Resource Report 9

Air and Noise Quality

Permian Basin Expansion Project

FERC Docket No. CP26-____-000

May 2026

RESOURCE REPORT 9 - AIR AND NOISE QUALITY	
MINIMUM FILING REQUIREMENTS	
INFORMATION	**DATA SOURCE**
1. Describe existing air quality in the vicinity of the project – 18 CFR § 380.12 (k) (1).	Section 9.1.1
2. 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 – 18 CFR § 380.12 (k) (2)	Sections 9.2.2 and 9.2.3 and Tables 9.2.3-1, 9.2.3-2, and 9.2.3-4
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 – 18 CFR § 380.12 (k) (3)	Section 9.1.2 and Table 9.1-2
4. Describe the existing compressor units at each station where new, additional, or modified compression units are proposed, including the manufacturer, model number, and horsepower of the compressor units. For proposed, new, additional, or modified compressor units, include horsepower, type, and energy source – 18 CFR § 380.12 (k) (4)	Section 9.1.3.3
5. Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building/enclosure – 18 CFR § 380.12 (k) (4)	Section 9.2.2 and Table 9.2.2-1
6. Identify any applicable state or local noise regulations – 18 CFR § 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 – 18 CFR § 380.12 (k) (4)	Section 9.2.4, 9.2.5, and Table 9.2.5-1
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS	
Air Quality Information	
Include climate information as part of the air quality information provided for the project area.	Section 9.1.1
Provide construction emissions (criteria pollutants, hazardous air pollutants, greenhouse gases) for proposed pipelines and aboveground facilities.	Table 9.1.3-1
Provide copies of state and federal applications for air permits.	Anticipated submission in June 2026
Provide operation and fugitive emissions (criteria pollutants, hazardous air pollutants, greenhouse gases) for pipelines and aboveground facilities.	Table 9.1.3-3
Provide air quality modeling for entire compressor stations.	Not applicable
Identify temporary and permanent emissions sources that may have cumulative air quality effects in addition to those resulting from the project	Section 9.1.3
Noise and Vibration	
Describe the existing noise environment and ambient noise surveys for compressor stations, liquefied natural gas facilities, meter and regulation facilities, and drilling locations.	Section 9.2.2
Identify any state or local noise regulations applicable to construction and operation of the project.	Section 9.2.1
Indicate whether construction activities would occur over 24-hour periods.	Section 9.2.4
Discuss construction noise impacts and quantify construction noise impacts from drilling, pile driving, dredging, etc.	Section 9.2.4
Quantify operation noise from aboveground facilities, including blowdowns.	Section 9.2.5 and Table 9.2.5-1
Describe the potential for the operation of the proposed facilities to result in an increase in perceptible vibration and how this would be prevented.	Section 9.2.7
Identify temporary and permanent noise sources that may have cumulative noise effects in addition to those resulting from the project.	Section 9.2.7

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Abbreviations and Acronyms

°F	degrees Fahrenheit
AP-42	Air Pollutant Emission Factors
AQCR	air quality control region
BMP	best management practice
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
dB	decibel
dBA	A-weighted decibel
EPA	U.S. Environmental Protection Agency
ft	feet
ft/s	feet per second
FERC	Federal Energy Regulatory Commission
g/s	grams per second
GHG	greenhouse gas
HAP	Hazardous Air Pollutant
hp	horsepower
Hz	hertz
ISO	International Organization for Standardization
lb/MWh	pounds per megawatt-hour
L_d	daytime equivalent sound level
L_{dn}	day-night sound level
L_{eq}	equivalent continuous sound level
L_n	nighttime equivalent sound level
MMBtu/hr	million British thermal units per hour
NAA	nonattainment area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
Northern	Northern Natural Gas Company
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
O_2	oxygen
O_3	ozone

PBR	Permit by Rule
PM	particulate matter
$PM_{2.5}$	particulate matter with a diameter less than or equal to 2.5 microns
PM_{10}	particulate matter with a diameter less than or equal to 10 microns
ppb	parts per billion
ppm	parts per million
Project	Permian Basin Expansion Project
PSD	Prevention of Significant Deterioration
PTE	potential to emit
scf	standard cubic feet
SIP	State Implementation Plan
SO_2	sulfur dioxide
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
tpy	tons per year
VOC	volatile organic compound

9.0 AIR AND NOISE

Northern Natural Gas Company (Northern) owns and operates a natural gas transmission pipeline system and associated aboveground facilities in New Mexico and Texas. Northern is seeking a Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC) under Section 7(c) of the Natural Gas Act, as amended, for its Permian Basin Expansion Project (Project).

The Project includes constructing approximately 15.1 miles of 24-inch-diameter and 1.1 miles of new 16-inch-diameter pipelines, a new International Organization for Standardization (ISO)-rated 7,700 horsepower compressor station, one interconnect with Transwestern Pipeline Company, LLC within the existing Phillips 66 Linam Ranch Plant, one bi-directional receiver within Northern's existing launcher facility, replacing a recycle valve at Northern's Plains compressor station, and one new delivery point for the customer at the Gaines County Generating Station.

