SUNRISE
PIPELINE PROJECT

RESOURCE REPORT 9
AIR AND NOISE QUALITY

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Prepared for

Equitrans, L.P.
EQT Plaza
625 Liberty Avenue
Pittsburgh, PA 15222

URS Corporation
501 Holiday Drive, Suite 300
Pittsburgh, PA 15220

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LIST OF ACRONYMS

BAT	Best available technology
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO2 e	carbon dioxide equivalent
dB	decibel
dBA	"A-weighted" decibel scale
DTI	Dominion Transmission, Incorporated
Equitrans	Equitrans, L.P.
ER	Environmental Report
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gas
GVWR	gross vehicle weight rating
HDD	horizontal directional drilling
HAP	Hazardous Air Pollutant
hp	horsepower
Hz	Hertz
INGAA	Interstate Natural Gas Association of America
km	kilometer
lb/MMcf	pounds of water per million cubic feet of gas
L_{dn}	day-night average, or time-weighted, sound level
L_{eq}	equivalent sound levels
LDAR	Leak detection and repair
M&R	metering and regulating
MACT	Maximum Achievable Control Technology
MAOP	maximum allowable operating pressure
MMBtu/hr	million British thermal units per hour
MMscfd	million standard cubic feet per day
MLV	mainline valve
MOP	maximum operating pressure
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act

LIST OF ACRONYMS

NO_2	nitrogen dioxide
NOx	nitrogen oxides
NSA	Noise Sensitive Area
NSCR	non-selective catalytic reduction
NSPS	New Source Performance Standard
NSR	New Source Review
OPP	Over-pressure protection
OTR	Ozone Transport Region
PADEP	Pennsylvania Department of Environmental Protection
PM10	particulate matter 10 µm and smaller in diameter
PM2.5	particulate matter 2.5 µm and smaller in diameter
ppb	parts per billion
ppm	parts per million
Project	Equitrans Sunrise Project
PSD	Prevention of significant deterioration
psig	pounds per square inch gauge
RACT	Reasonably Available Control Technology
RICE	Reciprocating Internal Combustion Engines
SI	Spark-ignition
SLM	sound level meter
SO_2	sulfur dioxide
Sunrise	Equitrans Sunrise Project
SWL	sound power levels
TECTO	Texas Eastern Transmission
TEG	triethylene glycol
tpy	tons per year
USEPA	United States Environmental Protection Agency
VOC	volatile organic compounds

FERC Filing Content Checklist
Resource Report 9
Air and Noise Quality

Minimum Requirements	Location in Report	Comment
☒ Describe existing air quality in the vicinity of the project. (Sec. 380.12(k)(1)).	Section 9.1.1, Tables 9.1-2 and 9.1-3	
☒ Quantify the existing noise levels (day-night sound level (Ldn) and other applicable noise parameters) at noise-sensitive areas and at other areas covered by relevant state and local noise ordinances. (Sec. 380.12(k)(2)). • 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 noise-sensitive areas. • Include a plot plan that identifies the locations and durations of noise measurements. • All surveys must identify the time of day, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement.	Sections 9.2.3, 9.2.4	Figure 1.1-2, included in the CEII volume, illustrates the NSAs relative to the proposed compressor building. Results of sound level surveys at the proposed compressor site and the proposed HDD crossings are summarized in Table 9.2-1. Figures 9.2-2 and 9.2-3A through 9.2-3H illustrate the locations of noise measurements.
☒ Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NOx) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the project. (Sec. 380.12(k)(3)).	Section 9.1.2, Table 9.1-4, Table 9.1-5 and Appendix 9-A	
☒ Describe the existing compressor units at each station where new, additional, or modified compressor units are proposed, including the manufacturer, model number, and hp of the compressor units. For proposed new, additional, or modified compressor units include the hp, type, and energy source. (Sec. 380.12(k)(4)).	N/A	There are no existing compressor units at the facility. New compressors are described in the report.
☒ Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building/enclosure (Sec. 380.12(k)(4)).	Section 9.2.2, Table 9.2-2	

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Resource Report 9
Air and Noise Quality

Minimum Requirements	Location in Report	Comment
☒ Identify any applicable state or local noise regulations. (Sec. 380.12(k)(4)). Specify how the facility will meet the regulations.	Section 9.2.1, Table 9.2-1	There is no noise regulation at the state or county level. However, the township has its own ordinances.
☒ 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 (Sec. 380.12(k)(4)).	Section 9.2.4	The NSAs are identified and the impacts are calculated with SoundPLAN software. However, the design is not final yet and engineering assumptions have been used in quantifying the impacts.

Responses to Additional data requested by FERC
Resource Report 9
Air and Noise Quality

Filing Requirements	Location in Report	Comment
☒ Section 9.2.1.1 states “Emissions from open burning are estimated and included in the tables in Appendix 9-A, Emission Estimates for Compressor Station and Pipeline Construction.” It was unclear in Appendix 9-A where construction and open burning emissions are provided. Please provide further clarification, or verify that burning would not occur.	Section 9.2.1.1 and Appendix 9-A	Open burning will not occur with this project; as such Section 9.2.1.1 text was revised accordingly. Emission calculations for construction related activities are now included in Appendix 9-A.
☒ Please include Appendix B, which is cited in Section 9.2.1.4.2 and include the gas analytical data and GLYCalc Report for the Project TEG dehydration units.	Section 9.2.1.4.2 and Appendix 9-B	The text incorrectly referenced Appendix B in Section 9.2.1.4.2. Gas analytical data and the associated GLYCalc report for the proposed TEG dehydration units is attached in the Air Permit Application now included in Appendix 9-C. Figures depicting noise measurement locations and noise sensitive areas are now included in Appendix 9-B.
☒ Provide copies of applications for state air permits and agency determinations, as appropriate.	Appendix 9-C	The state air permit application is now included as Appendix C to this report.

Responses to Additional data requested by FERC
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Filing Requirements	Location in Report	Comment
☒ In Table 9.4-4, the daytime and nighttime ambient L_{eq} sound measurements are given for each noise-sensitive area (NSA); however, in each case the measured nighttime L_{eq} sound levels are higher than the daytime L_{eq} sound levels, which would not normally be expected. Please identify any noise sources occurring at the time of the survey that contributed to the higher nighttime L_{eq}.	Section 9.4.2, Table 9.4-4	The survey area is located in a rural setting with many insects. During the nighttime measurements, the sounds produced by insects were more constant and louder than during the day, which is presumed to be the major contribution to the higher nighttime sound levels.
☒ If possible, please provide further documentation/references for the sound power level data presented in Table 9.4-7.	Section 9.4.3.1, Table 9.4-7; Appendix 9-D	Additional documentation to support the sound power level data contained in Table 9.4-7 is now attached in Appendix 9-D to this report. This documentation includes the following: • Compressor engines – information provided in Caterpillar's Gas Engine Technical Data sheet for engine model G3616. • Gas cooler fans – information for Howden Cooling Fans, 13 KLF 8 fan model. • Engine jacket water coolers – information for Howden Cooling Fans, 10 KLF 6 fan model. • Glycol dehydration units – sound information was estimated per the equation for centrifugal pumps included in Industrial Noise Control and Acoustics, Randall F. Barron, CRC Press, 1st Edition, November 14, 2002, P. 171 and 172: Pump Noise. • Building attenuation – assumed octave-band transmission losses for Semco Incorporated (Semco) 2" 18 gauge solid/22 gauge perforated panel per Semco's Acoustic/Thermal Panel Systems brochure will be similar to building selected at Equitrans.

Responses to Additional data requested by FERC
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Filing Requirements	Location in Report	Comment
☒ In Table 9.4-8, please include the direction of each NSA from the Jefferson Compressor Station.	Section 9.4.3.1, Table 9.4-8	Table 9.4-8 has been revised in this report to include the direction of each NSA from the Jefferson Compressor Station.
☒ Section 9.4.4.2 states that "construction equipment will be primarily operating during daytime hours on an as-needed basis." Identify what construction activities, if any, would occur during nighttime hours at any location during project construction.	Section 9.4.4.2	The following activities may potentially be performed during nighttime hours: • Pullback of the HDD(s) • Hydrostatic Testing
☒ In Section 9.2.1.1, the potential need for blasting is mentioned to reduce the bedrock for trench excavation. Please provide additional information related to blasting activities, including the estimated duration of blasting activities, the schedule of blasting activities (may occur at any time within a 24-hour period, or other), the size of explosive charges, and the distance and direction to the closest NSAs. Noise mitigation measures should be described, as necessary.	Section 9.2.1.1	At this time, Equitrans has not selected a blasting contractor for this project; therefore these details are currently unknown. Once a contractor is selected, Equitrans will provide a detailed blasting plan, including duration, schedule, size of charges and distances to the closest NSAs to the Commission for approval prior to any blasting occurring.
☒ Estimate the length of time required to complete any horizontal direction drill(s) (HDD) along the planned route.	9.4.3.3	The estimated length of time required to complete the drilling at the HDDs is 3.5 weeks at each location.
☒ Would Equitrans perform HDD operations on a 24-hour/7-days-per-week schedule? If so, please explain why daytime-only HDD activities would not be adequate.	9.4.3.3	Equitrans does not intend to perform HDD operations on a 24-hour/7-days-per-week schedule. The only potential non-daytime HDD activities that may be performed are pulling back the HDD(s) and one hydrostatic test.
☒ Tables 9.4-9 and 9.4-10 provide inconsistent and unclear "drilling site IDs" for the HDD locations. Please update the tables so that the "drilling site IDs" are consistent.	Section 9.4.3.3, Tables 9.4-9 and 9.4-10	The "drilling site IDs" have been updated to H-302A and H-302B for the HDD location crossing Toms Run and H-302C and H-302 D for the HDD location crossing US250 at Littleton. Tables 9.4-9 and 9.4-10 have been revised to reflect these IDs. Note that Table 9.4-10 also includes NSA IDs for each drilling site, but the drilling site IDs remain consistent.

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Filing Requirements	Location in Report	Comment
☒ Figures 9.4-2A and 9.4-2B display two points denoting the drilling locations. Please identify the entry and exit point in each figure.	Appendix 9-B, Figures 9.4-2A and 9.4-2B	At this time, Equitrans has not determined which location will be the entry point and exit point at each drilling location.
☒ Table 9.4-10 displays the NSAs at each HDD location. Please update the table to display which location (entry or exit) was used as a reference point for the distance/direction data provided.	Section 9.4.3.3, Table 9.4-10	At this time, Equitrans has not determined which location will be the entry point and exit point at each drilling site. Therefore, Equitrans has updated Table 9.4-10 with the revised "drilling site IDs" to differentiate which drilling site was used to measure the distance to the nearest NSA.

