Mountain Valley Pipeline Project

Docket No. PF15-3

Resource Report 9 – Air and Noise Quality

Draft

May 2015

Mountain Valley Pipeline Project
Resource Report 9 – Air and Noise Quality

Resource Report 9 Filing Requirements	
Information	**Location in Resource Report**
Minimum Filing Requirements – 18 CFR § 380.12(k)	
1. Describe the existing air quality, including background levels of nitrogen dioxide and other criteria pollutants that may be emitted above EPA-identified significance levels. (§ 380.12(k)(1))	Section 9.1.1.4
2. Quantitatively describe existing noise levels at noise-sensitive areas such as schools, hospitals, or residences and include any areas covered by relevant state or local noise ordinances: • Report existing noise levels as the L_{eq} (day), L_{eq} (night), and L_{dn} and include the basis for the data or estimates. • For existing compressor stations, include the results of a sound level survey at the site property line and nearby noise-sensitive areas while the compressors are operated at full load. • For proposed new compressor station sites, measure or estimate the existing ambient sound environment based on current land uses and activities. • Include a plot plan that identifies the locations and duration of noise measurements, the time of day, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement. (§ 380.12(k)(2)(i-iv))	To be included in Resource Report 9 with MVP's application to FERC
3. Estimate the impact of the project on air quality, including how existing regulatory standards would be met. • Provide the emission rate of nitrogen oxides from existing and proposed facilities, expressed in pounds per hour and tons per year for maximum operating conditions, include supporting calculations, emission factors, fuel consumption rates, and annual hours of operation. • For major sources of air emissions (as defined by the Environmental Protection Agency), provide copies of applications for permits to construct (and operate, if applicable) or for applicability determinations under regulations for the prevention of significant air quality deterioration and subsequent determinations. (§ 380.12(k)(3)(i-ii))	To be included in Resource Report 9 with MVP's application to FERC
4. Provide a quantitative estimate of the impact of the project on noise levels at noise-sensitive areas, such as schools, hospitals, or residences. • Include step-by-step supporting calculations or identify the computer program used to model the noise levels, the input and raw output data and all assumptions made when running the model, far-field sound level data for maximum facility operation, and the source of the data. • Include sound pressure levels for unmuffled engine inlets and exhausts, engine casings, and cooling equipment; dynamic insertion loss for all mufflers; sound transmission loss for all compressor building components, including walls, roof, doors, windows and ventilation openings; sound attenuation from the station to nearby noise-sensitive areas; the manufacturer's name, the model number, the performance rating; and a description of each noise source and noise control component to be employed at the proposed compressor station. For proposed compressors the initial filing must include at least the proposed horsepower, type of compression, and energy source for the compressor. • Far-field sound level data measured from similar units in service elsewhere, when available, may be substituted for manufacturer's far-field sound level data.	To be included in Resource Report 9 with MVP's application to FERC

Resource Report 9 Filing Requirements	
Information	**Location in Resource Report**
• If specific noise control equipment has not been chosen, include a schedule for submitting the data prior to certification. • The estimate must demonstrate that the project will comply with applicable noise regulations and show how the facility will meet the following requirements: ▪ The noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed a day- night sound level (L_{dn}) of 55 dBA at any pre-existing noise-sensitive area (such as schools, hospitals, or residences). ▪ New compressor stations or modifications of existing stations shall not result in a perceptible increase in vibration at any noise-sensitive area. (§ 380.12 (k)(4)(i-v))	
5. Describe measures and manufacturer's specifications for equipment proposed to mitigate impact to air and noise quality, including emission control systems, installation of filters, mufflers, or insulation of piping and buildings, and orientation of equipment away from noise-sensitive areas. (§ 380.12 (k)(5))	To be included in Resource Report 9 with MVP's application to FERC
Minimum Filing Requirements – Appendix A to Part 380 [Note: May overlap with requirements above.]	
1. Describe existing air quality in the vicinity of the project. (§ 380.12(k)(1))	Section 9.1.1.4
2. Quantify the existing noise levels (day-night sound level (L_{dn}) and other applicable noise parameters) at noise-sensitive areas and at other areas covered by relevant state and local noise ordinances. (§ 380.12(k)(2))	To be included in Resource Report 9 with MVP's application to FERC
3. Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NO_x) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the project. (§ 380.12(k)(3))	To be included in Resource Report 9 with MVP's application to FERC
4. Describe the existing compressor units at each station where new, additional, or modified compressor units are proposed, including the manufacturer, model number, and horsepower of the compressor units. For proposed new, additional, or modified compressor units include the horsepower, type, and energy source. (§ 380.12(k)(4)).	To be included in Resource Report 9 with MVP's application to FERC
5. Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building/enclosure. (§ 380.12(k)(4))	To be included in Resource Report 9 with MVP's application to FERC
6. Identify any applicable state or local noise regulations. (§ 380.12(k)(4))	Section 9.2.1
7. Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment. (§ 380.12(k)(4))	To be included in Resource Report 9 with MVP's application to FERC

FERC Environmental Information Request for Resource Report 9 Dated March 13, 2015	
Information	**Location in Resource Report**
1. Include a discussion of impacts resulting from greenhouse gas emissions from the Project. This analysis should include fugitive emissions from all Project components. Further, estimate how much of the natural gas delivered from the Project would be used to supplant other existing fuel sources, such as using new natural gas supplies to replace retiring coal-fired power plants.	Section 9.1.3.1.4, p. 9-11, additional information to be included in Resource Report 9 with application to FERC

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AIR AND NOISE QUALITY
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Note: Appendices will be included with Resource Report 9 filed with MVP's application to FERC

RESOURCE REPORT 9
AIR QUALITY AND NOISE

LIST OF ACRONYMS AND ABBREVIATIONS

AQS	Air Quality System data repository maintained by EPA
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
Commission	Federal Energy Regulatory Commission
CSR	Code of State Rules
dB	decibel
dBA	A-weighted decibel
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gases
HDD	horizontal directional drill
Hz	Hertz
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_p	sound pressure level
L_w	sound power level
$\mu g/m^3$	micrograms per cubic meter
MACT	Maximum Achievable Control Technology
MLV	mainline block valve
MMBtu/hr	million British thermal units per hour
MRR	Mandatory Reporting Rule
MVP	Mountain Valley Pipeline, LLC
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NSA	noise-sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
PM	particulate matter
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
Project	Mountain Valley Pipeline Project
PSD	Prevention of Significant Deterioration
SO_2	sulfur dioxide
tpy	tons per year
Transco	Transcontinental Gas Pipe Line Company, LLC
VOC	volatile organic compound

RESOURCE REPORT 9
AIR QUALITY AND NOISE

INTRODUCTION

Mountain Valley Pipeline, LLC (MVP), a joint venture between affiliates of EQT Corporation, NextEra Energy, Inc., WGL Holdings, Inc. and Vega Energy Partners, Ltd., is seeking a Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC or Commission) pursuant to Section 7(c) of the Natural Gas Act authorizing it to construct and operate the proposed Mountain Valley Pipeline Project (Project) located in 16 counties in West Virginia and Virginia MVP plans to construct an approximately 294.1-mile, 42-inch-diameter natural gas pipeline to provide timely, cost-effective access to the growing demand for natural gas for use by local distribution companies, industrial users and power generation in the Mid-Atlantic and southeastern markets, as well as potential markets in the Appalachian region.

The proposed pipeline will extend from the existing Equitrans, L.P. transmission system in Wetzel County, West Virginia to Transcontinental Gas Pipe Line Company, LLC's (Transco) Zone 5 compressor station 165 in Pittsylvania County, Virginia. In addition to the pipeline, the Project will require approximately 217,200 horsepower of compression at approximately four compressor stations currently planned along the route, as well as measurement, regulation, and other ancillary facilities required for the safe operation of the pipeline. The pipeline is designed to transport up to 2.0 billion cubic feet per day of natural gas. Resource Report 1 provides a complete summary of the Project facilities (see Tables 1.2-1 and 1.2-2) and a general location map of the Project facilities (Figure 1.2-1).

