result in construction peak year value-added or Gross Regional Product (“GRP”) of \$302 million in Virginia. Over the course of the project construction, the project would generate \$369 million in cumulative GRP as shown in Figure 6.

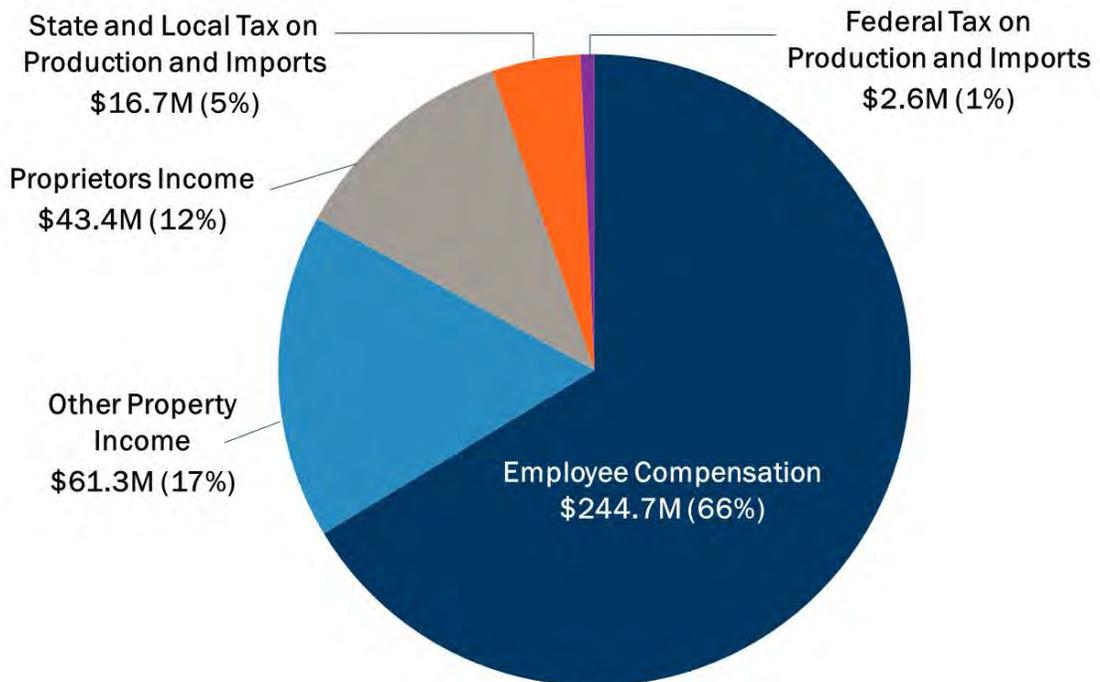
Figure 6 – MVP Contributions to Gross Regional Product



Figure 6 shows GDP segmented into direct, indirect, and induced GRP. As previously mentioned, ‘direct’ refers to the GRP occurring from the capital expenditures within the industry sectors immediately impacted. ‘Indirect’ represents the GRP impacts from suppliers to the directly impacted industries. ‘Induced’ GRP reflects the local spending of employee’s wages and salaries of directly and indirectly affected industries.

GRP is defined as the summation of employee compensation, proprietors’ income, other property income, and Federal, State, and local taxes on production and imports. Figure 7 shows that \$19 million in cumulative state and local taxes would be generated from the MVP project construction.

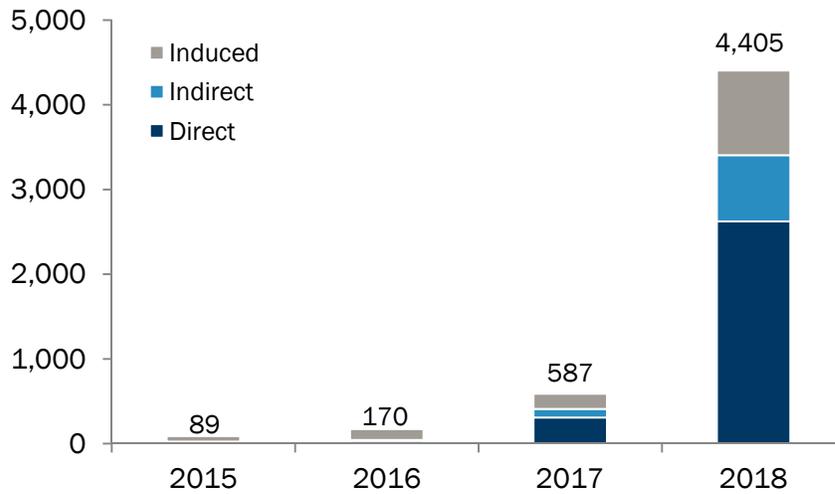
Figure 7 – Composition of MVP’s Cumulative Gross Regional Product Contributions



In addition to the GRP benefits, the project would spur approximately 4,400 jobs within the state in 2018 at peak construction activity. These jobs include construction jobs, indirect jobs (i.e., jobs created in the state by suppliers to the direct industries impacted), and induced jobs (i.e., jobs created in the state via the spending of construction workers and employees of businesses hired to construct the pipeline). Cumulatively, the MVP project would create approximately 5,250 job-years over the course of construction as shown in Figure 8.⁷

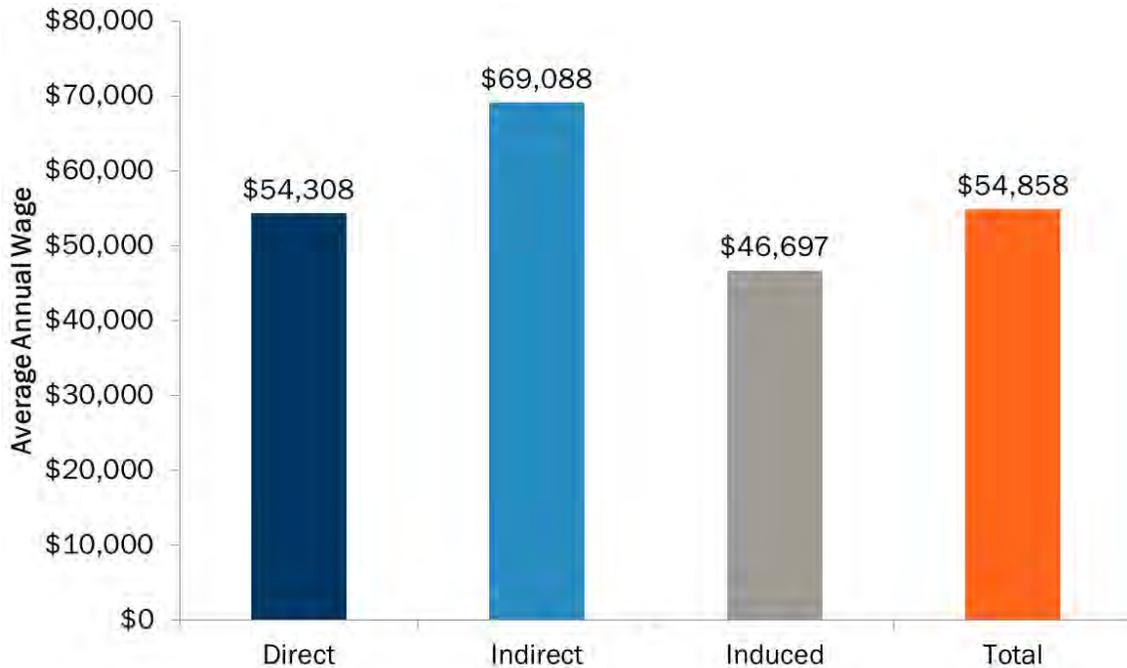
⁷ The MVP employment contributions are directly tied to the capital spending in each year and are best expressed in 'job-years'. A job-year is the equivalent of one full-time job lasting a single year.

Figure 8 - MVP Employment Contribution



The MVP employment contribution also would have a positive impact on employee compensation relative to the median income in the state. Figure 9 shows the average employee compensation for direct, indirect, and induced jobs from the MVP project.

Figure 9 – MVP Average Employee Labor Income



2.2. Operational Benefits

The MVP project would contribute employment and generate county property or ad valorem taxes during construction and operation. Once in service, the MVP project would continue to benefit

Virginia's economy in three main areas. The first is in operational employment and spending. Ongoing operation and maintenance of the pipeline would support a total of 34 jobs across the state with average annual wages and benefits of almost \$67,000 per job contributed.

In terms of property taxes, Table 3 shows the estimated ad valorem taxes by county once the pipeline is in service and compares these taxes to the counties' general fund budget.

Table 3 – Estimated Annual MVP Ad Valorem Taxes during Operation⁸

County	General Fund Total Revenues	Annual MVP Ad Valorem Taxes	Percent of General Fund Total Revenues
Craig	\$6,675,000	\$103,000	1.5%
Franklin	79,778,000	2,159,000	2.7%
Giles	51,810,000	1,140,000	2.2%
Montgomery	43,767,000	1,780,000	4.1%
Pittsylvania	58,971,000	1,215,000	2.1%
Roanoke	198,174,000	957,000	0.5%
Total 5 Counties	\$439,176,000	\$7,354,000	1.7%

Source: County Websites; FTI and EQT Calculations

In total, the ad valorem taxes generated during operation could represent up to 1.7% of the general fund revenues among all six Virginia counties. Ad valorem tax revenues provide counties with a number of options on how to allocate their revenues to constituents

2.3. Direct-Use Benefits – Existing Opportunities

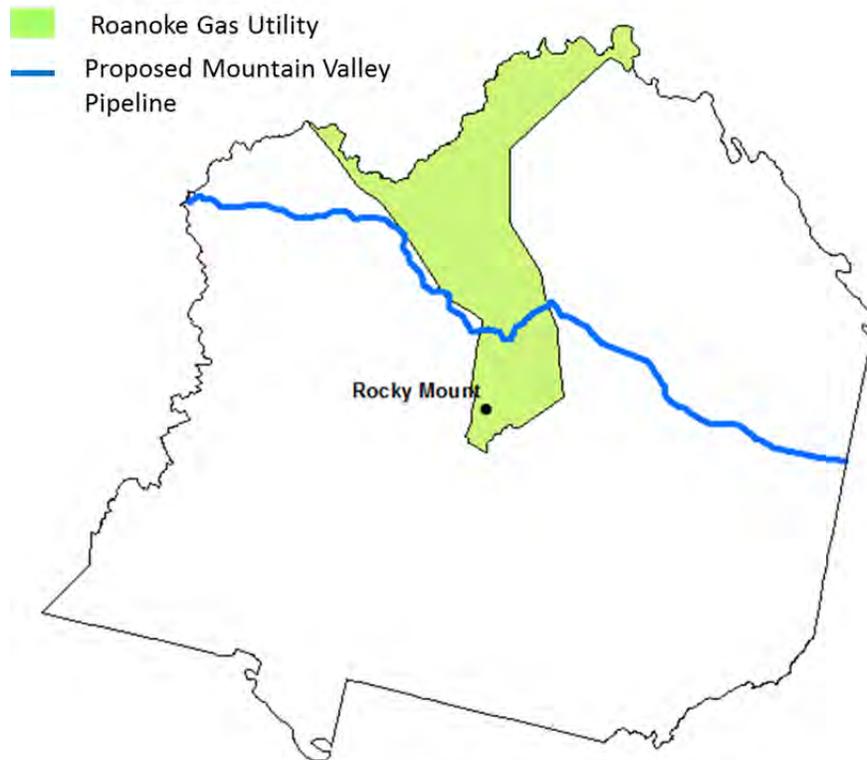
The following section reviews and discusses existing opportunities and savings in each county that could occur as a result of switching to natural gas from electricity, fuel oil, or electricity. These opportunities exist in each of the county's end-use energy consumption sectors – residential & commercial, municipal buildings, manufacturing, and transportation (fleet vehicles). The shale gas revolution has enabled these switching opportunities as it has increased the supply of natural gas, lowered its cost, and stabilized prices.

⁸ Dollars have been rounded to the nearest \$1,000. General Fund figures reflect the latest data available from county websites.

2.3.1. Franklin County

Franklin County, which has 56,000 residents, currently does not have natural gas service for its homes or businesses. The proposed Mountain Valley Pipeline (MVP) project could provide the county with a source of natural gas, particularly in the town of Rocky Mount, which is the county seat and serves as the county’s manufacturing hub. The pipeline is planned to cut across the middle of the county and to pass less than four miles north of Rocky Mount (see Figure 10).

Figure 10 – Roanoke Gas Company Franchise Territory in Franklin County



This route would lower the cost of pipeline access as compared to tapping into the closest access point in the Clearbrook area on the Roanoke Gas Company (Roanoke Gas) system. Clearbrook is more than 10 miles away from Rocky Mount.

The Franklin County situation represents the classic “chicken-or-the-egg” dilemma: Should infrastructure be constructed in anticipation of a major potential consumer arriving or should infrastructure development wait until a major consumer shows concrete interest in locating in the Rocky Mount area?

Bottom-up Demand Potential Analytical Approach

To answer the above question, FTI conducted a bottom-up demand potential analysis for the Rocky Mount and Ferrum areas by estimating what could be a reasonable amount of existing potential. Existing potential is defined as gas consumption made available via switching from a current fuel source, such as No. 2 fuel oil or propane, or electricity.

FTI performed the following steps for this analysis:

1. Perform a bottom-up demand potential analysis
2. Determine the consumer savings from switching to natural gas
3. Estimate the switching infrastructure and equipment costs
4. Perform a discounted cash flow analysis

These steps examine gas demand and economics from the perspective of the final consumer. The consumer savings calculated in Step 2 need to cover the infrastructure and equipment costs that would appear as fixed costs on a consumer's gas bill.

Findings

Residential

We conducted primary research, interviewed county officials, and interviewed gas LDCs in municipalities outside the counties to estimate residential switching potential. We estimate that the total residential natural gas switching opportunity for space heating and water heating in the Rocky Mount area of Franklin County is 82,000 MMBtu. Switching to gas would equate to 72 million standard cubic feet (MMSCF) in annual gas consumption and would produce an annual fuel savings of \$827,000, exclusive of supporting infrastructure and equipment installation costs. Factoring in the conversion costs, we have estimated that the residential sector could almost break even on the investment without being subsidized by commercial and manufacturing consumers.

Commercial

Most commercial entities use fuel oil or propane for their space heating and water heating needs. Older commercial entities, such as the main building for the Carilion Franklin Memorial Hospital and the remainder of Ferrum College that was not switched over to biomass-based heating⁹, tend to use fuel. Newer commercial entities tend to use propane.

⁹ http://www.ferrum.edu/campus_life/news/Articles/ferrum_college_to_go_greener_with_new_biomass_boiler.html

We estimate the natural gas switching potential for the commercial entities in Rocky Mount and Ferrum is 99 MMSCF annually, which would equate to \$1.5M in annual savings. These savings are based on fuel cost savings and does not account for the annualized cost of supporting gas infrastructure and installing or retrofitting equipment. Factoring in the annualized cost of the investments, we estimate the savings to be \$1.1M annually for the commercial sector.

Manufacturing

We estimate that the annual fuel demand for manufacturers in the Rocky Mount area is approximately 21,000 MMBtu, which, if converted to natural gas, would equate to 18.3 MMSCF. Switching to gas would result in \$346,000 in annual savings before equipment and labor. Factoring in the annualized cost of supporting gas infrastructure and installing or retrofitting equipment, the savings for manufacturers would total \$297,000 annually.

It is important to note the role of manufacturing in the Franklin County. Manufacturing jobs in the county average \$35,200 in weekly wages versus an average of \$31,500 across all industries.¹⁰ In Giles County where almost 23% of workers are employed in manufacturing, the average weekly wage is almost \$61,400. Giles has a high concentration of energy-intensive manufacturing, something that could be part of Franklin County's economic profile especially if the MVP project were to be built.

Municipal Buildings

We conservatively assumed that gas would be used only as a substitute fuel for space heating and water heating and not for on-site electricity generation due to the small load size per building. Municipal buildings consume approximately 36,505 MMBtu. Of this demand, we estimate the natural gas demand potential to be 32.1 MMSCF per year, which would equate to \$360,000 per year in savings, including the costs of conversion.

Fleet Vehicles

For transportation, we estimate there are more than 400 fleet vehicles – school buses, other school vehicles, county vehicles, and solid waste disposal trucks – located in Franklin County. These vehicles consume 587,500 gallons of gasoline and diesel fuel annually as shown in Table 4, which equates to \$2.2 million in annual costs. We estimate the natural gas switching potential to be 76.1 MMSCF per year if all vehicles were switched to natural gas. With current low fuel prices, the annual fuel savings would only partially offset the equipment conversion/ replacement and infrastructure costs. Savings would be significant if fuel prices were to increase.

¹⁰ Virginia Employment Commission Report, Franklin County Community Profile, page 26.

Table 4 – Estimated Municipal Fleet Vehicle Annual Energy Consumption

	Transportation Fuels (gallons)	Equivalent Natural Gas Consumption (MMSCF)
School Buses	250,000	33.7
Other School Vehicles	110,000	13.2
Solid Waste Trucks	115,000	15.6
County Vehicles	112,500	13.6
Total	587,500	76.1

Electricity Generation

Appalachian Power, a unit of American Electric Power, provides electricity to customers in Franklin County. The nearest utility-scale electricity generator is a hydroelectric and pumped storage facility at Smith Mountain Lake just outside of Franklin County. In 2012, this facility had a net generation of -73 gigawatt hours (GWh) out of a total gross generation of 321 gigawatt hours.¹¹ The pumped storage capabilities of the facility allowed Appalachian Power to produce electricity from the facility during peak hours while consuming electricity during off-peak hours as it refilled the reservoir, thus the negative generation from the facility.

Because of the net negative generation from the Smith Mountain Lake hydro facility, Appalachian Power must import electricity into the county to balance the demand. Franklin County could be a site for a new gas, baseload or peaking facility. The combination of the proposed MVP project route and the existing electric transmission infrastructure coming from the Smith Mountain Lake Hydro and Pumped Storage facility could make locating a gas power plant in Franklin County attractive. A commercial size gas peaking facility generally consumes 400 MMSCF annually whereas an average gas baseload facility consumes 12,000 MMSCF annually.¹²

Summary

Converting existing households, businesses and municipal buildings to natural gas would generate gas demand of 221 million standard cubic feet (MMSCF) annually. The county also counts more than 400 fleet vehicles, which over time could be candidates for compressed natural gas vehicle

¹¹ Energy Information Administration form EAI-923

¹² Assumes 100 MW for a gas peak facility operating at a 5% capacity factor and 500 MW for a gas baseload facility operating at a 40% capacity factor.

replacement. If completely converted, these vehicles would generate another 76.1 MMSCF in annual demand. These totals by sector are shown in Table 5.

Table 5 – Natural Gas Demand Potential in Rocky Mount and Ferrum Areas

Sector	MMSCF
Residential	71.9
Commercial	98.8
Manufacturing	18.3
Municipal Buildings	32.1
Total (without fleet vehicles)	221
Fleet Vehicles	76.1
Total (with fleet vehicles)	297.2

Potential fuel savings from switching totals \$4.2 million annually, before equipment and labor costs. Factoring in conversion costs, the savings is \$1.0 million annually with the biggest savings coming from commercial entities and the conversion as shown in Table 6.

Table 6 – Annualized Savings from Fuel Switching in the Rocky Mount Area

	Total (thousands of \$'s)
Fuel Savings	\$4,222
• Residential	\$827
• Commercial	\$1,469
• Manufacturing	\$346
• Municipal Buildings	\$439
• Transportation	\$1,140
<i>Less Equipment and Labor (Amortized)</i>	\$3,207
Total Annual Savings	\$1,015

Generally, the minimum demand level for an economic interconnection is approximately one billion cubic feet (1,000 MMSCF) annually¹³. While Franklin County existing demand potential is about one-third of this amount, the benefits shown in Table 6 may justify the investment. If the generally accepted minimum threshold must be met, Franklin County would need to find demand anchors of

¹³ Based on industry interviews. This is an approximation as each situation depends on locational circumstances, such as the terrain for the pipeline extension and the profile of gas consumption throughout the year.

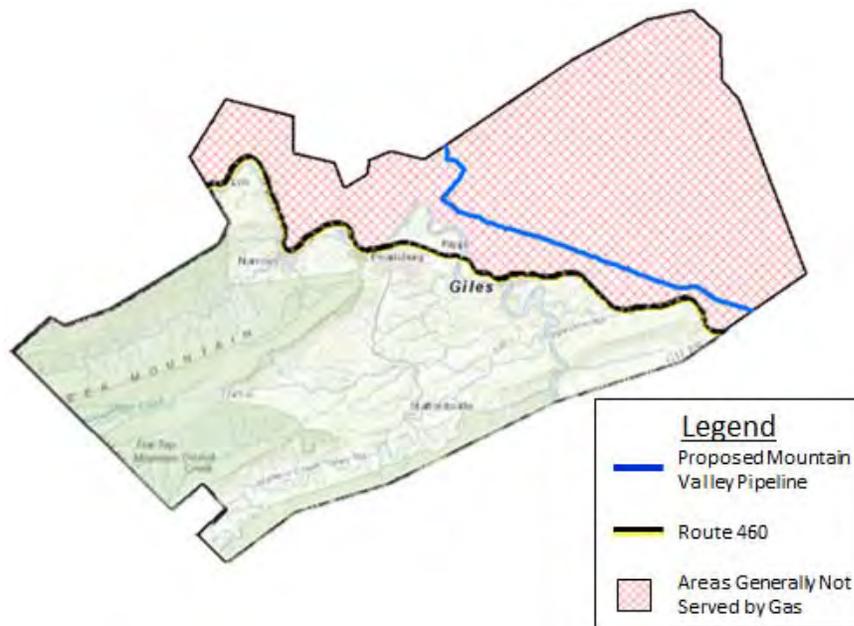
approximately 700 MMSCF in annual consumption to justify gaining access. Potential anchors that would satisfy the remaining demand requirement might include:

- **New Power Generation:** a 150 MW gas peaking power plant¹⁴
- **Combined Heat and Power (CHP):** a 10 MW CHP plant located at a manufacturing site or near commercial or municipal buildings to serve electricity demand and heating loads.¹⁵
- **A major manufacturer:** a manufacturer similar in size to Nestlé Purina PetCare in King William County, which recently was extended gas service via a 12 mile gas pipeline.
- **A number of small to medium manufacturers:** a doubling of the current manufacturing capacity in the Rocky Mount area would almost meet the general economic threshold level for interconnection.

2.3.2. Giles County

The type of fuel used in Giles County for residential and commercial heating is mainly bifurcated between natural gas and electricity. Most of the consumers in Pearisburg and Narrows use gas. However, these towns represent only 27% of the county households and commercial entities. Outside of these towns where the population density declines, residential and commercial consumers typically use electricity. While Columbia Gas has franchise rights to the county, it cannot service the remaining parts of the county economically due to distance from the gas system and sparse population density. We understand from interviews that the eastern portion of Giles County (east of the New River & Rt. 460) has no gas access as shown in Figure 11.

Figure 11 – Portion of Giles County without Gas Access



¹⁴ Assumes 9.2 MMBtu/MWh heat rate and 5% capacity factor

¹⁵ Assumes 7 MMBtu/MWh heat rate and an 85% capacity factor

In order to develop a fuel switching benefits analysis, FTI conducted extensive research that included review of news articles, conversations with private and public entities in the county, and interviews with local distribution companies and municipal agencies inside and outside the county. This research enabled us to profile the county's potential unmet natural gas demand. Potential unmet demand includes switching from current forms of energy to natural gas and the possibility of locating new, tangible opportunities, such as manufacturing and power generation in the county.

Our analysis found that the switching potential in the residential and commercial sectors are minimal due to existing gas service in the two largest towns – Pearisburg and Narrows. We did, however, find substantial opportunities for switching and expansion in the manufacturing and power generation sectors, which could have significant economic benefit impacts on Giles County. As such our analysis focuses mainly on these opportunities.

Approach for Assessing Natural Gas Potential

FTI examined new demand opportunities across all end-use sectors. These included opportunities for switching to gas in the residential, commercial, and municipal sectors and fuel switching, self-generation of power, and manufacturing expansion in the manufacturing and electric sectors. We collected data through primary research and interviews with county officials, LDCs, commercial entities, and manufacturers. These data allowed us to estimate potential demand, which we translated into direct economic benefits.

Natural Gas Potential and Economic Benefits by Sector

Manufacturing and Power Generation

The manufacturing and power generation sectors represent an important part of Giles County's economy. The sectors employ approximately 1,025 people, which equates to 23% of the total eligible workers and 36% of the total wage income in the county.¹⁶ As such, Giles County stands to benefit significantly from the MVP project. Table 7 provides a summary of the major manufacturers and power generation operators in Giles County.

¹⁶ Virginia Employment Commission Report, Giles County Community Profile, page 22.

Table 7 – Major Manufacturers in Giles County

Company	Products	Employees	Primary Fuels Used	Miles from MVP Pipeline
Celanese	Acetate	600	Coal, Electricity	4
Jennmar	Mining supports	~200	Electricity	7
LHoist	Chemical lime	120	Coking Coal, Electricity	1
UFP Mid-Atlantic	Wood products	~75	Natural Gas, Electricity	4
AEP Glen Lyn	Electricity	~75	Coal	9
GE Fairchild	Mining vehicles	50	Propane, Electricity	9

Manufacturers in Giles County use a mix of fuel types. The primary reliance on coal for some manufacturers has been due to the economics associated with pipeline access, available capacity, and reliability. As shown in Table 7, the proposed MVP project would run close to major manufacturing and power generation facilities in Giles County. MVP could provide greater accessibility and reliability to those already using gas and enable switching to coal for those currently without gas access.

The Celanese Acetate plant in Giles County exemplifies the economic benefits of providing gas access. Celanese was faced with upgrading its coal-fired boilers to comply with EPA's Boiler Maximum Achievable Control Technology Rule that will take effect in 2016. One option for Celanese was to re-locate if the upgrade costs became prohibitively expensive. Another option was to replace the coal-fired boilers with gas-fired boilers; however, this option was not certain because Celanese was 16 miles from The Columbia Gas Transmission Corporation (TCO) interstate pipeline. Celanese worked with TCO and Columbia Gas of Virginia to access the TCO interstate pipeline network, allowing Celanese to remain in Giles County and retain 600 employees. Additionally, Celanese's construction of the gas boilers created 200 temporary construction jobs and added twenty-two new permanent jobs at the site.

To estimate the opportunity and potential savings resulting from increased natural gas supply and access in the county, we conducted interviews and primary research to evaluate the demand potential for fuel switching and capacity expansion. Table 8 below shows the potential demand for these opportunities. We have aggregated these opportunities to protect company confidential information.

Table 8 – Manufacturing Potential Demand by Opportunity

Opportunity	Annual Potential Demand (MMSCF)
Fuel Switching	7,500
Capacity Expansion	1,000
Total	8,500

In terms of economic benefits, we have translated these potential demand opportunities into increases in direct jobs and wages in the county. We estimate an increase of 51 manufacturing and power sector jobs and \$3.1 million in additional direct wages. There are also indirect and induced economic impacts that would result from these opportunities, which we have not quantified here.¹⁷

Transportation

For transportation fuels, county end-use sectors consume primarily refined oil products – diesel and gasoline – along with insignificant volumes of natural gas and biofuels. Our interviews and research indicate approximately 100 fleet vehicles could be switched from gasoline and diesel to natural gas. In total, there is an annual fuel switching potential of 18 MMSCF, equating to \$118,000 in annual cost savings, inclusive of the cost of infrastructure development and vehicle retrofitting/replacement. If pursued, this switching process likely would occur over a number of years as vehicles are retired and replaced with compressed natural gas (CNG) vehicles.

Residential & Commercial

For the residential and commercial sectors, we examined the switching potential for those areas without natural gas access. Based on our interviews with county officials, approximately one-half of Narrows and all of Pembroke do not have natural gas service. Assuming the residents and commercial entities in these areas use primarily electricity, we estimate a total switching potential of 35.6 MMSCF, equating to \$342,000 in annual savings. This savings amount is inclusive of distribution investment and equipment replacement.

¹⁷ Indirect impacts include increases in GDP, jobs, wages, and tax revenues that are created by manufacturers procuring goods and services from other county employers. Induced impacts include the multiplier benefits to the county's economy from increasing the amount of disposable income to spend on goods and services (e.g., increased residential and commercial spending on food would, in turn, create more grocery and retail stores and employment). This is also known as the multiplier effect.

2.3.3. Montgomery County

Montgomery County is home to 96,207 residents in Virginia. The county encompasses the towns of Blacksburg and Christiansburg, which are the most populated towns in the county containing a majority of the manufacturing and commercial employers. Nearly half of the residents live in Blacksburg, home to Virginia Polytechnical Institute and State University (Virginia Tech). Atmos and Roanoke Gas both service Montgomery County, with Atmos servicing the western part of the state and Roanoke Gas servicing the eastern part. One area not serviced by either company is Riner, VA.

Montgomery County has a total employment of 40,633. The majority (52%) are workers in the commercial sector, followed by government (33%) and manufacturing (12%). Many manufacturers use natural gas and electricity to fuel their businesses.

Manufacturing jobs are among the highest paying jobs in Montgomery County. The average annual wage is \$53,700 versus a weighted average of \$40,300 for all sectors in the county. Energy intensive manufacturers can have even higher wages.

Some of the largest manufacturers in Montgomery County include the following:

- Moog, Inc.
- Federal Mogul Corp
- Lexington Rowe Furniture
- Corning Glass Works
- United Pet Group
- New River Energetics

Natural Gas Potential and Economic Benefits in the County

Natural gas access is common in much of Montgomery County. Two-thirds of county residents use natural gas as their primary fuel source for home heating.¹⁸ As such, there is only a handful of existing, fuel switching opportunities available. Switching the rest of the Virginia Tech Central Steam Plant over to gas and transitioning the municipal and private fleet vehicles to gas are the two main opportunities based on our research.

Currently, the Virginia Tech Central Steam Plant uses 78% coal, 20% natural gas, and 2% fuel oil to run the facility. Switching the coal to natural gas likely would be an economic cost to Virginia Tech because coal is less expensive than natural gas on an energy-equivalent basis. Switching to gas, however, would help in reducing air emissions from the facility.

For fleet vehicles, we estimate that there are more than 300 vehicles that could be switched from gasoline and diesel to natural gas. In total, there is an annual fuel switching potential of 66 MMSCF, equating to \$537,000 in annual cost savings, inclusive of the cost of infrastructure development and

¹⁸ 2013 US Census Bureau 5 Year American Community Survey.

vehicle retrofitting/replacement. If pursued, this switching process likely would occur over a number of years as vehicles are retired and replaced with compressed natural gas (CNG) vehicles.

2.3.4. Pittsylvania

Pittsylvania County is home to 63,500 residents in Virginia. The towns of Chatham, Hurt, and Gretna are the most populated towns in the county, containing a majority of the manufacturing and commercial employers. The City of Danville, located along the southern border of the county, is not within the county.

The Williams Transco Pipeline cuts across the county and provides natural gas access to Chatham. Columbia Gas serves Hurt, which is a small town in the northern part of the county. Some areas bordering Danville, such as Ringgold, are served by the City of Danville. Most other towns, including Gretna, do not have natural gas service. The proposed Mountain Valley Pipeline (MVP) project has the potential to provide the unserved areas of the county with natural gas service and would be an additional source of natural gas to improve access and reliability throughout the county to support anticipated growth.

Manufacturing jobs are among the highest paying jobs in Pittsylvania County. The average annual wage is \$43,700 versus a weighted average of \$31,400 for all sectors in the county. Energy intensive manufacturers can have even higher wages.

Natural Gas Potential and Economic Benefits in the County

Municipal Buildings

Pittsylvania has 20 schools across the county, with 9,000 students. Only 2 of these schools are served by natural gas. Chatham High School is served by Columbia Gas, and Twin Springs Elementary, just north of Danville, is served by the City of Danville. The two small administrative buildings in Chatham also are served by natural gas.

Fuel oil is the primary heating fuel in the other 18 schools. The annual fuel oil usage by type of school is as follows:

- High School: 20,000 gallons
- Middle School: 15,000 gallons
- Elementary School: 10,000 gallons

We estimate the natural gas switching potential for the schools is 29.3 MMSCF annually, which would equate to \$487,000 in annual cost savings, inclusive of installing or retrofitting gas equipment.

Fleet Vehicles

For transportation, we estimate there are more than 450 fleet vehicles located in Pittsylvania County. These vehicles consume approximately 684,000 gallons of gasoline and diesel fuel annually as shown in Table 9. We estimate the natural gas switching potential to be 89.6 MMSCF per year if all vehicles were switched to natural gas, which would equate to just covering equipment conversion/replacement and infrastructure costs under the current environment of low energy prices, but could provide significant cost savings if fuel prices were to rise.

Table 9 - Estimated Fleet Vehicle Annual Energy Consumption

	Transportation Fuels (gallons)	Equivalent Natural Gas Consumption (MMSCF)
School Buses	362,000	48.8
Solid Waste Trucks	128,000	17.3
Other School Vehicles	123,000	14.8
County Vehicles	71,000	8.6
Total	684,000	89.6

Residential

The town of Chatham has natural gas service, but most other towns, such as Gretna, a town of 1,250 people north of Chatham, are not served by natural gas. Switching Gretna to natural gas would equate to 21 MMSCF in annual gas consumption. Costs for conversion would slightly outweigh benefits unless an existing manufacturer such as Amthor International or a new manufacturing were to be included on the distribution system.

Manufacturing

The manufacturing sector accounts for 17% of the jobs in the county and is a sector that could benefit significantly from having more reliable natural gas service. Natural gas is an influencing factor in retaining existing manufacturers and attracting new ones to the county. With annual wages that are 40% higher than the average wages in the county, the manufacturing sector is crucial to the local economy and would only be bolstered by the MVP project.

As seen in cases throughout Virginia recently, access to natural gas is a major factor when businesses decide to invest in facilities, expand and modernize operations, and locate or relocate plants. Access to natural gas can draw new businesses to areas and ensure current businesses remain committed to the long-term success of their operations within the community.

2.3.5. Roanoke

Roanoke County is home to 93,524 residents. Parts of western Salem stretch into Roanoke County and form the Glenvar and Dixie Caverns areas, where there is significant commercial and manufacturing activity. The county does not include the cities of Roanoke and Salem located within the county.

Roanoke Gas currently serves businesses and residences throughout the county. The proposed Mountain Valley Pipeline (MVP) project has the potential to provide the county with an additional source of natural gas to improve access and reliability throughout the county and support anticipated growth. This is especially the case in the southwestern portion of the county along the proposed pipeline's route.

Roanoke County has a total employment of more than 34,000. The majority (73%) are workers in the commercial sector, followed by government (15%) and manufacturing (8%). The majority of manufacturers use gas and electricity,

Manufacturing jobs are among the highest paying jobs in Roanoke County. The average annual manufacturing wage is \$46,020 versus a weighted average of \$39,234 for all sectors in the county. Energy intensive manufacturers can have even higher wages. The largest manufacturers in Roanoke County include:

- Americold
- Blue Ridge Beverage
- Industrial Battery and Charger
- New Millenium
- Novozymes
- RR Donnelly
- Synchrony
- Tectron

Our analysis found that the switching potential in the residential and commercial sectors are minimal due to existing gas service to the county. We did, however, find opportunities for expansion in the manufacturing sector, which could have significant economic benefit impacts on Roanoke County. As such, our analysis focuses mainly on these opportunities.

The primary benefit of the pipeline to the manufacturing sector in Roanoke County would be the increased supply to the existing network, attracting more manufacturers to locate new sites within Roanoke County. Additionally, the increased supply would help support network expansion in the western and other developing areas of the county.

Natural gas is important to retaining existing manufacturers and attracting new manufacturers to the county. Our interviews and analysis identified that manufacturers value abundant and reliable gas service and that access to natural gas is a primary criterion for determining where to locate new manufacturing facilities.

2.4. Direct-Use Benefits – Future Opportunities

Natural gas is important to retaining existing manufacturers and attracting new manufacturers to the county. Our interviews with county representatives, regional partnership leaders, and manufacturers inside and outside the county identified that businesses value abundant and reliable gas service, and that access to natural gas is a primary criterion for determining where to locate new manufacturing facilities. Below we examine four case studies where natural gas service has provided significant economic benefits to communities in Virginia.

2.4.1. Celanese Conversion from Coal to Gas Boilers

Celanese is a global technology and specialty materials company that engineers and manufactures a wide variety of products. Celanese first established operations in Giles County, VA in 1939 and is one of the world's largest producers of cellulose acetate tow. Today, Celanese Acetate is the biggest employer in Giles County, with approximately 600 employees.

Celanese invested \$150M in its Giles County operation to replace its coal-fired boilers with natural gas-fired boilers.¹⁹ This investment allows the company to reduce its greenhouse gas emissions, improve its energy efficiency, and meet new EPA emissions standards moving forward. Virginia competed against and beat out global options for this investment. The project, combined with other efforts at the site, enabled the creation of at least 22 full-time Celanese positions and requires approximately 200 construction workers. It also affirms the commitment of Celanese towards their Giles County operations.

2.4.2. Pipeline Project to Serve Nestlé Purina PetCare Company

Nestlé Purina PetCare Company is part of the Swiss-based nutrition, health and wellness company. Nestlé Purina's opened the King William, VA facility in 1998 and today it employs 160 people at the Fontainebleau Industrial Park Plant.