9.0 INTRODUCTION

Equitrans, L.P. (Equitrans) is seeking authorization from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act (NGA) to construct and operate the proposed Sunrise Project (Project or Sunrise). Equitrans is a subsidiary of EQT Corporation. Equitrans will seek authorization to construct and operate this Project which will be located in Pennsylvania and West Virginia. This application for the Project requires the submittal of an Environmental Report (ER) to FERC, consisting of 13 Resource Reports as specified in 18 *Code of Federal Regulations* (CFR) § 157.14(a)(6-a), 380.3, and 380.12. Each Resource Report will evaluate potential effects on a particular aspect of the environment.

The proposed FERC jurisdictional facilities described in this report will consist of approximately 41.5 miles of 24-inch diameter pipeline, 0.21-mile of 20-inch pipeline and 2.7 miles of 16-inch pipeline parallel to existing EQT transmission and gathering pipelines; replacing a 2.6 mile section of inactive 16-inch pipeline with new 20-inch pipeline including appropriate over-pressure protection (OPP) facilities; uprating 4.8 miles of 20-inch pipeline with the addition of appropriate OPP facilities; installing one 14,205 horsepower (hp) new compressor station consisting of three units, aboveground sites for interconnections, mainline block valves, launchers and receivers, control systems, and other facilities as further described herein.

The proposed pipeline and aboveground compressor station facilities are summarized below:

1. **Pipeline – Facilities would include:**
   a. H-302 - Installation of 41.5 miles of 24-inch pipeline with a 1200 pounds per square inch gauge (psig) maximum allowable operating pressure (MAOP) (initial maximum operating pressure [MOP] of 1000 psig), with portions of the line paralleling the existing Equitrans pipelines: H-515, H-512, and H-111. The pipeline will be located in Greene County, PA and Wetzel County, WV. The pipeline will have mainline valves (MLVs) installed roughly every 10 miles. The H-302 pipeline will transport gas from Equitrans' Logansport facility and gathering/production companies along the pipeline to the proposed Jefferson Compressor Station for delivery to the Texas Eastern Transmission (TETCO) and Dominion Transmission, Incorporated (DTI) interconnects.

   b. H-306 - Installation of 2.7 miles of 16-inch pipeline with a 1200 PSIG MAOP (initial MOP of 1000 PSIG), paralleling the existing Equitrans pipeline: H-562 (GSF-912). The pipeline will be located in Wetzel County, WV. The pipeline

will have MLVs installed at each end of the pipeline. The H-306 will interconnect with the H-302 pipeline, the yard piping at the existing Equitrans' Logansport facility and Equitrans pipeline H-562 (GSF-912) at Equitrans' Pickenpaw facility. The H-306 pipeline will transport gas from Equitrans' Logansport facility and gathering/production companies along the pipeline to Equitrans' Pickenpaw facility for delivery to existing Equitrans facilities or transport gas from Equitrans pipeline H-562 (GSF-912) gas to the TETCO/DTI interconnects via the H-302 pipeline and the proposed Jefferson Compressor Station.

c. H-309 - Installation of 0.21 mile of 20-inch pipeline with a 720 PSIG MAOP (initial MOP of 655 PSIG). The pipeline will be located in Greene County, PA. The pipeline will have MLVs installed at each end of the pipeline. The H-309 pipeline will interconnect with the Equitrans H-111 pipeline and will transport gas from gathering/production companies along the existing Equitrans Mainline Transmission System for delivery to the TETCO/DTI interconnects via the proposed Jefferson Compressor Station.

d. H-111 Reactivation – Replace approximately 2.6 miles of inactive 16-inch pipeline with a new, 20-inch 655 PSIG MAOP pipeline on the existing Equitrans H-111 pipeline right-of-way (ROW). The H-111 pipeline replacement section is located in Greene County, PA between the previous location of Equitrans Zimmerman Gates and the existing location of Equitrans Bayard Gates facilities. The pipeline will include a new MLV setting installed at the Zimmerman Gates location. An existing valve setting will be used at the Bayard Gates location. The H-111 pipeline will transport gas from gathering/production companies along the existing Equitrans Mainline Transmission System for delivery to the TETCO/DTI interconnects via the H-309 pipeline and the proposed Jefferson Compressor Station. OPP will be installed at Zimmerman Gates to protect the 605 PSIG MAOP section of the H-111 (Low Pressure West System) pipeline from 655 PSIG MAOP H-111/H-115 (Low Pressure East System) pipelines. The OPP will be designed to allow for bi-directional flow of gas on the H-111 to the existing Pratt Compressor Station or to the proposed Jefferson Compressor Station.

e. H-111 Uprating and OPP Facilities – Requalify approximately 4.8 miles of the existing 20-inch Equitrans H-111 pipeline for a 655 PSIG MAOP. The H-111 pipeline uprate section is located in Greene County, PA between the Bayard Gates and the Mainline Valve to be installed for the line H-309. This section

will have a new MLV installed at the H-309 end. The H-111 pipeline will transport gas from gathering/production companies along the existing Equitrans Mainline Transmission System for delivery to the TETCO/DTI interconnects via the H-309 pipeline and the proposed Jefferson Compressor Station. OPP will be installed at the H-309 Mainline Valve setting to protect the 216 PSIG MAOP section of the H-111 pipeline, north of the tap for H-309, from the 655 PSIG MAOP H-111 pipeline, south of the tap for H-309. The existing OPP at Bayard Gates will be removed.

2. **Compression –** The Equitrans Sunrise project will consist of the construction of one new compressor station; the Jefferson Compressor Station.

   a. Jefferson Compressor Station - Equitrans will install three (3) natural gas combustion engine reciprocating compressors totaling approximately 14,205 hp at a location near to the TETCO corridor in Greene County, PA. The engine model will be a Caterpillar G3616LE rated at 4,735 hp each. The compressors will be Ariel KBU/6 units. Discharge piping will interconnect with TETCO operated pipelines. The work location is in Jefferson Township, Greene County, PA.

3. **Interconnections –** Sunrise will have a total of five (5) interconnections; three (3) to existing Equitrans facilities (H-111 at Jefferson, H-562 (GSF-912) at Pickenpaw and the yard piping at Logansport CS) and two (2) to foreign pipelines (TETCO/DTI).

Metering and regulating (M&R) facilities and ancillary facilities are within the limits of the study and the environmental affects to such facilities are included with the associated pipeline and compressor station.

9.1 AIR QUALITY

Air emissions associated with the construction of the project will be calculated for each piece of equipment that is anticipated to be utilized. The Project will be constructed over an approximate one-year period, including restoration activities. Emissions are calculated for both mobile and stationary equipment for fugitive particulate matter (PM) (PM_{10}/$PM_{2.5}$) emissions and exhaust emissions for several pollutants, including volatile organic compounds (VOCs), oxides of nitrogen (NO_X), carbon monoxide (CO), and PM_{10}/$PM_{2.5}$.

9.1.1 Existing Air Quality

Table 9.1-1 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. The proposed Jefferson Compressor Station will be located in Greene County which is classified in attainment with all NAAQS except for ozone and fine particulate matter ($PM_{2.5}$). The state of Pennsylvania is in the Ozone Transport Region (OTR) and, therefore, the entire state is classified as moderate nonattainment for ozone. Only Monongahela Township in Greene County is classified as nonattainment with the $PM_{2.5}$ NAAQS (both the 1997 and 2006 standards). However, the proposed Jefferson Compressor Station is not located in this township. EPA promulgated new and stricter NAAQS for nitrogen dioxide (NO_2), effective as of April 12, 2010, and has also finalized more stringent standards for sulfur dioxide (SO_2) that became effective on August 23, 2010. EPA has not yet designated new nonattainment areas based on these new standards. However, it is unlikely that the Jefferson Township will become a nonattainment area under either new standard.

Table 9.1-1
National Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Primary Stds.[a]	Averaging Times	Secondary Stds.[a]
Carbon Monoxide (CO)	9 ppm (10,000 µg/m^3)	8-hour[b]	None
	35 ppm (40,000 µg/m^3)	1-hour[b]	None
Lead	0.15 µg/m^3	Rolling 3-month Average[c]	Same as Primary
	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide (NO_2)	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary
	0.100 ppm (189 µg/m^3)	1-hour[i]	None
Particulate Matter (PM_{10})	150 µg/m^3	24-hour[d]	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual (Arith.Mean)	Same as Primary
	35 µg/m^3	24-hour[f]	
Ozone	80 ppb[g]	8-hour[h]	Same as Primary
Sulfur Oxides	0.03 ppm (80 µg/m^3)	Annual (Arith. Mean)	0.5 ppm (1,300 µg/m^3), 3-hour averaging time
	0.14 ppm (365 µg/m^3)	24-hour[b]	
	75 ppb[j] (196 µg/m^3)	1-hour	None

Source: http://epa.gov/air/criteria.html.
Notes:
[a] Primary standards set limits to protect public health. Secondary standards set limits to protect public welfare, including protection against decreased visibility, adverse impacts to animals, crops, vegetation, and buildings.
[b] Not to be exceeded more than once per year.