ENVIRONMENTAL RESOURCE REPORT ORGANIZATION

Resource Report 9 includes discussion of Air Quality and Noise in the Project area and potential Project impacts. Resource Report 9 is prepared and organized according to the FERC *Guidance Manual for Environmental Report Preparation* issued August 2002. Air quality resources and potential impacts from the Project are discussed in Section 9.1, including a summary of the regional climate and existing air quality in Section 9.1.1, a discussion of Project related emissions in 9.1.2, an overview of the permitting requirements in Section 9.1.3, and a discussion of potential Project-related air quality impacts in Section 9.1.4. Section 9.2.1 provides a description of the applicable regulatory requirements applicable to noise, Section 9.2.2 identifies the existing in-air acoustic conditions, and Section 9.2.3 estimates the construction and operation sound sources.

9.1 AIR QUALITY

9.1.1 Existing Air Quality

9.1.1.1 Climate

Monthly climatological data for the Compressor Station locations is referenced from the most representative nearby meteorological stations (National Weather Service cooperative stations 466202, 462718, 460582, and 447285). There are also closer non-airport meteorological data sources; however, these stations were determined to have the most similar terrain, elevation, surrounding topography, and the most complete meteorological data. Meteorological data for all stations was obtained from the National Climatic Data Center for the period from January 1981 to December 2010. The annual average temperatures and average precipitation data for these areas are presented in Table 9.1-1.

Table 9.1-1

Climate Parameters at the Compressor Station Locations

Station	Monitor	ID	Approximate Distance and Direction from Station	Average Daily Minimum Temperature – January (°F)	Average Daily Maximum Temperature – July (°F)	Annual Precipitation (inches)
Bradshaw	Morgantown Hart Field, WV US	GHCND: USW00013736	33 miles NE	23.7	83.4	41.83
Harris	Elkins-Randolph County Regional Airport, WV US	GHCND: USW 00013729	36 miles NE	19.4	81.0	45.93
Stallworth	Raleigh County Memorial Airport, WV US	GHCND: USW00003872	20 miles SW	22.8	79.8	41.19
Swann	Roanoke-Blacksburg Regional Airport, VA US	GHCND: USW 00013741	19 miles NE	27.5	87.0	41.25

9.1.1.2 National Ambient Air Quality Standards

Table 9.1-2 summarizes the National Ambient Air Quality Standards (NAAQS) that are currently in effect. Any area that does not meet the NAAQS for the corresponding pollutant is known as a non-attainment area. All counties in which the Project is located are classified as in attainment with all NAAQS.

Table 9.1-2

National Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide (CO)	9 ppm (10,000 µg/m^3)	8-hour	None
	35 ppm (40,000 µg/m^3)	1-hour	None
Lead	0.15 µg/m^3	Rolling 3-month Average	Same as Primary
Nitrogen Dioxide (NO_2)	53 ppb (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary
	100 ppb (188 µg/m^3)	1-hour	None

Table 9.1-2

National Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Particulate Matter (PM_{10})	150 µg/m^3	24-hour	Same as Primary
Particulate Matter ($PM_{2.5}$)	12 µg/m^3	Annual (Arithmetic Mean)	15 µg/m^3
	35 µg/m^3	24-hour	Same as Primary
Ozone	75 ppb	8-hour	Same as Primary
Sulfur Dioxide (SO_2)*	0.03 ppm (80 µg/m^3)	Annual (Arithmetic Mean)	0.02 ppm
	0.14 ppm (365 µg/m^3)	24-hour	None
	None	3-hour	0.5 ppm (1,300 µg/m^3)
	75 ppb (196 µg/m^3)	1-hour	None

Source: http://epa.gov/air/criteria.html. The counties of Wetzel, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe, WV, are each in attainment for all criteria pollutants. The counties of Giles, Montgomery, Roanoke, Franklin, and Pittsylvania, VA, are each in attainment for all criteria pollutants.

* The existing annual and 24-hour SO_2 standards will be revoked one year after the effective dates in areas with designated status for the revised SO_2 NAAQS.

9.1.1.3 Section 107 Attainment Status Designations

The Project is located in counties of Wetzel, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe, West Virginia, and Giles, Montgomery, Roanoke, Franklin, and Pittsylvania, Virginia. All counties listed are in attainment for all criteria pollutants.

9.1.1.4 Existing Ambient Background Levels

Existing ambient background concentrations for criteria air pollutants in the vicinity of the proposed compressor stations are presented in Tables 9.1-3 through 9.1-6 below. This data was obtained from the EPA's Air Quality System (AQS) which is the EPA's repository of ambient air quality data, collected and stored from over 10,000 monitors nationwide. The AQS system data is used to assess air quality, assist in Attainment/Non-Attainment designations, evaluate State Implementation Plans for Non-Attainment Areas, and provide inputs to support modeling for air quality permits and permit review. As mentioned above, all counties crossed by the Project are in attainment for all criteria pollutants.

Table 9.1-3

Existing Ambient Background Levels in the Vicinity of the Bradshaw Compressor Station

Pollutant	Averaging Period	Monitoring Station	AQS Site ID	County	State	Approx. Distance from Facility (miles)	Background Concentration ($\mu g/m^3$)	Primary NAAQS ($\mu g/m^3$)
NO_2	1-hour	Charleroi Waste Treatment Plant	42-125-0005	Washington	PA	54	68.4	188.0
NO_2	Annual	Charleroi Waste Treatment Plant	42-125-0005	Washington	PA	54	16.1	100.0
$PM_{2.5}$	24-hour	Marion Heath Care Hospital	54-049-0006	Marion	WV	22	18.8	35.0
$PM_{2.5}$	Annual	Marion Heath Care Hospital	54-049-0006	Marion	WV	22	9.7	12.0
CO	1-hour	Charleroi Waste Treatment Plant	42-125-0005	Washington	PA	54	2,864.0	40,000.0
CO	8-hour	Charleroi Waste Treatment Plant	42-125-0005	Washington	PA	54	1,718.4	10,000.0
PM_{10}	24-hr	Brilliant	39-081-0001	Jefferson	OH	50	47.0	150.0
SO_2	1-hour	Morgantown - Airport US	54-061-0003	Monongalia	WV	34	39.3	196.0
SO_2	3-hour	Morgantown - Airport US	54-061-0003	Monongalia	WV	34	41.9	1300.0
SO_2	24-hour	Morgantown - Airport US	54-061-0003	Monongalia	WV	34	16.8	365.0
SO_2	Annual	Morgantown - Airport US	54-061-0003	Monongalia	WV	34	73.4	80.0

Table 9.1-4

Existing Ambient Background Levels in the Vicinity of the Harris Compressor Station

Pollutant	Averaging Period	Monitoring Station	AQS Site ID	County	State	Approx. Distance from Facility (miles)	Background Concentration ($\mu g/m^3$)	Primary NAAQS ($\mu g/m^3$)
NO_2	1-hour	Rockingham VDOT	51-165-0003	Rockingham	VA	93	73.4	188.0
NO_2	Annual	Rockingham VDOT	51-165-0003	Rockingham	VA	93	17.0	100.0
$PM_{2.5}$	24-hour	Washington Irving Junior High School	54-033-0003	Harrison	WV	40	19.0	35.0
$PM_{2.5}$	Annual	Washington Irving Junior High School	54-033-0003	Harrison	WV	40	9.1	12.0
CO	1-hour	Charleroi Waste Treatment Plant	42-125-0005	Washington	PA	103	2,864.0	40,000.0
CO	8-hour	Charleroi Waste Treatment Plant	42-125-0005	Washington	PA	103	1,718.4	10,000.0
PM_{10}	24-hr	Charleston Baptist Temple	54-039-0010	Kanawha	WV	66	30	150.0
SO_2	1-hour	Morgantown - Airport US	54-061-0003	Monongalia	WV	71	39.3	196.0
SO_2	3-hour	Morgantown - Airport US	54-061-0003	Monongalia	WV	71	41.9	1300.0
SO_2	24-hour	Morgantown - Airport US	54-061-0003	Monongalia	WV	71	16.8	365.0
SO_2	Annual	Morgantown - Airport US	54-061-0003	Monongalia	WV	71	73.4	80.0