In April 2010, the Virginia governor announced a 12-mile natural gas pipeline project in King William County.²⁰ Area businesses including Nestlé Purina joined with the Commonwealth to provide the \$6.5M investment for the project to expand the Virginia Natural Gas network, extending it to the King William, VA facility. Nestlé Purina provided this investment as an ongoing commitment to operational environmental efficiency and a move towards cleaner energy. Nestlé Purina also made significant investments in equipment upgrades at the plant to reduce emissions and improve the plant's operating efficiency.

¹⁹ http://www.roanoke.com/business/news/giles_county/celanese-plant-in-giles-county-completes-conversion-to-boilers-fueled/article_94b6215e-f50b-54d9-88dc-28d8a442f3d3.html

²⁰ <http://www.yesvirginia.org/AboutUs/NewsItem/1050>

In addition to Nestlé Purina PetCare, officials expect the pipeline to support business development along the U.S. 360 corridor, especially at the industrial parks located along the route.

2.4.3. Gas Service Expansion in Caroline County

In 2012, the Virginia General Assembly enacted the Natural Gas Infrastructure Expansion for Economic Development (NEED) legislation, which allows natural gas utilities to expand infrastructure as necessary to provide natural gas to economic development projects to unserved areas. Caroline County became the first community to assist a business through this program with the construction of a new 6 mile pipeline to Hoover Treated Woods Products. The natural gas pipeline connection would begin at the Caroline Public Utilities Department. From there it would run northeast behind the high school and middle school and then turning east until it reaches Hoover Wood Products in the Milford industrial park. Both schools are expected to utilize the pipeline, which measures six inches in diameter.

Hoover Treated Woods Products provides lumber and plywood products for fire retardant and preservative applications. Hoover operates five treatment facilities and has been operating in Caroline since 1979. “We are very excited about having natural gas service for our Caroline County facility,” said Tim Borris, vice president, Hoover Treated Wood Products. “Natural gas improves our operation by reducing our energy costs and improving our cost position making us more competitive.”²¹

2.4.4. Mohawk Industries in Carroll County

Mohawk Industries is a Fortune 400 flooring company headquartered in Calhoun, Georgia. Mohawk is a leading producer of residential and commercial carpet, ceramic tile, hard wood flooring, laminate flooring and bath and area rugs. In 2005 Mohawk acquired a manufacturing facility in Carroll County, VA, from Wayne-Tex Industries. The facility employs 150 people. For years Mohawk tried to gain access to the Patriot natural gas pipeline that runs through the county to upgrade its operations, but Atmos, which held the certificate to provide natural gas service in the county, had failed to build an interconnect and the lateral. As a result, Mohawk began considering moving the operation to Georgia.

“We have lost business prospects because we did not have natural gas,” said the chairman of the county’s Industrial Development Authority (IDA). “Carroll County was at a competitive disadvantage to other communities.”

The IDA worked with Mohawk to develop a plan to deliver gas to the plant. IDA awarded the certificate to operate in the county to Roanoke Gas. The IDA also contributed funds to construct the line to the plant. As a result 150 jobs were retained in Carroll County.

²¹ <https://www.columbiagasva.com/about-us/news-archive/2014/09/17/caroline-county-company-is-the-first-beneficiary-of-legislation-to-promote-natural-gas-service-expansion-to-unserved-areas-of-virginia>

3. Summary

The proposed MVP pipeline would provide several benefits to the six counties in Virginia through which the pipeline would run. Four of the six counties along the proposed MVP route have natural gas access in the major towns and areas. The pipeline would benefit existing customers as it would help ensure future access to a reliable supply of natural gas. These customers include manufacturing firms, which pay higher wages and make up a substantial portion of these counties' economies.

The shale gas revolution has helped lower natural gas prices, making natural gas an economically attractive alternative to existing fuel sources. FTI estimated the potential demand for switching to natural gas and the associated savings, which can be millions of dollars a year. Franklin County, which does not have gas service, could benefit due to the proximity of the proposed MVP pipeline to Rocky Mount, the county's manufacturing hub. The transportation sector in many of the counties could also benefit by switching county vehicles (school buses, solid waste trucks, and other vehicles) to using natural gas.

The MVP pipeline could also help retain or attract manufacturers. Interviews with county representatives, regional partnership leaders, and manufacturers identified that businesses value abundant and reliable gas service. In Giles County, the Celanese Acetate, which employs 600 people, invested \$150M to replace its coal-fired boilers with gas-fired boilers.

These types of investments can provide large economic benefits to communities from an employment, wage, and tax revenue perspective. Input-output modeling software such as IMPLAN can help to estimate the magnitude of these impacts. In addition to the initial economic impact of the investment, businesses along the supply chain benefit through ripple, or multiplier, effects, as do households in the form of higher wages and disposable income.

Appendix I: County Economic and Energy Profiles

1. Franklin

Economic Profile

Franklin County, VA is a 683 square-mile county located in Southwest Virginia with a population of 56,012. It is 8 miles south of Roanoke, 173 miles southwest of Richmond, and 70 miles north of Greensboro, NC. Rocky Mount is the largest town in the county with approximately 5,000 residents and many of the county's employers. Ferrum has a population of approximately 2,000 and is home to Ferrum College, a small liberal arts institution. Much of the recent growth in the county has occurred in the Smith Mountain Lake area. Significant portions of the county's workforce are in health care and manufacturing.

The county had 1,312 employers in 2013 with total employment of 13,528 or 10.3 employees per employer. Table 10 provides the employment by sector.²²

Table 10 – Employment in Franklin County by Sector

Sector	Employment	Percent of Total Employment
Commercial	7,083	52.4%
Manufacturing	2,662	19.7%
Government	2,416	17.9%
Construction	1,015	7.5%
Other	352	2.6%
Total	13,528	100.0%

Franklin County's commercial entities employ 7,083 people. The commercial sector represents 52.4% of the total employment in Franklin County. The two largest commercial employers are Carilion Franklin Memorial Hospital, which employs 290 people, and Ferrum College, employing approximately 300 people.

²² Virginia Employment Commission, Franklin County Community Profile, page 20.

Approximately 20% of the County residents work in manufacturing with M.W. Manufacturers being the largest overall employer with ~800 employees.²³ The major energy-intensive manufacturers in Franklin County are all located in or around Rocky Mount and include the following:

- **McAirlaids:** A private company that makes paper products used in food packaging, hygiene, medical products, industrial filtration, and table decoration. The facility is about 5 miles outside of the town of Rocky Mount. It runs primarily on electricity but also uses propane for industrial space heaters.
- **M.W. Manufacturers:** The largest employer in the county is a manufacturer of window and door products for the residential construction industry that is owned by Ply Gem Industries (NYSE: PGEM). The facility rests on 38.7 acres occupied by a 578,000 square foot building and employees 600-1,000 workers.
- **Newbold Corporation:** A privately-held company with a manufacturing facility that produces solutions for positive patient identification, plastic cards, dog tag embossing, and retail technology/implementation for point of sale (POS) services. The facility is 100,000 square feet and employs approximately 90 people. The facility operates primarily on electricity with propane used for heating and backup electricity.
- **Ronile:** An employee-owned company that supplies custom dyed accent yarns, space-dyed nylon, polyester, acrylic, and other fibers to the carpet, rug, home furnishing, craft, and automotive markets. Ronile employs 100-300 workers in Rocky Mount. It uses a combination of electricity and biomass for operations.
- **Solution Matrix:** A manufacturer of cold therapy wraps. The facility is about 5 miles outside of the town of Rocky Mount, in the same industrial park as McAirlaids. The plant is 48,000 square feet and runs on electricity and propane.
- **Trinity Packaging Corporation:** A privately-owned business that manufactures plastics products (retail store bags, mailing envelopes, food service bags, lawn and garden bags, etc.). The facility has 300-600 employees. Trinity is investing \$9.5 million in an expansion project that will create 25 new jobs.²⁴
- **The Uttermost Company:** An upscale furniture manufacturer that operates a 600,000 square foot facility in Rocky Mount.

²³ Virginia Employment Commission Report, Franklin County Community Profile, page 22.

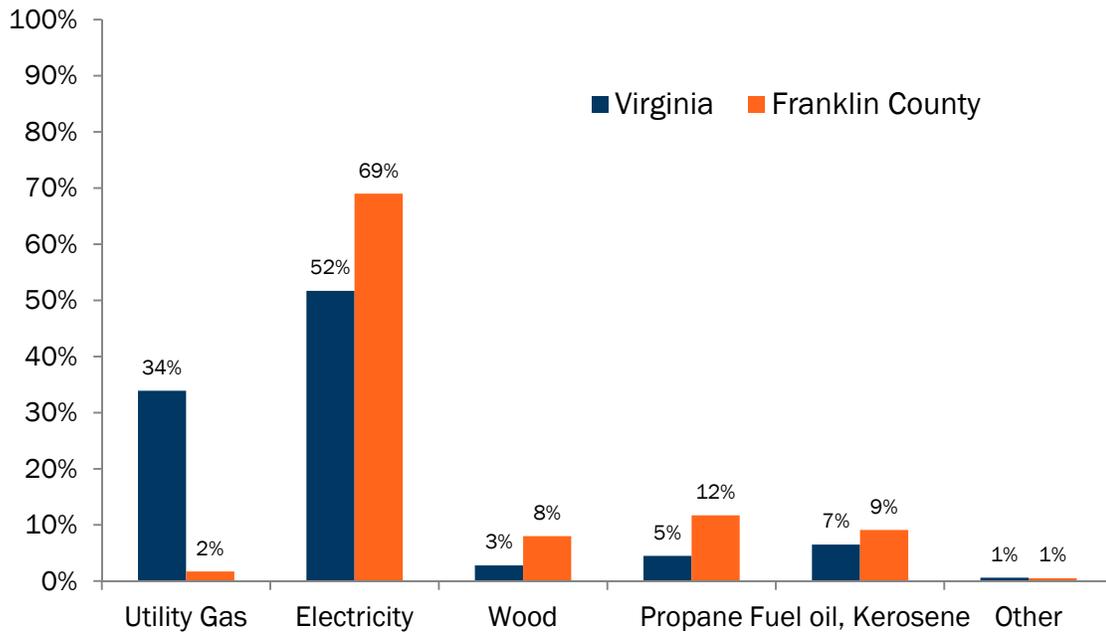
²⁴ www.thefranklinnewspost.com/article.cfm?ID=27728

Energy Profile

Residential and Commercial

There are approximately 23,500 housing units in Franklin County, of which approximately 1,900 units are located in Rocky Mount. Almost seventy percent of Franklin County households use electricity as their source for space heating as shown in Figure 12.

Figure 12 – Primary Space Heating Fuel Used in Franklin County versus the Commonwealth, Percentage of Housing Units²⁵



Typically natural gas consumption by commercial entities follows a similar pattern as residential since the decision to use natural gas is driven often by accessibility.

Municipal

The Franklin County municipal buildings principally include administration and schools. These buildings use electricity, fuel oil and/or propane for space heating and water heating. Most of the boilers in the Franklin County schools are equipped already to burn natural gas, especially in the northern part of the county.

²⁵ 2013 US Census Bureau 5 Year American Community Survey

Most commercial entities use electricity and/or propane for their space heating and water heating needs. Older buildings tend to use electricity and fuel oil, such as the main building for the Carilion Franklin Memorial Hospital.

Manufacturing

Since the manufacturers in Franklin County established their facilities in an area without natural gas, they rely primarily on electricity with propane where necessary. One manufacturer, Ronile, converted to biomass (wet sawdust) eight years ago for steam generation.

2. Giles

Economic Profile

Giles County is a 683 square-mile county located in Southwest Virginia with a population of 16,923. The county has a relatively strong economy. Its nominal GDP in 2014 was \$706 million or \$41,595 per person. The real GDP grew by 3.0% from 2013 to 2014²⁶ compared to the U.S. GDP growth of 2.4% during the same time period.²⁷ While its 2014 unemployment rate of 6.0% is above the Virginia average of 5.2%, it is just below the national average of 6.2%.

The county had 349 employers in 2013 with total employment of 4,530 or 13.0 employees per employer.²⁸ Almost one-quarter of the County residents works in manufacturing as shown in Table 11, with Celanese being the largest overall employer with ~600 employees.

Table 11 – Employment in Giles County by Sector

Sector	Employment	Percent of Total Employment
Commercial	2,053	45.3%
Manufacturing	1,025	22.6%
Government	868	19.2%
Construction	497	11.0%
Other	87	1.9%
Total	4,530	100%

²⁶ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

²⁷ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2nd.xlsx” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

²⁸ Virginia Employment Commission Report, Giles County Community Profile, page 20.

The average annual Giles County wage across all sectors in 2013 was \$38,100 as shown in Table 12. This wage rate was driven mainly by the high-paying 1,025 manufacturing jobs in the County, which averaged \$61,400 annually. Table 12 indicates that Giles County manufacturers paid, on average, 64% more than the next two highest-paying sectors (Government and Construction) in the county.

Table 12 – Annual Average Wages in Giles County by Sector²⁹

Sector	Average Annual Wage
Manufacturing	\$61,400
Government	\$37,300
Construction	\$36,900
Commercial	\$28,700
Arts, Entertainment, and Recreation	\$10,100
Weighted Average	\$38,100

The presence of manufacturing in Giles County also has a large influence on total wages paid. Table 13 shows that manufacturing represents over 36% of total wage income in Giles County while representing only 23% of employment. This is evidence of the extraordinary impact that manufacturing has on average county wage income.

Natural gas access could provide a significant boost in total wage income for Giles County. Combining the average wage rate for manufacturing with the 73 direct jobs potential from the previous section, we estimate that having additional gas capacity and access could increase total direct county-wide wages by almost \$4.5 million.

²⁹ Virginia Employment Commission Report, Giles County Community Profile, page 26.

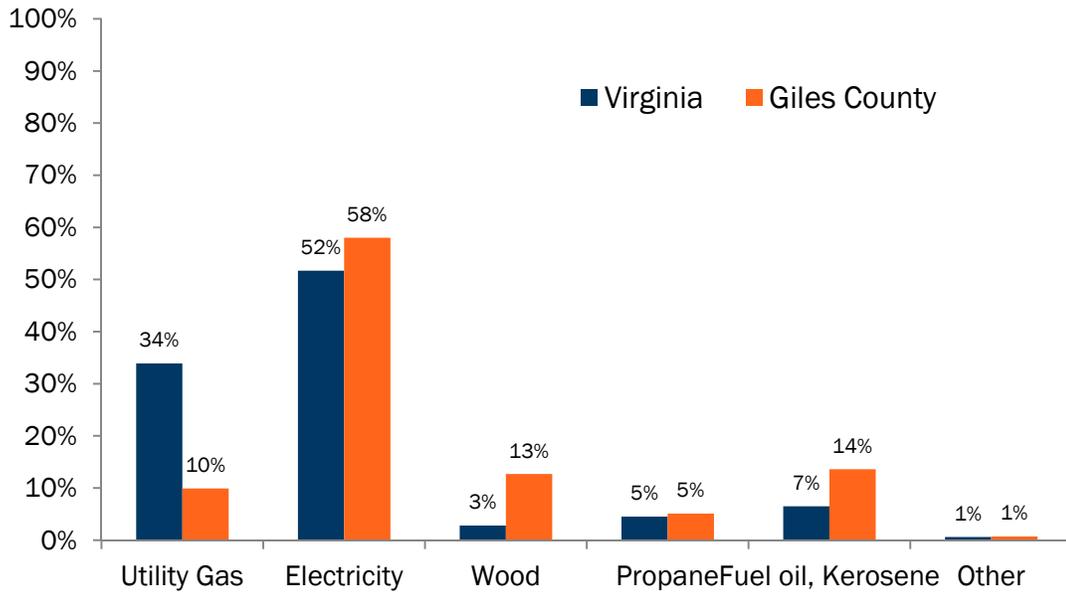
Table 13 – Giles County Total Wages by Sector – 2013 vs. Additional Jobs from MVP

Sector	2013 Total Wages	Share of Total Wages
Manufacturing	\$62,900,000	36.4%
Government	\$32,400,000	18.8%
Construction	\$18,300,000	10.6%
Commercial	\$58,900,000	34.1%
Arts, Entertainment, and Recreation	\$100,000	0.1%
Total	\$172,700,000	100%

Energy Profile

In the residential sector, approximately 58% of the 7,126 housing units in Giles County use electricity for home heating as shown in Figure 13, and 10% use natural gas. The remaining households use an almost equal mix of wood and fuel oil/kerosene.

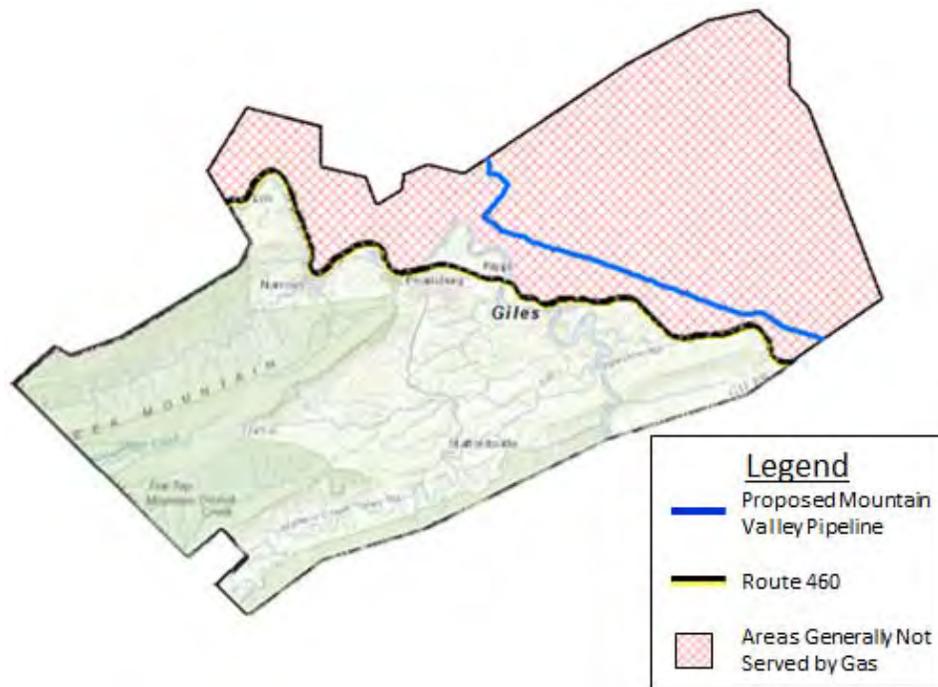
Figure 13 – Primary Space Heating Fuel Used in Giles County versus the Commonwealth, Percentage of Housing Units³⁰



Most of the consumers in Pearisburg and Narrows use gas and are serviced by Columbia Gas. However, these towns represent only 27% of the county households and commercial entities. Outside of these towns where the population density declines, residential and commercial consumers typically use electricity. Columbia Gas is the local distribution county (LDC) in Giles County with franchise rights. . We understand from interviews that the eastern portion of Giles County (east of the New River & Rt. 460) has no gas access as shown in Figure 14.

³⁰ 2013 US Census Bureau 5 Year American Community Survey.

Figure 14 – Portion of Giles County without Gas Access



In the manufacturing and electric sectors, there is a mix of fuel types used as shown in Table 14. The primary reliance on coal for some of its fuel has been due to economics associated with pipeline access, available capacity, and reliability.

Table 14 – Primary Fuel Consumed by Major Manufacturers in Giles County

Manufacturer	Fuel
Celanese	Coal, but switching to gas
LHoist	Coking Coal
Glen Lyn Power Plant	Coal, slated to be closed
Jennmar	Electricity
UFP Mid-Atlantic	Gas
GE Fairchild	Propane

For transportation fuels, county end-use sectors consume primarily refined oil products – diesel and gasoline – along with insignificant volumes of natural gas and biofuels.

3. Montgomery

Economic Profile

Montgomery County, VA is a 389 square-mile county located in Southwest Virginia with a population of 96,207. The county has a relatively strong economy. Its nominal GDP in 2013 was \$6.0 billion or \$62,366 per person.³¹ The real GDP grew by 1.4% from 2013 to 2014³² compared to the U.S. GDP real growth of 2.4%³³ during the same time period. Its 2014 unemployment rate of 5.2% is at the Virginia average and just the national average of 6.2%.

The county counted 2,105 employers in 2013 with total employment of 40,633 or 19 employees per employer.³⁴ Approximately 12% of the County residents work in manufacturing as shown in Table 15.

Blacksburg is the largest town with a population of 42,620 and is home to Virginia Polytechnic Institute and State University, better known as Virginia Tech. Virginia Tech is one of the nation's leading educational institutions and research universities. Blacksburg is also home to the Virginia Tech Corporate Research Center which is a research/business park that supports the region's high tech industries with over 140 high tech companies and research centers employing more than 2,000 people.³⁵

Table 15 – Employment in Montgomery County by Sector³⁶

Sector	Employment	Percent of Total Employment
Commercial	21,158	52.1%
Government	13,255	32.6%
Manufacturing	4,742	11.7%
Construction	1,077	2.7%
Other	401	1.0%
Total	40,633	100%

Manufacturing employs over 4,700 workers, representing 12% of the jobs in the county. Below are some of the largest manufacturers:

³¹ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

³² National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

³³ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xlsx.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

³⁴ Virginia Economic Development Partnership Report, Montgomery County Community Profile, page 4.

³⁵ Virginia Economic Development Partnership Report, Montgomery County Community Profile, page 3.

³⁶ Virginia Economic Development Partnership Report, Montgomery County Community Profile, page 22; FTI analysis.

- **Corning Glass Works:** A public company, located in Blacksburg, VA, that produces specialty glass, ceramics, and other materials used in the consumer electronics, telecommunications, transportation, and life sciences industries. The Blacksburg facility manufactures automotive ceramic substrates.
- **Federal Mogul Corp:** A publicly-traded company that creates products used in automotive, light commercial, heavy-duty and off-highway vehicles, as well as in power generation, aerospace, marine, rail and industrial. Located in Blacksburg, VA, it employs over 400 people.
- **Lexington Rowe Furniture Inc.:** An upscale furniture manufacturer located in Elliston, VA.
- **Moog, Inc.:** A public designer, manufacturer, and integrator of precision motion control products and systems, located in Blacksburg, VA. The Blacksburg location is specifically a design and manufacturing facility for motors, resolvers and fiber optic devices for military and aerospace markets and they also manufacture large slip rings for medical applications. Moog has 400,000 square feet in Montgomery County and relies primarily on electricity for processes.
- **New River Energetics:** Operated by Alliant Techsystems, and located in Radford, VA. This is a business involved in loading, assembling, and packing medium-caliber ammunition, as well as developing and producing commercial propellants. The company has 10 employees and \$1,000,000 in annual sales.
- **United Pet Group Inc.:** The aquatics division of United Pet Group is located in Blacksburg, VA. The company is a marketer and manufacturer of consumer and commercial aquatics products for the pet supplies industry.

Manufacturing jobs represent the highest wages among all job sectors in Montgomery County. As Table 16 shows, with an average of \$53,700 per year, manufacturing jobs are 33% higher than the average wage in the County.

Table 16 – Annual Average Wages in Montgomery County by Sector³⁷

Sector	Average Annual Wage
Manufacturing	\$53,700
Government	\$50,200
Construction	\$40,000
Commercial	\$31,500
Arts, Entertainment, and Recreation	\$11,900
Weighted Average	\$40,300

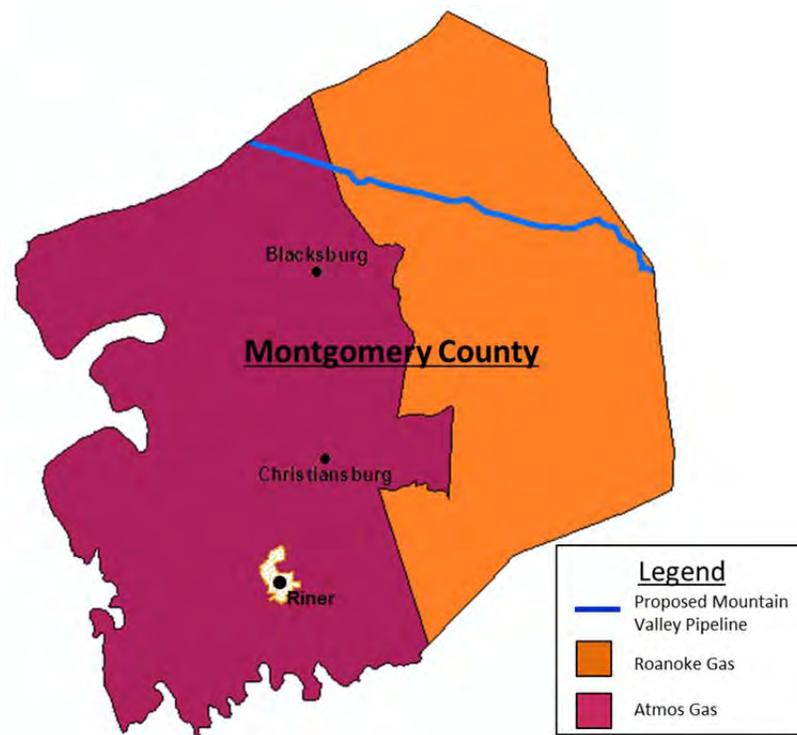
³⁷ Virginia Employment Commission Report, Montgomery County Community Profile, page 26; FTI analysis.

Furthermore, our analysis determined that energy-intensive manufacturers generally pay more than other manufacturing jobs. For example, in Giles County, where energy-intensive companies such as Celanese and LHoist are the top employers in the sector, average wages are more than \$60,000, which is 58% higher than the average wage in Montgomery County.

Energy Profile

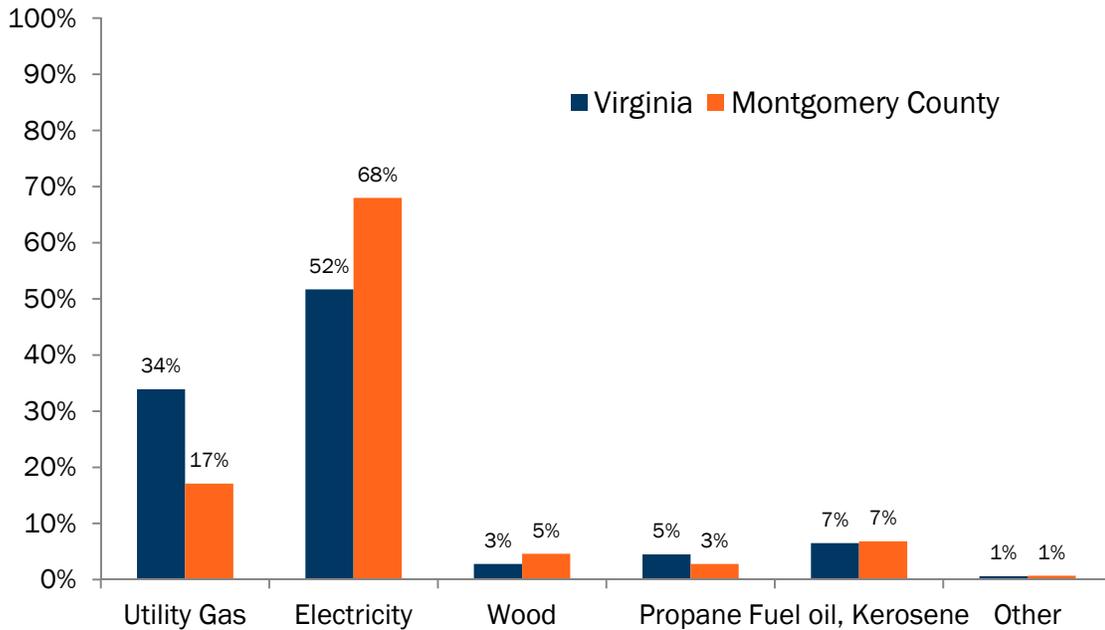
There is natural gas access in most of Montgomery County through Atmos in the western portion of the county and Roanoke Gas in the east as shown in Figure 15. One small area that is not served by natural gas is Riner, VA, which is south of Christiansburg.

Figure 15 – Natural Gas Service Territories in Montgomery County



A large portion of households (68%) use electricity as their primary fuel source for home heating as shown in Figure 16, and 17% use natural gas. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility.

Figure 16 – Primary Space Heating Fuel Used in Montgomery County versus the Commonwealth, Percentage of Housing Units³⁸



For the manufacturing sector, the primary fuel sources are natural gas and electricity.

4. Pittsylvania

Economic Profile

Pittsylvania County, VA is a 978 square-mile county located in the Piedmont region of Virginia with a population of 62,246. Its nominal GDP in 2014 was \$4.0 billion or \$64,000 per person. The real GDP declined by 2.3% from 2013 to 2014³⁹ compared to the U.S. GDP real growth of 2.4% during the same time period.⁴⁰ Its 2014 unemployment rate of 7.5% is above both the Virginia average of 5.2% and the national average of 6.2%.

The city of Danville, which is outside of the county, is located along the southern border of Pittsylvania. This economically diverse county has a substantial manufacturing and commercial base due to access to highway and rail transportation systems. Chatham is the largest town in Pittsylvania.

³⁸ 2013 US Census Bureau 5 Year American Community Survey.

³⁹ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁴⁰ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2Nd.xlsx” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

Pittsylvania County has a total employment of 11,824. The majority (47%) are workers in the commercial sector, followed by government (25%) and manufacturing (17%) as shown in Table 17. The county counted 1,223 employers in 2013 with an average employment of 9 employees per employer.⁴¹

Table 17 – Employment in Pittsylvania County by Sector

Sector	Employment	Percent of Total Employment
Commercial	5,510	46.6%
Government	2,979	25.2%
Manufacturing	2,020	17.1%
Construction	941	8.0%
Other	374	3.2%
Total	11,824	100%

Manufacturers in Pittsylvania County employ more than 2,000 people, which represent 17.1% of the total employment in the county. Manufacturers are primarily located around the Danville perimeter and in the Chatham area, and most have access to natural gas.

- **Amthor International:** A private company that manufactures tanks for fuel, propane, water and tank trucks. The company employees over 100 people in an 86,000 square foot facility located in Gretna, Virginia.
- **Elkay Wood Products Company:** Manufacturer of wood kitchen cabinets and countertops, which employs 500 employees at the Ringgold, Virginia location.
- **Owens Brockway Glass:** Creates glass contains for food, beer, wine, spirits and non-alcoholic beverage industries. Owens has locations in North American, Latin America, Europe, Asia and Australia. It also has a facility in Ringgold, Virginia.
- **Swedwood Danville LLC:** A furniture manufacturer which is a Swedish based subsidiary of IKEA. Production facility and local head office are located in Ringgold, Virginia, occupying one million square feet and employing 400 workers.

⁴¹ Virginia Employment Commission Report, Pittsylvania County Community Profile, page 22.

- **Times Fiber Communication:** A global manufacturer of high quality cables, fiber optic management equipment, and interconnect products for cable television, satellite, data, and powering applications for broadband communications networks. There is a facility located in Chatham, Virginia.
- **Unique Industries:** A wholesale supplier of party goods, located in Blairs, Virginia. Unique Industries employs over 350 associates in a 750,000 square foot facility. Facility uses natural gas.

Natural gas is important to retaining existing manufacturers and attracting new manufacturers to the county. Our interviews and analysis identified that manufacturers value abundant and reliable gas service and that access to natural gas is a primary criterion for determining where to locate new manufacturing facilities.

Manufacturing jobs represent the highest wages among all job sectors in Pittsylvania County. As Table 18 shows, with an average of \$43,700 per year, manufacturing jobs are 40% higher than the average wage in the County.

Table 18 – Annual Average Wages in Pittsylvania County by Sector⁴²

Sector	Average Annual Wage
Manufacturing	\$43,700
Government	\$35,600
Construction	\$29,600
Commercial	\$24,400
Arts, Entertainment, and Recreation	\$21,000
Weighted Average	\$31,400

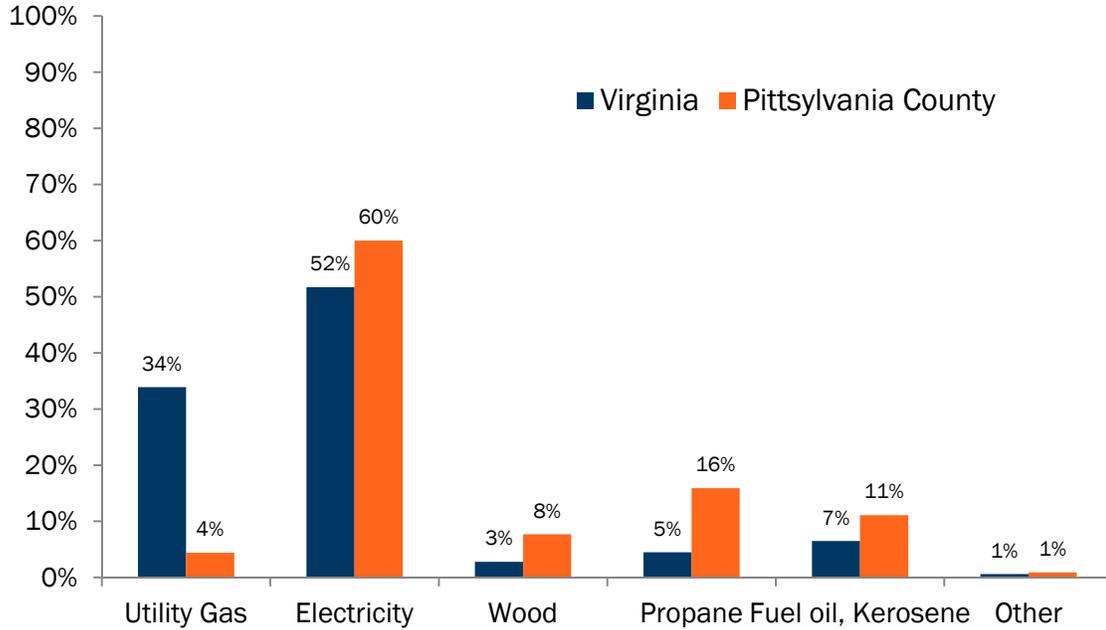
Energy Profile

The Williams Transco Pipeline cuts across the state and provides natural gas access to Chatham. Columbia Gas serves Hurt, which is a small town in the northern part of the county. Some areas bordering Danville, such as Ringgold, are served by the City of Danville. Most other towns, including Gretna, do not have natural gas service. As a result, large portion of households (60%) use

⁴² Virginia Employment Commission Report, Pittsylvania County Community Profile, page 26.

electricity as their primary fuel source for home heating as shown in Figure 16, and only 4% use natural gas.

Figure 17 – Primary Space Heating Fuel Used in Pittsylvania County versus the Commonwealth, Percentage of Housing Units⁴³



The majority of manufacturers use gas and electricity.

⁴³ 2013 US Census Bureau 5 Year American Community Survey.

5. Roanoke

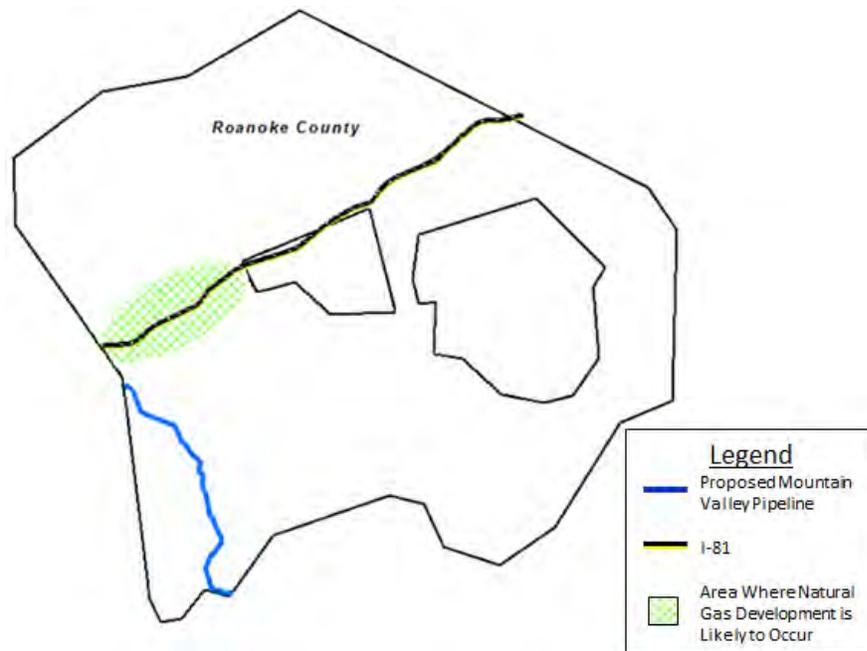
Economic Profile

Roanoke County, VA is a 251 square-mile county located in Southwest Virginia with a population of 93,524. It is the largest urban county in Virginia west of Richmond and the suburban hub of the Roanoke Valley. With I-81 running through Roanoke, the county has easy access to major markets along the east coast and is close to a number of major universities.