[c] Final rule signed October 15, 2008.
[d] Not to be exceeded more than once per year on average over 3 years.
[e] To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.
[f] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).
[g] This standard was reduced to 75 ppb in 2008. However, the USEPA has not yet issued attainment designations for areas under the new standard.
[h] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured.
[i] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
[j] Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

ppb = parts per billion
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

Table 9.1-2
Existing Ambient Air Quality Concentrations for Criteria Pollutants

Pollutant	Site	Monitor ID	Year of Data	Annual Average ppm (g/m3)	24-hour average (2nd high) ppm (g/m3)	3-hour average (1st high) ppm (g/m3)
NO_2	Washington County	421255001	2008	0.005	-	-
	Washington County	421250200	2008	0.011	-	-
	Washington County	421250005	2008	0.011	-	-
PM_{10}	Washington County	421250005	2008	-	(50)	-
	Washington County	421255001	2008	-	(46)	-
$PM_{2.5}$	Washington County	421250005	2008	(14.47)	(29.7)	-
	Washington County	421250200	2008	(13.07)	(28.4)	-
	Washington County	421255001	2008	(12.2)	(32)	-
SO_2	Greene County	420590002	2008	0.006	0.017	0.068
	Washington County	421250005	2008	0.008	0.017	0.085
	Washington County	421250200	2008	0.007	0.019	0.082
	Washington County	421255001	2008	0.004	0.016	0.043
Ozone	Greene County	420590002	2008	-	73	97
	Washington County	421250005	2008	-	71	95
	Washington County	421250200	2008	-	69	84
	Washington County	421255001	2008	-	77	88

Pollutant	Site	Monitor ID	Year of Data	Annual Average ppm (µg/m³)	8-hour average (2nd high) ppm (µg/m³)	1-hour average (2nd high) ppm (µg/m³)
CO	Greene County	420590002	2008	-	0.3	0.5
	Washington County	421250005	2008	-	1.1	1.2

Source: http://www.epa.gov/air/data/reports.html.
Notes :
(http://www.adeq.state.ar.us/air/branch_permits/default.htm), and are not available through USEPA website.
ppb = parts per billion
ppm = parts per million
µg/m^3 = micrograms per cubic meter
1st high = highest reported concentration
4th high = fourth highest reported concentration

9.1.1.1 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. Once designated as a Class I area, that area cannot be redesignated 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. While the Jefferson Compressor Station is not subject to NSR/PSD permitting, the Class I areas nearest to the proposed location of the Station have been identified.

The closest Class I areas to the Jefferson Compressor Station are listed in Table 9.1-3. Since the Project does not require PSD review, Class I modeling should not be required regardless of the station's distance from the Class I areas.

Table 9.1-3
Federal Class I Areas Closest to the Proposed Jefferson Compressor Station

Class I Area	Managing Agency	Direction from Jefferson	Distance to Compressor Station	
			Kilometers	Miles
Dolly Sods, WV	National Forest Service	Southeast of Jefferson	~120	~75
Otter Creek, WV	National Forest Service	Southeast of Jefferson	~115	~70
Shenandoah, VA	National Park Service	Southeast of Jefferson	~195	~120

Source: http://www.epa.gov/ttn/oarpg/t1/fr_notices/classimp.gif
Note: Distances are based on a direct path and were measured in Google Earth.

9.2 AIR QUALITY IMPACTS AND MITIGATION

9.2.1 Proposed Emissions

Air emissions from the Project will result during construction of the pipeline, compressor station, and other ancillary facilities. Operational emissions will occur at the compressor station from specific operational equipment such as the compressor engines. Detailed calculation sheets for construction emissions are presented in Appendix 9-A. Detailed calculation sheets for operational emissions are included in the Air Permit Application attached as Appendix 9-C.

9.2.1.1 Construction Emissions

The construction phase of the Project will result in intermittent and short-term air emissions that will be temporary and limited to the immediate vicinity of the construction area. The period of time over which construction related emissions will occur, and hence the total annual quantity of pollutants emitted from construction activities, will be determined by the Project construction schedule. The construction is projected to start in third quarter 2011 and take approximately one year for completion.

Pipeline, compressor station, and other construction activities for the Project will result in combustion emissions from diesel-fueled and gasoline-fueled vehicles used in earth-moving and construction activities. Combustion-related emissions will include NO_x, CO, VOCs, SO_2, $PM_{10}/PM_{2.5}$, and small amounts of hazardous air pollutants (HAPs).

Construction based land activities such as land clearing, grading, excavation, and vehicle traffic on both paved and unpaved roads will generate particulate matter (PM_{10} and $PM_{2.5}$) in the form of fugitive dust. The amount of dust generated would be a function of construction activities, soil type, moisture content, wind speed, frequency of precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity.

Blasting will be conducted, as needed, to reduce the bedrock for trench excavation, resulting in minor fugitive dust emissions and combustion-based emissions. Equitrans will develop a plan to safely allow blasting of the pipeline ditch. The plan will determine the location (s) where blasting is not permitted and the specification of the blasting charges where blasting will be permitted. The plan shall also include information concerning blasting durations, scheduling, distances and directions to any Noise Sensitive Areas (NSAs), and noise mitigation measures, if necessary.

It is anticipated that the plan will be completed after the construction contract for the pipeline portion of the project has been successfully awarded.

Before any blasting occurs, Equitrans will complete a project/site specific blasting plan and provide it to the Commission for approval.

Open burning to dispose of cleared vegetation is not planned as part of this project, therefore, emissions from open burning have not been estimated.

9.2.1.2 Operation Emissions

After the station becomes operational, emissions from the pipeline and the related ancillary facilities will be minimal, and the main emissions will be from the compressor engines, the generator engine, and the triethylene glycol (TEG) dehydration units at the compressor station. As a result, only emissions from the station have been quantified in this section of the report.

The Jefferson Compressor Station will generally be comprised of three areas: (1) compression (using gas-fired combustion engines); (2) TEG dehydration units (with associated gas-fired reboiler and flare) to remove undesirable moisture from the gas stream; and (3) ancillary emission sources, including a gas-fired electric generator, fuel gas heater, and storage tanks as well as process fugitive sources.

Natural gas will enter the Jefferson Compressor Station from the proposed Equitrans interstate transmission pipeline system associated with Project Sunrise and will first be compressed using three (3) gas-fired engine-driven compressors, rated at 4,735 hp each, which will be equipped with oxidation catalysts. These engines are the largest sources of operation emissions from the proposed facility. The compressed natural gas will then be processed through one of two TEG dehydration units, each rated at 225 million standard cubic feet per day (MMscfd) of gas throughput. The dehydration units will introduce TEG to the gas stream in two contact towers to absorb water vapor from the gas to a level not exceeding 7 pounds of water per million cubic feet of gas (lb/MMcf).

The glycol is then sent to one of the two natural gas-fired reboilers, rated at a maximum capacity of 4.3 million British thermal units per hour (MMBtu/hr) each, where the water is evaporated from the glycol. The natural gas stream from the contact towers flows into the

pipeline to be transported downstream along the distribution system. The reboiler overhead streams will be combusted in the associated enclosed ground-level flares. The Jefferson Compressor Station will also be equipped with a natural gas-fired electric generator rated at 450 kW (690 HP) and controlled with non-selective catalytic reduction (NSCR), as well as a natural gas-fired fuel gas heater rated at 0.25 MMBtu/hr. The Jefferson Compressor Station will also include the following storage tanks:

One (1) 10,000 gallon tank for pipeline liquids;

Two (2) 5,000 gallon tanks for new lube oil;

One (1) 4,000 gallon tank for waste oil;

One (1) 2,000 gallon tank for new engine mono-ethylene glycol (MEG);

One (1) 2,000 gallon tank for used engine MEG;

One (1) 10,000 gallon tank for new dehydration unit TEG;

One (1) 10,000 gallon tank for used dehydration unit TEG.

The emissions from the storage tanks are assumed negligible for the purpose of this report.

Facility-wide maximum potential emission rates are summarized in the Tables 9.2-1 below. All criteria and hazardous air pollutant emission rates are below Title V and NSR/PSD thresholds. Therefore, the proposed Jefferson Compressor Station is classified as a minor source. Emission rates were calculated based on manufacturer's specifications, design parameters, engineering estimates, and the U.S. Environmental Protection Agency (USEPA) AP-42 factors when possible. EPA AP-42 factors for engines, combustion units and other sources were used only when unit-specific data were not available. Emissions from the station were conservatively estimated using the worst case assumption that all equipment will operate on a full-time schedule (8,760 hours per year) at 100% load.

Table 9.2-1
Operational Emissions Summary from the Proposed Jefferson Compressor Station

ID No.	Description	Emissions (tons per year)								
		Criteria Pollutants						CO_{2e}	Formal-dehyde	Total for all HAPs
		NO_x	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$			
Jefferson Compressor Station										
C1-3	Compressor Engines (3)	68.6	18.8	25.9	0.2	4.1	4.1	48,000	5.5	13.5
Gen	Generator Engine	6.7	13.3	4.7	0.02	0.52	0.52	3,100	0.05	0.4
Deh1-2	Glycol Dehydration Units with Reboilers & Flares (2)	6.0	5.0	4.5	0.04	0.45	0.45	7,600	NA	0.9
GH1	Fuel Gas Heater	0.10	0.08	0.01	0.00	0.01	0.01	2,700	0.00	0.00
	Fugitive & Blowdown	N/A	N/A	7.8	N/A	0.31	0.08	1,000	N/A	0.02
Total Controlled Emissions		81.3	37.2	43.0	0.3	5.2	5.1	62,400	5.5	14.8
PSD/NSR Major Stationary Source Thresholds		100	250	50	250	250	250	100,000	N/A	N/A
Title V Major Source Threshold		100	100	50	100	100	100	100,000	10	25

Note: CO_2e is the sum of all greenhouse gas emissions in carbon dioxide equivalents (CO_2e), using the Global Warming Potential factors for methane (CH4: 21) and nitrous oxide (N2O: 310) as reported in USEPA's proposed greenhouse gas (GHG) reporting rule (74 FR 16448; April 10, 2009).

Note: Per 5/13/ 2010 Tailoring Rule, newly-constructed sources that trigger PSD for pollutant other than GHG in 1/2/2011 - 6/30/2011 timeframe would be subject to PSD for GHG if ≥ 75,000 tpy threshold. Starting 7/1/2011, first time construction projects that emit GHG ≥ 100,000 tpy would trigger PSD for GHG (regardless of other pollutants).

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9.2.1.3 Waste Heat Recovery

Per the Interstate Natural Gas Association of America (INGAA) Waste Energy Recovery Opportunities for Interstate Natural Gas Pipelines Paper, dated February 2008, waste heat recovery projects can be economical for gas turbine drivers where there is at least 15,000 hp historically operating at more than 5,250 hours per year. Reciprocating internal combustion engine drivers are less desirable for waste heat recovery projects because of their typically lower exhaust temperatures and lower exhaust gas flow rates. These internal combustion engines reject a large portion of their heat through engine jacket water coolers, thus reducing the net exhaust heat available for useful recovery.

For the Jefferson Compressor Station, there are currently three Caterpillar G3616 engine drivers proposed for the project and a potential fourth unit possible in the future. The following data indicates that it will require a minimum of six Caterpillar G3616 LE engine drivers to provide an equivalent volume of exhaust gas as a typical 15,000 hp turbine will provide, making useful waste heat recovery uneconomical for this particular application.