Table 9.1-5

Existing Ambient Background Levels in the Vicinity of the Stallworth Compressor Station

Pollutant	Averaging Period	Monitoring Station	AQS Site ID	County	State	Approx. Distance from Facility (miles)	Background Concentration ($\mu g/m^3$)	Primary NAAQS ($\mu g/m^3$)
NO_2	1-hour	East Vinton Elementary School	51-161-1004	Roanoke	VA	63	69.2	188.0
NO_2	Annual	East Vinton Elementary School	51-161-1004	Roanoke	VA	63	12.6	100.0
$PM_{2.5}$	24-hour	Salem High School	51-775-0011	Salem City	VA	54	17	35.0
$PM_{2.5}$	Annual	Salem High School	51-775-0011	Salem City	VA	54	9	12.0
CO	1-hour	Winston-Salem	37-067-0023	Forsyth	NC	127	2,749.5	40,000.0
CO	8-hour	Winston-Salem	37-067-0023	Forsyth	NC	127	1,947.5	10,000.0
PM_{10}	24-hr	Charleston Baptist Temple	54-039-0010	Kanawha	WV	58	30.0	150.0
SO_2	1-hour	Charleston Baptist Temple	54-039-0010	Kanawha	WV	58	110.9	196.0
SO_2	3-hour	Charleston Baptist Temple	54-039-0010	Kanawha	WV	58	120.5	1300.0
SO_2	24-hour	Charleston Baptist Temple	54-039-0010	Kanawha	WV	58	46.9	365.0
SO_2	Annual	Charleston Baptist Temple	54-039-0010	Kanawha	WV	58	157.2	80.0

Table 9.1-6

Existing Ambient Background Levels in the Vicinity of the Swann Compressor Station

Pollutant	Averaging Period	Monitoring Station	AQS Site ID	County	State	Approx. Distance from Facility (miles)	Background Concentration ($\mu g/m^3$)	Primary NAAQS ($\mu g/m^3$)
NO_2	1-hour	East Vinton Elementary School	51-161-1004	Roanoke	VA	24	69.2	188.0
NO_2	Annual	East Vinton Elementary School	51-161-1004	Roanoke	VA	24	12.6	100.0
$PM_{2.5}$	24-hour	Salem High School	51-775-0011	Salem City	VA	13	17	35.0
$PM_{2.5}$	Annual	Salem High School	51-775-0011	Salem City	VA	13	9	12.0
CO	1-hour	Winston-Salem	37-067-0023	Forsyth	NC	83	2,749.5	40,000.0
CO	8-hour	Winston-Salem	37-067-0023	Forsyth	NC	83	1,947.5	10,000.0
PM_{10}	24-hr	Gladeville Elementary School	51-035-0001	Carroll	VA	50	26	150.0
SO_2	1-hour	East Vinton Elementary School	51-161-1004	Roanoke	VA	24	14.1	196.0
SO_2	3-hour	East Vinton Elementary School	51-161-1004	Roanoke	VA	24	15.7	1300.0
SO_2	24-hour	East Vinton Elementary School	51-161-1004	Roanoke	VA	24	11.5	365.0
SO_2	Annual	East Vinton Elementary School	51-161-1004	Roanoke	VA	24	19.1	80.0

9.1.1.5 Federal Class I Areas

Federal Class I areas are certain areas established by Congress, such as wilderness areas and national parks, that are afforded special protection under the Clean Air Act (CAA). Once designated as a Class I area, that area cannot be re-designated to another (lower) classification. Class I areas are allowed the smallest degree of air quality deterioration through New Source Review (NSR) / Prevention of Significant Deterioration (PSD) permitting, and special considerations must be made in the NSR permitting process when a Class I area is located close to a proposed site. Based on preliminary calculations, the Project does not require PSD review and Class I modeling will not be required. Regardless, the Class I areas nearest to the proposed locations of the Bradshaw, Harris, Stallworth, and Swann Compressor Stations have been identified. The Class I areas are listed in Tables 9.1-7, 9.1-8, 9.1-9, and 9.1-10.

Table 9.1-7

Federal Class I Areas Closest to the Bradshaw Compressor Station

Class I Area	Managing Agency	Direction from Bradshaw	Approximate Distance to Compressor Station	
			Kilometers	Miles
Otter Creek, WV	U.S. Forest Service	Southeast of Bradshaw	98	61
Dolly Sods, WV	U.S. Forest Service	Southeast of Bradshaw	117	73
Shenandoah, VA	National Park Service	Southeast of Bradshaw	211	131
James River, VA	U.S. Forest Service	Southeast of Bradshaw	236	147

Table 9.1-8

Federal Class I Areas Closest to the Harris Compressor Station

Class I Area	Managing Agency	Direction from Harris	Approximate Distance to Compressor Station	
			Kilometers	Miles
Otter Creek, WV	U.S. Forest Service	Northeast of Harris	82	52
Dolly Sods, WV	U.S. Forest Service	Northeast of Harris	103	64
Shenandoah, VA	National Park Service	Southeast of Harris	166	103
James River, VA	U.S. Forest Service	Southeast of Harris	156	97

Table 9.1-9

Federal Class I Areas Closest to the Stallworth Compressor Station

Class I Area	Managing Agency	Direction from Stallworth	Approximate Distance to Compressor Station	
			Kilometers	Miles
Otter Creek, WV	U.S. Forest Service	Northeast of Stallworth	159	99
Dolly Sods, WV	U.S. Forest Service	Northeast of Stallworth	174	108
Shenandoah, VA	National Park Service	Northeast of Stallworth	189	117
James River, VA	U.S. Forest Service	Southeast of Stallworth	120	75

Table 9.1-10

Federal Class I Areas Closest to the Swann Compressor Station

Class I Area	Managing Agency	Direction from Swann	Approximate Distance to Compressor Station	
			Kilometers	Miles
Otter Creek, WV	U.S. Forest Service	Northeast of Swann	202	125
Dolly Sods, WV	U.S. Forest Service	Northeast of Swann	208	128
Shenandoah, VA	National Park Service	Northeast of Swann	185	115
James River, VA	U.S. Forest Service	Northeast of Swann	85	53

9.1.2 Project Emissions

9.1.2.1 Construction

The proposed Project includes the construction of approximately 294.1 miles of new 42-inch diameter natural gas pipeline through 16 counties in West Virginia and Virginia. The West Virginia counties include Wetzel, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe. The Virginia counties include Giles, Montgomery, Roanoke, Franklin, and Pittsylvania. The pipeline will deliver gas from the Equitrans L.P. transmission system, gathering systems, and natural gas production facilities to Columbia Gas Transmission, LLC's WB system and Transco's system.

Four compressor stations are anticipated to be required for the Project. An initial station at the northern-most point of the pipeline will provide suppliers with immediate pipeline access, and three relay stations located further south along the pipeline will boost pipeline pressure and allow for the designed capacity. The compressor stations will have pig launcher and receiver sites. Additional meter and mainline block valve (MLV) sites will be located along the pipeline.

The use of equipment to construct the Project will result in temporary, short-term emissions of air pollutants that will be restricted to the construction period for each facility and pipeline and will terminate once construction has been completed. Construction for the Project is expected to take place in 2017 and 2018. These emissions will not result in significant adverse impacts to air quality.

Construction activities can generally be categorized into the following activities:

- Construction Equipment Engines – Emissions from air compressors, backhoes, cranes, and other construction equipment;
- On-Road Vehicle Travel – Emissions from commuter buses, passenger vehicles, and diesel or gasoline trucks;
- Off-Road Vehicle Travel – Emissions from dump trucks, light/medium duty trucks, and water/fuel trucks;
- Earthmoving Fugitives – Emissions resulting from bulldozing, grading, and land disturbance; and
- Stockpile Fugitives – Emissions from wind erosion of stockpiles during pipeline construction.