In accordance with the FERC regulations at 18 Code of Federal Regulations (CFR) 380.12(k), *Resource Report 9 – Air and Noise Quality* describes the effects of the project on the existing air quality and noise environment and describe proposed measures to mitigate the effects. Operation of the proposed Hobbs compressor station will comprise the long-term impacts on air and noise quality associated with this Project and is the primary focus of this report.

9.1 AIR QUALITY

A determination of the Project's air quality impact was accomplished through a characterization of existing air quality in the Project region (Section 9.1.1) and an assessment of anticipated air quality regulatory impacts and mitigation for the Project (Sections 9.1.2 and 9.1.3).

9.1.1 Existing Conditions

9.1.1.1 Climate

The climate in the Project area encompassing Yoakum and Gaines counties, Texas, as well as Lea County, New Mexico, is characterized as semiarid to continental, consistent with the Southern High Plains region. Based on 1991-2020 climate normals compiled by the National Oceanic and Atmospheric Administration ([NOAA], 2026a), annual precipitation in Yoakum and Gaines counties averages 15.9 inches, and annual precipitation in Lea County, New Mexico, averages 15.1 inches per year. Both Texas and New Mexico segments of the Project experience hot, dry conditions in summer and cooler, relatively dry conditions in winter. January is the coldest month, with an average low temperature of 28 degrees Fahrenheit (°F) while July is the warmest month with average high temperatures of approximately 95°F (NOAA, 2026b). Eastern New Mexico and west Texas experience a wide range of weather events, including floods, drought, thunderstorms, and tornadoes.

9.1.1.2 National Ambient Air Quality Standards

The Clean Air Act (CAA) of 1970, 42 U.S. Code Part 7401 et seq., amended in 1977 and 1990, is the basic federal statute governing air quality. The provisions of the CAA that are potentially

relevant to construction and operation emission sources include the following: National Ambient Air Quality Standards (NAAQS), Prevention of Significant Deterioration (PSD), nonattainment area (NAA) New Source Review (NSR), New Source Performance Standard, National Emission Standards for Hazardous Air Pollutants, and Title V Operating Permits.

Section 109(b) of the CAA requires that the U.S. Environmental Protection Agency (EPA) establish NAAQS "requisite to protect" public health and public welfare (40 CFR Part 50). The CAA identifies two class types of NAAQS: primary standards and secondary standards. Primary standards are limits set to protect the public health of the most sensitive populations, such as asthmatics, children, and the elderly. Secondary standards are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife, and structures. The CAA requires the EPA to periodically review and, if new data indicate, update the NAAQS.

The EPA has promulgated NAAQS for six criteria pollutants: ozone (O_3), particulate matter (PM), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead. Standards for PM are categorized on the size of the PM based on diameters of particulate matter with a diameter less than or equal to 10 microns (PM_{10}) and particulate matter with a diameter less than or equal to 2.5 microns ($PM_{2.5}$). The NAAQS are summarized in Table 9.1.1-1 (EPA, 2025).

The EPA compares ambient air criteria pollutant measurements to NAAQS to assess the status of the air quality of regions within the United States. The regions are generally defined on a county level basis. The EPA maintains a list of attainment and nonattainment designation areas for all criteria pollutants on their "Green Book" website (EPA, 2026b). Based on these comparisons, regions are designated as being in one of the following categories for the criteria air pollutants:

- Attainment: A region is designated as in "attainment" if monitoring shows that ambient concentrations of a specific pollutant are less than or equal to NAAQS. An attainment area for a NAAQS that has been redesignated from nonattainment is classified as a "maintenance area" for a 10-year period so that the air quality improvements are sustained.

- Nonattainment: If the NAAQS are exceeded for a pollutant, then the region is designated as in "nonattainment" for that pollutant. NAAs can be further classified based on the severity of the exceedance of the relevant standard.

- Unclassifiable: An area is designated as "unclassifiable" if the ambient air monitoring data are incomplete and do not support a designation of attainment or nonattainment.

Lea County, New Mexico, and Yoakum and Gaines counties, Texas, will be affected by air emissions from the construction of the Project. All three affected counties are designated as unclassifiable/attainment for each of the NAAQS pollutants (EPA, 2026b).

The attainment status designations appear in 40 CFR Part 81. The attainment status of a region, in conjunction with projected emission rates or emissions increases, determines the regulatory review process for a new project. The Project will be in an area designated as unclassifiable/attainment with the NAAQS (EPA, 2026b).