Gas Turbine as Quoted by Solar Turbines for the Jefferson Project

Gas Turbine Manufacturer	Solar
Gas Turbine Model	Mars 100
Rated Power at ISO Conditions (hp)	14,486
Exhaust Flow (lbm/hr)	330,816
Exhaust Temperature (deg. F.)	906

Internal Combustion Engine as Proposed for the Jefferson Project

Engine Manufacturer	Caterpillar
Engine Model	G3616 LE
Rated Power (hp)	4,735
Exhaust Flow (lbm/hr)	56,128
Exhaust Temperature (deg. F.)	856

Equitrans has thoroughly evaluated the potential for useful waste heat recovery, with respect to the proposed Jefferson station equipment, and concluded that the installation of a waste heat recovery system is not economically feasible.

9.2.1.4 Applicable Regulatory Standards

Several federal and state air quality regulations will be applicable to the proposed Jefferson Compressor Station. Most of the applicable regulations will focus on the natural gas-fired

compressor engines, although air permitting requirements will apply to the entire compressor station facility.

9.2.1.4.1 Emissions from Construction

Construction emissions from the project must comply with State requirements for fugitive dust control and mobile equipment emissions. This section will review the applicable regulations in Pennsylvania and West Virginia. The USEPA currently does not regulate air emissions from construction activities other than the regulations that apply to the engines. As a result, the only federal regulations discussed are the engine regulations.

West Virginia Regulations

Part of the pipeline construction will be conducted in West Virginia. As such, the air quality regulations in West Virginia that could potentially apply during the construction activities have been reviewed under this section.

45 CSR 4 *To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors* generally applies to the construction activities even though the activities do not include any specific release of odor to the atmosphere. In addition, operation of internal combustion engines, which will be the dominant operation during the construction activities, is exempt from the odor rule. However, Equitrans will monitor odor during the construction activities to ensure compliance with this regulation.

45 CSR 17 *To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage, and Other Sources of Fugitive Particulate Matter* generally applies to the pipeline construction activities. The rule prohibits the emission of fugitive particulate matter to be discharged beyond the boundary lines of the property on which the discharge originates or at any public or residential location. The rule also requires using water or chemicals for control of particulate matter in demolition of existing buildings or structures, construction operations, grading of roads, or the clearing of land. The fugitive emissions from the pipeline construction activities will be emitted for a very short period of time. In accordance with the requirements of 45 CSR 17, Equitrans will use water or chemicals to suppress the fugitive emissions from the construction operations, as practicable when needed.

Pennsylvania Regulations

25 Pa Code §123.1 and §123.2 *Prohibition of Certain Fugitive Emissions* and *Fugitive Particulate Matter*, respectively, state exceptions to fugitive emissions sources and methods for

controlling fugitive emissions. This regulation applies to the construction operations in general. Equitrans will comply with these requirements by ensuring proper operation of the construction equipment and other reasonable measures to prevent particulate matter from becoming airborne.

25 Pa Code §123.21 *Sulfur Compound Emissions*, restricts the concentration of SO_2 in the emissions from any source to 500 parts per million (ppm). The regulation does not specify the type of source and as a result, it generally applies to the construction activities. The only sources of SO_2 emissions during the construction operations will include the SO_2 emissions from the mobile equipment and nonroad engines/generators. Equitrans will comply with this requirement by ensuring that the concentration of SO_2 from the mobile and nonroad equipment will not exceed the standard. The SO_2 concentration is expected to be well below the standard since all machinery will consume gasoline or diesel fuel that is in compliance with the latest fuel sulfur standards.

25 Pa Code §123.41 *Visible Emissions*, limits the visible emissions from any source to 20% for a period (or periods aggregating) more than three minutes in any one hour or 60% at any time. This standard generally applies to the construction equipment and activities associated with the proposed project. Equitrans will comply with this requirement by taking reasonable measures to limit combustion-related emissions by minimizing startup/shutdown of equipment. In addition, dust control measures will be employed as needed to minimize fugitive dust generation from construction activities.

25 Pa Code §126.500 *Pennsylvania Heavy-Duty Diesel Emissions Control Program*, applies to all heavy-duty diesel engines and vehicles with a gross vehicle weight rating (GVWR) of greater than 14,000 lbs used in the construction operations that are purchased, rented, acquired, or received after May 11, 2004. The regulation mostly applies to the manufacturers of such engines and vehicles.

Act 124 of 2008, Pennsylvania Diesel Powered Motor Vehicle Idling Act prohibits the owners and drivers of any diesel-powered motor vehicle with a GVWR of 10,001 pounds or more from idling the engine for more than five minutes in any continuous 60-minute period. The owners and operators of locations where such vehicles park, load, or unload have to post at least one permanent sign to inform the drivers of idling prohibition.

Federal Regulations

While the USEPA has promulgated standards that apply to non-road engines, virtually all of these regulations apply to the manufacturers, except fuel specifications and some engine maintenance requirements. There are no other regulations developed by the USEPA that apply to emissions from construction activities. Equitrans will make sure that the contractor will have all the applicable environmental documentation for the engines and equipment.

9.2.1.4.2 Emissions from Operation

Operating emissions from the project must comply with various Federal requirements for control of criteria and hazardous pollutants from stationary sources. This section will review the applicable Federal regulations that will apply to the operation of the Jefferson Compressor Station.

Standards for the Engines/Generator

NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

Stationary reciprocating internal combustion engines (RICE) at both area and major sources of HAP emissions are potentially subject to Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants *(NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE)*. Stationary RICE at facilities that are area sources of HAP are considered new if they are ordered after June 12, 2006. New area source stationary RICE are required to meet the requirements of this Maximum Achievable Control Technology (MACT) standard by meeting the applicable requirements of the applicable New Source Performance Standard (NSPS) in 40 CFR 60 (Subpart IIII for compression ignition engines and Subpart JJJJ for spark ignition engines). No further requirements apply to such engines under NESHAP Subpart ZZZZ.

The generator engine and the three compressor engines at the proposed Jefferson Compressor Station will comply with Subpart ZZZZ by complying with the applicable standards of 40 CFR 60, Subpart JJJJ as described in the following section.

NSPS Subpart JJJJ -- Stationary Spark Ignition Internal Combustion Engines

Subpart JJJJ, *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, applies to manufacturers, owners and operators of stationary spark (SI) engines. The requirements for SI engines with a maximum power rating greater than or equal to 500 hp (except lean burn engines 500 hp ≤ hp < 1,350) apply to owner/operators of such engines manufactured on or after July 1, 2007.

The generator engine at the proposed Jefferson Compressor Station will be a 4-stroke, rich burn spark ignition RICE rated at 690 hp equipped with emission controlled by non-selective catalytic reduction (NSCR). The engine will be intended for electric generation during emergency situations, but may operate at times in non-emergency use. The three compressor engines at the proposed Jefferson Compressor Station will be 4-stroke, lean burn RICE rated at 4,735 hp each. Each engine will be equipped with an oxidation catalyst. The engines will be non-emergency units with the potential to operate 8,760 hours per year. As such, the generator engine and the three compressor engines will be subject to the following emissions standards applicable to non-emergency engines manufactured on or after July 1, 2010 per 40 CFR §60.4233(e).

Table 9.2-2
Engine Emission Rates and Applicable Standards for NOx, CO, VOC, and Formaldehyde

Pollutant	Emission Standards (g/hp-hr)	Generator Engine w/NSCR Specifications* (g/hp-hr)	Compressor Engines w/Catalyst Specifications (g/hp-hr)
NO_X	1.0	1.0	0.5
CO	2.0	2.0	0.14
VOC	0.7	0.7	0.19

Source: Table 1 of NSPS Subpart JJJJ
g/hp-hr = gram/brake horsepower-hour
*Equitrans will comply with the NSPS emissions for this generator engine by using an exhaust after-treatment device. Detailed specifications are not yet available for this control equipment. As such, for the purposes of this report emissions have been estimated based on the NSPS standards shown above. However, Equitrans expects that emissions will be lower than those presented above.

As indicated in Table 9.2-2, the three compressor engines and the generator engine will comply with the NSPS JJJJ emissions standards as demonstrated through the average of a minimum of three (3) 1-hour test runs. The Jefferson Compressor Station engines will be operated in accordance with the requirements of 40 CFR §60.4243. If the engines are not certified by the manufacturer, Equitrans will demonstrate compliance with those requirements as outlined in §60.4243(b)(2)(ii), which will require a maintenance plan and records of conducted maintenance, as well as maintenance and operation of the engine in a manner consistent with good air pollution control practices for minimizing emissions. In addition, Equitrans will conduct an initial performance test and thereafter conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, to demonstrate on-going compliance with the emission limits shown above.

Standards for the Glycol Dehydration Units

NESHAP Subpart HHH – Natural Gas Transmission and Storage Facilities

The glycol dehydration units are potentially subject to Subpart HHH, *NESHAP from Natural Gas Transmission and Storage Facilities*. This standard applies to such units at natural gas transmission and storage facilities that are major sources of HAP emissions located downstream of the point of custody transfer (after processing and/or treatment in the production sector) but upstream of the distribution sector. Major source status must be determined in accordance with 40 CFR §63.1270(a) based on the maximum natural gas throughput of the facility. Major source dehydration units are subject to the control requirements in 40 CFR 63.1275, the monitoring requirements in 40 CFR §63.1283 and the recordkeeping and reporting requirements specified in 40 CFR §63.1284 and §63.1285. However, if the actual annual average flow of gas to the dehydration process is less than 1 MMscfd, or the actual average *emissions of benzene from the process vents to the atmosphere are less than 1.0 tons per year (tpy), the facility is exempt from these requirements per 40 CFR §63.1274(d).*

*The proposed TEG dehydration units at the Jefferson Compressor Station will be designed with a maximum throughput capacity of 450 MMscfd (225 MMscfd each). However, the available extended gas analy*ses for the natural gas produced in the area of the future proposed site predicts that the gas received at the Jefferson Compressor Station will be very low in benzene and heavier HAP constituents. In addition, the dehydration unit emissions are proposed to be controlled by an enclosed ground flare with an estimated VOC/HAP destruction efficiency of 98% or greater. As such, the actual average emissions of benzene from each of the dehydration unit process vents as estimated via GRI-GLYCalc™, Version 4.0 to the atmosphere will be well below the Subpart HHH benzene exemption threshold of 1.0 tpy (see Appendix 9-C for gas analytical data and GLYCalc Report). Therefore, the proposed Jefferson Compressor Station will be exempt from the emissions control, monitoring, recordkeeping and reporting requirements of this subpart per the exemption in 40 CFR §63.1274(d)(2), except that records of the determination that these exemption criteria are met must be maintained by the site as required in 40 CFR §63.1284(d).