The county has a relatively strong economy. While its nominal GDP in 2014 was \$7.0 billion or \$75,000 per person, real GDP growth was only 0.8% from 2013 to 2014⁴⁴ compared to the U.S. real GDP growth of 2.4%.⁴⁵ The unemployment rate in Roanoke County is 5.0%, which is just below the Virginia average of 5.2% and below the national average of 6.2%.

There are two independent cities within the Roanoke County boundaries that are not part of the county – Roanoke and Salem. Parts of western Salem stretch into Roanoke County and form the Glenvar and Dixie Caverns areas, where there is significant commercial and manufacturing activity. According to the Roanoke County Department of Economic Development, much of the county’s industrial development likely will occur along I-81 in the Dixie Caverns and Glenvar areas as shown in Figure 18. This area is in need of additional gas infrastructure.

Figure 18 – Areas Where Natural Gas Development is Likely to Occur



⁴⁴ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

⁴⁵ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file “gdp2q15_2Nd.xlsx” Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

The county counted 2,269 employers in 2013 with total employment of 34,301 or 15.1 employees per employer.⁴⁶ Approximately 8.4% of County residents work in manufacturing as shown in Table 19. The Roanoke County School Board is the largest employer in the county.

Table 19 - Employment in Roanoke County by Sector⁴⁷

Sector	Employment	Percent of Total Employment
Commercial	24,764	72.2%
Government	4,997	14.6%
Manufacturing	2,892	8.4%
Construction	978	2.9%
Entertainment	447	1.3%
Other	223	0.7%
Total	34,301	100%

Manufacturers in Roanoke County employ approximately 2,900 people and represent 8% of the total employment in the county. Most of these manufacturers already have access to natural gas through Roanoke Gas. Below are some of the largest manufacturers in the county:

- **Americold:** Located in Glenvar. Americold provides temperature controlled warehousing and logistics with the largest network in the US.
- **Blue Ridge Beverage:** Located in Glenvar – one of five locations throughout Virginia. Blue Ridge Beverage is a wholesale beverage distributor. The Glenvar facility is 78,000 square feet.
- **Industrial Battery and Charger:** Located in Glenvar. Largest independent and family owned distributor of industrial batteries and chargers in the US. Operates 12 branch locations covering AL, FL, GA, KY, NC, SC, TN, VA, and DC.
- **New Millenium:** Located in Glenvar. Provides structural steel building solutions. 6 locations across the US including a manufacturing facility. Salem plant manufactures steel joists and metal decking.
- **Novozymes:** Located near Dixie Caverns in the Center for Research and Technology. Novozymes is a leader in innovation, provide biological solutions used in the production of

⁴⁶ Virginia Employment Commission Report, Roanoke County Community Profile, page 20.

⁴⁷ Virginia Employment Commission Report, Roanoke County Community Profile, page 22.

numerous products such as biofuel, detergents, feed, and crops. The Salem facility is one of 10 in the U.S. and 33 worldwide.

- **RR Donnelley:** Located in Glenvar. RR Donnelley provides printing services to clients around the world. The company employs over 57,000 worldwide and has \$10.5B in sales. This plant is currently a large electricity consumer.
- **Synchrony:** Headquartered in Glenvar. Manufactures many products including active magnetic bearings, high speed motors and generators, and power electronics for clean, efficient, and reliable rotating machinery. The Salem manufacturing facilities span 57,800 square feet.
- **Tecton:** Located near Dixie Caverns in the Center for Research and Technology. Tecton designs and manufactures fiberglass products for the construction industry. The Salem facility is 73,500 square feet on a 20 acre site.

Manufacturing jobs represent among the highest wages among all job sectors in Roanoke County. As Table 20 shows, with an average of \$46,020 per year, manufacturing jobs are 17% higher than the average wage in the county.

Table 20 - Annual Average Wages in Roanoke County by Sector⁴⁸

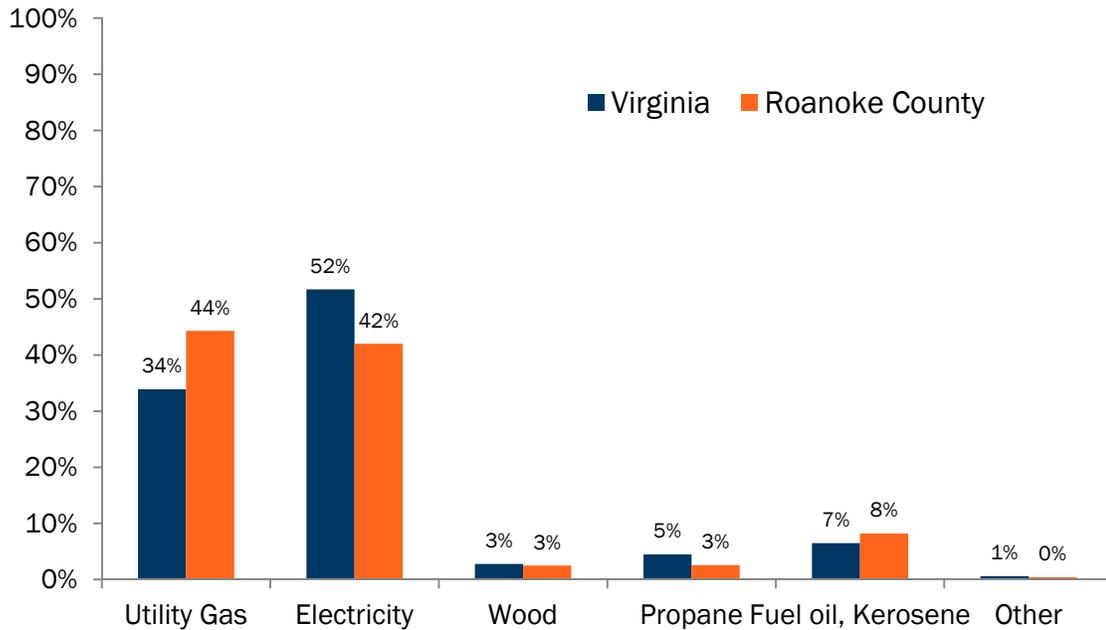
Sector	Average Annual Wage
Government	\$51,480
Manufacturing	\$46,020
Commercial	\$36,111
Construction	\$33,592
Entertainment	\$12,792
Weighted Average	\$39,234

Energy Profile

The residential, commercial, and municipal sectors in Roanoke County mainly use gas and electricity as their home heating fuel choice. As Figure 19 shows, the majority of households use natural gas as their primary fuel source for home heating. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility.

⁴⁸ Virginia Employment Commission Report, Roanoke County Community Profile, page 26.

Figure 19 – Primary Space Heating Fuel Used in Roanoke County versus the Commonwealth, Percentage of Housing Units⁴⁹



Based on our interviews, we found that the majority of manufacturers use gas and electricity to drive their processes. This preference for gas over other fuels typically is due to accessibility of gas relative to where manufacturers are located in the county along with the cost of gas. It is worth noting that a significant amount of manufacturing electricity consumption could be transferred to on-site, distributed generation if the economics and load profile of the consumption are amenable.

For transportation fuels, we found that traditional oil-refined fuels – gasoline and diesel – represent the vast majority of fuel consumption. Alternative transportation fuels, such as compressed natural gas, could be a substitute, especially for fleet vehicles.

6. Craig

Craig County is a 331 square-mile county located in Southwest Virginia with a population of 5,210. This sparsely-populated county had a nominal GDP in 2014 of \$85.5 million or \$16,411 per person. The real GDP declined slightly by 0.3% from 2013 to 2014⁵⁰ compared to the U.S. GDP growth of

⁴⁹ 2013 US Census Bureau 5 Year American Community Survey.

⁵⁰ National Association of Counties. <http://www.uscounties.org/countyTracker/index.html>

2.4% during the same time period.⁵¹ Its 2014 unemployment rate of 6.3% is above the Virginia average of 5.2%, and only slightly above the national average of 6.2%.

Craig is a rural county, with Jefferson National Forest and Niday State Park covering nearly two-thirds of the county. The county has not stop lights and is criss-crossed by Virginia Scenic Byways.⁵² New Castle, the county seat, is the only town in the county. It has a population of only 153.

As shown in Table 11, Craig County had 674 employees in 2013 and no manufacturing sector.⁵³ A large portion of the county employment is in the commercial and government sectors (82%). The Craig County Public School system is the largest employer. Many of Craig's residents commute into nearby Roanoke.

Table 21 – Employment in Craig County by Sector

Sector	Employment	Percent of Total Employment
Commercial	294	44%
Government	258	38%
Construction	16	2%
Manufacturing	0	0%
Other	106	16%
Total	674	100%

The average annual Craig County wage across all sectors in 2013 was \$30,024 as shown in Table 12. Government is the only sector that earns wages above the county average.

⁵¹ <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>; file "gdp2q15_2nd.xlsx" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

⁵² <http://craigcountyva.gov/about/>

⁵³ Virginia Employment Commission Report, Craig County Community Profile, page 20.

Table 22 – Annual Average Wages in Craig County by Sector⁵⁴

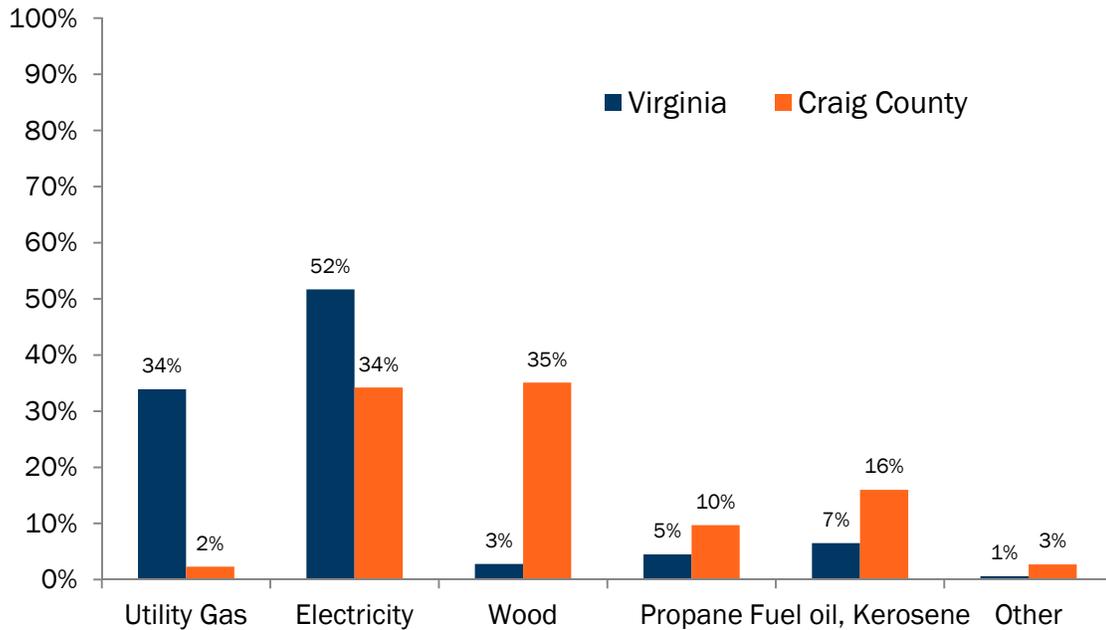
Sector	Average Annual Wage
Government	\$39,156
Commercial	\$27,079
Construction	\$20,384
Other	\$17,420
Weighted Average	\$30,024

Energy Profile

Craig County generally has no natural gas access. As Figure 13 shows, the majority of the county’s households use wood (35%), electricity (34%), and delivered petroleum-based fuels (26%) for home heating. The commercial and municipal sectors consume mainly electricity and petroleum-based fuels for space heating purposes.

⁵⁴ Virginia Employment Commission Report, Craig County Community Profile, page 26.

Figure 20 – Primary Space Heating Fuel Used in Craig County versus the Commonwealth, Percentage of Housing Units⁵⁵



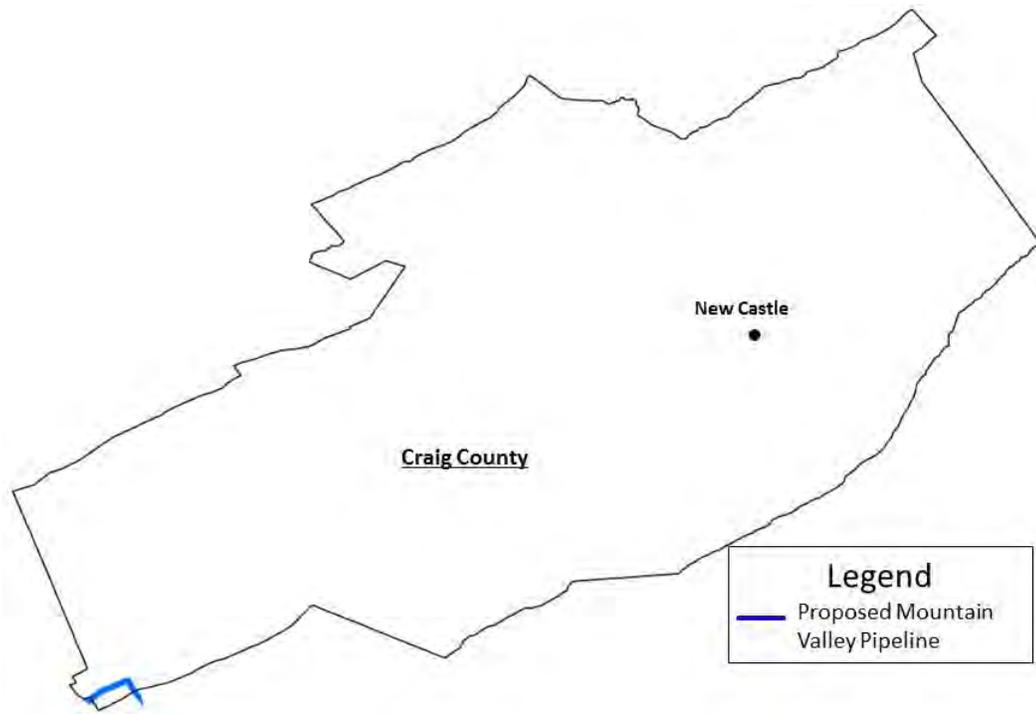
The MVP project would clip the southwestern corner of the Craig County with a 1.8 mile segment (Figure 21). The Town of New Castle, which would be 9 to 14 miles from the planned route, is not served by natural gas. The MVP project could create a savings opportunity for consumers if they were to switch to natural gas. Delivered natural gas prices in 2014 in Virginia were 65% less than the cost of average residential electricity prices in Craig County.

While there currently is no manufacturing activity in Craig County, the MVP project could help attract new manufacturers to the county as it would provide access to a supply of affordable fuel. The benefits of manufacturing to an economy are clear. In neighboring Giles County, the manufacturing sector employs over 1,000 people, accounting for \$63 million in annual wages or \$63,000 in average annual wages per employee.

Fuel switching in municipal and private vehicle fleets presents a possible savings opportunity, but only if a refueling station was shared with Roanoke County along I-81. There are about 15 potential county vehicles, which if converted from gasoline and diesel, would yield about \$60,000 in annual county savings.

Figure 21 – Proposed Route of MVP Pipeline in Craig County

⁵⁵ 2013 US Census Bureau 5 Year American Community Survey.





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AT THE CRITICAL TIME™**

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FTI Consulting, Inc. is a global business advisory firm dedicated to helping organizations protect and enhance enterprise value in an increasingly complex legal, regulatory and economic environment. FTI Consulting professionals, who are located in all major business centers throughout the world, work closely with clients to anticipate, illuminate and overcome complex business challenges in areas such as investigations, litigation, mergers and acquisitions, regulatory issues, reputation management and restructuring.

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Attachment E

**ASSISTANT SECRETARY'S CERTIFICATE
EQM GATHERING OPCO, LLC**

March 2, 2017

The undersigned, Tobin M. Nelson, does hereby certify that he is the duly elected, qualified and acting Assistant Secretary of EQM Gathering Opco, LLC, a Delaware limited liability company (the "Operator"), the duly appointed operator of Mountain Valley Pipeline, LLC, a Delaware limited liability company (the "Company"), pursuant to the terms of that certain Amended and Restated Construction, Operation and Management Agreement, dated as of June 16, 2015, by and between the Operator and the Company (the "COM Agreement"). The undersigned further certifies on behalf of the Company, by and through the Operator, as the operator of the Company, that:

1. Attached hereto as **Exhibit A** is a true and correct copy of the Amended and Restated Certificate of Formation of the Company as in full force and effect on the date hereof.

2. Attached hereto as **Exhibit B** are true and correct copies of (i) the Second Amended and Restated Limited Liability Company Agreement of the Company, dated as of March 10, 2015, (ii) the First Amendment to the Second Amended and Restated Limited Liability Company Agreement of the Company, dated as of January 21, 2016, and (iii) the Second Amendment to the Second Amended and Restated Limited Liability Company Agreement of the Company, dated as of October 24, 2016, in each case as filed by EQT Midstream Partners, LP with the U.S. Securities and Exchange Commission (the "SEC") in redacted form pursuant to confidential treatment requests granted by the SEC.

3. Attached hereto as **Exhibit C** is a true and correct copy of a certificate of good standing for the Company issued by the Secretary of State of the State of Delaware on February 28, 2017.

4. Attached hereto as **Exhibit D** are true and correct copies of resolutions duly adopted by the Management Committee of the Company as of March 2, 2017; such resolutions have not been amended, modified or rescinded and remain in full force and effect.

5. All of the information contained in this Assistant Secretary's Certificate is true, correct and complete on and as of the date first above written.

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IN WITNESS WHEREOF, this Assistant Secretary's Certificate is executed by the undersigned as of the date first above written.

By: 
Name: Tobin M. Nelson
Title: Assistant Secretary

EXHIBIT A

Certificate of Formation

[Attached]

Delaware

PAGE 1

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE RESTATED CERTIFICATE OF "MOUNTAIN VALLEY PIPELINE, LLC", FILED IN THIS OFFICE ON THE ELEVENTH DAY OF MARCH, A.D. 2015, AT 3:54 O'CLOCK P.M.

5580929 8100

150343690

You may verify this certificate online
at corp.delaware.gov/authver.shtml




Jeffrey W. Bullock, Secretary of State
AUTHENTICATION: 2192170

DATE: 03-12-15

**AMENDED AND RESTATED
CERTIFICATE OF FORMATION
OF
MOUNTAIN VALLEY PIPELINE, LLC**

The undersigned, being authorized to execute and file this Certificate, hereby certifies that:

- FIRST:** The name of the limited liability company (hereafter referred to as the "Company") is Mountain Valley Pipeline, LLC.
- SECOND:** The address of the registered office of the Company is: Corporate Trust Center, 1209 Orange Street, in the City of Wilmington, County of New Castle, State of Delaware. The name of the registered agent at such address is The Corporation Trust Company.
- THIRD:** The Company is organized for the bona fide purpose of operating as a natural gas company as defined in 15 U.S.C. §717(a), and for any other lawful business, purpose or activity in accordance with Section 18-106 of the Limited Liability Company Act of the State of Delaware.

IN WITNESS WHEREOF, the undersigned has executed this Certificate this 10th day of March, 2015.


Jonathan M. Lushko, Authorized Person

EXHIBIT B

Limited Liability Company Agreement

[Attached]

EX-10.1 2 a15-8244_1ex10d1.htm EX-10.1

Exhibit 10.1

*Portions of this Exhibit have been redacted pursuant to a request for confidential treatment under Rule 24b-2 of the General Rules and Regulations under the Securities Exchange Act. Omitted information marked "[***]" in this Exhibit has been filed with the Securities and Exchange Commission together with such request for confidential treatment.*

EXECUTION VERSION

**SECOND AMENDED AND RESTATED
LIMITED LIABILITY COMPANY AGREEMENT
OF
MOUNTAIN VALLEY PIPELINE, LLC
A Delaware Limited Liability Company**

March 10, 2015

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A – Members

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SECOND AMENDED AND RESTATED LIMITED LIABILITY COMPANY AGREEMENT OF MOUNTAIN VALLEY PIPELINE, LLC

This SECOND AMENDED AND RESTATED LIMITED LIABILITY COMPANY AGREEMENT OF MOUNTAIN VALLEY PIPELINE, LLC (this “*Agreement*”), dated as of March 10, 2015 (the “*Effective Date*”), is adopted, executed and agreed to by MVP Holdco, LLC, a Delaware limited liability company (“*EQT*”), US Marcellus Gas Infrastructure, LLC, a Delaware limited liability company (“*USG*”), Vega Midstream MVP LLC, a Delaware limited liability company (“*Vega*”), VED NPI IV, LLC, a Delaware limited liability company (“*Vega Carryco*”), WGL Midstream, Inc., a Delaware corporation (“*WGL*”), and Mountain Valley Pipeline, LLC, a Delaware limited liability company (the “*Company*”) and each Person from time to time admitted to the Company as a Member in accordance with the terms hereof.

RECITALS

WHEREAS, on August 22, 2014, the Company was formed as a “series” limited liability company upon the filing of the Delaware Certificate (as hereinafter defined) in accordance with the Act (as hereinafter defined) for the purpose of developing, constructing, owning, and operating an interstate natural gas pipeline and related facilities and EQT, as the Company’s initial member, entered into a written agreement governing the affairs of the Company and the conduct of its business (the “*Initial Agreement*”);

WHEREAS, on August 28, 2014, EQT, USG and the Company entered into that certain First Amended and Restated Limited Liability Company Agreement of the Company (the “*First Amended and Restated Agreement*”) to make certain provisions regarding the affairs of the Company and the conduct of its business and the rights and obligations of the Members on the terms and subject to the conditions set forth therein;

WHEREAS, on December 22, 2014, the Delaware Certificate was amended to specify that the Company was organized for the bona fide purpose of operating as a natural gas company as defined in 15 U.S.C. Section 717(a) and for any other lawful business, purpose or activity under the Act;

WHEREAS, on or about March 10, 2015, the Delaware Certificate was amended and restated in order to remove the provision that the Company was formed as a “series” limited liability company in accordance with the Act; and

WHEREAS, the Members desire to amend and restate the First Amended and Restated Agreement to admit Vega, Vega Carryco and WGL as Members and to make certain additional provisions regarding the affairs of the Company and the conduct of its business and the rights and obligations of the Members on the terms and subject to the conditions set forth herein.

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Members and the Company agree as follows:

ARTICLE 1 DEFINITIONS

1.01 Definitions. As used in this Agreement, the following terms have the respective meanings set forth below or set forth in the Sections referred to below:

708(b) Members – has the meaning set forth in Section 3.03(b)(viii).

AAA – has the meaning set forth in Section 11.05(a).

Act – means the Delaware Limited Liability Company Act.

Additional Contribution/Loan – has the meaning set forth in Section 4.06(a)(ii).

Additional Contribution/Loan Members – has the meaning set forth in Section 4.06(a)(ii).

Adjusted Capital Account – means the Capital Account maintained for each Member as provided in Section 4.05, (a) increased by (i) an amount equal to such Member’s allocable share of Minimum Gain as computed in accordance with the applicable Treasury Regulations, and (ii) the amount that such Member is deemed to be obligated to restore pursuant to Treasury Regulations Section 1.704-1(b)(2)(ii)(c), if any, and (b) reduced by the adjustments provided for in Treasury Regulation Section 1.704-1(b)(2)(ii)(d)(4)-(6). The foregoing definition of Adjusted Capital Account is intended to comply with the provisions of Treasury Regulations Section 1.704-1(b)(2)(ii)(d) and shall be interpreted consistently therewith.

Affiliate – means, (i) with respect to any Person, (a) each entity that such Person Controls; (b) each Person that Controls such Person, including, in the case of a Member, such Member’s Parent; and (c) each entity that is under common Control with such Person, including, in the case of a Member, each entity that is Controlled by such Member’s Parent; provided that, with respect to any Member, an Affiliate shall include (y) a limited partnership or a Person Controlled by a limited partnership if such Member’s Parent has the power to appoint the general partner of such limited partnership, or such general partner is otherwise is Controlled by such Member’s Parent, or (z) a limited liability company or a Person controlled by a limited liability company if such Member’s Parent has the power to appoint the managing member or manager (or, if more than one manager, a majority of managers) of the limited liability company, or such managing member or manager(s) are Controlled by such Member’s Parent; provided, further, that, for purposes of this Agreement, the Company shall not be an Affiliate of any Member; and (ii) specifically with respect to EQT, (a) EQT Corporation, a Pennsylvania corporation, and those Persons referred to in clause (i) hereof with respect to EQT Corporation and (b) EQM and those Persons referred to in clause (i) hereof with respect to EQM.

Affiliate's Outside Activities – has the meaning set forth in Section 6.05(a).

Agreement – has the meaning set forth in the Preamble.

Allocated Income – has the meaning set forth in Section 5.08.

Alternate Representative – has the meaning set forth in Section 6.02(a)(i).

Appraiser – has the meaning set forth in Section 13.11(c).

Approved Precedent Agreement – means each Precedent Agreement approved by the Management Committee pursuant to Section 6.02(i)(S).

Arbitration – has the meaning set forth in Section 11.05(a).

Arbitration Invoking Party – has the meaning set forth in Section 11.05(b).

Arbitration Notice – has the meaning set forth in Section 11.05(b).

Arbitration Noticed Party – has the meaning set forth in Section 11.05(b).

Assignee – means any Person that acquires a Membership Interest or any portion thereof through a Disposition; provided that an Assignee shall have no right to be admitted to the Company as a Member except in accordance with Section 3.03(b)(iii). Subject to the Preferential Rights set forth in Section 3.03(b)(ii), the Assignee of a dissolved Member is the shareholder, partner, member or other equity owner or owners of the dissolved Member to whom such Member's Membership Interest is assigned by the Person conducting the liquidation or winding-up of such Member. The Assignee of a Bankrupt Member is (a) the Person or Persons (if any) to whom such Bankrupt Member's Membership Interest is assigned by order of the bankruptcy court or other Governmental Authority having jurisdiction over such Bankruptcy, or (b) in the event of a general assignment for the benefit of creditors, the creditor to which such Membership Interest is assigned.

Authorizations – means licenses, certificates, permits, orders, approvals, determinations and authorizations from Governmental Authorities having valid jurisdiction.

Available Cash – means, with respect to any Quarter ending prior to the dissolution or liquidation of the Company, and without duplication:

(a) the sum of all cash and cash equivalents of the Company on hand at the end of such Quarter (excluding any Capital Contributions received from the Members), less

(b) the amount of any cash reserves that is necessary or appropriate in the reasonable discretion of the Management Committee to (i) provide for the proper conduct of the business of the Company (including reserves for future maintenance capital expenditures and for anticipated future credit needs of the Company) [***] or (ii) comply with applicable law or any loan agreement, security agreement, mortgage, debt instrument or other agreement or obligation to which the Company is a party or by which it is bound or its assets are subject.

Notwithstanding the foregoing, "Available Cash" with respect to the Quarter in which a liquidation or dissolution of the Company occurs and any subsequent Quarter shall be deemed to equal zero.

Bankruptcy or Bankrupt – means, with respect to any Person, that (a) such Person (i) makes a general assignment for the benefit of creditors; (ii) files a voluntary bankruptcy petition; (iii) becomes the subject of an order for relief or is declared insolvent in any federal or state bankruptcy or insolvency proceedings; (iv) files a petition or answer seeking for such Person a reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any Law; (v) files an answer or other pleading admitting or failing to contest the material allegations of a petition filed against such Person in a proceeding of the type described in subclauses (i) through (iv) of this clause (a); or (vi) seeks, consents to, or acquiesces in the appointment of a trustee, receiver, or liquidator of such Person or of all or any substantial part of such Person’s properties; or (b) against such Person, a proceeding seeking reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any Law has been commenced and 120 Days have expired without dismissal thereof or with respect to which, without such Person’s consent or acquiescence, a trustee, receiver, or liquidator of such Person or of all or any substantial part of such Person’s properties has been appointed and 90 Days have expired without the appointment’s having been vacated or stayed, or 90 Days have expired after the date of expiration of a stay, if the appointment has not previously been vacated.

Book Depreciation – means, with respect to any Company asset for each fiscal year or other period, an amount equal to the depreciation, amortization or other cost recovery deduction allowable with respect to such asset for such year or other period for federal income tax purposes, except that if the Book Value of an asset differs from its adjusted basis for federal income tax purposes at the beginning of such year or other period, Book Depreciation shall be an amount which bears the same ratio to such beginning Book Value as the federal income tax depreciation, amortization or other cost recovery deduction for such year or other period bears to such beginning adjusted tax basis; provided, however, that, if the adjusted tax basis of the asset is zero, Book Depreciation shall be determined under any reasonable method selected by the Management Committee, and; provided, further, if such asset is subject to adjustments under the remedial allocation method of Treasury Regulations Section 1.704-3(d), Book Depreciation shall be determined under Treasury Regulation Section 1.704-3(d)(2).

Book Value – means, with respect to any Company asset, such asset’s adjusted basis for U.S. federal income tax purposes, except as follows:

- (a) the initial Book Value of any asset contributed by a Member to the Company shall be the net agreed gross fair market value of such asset;
- (b) the respective Book Values of all Company assets shall be adjusted to equal their gross fair market values, as determined pursuant to Section 4.05(b), as of the time of any Revaluation Event;
- (c) the Book Value of any Company asset distributed to any Member shall be the net agreed gross fair market value of such asset on the date of distribution;
- (d) the Book Values of Company assets shall be increased (or decreased) to reflect any adjustments to the adjusted basis of such assets pursuant to Section 734(b) or Section 743(b) of the Internal Revenue Code, but only to the extent that such adjustments are taken into account in determining Capital Accounts pursuant to Treasury Regulations Section 1.704-

1(b)(2)(iv)(m); provided, however, that Book Values shall not be adjusted pursuant to this subsection (d) to the extent an adjustment occurs pursuant to subsection (b) as a result of a Revaluation Event in connection with a

transaction that would otherwise result in an adjustment pursuant to this subsection (d); and

(e) if the Book Value of an asset has been determined or adjusted pursuant to subsections (a), (b) or (d) above, such Book Value shall thereafter be adjusted by the Book Depreciation taken into account with respect to such asset for purposes of computing Net Profit and Net Loss (rather than by the depreciation, amortization or other cost recovery deduction computed for federal income tax purposes).

Breaching Member – means a Member that, as of any date, (a) has committed a failure or breach of the type described in the definition of “Default,” (b) has received a written notice with respect to such failure or breach of the type described in such definition of “Default,” and (c) has not cured such failure or breach as of the applicable cure period set forth in such definition of “Default.”

Business Day – means any day other than a Saturday, a Sunday, or a holiday on which national banking associations in the State of Delaware are closed.

[***]

Capital Account – means the account maintained by the Company for each Member in accordance with Section 4.05.

Capital Budget – means (a) the Construction Budget, (b) the capital budget associated with the Facilities covered by any Approved Precedent Agreement, and (c) the annual capital budget for the Company that is approved (or deemed approved) pursuant to Section 6.02(i)(GG). Each Capital Budget shall cover all items that are classified as capital items under Required Accounting Practices.

Capital Call – has the meaning set forth in Section 4.01(a)(i).

Capital Contribution – means, with respect to a Member, the amount of money and the net agreed fair market value of any property (other than money) contributed to the Company by the Member. Any reference in this Agreement to the Capital Contribution of a Member shall include a Capital Contribution of its predecessors in interest.

Certified Public Accountants – means a nationally recognized independent public accounting firm selected from time to time by the Management Committee.

Change of Control – means:

(a) with respect to any Member, the sale of substantially all of the assets of such Member or an event (such as a Disposition of voting securities or other equity interests of such Member) that causes such Member to cease to be Controlled by such Member’s then Parent; provided that the term “Change of Control” shall not include any of the following events:

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(A) with respect to a Founding Member, an event that causes such Member’s then Parent to be Controlled by another Person;

(B) a Disposition of the Membership Interests held by, or the equity or assets of, such Member to an Affiliate of such Member or such Member’s then Parent, or any other event, including any corporate reorganization, merger, combination or similar transaction, that results in such Member being Controlled by an Affiliate of such

Member's then Parent, including, in each case, a Disposition to a limited partnership whose general partner is Controlled by an Affiliate of such Member or its then Parent;

(C) in the case of a Member that is a publicly traded partnership or is Controlled by a publicly traded partnership, any Disposition of units or issuance of new units representing limited partner interests by such publicly traded partnership, whether to an Affiliate or an unrelated party and whether or not such units or interests are listed on a national securities exchange or quotation service so long as the general partner of such publicly traded partnership is Controlled by an Affiliate of such Member or its Parent; and

(D) [***];

(b) prior to and following the In-Service Date, with respect to the Operator, an event (such as a Disposition of voting securities or other equity interests of substantially all the assets of the Operator) that causes, directly or indirectly, the Operator to be Controlled by another Person, subject to Section 3.03(b)(vi)(D). With respect to the Operator, "Change of Control" shall not include an event (i) that causes the Operator to be Controlled by an Affiliate of the Operator or an Affiliate of the Operator's then Parent or (ii) that causes the Parent of the Operator to be Controlled by another Person so long as with respect to clause (ii) above the Management Committee determines [***] that, after giving effect to such event, the Operator has the experience, safety record, creditworthiness, and financial wherewithal generally acceptable within the midstream natural gas industry and is and will be able to perform its obligations under the COM Agreement; and

(c) Notwithstanding the foregoing, and for the avoidance of doubt, any event that (i) constitutes a Change of Control under clause (a) of this definition of Change of Control or (ii) is expressly excluded from this definition of Change of Control pursuant to clauses (a)(A), (a)(B), (a)(C) or (a)(D) above shall not be deemed a Disposition for purposes of Section 3.03 of this Agreement, other than for purposes of Section 3.03(b)(iv); provided, however, that Dispositions or issuances described in clause (a)(C) shall not be deemed a Disposition for purposes of Section 3.03(b)(iv).

Change Exercise Notice – has the meaning set forth in Section 3.03(b)(vi)(A).

Change Purchasing Member – has the meaning set forth in Section 3.03(b)(vi)(A).

Change Unexercised Portion – has the meaning set forth in Section 3.03(b)(vi)(A).

Changing Member – has the meaning set forth in Section 3.03(b)(vi)(A).

Claim – means any and all judgments, claims, causes of action, demands, lawsuits, suits, proceedings, Governmental investigations or audits, losses, assessments, fines, penalties, administrative orders, obligations, costs, expenses, liabilities and damages (whether actual, consequential or punitive), including interest, penalties, reasonable attorney's fees, disbursements and costs of investigations, deficiencies, levies, duties, imposts, remediation and cleanup costs, and natural resources damages.

Code – means the Internal Revenue Code of 1986, as amended.

COM Agreement – has the meaning set forth in Section 6.03.

COM Approval Matters – means all matters requiring the approval of the Company or providing for the exercise of rights by the Company, including, without limitation, those set forth in Sections 3.1, 3.2, 3.4,

3.5, 3.6, 4.2, 4.4, 5.1, 5.2, 7.1(b), 7.2, 8.2, and 8.3, Article 9, Sections 13.2 and 13.4, Article 15, Article 17, Section 18.6 and 18.9, Exhibit A, and Exhibit B of the COM Agreement.

Comment Deadline – has the meaning set forth in Section 6.09.

Company – has the meaning set forth in the Preamble.

Confidential Information – means all information and data (including all copies thereof) that is furnished or submitted by any of the Members, their Affiliates, or Operator, whether oral, written, or electronic, to the other Members, their Affiliates, or Operator in connection with the Facilities and the resulting information and data obtained from those studies, including market evaluations, market proposals, service designs and pricing, pipeline system design and routing, cost estimating, rate studies, identification of permits, strategic plans, legal documents, environmental studies and requirements, public and governmental relations planning, identification of regulatory issues and development of related strategies, legal analysis and documentation, financial planning, gas reserves and deliverability data, studies of the natural gas supplies for the Facilities, and other studies and activities to determine the potential viability of the Facilities and their design characteristics, and identification of key issues. Notwithstanding the foregoing, the term “Confidential Information” shall not include any information that:

(a) is in the public domain at the time of its disclosure or thereafter, other than as a result of a disclosure directly or indirectly by a Member or its Affiliates in contravention of this Agreement;

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(b) as to any Member or its Affiliates, was in the possession of such Member or its Affiliates prior to the execution of this Agreement and not subject to a separate confidentiality restriction;

(c) has been independently acquired or developed by a Member or its Affiliates without violating any of the obligations of such Member or its Affiliates under this Agreement; or

(d) is received from a third-party source on a non-confidential basis, provided that such third-party source is not subject to an obligation of confidentiality and would not reasonably have been expected to know that the information was to be kept confidential from the applicable party.

Construction Budget – means the capital budget covering the design, engineering, procurement, construction and installation of the Facilities through the In-Service Date, as approved by the Management Committee on February 11, 2015, as may be amended from time to time.

Contributing/Loan Member – has the meaning set forth in Section 4.06(a).