Table 9.1.1-1 National Ambient Air Quality Standards

Pollutant	Averaging Period	Standards	
		Primary	Secondary
SO_2	Annual [1]	--	10 ppb
	1-hour [2]	75 ppb	--
PM_{10}	24-hour [3]	150 µg/m^3	same as primary
$PM_{2.5}$	24-hour [4]	35 µg/m^3	same as primary
	Annual [1]	9 µg/m^3	15 µg/m^3
NO_2	Annual [5]	53 ppb	same as primary
	1-hour [6]	100 ppb	--
CO	8-hour [7]	9 ppm	--
	1-hour [7]	35 ppm	--
Ozone	8-hour [8]	0.07 ppm	same as primary
Lead	Rolling 3 Month Average [9]	0.15 µg/m^3	same as primary

[1] Compliance based on annual mean, averaged over 3 years.
[2] Compliance based on 3-year average of 99th percentile of the daily maximum 1-hour average.
[3] Not to be exceeded more than once per year on average over 3 years.
[4] Compliance based on 3-year average of 98th percentile of 24-hour concentrations.
[5] Compliance based on annual mean.
[6] Compliance based on 3-year average of 99th percentile of the daily maximum 1-hour average.
[7] Not to be exceeded more than once per year.
[8] Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
[9] Maximum arithmetic mean of 3 consecutive monthly means in a 3-year period.

Note: ppm = parts per million by volume; ppb = parts per billion by volume; µg/m^3 = micrograms per cubic meter; SO_2 = sulfur dioxide; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; NO_2 = nitrogen dioxide; CO = carbon monoxide.

Source: EPA, 2025.

9.1.1.3 Air Quality Control Regions Background Ambient Air Quality of Criteria Pollutants

Existing air quality conditions for the Project were determined using EPA's Monitor Values Report. These monitoring stations employ specialized instruments to measure concentrations of key pollutants in accordance with federal air monitoring requirements. The collected data help identify long-term air quality trends and determine compliance with the NAAQS.

For this analysis, the monitoring stations located nearest the Project were evaluated in greater detail. Table 9.1.1-2 presents the background air quality design values for 2022-2024 from the closest monitoring locations, along with each station's approximate distance from the Project components. The monitoring data are reported in the statistical format required by NAAQS. Table 9.1.1-2 summarizes the observed air quality values for the Project vicinity.

Table 9.1.1-2 Ambient Air Quality Concentrations Representative of the Project Area

Pollutant	Monitor Station / Site ID	Averaging Period [1]	Units	Rank	Monitored Concentration (2023) [2]	Monitored Concentration (2024) [2]	Monitored Concentration (2025) [2]	Primary NAAQS
CO	Ojo De Agua / 48-141-1021	1 hour	ppm	2nd High	1.0	1.3	1.1	35.0
CO	Ojo De Agua / 48-141-1021	8 hour	ppm	2nd High	0.8	1.2	0.9	9.0

Table 9.1.1-2 Ambient Air Quality Concentrations Representative of the Project Area

Pollutant	Monitor Station / Site ID	Averaging Period [1]	Units	Rank	Monitored Concentration (2023) [2]	Monitored Concentration (2024) [2]	Monitored Concentration (2025) [2]	Primary NAAQS
NO_2	Hobb Jefferson / 35-025-0008	1 hour	ppb	98th Percentile	33.1	38.4	41.2	100.0
NO_2	Hobbs Jefferson / 35-025-0008	Annual	ppb	Mean	5.4	5.6	5.8	53.0
PM_{10}	6ZL Holman Road / 480-029-1087	24 hour	µg/m^3	2nd High	50.0	106.0	127.0	150.0
$PM_{2.5}$	San Antonio Bulverde Parkway / 35-025-0008	Annual	µg/m^3	Mean	6.3	6.4	8.2	9.0
$PM_{2.5}$	Hobbs Jefferson / 35-025-0008	24 Hour	µg/m^3	98th Percentile	19.1	16.8	30.2	35.0
O_3	Hobbs Jefferson / 35-025-0008	8 hour	ppm	4th High	0.074	0.072	0.062	0.07
SO_2	El Paso Chamizal / 48-141-0044	1 hour	ppb	99th Percentile	5.6.0	5.5	6.0	75.0
SO_2	El Paso Chamizal / 48-141-0044	Annual	ppb	Mean	0.4	0.2	0.1	10.0

[1] Consistent with the definition of the NAAQS, second-high short-term concentrations are listed for most pollutants, but the fourth-highest 8-hour concentration is listed for O_3, the 98th percentile 24-hour concentration is listed for $PM_{2.5}$ and 1-hour NO_2, and the 99th percentile 1-hour concentration is listed for SO_2. The arithmetic mean concentrations are listed for the annual averages.

[2] The form for each pollutant/averaging period (i.e., H1H, H4H, and H8H) is based on EPA rulemaking. See EPA NAAQS Table (EPA, 2025).

Source: EPA, 2026a.

Note: NAAQS = National Ambient Air Quality Standards; µg/m^3 = microgram per cubic meter; ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter; SO_2 = sulfur dioxide; PM_{10} = particulate matter with a diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a diameter less than or equal to 2.5 microns; NO_2 = nitrogen dioxide; CO = carbon monoxide; O_3 = ozone.