Standards for Ancillary Equipment

The Jefferson Compressor Station also contains ancillary support equipment which includes air compressors, fuel gas heaters, and storage tanks, as well as fugitive emissions from operation and maintenance of the station. The air emissions from the ancillary equipment are considered negligible in comparison to the engine emissions. The only federal regulation that could potentially apply to the ancillary equipment at the Jefferson Compressor Station is NSPS Subpart Kb. However, due to the low vapor pressure of the material stored and the volume of the storage tanks, this NSPS does not apply to any of the storage tanks at the Jefferson Compressor Station. NSPS Subpart KKK regulates equipment leaks from onshore natural gas

processing plants. The definition of natural gas processing plant is defined as *any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both*. The Jefferson Compressor Station is not a natural gas processing plant as it does not meet this definition. As a result, no federal regulation applies to the ancillary equipment at the Jefferson Compressor Station at this time.

9.2.1.5 Air Permitting Requirements

Pennsylvania code 25 PA 127.11 requires all sources of air contamination to receive a permit before construction, modification, reactivation or installation of such source. The Jefferson Compressor Station will be located in Pennsylvania and, therefore, requires a Plan Approval issued by Pennsylvania Department of Environmental Protection (PADEP) to authorize construction of the source. This Plan Approval will require demonstration that Best Available Technology (BAT) will be employed for the proposed new sources of air pollution, and will include a detailed regulatory applicability study. The regulations that apply to the construction activities associated with this project, as well as the federal regulations that could apply to the Jefferson Compressor Station were reviewed above. The applicable State requirements are discussed in the following section.

The Pennsylvania Code contains regulations that fall under two main categories; those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., sulfur compound emissions from combustion units). The generally applicable requirements are straightforward (e.g., filing of emission statements) and, as such, are not discussed in further detail. The specific requirements associated with the proposed Jefferson Compressor Station are discussed in the following section.

25 Pa Code §123.1 and §123.2 Prohibition of Certain Fugitive Emissions and Fugitive Particulate Matter, respectively, state exceptions to fugitive emissions sources and methods for controlling fugitive emissions. This regulation applies to the facility in general. Equitrans will comply with these requirements by ensuring proper maintenance of roadways and other reasonable measures to prevent particulate matter from becoming airborne.

25 Pa Code §123.11 Particulate Emissions: Combustion Units defines particulate matter emissions for combustion units. Combustion units are defined in §121.1 as stationary equipment used to burn fuel primarily for the purpose of producing power or heat by indirect heat transfer such as boilers. This definition does not apply to the compressor engines, generator engine, dehydration unit reboilers, or fuel gas heater at the proposed Jefferson Compressor Station. As

such, the particulate matter emissions limitations for processes in 25 Pa Code §123.13 *Particulate Emissions*: *Processes* apply to these units instead.

25 Pa Code §123.13 defines particulate matter emissions limitations for processes. For processes excluded from Table 1 of §123.13(b), particulate emissions are limited to 0.04 grains per dry standard cubic foot (gr/dscf) and 0.02 gr/dscf for exhaust flow rates less than 150,000 dscfm and greater than 300,000 dscfm, respectively. Particulates from equipment with exhaust flow rates between 150,000 dscfm and 300,000 dscfm are limited to the allowable emission rate calculated using the formula in §123.13(c)(1)(ii). Potential particulate emissions from the combustion sources proposed for the Jefferson Compressor Station are expected to comply with these requirements since they will combust only natural gas.

25 Pa Code §123.21 Sulfur Compound Emissions generally states that the concentration of sulfur oxides in the effluent gas may not exceed 500 ppm. Since all combustion sources at the Jefferson Compressor Station will be fueled exclusively with natural gas containing only trace amounts of sulfur compounds, emissions from all such sources are not expected to approach the 500 ppm threshold established by this regulation.

25 Pa Code §123.31 Odor Emissions prohibits the emission of malodorous air contaminants from any source that are detectable outside the facility fence line. Equitrans will take measures to minimize odor from the Jefferson Compressor Station operations by combusting natural gas fuel only, by installing an enclosed ground flares on the TEG dehydration units, by implementation of a leak detection and repair (LDAR) program in compliance with 40 CFR 98, Subpart W as applicable, and by installing pressure/vacuum reliefs on the storage tanks to minimize atmospheric venting under normal operations.

25 Pa Code §123.41 Visible Emissions: Limitations states that a facility may not emit visible emissions equal to or greater than 20% for a period or periods aggregating more than 3 minutes in any 1 hour, or equal to or greater than 60% at any time. This standard applies to the proposed emission units at Jefferson Compressor Station. The use of natural gas as fuel will ensure compliance with this requirement.

25 PA Code §129.91 establishes control standards for major stationary sources of NO_x and VOC under the Reasonably Available Control Technology (RACT) program. Major stationary sources of NO_x and VOC are defined in 25 PA Code §121.1. The proposed Jefferson Compressor Station will be located in the Ozone Transport Region (OTR), and therefore the applicable major source thresholds are 100 tons per year of NO_x and 50 tons per year of VOC. Maximum

potential emissions from the proposed Jefferson Compressor Station will not exceed these major source thresholds.

25 Pa Code §129.202 and §129.203 contains additional NO_X requirements for stationary internal combustion engines, respectively. However, these additional requirements do not apply to the equipment in Greene County. Nevertheless, all new sources proposed for the Jefferson Compressor Station will demonstrate that they meet BAT requirements for NO_X and VOC (discussed in detail in Section 4 of this report), which would otherwise meet or exceed RACT requirements if these requirements were applicable.

9.2.1.6 Mitigation Measures

The construction and operation of the various components of the Project are expected to have no significant impact on the air quality in the general area of the Project. Construction of the Project will result in intermittent and temporary fugitive emissions. These emissions will include dust from soil disturbance and combustion emissions from construction equipment. Construction equipment will be operated only during the daylight hours on an as-needed basis. These emissions will be released near ground level and most will not significantly disperse from the construction site. Impacts from construction emissions will be minimal.

The Project's potential to emit for all criteria pollutants will categorize the project as a minor non-PSD source. Maximum annual emissions of all pollutants will be below all applicable major source thresholds (NSR/PSD, Title V, RACT) on a site-wide basis. These estimates are conservative because they assume that all the equipment will be operated for the maximum number of hours per year.

There are no federal Class I areas within 100 kilometer (km) of the proposed Jefferson Compressor Station. The nearest Class I area is Otter Creek Area in West Virginia, which is approximately 115 km away from the site. Due to the minor air emissions and the distance from a Class I area, the Project is expected to have only a minimal impact on the area's air quality. Furthermore, the Project will utilize best available control technology (oxidation catalysts), to reduce emissions from the natural gas-fired RICE at the Jefferson Compressor Station, and will utilize flares to reduce emissions from the proposed TEG dehydration units to mitigate overall air emissions during operation of the compression station.

Below are anticipated measures that will ensure that air quality impacts in the Project Area will remain well below Pennsylvania and federal ambient air quality standards:

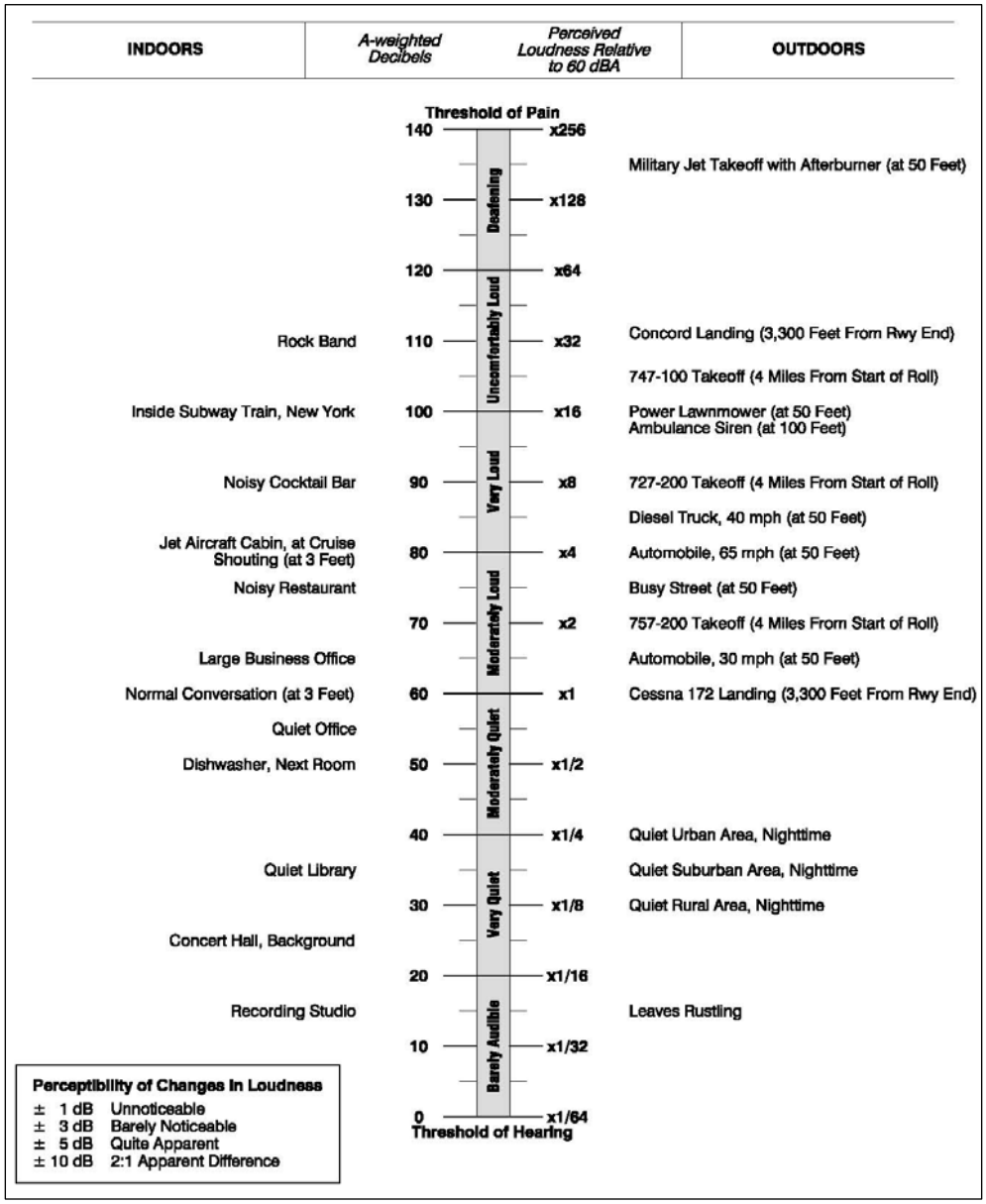
- During construction the applicant will require its contractors to incorporate dust mitigation measures into their operating programs. These will include watering of disturbed surfaces and on-site roads.
- Diesel engine-driven construction equipment will conform to the applicable off-road engine requirements and will be fueled with the applicable low-sulfur fuels. The applicant will encourage its contractors to maintain the engines according to manufacturer's specifications.
- The Compressor Station will be permitted in accordance with the Pennsylvania SIP. This will include a demonstration through BAT analysis to ensure very low emissions from the main sources of emissions at the Jefferson Compressor Station.
- The engines used to drive the gas compressors will be inherently low NOx design (with emission rates approximately ½ of the Federal NSPS limit) that will be equipped with catalytic oxidation technology to reduce the emissions of CO, VOC and organic HAPs. Also, the generator engine will be equipped with Non-Selective Catalytic Reduction (NSCR) to reduce the emissions. Finally, the TEG dehydration units will be equipped with enclosed ground flares for control of VOC/HAP emissions.
- The Project will comply with all of the conditions of its permit(s) and applicable state and federal rules, including those for periodic testing and monitoring of the emission sources.