Control, Controls or Controlled – means the possession, directly or indirectly, through one or more intermediaries, of the following:

(a) (i) in the case of a corporation, 50% or more of the outstanding voting securities thereof; (ii) in the case of a limited liability company, general partnership or venture, the right to 50% or more of the distributions therefrom (including liquidating distributions); (iii) in the case of a trust or estate, including a statutory trust, 50% or more of the beneficial interest therein; (iv) in the case of a limited partnership (A) the right to 50% or more of the distributions therefrom (including liquidating distributions), (B) where the general partner of such limited partnership is a corporation, ownership of 50% or more of the outstanding voting securities of such corporate general partner, (C) where the general

partner of such limited partnership is a partnership, limited liability company or other entity (other than a corporation or limited partnership), the right to 50% or more of the distributions (including liquidating distributions) from such general partner entity, or (D) where the general partner of such limited partnership is a limited partnership, Control of the general partner of such general partner in the manner described under subclause (B) or (C) of this clause, or (v) in the case of any other entity, 50% or more of the economic or beneficial interest therein; or

(b) in the case of any entity, the power or authority, through ownership of voting securities, by contract or otherwise, to exercise predominant control over the management of the entity.

Control Notice – has the meaning set forth in Section 3.03(b)(vi)(A).

Covered Person – has the meaning set forth in Section 6.07(a).

Credit Assurance – has the meaning set forth in Section 4.07(a).

Day – means a calendar day, provided that if any period of Days referred to in this Agreement shall end on a Day that is not a Business Day, then the expiration of such period shall be automatically extended until the end of the next occurring Business Day.

Deadlock – has the meaning set forth in Section 11.01.

December Deadline – has the meaning set forth in Section 6.09.

Default – means, with respect to any Member:

(a) the failure of such Member to contribute, within [***] Days of the date required pursuant to Section 4.06, all or any portion of a Capital Contribution that such Member is required to make as provided in this Agreement; or

(b) the failure of a Member to comply in any material respect with any of its other agreements, covenants or obligations under this Agreement, or the failure of any representation or warranty made by a Member in this Agreement to have been true and correct in all material respects at the time it was made;

in the case of each of clause (a) and (b) above if such breach is not cured by the applicable Member within [***] Days of its receiving written notice of such breach from any other Member (or, if a breach of clause (b) is not capable of being cured within such [***]-Day period, if such Member fails to promptly commence substantial efforts to cure such breach or to prosecute such curative efforts to completion with continuity and diligence). The Management Committee may, but shall have no obligation to, extend the foregoing [***]-Day and [***]-Day periods, as determined in its Sole Discretion.

Default Rate – means a rate per annum equal to the lesser of (a) a varying rate per annum equal to the sum of (i) the prime rate as published in *The Wall Street Journal*, with adjustments in that varying rate to be made on the same date as any change in that rate is so published, plus (ii) [***]% per annum, and (b) the maximum rate permitted by Law.

Delaware Certificate – means the Certificate of Formation of the Company that was filed with the Office of the Secretary of State of Delaware on August 22, 2014, as amended on December 22, 2014, as amended and restated on or about March 10, 2015, and as may be further amended from time to time.

Delaware Courts – has the meaning set forth in Section 11.03.

Demand Event – has the meaning set forth in Section 4.07(b).

Diluted Member – has the meaning set forth in Section 3.02(b)(ii)(B).

Dispose, Disposing, or Disposition – means, with respect to any asset (including a Membership Interest or any portion thereof), a sale, assignment, transfer, conveyance, gift, exchange or other disposition of such asset, whether such disposition be voluntary, involuntary or by operation of Law (and, with respect to a Membership Interest, any derivative or similar arrangement whereby a portion or all of the economic interests in, or risk of loss or opportunity

for gain with respect to, such Membership Interest is transferred or shifted to another Person), including the following: (a) in the case of an asset owned by a natural person, a transfer of such asset upon the death of its owner, whether by will, intestate succession or otherwise; (b) in the case of an asset owned by an entity, (i) a merger or consolidation of such entity (other than where such entity is the survivor thereof) or (ii) a distribution of such asset by such entity to its shareholders, partners, members, or other equity owners, including in connection with the dissolution, liquidation, winding-up or termination of such entity (unless, in the case of dissolution, such entity's business is continued without the commencement of liquidation or winding-up); and (c) a disposition in connection with, or in lieu of, a foreclosure of an Encumbrance; but such terms shall not include the creation of an Encumbrance.

Disposing Member – has the meaning set forth in Section 3.03(b)(ii)(A).

Disposition Notice – has the meaning set forth in Section 3.03(b)(ii)(A).

Dispute – has the meaning set forth in Section 11.01.

Disputing Member – has the meaning set forth in Section 11.01.

Dissolution Event – has the meaning set forth in Section 12.01(b).

Distribution Shortfall – has the meaning set forth in Section 5.08.

Economic Risk of Loss – has the meaning assigned to that term in Treasury Regulation Section 1.752-2(a).

Effective Date – has the meaning set forth in the Preamble.

Encumber, Encumbering, or Encumbrance – means the creation of a security interest, lien, pledge, mortgage or other encumbrance, other than a Permitted Encumbrance, whether such encumbrance be voluntary, involuntary or by operation of Law.

EQM – means EQT Midstream Partners, LP, a Delaware limited partnership.

EQT – has the meaning set forth in the Preamble, or any permitted transferee of any of EQT's Membership Interest pursuant to Article III of this Agreement..

[***]

Exchange – means any public exchange, such as the New York Stock Exchange, American Stock Exchange, The NASDAQ Stock Market or other similar listed securities exchange.

Facilities – means (a) approximately 300 miles of pipeline having a capacity of approximately 2.0 Bcf/day and expected to be 42 inches in diameter and certain compression facilities, as described in the FERC Application for such facilities, if and as amended from time to time, together with any upgrades thereto, extending from the tailgate of the MarkWest Mobley plant in Smithfield, West Virginia to Transco Station 165 near Chatham, Virginia;

(b) constructing or installing any pipeline that would loop (as such term is commonly used in the natural gas pipeline industry) the facilities described in clause (a) above; (c) installing or upgrading any compression with respect to the facilities described in clause (a) above; and (d) increasing the transportation capacity of the facilities described in clause (a) above through the installation of greater capacity pipe, looping, or similar improvements.

Fair Market Value – means (i) the fair market cash value of the Membership Interest of the Changing Member as determined pursuant to the terms of Section 13.11(b) or (c), as applicable, or (ii) the fair market cash value of the consideration to be paid to the Disposing Member pursuant to the proposed Disposition as determined pursuant to the terms of Section 13.11(a) or (c), as applicable.

FERC – means the Federal Energy Regulatory Commission or any Governmental Authority succeeding to the powers of such commission.

FERC Application – means the document pursuant to which application for a certificate(s) of public convenience and necessity is made under Section 7 of the NGA to the FERC by the Company for authority to construct, own, acquire, and operate, and provide service on the Facilities.

FERC Certificate – means the certificate(s) of public convenience and necessity issued by the FERC pursuant to the FERC Application.

FERC Response Date – means the date that is 30 Days following the date upon which the FERC has issued the FERC Certificate.

First Amended and Restated Agreement – has the meaning set forth in the Recitals.

Financing Commitment – means the definitive agreements between one or more financial institutions or other Persons and the Company or the Financing Entity pursuant to which such financial institutions or other Persons agree, subject to the conditions set forth therein, to lend money to, or purchase securities of, the Company or the Financing Entity, the proceeds of which shall be used to finance all or a portion of the Facilities or to repay loans made by the Members pursuant to Section 4.02.

Financing Entity – means a corporation, limited liability company, trust, or other entity that may be organized for the purpose of issuing securities, the proceeds from which are to be advanced directly or indirectly to the Company to finance all or a portion of the Facilities.

FMV Notice – has the meaning set forth in Section 13.11(c).

Founding Members – means EQT, USG and any of their respective Affiliates that are Members (and any limited partnership or master limited partnership to which such Members' Membership Interests have

been assigned pursuant to Section 3.03(e) or Section 3.03(f) of this Agreement); provided, however, that, a Member shall automatically cease to constitute a Founding Member or have any of the rights applicable to Founding Members as set forth in this Agreement from and after the time that (i) with respect to EQT and any of its

applicable Affiliates, EQT and such Affiliates shall collectively own Membership Interests having an aggregate Sharing Ratio of less than [***] percent ([***]%) and (ii) with respect to USG and any of its applicable Affiliates, USG and such Affiliates shall collectively own Membership Interests having an aggregate Sharing Ratio of less than [***] percent ([***]%).

Founding Shippers – means the Affiliate of EQT and the Affiliate of USG that, in each case, enters into a Precedent Agreement to provide a commitment for firm transportation [***].

FPL – has the meaning set forth in Section 6.05(f).

GAAP – means United States generally accepted accounting principles.

Gas Transportation Service Agreements – means the gas transportation service agreements by and between the Company or its designee and the Shippers for the transportation of natural gas through the Facilities.

General Buy-out Right – has the meaning set forth in Section 3.03(b)(vi)(A).

Governmental Authority (or Governmental) – means a federal, state, local or foreign governmental authority; a state, province, commonwealth, territory or district thereof; a county or parish; a city, town, township, village or other municipality; a district, ward or other subdivision of any of the foregoing; any executive, legislative or other governing body of any of the foregoing; any agency, authority, board, department, system, service, office, commission, committee, council or other administrative or regulatory body of any of the foregoing; including the FERC, any Exchange, any court or other judicial body; and any officer, official or other representative of any of the foregoing.

Hypothetical Tax Amount – has the meaning set forth in Section 5.08.

Indebtedness – means any amount (absolute or contingent) payable by the Company as debtor, borrower, issuer, guarantor or otherwise, pursuant to (a) an agreement or instrument involving or evidencing money borrowed, the advance of credit, a conditional sale or a transfer with recourse or with an obligation to repurchase; (b) indebtedness of a third party guaranteed by or secured by (or for which the holder of such indebtedness has an existing right, contingent or otherwise, to be secured by) any lien on assets owned or acquired by the Company, whether or not the indebtedness secured thereby has been assumed; (c) purchase-money indebtedness and capital lease obligations; (d) an interest rate protection agreement, foreign currency exchange agreement or other hedging arrangement; or (e) a letter of credit issued for the account of the Company.

Independent Accounting Firm – has the meaning set forth in Section 3.03(b)(viii).

Initial Agreement – has the meaning set forth in the Recitals.

Initial Operating Budget – means an Operating Budget covering the 12-month period following the In-Service Date, as approved by the Management Committee on February 11, 2015, as may be amended from time to time.

Initial Release – has the meaning set forth in Section 4.01(b)(i).

Investment Grade – means, with respect to any Person, having debt rated as investment grade by at least two of the three nationally-recognized ratings agencies, being at least [***] for Moody's Investor Services and at least [***] for each of Standard & Poor's and Fitch Ratings.

In-Service Date – means the date of the placing of the Facilities in service. On, or as promptly as practicable after, such date, the Operator shall notify the Members of its occurrence.

Law – means any applicable constitutional provision, statute, act (including the Act), code (including the Code), law, regulation, rule, ordinance, order, decree, ruling, proclamation, resolution, judgment, decision, declaration, or interpretative or advisory opinion or letter of a Governmental Authority having valid jurisdiction.

Letter of Credit – means an irrevocable, unconditional, transferable standby letter of credit in form and substance satisfactory to the Management Committee for the benefit of the Company, issued by a United States bank or a foreign bank with a United States branch, with United States based assets of at least \$10,000,000,000 and a rating of “[***]” or better from Standard & Poor's Ratings Service or a rating of “[***]” from Moody's Investor Service.

Management Committee – has the meaning set forth in Section 6.02.

Management Committee Member – has the meaning set forth in Section 6.01.

Material Contracts – means any of the following contracts, agreements, letter agreements or other instruments to which the Company is or becomes a party after the Effective Date: engineering, procurement and construction contracts, contracts for the construction of the Facilities, contracts for the procurement of pipe, compression and associated equipment and any other contracts that require expenditures by the Company in excess of [***] Dollars (\$[***]) in the aggregate or provide for revenue to the Company in excess of [***] Dollars (\$[***]), in each case, subject to the approval of the Management Committee pursuant to Section 6.02(i)(D).

Matured Financing Obligation – means the Company's debt for borrowed money (including any related interest, costs, fees, hedge unwind costs or other repayment obligations) that has become due (including by acceleration or any full or partial mandatory prepayment thereof) under any Financing Commitment.

Member – means any Person executing this Agreement as of the date of this Agreement as a member or hereafter admitted to the Company as a member as provided in this Agreement, but such term does not include any Person who has ceased to be a member in the Company.

Member Nonrecourse Debt – has the meaning assigned to the term “partner nonrecourse debt” in Treasury Regulation Section 1.704-2(b)(4).

Member Nonrecourse Debt Minimum Gain – has the meaning assigned to the term “partner nonrecourse debt minimum gain” in Treasury Regulation Section 1.704-2(i)(2).

Member Nonrecourse Deductions – has the meaning assigned to the term “partner nonrecourse deductions” in Treasury Regulation Sections 1.704-2(i)(1) and 1.704-2(i)(2).

Membership Interests – has the meaning set forth in Section 3.01.

Minimum Gain – means (a) with respect to Nonrecourse Liabilities, the amount of gain that would be realized by the Company if it disposed of (in a taxable transaction) all Company properties that are subject to the Nonrecourse Liabilities in full satisfaction of the Nonrecourse Liabilities, computed in accordance with Treasury Regulations Section 1.704-2(d), or (b) with respect to each Member Nonrecourse Debt, the amount of gain that would be realized by the Company if it disposed of (in a taxable transaction) the Company property that is subject to such Member Nonrecourse Debt in full satisfaction of such Member Nonrecourse Debt, computed in accordance with Treasury Regulations Section 1.704-2(i).

Necessary Regulatory Approvals – means all Authorizations as may be required (but excluding Authorizations of a nature not customarily obtained prior to commencement of construction of facilities) in connection with (a) the formation of the Company and the construction, acquisition and operation of the Facilities; and (b) the transportation of the natural gas to be transported under the applicable Gas Transportation Service Agreements through the Facilities including the FERC Certificate.

Net Profit or Net Loss – means, with respect to any fiscal year or other period, the net income or net loss of the Company for such period determined in accordance with U.S. federal income tax accounting principles and Section 703(a) of the Code (including any items that are separately stated for purposes of Section 702(a) of the Code), with the following adjustments (without duplication):

- (a) any income of the Company that is exempt from U.S. federal income tax shall be included as income;
- (b) any expenditures of the Company that are described in Section 705(a)(2)(B) of the Code or treated as so described pursuant to Treasury Regulation Section 1.704-1(b)(2)(iv)(i) shall be treated as current expenses;
- (c) if Company assets are distributed to the Members in kind, such distributions shall be treated as sales of such assets for cash at their respective fair market values in determining Net Profit and Net Loss;
- (d) in the event the Book Value of any Company asset is adjusted pursuant to a Revaluation Event, the amount of such adjustment shall be taken into account as gain or loss

from the disposition of such asset for purposes of computing Net Profit or Net Loss for the fiscal year or other relevant period in which such adjustment occurs;

(e) gain or loss resulting from any disposition of any Company asset with respect to which gain or loss is recognized for federal income tax purposes shall be computed by reference to the Book Value of the asset disposed of, notwithstanding that the adjusted tax basis of such property differs from its Book Value;

(f) in lieu of the depreciation, amortization and other cost recovery deductions taken into account in computing federal taxable income or loss, there shall be taken into account Book Depreciation for such fiscal year or other period; and

(g) all items of income, gain, loss or deduction specially allocated pursuant to Section 5.04(c) shall be excluded from the determination of Net Profit or Net Loss.

New Member – means a Person admitted as a Member after the Effective Date pursuant to the terms and conditions of this Agreement.

NGA – means the Natural Gas Act of 1938, as amended.

Non-Contributing/Loan Member – has the meaning set forth in Section 4.06(a).

Non-Changing Founding Member – has the meaning set forth in Section 3.03(b)(vi)(D).

Non-Disposing Founding Member – has the meaning set forth in Section 3.03(b)(ii)(A).

Nonrecourse Deductions – has the meaning assigned that term in Treasury Regulation Sections 1.704-2(b) and 1.704-2(c).

Nonrecourse Liabilities – means nonrecourse liabilities (or portions thereof) of the Company for which no Member bears the economic risk of loss, as determined under Treasury Regulations Section 1.704-2(b)(3) and 1.752-1(a)(2).

Non-Termination Member – has the meaning set forth in Section 3.03(b)(viii).

Operator – means EQT Gathering, LLC, a Delaware limited liability company, and any successor operator appointed following a termination of the COM Agreement.

Operating Budget – means the Initial Operating Budget and each subsequent annual operating budget for the Company that is approved (or deemed approved) pursuant to Section 6.02(i)(GG). The Operating Budget shall cover all items that are classified as non-capital items under Required Accounting Practices.

[***]

Operator Preferential Right – has the meaning set forth in Section 3.03(b)(ii)(D).

Outstanding Capital Contributions – means, with respect to any Member as of the time of any determination, the excess, if any, of (i) the aggregate Capital Contributions previously made by such Member, over (ii) the aggregate distributions previously made by the Company to such Member pursuant to Article 5.

Parent – means (i) with respect to a Member, the Person that directly or indirectly Controls such Member as set forth in Exhibit A, which shall be promptly updated by a Member upon any change to the identity of such Member's Parent, or (ii) with respect to the Operator, the Person that ultimately Controls the Operator.

Parent Decision Makers – means the chief executive officer of the Parent of each of USG and EQT or another senior executive officer designated in writing by the chief executive officer of the Parent of each of USG and EQT (a copy of which writing to be delivered promptly to the other Founding Member(s)).

Performance Assurances – has the meaning set forth in Section 4.01(b)(i).

Permitted Encumbrance – means (i) liens for taxes or assessments not yet due or not yet delinquent or, if delinquent, that are being contested in good faith in the normal course of business;

(ii) easements, rights-of-way, servitudes, permits, surface leases, and other rights in respect of surface operations, pipelines, grazing, logging, canals, ditches, reservoirs or the like, and easements for streets, alleys, highways, pipelines, telephone lines, power lines, railways, and other easements and rights-of-way, on, over or in respect of any properties that do not materially impair the use of the assets of, or the operation of the business of, the Company; and (iii) rights reserved to or vested in any municipality or governmental, statutory, or public authority to control or regulate any properties in any manner, and all applicable Laws of any Governmental Authority.

Person – has the meaning assigned that term in Section 18-101(11) of the Act and also includes a Governmental Authority and any other entity.

Precedent Agreement – means any agreement between the Company and a prospective shipper of natural gas through the Facilities that involves the commitment by such shipper to pay demand charges in return for a firm transportation obligation on the part of the Company, in each case subject to the satisfaction of one or more conditions precedent.

Preferential Exercise Notice – has the meaning set forth in Section 3.03(b)(ii)(A).

Preferential Purchasing Member – has the meaning set forth in Section 3.03(b)(ii)(A).

Preferential Right – has the meaning set forth in Section 3.03(b)(ii)(A).

[***]

[***]

Project Schedule – means a schedule containing milestones and including details to support all major development, engineering, procurement, construction, commissioning and testing activities of the Facilities during the period prior to the In-Service Date, as approved by the Management Committee on February 11, 2015, as may be amended from time to time.

Qualified Guarantor – means, with respect to a Member, such Member's Parent or a subsidiary of such Member's Parent, in each case, so long as such Person is Investment Grade [***].

Quarter – unless the context requires otherwise, means a fiscal quarter of the Company.

Related Party Matter – means (a) any occurrence or circumstance where (i) the Company, on the one hand, and a Member or an Affiliate of such Member, on the other hand, propose to enter into, terminate, or amend a contract or arrangement with each other, including, without limitation, a Gas Transportation Service Agreement, a Precedent Agreement, the COM Agreement, or any other contract or arrangement, or (ii) any Member believes that a dispute has arisen between the Company and an Affiliate of any Member under a Gas Transportation Service Agreement, a Precedent Agreement, the COM Agreement, or any other contract or arrangement, or (iii) a matter with respect to enforcement under any such Gas Transportation Service Agreement, Precedent Agreement, COM Agreement, or other contract or arrangement is involved; (b) making any determination as to the suitability of a Qualified Guarantor of a Member (other than a Founding Member, which is addressed in the definition of "Qualified Guarantor") or substitution of a successor Qualified Guarantor of such Member; (c) the appointment of any successor Operator or Shipper that is an Affiliate of a Member; (d) any decision by the Company to exercise any of the owner performance rights under Section 4.4 of the COM Agreement while an Affiliate of EQT or USG is the Operator; or (e) making any determination, not to be

unreasonably withheld, with respect to the suitability of the Operator pursuant to clause (b) of the definition of Change of Control.

Representative – has the meaning set forth in Section 6.02(a)(i).

Representative Budget Comments – has the meaning set forth in Section 6.09.

Required Accounting Practices – means the accounting rules and regulations, if any, at the time prescribed by the Governmental Authorities under the jurisdiction of which the Company is at the time operating and, to the extent of matters not covered by such rules and regulations, generally accepted accounting principles as practiced in the United States at the time prevailing for companies engaged in a business similar to that of the Company.

Revaluation Event – has the meaning set forth in Section 4.05(b).

Rules – has the meaning set forth in Section 11.05(a).

[***]

[***]

[***]

[***]

Selection Notice – has the meaning set forth in Section 11.05(c).

Sharing Ratio – means, subject in each case to adjustments in accordance with this Agreement or in connection with Dispositions of Membership Interests, (a) in the case of a Member executing this Agreement as of the date of this Agreement or a Person acquiring such Member's Membership Interest, the percentage specified for that Member as its Sharing Ratio on Exhibit A with respect to the Company, and (b) in the case of Membership Interests issued pursuant to Section 3.04, the Sharing Ratio established pursuant thereto; provided that the total of all Sharing Ratios shall always equal 100%.

[***]

[***]

[***]

Shippers – means the Founding Shippers and any other Person that (a) has entered into a Gas Transportation Service Agreement with the Company or its designee (or, if applicable, a Precedent Agreement relating thereto) to provide transportation of natural gas through the Facilities and (b) meets the criteria for creditworthiness determined by the Management Committee.

Sole Discretion – has the meaning set forth in Section 6.02(f)(ii).

Subject Contract – has the meaning set forth in Section 4.07(a).

Supermajority Interest – means the approval of the Representatives of the Founding Members representing greater than [***]% of the aggregate Sharing Ratios of the Founding Members; provided, however, that in the event there are no longer any Founding Members, the approval of the Representatives of the Members representing greater than [***]% of the aggregate Sharing Ratios of the Members.

Target Capital Account Amount – has the meaning set forth in Section 5.04(a).

Tax Advances – has the meaning set forth in Section 5.08.

Tax Matters Member – has the meaning set forth in Section 8.03(a).

Tax Rate – means a percentage determined in good faith by the Management Committee from time to time that represents the highest combined marginal U.S. federal, state and local tax rate applicable to any individual resident of New York, New York taking into account the character of the applicable income and the deductibility of state and local income taxes for U.S. federal income tax purposes, unless a Member provides reasonably satisfactory evidence to the Management Committee that the tax rate applicable to such Member is higher

than the rate applicable to any individual resident of New York, New York (in which case the “**Tax Rate**” for all Members shall be the rate applicable to such Member).

Term – has the meaning set forth in Section 2.07.

Termination Member – has the meaning set forth in Section 3.03(b)(viii).

Total Event Demand Amount – has the meaning set forth in Section 4.07(b).

Treasury Regulations – means the regulations (including temporary regulations) promulgated by the United States Department of the Treasury pursuant to and in respect of provisions of the Code. All references herein to sections of the Treasury Regulations shall include any corresponding provision or provisions of succeeding, similar or substitute, temporary or final Treasury Regulations.

USG – has the meaning set forth in the Preamble, or any permitted transferee of any of USG’s Membership Interest pursuant to Article III of this Agreement..

[***]

Vega – has the meaning set forth in the Preamble, or any permitted transferee of any of Vega’s Membership Interest pursuant to Article III of this Agreement.

Vega Carryco – has the meaning set forth in the Preamble, or any permitted transferee of any of Vega Carryco’s Membership Interest pursuant to Article III of this Agreement.

WGL – has the meaning set forth in the Preamble or any permitted transferee of any of WGL’s Membership Interest pursuant to Article III of this Agreement.

[***]

Withdrawal, or Withdrawn – means or refers to the withdrawal, resignation, or retirement of a Member from the Company as a Member. Such terms shall not include any Dispositions of Membership

Interests (which are governed by Sections 3.03(a) and (b)), even though the Member making a Disposition may cease to be a Member as a result of such Disposition.

Withdrawn Member – has the meaning set forth in Section 10.03.

Other terms defined herein have the meanings so given them.

1.02 Interpretation. Unless the context requires otherwise: (a) the gender (or lack of gender) of all words used in this Agreement includes the masculine, feminine and neuter; (b) references to Articles and Sections refer to Articles and Sections of this Agreement; (c) references to Exhibits refer to the Exhibits attached to this Agreement, each of which is made a part hereof for all purposes; (d) references to Laws refer to such Laws as they may be amended from time to time, and references to particular provisions of a Law include any corresponding

provisions of any succeeding Law; (e) references to money refer to legal currency of the United States of America; (f) the definitions given for terms in this Article 1 and elsewhere in this Agreement shall apply to both the singular and plural forms of the terms defined, (g) the conjunction “or” shall be understood in its inclusive sense (i.e., and/or); (h) the words “hereby”, “herein”, “hereunder”, “hereof” and words of similar import refer to this Agreement as a whole (including any Exhibits and Schedules hereto) and not merely to the specific section, paragraph or clause in which such word appears; and (i) the word “including” and words of similar import when used in this Agreement will mean “including, without limitation,” unless otherwise specified.

ARTICLE 2 ORGANIZATION

2.01 Formation. The Company has been organized as a Delaware limited liability company by the filing of the Delaware Certificate and execution of the Initial Agreement as of August 22, 2014.

2.02 Name. The name of the Company is Mountain Valley Pipeline, LLC, and all Company business shall be conducted in that name or such other names that comply with Law as the Management Committee may select.

2.03 Registered Office; Registered Agent; Principal Office in the United States; Other Offices. The registered office of the Company required by the Act to be maintained in the State of Delaware shall be the office of the initial registered agent named in the Delaware Certificate or such other office (which need not be a place of business of the Company) as the Management Committee may designate in the manner provided by Law. The registered agent of the Company in the State of Delaware shall be the initial registered agent named in the Delaware Certificate or such other Person or Persons as the Management Committee may designate in the manner provided by Law. The principal office of the Company in the United States shall be at such place as the Management Committee may designate, which need not be in the State of Delaware, and the Company shall maintain records there or such other place as the Management Committee shall designate and shall keep the street address of such principal office at the registered office of the Company in the State of Delaware. The Company may have such other offices as the Management Committee may designate.

2.04 Purposes. The purposes of the Company are to plan, design, construct, acquire, own, finance, maintain, and operate the Facilities, to market the services of the Facilities, to engage in the transmission of natural gas through the Facilities, and to engage in any activities directly or indirectly relating thereto, including the Disposition of the Facilities.

2.05 No State Law Partnership. The Members intend that the Company shall be a limited liability company and, except as provided in Article 8 with respect to U.S. federal income tax treatment (and other tax treatment therewith), the Company shall not be a partnership (including a limited partnership) or joint venture, and no Member shall be a partner or joint venture of any other Member, for any purposes, and this Agreement may not be construed to suggest otherwise.

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2.06 Foreign Qualification. Prior to the Company's conducting business in any jurisdiction other than Delaware, the Management Committee shall cause the Company to comply, to the extent procedures are available and those matters are reasonably within the control of the Management Committee, with all requirements necessary to qualify the Company as a foreign limited liability company in that jurisdiction. At the request of the Management Committee, each Member shall execute, acknowledge, swear to, and deliver all certificates and other instruments conforming with this Agreement that are strictly necessary to qualify, continue, and terminate the Company as a foreign limited liability company in all such jurisdictions in which the Company may conduct business; provided, that no such certificate or instrument shall create any liability on behalf of such Member.

2.07 Term. The period of existence of the Company (the "*Term*") commenced on August 22, 2014, and shall end at such time as a certificate of cancellation is filed with the Secretary of State of Delaware in accordance with Section 12.04.

2.08 Title to Property. All assets, property and rights of the Company shall be owned or leased by the Company as an entity and, except with respect to assets, property or rights of the Company leased or licensed to the Company by a Member (subject to the terms hereof), no Member shall have any ownership interest in such assets, property or rights in its individual name or right, and each Member's Membership Interest shall be personal property for all purposes. The Company shall hold all assets, property and rights of the Company in the name of the Company and not in the name of any Member.

ARTICLE 3 MEMBERSHIP INTERESTS; DISPOSITIONS OF INTERESTS

3.01 Capital Structure. The capital structure of the Company shall consist of one class of limited liability company interests called "*Membership Interests*," which shall represent, with respect to any Member, (a) that Member's status as a Member; (b) that Member's share of the income, gain, loss, deduction, and credits of, and the right to receive distributions from, the Company; (c) any [***] to which that Member is entitled pursuant to Section 4.06(b); (d) all other rights, benefits, and privileges enjoyed by that Member (under the Act, this Agreement, or otherwise) in its capacity as a Member, including that Member's rights to vote, consent, and approve amendments to this Agreement pursuant to Section 13.05; (e) with respect to the Founding Members only, such Founding Members' rights to participate in the management of the Company through the Management Committee; and (f) all obligations, duties, and liabilities imposed on that Member (under the Act or this Agreement or otherwise) in its capacity as a Member, including any obligations to make Capital Contributions to the extent set forth in Article 4. As of the Effective Date, EQT, USG, Vega, Vega Carryco and WGL are the Members of the Company with the Sharing Ratios set forth on Exhibit A hereto.

3.02 Representations, Warranties and Covenants.

(a) Each Member (as of the Effective Date) and each New Member (as of such Person's date of admission as a Member) hereby represents, warrants, and covenants to the Company and to each other Member that the following statements are true and correct:

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(i) that such Member is duly incorporated, organized, or formed (as applicable), validly existing, and (if applicable) in good standing under the Law of the jurisdiction of its incorporation, organization, or formation; if required by applicable Law, that such Member is duly qualified and in good standing in the jurisdiction of its principal place of business, if different from its jurisdiction of incorporation, organization, or formation; and that such Member has the requisite power and authority to execute and deliver this Agreement and to perform its obligations hereunder, and all necessary actions by the board of directors, officers, shareholders, managers, members, partners, trustees, beneficiaries, or other applicable Persons necessary for the due authorization, execution, delivery, and performance of this Agreement by that Member have been duly taken;

(ii) that such Member has duly executed and delivered this Agreement and the other documents that this Agreement contemplates that such Member will execute, and they each constitute the valid and binding obligation of such Member enforceable against it in accordance with their respective terms (except as may be limited by bankruptcy, insolvency or similar Laws of general application and by the effect of general principles of equity, regardless of whether considered at law or in equity); and

(iii) that such Member's authorization, execution, delivery, and performance of this Agreement does not and will not (A) conflict with, or result in a breach, default or violation of, (1) the organizational documents of such Member, (2) any contract or agreement to which that Member is a party or is otherwise subject, or (3) any Law, writ, injunction, or arbitral award to which such Member is subject; or (B) other than the FERC Application and the Necessary Regulatory Approvals that the Members have agreed to obtain pursuant to Article 7, require any consent, approval, or authorization from, filing or registration with, or notice to, any Governmental Authority or other Person, unless such requirement has already been satisfied.

(b) The Company hereby represents and warrants, and the Company covenants, to each Member that the following statements are true and correct as of the Effective Date:

(i) (x) the Company is duly formed and is validly existing, and in good standing under the Act; (y) the Company has full power and authority to execute and deliver this Agreement and to perform its obligations hereunder (including the issuance of the Membership Interests to each Member), and all necessary actions by the Company's managers, members or other applicable Persons necessary for the due authorization, execution, delivery, and performance of this Agreement by the Company have been duly taken; and (z) the Company has full power and authority to [***];

(ii) the issuance of the Membership Interests to each Member, as contemplated hereby, has been duly authorized by all requisite limited liability company action on the part of the Company and its members, managers or other applicable Persons, and such Membership Interests are validly issued and, subject only to the terms of Article 4, fully paid and nonassessable and, subject to the restrictions in Article 3, are being issued free and clear of any preemptive rights under the Act or other applicable law, the organizational documents of the

Company, and any other contract to which the Company or its members, managers or other Person is bound or by which their property is subject;

(iii) no other Person has any right to acquire any Membership Interest or other equity interest in the Company or take part in the management of the Company; and

(iv) other than [***], the Company has not entered into any contract, agreement, or other arrangement with any Person with respect to the Company, the Facilities, the Membership Interests, or voting rights with respect to the Company.

3.03 Dispositions and Encumbrances of Membership Interests.

(a) **General Restriction.** A Member may not Dispose of or Encumber all or any portion of its Membership Interest except in strict accordance with this Section 3.03. References in this Section 3.03 to Dispositions or Encumbrances of a "Membership Interest" shall also refer to Dispositions or Encumbrances of a portion of a Membership Interest. Any attempted Disposition or Encumbrance of a Membership Interest, other than in strict accordance with this Section 3.03, shall be, and is hereby declared, null and void *ab initio*. The rights and obligations constituting a Membership Interest may not be separated, divided, or split from the other attributes of a Membership Interest except as contemplated by the express provisions of this Agreement. The Members agree that the provisions of this Section 3.03 may be enforced by specific performance pursuant to Section 11.04.

(b) ***Dispositions of Membership Interests.***

(i) **General Restriction.** Subject to Sections 3.03(d), (e) and (f), no Member may Dispose of its Membership Interest without the prior written consent of each of EQT and USG (but only for so long as they remain Founding Members), which consent may be withheld by each in its Sole Discretion; provided, however, that no such consent shall be required (A) with respect to any Founding Member, where such Disposition would not cause the Company to be treated as a publicly traded partnership subject to tax as an association for U.S. federal income tax purposes and (B) with respect to a [***] or any other Member (other than a Founding Member), where such Disposition (x) when added to all Dispositions by such [***] or Member during the immediately preceding twelve (12) months, is less than 50% of such [***] or Member's Sharing Ratio as of the beginning of such period of twelve (12) months, (y) would not cause any adverse tax consequences to the Company or any Member, and (z) would not cause the Company to be treated as a publicly traded partnership subject to tax as an association for U.S. federal income tax purposes. Subject to receiving the consent required in the foregoing sentence, if necessary, a Member may Dispose of its Membership Interest only by complying with all of the following requirements: (I) such Member must offer the Founding Members the right to acquire such Membership Interest in accordance with Section 3.03(b)(ii), unless (1) the proposed Assignee is an Affiliate of the Disposing Member or the Founding Members consent to the Disposition to such Assignee, which consent may be granted or withheld in the Sole Discretion of each Founding Member or (2) the Disposition is made by EQT or USG in accordance with Sections 3.03(e) or (f); and (II) such Member must comply with the requirements of Section 3.03(b)(iv) and, if the Assignee is to be admitted as a Member, Section 3.03(b)(iii).

(ii) **Preferential Purchase Rights.**

(A) **Preferential Purchase Rights.** Subject to Section 3.03(b)(ii)(B), Section 3.03(b)(ii)(C) and Section 3.03(b)(ii)(D), if a Member desires to consummate a bona fide transaction that will result in the Disposition of all or a portion of its Membership Interest (whether or not the proposed Disposition is to another Member), then such Member (the "**Disposing Member**") shall promptly give notice thereof (the "**Disposition Notice**") to the Company and each Founding Member; provided that this Section 3.03(b)(ii) shall not apply to a Disposition to an Affiliate of the Disposing Member or a Disposition in accordance with Section 3.03(d), [***], or Section 3.03(e) or Section 3.03(f). The Disposition Notice shall set forth all relevant information with respect to the proposed Disposition, including the name and address of the prospective

acquirer, the precise Membership Interest that is the subject of the Disposition, the price to be paid for such Membership Interest, and any other terms and conditions of the proposed Disposition. If any Member is a Disposing Member but either or both of EQT and/or USG and their respective Affiliates are not the Disposing Member (such of EQT and/or USG and their respective Affiliates as is not a Disposing Member being referred to herein as the “*Non-Disposing Founding Member(s)*”), such Non-Disposing Founding Member(s) shall have the right (the “*Preferential Right*”) to acquire, for the same purchase price, and on the same material terms and conditions, as are set forth in the Disposition Notice, some or all of the Membership Interest specified in the Disposition Notice; provided that, if the purchase price to be paid to the Disposing Member pursuant to the proposed Disposition is not entirely in cash, the purchase price for the Non-Disposing Founding Member(s) exercising the Preferential Right shall be [***]. The Non-Disposing Founding Member(s) shall have [***] Business Days following receipt of the Disposition Notice (or if the price to be paid pursuant to such offer is not in cash, then [***] Business Days following [***]), subject to any reasonable and necessary extension to obtain customary board approval, in which to notify the other Members (including the Disposing Member) whether such Non-Disposing Founding Member(s) desires to exercise its Preferential Right. A notice in which a Non-Disposing Founding Member exercises such Preferential Right is referred to herein as a “*Preferential Exercise Notice*” and as deliverer of a Preferential Exercise Notice, such Non-Disposing Founding Member is referred to herein as a “*Preferential Purchasing Member.*” The Preferential Purchasing Member(s) shall indicate in a Preferential Exercise Notice whether the Preferential Purchasing Member(s) elects to purchase all of the Disposing Member’s Membership Interest as set forth in the Disposition Notice or any portion thereof. In the event that more than one of EQT or USG (or their respective Affiliates) is a Preferential Purchasing Member, then each Preferential Purchasing Member shall indicate in a Preferential Exercise Notice whether it elects to purchase only its *pro rata* share of the Membership Interest offered in the

Disposition Notice (based on its Sharing Ratio) or whether such Preferential Purchasing Member elects to purchase a greater portion of such Membership Interest (up to the full amount thereof). If the Preferential Purchasing Member(s) elects to exercise the Preferential Right to purchase the entire Membership Interest offered in the Disposition Notice (subject to proration based on the Preferential Purchasing Members’ respective Sharing Ratios in the event that Preferential Purchasing Members elected to purchase a greater number of Membership Interests than the amount offered), the Disposing Member and the Preferential Purchasing Member(s) shall close the acquisition of the Membership Interest in accordance with Section 3.03(b)(ii)(C). In the event that the Preferential Purchasing Member(s) elect to purchase less than the entire Membership Interest specified in the Disposition Notice, then the Disposing Member shall have the right to Dispose of the remaining amount of the unexercised portion of the Membership Interest in accordance with Section 3.03(b)(ii)(C).