9.1.1.4 Air Quality Control Regions

A useful way to characterize existing air quality in a given area is to identify the attainment status of the air quality control region (AQCR) in which it is located. An AQCR, as defined in Section 107 of the CAA, is a federally designated area in which NAAQS must be met. An implementation plan is developed for each AQCR describing how ambient air quality standards will be achieved and maintained. The Project area lies within three AQCRs: Lea County, New Mexico is in the Pecos-Permian Basin Intrastate AQCR (AQCR 155), Yoakum County, Texas is part of the Midland-Odessa-San Angelo Intrastate AQCR (AQCR 218), and Gaines County, Texas, is within the Amarillo-Lubbock Intrastate AQCR (AQCR 211). These AQCR designations provide the regulatory context under which attainment status and air permitting requirements are evaluated. The Project will be in an area designated as unclassifiable/attainment with the NAAQS (EPA, 2026b).

9.1.2 Air Regulatory Requirements

9.1.2.1 New Source Review – Prevention of Significant Deterioration

Congress established the NSR preconstruction permitting program under the CAA. Texas and New Mexico implement the Federal CAA through EPA-approved State Implementation Plans (SIP). Under these SIPs, the Texas Commission on Environmental Quality (TCEQ) and New Mexico Environment Department (NMED) are the delegated authorities responsible for administering each states' air permitting programs. NSR includes three permitting categories:

- PSD permits, required for new major sources or existing sources making major modifications in attainment areas;
- Nonattainment NSR permits, required for new major sources or existing sources making major modifications in NAAs; and
- Minor NSR permits, required for new minor sources.

PSD permits prevent new air emission sources from causing existing air quality to deteriorate beyond acceptable levels. For compressor station sources, a PSD "new major source" is any stationary source that emits, or has the potential to emit (PTE), 250 tons per year (tpy) or more of a PSD-regulated pollutant (40 CFR 51.166(b)(1)(i)(b)).

PSD permitting requirements will not be triggered by any portion of the Project.

9.1.2.2 Federal Class I Areas

The CAA designates certain United States areas, such as wilderness areas and national parks, as Mandatory Federal Class I areas due to their unique air quality. Class I areas receive protection from elevated criteria pollutant concentrations, visibility degradation, and acid deposition. PSD projects within 100 kilometers (62 miles) of a Class I area must notify the appropriate Federal Land Manager and assess potential impacts. Projects within 10 kilometers (6.2 miles) must evaluate ambient air pollutant impacts from any emission increase.

PSD permitting for regulated NSR pollutants does not apply to any of the Project components; therefore, further analysis of Class I areas is not required. Moreover, the Project is not located near (i.e., within 50 kilometers) any Class I areas, as shown in Table 9.1.2-1.

Class I areas and their distance to the Hobbs compressor station are listed in Table 9.1.2-1.

Table 9.1.2-1 Nearest Class I Areas to the Hobbs Compressor Stations

Class I Area	Distance (kilometers) and Direction from Facility Hobbs Compressor Station
Carlsbad Caverns National Park	137 km Northeast
Bosque del Apache Wilderness Area	250 km North
White Mountain Wilderness Area	300 km North
Salt Creek Wilderness Area	290 km North
Great Sand Dunes National Park and Preserve	630 km North
Guadalupe Mountains National Park	380 km West

Table 9.1.2-1 Nearest Class I Areas to the Hobbs Compressor Stations	
	Distance (kilometers) and Direction from Facility
Class I Area	Hobbs Compressor Station
Big Bend National Park	560 km South-Southeast

9.1.2.3 Title V Operating Permits

Title V of the CAA requires major sources of air pollutants to obtain and operate under a federally enforceable operating permit. Sources subject to Title V must certify compliance with all permit requirements at least annually. The EPA has delegated authority for the 40 CFR Part 70 Operating Permit Program to the New Mexico Environment Department (NMED) Air Quality Bureau, and the TCEQ. NMED implements the Title V program under 20.2.70 New Mexico Administrative Code (NMAC), while TCEQ administers the program under 30 Texas Administrative Code (TAC) Chapter 122.

In attainment areas, Title V applies to sources that emit:

- 100 tpy or more of any criteria pollutant;
- 10 tpy or more of any individual hazardous air pollutant (HAP); or
- 25 tpy or more of any combination of HAPs.

Construction of the Hobbs compressor station will remain a minor source with respect to Title V and not require a federally enforceable operating permit. Title V permitting requirements will not be triggered by any portion of the Project.

9.1.2.4 Greenhouse Gas Reporting Rule

On November 8, 2010, the EPA signed a rule that finalized reporting requirements for the petroleum and natural gas industry under 40 CFR Part 98. Subpart W of 40 CFR Part 98 was revised on May 14, 2024, and requires petroleum and natural gas facilities that emit 25,000 metric tons or more of carbon dioxide equivalent (CO_2e) per year to report annual emissions of specified greenhouse gases (GHG) from various processes within the facility. Stationary combustion sources as well as natural gas and petroleum systems are considered source categories subject to 40 CFR Part 98.