9.3 NOISE QUALITY

Sound is caused by vibrations that generate waves of minute pressure fluctuations in the surrounding air. Sound levels are typically measured using a logarithmic decibel (dB) scale. Sound that causes disturbance or annoyance, or unwanted sound, is often called "noise." The terms sound and noise are used interchangeably in this analysis.

Human hearing varies in sensitivity for different sound frequencies. The ear is most sensitive to sound frequencies between 800 and 8,000 Hertz (Hz) and is least sensitive to sound frequencies below 400 Hz or above 12,500 Hz. Consequently, several different frequency weighting schemes have been used to approximate the way the human ear responds to noise levels. The "A-weighted" decibel scale (dBA) is the most widely used for this purpose. A list of typical sound levels for example sound sources is presented in Figure 9.3-1.

Figure 9.3-1
Sound Levels of Typical Noise Sources



Source: Caltrans, 2002.

Varying sound levels often are described in terms of an equivalent constant decibel level. Equivalent sound levels (L_{eq}) are not a simple averaging of decibel values but are based on the cumulative acoustical energy associated with the variable sound levels. L_{eq} values sometimes are referred to as energy-averaged sound levels. As a consequence of the calculation procedure, high dB events contribute more to the L_{eq} value than do low dB events. L_{eq} values are used to develop single-value descriptions of average sound exposure over various periods

of time. Such average sound exposure ratings often include additional weighting factors for potential annoyance due to time of day or other considerations. The L_{eq} data used for average sound exposure descriptors are generally based on A-weighted sound level measurements.

Average sound exposure over a 24-hour period is often presented as a day-night average, or time-weighted, sound level (L_{dn}). L_{dn} values are calculated from hourly L_{eq} values, with the L_{eq} values for the nighttime period (10 p.m. to 7 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime sounds.

Certain statistical noise values are sometimes used to describe the allowable sound levels, or limits, at NSAs. The L1, L10, and L50 statistical noise level descriptors are the noise levels that are equaled or exceeded a stated percentage of the time during a given hour. For example, an L10 = 60 dBA implies that in any hour of the day, a noise level of 60 dBA is equaled or exceeded 10 percent of the time, or for 6 minutes. The L50, the noise level exceeded 50 percent of the time, is commonly known as the "median noise level."

Sound intensity attenuates with distance as it propagates over a larger area, generally in a spherical spreading pattern, away from a point source where the sound waves were generated. Generally speaking, the sound pressure level emitted from a point source decreases by approximately 6 dBA for each doubling of distance. Sound emitted from a line of point sources attenuates in a cylindrical spreading pattern and decreases approximately 3 dBA for each doubling of distance.

9.4 APPLICABLE NOISE REGULATIONS

FERC noise analysis guidelines require that any applicable state or local noise regulations be identified. It is further required to specify how the proposed facility will meet the applicable regulations. The basic FERC 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 operation must not exceed an L_{dn} of 55 dBA at any pre-existing NSA.

Internet searches and telephone interviews were conducted in an effort to identify applicable state, county, or local noise regulations for the proposed Project, including telephone interviews with the states of Pennsylvania and West Virginia County officials where the Compressor Station will be constructed and the counties where HDD activities associated with pipeline construction are proposed. A summary of applicable noise regulations in the counties in which NSAs were identified is presented in Table 9.4-1.

Table 9.4-1
Summary of Regulatory Noise Thresholds

Noise Source	Regulatory Agency	Noise Thresholds	Comments
Jefferson Compressor Station	Federal Energy Regulatory Commission (FERC)	L_{dn}, 55 dBA	Maximum impact from operation of the compressor station as predicted at the nearest NSA
H-302	FERC	L_n, 55 dBA	Maximum impact from drilling which will occur between 10 pm and 7 am at the nearest NSA
Jefferson Compressor Station, H-302	State of Pennsylvania	None	No applicable noise policy or regulations identified
	Greene County	None	No applicable noise policy or regulations identified
	Jefferson Township	90 dB 60 dB	At distance 25 feet from any property line Between 7:00 pm and 7:00 am in any district
H-302	State of West Virginia	None	No applicable noise policy or regulations identified
	Wetzel County	None	Only applicable noise regulation is within city of New Martinsville

Source: FERC, 2002. Trinity Consultants, 2010.
*Note this is a guideline and county will not interfere unless the noise persists for 12 hours or more during the nighttime.

9.4.1 Existing Noise Sensitive Areas

Aerial and field surveys of the area surrounding the Compressor Station were conducted in order to identify residences, schools, churches and hospitals located near the Project area and allow their assessment as potential NSAs. Areas surrounding both the Compressor Station and the proposed sites where the HDDs occur were included in the surveys, since these are physically removed from one another and are the only Project components that are expected to contain noise sources of any significance during construction and operation.

9.4.1.1 NSAs in the Vicinity of the Compressor Station

The potential NSAs in the vicinity of the Compressor Station are designated on Figure 9.4-1. Three NSAs located nearest the proposed compressor station (designated NSA-1, NSA-3, and NSA-4 in Figure 9.4-1) in each general compass direction (except the directions in which no potential NSAs were found within one mile of the compressor station) were selected for ambient sound measurements and noise impact assessments. The distances and general directions of those NSAs from the compressor station are listed in Table 9.4-2 below.

Table 9.4-2
NSAs in the Vicinity of the Compressor Station

ID	Description	Approximate Distance to Station (ft)	Direction from Station
NSA-1	Residence	1,797	S
NSA-3	Residence	2,295	E
NSA-4	Residence	1,912	W

9.4.1.2 NSAs in the Vicinity of the Proposed Drilling Sites

The potential NSAs in the vicinity of the proposed pipeline construction drilling sites are designated on Figures 9.4-2A and 9.4-2B. Several NSAs were identified in the vicinity of each drilling location's entrance and exit sites. The distances of the NSAs from the various drilling sites are listed in Table 9.4-3 below.

Table 9.4-3
NSAs in the Vicinity of the Pipeline Construction Drilling Locations

Drilling Site ID	NSA ID	Description	Approximate Distance to Site (ft)
H-302 (PA)	NSA-1	Farm/residence	1,136
	NSA-2	Residence	877
	NSA-3	Residence	920
	NSA-4	Residence	882
	NSA-5	Uncertain – Farm	939
H-302 (WV)	NSA-1	Uncertain	1,276
	NSA-2	Residence	1,045
	NSA-3	Residence	1,883
	NSA-4	Residence or Office	315
	NSA-5	Farm/residence	442
	NSA-6	Residence	320
	NSA-7	Residence	324

Source: Trinity Consultants 2010.

9.4.2 Existing Sound Environment

FERC rules at 18 C.F.R. § 380.12(k)(2) pertaining to environmental reports for Natural Gas Act applications require the applicant to quantitatively describe existing noise levels at existing

NSAs. Therefore, ambient noise measurements were made at NSA-1, NSA-3, and NSA-4 near the proposed compressor station. Note that existing ambient noise measurements were not conducted at the proposed drilling locations because there are currently no other significant sources of noise in these areas.[1]

Short-term (five minute) noise measurements were conducted during both daytime and nighttime periods in order to characterize the ambient noise levels at the NSAs listed in the above table. A Type 2 sound level meter (SLM) was used to measure the octave band ambient sound pressure levels in the selected measurement locations. The following general procedures were used during the noise measurements at each location:

- Calibrate the SLM;
- Fit SLM with a wind screen and mount on a tripod with the microphone oriented at grazing incidence at a height of approximately four feet above the ground surface;
- Program the SLM to acquire a 5-minute sample of ambient sound;
- Acquire sample;
- Record the measured values and statistics from the meter; and
- Repeat process two times.

During each measurement, care was taken to characterize the types and relative magnitudes of ambient sound in each location. In addition, personnel noted the weather conditions and noted sound sources in the area.

Day and night measurements were performed at the same NSA locations by placing the tripod in identical locations. The day-night equivalent noise level (L_{dn}) were calculated for each NSA from the daytime and nighttime L_{eq} values according to the following formula:

$$L_{dn} = 10 \times Log_{10}\left(\frac{15}{24} \times 10^{(L_{eq(day)}/10)} + \frac{9}{24} \times 10^{((L_{eq(night)}+10)/10)}\right)$$

The results of the noise measurements are summarized in Table 9.4-4.

[1] Per discussion between Hanna McCoy (Equitrans) and with Equitrans' FERC PM, only if there is currently a high level of noise should ambient measurements be conducted.