Emissions from these source categories will be calculated using emission factors and the U.S. Environmental Protection Agency (EPA) models from the following sources:

- Compilation of Air Pollutant Emission Factors, EPA AP-42;
- EPA NONROAD2008a Model; and
- EPA MOVES2014 Vehicle Emission Modeling Software.

As the Project design is not yet complete, potential emissions from construction cannot yet be calculated. This section will be updated to present estimated construction emissions once the design is final and the information will be included in the final Resource Report 9 to be filed with MVP's application to FERC.

9.1.2.2 Operation (including maintenance and malfunctions)

The following four sections list the equipment to be installed at each compressor station based on the preliminary design. Final list of equipment along with the ratings and capacities will be provided once the design is finalized. As the Project design is not yet complete, potential emissions from operation cannot yet be calculated. This section will be updated to present potential operation emissions once the design is final and the information will be included in the final Resource Report 9 to be filed with MVP's application to FERC.

9.1.2.2.1 Bradshaw Compressor Station

The proposed Bradshaw Compressor Station located in Wetzel County, West Virginia may involve the installation of approximately 121,800 horsepower and the following equipment:

- Two natural gas-fired emergency engines;
- Four turbines for the compression and transmission of natural gas;
- Five microturbines to provide power;
- Two natural gas-fired heaters;
- One produced fluids tank and associated loadout;
- One waste oil tank and associated loadout; and
- Associated piping and components.

9.1.2.2.2 Harris Compressor Station

The proposed Harris Compressor Station located in Braxton County, West Virginia may involve the installation of approximately 31,800 horsepower and the following equipment:

- One natural gas-fired emergency engine;
- Two turbines for the compression and transmission of natural gas;
- Five microturbines to provide power;
- Two natural gas-fired heaters;
- One produced fluids tank and associated loadout;
- One waste oil tank and associated loadout; and
- Associated piping and components.

9.1.2.2.3 Stallworth Compressor Station

The proposed Stallworth Compressor Station located in Fayette County, West Virginia may involve the installation of approximately 31,800 horsepower and the following equipment:

- One natural gas-fired emergency engine;

- Two turbines for the compression and transmission of natural gas;
- Five microturbines to provide power;
- Two natural gas-fired heaters;
- One produced fluids tank and associated loadout;
- One waste oil tank and associated loadout; and
- Associated piping and components.

9.1.2.2.4 Swann Compressor Station

The proposed Swann Compressor Station located in Montgomery County, Virginia may involve the installation of approximately 31,800 horsepower. The equipment and layout of the proposed compressor station is still under review. Additional information, including expected equipment that would contribute to emissions during station operation, will be provided in the final Resource Report 9 included with MVP's application to FERC.

9.1.2.3 Decommissioning

Decommissioning of facilities is not currently planned. MVP will obtain the necessary permission for decommissioning at the end of the useful project life.

9.1.3 Regulatory Review and Applicability

This section lists applicable air quality regulations. As the Project design is not yet complete, the applicable regulations included in this section are not comprehensive. This section will be updated once the design is final and the information will be included in the final Resource Report 9 to be filed with MVP's application to FERC.

9.1.3.1 Federal Air Quality Regulations

9.1.3.1.1 Major New Source Review and Title V Operating Permit

The federal NSR program applies to major stationary sources. The NSR program regulates the installation of new major sources or major modifications to existing major sources and is comprised of two programs: 1) PSD; and 2) Nonattainment New Source Review (NNSR). Since none of the compressor stations are in nonattainment counties, NNSR is categorically not applicable and only PSD applicability has been addressed.

The compressor stations that are part of the Project are all located in counties that are classified as "Unclassifiable/Attainment" with all NAAQS per 40 Code of Federal Regulations (CFR) 81.349. Compressor stations are also not listed as one of the 28 categories of stationary sources subject to a 100 ton per year (tpy) major source threshold (40 CFR 52.21(b)(1)(i)(a)). As a result, the PSD major source thresholds are 250 tpy for the main criteria pollutants expected to be emitted as part of the Project (i.e., PM_{10}, $PM_{2.5}$, sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen oxides (NO_X), and volatile organic compounds [VOC]). The design of the Project is still in preliminary phases; however, MVP does not expect the compressor stations to trigger PSD permitting but will present final emissions and a detailed PSD analysis in the final Resource Report 9 filed with the application to FERC after the design is complete.

Similarly, the Title V major source permitting thresholds are 100 tpy for the criteria pollutants noted above (40 CFR 70.2). The need for obtaining a Title V operating permit will also be evaluated after the finalization of the design.

The pipeline associated with this project is not expected to be a major stationary emission source, based on its potential fugitive emissions, and is thus not expected to be subject to the potential requirements of the Major NSR and Title V Operating Permit programs. Potential fugitive emissions from the pipeline and associated equipment, such as pig launcher and receiver sites, meter stations, and MLVs, will be calculated after the finalization of the design.

9.1.3.1.2 National Emission Standards for Hazardous Air Pollutants (NESHAP or MACT)

The potential hazardous air pollutants emissions at the Bradshaw, Harris, Stallworth, and Swann Compressor Stations are not yet known and as a result, a complete NESHAP applicability cannot be presented. Potentially applicable subparts are presented below.

NESHAP Subpart HH – Oil and Natural Gas Production Facilities

Because the Bradshaw, Harris, Stallworth, and Swann Compressor Stations do not meet the definition of natural gas production facilities per 40 CFR 63.761, the requirements of this subpart do not apply.

NESHAP Subpart HHH – Natural Gas Transmission and Storage Facilities

This Subpart is potentially applicable to the stations but its applicability and specific requirements will be determined and presented in the Resource Report 9 filed with MVP's application to FERC after the design is complete.

NESHAP Subpart YYYY – Stationary Combustion Turbines

This Subpart is potentially applicable to the stations but its applicability and specific requirements will be determined and presented in final Resource Report 9 after the design is complete.

NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

The Bradshaw, Harris, Stallworth, and Swann Compressor Stations will include natural gas-fired emergency engines. These engines will be subject to NESHAP Subpart ZZZZ, but the specific requirements will be discussed after the design is complete and major or area source status of the facilities is determined.

9.1.3.1.3 New Source Performance Standards (NSPS)

NSPS Subpart Dc

The heaters at the Bradshaw, Harris, Stallworth, and Swann Compressor Stations will meet the definition under this subpart of a 'steam generating unit'. However, MVP does not anticipate the rated heat input of these units to exceed the Subpart Dc applicability threshold of 10 million British thermal units per hour (MMBtu/hr). Therefore, Subpart Dc is not expected to apply to the facilities.

NSPS Subparts K, Ka, and Kb

Based on the preliminary design, the tanks at the Bradshaw, Harris, Stallworth, and Swann Compressor Stations will have a capacity of 10,000 gallons or less. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the facilities.

NSPS Subpart GG – Stationary Gas Turbines

NSPS Subpart GG was promulgated in 1979. The applicability of Subpart KKKK, promulgated in 2006, is similar to that of Subpart GG and applies to stationary combustion turbines that commence construction after February 18, 2005. Turbines subject to Subpart KKKK are specifically exempt from the requirements of Subpart GG, per 40 CFR 60.4305(b). The combustion turbines will be subject to Subpart

KKKK and, as such, this subpart is not expected to apply to any combustion turbines that will be installed at the Bradshaw, Harris, and Stallworth Compressor Stations.

NSPS Subpart IIII – Stationary Compression Ignition Internal Combustion Engines
As noted in Section 9.1.2.2, there are no compression ignition engines in the preliminary design. Therefore, the requirements of this subpart do not apply.

NSPS Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines
The Bradshaw, Harris, Stallworth, and Swann Compressor Stations will include natural gas-fired emergency engines. These emergency engines will be considered affected facilities subject to NSPS Subpart JJJJ. MVP will provide more details on compliance with the applicable requirements of this regulation after the specifics for each engine is known.

NSPS Subpart KKKK – Stationary Combustion Turbines
Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, applies to stationary combustion units with a heat input at peak load equal to or greater than 10 MMBtu/hr, based on the higher heating value of the fuel, commencing construction after February 18, 2005.