If actual GHG emissions exceed 25,000 metric tons of CO_2e per year at a compressor station associated with the Project, then Northern will report GHG emissions per 40 CFR Part 98.

9.1.2.5 General Conformity

A General Conformity applicability analysis is required for any part of the Project occurring in nonattainment or maintenance areas. Section 176(c) of the CAA requires federal agencies to ensure that federally approved or funded projects conform to the applicable approved SIP. As specified in Section 176(c)(1)(B) of the CAA, such activities must not:

1. cause or contribute to any new violation of any standard in any area;

2. increase the frequency or severity of any existing violation of any standard in any area; or

3. delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

General Conformity applies in designated nonattainment or maintenance areas on a pollutant-by-pollutant basis. To determine if General Conformity is applicable, Project emissions from construction and operation (excluding emission sources covered by the NSR permitting program) are compared to the *de minimis* thresholds defined in the General Conformity Rule. The General Conformity Rule thresholds are shown in Table 9.1.2-2. As indicated above, General Conformity does not apply to federal actions in attainment or unclassified/attainment areas. The Project is not located in an Ozone Transport Region.

Table 9.1.2-2 General Conformity *De Minimis* Thresholds

Pollutant/Area Designation	Tons/Year
Ozone (VOCs or NO_x)	
Serious NAAs	50
Severe NAAs	25
Extreme NAAs	10
Other Ozone NAAs outside an ozone transport region	100
Other ozone NAAs inside an ozone transport region:	
VOC	50
NO_x	100
CO (All NAAs and Maintenance Areas)	100
SO_2 or NO_x (All NAAs and Maintenance Areas)	100
PM_{10}	
Moderate NAAs	100
Serious NAAs	70
All Maintenance Areas	100
$PM_{2.5}$ (Direct $PM_{2.5}$, SO_2, NO_x, VOCs, and Ammonia)	
Moderate NAAs	100
Serious NAAs	70
All Maintenance Areas	100
Lead (All NAAs and Maintenance Areas)	25

Source: EPA, 2024a.

Note: NAA = Nonattainment Area; VOC= volatile organic compound; NOx = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less.

The Project area is classified as being in attainment or unclassifiable for all criteria pollutant standards. Therefore, General Conformity does not apply.

9.1.2.6 New Source Performance Standards

Section 111 of the CAA authorized the U.S. Environmental Protection Agency to develop technology-based standards which apply to specific categories of stationary sources. These standards, referred to as New Source Performance Standards (NSPS), are codified in 40 CFR Part 60. NSPS apply to new, modified, and reconstructed affected facilities in specific source

categories. NSPS regulations are issued for categories of sources causing or contributing significantly to air pollution that may reasonably be anticipated to endanger public health or welfare. A preliminary analysis of NSPS that will apply to the Project is provided below.

The general provisions listed in Subpart A include broad definitions of applicability and various methods for maintaining compliance with requirements listed in subsequent subparts. Equipment located at the compressor station subject to any of the NSPS subparts will also be subject to Subpart A.

Subpart A – General Provisions

The general provisions listed in Subpart A include broad definitions of applicability and various methods for maintaining compliance with requirements listed in subsequent subparts. Equipment located at compressor station subject to any of the NSPS subparts will also be subject to Subpart A.

Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units and Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

Subpart Db applies to steam-generating units with a maximum heat input greater than 100 million British thermal units per hour (MMBtu/hr), and Subpart Dc applies to units with a maximum heat input between 10 and 100 MMBtu/hr. The proposed fuel gas heater that will be installed at the Hobbs compressor station as part of this Project will be rated at less than 10 MMBtu/hr; therefore, Subpart Db and Subpart Dc do not apply.

Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Subpart JJJJ applies to stationary spark-ignition engine manufacturers and owners/operators. For natural gas-fired emergency engines manufactured after January 1, 2009, with ratings over 130 horsepower (hp), Subpart JJJJ limits emissions to the following standards:

- For NO_X, the limit is 2.0 grams per hp-hour or 160 ppm by volume on a dry basis at 15 percent oxygen (O_2);
- For CO, the limit is 4.0 grams per hp-hour or 540 ppm by volume on a dry basis at 15 percent O_2; and
- For VOC, the limit is 1.0 gram per hp-hour or 86 ppm by volume on a dry basis at 15 percent O_2.

Northern will install a natural gas-fired emergency engine at the Hobbs compressor station. Northern will operate the engine in compliance with Subpart JJJJ emission limits for NO_X, CO,

and VOCs and maintain compliance with performance testing, work practices, monitoring, recordkeeping, and reporting requirements.

Subpart KKKKa – Standards of Performance for Stationary Combustion Turbines

NSPS Subpart KKKKa establishes standards of performance for stationary combustion turbines that commenced construction, modification, or reconstruction after December 13, 2024 and have a base load rating equal to or greater than 10 MMBtu/hr. Sources covered by Subpart KKKKa are exempt from the requirements in Subpart KKKK and GG (the previous combustion turbine NSPS) per 40 CFR §60.4305a(b).