(B) [***]

(C) [***]

(D) *Preferential Purchase Right Resulting from Disposition of Membership Interests Held by the Operator.* Notwithstanding the foregoing, for so long as the Operator is an Affiliate of a Member, if the Disposing Member is the Operator and the

Assignee of such Disposing Member's Membership Interests is not an Affiliate of such Member (including, for the avoidance of doubt, in the event the Operator is an Affiliate of EQT or EQM, where the Assignee is not an Affiliate of either EQT or EQM), then such Disposing Member shall promptly deliver the Disposition Notice to the Non-Disposing Founding Members that are not Affiliates of the Operator, and such Non-Disposing Founding Members and their Affiliates shall have the right (the "**Operator Preferential Right**") to acquire a portion of the Membership Interests of the Disposing Member for the same purchase price and on the same material terms and conditions as are set forth in the Disposition Notice; provided that, if the purchase price to be paid to the Disposing Member pursuant to the proposed Disposition is not entirely in cash, the purchase price shall be [***]. The Non-Disposing Founding Members and their Affiliates shall have [***] Business Days following receipt of the Disposition Notice (or if the price to be paid pursuant to such offer is not in cash, then [***] Business Days following [***]), subject to any reasonable and necessary extension to obtain customary board approval, in which to notify the Disposing Member whether they desire to exercise the Operator Preferential Right. To the extent a Non-Disposing Founding Member or any of its Affiliates exercises its Operator Preferential Right, such Non-Disposing Founding Member (or its Affiliate) will be deemed a Preferential Purchasing Member. If the Non-Disposing Founding Member or any of its Affiliates

elects to exercise the Operator Preferential Right to purchase the entire Membership Interest offered in the Disposition Notice, then the Disposing Member and the Non-Disposing Founding Member (or its Affiliate) shall close the acquisition of the Membership Interest in accordance with Section 3.03(b)(ii)(E). In the event that the Non-Disposing Founding Member (or its Affiliate) elects to purchase less than the entire Membership Interest specified in the Disposition Notice, then the Disposing Member shall have the right to Dispose of the remaining amount of the unexercised portion of the Membership Interest in accordance with Section 3.03(b)(ii)(E).

(E) *Closing.* If the Preferential Rights are exercised in accordance with Section 3.03(b)(ii)(A), 3.03(b)(ii)(B), 3.03(b)(ii)(C) or 3.03(b)(ii)(D), as applicable, the closing of the purchase of the Membership Interest shall occur at the principal place of business of the Company no later than the [***] Day after the expiration of the [***]-Day period referred to in Section 3.03(b)(ii)(A), 3.03(b)(ii)(B), 3.03(b)(ii)(C) or Section 3.03(b)(ii)(D), as applicable, subject to such extensions as may be necessary to obtain all applicable Authorizations to the purchase (and in such instance, the fifth Business Day after the receipt of all such applicable Authorizations to the purchase), unless the Disposing Member and the Preferential Purchasing Member(s) agree upon a different place or date. At the closing, (1) the Disposing Member shall execute and deliver to the Preferential Purchasing Member(s) (aa) an assignment of the Membership Interest, in form and substance reasonably acceptable to the Preferential Purchasing Member(s) containing a general warranty of title as to such Membership Interest (including that such Membership Interest is free and clear of all Encumbrances, other than those permitted under Section 3.03(c)(ii)) and (bb) any other instruments reasonably requested by the Preferential Purchasing Member(s) to give effect to the purchase; and (2) the Preferential Purchasing Member(s) shall deliver to the Disposing Member in immediately-available funds the purchase price provided for in Section 3.03(b)(ii)(A), 3.03(b)(ii)(B), 3.03(b)(ii)(C) or 3.03(b)(ii)(D), as applicable. The Sharing Ratios and Capital Accounts of the Members shall be deemed adjusted to reflect the effect of the purchase.

(F) *Waiver of Preferential Right.* If no Non-Disposing Founding Member delivers a First Preferential Exercise Notice or Second Preferential Exercise Notice, or if the Preferential Rights are not exercised in full pursuant to Section 3.03(b)(ii)(A), 3.03(b)(ii)(B), 3.03(b)(ii)(C) or 3.03(b)(ii)(D), the Disposing Member shall have the right, subject to compliance with the provisions of Sections 3.03(a) and (b), to Dispose of the portion of the Membership Interest described in the Disposition Notice that is not purchased pursuant to the Preferential Rights to the proposed Assignee strictly in accordance with the terms of the Disposition Notice for a period of [***] Days after the expiration of the [***]-Day period referred to in such Section 3.03(b)(ii)(A), 3.03(b)(ii)(B), 3.03(b)(ii)(C) or

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3.03(b)(ii)(D) (or, if later, the fifth Business Day after the receipt of all applicable Authorizations to the purchase). If, however, the Disposing Member fails so to Dispose of the Membership Interest within such [***]-Day period (or, if applicable, such fifth Business Day period), the proposed Disposition shall again become subject to the Preferential Rights.

(G) *Transfer of Operator Rights.* In connection with a Disposition of Membership Interests where the rights provided for in this Section 3.03(b)(ii) are not exercised or where such rights are waived pursuant to Section 3.03(b)(ii)(F), the Member with the right to appoint the Operator (which Member shall initially be EQT) may transfer such right to appoint the Operator to the assignee of such Membership Interests; provided, however, that, except with respect to transfers to an Affiliate, any successor Operator appointed by the transferee of such right to appoint the Operator and the Parent of such Operator must have the experience, safety record, creditworthiness, and financial wherewithal generally acceptable within the midstream natural gas industry.

(iii) Admission of Assignee as a Member. An Assignee has the right to be admitted to the Company as a Member, with the Membership Interest and attendant Sharing Ratio) so transferred to such Assignee, only if such Disposition is effected in strict compliance with Sections 3.03(a) and (b) or is effected in accordance with Section 3.03(d), [***], or Section 3.03(e) or Section 3.03(f).

(iv) Requirements Applicable to All Dispositions and Admissions. In addition to the requirements set forth in Sections 3.03(b)(i), 3.03(b)(ii) and 3.03(b)(iii), any Disposition of a Membership Interest and any admission of an Assignee as a Member shall also be subject to the following requirements, and such Disposition (and admission, if applicable) shall not be effective unless such requirements are complied with; provided the Management Committee, in its sole and absolute discretion, may waive any of the following requirements:

(A) *Disposition Documents.* The following documents must be delivered to the Management Committee and must be satisfactory, in form and substance, to the Management Committee in its sole and absolute discretion:

(1) *Disposition Instrument.* A copy of the instrument pursuant to which the Disposition is effected.

(2) *Ratification of this Agreement.* An instrument, executed by the Disposing Member and its Assignee, containing the following information and agreements, to the extent they are not contained in the instrument described in Section 3.03(b)(iv)(A)(1):

(aa) the notice address of the Assignee; (bb) if applicable, the Parent of the Assignee; (cc) the Sharing Ratios after the Disposition of the Disposing Member and its Assignee (which together must total the Sharing Ratio of the Disposing Member before the Disposition); (dd) the Assignee's ratification of this

Agreement, as modified by any applicable amendment, supplement or side letter hereto, and agreement to be bound by it, and its confirmation that the representations and warranties in Section 3.02 are true and correct with respect to it; (ee) [***]; and (ff) representations and warranties by the Disposing Member and its Assignee (1) that the Disposition and admission is being made in accordance with all applicable Laws, (2) that the matter set forth in Section 3.03(b)(iv)(A)(3) is true and correct, and (3) that the Disposition and admission do not violate any Financing Commitment or any other agreement to which the Company is a party.

(3) *Securities Law Opinion.* Upon the reasonable request of the Management Committee, unless the Membership Interest subject to the Disposition is registered under the Securities Act of 1933, as amended, and any applicable state securities Law, a favorable opinion of the Disposing Member's legal counsel, or, if so elected by the Management Committee, the Company's legal counsel or other legal counsel acceptable to the Management Committee, to the effect that the Disposition and admission is being made pursuant to a valid exemption from registration under those Laws and in accordance with those Laws; provided that no such opinion shall be required in the case of a Disposition by a Member to an Affiliate or a Disposition made in accordance with Section 3.03(d), with respect to [***], or Section 3.03(e) or Section 3.03(f).

(4) *Tax Opinion.* A favorable opinion of the Disposing Member's legal counsel, or, if so elected by the Management Committee, the Company's legal counsel or other legal counsel acceptable to the Management Committee, to the effect that the Disposition is being made to a transferee that either (i) is not a partnership, grantor trust, or Subchapter S corporation for United States federal income tax purposes, or (ii) is a partnership, grantor trust, or Subchapter S corporation for United States federal income tax purposes that is not part of a tiered arrangement, a principal purpose of which is to permit the Company to satisfy the 100 partner limitation set forth in Section 1.7704-1(h)(1)(ii) of the Treasury Regulations promulgated under the Code; provided that no such opinion shall be required in the case of a Disposition by a Member to an Affiliate or a Disposition made in accordance with Section 3.03(d), with respect to [***], or Section 3.03(e) or Section 3.03(f).

(B) *Payment of Expenses.* The Disposing Member and its Assignee shall pay, or reimburse the Company for, all reasonable costs and expenses incurred by the Company in connection with the Disposition and admission, including the legal fees incurred in connection with the legal opinions referred to in Section 3.03(b)(iv)(A)(3) and (4), on or before the 10th Day after the receipt by that Person of the Company's invoice for the amount due. The Company will provide such invoice as soon as practicable after the amount due is determined but in no event later than [***] Days thereafter. If payment is not made by the date due,

the Person owing that amount shall pay interest on the unpaid amount from the date due until paid at a rate per annum equal to the Default Rate.

(C) *No Release.* No Disposition of a Membership Interest shall effect a release of the Disposing Member from any liabilities to the Company or the other Members arising from events occurring prior to the Disposition.

(D) *Indebtedness of Company.* Any Disposition of all or any portion of the Membership Interest of a Member shall also include the Disposition of a proportionate share of the Indebtedness owed by the Company to the Disposing Member. As long as this Agreement shall remain in effect, all evidences of Indebtedness of the Company owed to any of the Members shall bear an appropriate legend to indicate that it is held subject to, and may be Disposed only in accordance with, the terms and conditions of this Agreement, and that such Disposition may be made only in conjunction with the Disposition of a proportionate part of such Member's Membership Interest.

(v) [Intentionally omitted.]

(vi) Change of Control.

(A) *General Buy-out Right.* Subject to Section 3.03(b)(vi)(B), 3.03(b)(vi)(C) and Section 3.03(b)(vi)(D), in the event of a Change of Control, then the Member with respect to which the Change of Control has occurred (the "*Changing Member*") shall promptly (and in all events within [***] Business Days after entrance into a definitive agreement providing for a Change of Control) give notice thereof (the "*Control Notice*") to the Company and each Founding Member. If the Control Notice is not given by the Changing Member as provided above and any other Member becomes aware of such Change of Control, such other Member shall have the right to give the Control Notice to the Changing Member, the Company and the other Members. Each of the Founding Members (excluding the Changing Member and its Affiliates) shall have the right (the "*General Buy-out Right*") to acquire the Membership Interest of the Changing Member for [***]. Each of the Founding Members (excluding the Changing Member and its Affiliates) shall have the right (but not the obligation) to acquire all or any portion of the Membership Interest of the Changing Member that is equal to [***]. Each of EQT and USG and their respective Affiliates (other than the Changing Member) shall have [***] Business Days, subject to any reasonable and necessary extension to obtain customary board approval, following the determination of [***] of such Membership Interest in which to notify each other Member and the Changing Member whether it desires to exercise its General Buy-out Right. A notice in which EQT and/or USG or their respective Affiliates exercises such General Buy-out Right is

referred to herein as a "*Change Exercise Notice*," and a Member that delivers a Change Exercise Notice is referred to herein as a "*Change Purchasing Member*." If, at the end of such [***]-Day period, there remains a portion of the Membership Interest for which such General Buy-out Right has not been exercised (a "*Change Unexercised Portion*"), then the Change Purchasing Members shall have an additional [***]-Day period in which to elect to purchase the remaining Change Unexercised Portion. The Changing Member and the Change Purchasing Members shall close the acquisition of the Membership Interest in accordance with Section 3.03(b)(vi)(E). A Member that fails to exercise a right

during any applicable period set forth in this Section 3.03(b)(vi)(A) shall be deemed to have waived such right for the subject Change of Control, but not any right for future Changes of Control. If none of the Founding Members exercises the General Buy-out Right, the Change of Control shall be effective and the successor in interest to the Changing Member shall be admitted as a Member upon compliance with Section 3.03(b)(iv).

(B) [***]

(C) [***]

(D) *Change of Control of Member That Is the Operator.* Notwithstanding the foregoing, [***].

(E) *Closing.* If the [***].

(F) *Definitions.* As used in this Section 3.03(b)(vi), [***].

(vii) [Intentionally omitted.]

(viii) [***]

(c) ***Encumbrances of Membership Interest.*** A Member may not Encumber its Membership Interest, except by complying with one of the following paragraphs:

(i) (A) such Member must receive the consent of [***] of the non-Encumbering Founding Members (calculated without reference to the Sharing Ratio of the Encumbering Founding Member), which consent (as contemplated by Section 6.02(f)(ii)) may be granted or withheld in the Sole Discretion of each such other Member; and (B) the instrument creating such Encumbrance must provide that any foreclosure of such Encumbrance (or Disposition in lieu of such foreclosure) must comply with the requirements of Sections 3.03(a) and (b); or

(ii) such Encumbrance is required by the terms of a Financing Commitment.

(d) [***]

(e) ***EQT MLP and Related Assignment Rights.*** Notwithstanding anything in this Agreement to the contrary, EQT shall have the right from time to time to sell or assign (i) to EQM, whether or not Controlled by EQT or its then Parent, or (ii) to any limited partnership, master limited partnership, any other Person or arrangement treated as a partnership for U.S. federal income tax purposes, any entity treated as a disregarded entity from any of the foregoing for such purposes or other Person Controlled by EQT or its then Parent all or any part of the Membership Interest then held by EQT or its Affiliates (provided that, in either case, if such sale or assignment occurs prior to the In-Service Date, then, at the time of such sale or assignment, such Assignee provides the Company with replacement Performance Assurances, if applicable, meeting the requirements of Section 4.01(b)), and any such Assignee may further sell or assign such Membership Interest to any such Person, directly or indirectly through multiple sales or assignment among Affiliates, in each case, without any consent from USG or its Affiliates and without triggering any rights or restrictions under or the provisions of Section 3.03(b)(ii) or during the period commencing on the Effective Date through the twelve-month anniversary of the In-Service Date, Section 3.03(b)(viii). EQT shall promptly provide to the Company and USG copies of the assignment instrument and the ratification instrument associated with each such sale or

assignment, and the Members shall amend Exhibit A to reflect the Sharing Ratios set forth in such ratification instrument.

(f) ***USG MLP and Related Assignment Rights.*** Notwithstanding anything in this Agreement to the contrary, USG shall have the right from time to time to sell or assign to any limited partnership or master limited partnership or other Person Controlled by USG or its then Parent all or any part of the Membership Interest then held by USG or its Affiliates (provided that, in either case, if such sale or assignment occurs prior to the In-Service Date, then, at the time of such sale or assignment, such Assignee provides the Company with replacement Performance Assurances, if applicable, meeting the requirements of Section 4.01(b)), and any such Assignee may further sell or assign such Membership Interest to any such Person, directly or indirectly through multiple sales or assignments among Affiliates, in each case, without any consent from EQT or its Affiliates and without triggering any rights or restrictions under or the provisions of Section 3.03(b)(ii) or during the period commencing on the Effective Date through the twelve-month anniversary of the In-Service Date, Section 3.03(b)(viii). USG shall promptly provide to the Company and EQT copies of the assignment instrument and the ratification instrument associated with each such sale or assignment, and the Members shall amend Exhibit A to reflect the Sharing Ratios set forth in such ratification instrument.

3.04 Creation of Additional Membership Interests. Additional Membership Interests may be created and issued to existing Members or to other Persons ([***]), and such other Persons may be admitted to the Company as Members, with the consent of [***], on such terms and conditions as [***] may determine at the time of admission. The terms of admission or issuance must specify the Sharing Ratios applicable thereto and may provide for the creation of different classes of Members having different rights, powers and duties. Any such admission is effective only after the New Member has executed and delivered to the Members an instrument containing the notice address of the New Member, the Assignee's ratification of this Agreement and agreement to be bound by it, and its confirmation that the representations and warranties in Section 3.02 are true and correct with respect to it. The provisions of this Section 3.04 shall not apply to Dispositions of Membership Interests or admissions of Assignees in connection therewith, such matters being governed by Sections 3.03(a) and (b).

3.05 Access to Information.

(a) Each Founding Member of the Company shall be entitled to receive any information that it may request concerning the Company; provided that this Section 3.05 shall not obligate the Company, the Management Committee, or the Operator to create any information that does not already exist at the time of such request (other than to convert existing information from one medium to another, such as providing a printout of information that is stored in a computer database), except as otherwise provided in Section 9.02. Each Founding Member shall also have the right, upon reasonable notice, and at all reasonable times during usual business hours to inspect the properties of the Company and to audit, examine, and make copies of the books of account and other records of the Company and to have access to the employees of the Operator to discuss the Company's businesses and financial affairs. Such right may be exercised through any agent or employee of such Founding Member designated in writing by it or by an independent public accountant, engineer, attorney or other consultant so designated. The Founding Member making the request shall bear all costs and expenses incurred in any inspection, examination or audit made on such Founding Member's behalf. The Founding Members and the Operator agree to reasonably cooperate, and to cause their respective independent public accountants, engineers, attorneys or other consultants to reasonably cooperate, in connection with any such request. Confidential Information obtained pursuant to this Section 3.05(a) shall be subject to the provisions of Section 3.06.

(b) Each New Member shall be entitled to receive only the information and reports set forth in Section 9.02. Confidential Information received pursuant to this Section 3.05(b) shall be subject to the

provisions of Section 3.06.

3.06 Confidential Information.

(a) Except as permitted by Section 3.06(b), (i) each Member shall keep confidential all Confidential Information and shall not disclose any Confidential Information to any Person, including any of its Affiliates, and (ii) each Member shall use the Confidential Information only in connection with the Facilities and the Company.

(b) Notwithstanding Section 3.06(a), but subject to the other provisions of this Section 3.06, a Member may make the following disclosures and uses of Confidential Information:

- (i) disclosures to another Member or to the Operator in connection with the Company;
- (ii) disclosures and uses that are approved in advance by the Management Committee;
- (iii) disclosures that may be required from time to time to obtain requisite Authorizations or financing for the Facilities, if such disclosures are approved in advance by the Management Committee;
- (iv) disclosures to an Affiliate of such Member, including the directors, officers, members, managers, employees, agents and advisors of such Affiliate, if such Affiliate

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has agreed to abide by the terms of this Section 3.06; provided, however, that in no event shall [***];

(v) disclosures to a Person that is not a Member or an Affiliate of a Member, if such Person has been retained by the Company, a Member, or the Operator to provide services in connection with the Company and has agreed to abide by the terms of this Section 3.06;

(vi) disclosures to a bona fide potential direct or indirect purchaser, or parent of such purchaser, of such Member's Membership Interest, if such potential purchaser has executed a confidentiality agreement in form and substance acceptable to the Management Committee;

(vii) disclosures required, with respect to a Member or an Affiliate of a Member, pursuant to (i) the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder, (ii) the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder, (iii) any state securities Laws, or (iv) any national securities exchange or automated quotation system; and

(viii) disclosures that a Member is legally compelled to make by deposition, interrogatory, request for documents, subpoena, civil investigative demand, order of a court of competent jurisdiction, or similar process, or otherwise by Law or that a Member makes to a Governmental Authority or regulatory authority pursuant to a regulatory request, examination, or audit; provided that, prior to any such disclosure, such Member shall, to the extent legally permissible:

(A) provide the Management Committee with prompt notice of such requirements so that one or more of the Members may seek a protective order or other appropriate remedy or waive compliance with the terms of this Section 3.06(b)(viii); and

(B) cooperate with the Management Committee and with the other Members in any attempt one or more of them may make to obtain a protective order or other appropriate remedy or assurance that confidential treatment will be afforded the

Confidential Information; and in the event such protective order or other remedy is not obtained, or the other Members waive compliance with the provisions hereof, such Member agrees (1) to furnish only that portion of the Confidential Information that, in the opinion of such Member's counsel, such Member is legally required to disclose, and (2) to exercise all reasonable efforts to obtain assurance that confidential treatment will be accorded such Confidential Information.

(c) Each Member shall take such precautionary measures as may be required to ensure (and such Member shall be responsible for) compliance with this Section 3.06 by any of its Affiliates, and its and their directors, officers, employees and agents, and other Persons to which it may disclose Confidential Information in accordance with this Section 3.06.

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(d) Promptly after any Withdrawal or Disposition by any Member of all of its Membership Interests pursuant to Sections 3.03 or 10.02, a Withdrawn Member or Disposing Member, as applicable, shall promptly destroy (and provide a certificate of destruction to the Company with respect to), or return to the Company, all Confidential Information in its possession. Notwithstanding the immediately preceding sentence, but subject to the other provisions of this Section 3.06, a Withdrawn Member or Disposing Member may retain for a stated period, but not disclose to any other Person, Confidential Information for the limited purposes of (i) explaining such Member's corporate decisions with respect to the Facilities; (ii) preparing such Member's tax returns and defending audits, investigations and proceedings relating thereto; or (iii) in compliance with such Member's document retention policy; provided that the Withdrawn Member or Disposing Member must notify the Management Committee in advance of such retention and specify in such notice the stated period of such retention.

(e) The Members agree that no adequate remedy at law exists for a breach or threatened breach of any of the provisions of this Section 3.06, the continuation of which unremedied will cause the Company and the other Members to suffer irreparable harm. Accordingly, the Members agree that the Company and the other Members shall be entitled, in addition to other remedies that may be available to them, to immediate injunctive relief from any breach of any of the provisions of this Section 3.06 and to specific performance of their rights hereunder, as well as to any other remedies available at law or in equity, pursuant to Sections 11.03 and 11.04.

(f) The obligations of the Members under this Section 3.06 (including the obligations of any Withdrawn Member) shall terminate on the [***] anniversary following the date on which such Member ceases to be a Member of the Company.

3.07 Liability to Third Parties. No Member or its Affiliates shall be liable for the debts, obligations or liabilities of the Company.

3.08 Use of Members' Names and Trademarks. The Company, the Members and their Affiliates shall not use the name or trademark of any Member or its Affiliates in connection with public announcements regarding the Company, or marketing or financing activities of the Company, without the prior written consent of such Member or Affiliate.

ARTICLE 4 CAPITAL CONTRIBUTIONS/LOANS

4.01 Capital Contributions. (a) Capital Calls.

(i) The Management Committee shall issue or cause to be issued a written request to each Member for the making of Capital Contributions at such times and in such amounts, in cash, as the Management Committee shall approve or as determined pursuant to Section 4.01(iii) (such written request referred to herein as a “*Capital Call*”) [***]. Capital Contributions shall be made by the Members in accordance with their respective Sharing Ratio. Such Capital Contributions shall be made in cash, unless a Supermajority Interest elects to request non-cash Capital Contributions; provided, that any Members that do not make such Capital Contributions in kind shall have the right to make such Capital Contributions in cash on a

pro rata basis. All amounts timely received by the Company pursuant to this Section 4.01 shall be credited to the respective Member’s Capital Account as of such specified date. All amounts timely received by the Company pursuant to this Section 4.01 shall be credited to the respective Member’s Capital Account as of such specified date.

(ii) As to the Construction Budget, the Initial Operating Budget and any Capital Budget associated with any Facility covered by any Approved Precedent Agreement approved by the Management Committee in accordance with Section 6.02(i)(S) or 6.02(i)(GG), no further approval of [***] shall be required for the Capital Calls required to fund such budget or project as set forth therein, subject to Section 6.02(i)(S) or 6.02(i)(GG); rather, subject to and in accordance with the COM Agreement, the Operator (in accordance with Section 4.01(a)(i)) shall issue written notices to the Company for such Capital Calls and, subject to Sections 6.02(i)(I) and (K), loans from Members, at such times and in such amounts necessary to fund the costs associated with such budget or project; provided, that approval of the Management Committee shall be required for any Capital Call issued by the Operator that would otherwise be subject to [***].

(iii) In connection with each individual Capital Call, the Management Committee, by the affirmative vote of [***], will determine what portion (if any) of such funding will be made pursuant to Capital Contributions and what portion (if any) of such funding will be made by loans by the Members to the Company. Upon receipt of each notice issued by the Operator pursuant to Section 4.01(ii), the Company shall issue written requests to each Member, consistent with the determination made pursuant to the preceding sentence, for the making of the Capital Contributions and/or loans required in connection with such notice.

(iv) Each Capital Call shall contain the following information:

(A) The total amount of Capital Contributions or loans requested from all Members;

(B) The amount of Capital Contribution or loans requested from the Member to whom the request is addressed, such amount to be in accordance with the Sharing Ratio of such Member;

(C) The purpose for which the funds are to be applied in such reasonable detail as the Management Committee shall reasonably direct; and

(D) The date on which payments of the Capital Contribution or loan shall be made (which date shall not be less than 30 Days following the date the Capital Call is given, unless a sooner date is reasonably determined to be necessary by the Management Committee) and the method of payment, provided that such date and method shall be the same for each of the Members.

(v) In the event the Management Committee fails to approve an Operating Budget within 30 Days of the submission of such Operating Budget to all of the Representatives on the Management

Committee for approval, the Operator is authorized, subject

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to Section 4.01(a)(ii), to issue a notice to the Company, pursuant to which the Company shall issue written requests to each Member for the making of Capital Contributions and/or loans required to fund the costs associated with such Operating Budget in an amount consistent with the Operating Budget most recently approved by the Management Committee and including costs that do not exceed, for any line item, [***] percent ([***]%) of the amount set forth for such line item in such most recently approved Operating Budget.

(vi) Each Member agrees that it shall make payments of its respective Capital Contributions or loans in accordance with Capital Calls issued pursuant to this Section 4.01.

(b) Each Member shall deliver, or cause to be delivered on such Member's behalf, to the Company:

(i) within [***] Business Days of the date hereof (or, with respect to a New Member admitted after the date hereof and prior to the In-Service Date, within 10 Business Days of such admission), for the period up to the issuance of FERC's initial release to the Company to commence construction pursuant to the FERC Certificate (the "*Initial Release*"), performance assurances ("*Performance Assurances*") equal to such Member's share of \$[***] (calculated based on such Member's Sharing Ratio); and

(ii) within ten (10) Business Days of the date of the Initial Release (or, with respect to a New Member admitted after the Initial Release, within ten (10) Business Days of such admission) for the period following the Initial Release and up to the In-Service Date, Performance Assurances equal to [***] percent ([***]%) of an amount equal to such Member's Sharing Ratio multiplied by the remaining obligations under the applicable Construction Budget and less any security posted by such Member, or Member's Affiliate, under any Approved Precedent Agreement).

The Company shall be entitled to draw from the Performance Assurances in the event a Member fails to make payments of its respective Capital Contributions in accordance with Capital Calls issued pursuant to this Section 4.01. The Performance Assurances posted by a Member pursuant to this Section 4.01(b) shall be reduced (i) at the end of each Quarter, to reflect the [***] percent ([***]%) of such Member's actual Capital Contributions made to the Company during such Quarter, (ii) to reflect any Performance Assurances posted by any New Members, and (iii) in connection with a Disposition of all or a portion of such Member's Membership Interest, to reflect the replacement Performance Assurances to be posted by the Assignee of such Membership Interest pursuant to this Section 4.01(b). Notwithstanding anything to the contrary in this Section 4.01(vi), at no time prior to the In-Service Date will a Member's Performance Assurance obligation be less than such Member's share of \$[***] (calculated based on a Member's Sharing Ratio). Such Performance Assurances shall be permitted to be in the form of one or more of (A) a full and unconditional written guarantee from a Qualified Guarantor, (B) a Letter of Credit or (C) cash collateral (with the ability to substitute from time to time among (A), (B) or (C)). For the avoidance of doubt, a Member's obligation to post Performance Assurances pursuant to this Section 4.01(vi) shall expire (and any obligations under any posted Performance Assurances shall terminate) on the In-Service Date.

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(c) In addition to the authority granted the Management Committee in the other provisions of this Section 4.01 to issue Capital Calls, if within [***] Days prior to the date any Indebtedness of the Company will become a Matured Financing Obligation (or within [***] Days after any notice of acceleration of any such

Indebtedness received prior to the maturity date thereof), (i) the Management Committee has not made a Capital Call for the payment of such amount that is (or is expected to be) a Matured Financing Obligation, and (ii) the Company has been unable to secure refinancing for such Matured Financing Obligation on reasonably acceptable terms after negotiating in good faith to do so with third-party lender(s), then at any time thereafter, (1) either EQT or USG may, on behalf of the Management Committee, issue a Capital Call for cash in the amount required for the payment of such Matured Financing Obligation, and each Member shall be obligated to pay such Capital Call as provided in this Section 4.01, but such payment shall be made within [***] Days after the date the Capital Call is given (and not the [***] Day period provided for in Section 4.01(a)(v)(D)); provided that any failure by a Member to make a Capital Contribution with respect to a Capital Call made pursuant to this Section 4.01(c)(1) shall not constitute a Default under or breach of this Agreement; and (2) in the event any Member fails to make a Capital Contribution with respect to a Capital Call made pursuant to Section 4.01(c)(1), on or prior to such [***] Day, then each Founding Member shall have the right, but not the obligation, to pay the portion of the Capital Contribution owed and unpaid to permit the Company to discharge such Matured Financing Obligation. If any Founding Member elects to pay such Matured Financing Obligation pursuant to Section 4.01(c)(2), then such Founding Member will be deemed to be an Additional Contribution/Loan Member with respect to such payment, and its payment of the Matured Financing Obligation shall be treated, at the election of such Additional Contribution/Loan Member, as one of either: (A) a Capital Contribution or loan resulting in the Additional Contribution/Loan Members receiving [***] or (B) a permanent Capital Contribution that results in an adjustment of the Sharing Ratios of the non-contributing Member and the electing Founding Member under Section 4.06(c).

4.02 Loans.

(a) If pursuant to Section 4.01(a)(iii) the Management Committee determines as to any individual Capital Call that all or a portion of such Capital Call shall be made by loans from the Members to the Company, then each Member shall make a loan to the Company at the time and in the amount and under such terms and conditions as the Management Committee shall approve by the affirmative vote of a Supermajority Interest; provided that the Management Committee shall not call for loans rather than Capital Contributions if doing so would breach any Financing Commitment or other agreement of the Company.

(b) All amounts received from a Member after the date specified in Section 4.02(c)(iv) by the Company pursuant to this Section 4.02 shall be accompanied by interest on such overdue amounts (and the default shall not be cured unless such interest is also received by the Company), which interest shall be payable to the Company and shall accrue from and after such specified date at the Default Rate. Any such interest paid shall be treated as a penalty and shall not be considered part of the principal of the loan and shall not be repaid by the Company.

(c) In addition to the information required pursuant to Section 4.01(a)(iv), each written request issued pursuant to Section 4.01(a)(iv)(D) shall contain all terms concerning

the interest rate, security, seniority, repayment and any other material terms of or otherwise related to such loans; provided that such terms shall be the same for each of the Members.

(d) Each Member agrees that it shall make its respective loans in accordance with requests issued pursuant to this Section 4.02.

4.03 No Other Contribution or Loan Obligations. No Member shall be required or permitted to make any Capital Contributions or loans to the Company except pursuant to this Article 4.

4.04 Return of Contributions. Except as expressly provided herein, a Member is not entitled to the return of any part of its Capital Contributions or to be paid interest in respect of either its Capital Account or its Capital Contributions. An unreturned Capital Contribution is not a liability of the Company or of any Member. A Member is not required to contribute or to lend any cash or property to the Company to enable the Company to return any Member's Capital Contributions.

4.05 Capital Accounts.

(a) A separate Capital Account shall be established and maintained for each Member with respect to such Member's Membership Interest in the Company. Each Member's Capital Account shall be increased by (i) the amount of money contributed by that Member to the Company; (ii) the initial Book Value of property contributed by that Member to the Company (net of liabilities secured by such contributed property that the Company is considered to assume or take subject to under Section 752 of the Code); (iii) allocations to that Member of Net Profit and items of income or gain, including items specifically allocated to such Member pursuant to Section 5.04(c); and (iv) the amount of any liabilities assumed by such Member and shall be decreased by (v) the amount of money distributed to that Member by the Company; (vi) the Book Value of property distributed to that Member by the Company (net of liabilities secured by such distributed property that such Member is considered to assume or take subject to under Section 752 of the Code); (vii) allocations to that Member of Net Loss and items of loss or deduction, including items specifically allocated to such Member pursuant to Section 5.04(c) and (viii) the amount of any liabilities of such Member assumed by the Company. A Member who has more than one Membership Interest shall have a single Capital Account that reflects all such Membership Interests, regardless of the class of Membership Interests owned by such Member and regardless of the time or manner in which such Membership Interests were acquired. Upon the Disposition of all or a portion of a Membership Interest, the Capital Account of the Disposing Member that is attributable to such Membership Interest shall carry over to the Assignee in accordance with the provisions of Treasury Regulation Section 1.704-1(b)(2)(iv)(l). The Capital Accounts shall not be deemed to be, nor have the same meaning as, the capital account of the Company under the NGA.

(b) In the discretion of the Management Committee, the Book Value of the Company's assets shall be increased or decreased to reflect a revaluation of the property based on the fair market value of the property on the date of adjustment immediately prior to any of the following (each, a "**Revaluation Event**") (A) the contribution of more than a *de minimis* amount of money or other property to the Company by a new or existing Member as consideration for a

Membership Interest or an increased Sharing Ratio, (B) the distribution of more than a *de minimis* amount of money or other property by the Company to a Member as consideration for a Membership Interest, or (C) the liquidation of the Company. Whenever the fair market value of property is required to be determined pursuant to this Agreement (including the preceding sentence), the Operator shall propose such a fair market value in a notice to the other Members. If any other Member disagrees with such determination, such Member shall notify the other Members of such disagreement within [***] Business Days of receiving such notice. If such Dispute is not resolved within [***] Business Days after such notice, any Member may submit such Dispute for binding appraisal in accordance with Section 13.11(c) by delivering a FMV Notice to the other Members.

This Section 4.05 is intended to comply with the capital account maintenance provisions of Treasury Regulations Section 1.704-1(b)(2)(iv) and will be applied and interpreted in accordance with such Treasury Regulations.

4.06 Failure to Make a Capital Contribution or Loan.

(a) **General.** If any Member fails to make a Capital Contribution as requested by the Management Committee (but excluding Capital Calls issued on behalf of the Management Committee pursuant to Section 4.01(c)) in a Capital Call validly and timely issued pursuant to Section 4.01 or a loan when required pursuant to Section 4.02(a) (each such Member being a “*Non-Contributing/Loan Member*”), and if such failure continues for more than [***] Days after the date on which it is due, the Members that have contributed their Capital Contribution or made their loan, as applicable (each, a “*Contributing/Loan Member*”) may (without limitation as to other remedies that may be available, and in particular such other remedies shall include the right to specifically enforce the obligation of the Non-Contributing/Loan Member to make the required Capital Contribution or loan) thereafter elect to:

(i) treat the Non-Contributing/Loan Member’s failure to contribute as a Default by giving notice thereof to the Non-Contributing/Loan Member, in which event the provisions of this Agreement regarding the commission of a Default by a Member shall apply (but if the Capital Call is for the payment of a Matured Financing Obligation, the Default shall be immediate on the giving of such notice and the [***]-Day cure period contemplated in the definition of Default shall not apply); or

(ii) pay the portion of the Capital Contribution owed and unpaid by, or make the loan required from, the Non-Contributing/Loan Member (the “*Additional Contribution/Loan*”) in which event the Contributing/Loan Members that elect to fund the Non-Contributing/Loan Members’ share (the “*Additional Contribution/Loan Members*”) may treat the contribution or loan, as applicable as one of: (1) a Capital Contribution or loan, as applicable, resulting in the Additional Contribution/Loan Members receiving [***] under Section 4.06(b), or (2) a permanent Capital Contribution that results in an adjustment of Sharing Ratios under Section 4.06(c), as determined by the Additional Contribution/Loan Members as set forth below.