The microturbines that will be used at the Bradshaw, Harris, Stallworth, and Swann Compressor Stations have a heat input lower than 10 MMBtu/hr and as such, NSPS Subpart KKKK does not apply to the microturbines.

The turbines designed for compression and transmission of natural gas, however, will have a heat input at peak load greater than 10 MMBtu/hr. They are therefore subject to this Subpart. MVP will comply with all applicable requirements under this Subpart for the turbines, which includes emission limitations for NO_X (40 CFR 60.4320(a)) and SO_2 (40 CFR 60.4330(a)), monitoring (40 CFR 60.4340, 60.4365, and 60.4370), reporting (40 CFR 60.4375) and performance testing (40 CFR 60.4400).

NSPS Subpart OOOO – Oil & Natural Gas Sector
The Bradshaw, Harris, Stallworth, and Swann Compressor Stations are not gas wellheads, nor are they natural gas processing plants. The Bradshaw, Harris, and Stallworth Compressor Stations will be located in the transmission segment. Therefore, the only potentially applicable requirements for the proposed equipment at these facilities are those for new storage vessels where construction commenced after August 23, 2011.

Each compressor station will have a storage vessel (as defined in Subpart OOOO) installed as a result of this project. However, since VOC emissions are not anticipated to exceed 6 tpy, the tanks will likely not be considered storage vessel affected facilities under the rule, per 40 CFR 60.5365(e) and the rule is not expected to be applicable. The applicability will be reevaluated when the design is finalized and final emission calculations can be reviewed.

9.1.3.1.4 Greenhouse Gas Reporting Rule

Per 40 CFR 98.2(a)(2), facilities which contain a source category listed in Table A-4 of 40 CFR 98 Subpart A, and which emit 25,000 metric tons per year of carbon dioxide equivalent (CO_2e) in combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all applicable source categories in Tables A-3 and A-4 are subject to reporting under the Greenhouse Gas Mandatory Reporting Rule (MRR). Table A-4 of 40 CFR 98 Subpart A includes Petroleum and Natural Gas Systems. Greenhouse gas (GHG) emissions from each of the compressor stations will be calculated and

compared with the 25,000 metric tons per year of CO_2e when the design is final to address the applicability of the rule. As applicable, MVP will meet all requirements of the MRR for these new compressor stations. No other subparts under the MRR are applicable to the facilities.

9.1.3.2 West Virginia Air Quality Regulations

The Bradshaw, Harris, and Stallworth Compressor Stations are potentially subject to regulations contained in the West Virginia Code of State Rules, Chapter 45 (Code of State Rules, or CSR). The specific requirements associated with this project are discussed in the following sections. Since the design is in preliminary phases, the requirements that generally apply to the Project have been discussed in this section. However, after the design of each compressor station is finalized, the regulatory applicability will be reevaluated to ensure that specific requirements that could be applicable to each individual compressor station are properly addressed.

45 CSR 2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

45 CSR 2 applies to fuel burning units, defined as equipment burning fuel "for the primary purpose of producing heat or power by indirect heat transfer".

The turbines and microturbines do not meet the definition of a fuel burning unit, as power is not produced by indirect heat transfer. Units less than 10 MMBtu/hr, such as the proposed heaters, are only subject to opacity limits. The heaters do produce heat by indirect heat transfer, and visible emissions from these units will be minimized via the use of natural gas as a fuel.

45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

> *No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.*

The Bradshaw, Harris, and Stallworth Compressor Stations are generally subject to this requirement. However, due to the nature of the process at these compressor stations, production of objectionable odor from the facilities is unlikely.

The pipeline is generally subject to this requirement. However, emissions from the pipeline will result from its construction, will be temporary in nature, and production of objectionable odor from these operations is unlikely.

45 CSR 13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation

According to 45 CSR 13-5:

> *No person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without notifying the Secretary of such intent and obtaining a permit to construct, modify, relocate and operate the stationary source as required in this rule or any other applicable rule promulgated by the Secretary.*

The proposed units at the Bradshaw, Harris, and Stallworth Compressor Stations will be installed upon the fulfillment of this requirement. Any future emission source at the Bradshaw, Harris, and Stallworth Compressor Stations will be installed only upon receipt of the necessary approval from the West Virginia Department of Environmental Protection.

45 CSR 14: Permits for Construction and Major Modification of Major Stationary Sources for the Prevention of Significant Deterioration of Air Quality

The requirements of this section are already discussed under the PSD section and the federal regulations in Section 9.1.3.1.1.

45 CSR 16: Standards of Performance for New Stationary Sources

45 CSR 16-1 incorporates the federal CAA standards of performance for new stationary sources set forth in 40 CFR Part 60 by reference, with the exception of a few Subparts.

By complying with all applicable requirements of 40 CFR Part 60, MVP will be complying with 45 CSR 16.

45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

According to 45 CSR 17-3.1:

> *No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.*

Due to the nature of the activities at the Bradshaw, Harris, and Stallworth Compressor Stations, it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, MVP will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur. Particulate emissions from the pipeline will result from its construction, but will be temporary in nature. MVP will take all measures necessary to ensure compliance with this requirement and will follow its fugitive dust control plan that will be submitted to the FERC in future filing.

45 CSR 34: Emissions Standards for Hazardous Air Pollutants

45 CSR 34-1 incorporates the federal CAA NESHAPs as set forth in 40 CFR Parts 61 and 63 by reference.

By complying with all applicable requirements of 40 CFR Parts 61 and 63 at the Bradshaw, Harris, and Stallworth Compressor Stations, MVP will be complying with 45 CSR 34.

9.1.3.3 Virginia Air Quality Regulations

The Swann Compressor Station is potentially subject to regulations contained in the Virginia Administrative Code, Title 9, Agency 5 (9 VAC 5). The Virginia air quality regulations mostly apply to operating sources and are expected to apply to the proposed new Swann Compressor Station during operation. MVP will reevaluate the applicable air quality regulations when the design is final. An analysis will be provided in final Resource Report 9 of MVP's application to FERC.

9.1.3.4 General Conformity

Under the CAA, a General Conformity analysis is required for any project that requires federal action. General Conformity applies to those emission generating activities resulting from the Project that are not already covered by permitting and located in an area that is designated as nonattainment or a maintenance area (40 CFR 93.153(b)). The counties of Wetzel, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe, West Virginia, are each in attainment for all criteria pollutants. Similarly, the counties of Giles, Montgomery, Roanoke, Franklin, and Pittsylvania, Virginia, are each in attainment for all criteria pollutants. Therefore, a General Conformity analysis is not required for the construction at the Bradshaw, Harris, Stallworth, and Swann Compressor Stations or for the construction along the proposed pipeline. Construction emissions will be presented for informational purposes only to show that the Project will not result in significant adverse impacts to air quality, even though this project is not required to undergo a full General Conformity analysis, and there are no numerical thresholds that apply to the construction emissions.

9.1.4 Air Quality Mitigation Measures

MVP will address the air quality impact assessment with regard to construction emissions, operating emissions, and GHG impacts after the design of the Project is final, and potential and actual emissions are calculated to allow for a comprehensive assessment. General mitigation measures are addressed here.

Construction Emissions

As demonstrated in Section 9.1.2.1, the construction emissions associated with the Project are expected to have minimal impact on the air quality in the surrounding area. However, MVP will implement various mitigation measures to minimize construction emissions. These include:

- Unnecessary construction activities leading to increased emissions will be avoided, where possible.
- MVP will follow manufacturer's operating recommendations regarding good combustion practices to ensure that fuel efficiency is maximized and engines are operated such that emissions are minimized.
- MVP will implement a fugitive dust control plan, and will utilize certain dust control measures such as water suppression, enclosures, or other techniques.

Operational Emissions

Emissions from operating the equipment at the new Bradshaw, Harris, Stallworth, and Swann Compressor Stations are a result of combustion of natural gas of the turbines at the stations. While the design is not yet final MVP will purchase turbines that meet the emission limitations found in the applicable NSPS sections. Further, MVP will mitigate these emissions through the development and implementation of an operation and maintenance plan that is in line with the manufacturer's recommendations for good combustion practices. Proper operation and preventative maintenance activities will ensure that emissions from the turbines will be minimized and continue to meet the emission standards.