Subpart KKKKa applies to the gas turbine to be installed at the Hobbs compressor station as part of the Project. Table 1 of Subpart KKKKa lists the following applicable emission limits.

- For new turbines firing natural gas greater than 50 MMBtu/hr and less than or equal to 850 MMBtu/h, the NO_x emission limit is 25 ppm at 15 percent O_2, or 1.2 pounds per megawatt-hour (lb/MWh).

- For turbines with a peak capacity equal to or less than 30-megawatt output, which are operating at less than 75 percent of peak load or at temperatures less than 0 degrees °F, the NO_x emission limit is 150 ppm at 15 percent O_2, or 8.7 lb/MWh.

- An emission limit for SO_2 of 0.060 lb/MMBtu or maximum total sulfur content of 28 grains of sulfur or less per 100 standard cubic feet (scf) of natural gas.

Northern will operate the turbine at the Hobbs compressor station in compliance with Subpart KKKKa and maintain compliance with the performance testing, work practices, monitoring, recordkeeping, and reporting requirements.

Subpart OOOOa and OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities

The NSPS for the oil and natural gas source category sets standards for both GHGs and VOCs under 40 CFR 60 Subparts OOOOa and OOOOb. These regulations establish emission limits for centrifugal compressors, reciprocating compressors, process controllers, storage vessels, pneumatic pumps, and fugitive emission components at affected facilities. The Hobbs compressor station facility must comply with 40 CFR 60 Subpart OOOOb if construction or modification occurs after December 6, 2022. Northern will comply with applicable Subpart OOOOb requirements for the affected compressor stations. The following section describes the applicable provisions of Subpart OOOOb.

- Northern plans to install zero emission process controllers at the compressor station. Zero emission process controllers are excluded from the affected facility definition per 40 CFR §60.5365b(d). Northern also plans to install process controllers which meet the definition of emergency shutdown device per 40 CFR §60.5430(b). Emergency shutdown devices are excluded from the process controller affected facility definition per 40 CFR §60.5365b(d).

- The proposed installation of new centrifugal compression at the Hobbs compressor station with dry seals requires monitoring and repair of the seals to maintain volumetric flow rate at or below 10 standard cubic feet per minute per compressor seal.

- VOC and methane (CH_4) emissions from condensate storage tanks will not exceed the emission thresholds for control per 40 CFR §60.5365b(e)(1)(i) or 40 CFR §60.5365b(e)(1)(ii). A throughput limit is requested to show compliance with 40 CFR §60.5365b(e)(2)(i).

- The compressor station will be an affected facility for the collection of fugitive emission components per §60.5365b. The compressor station will comply, consistent with applicable requirements with the applicable requirements for the collection of fugitive emission components per §60.5397b(a) through (k) as required; including:

    - Developing a fugitive emissions monitoring plan which includes the elements of paragraphs §60.5397b(c) and (d).

    - Completing an initial monitoring survey in accordance with the requirements of §60.5397b(f) and quarterly using optical gas imaging or Method 21 (determination of VOC emission leaks) of Appendix A-7.

    - If required, perform repairs of fugitive emissions within 30 days of detection and resurvey within 30 days of repair.

9.1.2.7 National Emission Standards for Hazardous Air Pollutants

The National Emission Standards for Hazardous Air Pollutants (NESHAP), codified in 40 CFR Parts 61 and 63, regulate HAP emissions from new and existing sources. Part 61 applies to specific source categories, none of which affect the Project. The 1990 CAA Amendments established a list of 189 HAPs, prompting the promulgation of Part 63, also known as Maximum Achievable Control Technology standards. Part 63 regulates HAP emissions from major sources and certain source categories, while some standards also apply to area sources. NESHAP defines a major source as one that emits 10 tpy or more of any single HAP or 25 tpy or more of total HAPs. The Hobbs compressor station will operate as an area source of HAPs. The following section provides a preliminary analysis of NESHAP requirements applicable to the Project.

Subpart HH – National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities

Subpart HH applies to oil and natural gas production facilities, as defined in 40 CFR §63.760. This regulation does not apply to the Project because the compressor station serves transmission and storage functions and do not meet the regulatory definition of an oil and gas production facility.

Subpart HHH – National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities

Subpart HHH applies to natural gas transmission and storage facilities that are a major source of HAP emissions. This regulation is not applicable to the Project because the compressor station will not operate an affected source, as specified in 40 CFR §63.1270(b), nor will they be a major source of HAPs.

Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

40 CFR Part 63 Subpart ZZZZ establishes national emission and operating limitations for HAPs from stationary reciprocating internal combustion engines at major and area (minor) HAP sources. Subpart ZZZZ also sets requirements for demonstrating initial and continuous compliance.

Subpart ZZZZ applies to the new emergency engine generator at the Hobbs compressor station. Northern will comply with the requirements of Subpart ZZZZ by complying with 40 CFR Part 60, Subpart JJJJ.

Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

40 CFR Part 63 Subpart YYYY is applicable to natural gas-fired combustion turbines at major sources of HAPs. All Project facilities will be minor sources of HAP emissions, and, therefore, are not subject to Subpart YYYY.

Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Area Source Boilers

40 CFR Part 63 Subpart JJJJJJ establishes national emission limitations and operating limitations for HAPs emitted from industrial, commercial, and institutional boilers located at area (minor) sources of HAP emissions. Natural gas-fired boilers are exempt from all requirements of Subpart JJJJJJ, therefore Subpart JJJJJJ will not apply to the Project.

9.1.2.8 New Mexico Permitting Requirements

In New Mexico, air quality permitting is administered by NMED pursuant to the New Mexico Air Quality Control Act and implementing regulations. New or modified sources of regulated air contaminants must obtain a construction permit under 20.2.72 NMAC prior to beginning construction. Applicability is determined based on a facility's PTE, assuming continuous operation (8,760 hours per year). NMED also offers General Construction Permits for certain source categories and streamlined permitting pathways for qualifying minor sources.

Facilities that meet major source thresholds, defined as the PTE 100 tons per year or more of any criteria pollutant, 10 tons per year or more of any single HAP, or 25 tons per year or more of combined HAPs, are subject to Title V Operating Permit requirements under 20.2.70 NMAC. Title V sources must obtain and operate under a federally enforceable operating permit and certify

compliance with permit conditions on an annual basis. Initial Title V Operating Permit applications are generally required within 12 months of commencing operation as a major source.

Additionally, the Hobbs compressor station is subject to the New Mexico Oil and Gas Sector Ozone Precursor Pollutants Rule (20.2.50 NMAC), which establishes emissions control requirements for certain ozone precursor pollutants, including volatile organic compounds (VOCs) and nitrogen oxides (NOx) from oil and gas sector sources located in designated ozone precursor pollutant areas. Compliance with applicable emission standards for combustion equipment will be demonstrated through adherence to established emission limits, including VOC limits expressed on a propane limit, as applicable, and carbon monoxide limits expressed in concentration or mass-based units. Manufacturer-provided product information letters, including emissions data and performance specifications for the selected turbine unit, will be used to support the emissions estimates included in Attachment 9A. The Hobbs compressor station will be designed and operated to meet applicable emission limits under 20.2.50 NMAC.

The Hobbs compressor station will require a state construction permit and operating authorization from the NMED. The state construction permit application for the Hobbs compressor station will be submitted in February 2027 and the anticipated PTE calculations are included as Appendix 9A.

9.1.2.9 Texas Air Permitting Requirements

In Texas, sources that emit regulated air contaminants must obtain appropriate air authorization prior to construction or modification. Authorization options include NSR permits, standard permits, and Permit by Rule (PBR), depending on the type of facility and emission levels. A PBR is a state air authorization for specified activities or facilities that meet criteria and conditions established in 30 TAC Chapter 106 and do not constitute a new major source or major modification; to qualify, total actual emissions authorized under a PBR must not exceed specified thresholds for criteria pollutants (e.g., 250 tpy for CO or NO_x; 25 tpy for VOCs, SO_2, or PM; and lower thresholds for PM_{10}/$PM_{2.5}$) and must meet other general requirements in 30 TAC § 106.4.

Title V of the CAA applies to major sources and certain other facility types and requires those sources to obtain and operate under a federally enforceable operating permit. In Texas, the Title V Federal Operating Permit Program is implemented under 30 TAC Chapter 122, and owners/operators of sites that meet the major source criteria (e.g., 100 tpy of a criteria pollutant or 10 tpy of an individual HAP) must submit an operating permit application to TCEQ and annually certify compliance with all permit conditions.

Removing an existing recycle valve and installing a new recycle valve within the existing Plains compressor station will not require modification of the existing Title V permit.

9.1.3 Anticipated Air Quality Impacts and Mitigation

9.1.3.1 Construction Emissions

Construction of the Project will result in intermittent and temporary emissions of criteria pollutants during the construction period. Construction equipment emissions will depend on the duration, number, and type of vehicles and equipment. Potential emissions include NO_X, CO, VOCs, SO_2,

PM_{10}, $PM_{2.5}$, CO_2e, HAPs, and fugitive dust. The amount of dust generated during construction will be a function of vehicle numbers and types, vehicle speeds, roadway characteristics, and precipitation events. Dust emissions will be greater during dry periods and in areas of fine-textured soils. The Project, as planned, will require no blasting. In addition, Northern will not conduct any open burning.

Fugitive Dust Emissions

In Texas and New Mexico, state air quality programs require reasonable precautions to minimize fugitive dust (i.e., particulate matter) emissions during construction and operation activities. In Texas, the TCEQ requires that owners and operators take appropriate measures to prevent fugitive dust from becoming airborne in amounts that cause or contribute to a violation of applicable air quality standards or create a nuisance condition. Typical control measures include, but are not limited to, watering active construction areas; stabilizing unpaved access roads and material stockpiles; applying dust suppressants or chemical stabilizers; enclosing or covering dusty operations; covering conveyor systems and transfer points; covering haul trucks or requiring load covers; promptly removing accumulated material from paved surfaces; and minimizing vehicle speeds on unpaved areas consistent with TCEQ guidance for controlling fugitive dust.