No Contributing/Loan Member shall be obligated to make either election under clause (i) or clause (ii) above. The decision of the Contributing/Loan Members to elect (i) or (ii) above shall be made by the determination of the Contributing/Loan Members holding the

Supermajority Interest of all Contributing/Loan Members, but clause (ii) above may not be elected unless at such time of determination there is one or more Additional Contribution/Loan Members. The decision of the Additional Contribution/Loan Members to elect clause (ii)(1) or clause (ii)(2) above shall be made by the determination of the Additional Contribution/Loan Members holding the Supermajority Interest of all Additional Contribution/Loan Members. Unless and until such election is made, payment of the Additional Contribution/Loan shall be treated as a Priority Interest under Section 4.06(a)(ii) (1). [***]

(b) [***]:

(i) [***]

(ii) [***] shall not alter the Sharing Ratios of the Members, nor shall [***] alter any distributions to the Contributing/Loan Members (in their capacity as Contributing/Loan Members, as opposed to their capacity as Additional Contribution/Loan Members) in accordance with their respective Sharing Ratios. Notwithstanding any provision in this Agreement to the contrary, a Member may not Dispose of all or a portion of [***] except to a Person to whom it Disposes all or the applicable *pro rata* portion of its Membership Interest after compliance with the requirements of this Agreement in connection therewith.

(iii) For so long as any Additional Contribution/Loan Member holds [***], neither any Non-Contributing/Loan Member nor its Representative shall have the right to vote its Membership Interest (or Sharing Ratio) under this Agreement with respect to any decision regarding distributions from the Company, and any distribution to which such Non-Contributing/Loan Member is entitled shall be paid [***].

(iv) No Member that is a Non-Contributing/Loan Member may Dispose of its Membership Interest unless, at the closing of such Disposition, either the Non-Contributing/Loan Member or the proposed Assignee pays [***]. No Assignee shall be admitted to the Company as a Member until compliance with this Section 4.06(b)(iv) has occurred.

(c) **Permanent Contribution.** If the Additional Contribution/Loan Members elect under Section 4.06(a)(ii) to have the Additional Contribution/Loan treated as a permanent Capital Contribution, then the Sharing Ratios of the Additional Contribution/Loan Members and the Non-Contributing/Loan Member will be automatically adjusted to equal each Member's total Capital Contributions when expressed as a percentage of all such Members' Capital Contributions (after giving effect to the Capital Contribution made by the Additional Contribution/Loan Members).

(d) **Further Assurance.** In connection with this Section 4.06, each Member shall execute and deliver any additional documents and instruments and perform any additional acts that may be necessary or appropriate to effectuate and perform the provisions of this Section 4.06.

(e) **Deemed Non-Contributing/Loan Member.** Notwithstanding anything to the contrary, for purposes of this Agreement the term "Non-Contributing/Loan Member" shall include any Member who (i) fails to duly elect to make a proposed Capital Call under Section 4.01 or a proposed loan pursuant to Section 4.02 and (ii) fails to fund such Capital Call or loan,

in each case, to the extent necessary to cover the amount of any Matured Financing Obligation that is to become due within [***] Days or that has become due (by acceleration or otherwise).

4.07 **Credit Assurance.**

(a) Unless otherwise agreed to by [***], if the Company is required to provide a guaranty, letter of credit or other credit support (each a "**Credit Assurance**") to a counterparty under any contract or agreement (including an Approved Precedent Agreement) approved by the Management Committee of the Company prior to the In-Service Date (each a "**Subject Contract**"), then each Member agrees to provide or cause to be provided (on behalf of the Company and within [***] Business Days of the Company's request) to such counterparty the required form of Credit Assurance in an amount equal to the product of (i) the total dollar amount of the obligations for which the Company is required to provide such Credit Assurance, and (ii) such Member's Sharing Ratio. As to any New Member, if at the time of admittance any Credit Assurance has been provided by the Members, then such New Member shall provide (on behalf of the Company and within [***] Business Days of the Company's request) to the applicable counterparty such Credit Assurance in the same form and in an amount equal to the product of (i) the total dollar amount of obligations for which the Company is required to provide such Credit Assurance and (ii) such New Member's Sharing Ratio. Any Credit Assurances posted by the then-current Members shall be reduced to reflect the New Member's Credit Assurances and in accordance with such Member's Sharing Ratio.

(b) If a breach, default or other event occurs under a Subject Contract and the counterparty thereunder makes a demand or draw on one or more Credit Assurances for such breach, default or other event (a "**Demand Event**"), then a determination will be made as to the total dollar amount demanded or drawn by such counterparty for such Demand Event ("**Total Event Demand Amount**"). [***]

(c) If any Member [***] then such Member [***].

ARTICLE 5 DISTRIBUTIONS AND ALLOCATIONS

5.01 Distributions. Within [***] Days following the end of each Quarter following the In-Service Date, the Management Committee shall determine the amount of Available Cash with respect to such Quarter, and an amount equal to 100% of Available Cash with respect to such Quarter shall, subject to Section 18-607 of the Act, be distributed in accordance with this Article 5 to the Members (other than a Breaching Member) in proportion to their respective Sharing Ratios (at the time the amounts of such distributions are made); provided, however, that, if the Management Committee fails timely to determine the amount of Available Cash with respect to any Quarter following the In-Service Date, an amount equal to [***]% of the Available Cash determined with respect to the immediately preceding Quarter shall, subject to Section 18-607 of the Act, be distributed in accordance with this Article 5 to the Members (other than a Breaching Member) in proportion to their respective Sharing Ratios (at the time the amounts of such distributions are made); provided that amounts otherwise distributable to WGL pursuant to the foregoing shall be further apportioned between WGL and Vega Carryco and distributed as follows:

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- (a) prior to the occurrence of a Dissolution Event, [***]% to WGL and [***]% to Vega Carryco; and
- (b) upon and following the occurrence of a Dissolution Event:
- (i) *first*, [***]% to WGL until [***], and
- (ii) *thereafter*, [***]% to WGL and [***]% to Vega Carryco.

5.02 [Intentionally omitted.]

5.03 [Intentionally omitted.]

5.04 Allocations for Maintaining Capital Accounts.

(a) Except as otherwise provided herein, for purposes of maintaining the Capital Accounts pursuant to Section 4.05, Net Profit and Net Loss (and, to the extent necessary, individual items of income, gain, loss or deduction) for a fiscal year or other period shall be allocated among the Members such that the Adjusted Capital Account (determined without regard to clause (b) of the definition of Adjusted Capital Account) balance of each Member, immediately after making such allocation, is, as nearly as possible, equal proportionately to such Member's Target Capital Account Amount. For these purposes, a Member's "***Target Capital Account Amount***" equals the amount of distributions that would be made to such Member pursuant to Section 5.01 if all of the Company's assets were sold for cash at a price equal to their Book Value, all Company liabilities were satisfied (limited with respect to each nonrecourse liability within the meaning of Treasury Regulations Section 1.704-2(b)(3) to the Book Value of the assets securing such liability) and all of the remaining assets of the Company were distributed in accordance with Section 5.01 to the Members immediately after such hypothetical sale of assets.

(b) [Intentionally omitted].

(c) Notwithstanding the foregoing provisions of Section 5.04, the following special allocations will be made:

(i) [Intentionally omitted.]

(ii) Nonrecourse Deductions shall be allocated to the Members in proportion to their Sharing Ratios.

(iii) Member Nonrecourse Deductions attributable to Member Nonrecourse Debt shall be allocated to the Members bearing the Economic Risk of Loss for such Member Nonrecourse Debt as determined under Treasury Regulation Section 1.704-2(b)(4). If more than one Member bears the Economic Risk of Loss for such Member Nonrecourse Debt, the Member Nonrecourse Deductions attributable to such Member Nonrecourse Debt shall be allocated among the Members according to the ratio in which they bear the Economic Risk of Loss. This Section 5.04(c)(iii) is intended to comply with the provisions of Treasury Regulation Section 1.704-2(i) and shall be interpreted consistently therewith.

(iv) Notwithstanding any other provision hereof to the contrary, if there is a net decrease in Minimum Gain for an allocation period (or if there was a net decrease in Minimum Gain for a prior allocation period and the Company did not have sufficient amounts of income and gain during prior periods to allocate among the Members under this Section 5.04(c)(iv), items of income and gain shall be allocated to each Member in an amount equal to such Member's share of the net decrease in such Minimum Gain (as determined pursuant to Treasury Regulation Section 1.704-2(g)(2)). This Section 5.04(c)(iv) is intended to constitute a minimum gain chargeback under Treasury Regulation Section 1.704-2(f) and shall be interpreted consistently therewith.

(v) Notwithstanding any provision hereof to the contrary except Section 5.04(c)(iv) (dealing with Minimum Gain), if there is a net decrease in Member Nonrecourse Debt Minimum Gain for an allocation period (or if there was a net decrease in Member Nonrecourse Debt Minimum Gain for a prior allocation period and the Company did not have sufficient amounts of income and gain during prior periods to allocate among the Members under this Section 5.04(c)(v)), items of income and gain shall be allocated to each Member in an amount equal to such Member's share of the net decrease in Member Nonrecourse Debt Minimum Gain (as determined pursuant to Treasury Regulation Section 1.704-2(i)(4)). This Section 5.04(c)(v) is intended to constitute a partner nonrecourse debt minimum gain chargeback under Treasury Regulation Section 1.704-2(i)(4) and shall be interpreted consistently therewith.

(vi) Notwithstanding any provision hereof to the contrary except Section 5.04(c)(ii) and Section 5.04(c)(iii), no Net Loss or items of loss or deduction shall be allocated to any Member to the extent that such allocation would cause such Member to have a deficit Adjusted Capital Account balance (or increase any existing deficit Adjusted Capital Account balance) at the end of the allocation period. All Net Loss and items of loss or deduction in excess of the limitation set forth in this Section 5.04(c)(vi) shall be allocated to the Members who do not have a deficit Adjusted Capital Account balance in proportion to their relative positive Adjusted Capital Accounts but only to the extent that such Net Loss and items of loss or deduction do not cause any such Member to have a deficit Adjusted Capital Account balance.

(vii) If any Member unexpectedly receives any adjustments, allocations or distributions described in Treasury Regulations Sections 1.704-1(b)(2)(ii)(d)(4), (5) or (6) resulting in or increasing an Adjusted Capital Account deficit for such Member, items of income and gain will be specially allocated to such Member in any amount and manner sufficient to eliminate, to the extent required by the Treasury Regulations, such Adjusted Capital Account deficit of the Member as quickly as possible; provided, however, that an allocation pursuant to this Section 5.04(c)(vii) shall be made only if and to the extent that such Member would have a deficit Adjusted Capital Account balance after all other allocations provided for in this Article 5 have been tentatively made as if this Section 5.04(c)(vii) were not in this Agreement. The items of income or gain to be allocated will be determined in accordance with Treasury Regulations Section 1.704-1(b)(2)(ii)(d). This subsection (vii) is intended to qualify and be construed as a "qualifying income offset" within the meaning of

Treasury Regulations Section 1.704-1(b)(2)(ii)(d) and will be applied and interpreted in accordance with such Treasury Regulations.

(viii) To the extent that an adjustment to the adjusted tax basis of any Company asset pursuant to Sections 734(b) or 743(b) of the Internal Revenue Code is required, pursuant to Treasury Regulations Section 1.704-1(b)(2)(iv)(m)(2) or Treasury Regulation Section 1.704-1(b)(2)(iv)(m)(4), to be taken into account in determining Capital Accounts as a result of a distribution to a Member in complete liquidation of its Membership Interest, the amount of such adjustment to the Capital Accounts will be treated as an item of gain (if the adjustment increases the basis of the asset) or loss (if the adjustment decreases the basis of the asset), and such gain or loss will be specially allocated to the Members in accordance with Section 5.04(a) in the event that Treasury Regulations Section 1.704-1(b)(2)(iv)(m)(2) applies, or to the Members to whom such distribution was made in the event that Treasury Regulations Section 1.704-1(b)(2)(iv)(m)(4) applies.

5.05 Allocations for Tax Purposes.

(a) Except as provided in Section 5.05(b) and Section 5.05(c) or as otherwise required by the Code or Treasury Regulations, solely for federal income tax purposes, items of taxable income, gain, loss and deduction of the Company for each fiscal year or other relevant period shall be allocated among the Members in the same manner as each correlative item of “book” income, gain, loss and deduction is allocated to the Capital Accounts of the Members pursuant to Section 5.04 and each tax credit shall be allocated to the Members in the same manner as the receipt or expenditure giving rise to such credit is allocated pursuant to Section 5.04.

(b) Income, gain, loss, and deduction with respect to property contributed to the Company by a Member or revalued pursuant to Treasury Regulation Section 1.704-1(b)(2)(iv)(f) shall be allocated among the Members in a manner that takes into account the variation between the adjusted tax basis of such property and its Book Value, as required by Section 704(c) of the Code and Treasury Regulation Section 1.704-1(b)(4)(i), using the remedial allocation method permitted by Treasury Regulation Section 1.704-3(d).

(c) Pursuant to Treasury Regulations Section 1.1245-1(e), to the extent the Company recognizes gain as a result of a sale, exchange or other disposition of Company assets which is taxable as recapture income under Sections 1245 or 1250 of the Code or unrecaptured Section 1250 gain under Section 1(h) of the Code, such recapture income shall be allocated among the Members in the same proportion as the depreciation and amortization giving rise to such recapture income was allocable among the Members. In no event, however, shall any Member be allocated recapture income hereunder in excess of the amount of gain allocated to the Member under this Agreement. Any recapture income that is not allocated to a Member due to the gain limitation described in the previous sentence shall be allocated among those Members whose shares of total gain on the sale, exchange or other disposition of the property exceed their share of depreciation and amortization attributable to Company assets, in proportion to their relative shares of the total allocable gain.

(d) The Members’ proportionate share of the “excess nonrecourse liabilities,” within the meaning of the Treasury Regulation Section 1.752-3(a)(3), shall be allocated to the Members in proportion to their respective Sharing Ratios; provided, that WGL’s Sharing Ratio

share of such “excess nonrecourse liabilities” shall be further allocated 6.67% to Vega Carryco and 93.33% to WGL.

(e) Allocations pursuant to this Section 5.05 are solely for federal (and, where applicable, state and local) tax purposes and shall not affect, or in any way be taken into account in computing, any Capital Account or share of income, gain, loss and other deduction described in Section 5.04 or distributions pursuant to any provision of this Agreement.

(f) The Members are aware of the income and other tax consequences of the allocations made by this Agreement and hereby agree to be bound by the provisions of this Agreement in reporting their shares of items of income, gain, loss, credit and deduction.

5.06 Varying Interests. All items of income, gain, loss, deduction or credit shall be allocated, and all distributions shall be made, to the Persons shown on the records of the Company to have been Members as of the last Day of the period for which the allocation or distribution is to be made. Notwithstanding the foregoing, if during any taxable year there is a change in any Member's Sharing Ratio, the Members agree that their allocable shares of such items for the taxable year shall be determined based on any method determined by the Management Committee to be permissible under Code Section 706 and the related Treasury Regulations to take account of the Members' varying Sharing Ratios.

5.07 Amounts Withheld. The Company is authorized to withhold from payments and distributions to the Members and to pay over to any federal, state or local Governmental Authority any amounts required to be so withheld pursuant to the Code or any provisions of any applicable Law and shall allocate such amounts to the Members with respect to which such amounts were withheld. All amounts withheld pursuant to the Code or any provisions of any applicable Law with respect to any payment, distribution or allocation shall be treated for all purposes under this Agreement as amounts paid or distributed pursuant to this Article 5 to the Members with respect to which such amount was withheld. All taxes paid on behalf of such Member pursuant to this Section 5.07 in excess of any distributions otherwise payable to such Member shall, at the option of the Company, (i) be promptly paid to the Company by such Member or (ii) be repaid by reducing the amount of the current or next succeeding distribution or distributions which would otherwise have been made to such Member or, if such distributions are not sufficient for that purpose, by so reducing the proceeds of liquidation otherwise payable to such Member. Whenever the Company selects option (ii) of the preceding sentence, such Member shall for all purposes of this Agreement be treated as having received a distribution under 5.01 of the amount of the tax payment. To the fullest extent permitted by law, each Member hereby agrees to indemnify and hold harmless the Company and the other Members from and against any liability for taxes (and related interest, penalties or additions to tax) with respect to income attributable to or distributions or other payments to such Member.

5.08 Tax Distributions. Notwithstanding the provisions of Section 5.01, and unless prohibited by applicable Law or any contractual limitations of the Company, to the extent a Member receives or is estimated to receive allocations of net taxable income or gain for a fiscal year (or a portion thereof) ("**Allocated Income**") but has not otherwise received aggregate distributions of Available Cash pursuant to Section 5.01 during such fiscal year (or portion thereof) and this Section 5.08 with respect to such fiscal year (or portion thereof) sufficient to

pay the Member's Hypothetical Tax Amount on such Member's Allocated Income (including any estimate thereof) (the "**Distribution Shortfall**"), the Company shall distribute pro rata, based on the Members' Sharing Ratios, a sufficient amount of Available Cash (limited to the amount thereof) to satisfy such Distribution Shortfall for each Member ("**Tax Advances**"). Such Tax Advances shall be made on an estimated basis no later than the 31st day of each March of each calendar year. For the avoidance of doubt, Tax Advances paid in March shall be deemed made with respect to the immediately preceding fiscal year. The term "**Hypothetical Tax Amount**" means, with respect to each Member, an amount equal to the product of (a) the amount of such Member's Allocated Income, multiplied by (b) the Tax Rate. The Management Committee shall use the information reasonably available to it at the time in calculating the Hypothetical Tax Amount for each Member.

Any distributions to a Member under this Section 5.08 shall be treated as a preliminary distribution of future amounts due to such Member under Section 5.01 and any future distributions due to such Member under Section 5.01, including distributions in liquidation pursuant to Section 12.02, shall be adjusted so that aggregate distributions are according to Section 5.01 priorities. In the event that, at the time of liquidation of the Company distributions under this Section 5.08 have not been fully recouped against amounts distributable under Section 5.01 and Section 12.02, the Member who received such excess distributions shall be obligated to recontribute the amount of such excess to the Company in connection with the dissolution of the Company.

ARTICLE 6 MANAGEMENT

6.01 Generally. The management of the Company is fully vested in the Founding Members as set forth in Section 6.02; provided, however, that in the event there are no longer any Founding Members, the Management Committee shall be comprised of one Representative for each Member, which Representative shall have a vote equal to the designating Member's Sharing Ratio (each Member entitled to participate in the Management Committee at a given time, a "*Management Committee Member*"). To facilitate the orderly and efficient management of the Company, the Founding Members (or, in the event there are no longer any Founding Members, the Members' Representatives) shall act (a) collectively as a "committee of the whole" pursuant to Section 6.02, and (b) through the delegation of certain duties and authority to the Operator. Subject to the express provisions of this Agreement, each Member agrees that it will not exercise its authority under the Act to bind or commit the Company to agreements, transactions or other arrangements, or to hold itself out as an agent of the Company.

6.02 Management Committee. The Management Committee Members shall act collectively through meetings as a "committee of the whole," which is hereby named the "*Management Committee.*" Decisions or actions taken by the Management Committee in accordance with the provisions of this Agreement shall constitute decisions or actions by the Company and shall be binding on each Member, Representative, and employee of the Company. The Management Committee shall conduct its affairs in accordance with the following provisions and the other provisions of this Agreement:

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(a) Representatives.

(i) Designation. To facilitate the orderly and efficient conduct of Management Committee meetings, each Management Committee Member (together with its Affiliates, if applicable, for Founding Members, if any) shall notify the other Management Committee Member(s), from time to time, of the identity of (A) one of its senior officers, who will represent it at such meetings (a "*Representative*"), and (B) at least one, but not more than two, additional senior officers, who will represent it at any meeting that the Management Committee Member's Representative is unable to attend (each an "*Alternate Representative*"). (The term "*Representative*" shall also refer to any Alternate Representative that is actually performing the duties of the applicable Representative.) [***] The initial Representative and Alternate Representatives of each Management Committee Member are set forth in Exhibit A. A Management Committee Member may designate a different Representative or Alternate Representatives for any meeting of the Management Committee by notifying the other Management Committee Member(s) at least [***] Business Days prior to the scheduled date for such meeting; provided that, if giving such advance notice is not feasible, then such new Representative or Alternate Representatives shall present written evidence of his or her authority at the commencement of such meeting.

(ii) Authority. Each Representative shall have the full authority to act on behalf of the Management Committee Member that designated such Representative; the action of a Representative at a meeting (or through a written consent) of the Management Committee shall bind the Management Committee

Member that designated such Representative; and the other Members shall be entitled to rely upon such action without further inquiry or investigation as to the actual authority (or lack thereof) of such Representative. In addition, the act of an Alternate Representative shall be deemed the act of the Representative for which such Alternate Representative is acting, without the need to produce evidence of the absence or unavailability of such Representative.

(iii) DISCLAIMER OF DUTIES; INDEMNIFICATION. EACH REPRESENTATIVE SHALL REPRESENT, AND OWE DUTIES TO, ONLY THE MEMBER THAT DESIGNATED SUCH REPRESENTATIVE (THE NATURE AND EXTENT OF SUCH DUTIES BEING AN INTERNAL AFFAIR OF SUCH MEMBER), AND SHALL NOT OWE ANY DUTIES (INCLUDING FIDUCIARY DUTIES) TO THE COMPANY, ANY OTHER MEMBER OR REPRESENTATIVE, OR ANY AFFILIATE, OFFICER, OR EMPLOYEE OF THE COMPANY, ANY OTHER MEMBER, OR ANY OTHER PERSON. THE PROVISIONS OF SECTIONS 6.02(f)(ii) AND 6.04 SHALL ALSO INURE TO THE BENEFIT OF EACH MEMBER'S REPRESENTATIVE. THE COMPANY SHALL INDEMNIFY, PROTECT, DEFEND, RELEASE AND HOLD HARMLESS EACH REPRESENTATIVE FROM AND AGAINST ANY CLAIMS ASSERTED BY OR ON BEHALF OF ANY PERSON (INCLUDING ANOTHER MEMBER), OTHER THAN THE MEMBER THAT DESIGNATED SUCH REPRESENTATIVE, THAT ARISE OUT OF, RELATE TO, OR ARE OTHERWISE ATTRIBUTABLE TO, DIRECTLY OR INDIRECTLY, THE COMPANY OR SUCH REPRESENTATIVE'S SERVICE ON THE MANAGEMENT COMMITTEE.

(iv) Attendance. Each Management Committee Member shall use all reasonable efforts to cause its Representative or Alternate Representative to attend each meeting

of the Management Committee, unless its Representative is unable to do so because of a "force majeure" event or other event beyond his reasonable control, in which event such Management Committee Member shall use all reasonable efforts to cause its Representative or Alternate Representative to participate in the meeting by telephone pursuant to Section 6.02(h).

(b) Secretary. The Management Committee may designate a Secretary of the Management Committee, who need not be a Representative or an employee of a Member or any Affiliate thereof.

(c) Procedures. The Secretary, or if no Secretary has been appointed, a person designated in writing by the Representatives, of the Management Committee shall maintain written minutes of each meeting held by the Management Committee. The Management Committee may adopt whatever rules and procedures relating to its activities as it may deem appropriate, provided that such rules and procedures shall not be inconsistent with or violate the provisions of this Agreement.

(d) Time and Place of Meetings. The Management Committee shall meet quarterly, subject to more or less frequent meetings upon approval of the Management Committee. Notice of, and an agenda for, all Management Committee meetings shall be provided by the Representatives to all Members at least five Days prior to the date of each meeting, together with proposed minutes of the previous Management Committee meeting (if such minutes have not been previously ratified). Among other items, the agenda will provide for a discussion of (i) the results of operations, including explanations of significant variances in revenues, expenses and cash flow activities and (ii) amounts due for contractual obligations that will impact Available Cash. Special meetings of the Management Committee may be called at such times, and in such manner, as any Management Committee Member reasonably deems necessary. Any Management Committee Member calling for any such special meeting shall notify the Representatives, who in turn shall notify all Management Committee Members of the date and agenda for such meeting at least five Days prior to the date of such meeting. Such five-Day period may be shortened by the Management Committee, acting through Supermajority Interest. All meetings of the Management Committee shall be held at a location agreed upon by the

Representatives. Attendance of a Representative of a Management Committee Member at a meeting of the Management Committee shall constitute a waiver of notice of such meeting, except where such Representative attends the meeting for the express purpose of objecting to the transaction of any business on the ground that the meeting is not lawfully called or convened.

(e) ***Quorum.*** The presence of Representative(s) of Management Committee Members representing a Supermajority Interest shall constitute a quorum for the transaction of business at any meeting of the Management Committee.

(f) ***Voting.***

(i) ***Voting by Sharing Ratios.*** Subject to Sections 6.02(j), 6.05(a), and 6.05(e), each Representative shall be entitled to vote on all matters submitted to a vote of the Management Committee in accordance with the respective Sharing Ratio of the Management Committee Member that designated such Representative.

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(ii) ***DISCLAIMER OF DUTIES.*** WITH RESPECT TO ANY VOTE, CONSENT OR APPROVAL AT ANY MEETING OF THE MANAGEMENT COMMITTEE OR OTHERWISE UNDER THIS AGREEMENT, EXCEPT TO THE EXTENT OTHERWISE EXPRESSLY PROVIDED IN SECTION 6.02(j) AND SECTION 6.05(e) OF THIS AGREEMENT, EACH REPRESENTATIVE MAY GRANT OR WITHHOLD SUCH VOTE, CONSENT OR APPROVAL (A) IN ITS SOLE AND ABSOLUTE DISCRETION, (B) WITH OR WITHOUT CAUSE, (C) SUBJECT TO SUCH CONDITIONS AS IT SHALL DEEM APPROPRIATE, AND (D) WITHOUT TAKING INTO ACCOUNT THE INTERESTS OF, AND WITHOUT INCURRING LIABILITY TO, THE COMPANY, ANY OTHER MEMBER OR REPRESENTATIVE, OR ANY AFFILIATE, OFFICER, OR EMPLOYEE OF THE COMPANY OR ANY OTHER MEMBER (COLLECTIVELY, "***SOLE DISCRETION***"). THE PROVISIONS OF THIS SECTION 6.02(f)(ii) SHALL APPLY NOTWITHSTANDING THE NEGLIGENCE, GROSS NEGLIGENCE, WILLFUL MISCONDUCT, STRICT LIABILITY OR OTHER FAULT OR RESPONSIBILITY OF A MEMBER OR ITS REPRESENTATIVE.

(iii) ***Exclusion of Certain Members and Their Sharing Ratios.*** With respect to any vote, consent or approval, any Breaching Member or Withdrawn Member (and any Representative of such Breaching Member or Withdrawn Member) shall be excluded from such decision (as contemplated by Section 10.03(b)), and the Sharing Ratio of such Breaching Member or Withdrawn Member shall be disregarded in calculating the voting thresholds in Section 6.02(f)(i). In addition, if any other provision of this Agreement provides that a Supermajority Interest is to be calculated without reference to the Sharing Ratio of a particular Management Committee Member, then the applicable voting threshold shall be deemed adjusted accordingly.

(g) ***Action by Written Consent.*** Any action required or permitted to be taken at a meeting of the Management Committee may be taken without a meeting, without prior notice, and without a vote if a consent or consents in writing, setting forth the action so taken, is signed by the Representatives that could have taken the action at a meeting of the Management Committee.

(h) ***Meetings by Telephone.*** Representatives may participate in and hold such meeting by means of conference telephone, videoconference or similar communications equipment by means of which all persons participating in the meeting can hear each other. Participation in such a meeting shall constitute presence in person at such meeting, except where a Representative participates in the meeting for the express purpose of objecting to the transaction of any business on the ground that the meeting is not lawfully called or convened.

(i) ***Matters Requiring Approval of the Management Committee.*** Notwithstanding any other provision of this Agreement, but subject to Section 6.05(e), none of the following actions may be taken by, or on behalf of, the Company without first obtaining the approval of a Supermajority Interest of the Management Committee:

(A) conducting any activity or business that, in the reasonable judgment of the Operator acting in good faith, may generate income for federal income tax purposes that may not be “qualifying income” (as such

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term is defined pursuant to Section 7704 of the Code) in excess of [***]% of the gross income of the Company;

(B) any material tax elections or any material decisions relating to material tax returns, in each case, as determined in the reasonable judgment of the Operator acting in good faith;

(C) considering at a meeting of the Management Committee a material matter not on the agenda for that meeting;

(D) entering into, amending in any material respect, or terminating any Material Contract, or taking any action that results in a material default under any Material Contract;

(E) approving any material loans made by the Company or the provision of any material financial guarantees by the Company, except to the extent such material loans or material financial guarantees have been specifically included in and approved as part of the Construction Budget, the Initial Operating Budget, or any subsequent annual Capital Budget or Operating Budget that has been approved by the Management Committee;

(F) placing or permitting any liens or other encumbrances (other than Permitted Encumbrances) to exist on the assets of the Company;

(G) [***]

(H) [***]

(I) [***]

(J) [Intentionally omitted.]

(K) [***]

(L) except as otherwise provided in Section 4.01(i) making a Capital Call or otherwise requiring any Member to make any Capital Contribution, except to the extent such Capital Call or Capital Contribution has been specifically included in and approved as part of the Construction Budget, the Initial Operating Budget, or any subsequent annual Capital Budget or Operating Budget that has been approved by the Management Committee;

(M) [Intentionally omitted.];

(N) selecting a different name for the Company, or making any change to the principal nature of the business of the Company;

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(O) [***]

(P) [***]

(Q) approving accounting procedures for the Company in accordance with GAAP, or voluntarily changing or terminating the appointment of the Company's accountants;

(R) [***]

(S) [***]

(T) [***]

(U) [***]

(V) on the occurrence of a Dissolution Event, the designation of a Member or other Person to serve as liquidator pursuant to Section 12.02;

(W) the commencement, conduct or settlement of any suit, action or proceeding or arbitration, each involving in excess of \$[***];

(X) the formation of any subcommittee of the Management Committee pursuant to Section 6.02(k);

(Y) dissolution of the Company pursuant to Section 12.01;

(Z) causing or permitting the Company to become Bankrupt (but this provision shall not be construed to require any Member to ensure the profitability or solvency of the Company);

(AA) the Disposition or abandonment of all or substantially all of the Company's assets, or of the Company's material assets other than any Disposition(s) in the ordinary course of business;

(BB) causing or permitting the Company to merge, consolidate or convert into any other entity;

(CC) [***]

(DD) approving the FERC Application pursuant to Section 7.01(a);

(EE) making any decision required pursuant to Sections 7.01(b), (c) or (d);

(FF) [***]

(GG) [***]

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(HH) [***]

(j) **Reasonableness.** In any matter proposed to the Management Committee pursuant to [***].

(k) **Subcommittees.** The Management Committee may create such subcommittees, and delegate to such subcommittees such authority and responsibility, and rescind any such delegations, as it may deem appropriate.

(l) **Officers.** The Management Committee may designate one or more Persons to be officers of the Company. Any officers so designated shall have such titles and, subject to the other provisions of this Agreement, have such authority and perform such duties as the Management Committee may delegate to them and shall serve at the pleasure of the Management Committee and report to the Management Committee.

6.03 Construction, Operation and Management Agreement. The Company shall enter into a Construction, Operation and Management Agreement with Operator (the "**COM Agreement**") in such form as shall be approved by the Founding Members.

6.04 No Duties; Disclaimer of Duties. Each Member acknowledges its express intent, and agrees with each other Member for the mutual benefit of all the Members, that

(a) to the fullest extent permitted by applicable Law, no Member, in its capacity as Member, nor any of such Member's or any of its Affiliates' respective employees, agents, directors, managers or officers shall have any fiduciary duty to the Company, any other Member or Representative or any other Person in connection with the business and affairs of the Company or any consent or approval given or withheld pursuant to this Agreement; provided, however, that nothing herein shall eliminate the implied contractual covenant of good faith and fair dealing;

(b) to the fullest extent permitted by applicable Law, no Representative, in such Person's capacity as a Representative, shall have any fiduciary duty to the Company, any Member (other than the Member that designated such Representative), any other Representative, or any other Person in connection with the business and affairs of the Company or any consent or approval given or withheld pursuant to this Agreement; provided, however, that nothing herein shall eliminate the implied contractual covenant of good faith and fair dealing; and

(c) the provisions of this Section 6.04 will apply for the benefit of each Member, and no standard of care, duty, or other legal restriction or theory of liability shall limit or modify the right of each Member to act and direct its Representative to vote in the manner determined by the Member that designated such Representative in its Sole Discretion.

To the maximum extent permitted by applicable Law, each Member hereby releases and forever discharges each other Member and such other Member's Representative from all liabilities that such other Member or its Representative might owe, under the Act or otherwise, to the Company, the releasing Member, or such releasing Member's Representative on the ground that any decision of that other Member or such other Member's Representative to grant or withhold any vote, consent or approval constituted the breach or violation of any standard of care, any.

fiduciary duty or other legal restriction or theory of liability applicable to such other Member or its Representative; provided, however, that nothing herein shall eliminate any Member's liability for any act or omission that constitutes a bad faith violation of the implied contractual covenant of good faith and fair dealing. Notwithstanding anything in this Agreement to the contrary, nothing in this Section 6.04 shall limit or waive any claims against, actions, rights to sue, other remedies or other recourse of the Company, any Member or any other Person may have against any Member, Representative or employee of the Company for a breach of contract claim relating to any binding agreement (including this Agreement).

6.05 Business Opportunities.

(a) During the Term, except as otherwise provided in the COM Agreement, any project involving the planning, design, construction, acquisition, ownership, maintenance, or operation of the Facilities may be conducted only by the Company and not by any Member or any Affiliate of a Member.

(b) A Member and each Affiliate of a Member may engage in and possess interests in other business ventures of any and every type and description, independently or with others, including ones in competition with the Company, with no obligation to offer to the Company, any other Member or any Affiliate of another Member the right to participate therein. Subject to Section 6.02(i)(HH), the Company may transact business with any Member or Affiliate thereof. Without limiting the generality of the foregoing, the Members recognize and agree that their respective Affiliates currently engage in certain activities involving natural gas and electricity marketing and trading (including futures, options, swaps, exchanges of future positions for physical deliveries and commodity trading), gathering, processing, storage, transportation and distribution, electric generation, development and ownership, as well as other commercial activities related to natural gas and that these and other activities by Members' Affiliates may be based on natural gas that is shipped through the Facilities or otherwise made possible or facilitated by reason of the Company's activities (herein referred to as "*Affiliate's Outside Activities*"). No Affiliate of a Member shall be restricted in its right to conduct, individually or jointly with others, for its own account any Affiliate's Outside Activities, and no Member or its Affiliates shall have any duty or obligation, express or implied, fiduciary or otherwise, to account to, or to share the results or profits of such Affiliate's Outside Activities with, the Company, any other Member or any Affiliate of any other Member, by reason of such Affiliate's Outside Activities. The provisions of this Section 6.05(b) and Sections 6.02(a)(iii), 6.02(f)(ii), 6.04, 6.05(d), 6.05(e), and 6.07(a) constitute an agreement to modify or eliminate, as applicable, fiduciary duties pursuant to the provisions of Section 18-1101 of the Act.

(c) Subject to Section 6.05(a) and (b), each Member:

(i) renounces in advance each and every interest or expectancy it or any of its Affiliates might be considered to have under the Act, at common law or in equity by reason of its membership in the Company in any business opportunity, or in any opportunity to participate in any business opportunity, in any business or industry in which any other Member or its Affiliates now or in the future engages, which is presented to the Company, to any other Member or any of its Affiliates or to any present or future partner, member, director, officer,

manager, supervisor, employee, agent or representative of the Company or of any other Member or any of its Affiliates; and

(ii) waives and consents to [***].

(d) Subject to Section 6.05(a) and (b), the Company:

(i) renounces in advance each and every interest or expectancy it might be considered to have under the Act, at common law or in any business opportunity, or in any opportunity to participate in any business opportunity, in any business or industry in which any Member or any of its Affiliates now or in the future engages, which is presented to such Member or any of its Affiliates or to any present or future partner, member, director, officer, manager, supervisor, employee, agent or representative of such Member or any of its Affiliates; and

(ii) waives and consents to [***].

(e) Notwithstanding any other provision in this Agreement, with respect to a Related Party Matter, the Representative of the Founding Member who is, or whose Affiliate is, involved in such Related Party Matter [***].

(f) [***]

(g) [***]

6.06 Insurance Coverage.

(a) ***Operator Insurance.*** Pursuant to the COM Agreement, the Operator is required to carry and maintain or cause to be carried and maintained certain liability insurance coverages.

(b) ***Owner Insurance.*** The Management Committee shall determine the type limits, deductibles and other terms applicable to the insurance coverages to be maintained by the Company, and the Company shall engage an insurance broker to provide recommendations and to procure such insurance coverages on behalf of the Company.