9.2 NOISE

A sound source is defined by a sound power level (L_W), which is the rate at which acoustical energy is radiated outward and is expressed in units of watts (W). A sound pressure level (L_P) is a measure of this fluctuation at a given receiver location and can be obtained through the use of a microphone or calculated from information about the source sound power level and the surrounding environment. Sound power cannot be measured directly, but rather calculated from measurements of sound intensity or sound pressure at a given distance from the source. The perception of sound as "noise" is influenced by several technical factors such as intensity, sound quality, tonality, duration, and existing background levels. Sound levels are presented on a logarithmic scale to account for the large range of acoustic pressures that the human ear is exposed to and are expressed in units of decibels (dB). Broadband sound includes sound energy summed across the frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum is used to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines 11 octave (or 33 1/3 octave) bands ranging from 16 Hz (low) to 16,000 Hz (high). One-third (1/3) octave bands take these 11 octave bands and split them into three, giving a higher resolution and a more detailed description of the frequency content of the sound. Because the human ear does not perceive every frequency with equal loudness, spectrally varying sounds are often adjusted with a weighting filter.

The A-weighted filter is applied to compensate for the frequency response of the human auditory system and sound exposure in acoustic assessments and is designated in A-weighted decibels (dBA). Environmental noise is commonly described in terms of equivalent sound level (L_{eq}). The L_{eq} value, conventionally expressed in dBA, is the energy-averaged, A-weighted sound level for the complete time period represented as a steady, continuous sound level. Another common noise descriptor used when assessing environmental noise is the day-night sound level (L_{dn}), which is calculated by averaging the 24-hour hourly L_{eq} levels at a given location and adding 10 dB to noise emitted during the nighttime period (10:00 p.m. to 7:00 a.m.) to account for the increased sensitivity of people to noises that occur at night. The L_{max} is the maximum instantaneous sound level as measured during a specified time period. It can also be used to quantify the time-varying maximum instantaneous sound pressure level (as generated by equipment or an activity) or a manufacturer maximum source emission level. Estimates of common noise sources and outdoor acoustic environments, and the comparison of relative loudness are presented in Figure 9.2-1.

9.2.1 Applicable Noise Regulations

The Project is located in West Virginia and Virginia and crosses portions of Braxton, Doddridge, Fayette, Greenbrier, Harrison, Lewis, Monroe, Nicholas, Summers, Webster, and Wetzel counties in West Virginia and Franklin, Giles, Montgomery, Pittsylvania, and Roanoke counties in Virginia. MVP reviewed noise regulations at the federal, state, county, and local levels to identify possible regulations that are applicable to the Project. There are no state noise standards applicable to the Project; however, there are some county noise regulations that are applicable to the Project, as described below.

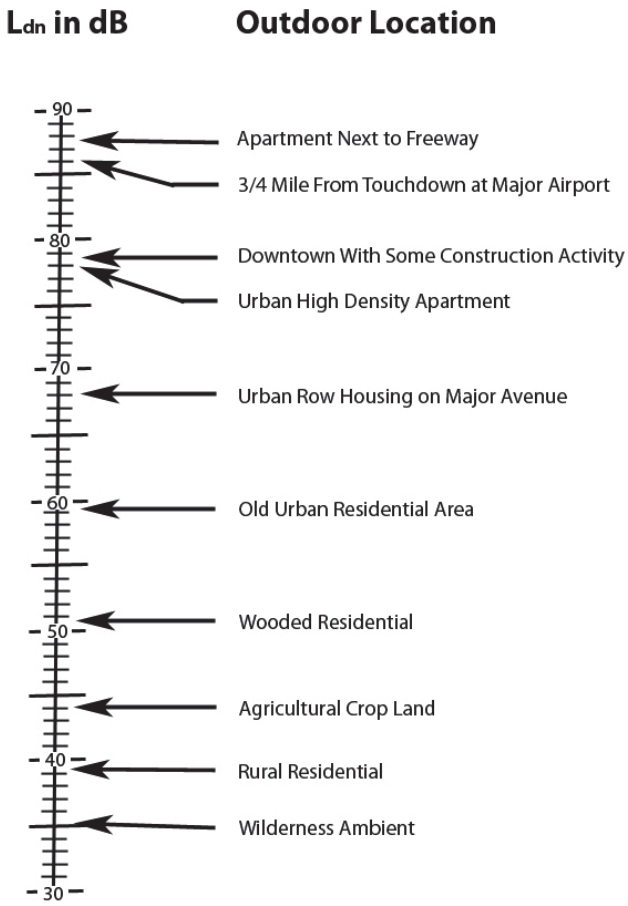

Figure 9.2-1. Sound Pressure Levels (Lp)

9.2.1.1 Commission Requirements

The Commission's noise regulations, set forth in 18 CFR §380.12(k)(2), require an applicant to identify existing noise sensitive areas (NSAs) (e.g., residences, schools, churches) and quantitatively describe existing sound levels at NSAs and at other areas covered by relevant state and local noise ordinances. The following stipulations are given:

- If new compressor station sites are proposed, measure or estimate the existing ambient sound environment based on current land uses and activities;
- For existing compressor stations (operated at full load), include the results of a sound level survey at the site property line and nearby NSAs;
- Include a plot plan that identifies the locations and duration of noise measurements; and
- All surveys must identify the time of day, weather conditions, wind speed and direction, engine load and other noise sources present during each measurement.

In addition, the Commission's requirement for noise quality, in the absence of any applicable state or local noise regulation, is that the noise attributable to any new compressor station and associated pipeline facilities must not exceed an L_{dn} of 55 dBA at any pre-existing NSA such as schools, hospitals, or

residences. This criterion limits the sound level contribution from the Project at any pre-existing NSA to 55 dBA (L_{dn}). An L_{dn} of 55 dBA is equivalent to a continuous noise level of 48.6 dBA L_{eq} for facilities that operate at a constant level of noise.

9.2.1.2 County Limits

Four of the counties that are crossed by the Project prescribe noise level limits that may be applicable to the Project. Table 9.2-1 provides a summary of these limits. Note that the FERC limits are more stringent than the County limits and are therefore controlling.

Table 9.2-1

Noise Level Limits for Counties with Noise Regulations Crossed by the Project

County	Daytime	Nighttime
Fayette County, West Virginia	65 dBA L_{eq} (7AM – 6PM)	55 dBA L_{eq} (6PM – 7AM
Franklin County, Virginia	67 dBA L_{eq} (7AM – 10PM)	62 dBA L_{eq} (10PM – 7AM)
Montgomery County, Virginia	57 dBA L_{eq} (7AM – 10PM)	52 dBA L_{eq} (10PM – 7AM)
Pittsylvania County, Virginia	57 dBA L_{eq} (7AM – 10PM)	52 dBA L_{eq} (10PM – 7AM)

9.2.2 Existing Sound Environment

MVP will quantify the existing noise levels at NSAs at each compressor station and near sites where pipeline installation is proposed using the horizontal directional drill (HDD) technique. Existing noise levels will be quantified following the guidance for baseline noise surveys given in the Commission's noise regulations in 18 CFR §380.12(k)(2). Results of the baseline sound surveys will be provided in Resource Report 9 included with MVP's application to the FERC.

9.2.3 Noise Impacts

9.2.3.1 Construction Noise and Mitigation

Potential impacts from the Project could include short-term increases in sound during construction. Construction of the pipeline will generate noise from heavy machinery and equipment as construction moves in phases along the right-of-way (see draft Resource Report 1 for description of pipeline construction). Sound from pipeline construction will generally be temporary, sporadic, and short-term in any one location along the pipeline route. One exception will be locations where the pipeline will be installed using the HDD technique. At HDD sites drilling equipment is typically in place for a number of days or weeks, and may run continuously until the drilling operation is completed. Although temporary, NSAs near HDD sites could therefore experience noise impacts above an acceptable level.