Table 9.4-4
Short-Term Ambient Sound Level Measurements

Measurement Location / NSA		Sound Measurement Data							
ID	Description	Time	L_{eq}, dBA	Temp (°F)	L_{dn} dBA	% RH	Wind (MPH)	Wind (Dir.)	Comments, Dominant Noise Sources
	Compressor Station (Measurements taken on September 7, 2010*)								
NSA-1	Bowden Residence 511 Ridge Road Jefferson, PA 15344	3:51 pm	49.2	92	57.4	21	14	SW	Traffic hum in distance, occasional car passing on road. Insects, wind and leaves. Construction/machine noise. Train moving on tracks and horn in distance.
		10:11 pm	51.2	81		36	6	SW	Birds and insects. Train moving on tracks and horn in distance. Occasional car passing on road.
NSA-3	Rush Residence 373 Ridge Road Jefferson, PA 15344	5:26 pm	48.1	92	57.7	21	14	SW	Birds, insects, wind and leaves. Traffic and construction in distance. Occasional car passing on road.
		10:40 pm	51.7	81		36	7	SW	Insects. Traffic noise.
NSA-4	Simatic Residence 318 Denny Hill Road Jefferson, PA 15344	4:45 pm	48.5	92	59.0	21	16	SW	Traffic hum on nearby highway, occasional car passing on road. Birds, insects and leaves in wind. Construction/machine beeping.
		11:03 pm	53.0	82		36	11	WSW	Insects. Traffic hum in distance. Occasional car passing on road.

* Data from a survey performed by Trinity Consultants 2010.
% RH = Relative Humidity
dBA = "A-weighted" sound level, decibels
L_{eq} = Equivalent sound level
MPH = miles per hour
NA = Data not available
(°F) = degrees Fahrenheit

9.4.3 Noise Impacts

Operational noise impacts were evaluated for the proposed Jefferson Compressor Station site. Construction noise impacts were assessed for general compressor station construction activity as well as at drilling sites along the proposed pipeline route in Pennsylvania and West Virginia. The following sections summarize these noise impacts analyses.

9.4.3.1 Operational Noise

Table 9.4-5 summarizes the proposed Jefferson Compressor Station information.

Table 9.4-5
Proposed Compressor Station Information

Site Parameter	Site Description
State	Pennsylvania
County	Greene
Town	Jefferson Township
Compressor model (#)	Ariel KBU6
Compressor hp (total)	14,205 hp

Source: Equitrans 2010.

Table 9.4-6 summarizes the significant sources of noise at the proposed Jefferson Compressor Station. Note that the facility is expected to operate continuously except as noted.

Table 9.4-6
Summary of Significant Noise Sources at NS1

Noise Source	Description
(3) Gas Compressors	Ariel KBU6 reciprocating compressors; each driven by 4,735 hp Caterpillar G3616LE (total 14,205 hp). Enclosed in an acoustically insulated building; air intake and exhaust attenuated with silencers
(3) Engine Jacket Water Coolers	Forced draft fans, ~265 rpm, air flow of 141,300 acfm
(3) Gas Coolers	Forced draft fans, 217 rpm, air flow of 195,700 acfm
(2) Glycol Dehydration Units	Two approximately 50 hp pumps each
(1) Generator	Natural Gas Fired, 450 kW standby engine
(1) Facility ESD Vent (as necessary; not continuous)	Occasional noise from facility blowdowns (one yearly ESD test; unscheduled station emergency events)

Source: Equitrans 2010.

Note that there may be minimal flow noise associated with piping and components of the compressor station equipment. This noise will be minimized by placing piping and components underground where possible, using lagging, etc.; specific noise impacts are not known or analyzed further at this time.

Equitrans plans to enclose the compressors and compressor engines in one acoustically insulated building. The compressor building will have metal sides with insulation on the walls, no windows, and insulated doors. The building will have noise limiting air supply fans and vents. In addition, the compressor engines will be equipped with air intake silencers and exhaust silencers to minimize noise emissions.

Table 9.4-7 summarizes the noise data utilized to estimate the noise impacts from the proposed Jefferson Compressor Station. See Appendix 9-D for additional documentation to support the sound power level data.

Table 9.4-7
Operational Noise Originating from Compressor Station

Noise Prediction Parameters	Octave Band Center Frequency (Hz)									
	31.5	63	125	250	500	1K	2K	4K	8K	dBA
Sound Source SWL (Raw Levels, unweighted dB)										
Compressor Engines (each)										
Mechanical (casing radiation)	111.1	118.1	124.9	121.4	119.4	119.2	121.5	123.3	118.1	128.2
Combustion Exhaust (right)	122.1	127.0	133.4	129.2	130.1	133.8	139.5	144.6	143.8	148.4
Combustion Exhaust (left)	122.3	131.8	131.1	125.9	125.9	128.1	128.3	125.7	124.7	134.0
Air Intake (left)	104.7	104.7	104.7	107.7	107.7	112.8	119.6	131.0	130.3	134.0
Gas Cooler Fans (each)										
G3616 Gas Cooler, Howden	-	102.9	101.4	99.4	96.4	92.9	91.4	88.4	84.4	99.3
Engine Jacket Water Coolers (each)										
Total	-	101.3	99.8	97.8	94.8	91.3	89.8	86.8	82.8	97.7
Glycol Dehydration Units Pumps (each)										
Total	-	108.0	109.0	109.0	110.0	112.0	109.0	106.0	101.0	115.8
Attenuation Elements (DIL, dB)										
Compressor Engines										
Exhaust Silencer[1]	24	28	40	42	39	37	36	34	33	43.2
Intake Silencer[2]	1	5	13	22	28	35	42	50	47	52.3
Building										
2” 18 gauge solid/22 gauge perforated metal wall[3]	16	20	26	29	33	44	52	60	60	63.5

Source: Input parameter data and other engineering data sheets supplied by Equitrans, 2010.
Notes:
DIL = Dynamic Insertion Loss.
Hz = Hertz
K = Thousand
Octave band levels (dB) and overall (dBA) are Leq (same during daytime and nighttime since continuous operation)
[1] Assumed to be similar to selected unit
[2] Assumed to be similar to selected unit
[3] Assumed minimum design

The predicted noise impacts of the compressor station equipment at each NSA were estimated by first calculating the combined sound power of the compressor station equipment and attenuation elements. Then the sound power was adjusted for the attenuation due to hemispherical sound propagation for each NSA based on the associated distance from the compressor station.

Hemispherical sound propagation assumes sound radiates hemispherically from a source located on a flat continuous surface. The following equation is the theoretical decrease of sound energy when determining the resulting sound pressure level (SPL) of a noise source at a specific distance ("r") of a receiver from a source sound power level (PWL):

$$\text{Decrease in sound from a noise source (dB)} = 20*\log(r) - 2.3$$

where:

r = distance of the NSA receiver from the noise source

Table 9.4-8 summarizes the noise impacts at the NSAs for the Jefferson Compressor Station.

Table 9.4-8
Noise Quality Analysis at NSAs for Jefferson Compressor Station

Compressor Station/NSA	Distance to NSA (feet) / Direction	Direction from Compressor Station	Existing Noise Level (dBA)			Predicted Future Noise Level (dBA)		
			L_{eq} (d) (Measured)	L_{eq} (n) (Measured)	L_{dn} (Calculated)	L_{dn} (Project-Related)	Cumulative L_{dn} (Total of Existing and Project-Related)	Increase over Existing
NSA-1	1,797	South	49.2	51.2	57.4	61.9	63.2	5.8
NSA-3	2,295	East	48.1	51.7	57.7	59.8	61.9	4.2
NSA-4	1,912	West	48.5	53.0	59.0	61.4	63.4	4.4
Property Line[1]	~267 (closest point)	N/A	48.6	52.0	58.0	78.5	78.5	20.5

Source: Trinity Consultants 2010.
Note:
The distances between the compressor station and the NSAs used for this analysis assume that the compressor station would be located at approximately the center of the proposed compressor station site.
The existing noise levels at the property line are assumed to equal the average of the existing noise levels measured at the NSAs.

The emergency generator and ESD vent were not included in the calculations to estimate the proposed station's operational noise because the units will not operate continuously. Noise levels from the proposed ESD vent are anticipated to remain below an L_{eq} of 55 dBA at all NSAs and 70 dBA at the property line.

9.4.3.2 Construction Noise Impacts – Compressor Station and Typical Pipeline Construction

Construction of the compressor station will consist of earth work (e.g., site grading), construction of the buildings, and installation of the equipment. The noise impact at the NSAs from construction activities will be dependent on the type of equipment used, the duration of use for each piece of equipment, and the quantity of construction equipment operating simultaneously.

9.4.3.3 Construction Noise Impacts – Drilling

Construction of the pipeline will require horizontal directional drilling (HDD). The entry sites for the drilling will include the following equipment:

- Drilling rig (200 tons or less) & associated engine-driven power unit
- Engine-driven mud pump(s)
- Engine-driven generator sets
- Mud mixing & mud cleaning equipment
- Two trackhoes
- Engine-driven light plants, if operate during nighttime

The drilling exit site will include the following equipment:

- Engine-driven generator set
- Backhoe
- Engine-driven light plants, if operate during nighttime

Note that mud pumps will not be required at the exit point.

Table 9.4-9 describes the proposed pipeline construction drilling locations.

Table 9.4-9
Drilling Site Noise Survey Description

Drilling Site ID	Feature Information Feature Crossed	County	State	Milepost	Crossing Width (feet)	Approximate Drill Length (feet)	Comments
H-302A & H-302B (PA)	Toms Run	Greene	PA	16.2	1,944	2,099	Treed area with residences nearby
H-302C & H-302D (WV)	US 250 at Littleton	Wetzel	WV	28.8	2,733	2,977	Dense tree cover with residences nearby

Source: HMM, 2009 and Trinity Consultants, 2010.

Equitrans does not intend to perform HDD operations on a 24-hour/7days-per-week schedule. The only potential non-daytime HDD activities that may be performed would be pullback of the drill and hydrostatic testing. It should also be noted that Equitrans estimates that the HDD activities at each drill site will take 3.5 weeks for completion.

The specific construction equipment for the project has not yet been selected, and thus, anticipated sound power levels (SPL) specific to the pipeline construction drilling are unknown. However, the noise level associated with the construction phase of site clearing and excavation, including equipment such as a dump truck and backhoe, is approximately 89 dBA at 50 feet.[2] Therefore, Equitrans has predicted impacts of the pipeline drilling based on this estimate as summarized in Table 9.4-10.

[2] US EPA (U.S. Environmental Protection Agency), 1971. Noise from Construction Equipment and Operations, US Building Equipment, and Home Appliances. Prepared by Bolt Beranek and Newman for US EPA Office of Noise Abatement and Control, Washington, DC.