(c) ***Claim for Property Loss or Damage.*** In the event of actual loss or damage to the Company's property or any incident reasonably anticipated to give rise to a claim for loss or damage to the Company's property, the Company shall promptly provide written notice to the Members of such loss, damage or incident. The Company shall take all actions necessary to provide proper and timely notification to its insurers of such loss, damage or incident. The Company shall be responsible for the preparation, submittal and negotiation of all insurance claims related to any loss, damage or incident involving the Company's property. The Members each agree to use all reasonable efforts to cooperate with each other and the Company in the preparation, submittal and negotiation of all such claims by the Company, including, but not limited to, the assignment of adjusters and the provision and exchange of information related to any loss, damage or incident involving the Company's property.

(d) ***Directors' and Officers' Liability.*** Each Member shall carry and maintain Directors' and Officers' Liability insurance covering its own respective persons who are serving as officers, directors, Representatives or Management Committee members. Each Member shall also be responsible for insuring its respective Membership Interest for securities claims against the Company.

6.07 Indemnification.

(a) Subject to Section 6.07(b), to the fullest extent permitted by the Act, the Company shall indemnify and hold harmless each Representative and each Member and the managers, officers, directors,

stockholders, partners, members, managers, employees, affiliates, representatives and agents of such Member, as well as each officer, employee, representative, and agent of the Company (individually, a “*Covered Person*”) from and against any and all Claims in which the Covered Person may be involved, or threatened to be involved, as a party or otherwise, by reason of the fact that he or it is a Covered Person or which relates to or arises out of the Company or its property, business or affairs. A Covered Person shall not be entitled to indemnification under this Section 6.07(a) with respect to [***].

(b) Notwithstanding the obligations of the Company pursuant to Section 6.07(a) and subject to Section 6.08, each Member shall indemnify, protect, defend, release and hold harmless the Company and each other Member, its Representative, its Affiliates, and its and their respective directors, officers, trustees, employees and agents from and against [***].

6.08 Limitation on Liability. EXCEPT IN CONNECTION WITH INDEMNIFICATION OBLIGATIONS ARISING FROM AN ACTION OR PROCEEDING BROUGHT BY A THIRD PARTY FOR AMOUNTS PAID OR OWING TO SUCH THIRD PARTY, EACH MEMBER AGREES THAT NO MEMBER SHALL BE LIABLE UNDER THIS AGREEMENT FOR EXEMPLARY, INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES WHICH IN ANY WAY ARISE OUT OF, RELATE TO, OR ARE A CONSEQUENCE OF, ITS PERFORMANCE OR NONPERFORMANCE HEREUNDER, OR THE PROVISION OF OR FAILURE TO PROVIDE ANY SERVICE HEREUNDER, INCLUDING, BUT NOT LIMITED TO, LOSS OF FUTURE PROFITS, BUSINESS INTERRUPTIONS, AND LOSS OF CUSTOMERS, WHETHER SUCH DAMAGES ARE ASSERTED IN AN ACTION BROUGHT IN CONTRACT, IN TORT OR PURSUANT TO SOME OTHER THEORY, AND WHETHER THE POSSIBILITY OF SUCH DAMAGES WAS MADE KNOWN OR WAS FORESEEABLE.

6.09 Delivery of Operating Budget. On or prior to [***] of each year, the Operator shall deliver a draft annual Operating Budget for the following year to each of the Representatives, which Representatives will have [***] Days to provide comments (the “*Comment Deadline*”) on such draft annual Operating Budget (such comments, the “*Representative Budget Comments*”). The Operator shall make a good faith effort to respond to, and incorporate into such draft annual Operating Budget, the Representative Budget Comments and shall deliver to each of the Representatives the final annual Operating Budget for the following year on or before [***] (the “*December Deadline*”) of each year; provided, however, that, if the board of directors of the Operator has not convened to approve the annual Operating Budget by [***] of a given year, then the December Deadline shall be extended to [***] of such

year; provided, further, that, if the meeting of the board of directors of the Operator to approve the annual Operating Budget is scheduled prior to the Comment Deadline, the Operator shall promptly notify the Representatives in writing of the date and time of such meeting (but no less than [***] Business Days in advance of such meeting), and the Representatives shall use reasonable efforts to provide the Representative Budget Comments in advance of such meeting. The Operator and the Representatives shall work together in good faith to cause the Operating Budget to be approved by [***] of such year.

ARTICLE 7 DEVELOPMENT OF FACILITIES

7.01 Development of Facilities.

(a) **FERC Application.** Pursuant to the terms of the COM Agreement, USG, EQT, and the Operator shall jointly prepare and submit to the Management Committee the proposed FERC Application related to the Facilities; and, following the approval of the FERC Application by the Management Committee, USG, EQT, and the Operator shall, on behalf of the Company, file the FERC Application with the FERC.

(b) **Approval of FERC Certificate.** No later than [***] Days prior to the FERC Response Date, the Management Committee shall vote on whether the FERC Certificate for the Facilities is issued on terms and conditions which are not materially different from those requested in a FERC Application for the Facilities and whether the Company shall (i) accept the FERC Certificate for the Facilities without seeking rehearing; (ii) accept such FERC Certificate and seek rehearing of the order issuing the FERC Certificate; (iii) file for rehearing before committing to accept or reject the FERC Certificate; or (iv) reject such FERC Certificate. The Management Committee shall be deemed to have approved the FERC Certificate for the Facilities if the Management Committee determines that such certificate is issued on terms and conditions which are not materially different from those requested in the FERC Application for the Facilities. In such event the Management Committee shall accept the FERC Certificate prior to the FERC Response Date with or without seeking rehearing of the order issuing the FERC Certificate for the Facilities. In such event, subject to the terms of this Agreement, each Member shall be firmly committed to the construction of the Facilities and the construction of the Facilities shall not be subject to any conditions precedent, including but not limited to Management Committee approval of any financial commitment for obtaining funds to finance the Facilities or the Management Committee approval to construct the Facilities.

(c) If the Management Committee finds that the FERC Certificate for the Facilities is issued on terms and conditions which are materially different from those requested in the FERC Application and EQT and USG vote to accept the order issuing the FERC Certificate with or without seeking rehearing, then the Management Committee and the Company shall accept the FERC Certificate prior to the FERC Response Dates, and in such event, and subject to the terms of this Agreement, each Member shall be firmly committed to the construction of the Facilities and the construction of the Facilities shall not be subject to any conditions precedent as provided in Section 7.01(b).

(d) If the Management Committee finds that the FERC Certificate for the Facilities is issued on terms and conditions which are materially different from those requested in the FERC Application for the Facilities and one or more of the Members (including either USG or EQT) vote to accept the order issuing the FERC Certificate with or without seeking rehearing and one or more of the Members vote to reject the order issuing the FERC Certificate for the Facilities with or without seeking rehearing (or did not vote), then the Members that voted to accept such FERC Certificate shall be free to proceed with the construction of the Facilities under this Agreement (but only if one of EQT or USG so elects to proceed), such vote being deemed the requisite vote of the Management Committee, and the Member or Members that voted to reject such FERC Certificate shall be deemed to have Withdrawn from the Company. Subject to the terms of this Agreement, those Members that elect to proceed with the construction of the Facilities shall be firmly committed to the construction of the Facilities and the construction of the Facilities shall not be subject to any conditions precedent as provided in Section 7.01(b). In the event no Member votes to accept the order issuing the FERC Certificate for the Facilities, then such vote shall be a Dissolution Event and the Company shall dissolve and its offices shall be wound up pursuant to Article 12.

7.02 Employee Matters. To facilitate placing the Facilities in service, a Founding Member that is not, or does not have an Affiliate that is, the Operator shall have the right to have one (1) employee located in the Operator's primary place of business with respect to the Facilities and any construction or engineering site until the In-Service Date for such Facilities, and such employee shall have access to all construction and engineering offices related to the Facilities and shall be permitted to review, examine, and copy the books, records, plans, reports, forecasts, studies, budgets, and other information related to such Facilities.

7.03 General Regulatory Matters.

(a) The Members acknowledge that either the Company will be a “natural gas company” as defined in Section 2(6) of the NGA or the assets of the Company will be operated by a “natural gas company” as defined in Section 2(6) of the NGA in accordance with the certificate of authority granted by the FERC.

(b) Each Member shall (i) cooperate fully with the Company, the Management Committee, USG, EQT, and the Operator in securing the Necessary Regulatory Approvals, including supporting all FERC Applications, and in connection with any reports prescribed by the FERC and any other Governmental Authority having jurisdiction over the Company; (ii) join in any eminent domain takings by the Company, to the extent, if any, required by Law; and (iii) without limiting or modifying Section 6.04 or 6.05, devote such efforts as shall be reasonable and necessary to develop and promote the Facilities for the benefit of the Company, taking into account such Member’s Sharing Ratio, resources, and expertise.

ARTICLE 8 TAXES

8.01 Tax Returns. Operator shall prepare and timely file (on behalf of the Company) all federal, state and local tax returns required to be filed by the Company; provided that so long as USG is a Founding Member to which a material tax return relates, USG shall have the right to

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review and comment on such material return at least 25 Days prior to the relevant due date for such return (which return may be provided to USG in draft form) and that the Operator shall include any such timely received comments as are reasonable, subject to applicable Law and to any ethical obligations of a return preparer. Each Member shall furnish to Operator all pertinent information in its possession relating to the Company’s operations that is necessary to enable the Company’s tax returns to be timely prepared and filed. The Company shall bear the costs of the preparation and filing of its returns.

8.02 Tax Elections. The Company shall make the following elections on the appropriate tax returns:

- (a) to adopt the calendar year as the Company’s fiscal and taxable year;
- (b) to adopt the accrual method of accounting;
- (c) to make the election described in Code Section 754 with respect to the first taxable year of the Company;
- (d) to elect to deduct or amortize the organizational expenses of the Company in accordance with Section 709(b) of the Code and to depreciate property pursuant to the most rapid depreciation or cost recovery method available; and
- (e) any other election the Management Committee may deem appropriate or that the Operator is permitted to make without Management Committee approval in accordance with Section 6.02(i)(B).

Notwithstanding the foregoing, however, neither the Company nor any Member shall make an election for the Company to be excluded from the application of the provisions of subchapter K of chapter 1 of subtitle A of the Code or elect for the Company to be treated as an association taxable as a corporation or any similar provisions of applicable state law and no provision of this Agreement shall be construed to sanction or approve such an election.

8.03 Tax Matters Member.

(a) EQT shall serve as the “tax matters partner” of the Company pursuant to Section 6231(a)(7) of the Code (the “*Tax Matters Member*”). The Tax Matters Member shall take such action as may be necessary to cause to the extent possible each other Member to become a “notice partner” within the meaning of Section 6223 of the Code. The Tax Matters Member shall inform each other Member of all significant matters that may come to its attention in its capacity as Tax Matters Member by giving notice thereof on or before the fifth Business Day after becoming aware thereof and, within that time, shall forward to each other Member copies of all significant written communications it may receive from a taxing authority in that capacity. In the event that EQT ceases to be the Tax Matters Member (or any successor Tax Matters Member ceases to be a Member), the Management Committee shall appoint a successor Tax Matters Member.

(b) The Tax Matters Member shall provide any Member, upon reasonable request, access to accounting and tax information and schedules obtained by the Tax Matters

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Member solely in its capacity as Tax Matters Member as shall be necessary for the preparation by such Member of its income tax returns and such Member’s tax information reporting requirements.

(c) The Tax Matters Member shall take no action in its capacity as Tax Matters Member without the authorization of the Management Committee, other than such action as may be required by Law. Any cost or expense incurred by the Tax Matters Member in connection with its duties, including the preparation for or pursuance of administrative or judicial proceedings and in complying with Section 8.03(b), shall be paid by the Company.

(d) The Tax Matters Member shall not enter into any extension of the period of limitations for making assessments on behalf of the Members without first obtaining the consent of the Management Committee. The Tax Matters Member shall not bind any Member to a settlement agreement without obtaining the consent of such Member. Any Member that enters into a settlement agreement with respect to any partnership item (as described in Code Section 6231(a)(3)) with respect to the Company shall notify the other Members of such settlement agreement and its terms within [***] Days from the date of the settlement.

(e) No Member shall file a request pursuant to Code Section 6227 for an administrative adjustment of Company items for any taxable year without first notifying the other Members no later than [***] Days prior to filing such request. If the Management Committee consents to the requested adjustment, the Tax Matters Member shall file the request for the administrative adjustment on behalf of the Members. If such consent is not obtained within [***] Days from such notice, any Member, including the Tax Matters Member, may file a request for administrative adjustment on its own behalf. Any Member intending to file a petition under Code Sections 6226, 6228 or other Code Section with respect to any item involving the Company shall notify the other Members of such intention and the nature of the contemplated proceeding. In the case where the Tax Matters Member is the Member intending to file such petition on behalf of the Company, such notice shall be given within a reasonable period of time to allow the other Members to participate in the choosing of the forum in which such petition will be filed.

(f) If any Member intends to file a notice of inconsistent treatment under Code Section 6222(b), such Member shall give reasonable notice under the circumstances to the other Members of such intent and the manner in which the Member’s intended treatment of an item is (or may be) inconsistent with the treatment of that item by the other Members.

ARTICLE 9 BOOKS, RECORDS, REPORTS, AND BANK ACCOUNTS

9.01 Maintenance of Books.

(a) The Operator shall keep or cause to be kept at the principal office of the Company or at such other location approved by the Management Committee complete and accurate books and records of the Company, including all books and records necessary to provide to the Members any information required to be provided pursuant to Section 9.02, supporting documentation of the transactions with respect to the conduct of the Company's

business and minutes of the proceedings of its Members and the Management Committee, and any other books and records that are required to be maintained by applicable Law.

(b) The books of account of the Company shall be (i) maintained on the basis of a fiscal year that is the calendar year, (ii) maintained on an accrual basis in accordance with Required Accounting Practices, and (iii) unless the Management Committee decides otherwise, audited by the Certified Public Accountants at the end of each calendar year.

9.02 Reports.

(a) With respect to each calendar year, the Operator shall prepare and deliver to each Member:

(i) Within 75 Days after the end of such calendar year, a statement of operations and a statement of cash flows for such year, a balance sheet as of the end of such year, and an audited report thereon of the Certified Public Accountants; provided that, upon the written request of one or more Members at least [***] Days prior to the applicable calendar year end, which request shall be a standing request effective for subsequent calendar years unless and until revoked by the requesting Member, the Operator shall prepare and deliver to the requesting Member(s) within 25 Days after the end of each such calendar year the foregoing information except for the audited report, which the Operator shall use reasonable efforts to prepare and deliver to the requesting Member(s) no later than 14 Days prior to any regulatory, contractual or filing deadlines of such Member for which the Operator has been notified by such Member.

(ii) Within 75 Days after the end of such calendar year, such federal, state and local income tax returns and such other accounting and tax information and schedules as shall be necessary for tax reporting purposes by each Member with respect to such year.

(b) Upon the written request of one or more Founding Members at least [***] Days prior to the applicable calendar year end, the Operator shall use reasonable efforts to prepare and deliver to the requesting Founding Member(s) the following information within [***] Days after the end of such calendar year:

(i) A discussion and analysis of the results of operations including detailed explanations of significant variances in revenues, expenses and cash flow activities appearing in the audited financial statements, as compared to the same periods in the prior calendar year, and relevant operational statistics, including volumetric data;

(ii) A schedule of amounts due by year for contractual obligations that will impact Available Cash including notes payable, capital leases, operating leases, and purchase obligations; and

(iii) A three-year forward-looking forecast that includes a balance sheet, profit and loss statement, and a statement of cash flows. Such forecast shall include information pertaining to the underlying assumptions used in its preparation including volumetric, revenue per-unit and capital expenditure

assumptions. Such forecast also shall be updated within 45 Days after execution by the Company of a material Gas Transportation Service Agreement if the

timing and amount of revenues or expenses resulting from such agreement are materially different than estimates included in the forward-looking forecast.

The reasonable incremental cost to the Operator of preparing the above reports shall be reimbursed to the Operator by the Founding Member requesting such reports and, in the case of two or more Founding Members requesting such reports, equally by such Founding Members. Such cost shall be determined in accordance with the Accounting Procedure set forth in the COM Agreement.

(c) Within 25 Days after the end of each calendar month, the Operator shall cause to be prepared and delivered to each Member with an appropriate certification of the Person authorized to prepare the same (provided that the Management Committee may change the financial statements required by this Section 9.02(c) to a quarterly basis or may make such other change therein as it may deem appropriate):

(i) A statement of operations for such month (including sufficient information to permit the Members to calculate their tax accruals) and for the portion of the calendar year then ended as compared with the same periods for the prior calendar year and with the budgeted results for the current periods;

(ii) A balance sheet as of the end of such month and the portion of the calendar year then ended; and

(iii) For quarter month end, a statement of cash flows for the portion of the calendar year then ended as compared to the same period for the prior calendar year.

(d) In addition to its obligations under subsections (a), (b), and (c) of this Section 9.02, but subject to Section 3.06, the Operator shall timely prepare and deliver to any Member, upon request, all of such additional financial statements, notes thereto and additional financial information as may be required in order for each Member or an Affiliate of such Member to comply with any reporting requirements under (i) the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder, (ii) the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder, and (iii) any national securities exchange or automated quotation system. The reasonable incremental cost to Operator of preparing and delivering such additional financial statements, notes thereto and additional financial information, including any required incremental audit fees and expenses, shall be reimbursed to the Operator by the Member requesting such reports and, in the case of two or more Members requesting such additional information, equally by such Members. Such cost shall be determined in accordance with the Accounting Procedure set forth in the COM Agreement.

(e) Operator shall also cause to be prepared and delivered to each Founding Member such other reports, forecasts, studies, budgets and other information as such Founding Member may reasonably request from time to time.

(f) For purposes of clarification and not limitation, any audit or examination by a Member pursuant to Section 3.6 of the COM Agreement may, at the option of such Member,

include audit or examination of the books, records and other support for the costs incurred pursuant to subsections (b) and (e) of this Section 9.02.

9.03 Bank Accounts. Funds of the Company shall be deposited in such banks or other depositories as shall be designated from time to time by the Management Committee and shall not be commingled with the Operator's funds. All withdrawals from any such depository shall be made only as authorized by the Management Committee and shall be made only by check, wire transfer, debit memorandum or other written instruction. The Management Committee may authorize the Operator to designate and maintain accounts in any such banks or other depositories in accordance with Exhibit A to the COM Agreement.

ARTICLE 10 WITHDRAWAL

10.01 Right of Withdrawal. (a) Prior to the In-Service Date, no Member shall have the right to withdraw from the Company and (b) following the In-Service Date, each Member shall have the right to withdraw from the Company [***] Days following delivery of written notice to the Management Committee.

10.02 Deemed Withdrawal. A Member is deemed to have Withdrawn from the Company upon the occurrence of any of the following events:

- (a) the Member is deemed, pursuant to Section 7.01(d) to have Withdrawn from the Company;
- (b) there occurs an event that makes it unlawful for the Member to continue to be a Member;
- (c) the Member becomes Bankrupt;
- (d) the Member dissolves and commences liquidation or winding-up; or
- (e) the Member commits a Default; provided, that such Member shall not be considered a Withdrawn Member if such Member cures such Default within 60 Business Days of the applicable Default.

10.03 Effect of Withdrawal. A Member that is deemed to have Withdrawn pursuant to Section 10.01 or Section 10.02 (a "*Withdrawn Member*"), must comply with the following requirements in connection with its Withdrawal:

- (a) The Withdrawn Member ceases to be a Member immediately upon the occurrence of the applicable Withdrawal event.
- (b) The Withdrawn Member shall not be entitled to receive any distributions from the Company except as set forth in Section 10.03(e), and neither it nor its Representative shall be entitled to exercise any voting or consent rights, or to appoint any Representative or Alternate Representative to the Management Committee (and the Representative (and the Alternate Representative) appointed by such Member shall be deemed to have resigned) or to

receive any further information (or access to information) from the Company. The Sharing Ratio of such Member shall not be taken into account in calculating the Sharing Ratios of the Members for any purposes. This Section 10.03(b) shall also apply to a Breaching Member; but if a Breaching Member cures its breach during the applicable cure period, then any distributions that were withheld from such Member shall be paid to it, without interest.

(c) The Withdrawn Member must pay to the Company all amounts owed to it by such Withdrawn Member.

(d) The Withdrawn Member shall remain obligated for all liabilities it may have under this Agreement or otherwise with respect to the Company that accrue prior to the Withdrawal.

(e) In the event of a Withdrawal under Section 10.01 or a deemed Withdrawal under Section 10.02(b) or (c), the Withdrawn Member shall be entitled to receive a portion of each distribution that is made by the Company from and after the In-Service Date, equal to the product of the Withdrawn Member's Sharing Ratio as of the date of its Withdrawal *multiplied by* the aggregate amount of such distribution; provided that the Withdrawn Member's rights under this Section 10.03(e) shall automatically terminate at such time as the Withdrawn Member has received an aggregate amount under this Section 10.03(e) equal to the sum of (i) lesser of (A) the Withdrawn Member's Outstanding Capital Contribution, and (B) the Fair Market Value of the Withdrawn Member's Membership Interest, each determined as of the date of the Withdrawal, *plus* (ii) any Indebtedness of the Company owed to such Member at the time of Withdrawal. From the date of the Withdrawal to the date of such payment, the Withdrawn Member shall be treated as a non-Member equity holder with no rights other than the right to receive the amount owing to the Withdrawn Member pursuant to the preceding sentence. The rights of a Withdrawn Member under this Section 10.03(e) shall (A) be subordinate to the rights of any other creditor of the Company, (B) not include any right on the part of the Withdrawn Member to receive any interest or other amounts with respect thereto (except as may otherwise be provided in the evidence of any Indebtedness of the Company owed to such Withdrawn Member); (C) not require the Company to make any distribution (the Withdrawn Member's rights under this Section 10.03(e) being limiting to receiving a portion of such distributions as the Management Committee may, in its Sole Discretion, decide to cause the Company to make); and (D) not require any Member to make a Capital Contribution or a loan to permit the Company to make a distribution or otherwise to pay the Withdrawn Member.

(f) Except as set forth in Section 10.03(e), a Withdrawn Member shall not be entitled to receive any return of its Capital Contributions or other payment from the Company in respect of its Membership Interest. Any Performance Assurances or Credit Assurances provided by the Withdrawn Member and outstanding as of the date of Withdrawal shall continue as to the liabilities accrued prior to the date of Withdrawal for which such Performance Assurances were provided under Section 4.01(b) or such Credit Assurances were provided under Section 4.07; provided that, in the event a Member is Withdrawn pursuant to Section 10.02(e), such Member shall pay over and forfeit any remaining Performance Assurances as liquidated damages and not as a penalty.

(g) The Sharing Ratio of the Withdrawn Member shall be allocated among the remaining Members in the proportion that each Member's Sharing Ratio bears to the total Sharing Ratio of all remaining Members, or in such other proportion as the remaining Members may unanimously agree.

(h) A deemed Withdrawal under Section 7.01(d) shall carry no connotation or implication that the Withdrawn Member has breached this Agreement or otherwise acted contrary to the intent of this Agreement, it being understood that (i) each Member is completely free to cast its vote as it wishes at the Management Committee meetings described in such Section and (ii) the concept of "deemed Withdrawal" in such Section is merely a convenient technique for permitting the continued development of the Facilities by the Members that desire to continue such development.

ARTICLE 11 DISPUTE RESOLUTION

11.01 Disputes. This Article 11 shall apply to any dispute arising under or related to this Agreement (whether arising in contract, tort or otherwise, and whether arising at law or in equity), including (a) any dispute regarding the construction, interpretation, performance, validity or enforceability of any provision of this Agreement or whether any Person is in compliance with, or breach of, any provisions of this Agreement; (b) any deadlock among the Representatives on any matter requiring approval of the Management Committee (including any dispute over whether the Representatives of any Founding Member (or its Affiliates) are reasonably withholding their consent in connection with a determination by the Management Committee, but only with respect to those matters specifically identified in Section 6.02(j) and Section 6.05(e)) other than the matters covered by Sections 6.02(i)(G) or 6.02(i)(BB) (a “**Deadlock**”); and (c) the applicability of this Article 11 to a particular dispute. Notwithstanding the foregoing, this Section 11.01 shall not apply to any matters that, pursuant to the provisions of this Agreement, are to be resolved by a vote of the Management Committee; provided that, if a vote, approval, consent, determination or other decision must, under the terms of this Agreement, be made (or withheld) in accordance with a standard other than Sole Discretion (such as a reasonableness standard), then the issue of whether such standard has been satisfied may be a dispute to which this Article 11 applies (including Section 11.03); and provided, further, that any Deadlock shall be resolved solely as provided in Sections 11.02 and 11.05 hereof. Any dispute to which this Article 11 applies is referred to herein as a “**Dispute**.” With respect to a particular Dispute, each Member that is a party to such Dispute is referred to herein as a “**Disputing Member**.” The provisions of this Article 11 shall be the exclusive method of resolving Disputes.

11.02 Negotiation to Resolve Disputes. If a Dispute arises, the Disputing Members shall attempt to resolve such Dispute through the following procedure:

- (a) first, the designated Representative of each of the Disputing Members shall promptly meet (whether by phone or in person) in a good faith attempt to resolve the Dispute; and
- (b) second, if the Dispute is still unresolved after ten (10) Business Days following the commencement of the negotiations described in Section 11.02(a), then the Parent

Decision Makers shall meet in person within five (5) Business Days after the expiration of the aforementioned period of ten (10) Business Days, and such Parent Decision Makers shall attempt in good faith to resolve the Dispute as promptly as practicable.

11.03 Courts. If a Dispute (other than a Deadlock) is still unresolved following ten (10) Business Days after a written request or demand for negotiations described in Section 11.02(b), then any of such Disputing Members may submit such Dispute only to the Court of Chancery of the State of Delaware or, in the event that such court does not have jurisdiction over the subject matter of such Dispute, to another court of the State of Delaware or a U.S. federal court located in the State of Delaware (collectively, “**Delaware Courts**”), and each of the Members irrevocably submits to the exclusive jurisdiction of the Delaware Courts and hereby consents to service of process in any such Dispute by the delivery of such process to such party at the address and in the manner provided in Section 13.02. Each of the Members hereby irrevocably and unconditionally waives any objection to the laying of venue in any Dispute in the Delaware Courts and hereby further irrevocably and unconditionally waives and agrees not to plead or clam in any such court that any action, suit or proceeding brought in any such court has been brought in an inconvenient forum. EACH MEMBER IRREVOCABLY WAIVES TRIAL BY JURY IN ANY ACTION OR PROCEEDING WITH RESPECT TO THIS AGREEMENT.

11.04 Specific Performance. The Members understand and agree that (a) irreparable damage would occur in the event that any provision of this Agreement were not performed in accordance with its specific terms, (b) although monetary damages may be available for the breach of such covenants and agreements such

monetary damages are not intended to and do not adequately compensate for the harm that would result from a breach of this Agreement, would be an inadequate remedy therefor and shall not be construed to diminish or otherwise impair in any respect any Member's or the Company's right to specific performance and (c) the right of specific performance is an integral part of the transactions contemplated by this Agreement and without that right none of the Members would have entered into this Agreement. It is accordingly agreed that, in addition to any other remedy that may be available to it, including monetary damages, each of the Members and the Company shall be entitled to an injunction or injunctions to prevent breaches of this Agreement and to enforce specifically the terms and provisions of this Agreement. Each of the Members further agrees that no Member nor the Company shall be required to obtain, furnish or post any bond or similar instrument in connection with or as a condition to obtaining any remedy referred to in this Section 11.04 and each Member waives any objection to the imposition of such relief or any right it may have to require the obtaining, furnishing or posting of any such bond or similar instrument.

11.05 Arbitration.

(a) If a Deadlock is still unresolved pursuant to the procedures set forth in Section 11.02, then the Deadlock shall be settled by arbitration conducted in the English language in New York, New York, administered by and in accordance with the terms of this Agreement and the Commercial Arbitration Rules ("**Rules**") of the American Arbitration Association ("**AAA**") (the "**Arbitration**").

(b) Any Disputing Member (the "**Arbitration Invoking Party**") may, by notice (the "**Arbitration Notice**") to any other Disputing Member (the "**Arbitration Noticed**

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Party"), submit the Dispute to Arbitration in accordance with the provisions of this Section 11.05(b). Any Disputing Member may initiate Arbitration by filing with the AAA a notice of intent to arbitrate within the mediation period.

(c) Any such Arbitration proceeding shall be before a tribunal of three (3) arbitrators, one (1) designated by the Arbitration Invoking Party, one (1) designated by the Arbitration Noticed Party, and one (1) designated by the two (2) arbitrators so designated. The Arbitration Invoking Party and the Arbitration Noticed Party shall each name their arbitrator by notice (the "**Selection Notice**") given within five (5) Business Days after the date of the Arbitration Notice, and the two (2) arbitrators so appointed shall agree upon the third member of the tribunal within five (5) Business Days after the date of the Selection Notice. Any member of the tribunal not appointed within the period required, whether by one of the Disputing Members or by the two (2) arbitrators chosen by the Disputing Members, shall be appointed by the AAA. The arbitrators shall have no affiliation with, financial or other interest in, or prior employment with either Disputing Member or their Affiliates and shall be experienced and well-regarded oil and gas attorneys knowledgeable in the field of the dispute.

(d) In any Arbitration in which the Deadlock involves a dispute over whether the Representatives of any Founding Members are reasonably withholding their consent in connection with a determination by the Management Committee with respect to any matter identified in Section 6.02(j) or Section 6.05(e), the arbitrators shall first determine whether the Representatives of such Founding Member are reasonably withholding their consent in the matter(s) in question and, if such Representatives are determined to have acted reasonably, the arbitrators shall then immediately proceed to resolve the Deadlock among the Representatives on the matter(s) requiring approval of the Management Committee.

(e) Each of the Arbitration Invoking Party and the Arbitration Noticed Party shall have twenty (20) Business Days, commencing on the date the Arbitration Notice is given, to prepare and submit a proposal for the resolution of the dispute to the tribunal, including a description of how such Disputing Member

arrived at its proposal and the arguments therefor, as it deems appropriate. Each of the Arbitration Invoking Party and the Arbitration Noticed Party shall deliver a copy of its proposal, including any such supplemental information, to the other Disputing Member at the same time it delivers the proposal to the tribunal.

(f) Each of the Arbitration Invoking Party and the Arbitration Noticed Party shall have five (5) Business Days after the receipt of the other Disputing Member's proposal to revise its respective proposal and submit a final proposal to the tribunal, including supporting arguments for its own and against the other Disputing Member's proposal.

(g) Each of the Arbitration Invoking Party and the Arbitration Noticed Party shall present oral arguments supporting its final proposal to the tribunal at a proceeding held five (5) Business Days after the deadline for submission of final proposals to the tribunal. Each of the Arbitration Invoking Party and the Arbitration Noticed Party shall have three (3) hours to make its oral presentation to the tribunal.

(h) The tribunal shall, within ten (10) Business Days after presentation of the oral arguments, render a decision that selects the Arbitration Invoking Party's final proposal

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(with no modifications thereto) or the Arbitration Noticed Party's final proposal (with no modifications thereto), and no other proposal. The award rendered pursuant to the foregoing shall be final and binding on the Disputing Members, shall not be subject to appeal, and judgment thereon may be entered or enforcement thereof sought by either Disputing Member in any court of competent jurisdiction.

(i) Each Disputing Member shall bear the costs of its appointed arbitrator and its own attorneys' fees, and the costs of the third arbitrator incurred in accordance with the foregoing shall be shared equally by the Disputing Members. Additional incidental costs of the Arbitration shall be paid for by the non-prevailing Disputing Member in the Arbitration.

(j) Notwithstanding the foregoing, each Disputing Member may at any time in a Dispute apply to the Court of Chancery for a decree of dissolution of the Company pursuant to Section 18-802 of the Act.

ARTICLE 12 DISSOLUTION, WINDING-UP AND TERMINATION

12.01 Dissolution. The Company shall dissolve and its affairs shall be wound up on the first to occur of the following events (each a "**Dissolution Event**"):

- (a) decision to dissolve the Company by Supermajority Interest;
- (b) entry of a decree of judicial dissolution of the Company under Section 18-802 of the Act;
- (c) the Disposition or abandonment of all or substantially all of the Company's business and assets;
- (d) an event that makes it unlawful for the business of the Company to be carried on;
- (e) by 10 Business Days' written notice of termination given by USG or EQT if the initial Construction Budget, the Project Schedule and the Initial Operating Budget have not been approved by USG and EQT by the [***] Day following the delivery thereof to USG; provided, however, that, if the initial Construction Budget, Project Schedule and the Initial Operating Budget are approved within 10 Business Days following

delivery of such notice of termination, then such written notice of termination shall be null and void, and this Agreement shall continue in full force and effect.

12.02 Winding-Up and Termination.

(a) On the occurrence of a Dissolution Event, the Management Committee shall designate a Member or other Person to serve as liquidator. The liquidator shall proceed diligently to wind up the affairs of the Company and make final distributions as provided herein and in the Act. The costs of winding-up shall be borne as a Company expense. Until final distribution, the liquidator shall continue to operate the Company properties with all of the power and authority of the Members. The steps to be accomplished by the liquidator are as follows:

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(i) as promptly as possible after dissolution and again after final winding-up, the liquidator shall cause a proper accounting to be made by a recognized firm of certified public accountants of the Company's assets, liabilities, and operations through the last Day of the month in which the dissolution occurs or the final winding-up is completed, as applicable;

(ii) the liquidator shall discharge from Company funds all of the Indebtedness of the Company and other debts, liabilities and obligations of the Company (including all expenses incurred in winding-up and any loans described in Section 4.02) or otherwise make adequate provision for payment and discharge thereof (including the establishment of a cash escrow fund for contingent liabilities in such amount and for such term as the liquidator may reasonably determine); and

(iii) all remaining assets of the Company shall be distributed to the Members as follows:

(A) the liquidator may sell any or all Company property, including to Members, and any resulting gain or loss from each sale shall be computed and allocated to the Capital Accounts of the Members in accordance with the provisions of Article 5;

(B) with respect to all Company property that has not been sold, the fair market value of that property shall be determined and the Capital Accounts of the Members shall be adjusted to reflect the manner in which the unrealized income, gain, loss, and deduction inherent in property that has not been reflected in the Capital Accounts previously would be allocated among the Members if there were a taxable disposition of that property for the fair market value of that property on the date of distribution; and

(C) Company property (including cash) shall be distributed among the Members in accordance with Section 5.01; and those distributions shall be made by the end of the taxable year of the Company during which the liquidation of the Company occurs (or, if later, [***] Days after the date of the liquidation).

(b) The distribution of cash or property to a Member in accordance with the provisions of this Section 12.02 constitutes a complete return to the Member of its Capital Contributions and a complete distribution to the Member of its Membership Interest and all the Company's property and constitutes a compromise to which all Members have consented pursuant to Section 18-502(b) of the Act. To the extent that a Member returns funds to the Company, it has no claim against any other Member for those funds.

(c) No dissolution or termination of the Company shall relieve a Member from any obligation to the extent such obligation has accrued as of the date of such dissolution or termination. Upon such termination, any books and records of the Company that there is a reasonable basis for believing will ever be needed again shall be furnished to the Operator, who

shall keep such books and records (subject to review by any Person that was a Member at the time of dissolution) for a period at least three (3) years. At such time as the Operator no longer agrees to keep such books and records, it shall offer the Persons who were Members at the time of dissolution the opportunity to take over such custody, shall deliver such books and records to such Persons if they elect to take over such custody, and may destroy such books and records if they do not so elect. Any such custody by such Persons shall be on such terms as they may agree upon among themselves.

12.03 Deficit Capital Accounts. No Member will be required to pay to the Company, to any other Member or to any third party any deficit balance that may exist from time to time in any Member's Capital Account.

12.04 Certificate of Cancellation. On completion of the distribution of the Company's assets as provided herein, the Members (or such other Person or Persons as the Act may require or permit) shall file a certificate of cancellation with the Secretary of State of Delaware, cancel any other filings made pursuant to the Act, and take such other actions as may be necessary to terminate the existence of the Company. Upon the filing of such certificate of cancellation, the existence of the Company shall terminate (and the Term shall end), except as may be otherwise provided by the Act or other applicable Law.

ARTICLE 13 GENERAL PROVISIONS

13.01 Offset; Costs and Expenses.

(a) Whenever the Company is to pay any sum to any Member, any amounts that Member owes the Company may be deducted from that sum before payment.

(b) The Company shall reimburse the Founding Members for all out-of-pocket costs and expenses incurred by the Founding Members prior to the Effective Date in connection with the drafting, review and negotiation of this Agreement, the COM Agreement [***], with a schedule of such costs and expenses having been delivered to Vega and WGL on or prior to the date hereof.

13.02 Notices. Except as expressly set forth to the contrary in this Agreement, all notices, requests or consents provided for or permitted to be given under this Agreement must be in writing and must be delivered to the recipient in person, by courier or mail, or by facsimile or other electronic transmission, including electronic mail. A notice, request or consent given under this Agreement is effective on receipt by the Member to receive it; provided that a facsimile or other electronic transmission that is transmitted after the normal business hours of the recipient shall be deemed effective on the next Business Day. All notices, requests and consents to be sent to a Member must be sent to or made at the addresses given for that Member on Exhibit A or in the instrument described in Section 3.03(b)(iv)(A)(2) or Section 3.04, or such other address as that Member may specify by notice to the other Members. Any notice, request or consent to the Company must be given to all of the Members. Whenever any notice is required to be given by Law, the Delaware Certificate or this Agreement, a written waiver thereof, signed by the Person

entitled to notice, whether before or after the time stated therein, shall be deemed equivalent to the giving of such notice.