Analysis of construction noise impacts is ongoing. Final results will be provided in Resource Report 9 included with MVP's application to the FERC.

9.2.3.2 Operation Noise and Mitigation

MVP prepared preliminary noise models for the Bradshaw, Harris, and Stallworth compressor stations, using conceptual station designs and manufactures' specifications. The preliminary noise models also assumed typical noise attenuation would be designed into each station. Among the conceptual equipment

assumed to be included at each station the following were considered significant sound sources in the model:

- Noise from the turbine exhaust, including the exhaust outlet and noise radiated from the exhaust ductwork, expansion joints, and silencer shell;
- Noise from the turbine intake air system, including the inlet opening and noise radiated from the silencer/ductwork shell and any duct joints;
- Turbine/Compressor casing noise that penetrates the building and building ventilation openings;
- Noise from the lube oil/auxiliary cooler and gas aftercooler; and
- Noise radiated by aboveground station piping.

Model Data Inputs

The following assumptions were made when generating the preliminary noise models for Bradshaw, Harris, and Stallworth. An exhaust system consistent with past turbine installations and current vendor proposals for MVP was modeled assuming an exhaust height of 58 feet above grade. This will be updated as a turbine vendor is selected and additional information becomes available.

Each compressor building was assumed to include wall intakes, and a throat ridge ventilator along the roof. The sound levels due to intake ductwork, exhaust system ductwork, and suction and discharge piping were based on sound level measurements of a Mars 100 turbine-driven compressor at an existing compressor station.

The gas cooler sound power levels were taken from a datasheet for a fan at an existing compressor station, and adjusted to account for the presence of three fans in each cooler consistent with current preliminary cooler sizing. The lube oil cooler sound power levels were taken from Solar turbine manufacturers' noise data book for a 90 dBA "Special" lube-oil cooler.

Noise levels will be modeled again at each compressor station using manufacturer specific data once the turbine/compressor equipment is selected. This information will be provided in MVP's Resource Report 9 filing with FERC.

Noise Control Treatments

The preliminary noise models assumed certain noise control treatments would be part of each compressor station design. However, there are many different combinations of noise control mitigation measures that would provide similar noise control. As the station designs are finalized, noise mitigation treatments will also be finalized, and will be modified as needed to ensure each station operates in compliance with the FERC and local sound level requirements. Assumed noise control treatments included in the preliminary noise model are summarized below.

Compressor Building Walls and Roof

The compressor building was assumed to have a wall and roof system with typical transmission loss performance across each octave band consistent with past installations. It was assumed that the compressor building would have no windows, skylights, or translucent panels. The building would be well sealed with no cracks or gaps, and all piping penetrations through the building walls would be well

insulated, flashed, and caulked. The interior surface of the compressor building walls would be acoustically absorptive.

Compressor Building Doors and Ventilation

The compressor building was assumed to have standard insulated overhead doors and industrial metal doors with good perimeter seals, all meeting defined acoustic transmission loss specifications. All building ventilation openings would include standard acoustical louvers or silencers.

Turbine Exhausts and Silencers

An exhaust system consistent with past turbine installations was assumed and calibrated to be consistent with preliminary silencer performance data provided by the turbine vendors that are being evaluated for MVP.

Turbine Intake Silencers and Breakout

A standard turbine inlet silencing system was assumed that was consistent with past installations and designs. The model includes the performance of the entire system, including any filter insertion losses.

Station Piping

Noise from centrifugal compressors can cause significant noise radiation from connected piping. It was assumed that to the extent practical, suction and discharge piping would be run underground. Above ground main gas piping would be acoustically lagged as necessary.

Results of Preliminary Noise Modeling

Preliminary results from acoustic modeling for the Bradshaw, Harris and Stallworth Compressor Stations are represented below in Figures 9.2-2 through 9.2-4, and predicted noise impacts on the nearest NSAs to each station are presented in Tables 9.2-2 through 9.2-4. Preliminary results for the Swann Compressor Station are not available at this time since the equipment and layout of this proposed compressor station is still under review; necessary data will be provided in final Resource Report 9 of MVP's application to FERC. Site locations, layouts and modeled equipment were determined from best available information and assumed typical sound mitigation for compressor stations such as acoustical building enclosures, air inlet silencers, and pipeline lagging.

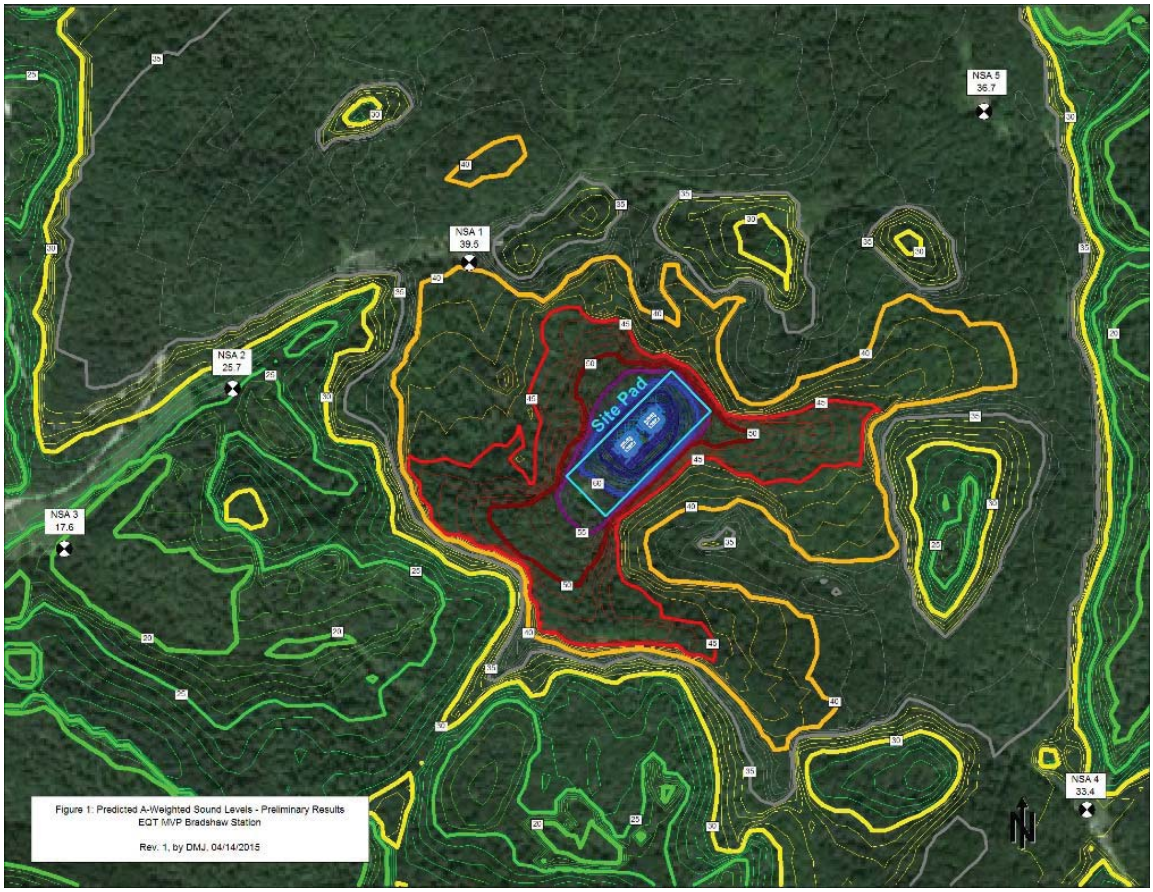

Figure 9.2-2. Preliminary Modeled Sound Levels (dBA) During Operation of Bradshaw Compressor Station

Table 9.2-2

Predicted Sound Levels – Preliminary – Bradshaw Compressor Station

Location	Distance (feet)/Direction from Compressor Station to NSA	Predicted Sound Level (dBA)
NSA 1	1,170′/NW	39.5
NSA 2	2,230′/W	25.7
NSA 3	3,220′/W	17.6
NSA 4	3,210′/SE	33.4
NSA 5	2,550′/NE	36.7