Table 9.4-10
Results of Noise Quality Analysis for Proposed Pipeline Construction Drilling Sites

Drilling Site ID	NSA ID	Approximate Distance to Drilling Site (feet)	Predicted Noise Level L_{eq} (dBA)
H-302A	NSA-1	1,136	61.9
	NSA-2	877	64.1
H-302B	NSA-3	920	63.7
	NSA-4	882	64.1
	NSA-5	939	63.5
H-302C	NSA-1	1,276	60.9
	NSA-2	1,045	62.6
	NSA-3	1,883	57.5
H-302D	NSA-4	315	73.0
	NSA-5	442	70.1
	NSA-6	320	72.9
	NSA-7	324	72.8

Source: Trinity Consultants, 2010.

9.4.4 Noise Mitigation

9.4.4.1 Operational Noise

Operational noise will be mitigated by the design of the compressor station, which includes enclosing the compressors in an acoustically insulated building, equipping the engine's air intakes and exhausts with silencers, and using a silencer on the ESD vent. In addition, Equitrans will limit use of the ESD vent to emergency events only, with the exception of the required annual ESD test.

9.4.4.2 Compressor Station and Typical Pipeline Construction Noise

Construction equipment will be primarily operating during daytime hours on an as-needed basis. Activities with the potential to occur during nighttime hours include pullback of the HDD(s) and hydrostatic testing. In addition, construction activities will be temporary in nature. Noise resulting from construction on the compressor station and pipeline are anticipated to have negligible impacts on the nearby NSAs.

9.4.4.3 Pipeline Construction Drilling Noise

Equitrans will work to reduce annoyance from the pipeline construction HDD by employing some or all of the following measures as necessary or as requested by affected NSAs:

- Schedule drilling during daylight hours
- Equip engine-driven machinery with mufflers
- Inform nearby residents about the project and upcoming drilling activities
- Respond to and investigate complaints
- Measure sound level during drilling, if necessary
- Offer temporary housing in a commercial hotel to occupants of affected residences, as applicable

9.5 REFERENCES

Equitrans, L.P. 2010 and 2011

Jefferson Morgan Multi-Municipal Zoning Ordinance Clarksville Borough, Jefferson Borough, Jefferson Township, Morgan Township, Greene County, Pennsylvania. Enacted August 12, 2008.

Appendix 9-A

Emission Estimates for

Compressor Station and Pipeline Construction

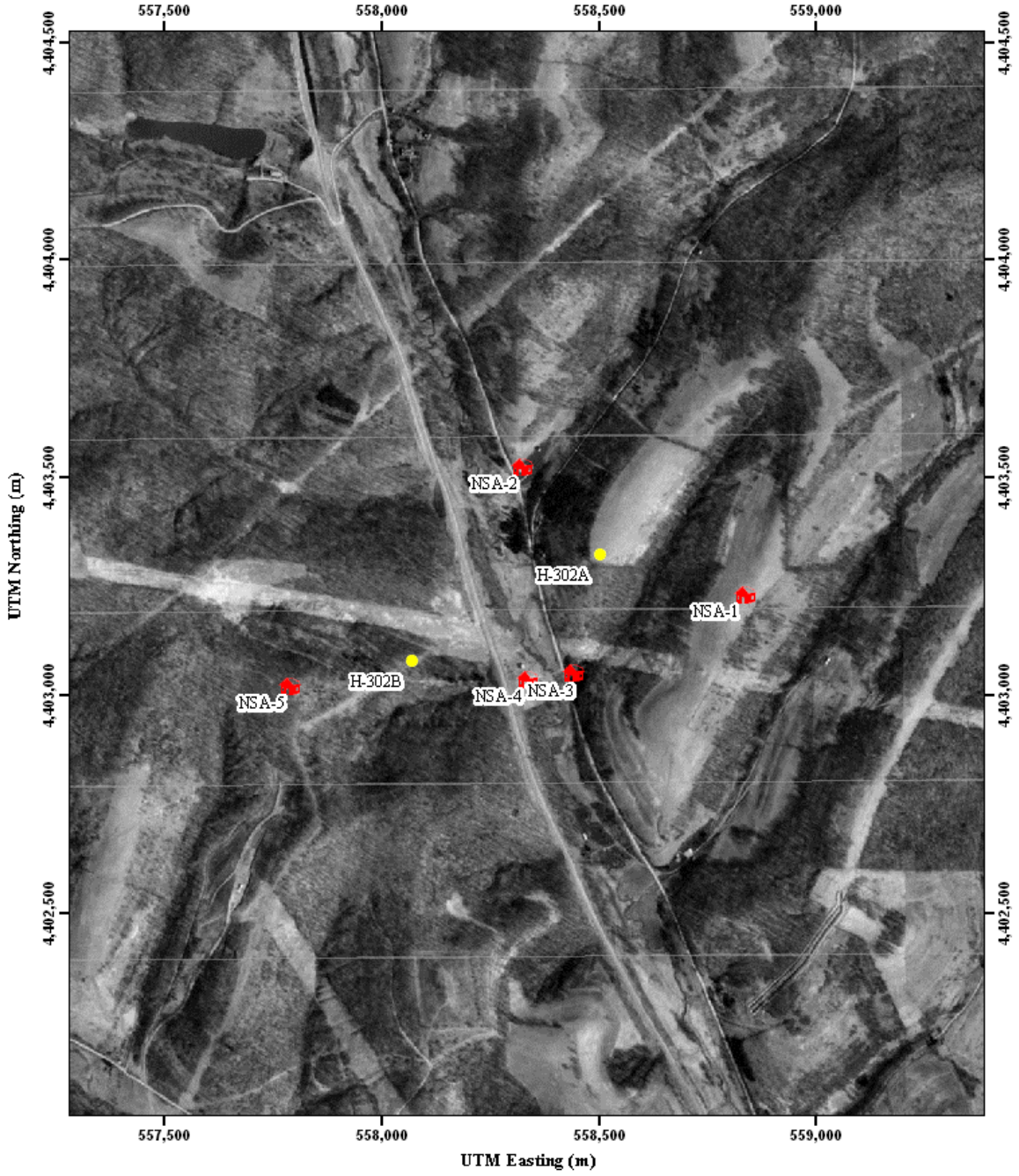
Appendix 9-B

Figures Illustrating Noise Measurement Locations and Noise Sensitive Areas (NSAs)

Figure 9.4-1
Site Map for Noise Measurement Locations/NSAs Near
Proposed Jefferson Compressor Station

Figure 9.4-2A

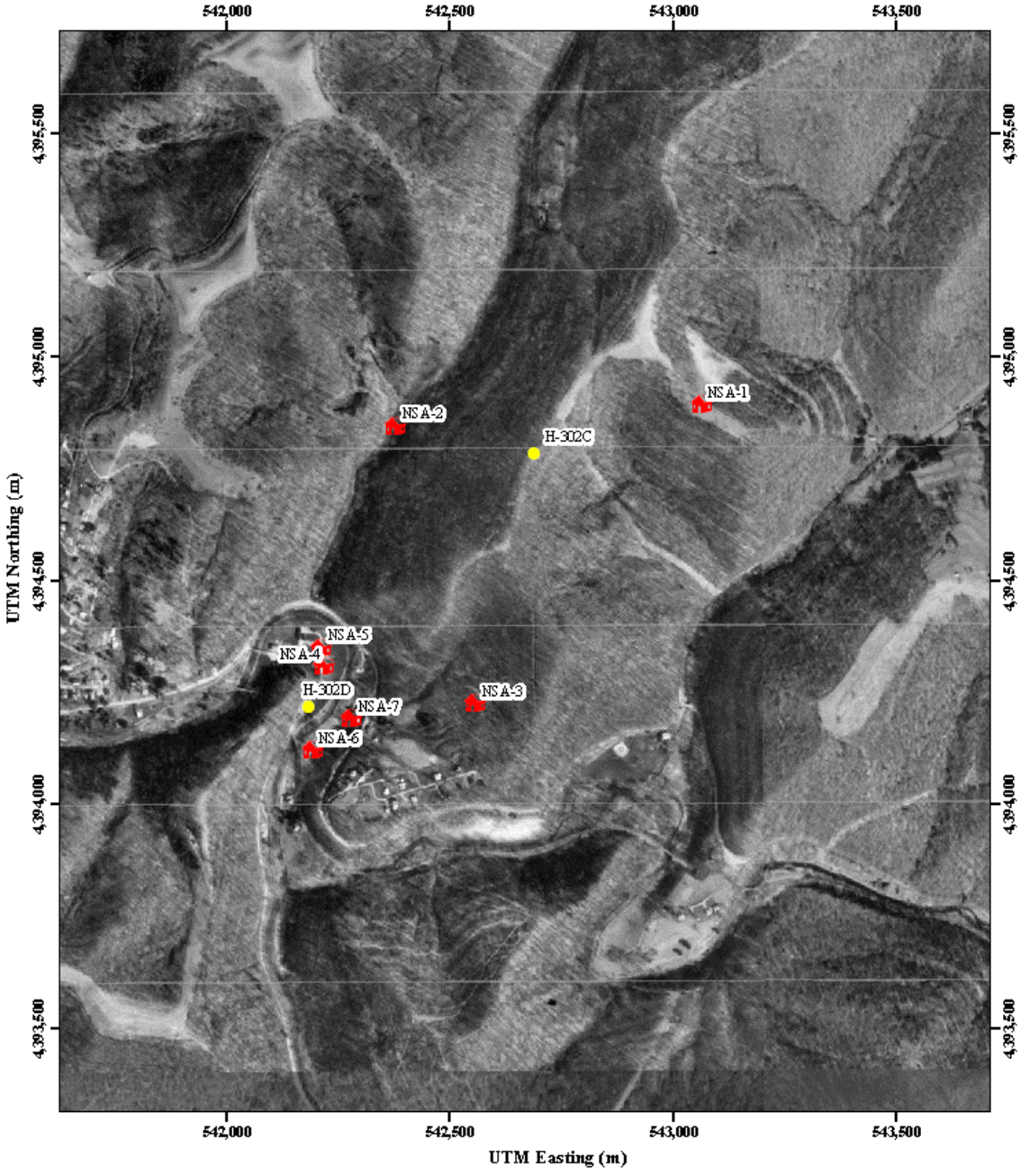
NSAs Near HDD Sites H-302A and H-302B



Coordinates reflect UTM projection Zone 17, NAD 83.

Figure 9.4-2B

NSAs Near HDD Sites H-302C and H-302D



Coordinates reflect UTM projection Zone 17, NAD 83.

Appendix 9-C

Jefferson Compressor Station

Plan Approval Air Permit Application

Appendix 9-D

Sound Power Level Data

Supporting Documents