13.03 Entire Agreement; Superseding Effect. This Agreement, [***] and the COM Agreement constitute the entire agreement of the Members and their Affiliates relating to the Company and the transactions contemplated hereby and supersede all provisions and concepts contained in all prior agreements.

13.04 Effect of Waiver or Consent. Except as otherwise provided in this Agreement, a waiver or consent, express or implied, to or of any breach or default by any Member in the performance by that Member of its obligations with respect to the Company is not a consent or waiver to or of any other breach or default in the performance by that Member of the same or any other obligations of that Member with respect to the Company. Except as otherwise provided in this Agreement, failure on the part of a Member to complain of any act of any Member or to declare any Member in default with respect to the Company, irrespective of how long that failure continues, does not constitute a waiver by that Member of its rights with respect to that default until the applicable statute-of-limitations period has run.

13.05 Amendment or Restatement. This Agreement and the Delaware Certificate may be amended or restated only by a written instrument executed (or, in the case of the Delaware Certificate, approved) by Supermajority Interest; provided, however, that any amendment or restatement that is materially adverse to any Member in a manner that is disproportionate to such Member's interest (as compared to the interest of other Members) shall (a) if the affected Member is a Founding Member, require the written consent or approval of such Founding Member; or (b) if the affected Member is not a Founding Member, require the written consent or approval of a majority of all Members similarly adversely affected.

13.06 Binding Effect. Subject to the restrictions on Dispositions set forth in this Agreement, this Agreement is binding on and shall inure to the benefit of the Members and their respective successors and permitted assigns.

13.07 Governing Law; Severability. THIS AGREEMENT IS GOVERNED BY AND SHALL BE CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF DELAWARE, EXCLUDING ANY CONFLICT-OF-LAWS RULE OR PRINCIPLE THAT MIGHT REFER THE GOVERNANCE OR THE CONSTRUCTION OF THIS AGREEMENT TO THE LAW OF ANOTHER JURISDICTION. In the event of a direct conflict between the provisions of this Agreement and any mandatory, non-waivable provision of the Act, such provision of the Act shall control. If any provision of the Act provides that it may be varied or superseded in a limited liability company agreement (or otherwise by agreement of the members or managers of a limited liability company), such provision shall be deemed superseded and waived in its entirety if this Agreement contains a provision addressing the same issue or subject matter. If any provision of this Agreement or the application thereof to any Member or circumstance is held invalid or unenforceable to any extent, (a) the remainder of this Agreement and the application of that provision to other Members or circumstances is not affected thereby, and (b) the Members shall negotiate in good faith to replace that provision with a new provision that is valid and enforceable and that puts the Members in substantially the same economic,

business and legal position as they would have been in if the original provision had been valid and enforceable.

13.08 Further Assurances. In connection with this Agreement and the transactions contemplated hereby, each Member shall execute and deliver any additional documents and instruments and perform any additional acts that may be necessary or appropriate to effectuate and perform the provisions of this Agreement

and those transactions; provided, however, that this Section 13.08 shall not obligate a Member to furnish guarantees or other credit supports by such Member's Parent or other Affiliates.

13.09 Waiver of Certain Rights. Each Member irrevocably waives any right it may have to maintain any action for dissolution of the Company or for partition of the property of the Company.

13.10 Counterparts; Facsimiles. This Agreement may be executed in any number of counterparts with the same effect as if all signing parties had signed the same document. All counterparts shall be construed together and constitute the same instrument. A signature page to this Agreement or any other document prepared in connection with the transactions contemplated hereby that contains a copy of a party's signature and that is sent by such party or its agent with the apparent intention (as reasonably evidenced by the actions of such party or its agent) that it constitute such party's execution and delivery of this Agreement or such other document, including a document sent by facsimile transmission or by email in portable document format (PDF), shall have the same effect as if such party had executed and delivered an original of this Agreement or such other document. Minor variations in the form of the signature page, including footers from earlier versions of this Agreement or any such other document, shall be disregarded in determining the party's intent or the effectiveness of such signature.

13.11 Fair Market Value Determination.

(a) [***]

(b) [***]

(c) [***]

13.12 Other Agreements. Notwithstanding any other provision of this Agreement, it is hereby acknowledged and agreed that the Company has the power and authority, without further act, approval, or vote of the Management Committee, to [***]. The Company agrees that it shall be [***].

[Remainder of page intentionally left blank. Signature page follows.]

IN WITNESS WHEREOF, the Members have executed this Agreement as of the date first set forth above.

MEMBERS:

MVP HOLDCO, LLC

By: /s/ Randall L. Crawford
Name: Randall L. Crawford
Title: President

US MARCELLUS GAS
INFRASTRUCTURE, LLC

By: /s/ Lawrence A. Wall, Jr.

Name: Lawrence A. Wall, Jr.
Title: President

VEGA MIDSTREAM MVP LLC

By: /s/ David Modesett
Name: David Modesett
Title: President

VEGA NPI IV, LLC

By: /s/ David Modesett
Name: David Modesett
Title: President

WGL MIDSTREAM, INC.

By: /s/ Terry McAllister
Name: Terry McAllister
Title: Chairman of the Board

[Signature page to Second Amended and Restated LLC Agreement of Mountain Valley Pipeline, LLC]

COMPANY:

MOUNTAIN VALLEY PIPELINE, LLC

By: MVP Holdco, LLC,
its Member

By: /s/ Randall L. Crawford
Name: Randall L. Crawford
Title: President

By: US Marcellus Gas Infrastructure, LLC,
its Member

By: /s/ Lawrence A. Wall, Jr.
Name: Lawrence A. Wall, Jr.
Title: President

[Signature page to Second Amended and Restated LLC Agreement of Mountain Valley Pipeline, LLC]

EXHIBIT A**MEMBERS**

Name, Address, Fax and E-mail	Sharing Ratio	Parent	Representative and Alternate Representatives
<p>MVP HOLDCO, LLC</p> <p>EQT Plaza 625 Liberty Avenue Pittsburgh, Pennsylvania 15222 Fax: (412) 553-7781 Attention: Blue Jenkins [***] David Gray [***] Sean McGinty [***]</p> <p>with a copy to:</p> <p>Baker Botts L.L.P. 98 San Jacinto Blvd., Suite 1500 Austin, Texas 78701 Fax: (512) 322-8349 Attn: Michael L. Bengtson [***]</p>	55%	[***]	[***] [***]
<p>US MARCELLUS GAS INFRASTRUCTURE, LLC</p> <p>601 Travis Street Suite 1900 Houston, Texas 77002 Fax: 713.751.0375 Attention: Lawrence A. Wall, Jr. [***] Karina Amelang [***]</p>	35%	[***]	[***] [***]
<p>WGL MIDSTREAM, INC.</p> <p>c/o WGL Holdings, Inc. 101 Constitution Avenue, N.W. Washington, DC 20080 Fax: (202) 624-6655 Attn: Anthony M. Nee [***]</p>	7%	[***]	N/A

<p>VEGA MIDSTREAM MVP LLC</p> <p>c/o Vega Energy Partners, Ltd. 3701 Kirby Dr., Suite 1290 Houston, Texas 77098 Fax: (713) 527-0850 Attn: David A. Modesett [***]</p> <p>with a copy to:</p> <p>Norton Rose Fulbright 1301 McKinney St., Suite 5100 Houston, TX 77010 Fax: (713) 651-5246 Attn: Ned Crady [***]</p>	<p>3%</p>	<p>[***]</p>	<p>N/A</p>
<p>VEGA NPI IV, LLC</p> <p>c/o Vega Energy Partners, Ltd. 3701 Kirby Dr., Suite 1290 Houston, Texas 77098 Fax: (713) 527-0850 Attn: David A. Modesett [***]</p> <p>with a copy to:</p> <p>Norton Rose Fulbright 1301 McKinney St., Suite 5100 Houston, TX 77010 Fax: (713) 651-5246 Attn: Ned Crady [***]</p>	<p>0%</p>	<p>[***]</p>	<p>N/A</p>

*Portions of this Exhibit have been redacted pursuant to a request for confidential treatment under Rule 24b-2 of the General Rules and Regulations under the Securities Exchange Act. Omitted information marked "[***]" in this Exhibit has been filed with the Securities and Exchange Commission together with such request for confidential treatment.*

**FIRST AMENDMENT TO
SECOND AMENDED AND RESTATED
LIMITED LIABILITY COMPANY AGREEMENT
OF
MOUNTAIN VALLEY PIPELINE, LLC**

This FIRST AMENDMENT (this "*Amendment*") TO SECOND AMENDED AND RESTATED LIMITED LIABILITY COMPANY AGREEMENT (the "*Second A&R Agreement*;" as modified by this Amendment, the "*Agreement*") OF MOUNTAIN VALLEY PIPELINE, LLC, dated March 10, 2015, is adopted, executed and agreed to as of January 21, 2016 by MVP Holdco, LLC, a Delaware limited liability company ("*EQT*"), US Marcellus Gas Infrastructure, LLC, a Delaware limited liability company ("*USG*"), and Mountain Valley Pipeline, LLC, a Delaware limited liability company (the "*Company*"). EQT, USG and the Company are sometimes referred to herein collectively as the "*Parties*," and each, a "*Party*."

RECITALS

WHEREAS, concurrently with the execution of this Amendment, Con Edison Gas Midstream, LLC, a New York limited liability company ("*Con Edison*"), has executed and delivered to the Company a joinder to the Agreement (the "*Joinder*"), pursuant to which Con Edison has become a Member of the Company; and

WHEREAS, subject to Section 13.05 of the Second A&R Agreement, the Agreement may be amended by a written instrument executed by Supermajority Interest; and

WHEREAS, in connection with the execution and delivery of the Joinder by the parties thereto, EQT and USG, the holders of a Supermajority Interest, and the Company desire to enter into this Amendment to [***]; and

WHEREAS, capitalized terms used in this Amendment but not defined herein shall have the meanings ascribed to such terms in the Second A&R Agreement.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, EQT and USG, on behalf of themselves and the Members, and the Company agree as follows:

1. **Amendments.**

(a) The Agreement shall be amended to add the following as paragraph (e) of the definition of "Net Profit or Net Loss," and paragraphs (e), (f) and (g) of that definition are hereby renumbered as paragraphs (f), (g) and (h), respectively:

“(e) to the extent an adjustment to the adjusted tax basis of any Company asset pursuant to Section 734(b) of the Code is required pursuant to Treasury

Regulations Section 1.704-1(b)(2)(iv)(m)(4) to be taken into account in determining Capital Accounts as a result of a distribution other than in liquidation of a Member's Membership Interest, the amount of such adjustment shall be treated as an item of gain (if the adjustment increases the basis of the asset) or loss (if the adjustment decreases the basis of the asset) from the disposition of the asset and shall be taken into account in computing Net Profits and Net Losses;"

(b) The Agreement shall be amended to add the following as new Section 8.03(g):

"(g) For any taxable year beginning on or after January 1, 2018, the Tax Matters Member shall be the Partnership Representative as that term is defined in Code Section 6223(a), as added by the Bipartisan Budget Act of 2015, and each Member shall take all actions necessary to cause the Tax Matters Member to be so designated in accordance with any procedures prescribed therefor. Each Party agrees that the Company shall, unless determined otherwise by the Management Committee in its reasonable discretion, elect the alternative method of paying any imputed underpayment resulting from any Company adjustment as provided by Code Section 6226, as added by the Bipartisan Budget Act of 2015, and each Member shall take any and all actions necessary to effect such election, including but not limited to the filing by each Member of amended returns and the payment of any tax, including any interest, penalties, or additions to such tax, resulting from the imputed underpayment."

(c) Section 13.11(c) of the Agreement is hereby amended and restated in its entirety as follows:

"(c) *Appraisal.* Duff & Phelps LLC or, if Duff & Phelps LLC does not exist or is unable or unwilling to act in the applicable capacity, another nationally recognized appraisal firm (the "*Appraiser*") is hereby appointed to resolve any dispute relating to the determination of Fair Market Value of a Membership Interest arising under Section 10.03(e) and the foregoing Sections 13.11(a) or (b); provided, that if a Member disagrees with the appointment of such Appraiser (with notice of such disagreement being provided to the Company and each applicable Member within five (5) Business Days of the delivery of the FMV Notice), the applicable Members shall use their best efforts to appoint a mutually agreeable alternative Appraiser within five (5) Business Days following the delivery of the disagreement notice described above. Within 30 Days of the date on which one side gives notice (the "*FMV Notice*") to the other side and the Appraiser pursuant to Section 13.11(a) or (b), each side shall submit a proposed Fair Market Value to the Appraiser, together with any supporting documentation such side deems appropriate. The Appraiser shall consider such submissions and make a determination as to Fair Market Value as promptly as practicable and in any event on or before the 30th Day after submission by each side of its proposed Fair Market Value to the Appraiser. The determination of Fair Market Value by the Appraiser shall be final and binding on both sides. The cost of such appraisal shall be paid in equal portions by both sides. Each side shall provide to the other and, if applicable, the Appraiser, all information reasonably requested by them."

(d) The Agreement shall be amended to include the following as new Article 14:

“ARTICLE 14
[***]

14.01 Definitions. As used in this Article 14, the following terms have the respective meanings set forth below:

[***]

“*CECONY*” means Consolidated Edison Company of New York, Inc., a New York corporation.

“*Con Edison*” means Con Edison Gas Midstream, LLC, a New York limited liability company.

[***]

“*EQT Precedent Agreement*” means that certain Restated Precedent Agreement, dated October 20, 2015, between the Company and EQT Energy, LLC, as may be amended or otherwise modified from time to time.

[***]

“*Facilities Expansion*” means the expansion of the Facilities pursuant to clauses (b)-(d) in the definition of “Facilities”.

“*Initial Facilities*” means those Facilities described in clause (a) of the definition of Facilities.

“*IPO*” means the closing of the first firm commitment underwritten public offering and sale of securities of the Company (or any entity or entities created through any reorganization or designated by the Management Committee) pursuant to an effective registration statement (excluding any registration statement on Form S-4 or S-8 or their equivalent) filed by the Company under the Securities Act of 1933, as amended.

“*Loans*” means loans made to the Company pursuant to Section 4.02(a).

“*Supermajority Interest*” means the approval of the Representatives [***] of the Management Committee representing greater than [***]% of the aggregate Sharing Ratios of the Members represented by such Representatives.

“*USG Precedent Agreement*” means that certain Restated Precedent Agreement, dated October 20, 2015, between the Company and USG Properties Marcellus Holdings, LLC, as may be amended or otherwise modified from time to time.

14.02 [***].

(a) Subject to the provisions of this Section 14.02, the Company hereby grants to [***] the right to [***]. For the avoidance of doubt, [***].

(b) The Company shall give written notice ([***]“[***] *Notice*”) of any [***] within five Business Days of the approval of [***].

(c) If, within ten Business Days following the receipt of [***] Notice [***] shall have the right to [***].

(d) The Company may, in accordance with [***].

(e) [***]. Each party to the [***] shall take all such other actions as may be reasonably necessary to [***].

14.03 [***]. Notwithstanding anything to the contrary in [***]

[***]

14.04 Management Committee Observer; [***].

(a) ***Observer***. Con Edison shall have the right to designate (i) one Management Committee observer (the “***Observer***”) and (ii) one alternate Management Committee observer (the “***Alternate Observer***”) that shall have the same rights as the Observer in the event that the Observer is unable to fulfill its duties as set forth herein. The term “Observer” shall also refer to the Alternate Observer when the Alternate Observer is actually performing the duties of the Observer. The initial Observer and Alternate Observer are [***] and [***], respectively, which may be changed by Con Edison from time to time with three Business Days prior written notice in advance of a meeting to the Company and the Founding Members; provided, that if giving such advance notice is not feasible, then any new Observer shall present written evidence of his or her authority at the commencement of such meeting.

(b) ***Rights of Observer***. The Observer shall have the right to attend and participate in meetings of the Management Committee and to receive all information provided to the Management Committee (including minutes of the Management Committee meetings) [***].

(c) [***]. [***] shall have the right to [***] and the [***] agree to cause [***]. Solely to the extent necessary for [***] to exercise its rights under this Section 14.04(c), all provisions of this Agreement applicable to [***] shall be applicable to [***].

(d) ***Notice of Meetings***. [***], the Observer shall be entitled to receive notice of, and an agenda for, all Management Committee meetings at least five Days prior to the date of each meeting, together with proposed minutes of the previous Management Committee meeting (if such minutes have not been previously ratified), unless, with respect to special meetings of the Management Committee, such five Day period is shortened by the Management Committee pursuant to Section 6.02(d), in which

case the Observer shall be entitled to receive notice by such shortened time, which shall in no event be less than one Business Day before any special meeting. The Observer shall have the right to participate in all Management Committee meetings in accordance with Section 6.02(g)(i) regardless of whether all other participants are present at such meeting in person. For the avoidance of doubt, actions taken at any meeting where the Observer was not given proper notice shall be null and void; provided, that such actions may be reinstated and be of full force and effect if re-authorized by written consent of the Management Committee (such consent to be made available to the Observer in accordance with Section 14.04(e)).

(e) *Action by Written Consent.* [***], in the event the Management Committee takes any action by written consent pursuant to Section 6.02(g), the Management Committee shall cause to be delivered a copy of such written consent to the Observer when sent to the Representatives for execution.

(f) [***]. The provisions of [***] shall apply to [***].

(g) [***]. The provisions of [***] with respect to [***] shall apply to [***].

14.05 [***].

(a) [***]. If [***] EQT and [***] propose to [***] shall be permitted to [***]; provided, however, that [***] would not be subject to [***] (unless [***] in which case such transaction shall be [***]). For the avoidance of doubt, any transactions pursuant to [***] shall not constitute [***].

(b) [***]. Prior to [***] EQT and/or [***] shall deliver to [***].

(c) [***].

(i) [***] shall exercise its right to [***] by delivering [***]. If [***] does not approve [***] then [***] shall not [***].

(ii) If [***] does not [***], then [***] shall be deemed to have [***].

(iii) Each Member [***] shall [***].

(d) [***]. This Section 14.05 shall not apply to [***].

14.06 [***].

(a) [***]. If [***] a Member [***] desires to [***], then [***] shall be permitted to [***] on the terms and conditions set forth in this Section 14.06.

(b) [***]. Within [***] Business Days of [***].

- (c) [***].
 - (iv) [***] shall [***].
 - (v) If [***].
 - (vi) Prior to the time the [***]. Promptly following [***]:
 - (1) such [***] shall [***]; and
 - (2) the Company shall [***].

14.07 [***].

- (a) Notwithstanding anything to the contrary in this Agreement, the Founding Members and the Company agree that [***].
- (b) Notwithstanding anything to the contrary in [***] EQT and [***] hereby [***].
- (c) Notwithstanding anything to the contrary in [***] EQT and [***] agree that [***].

14.08 [***]. [***] shall have the [***], which shall specifically include [***]. If [***] another [***] then [***] shall [***]; provided; however, that nothing herein shall be deemed to [***].

14.09 **Confidential Information**. Notwithstanding anything to the contrary in this Agreement, the Founding Members and the Company agree that Con Edison may disclose Confidential Information to an Affiliate of Con Edison, including the directors, officers, members, managers, employees, agents and advisors of such Affiliate, if such Affiliate has agreed to abide by the terms of Section 3.06; provided, however, that in no event shall Con Edison or any of its successors, assigns or Affiliates disclose Confidential Information to any Shipper that is an Affiliate of Con Edison [***].

14.10 [***]. Notwithstanding anything to the contrary in this Agreement, the Founding Members and the Company hereby agree that [***].

14.11 [***].

- (a) If the Company shall [***], the Company shall [***]. The Company shall use [***]; provided, that, in the event that the [***]. The Company shall have the right to [***].
- (b) In connection with its obligations under this Section 14.11, the Company shall:

- (i) [***]; and
- (ii) [***] such other actions as are [***].

14.12 [***]. Notwithstanding any provision of the Agreement to the contrary, in the event [***] shall have the right [***]; provided that, any [***] shall [***]. Upon such election [***]; provided that [***] shall not [***] and shall not [***], and no [***] shall be [***] as a consequence of [***].

14.13 [*]; Assignability; Joinder.** None of the Company, EQT or [***]. EQT and USG shall have the right to assign their obligations under this Article 14 without the prior written consent of any other Member only in connection with transfer of any Membership Interests to a third party [***]. This Article 14 will be binding upon, and inure to the benefit of, the respective successors and permitted assigns, as permitted by the terms of this Agreement, of the Members.

14.14 Waivers. None of EQT, USG [***] waives any right under this Article 14 by failure or delay in its exercise. A single or partial exercise of any right does not preclude its later or further exercise or the exercise of any other right. The rights and remedies in this Agreement are cumulative and not exclusive of any rights or remedies provided by law.

14.15 Representations and Warranties. Each of the Company, EQT and USG hereby represent and warrant to [***].

14.16 Conflicts. In the event of a conflict between the terms and provisions of this Article 14 and the other terms and provisions of this Agreement, the terms and provisions of this Article 14 shall govern and control.

14.17 Final Investment Decision. At any time prior to the earlier to occur of (a) the date that is 30 Days after the FERC's issuance of its final Environmental Impact Study related to the Facilities and (b) December 31, 2016, Con Edison shall have the option (the "*Con Edison Termination Option*"), exercisable in its sole discretion, to (a) re-assign its Membership Interests to EQT and USG *pro rata* based on the amounts by which EQT and USG were diluted in connection with their respective assignments of such Membership Interests to Con Edison and (b) be reimbursed (without interest) by EQT and USG (based on the same proportion by which the Membership Interests are re-assigned pursuant to clause (a) of this Section 14.17) for the amount of all Capital Contributions made by Con Edison in respect of such Membership Interests."

2. **Limited Effect.** Except as specified in this Amendment, all provisions, terms and conditions of the Agreement shall continue in full force and effect.

3. **Term.** The terms and provisions set forth in Section 1(d) of this Amendment shall automatically terminate and no longer be a part of the Agreement, without any further action on the part of any Person, if [***].

4. **Governing Law.** The laws of the State of Delaware govern this Amendment, and this Amendment shall be construed in accordance therewith, regardless of its choice of law principles. Jurisdiction and venue for any proceeding relating to this Amendment shall be as set forth in the Agreement.

5. **Representations and Warranties.** Each Party hereby represents and warrants that (a) such Party is duly formed, validly existing, and in good standing under the Laws of the jurisdiction of its formation; (b) if required by applicable Law, such Party is duly qualified and in good standing in the jurisdiction of its principal place of business, if different from its jurisdiction of formation; and (c) such Party has the requisite power and authority to execute and deliver this Amendment and to perform its obligations hereunder, and all necessary actions by the board of directors, management committee, officers, managers, members, partners or other applicable Persons necessary for the due authorization, execution, delivery, and performance of this Amendment by such Party have been duly taken.

6. **Counterparts.** This Amendment may be executed in any number of counterparts with the same effect as if all signing Parties had signed the same document. All counterparts shall be construed together and constitute the same instrument. A signature page to this Amendment or any other document prepared in connection with the transactions contemplated hereby which contains a copy of a Party's signature and which is sent by such Party or its agent with the apparent intention (as reasonably evidenced by the actions of such Party or its agent) that it constitute such Party's execution and delivery of this Amendment or such other document, including a document sent by facsimile transmission or by email in portable document format (pdf), shall have the same effect as if such Party had executed and delivered an original of this Amendment or such other document. Minor variations in the form of the signature page, including footers from earlier versions of this Amendment or any such other document, shall be disregarded in determining the Party's intent or the effectiveness of such signature.

[SIGNATURES APPEAR ON THE FOLLOWING PAGES]

IN WITNESS WHEREOF, the Parties have caused this Amendment to be executed by their duly authorized representatives as of the date first set forth above

Mountain Valley Pipeline, LLC

By: MVP Holdco, LLC,
its Member

By: /s/ Randall L. Crawford
Name: Randall L. Crawford
Title: President

By: US Marcellus Gas Infrastructure, LLC,
its Member

By: /s/ Matthew Schafer
Name: Matthew Schafer
Title: Vice President

MVP HOLDCO, LLC

By: /s/ Randall L. Crawford
Name: Randall L. Crawford
Title: President

**US MARCELLUS GAS
INFRASTRUCTURE, LLC**

By: /s/ Matthew Schafer
Name: Matthew Schafer
Title: Vice President

EX-10.25(C) 4 ex1025cmvpllcagreement.htm EXHIBIT 10.25(C)

Exhibit 10.25(c)

*Portions of this Exhibit have been redacted pursuant to a request for confidential treatment under Rule 24b-2 of the General Rules and Regulations under the Securities Exchange Act. Omitted information marked "[***]" in this Exhibit has been filed with the Securities and Exchange Commission together with such request for confidential treatment.*

Execution Version

**SECOND AMENDMENT TO
SECOND AMENDED AND RESTATED
LIMITED LIABILITY COMPANY AGREEMENT
OF
MOUNTAIN VALLEY PIPELINE, LLC**

This SECOND AMENDMENT (this "*Amendment*") TO SECOND AMENDED AND RESTATED LIMITED LIABILITY COMPANY AGREEMENT (as amended, supplemented or otherwise modified from time to time, including by that certain First Amendment to Second Amended and Restated Limited Liability Company Agreement, dated January 21, 2016, the "*Second A&R Agreement*;" as modified by this Amendment, the "*Agreement*") OF MOUNTAIN VALLEY PIPELINE, LLC, dated March 10, 2015, is adopted, executed and agreed to as of October 24, 2016 by MVP Holdco, LLC, a Delaware limited liability company ("*EQT*"), US Marcellus Gas Infrastructure, LLC, a Delaware limited liability company ("*USG*"), WGL Midstream, Inc., a Delaware corporation ("*WGL*"), VED NPI IV, LLC, a Delaware limited liability company ("*Vega Carryco*"), Vega Midstream MVP LLC, a Delaware limited liability company ("*Vega*"), and Mountain Valley Pipeline, LLC, a Delaware limited liability company (the "*Company*"). EQT, USG, WGL, Vega Carryco, Vega and the Company are sometimes referred to herein collectively as the "*Parties*," and each, a "*Party*."

RECITALS

WHEREAS, pursuant to that certain Equity Purchase Agreement dated as of October 3, 2016 by and among Vega, Vega Carryco, WGL and Vega Energy Partners, Ltd., a Texas limited partnership (the "*Equity Purchase Agreement*"), Vega shall Dispose of its Membership Interest to WGL [***] subject to the consent of the Founding Members set forth therein, which consent has been granted (the "*Vega/WGL Disposition*");

WHEREAS, pursuant to Section 13.05 of the Second A&R Agreement, the Agreement may be amended by a written instrument executed by Supermajority Interest; provided, however, that any amendment or restatement that is materially adverse to any Member in a manner that is disproportionate to such Member's interest (as compared to the interest of other Members) shall, if the affected Member is not a Founding Member, require the written consent or approval of a majority of all Members similarly adversely affected;

WHEREAS, in connection with the consummation of the Vega/WGL Disposition by the parties thereto, WGL, Vega and Vega Carryco, as the affected Members, and EQT and USG, the holders of a Supermajority Interest, and the Company desire to enter into this Amendment to revise certain distribution rights contained in Section 5.01 of the Second A&R Agreement; and

WHEREAS, capitalized terms used in this Amendment but not defined herein shall have the meanings ascribed to such terms in the Second A&R Agreement.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, WGL, Vega and Vega Carryco and EQT, USG, on behalf of themselves and the Members, and the Company agree as follows:

1. **Amendments.** Contingent upon the consummation of the Closing (as defined in the Equity Purchase Agreement) and effective simultaneously therewith, the Second A&R Agreement shall be amended as described in clauses (a) and (b) below.

(a) The Agreement shall be amended to delete all references to “Vega Midstream MVP LLC” and “Vega,” but, for the avoidance of doubt, not “Vega Carryco.”

(b) The Agreement shall be amended to restate the definition of “Qualified Guarantor” as follows:

“*Qualified Guarantor* – means, with respect to a Member, such Member’s Parent or a subsidiary of such Member’s Parent, in each case, so long as such Person is Investment Grade.”

(c) The Agreement shall be amended to delete the defined terms [***] and “Vega.”

(d) The Agreement shall be amended to add the following defined terms in Section 1.01 of the Agreement:

[***]

[***]

(e) The Agreement shall be amended to replace all references to [***] with [***] with the appropriate conjunction as the context may require.

(f) The Agreement shall be amended to restate clauses (a) and (b) of Section 5.01 in their entirety as follows:

“(a) prior to the occurrence of a Dissolution Event, [***]% to WGL and [***]% to Vega Carryco; and

(b) upon and following the occurrence of a Dissolution Event:

(i) *first*, [***]% to WGL until [***] and

(ii) *thereafter*, [***]% to WGL and [***]% to Vega Carryco.”

(g) The Agreement shall be amended to restate clause (d) of Section 5.05 in its entirety as follows:

“(d) The Members’ proportionate share of the “excess nonrecourse liabilities,” within the meaning of the Treasury Regulation Section 1.752-3(a)(3), shall be allocated to the Members in proportion to their respective Sharing Ratios;

provided, that WGL's Sharing Ratio share of such "excess nonrecourse liabilities" shall be further allocated [***]% to Vega Carryco and [***]% to WGL. "

(h) Exhibit A of the Agreement is hereby deleted and replaced with Exhibit A hereto.

2. **Limited Effect.** Except as specified in this Amendment, all provisions, terms and conditions of the Agreement shall continue in full force and effect.

3. **Governing Law.** The laws of the State of Delaware govern this Amendment, and this Amendment shall be construed in accordance therewith, regardless of its choice of law principles. Jurisdiction and venue for any proceeding relating to this Amendment shall be as set forth in the Agreement.

4. **Representations and Warranties.** The representations and warranties contained in Section 3.02(a) of the Second A&R Agreement are repeated by WGL, Vega and Vega Carryco and incorporated herein *mutatis mutandis*, with all references therein to the Second A&R Agreement referring instead to this Amendment. Without limiting the preceding sentence, each such Party hereby represents and warrants that (a) such Party is duly formed, validly existing, and in good standing under the Laws of the jurisdiction of its formation; (b) if required by applicable Law, such Party is duly qualified and in good standing in the jurisdiction of its principal place of business, if different from its jurisdiction of formation; and (c) such Party has the requisite power and authority to execute and deliver this Amendment and to perform its obligations hereunder, and all necessary actions by the board of directors, management committee, officers, managers, members, partners or other applicable Persons necessary for the due authorization, execution, delivery, and performance of this Amendment by such Party have been duly taken.

5. **Counterparts.** This Amendment may be executed in any number of counterparts with the same effect as if all signing Parties had signed the same document. All counterparts shall be construed together and constitute the same instrument. A signature page to this Amendment or any other document prepared in connection with the transactions contemplated hereby which contains a copy of a Party's signature and which is sent by such Party or its agent with the apparent intention (as reasonably evidenced by the actions of such Party or its agent) that it constitute such Party's execution and delivery of this Amendment or such other document, including a document sent by facsimile transmission or by email in portable document format (pdf), shall have the same effect as if such Party had executed and delivered an original of this Amendment or such other document. Minor variations in the form of the signature page, including footers from earlier versions of this Amendment or any such other document, shall be disregarded in determining the Party's intent or the effectiveness of such signature.

[SIGNATURES APPEAR ON THE FOLLOWING PAGES]

IN WITNESS WHEREOF, the Parties have caused this Amendment to be executed by their duly authorized representatives as of the date first set forth above.

MOUNTAIN VALLEY PIPELINE, LLC

By: MVP Holdco, LLC
Its Member

By: /s/ Donald M. Jenkins
Name: Donald M. Jenkins
Title: EVP

By: US Marcellus Gas Infrastructure, LLC
Its Member

By: /s/ Matt Schafer
Name: Matt Schafer
Title: Representative of US Marcellus Gas
Infrastructure, LLC

MVP HOLDCO, LLC

By: /s/ Donald M. Jenkins
Name: Donald M. Jenkins
Title: EVP

US MARCELLUS GAS INFRASTRUCTURE, LLC

By: /s/ Matt Schafer
Name: Matt Schafer
Title: Representative of US Marcellus Gas
Infrastructure, LLC

Signature Page to Second Amendment to
Second Amended and Restated Limited Liability Company Agreement of
Mountain Valley Pipeline, LLC

IN WITNESS WHEREOF, the Parties have caused this Amendment to be executed by their duly authorized representatives as of the date first set forth above.

WGL MIDSTREAM, INC.

By: /s/ Terry McCallister
Terry McCallister
Chairman of the Board

Signature Page to Second Amendment to
Second Amended and Restated Limited Liability Company Agreement of
Mountain Valley Pipeline, LLC

IN WITNESS WHEREOF, the Parties have caused this Amendment to be executed by their duly authorized representatives as of the date first set forth above.

VEGA MIDSTREAM MVP LLC

By: /s/ David A. Modesett
David A. Modesett
President

VED NPI IV, LLC

By: /s/ David A. Modesett
David A. Modesett
President

Signature Page to Second Amendment to
Second Amended and Restated Limited Liability Company Agreement of
Mountain Valley Pipeline, LLC

EXHIBIT A
MEMBERS

Name, Address, Fax and E-mail	Sharing Ratio	Parent	Representative and Alternate Representatives
<p>MVP HOLDCO, LLC</p> <p>EQT Plaza 625 Liberty Avenue Pittsburgh, Pennsylvania 15222 Fax: (412) 553-7781 Attention: Blue Jenkins [***] David Gray [***] Sean McGinty [***]</p> <p>with a copy to:</p> <p>Baker Botts L.L.P. 98 San Jacinto Blvd., Suite 1500 Austin, Texas 78701 Fax: (512) 322-8349 Attn: Michael L. Bengtson [***]</p>	45.5%	EQT Midstream Partners, LP	<p>David Gray – Representative</p> <p>Blue Jenkins – Alternate Representative</p>
<p>US MARCELLUS GAS INFRASTRUCTURE, LLC</p> <p>601 Travis Street Suite 1900 Houston, Texas 77002 Fax: 713.751.0375 Attention: Lawrence A. Wall, Jr. [***] Karina Amelang [***]</p>	31%	NextEra Energy Capital Holdings, Inc.	<p>TJ Tuscai, Chief Executive Officer – Representative</p> <p>Lawrence A. Wall, Jr., President – Alternate Representative</p>
<p>WGL MIDSTREAM, INC.</p> <p>c/o WGL Holdings, Inc. 101 Constitution Avenue, N.W. Washington, DC 20080 Fax: (202) 624-6655 Attn: Anthony M. Nee [***]</p>	10%	WGL Holdings, Inc.	N/A

<p>VEGA NPI IV, LLC</p> <p>c/o Vega Energy Partners, Ltd. 3701 Kirby Dr., Suite 1290 Houston, Texas 77098 Fax: (713) 527-0850 Attn: David A. Modesett [***]</p> <p>with a copy to:</p> <p>Norton Rose Fulbright 1301 McKinney St., Suite 5100 Houston, TX 77010 Fax: (713) 651-5246 Attn: Ned Crady [***]</p>	0%	Vega Energy Partners, Ltd.	N/A
<p>RGC MIDSTREAM, LLC</p> <p>519 Kimball Ave NE Roanoke, Virginia 24016 Fax: (540) 777-2636 Attn: Paul Nester [***]</p>	1%	RGC Resources, Inc.	N/A
<p>CON EDISON GAS MIDSTREAM, LLC</p> <p>4 Irving Place New York, New York 10003 Fax: (917) 534-4476 Attn: Joseph Oates [***]</p>	12.5%	Consolidated Edison, Inc.	N/A

EXHIBIT C

Certificate of Good Standing

[Attached]

Delaware

Page 1

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "MOUNTAIN VALLEY PIPELINE, LLC" IS DULY FORMED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE TWENTY-EIGHTH DAY OF FEBRUARY, A.D. 2017.

AND I DO HEREBY FURTHER CERTIFY THAT THE AFORESAID "MOUNTAIN VALLEY PIPELINE, LLC" IS A SERIES LIMITED LIABILITY COMPANY.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL TAXES HAVE BEEN PAID TO DATE.



5580929 8300E

SR# 20171435188

You may verify this certificate online at corp.delaware.gov/authver.shtml

A handwritten signature in black ink, appearing to read "JBULLOCK", is written over a horizontal line. Below the line, the text "Jeffrey W. Bullock, Secretary of State" is printed.

Authentication: 202115595

Date: 02-28-17

EXHIBIT D

Resolutions of the Management Committee

Bureau of Land Management Application

RESOLVED, that the Management Committee and the Deemed Representative, if applicable, hereby approve, adopt, ratify and confirm by Supermajority Interest the filing of that certain Application for Transportation and Utility Systems and Facilities on Federal Lands, in substantially the form presented to the Management Committee and the Deemed Representative on or before the date hereof (the "BLM Application"); and

FURTHER RESOLVED, that the officers of the Operator be, and each of them individually hereby is, authorized, empowered and directed to execute, deliver and file the BLM Application and any exhibits, appendices, attachments or other documents and instruments to be attached thereto, in the name of and on behalf of the Company, with such changes as any officer of the Operator shall approve, the execution thereof by such officer being conclusive evidence of his or her approval of any such changes.