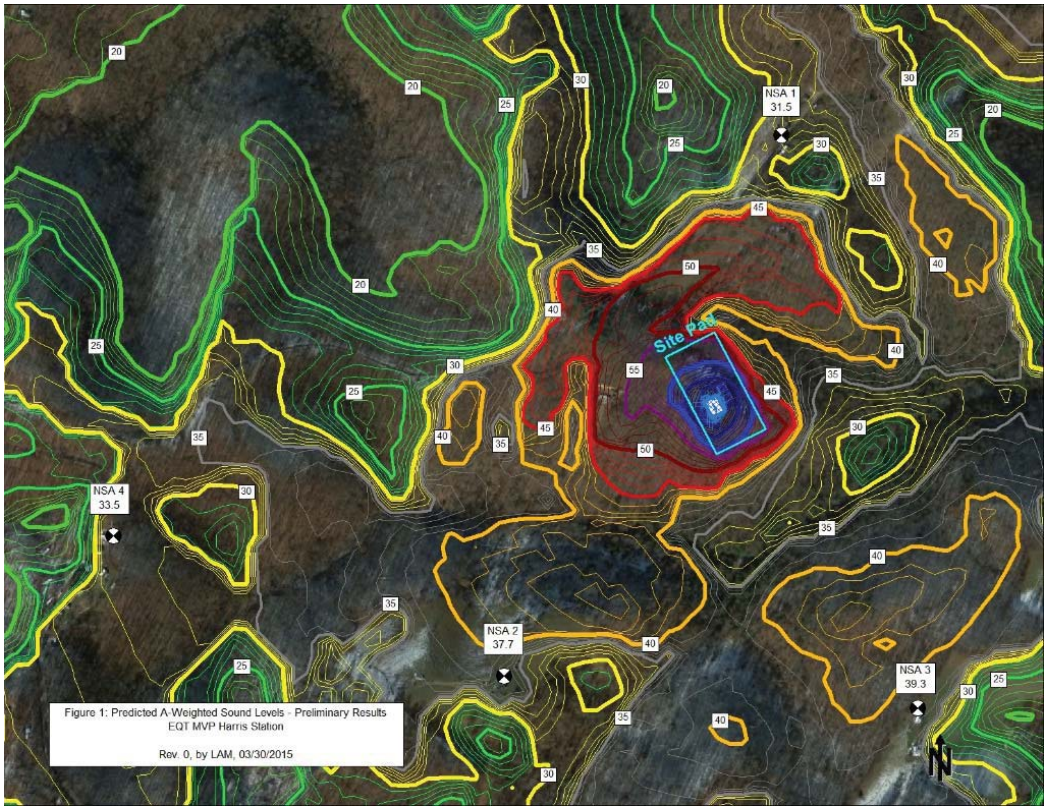

Figure 9.2-3. Preliminary Modeled Sound Levels (dBA) During Operation of Harris Compressor Station

Table 9.2-3

Predicted Sound Levels – Preliminary – Harris Compressor Station

Location	Distance (feet)/Direction from Compressor Station to NSA	Predicted Sound Level (dBA)
NSA 1	1,650′/N	31.5
NSA 2	1,980′/SW	37.7
NSA 3	1,780′/SE	39.3
NSA 4	3,640′/W	33.5

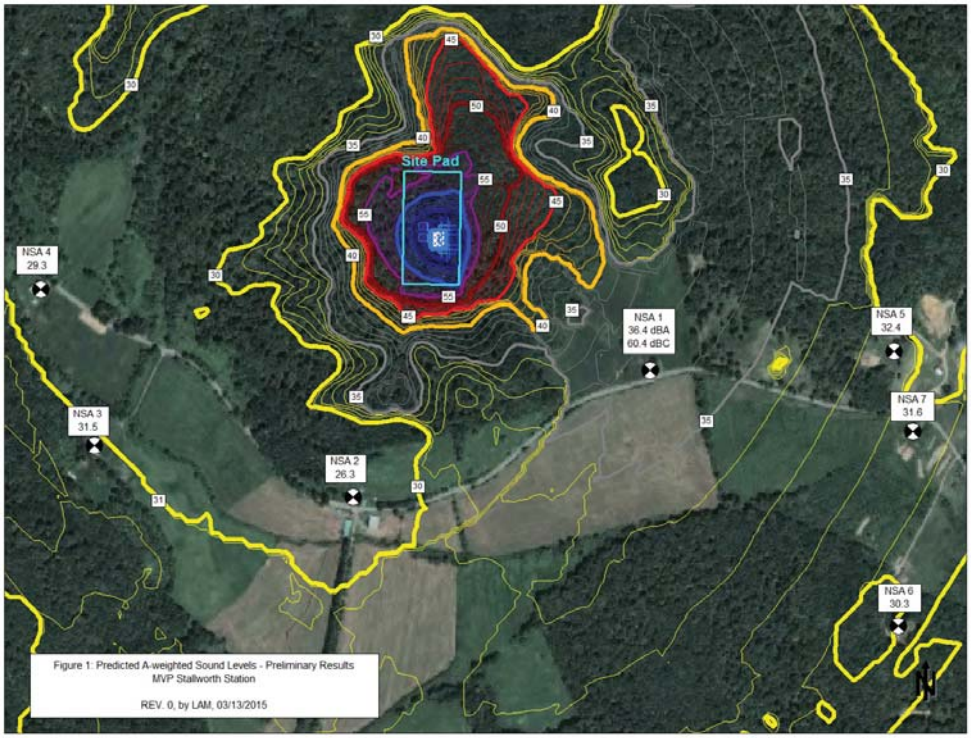

Figure 9.2-4. Preliminary Modeled Sound Levels (dBA) During Operation of Stallworth Compressor Station

Table 9.2-4

Predicted Sound Levels – Preliminary – Stallworth Compressor Station

Location	Distance (feet)/Direction from Compressor Station to NSA	Predicted Sound Level (dBA)
NSA 1	1,330′/SE	36.4
NSA 2	1,430′/S	26.3
NSA 3	2,120′/SW	31.5
NSA 4	2,170′/W	29.3
NSA 5	2,490′/E	32.4
NSA 6	3,080′/SE	30.3
NSA 7	2,760′/SE	31.6

Results from the preliminary modeling show that predicted sound levels at the modeled NSAs at each compressor station are within the county and FERC noise limits. Final results of acoustic modeling will include detailed sound level information about major pieces of equipment within each compressor station, and proposed sound mitigation as needed to ensure the final modeled sound levels at NSAs are below the county and FERC limits. Final results of noise modeling will be included with final Resource Report 9 filed with MVP's application to FERC.

9.3 REFERENCES

EPA (U.S. Environmental Protection Agency). 1978. Protective Noise Levels Condensed Version of EPA Levels Document. Prepared by the U.S. Environmental Protection Agency.

Mountain Valley Pipeline Project

Docket No. PF15-3

Draft Resource Report 9

Appendix 9-A
Construction Emissions Calculations
(will be provided with Resource Report 9 included with MVP's application to FERC)

Mountain Valley Pipeline Project

Docket No. PF15-3

Draft Resource Report 9

Appendix 9-B
Operating Emissions Calculations
(will be provided with Resource Report 9 included with MVP's application to FERC)

Mountain Valley Pipeline Project

Docket No. PF15-3

Draft Resource Report 9

Appendix 9-C
West Virginia State Air Permit Applications
(will be provided with Resource Report 9 included with MVP's application to FERC)

Mountain Valley Pipeline Project

Docket No. PF15-3

Draft Resource Report 9

Appendix 9-D
Baseline Noise Reports
(will be provided with Resource Report 9 included with MVP's application to FERC)

Mountain Valley Pipeline Project

Docket No. PF15-3

Draft Resource Report 9

Appendix 9-E
Pipeline HDD Noise Assessments
(will be provided with Resource Report 9 included with MVP's application to FERC)

Mountain Valley Pipeline Project

Docket No. PF15-3

Draft Resource Report 9

Appendix 9-F
Compressor Station Noise Assessments
(will be provided with Resource Report 9 included with MVP's application to FERC)