In New Mexico, the NMED Air Quality Bureau requires that responsible parties implement reasonable precautions to control fugitive dust emissions to prevent particulate matter from becoming airborne to the extent that it causes air quality standard exceedances or nuisance conditions. Reasonable precautions may include use of water or chemical dust suppressants on construction areas, unpaved roads, and material stockpiles; installation and use of containment or control equipment for handling and transfer of dusty materials; covering or stabilizing exposed surfaces; covering open-bodied vehicles transporting loose material; prompt removal of spilled or tracked materials from paved roadways; and controlling vehicle speed on unpaved surfaces. These measures are consistent with New Mexico Regulation 20.2.2.7 NMAC and other applicable fugitive dust control guidance promulgated by NMED.

Construction of the Project will generally take place during daytime hours. This schedule will allow equipment operators to assess the presence of fugitive emissions and dust and to implement abatement measures, as needed. Northern will employ dust control measures, such as watering access roads, storage piles, and disturbed surfaces during construction and restoration. The addition of construction stone to unpaved areas also will mitigate dust emissions. Additional measures that may be employed include imposing vehicle speed restrictions on unpaved areas, using gravel tracking pads at egress points to remove dirt from tires and tracks and restoring disturbed areas following construction per FERC Upland Erosion Control and Revegetation Plan and FERC Wetland and Waterbody Construction and Mitigation Procedures.

Northern will implement the following best management practices (BMP) to control fugitive dust emissions.

- Stabilization of open storage piles and disturbed areas will be managed in accordance with applicable state and local regulations. Water from a municipal source and/or temporary seed and mulch will be the primary methods of dust control.

- Northern will enforce a 15-mile-per-hour speed limit for all vehicles and construction equipment in the Project workspaces.

Construction Engine Emissions

Construction also results in combustion emissions from diesel and gasoline-fueled vehicles used in various construction activities. Combustion-related emissions will include NO_x, CO, VOC, SO_2, PM, and small amounts of HAPs. The EPA requires manufacturers of on- and off-road engines to certify their products to engine emission standards based on the year of manufacture. On-road equipment, such as automobiles and pickup trucks, have had a series of standards imposed since the 1970s.

Large construction equipment, such as a grader or a front-end loader, as well as the generators used for temporary compression testing, are generally powered by diesel engines. For diesel engines, the emission standards have been phased in over the past two decades in four steps, referred to as Tier 1 to Tier 4. The engine must comply with the emission standards in place based on the size of the engine for the year the engine was built and must comply with the appropriate standard throughout its useful life. The engine manufacturers must certify the engine emissions to the EPA. In 2010, the EPA required the sulfur concentration in diesel fuels be lowered from a historical concentration of 500 ppm to 15 ppm (ultra-low-sulfur diesel fuel), which allows diesel engines to meet current Tier 4 emission requirements. Proper maintenance of construction equipment and use of ultra-low-sulfur diesel fuel will minimize engine emissions during Project construction. To reduce emissions from internal combustion engines, idling of construction vehicles will be minimized.

Northern has reviewed the EPA Construction Emission Control Checklist and has adopted the following controls and best practices, including the following for mobile and stationary-source diesel controls.

- For on-highway vehicles, Northern verified that its primary construction contractors have programs in place to replace their on-highway vehicles within 10 years of purchase. The primary contractors do not generally own or maintain vehicles from 2010 or older.

- For non-road vehicles and equipment, Northern's general contractors have indicated most of the construction equipment, excluding specialty equipment (e.g., side booms), operated by the companies are fewer than 10 years old and equipped to comply with Tier 4 exhaust emissions standards.

- The remaining stationary-source vehicles (i.e., locomotives and marine vessels) noted by the EPA are not applicable to the Project.

Regarding the best practices applied through the construction contracting or oversight process, Northern verified with its contractors that many have already adopted the following BMPs.

- Limiting construction equipment idling time to 15 to 30 minutes between usages, dependent on the construction task.

- Maintaining diesel engines per the manufacturer's recommended maintenance schedule and procedures.

Additionally, Northern will encourage contractors to retrofit older-tier or Tier 0 non-road engines with exhaust filtration devices before they enter the construction site. Northern's contractors have indicated most of their equipment is not older-tier or Tier 0 and already meets a higher level of exhaust emissions standards. Given the current alternative energy vehicle technology and the remote locations of the project components, use of hybrid or battery-electric vehicles is not feasible.

The air emissions from the construction activities and engine emissions from the construction equipment for the Project are summarized in Table 9.1.3-1. In this analysis, Northern assumed that the construction equipment engines, on average, would comply with Tier 2 standards. Detailed construction emission calculations, including assumed quantities of equipment type for the Project, are provided as Appendix 9B.

Table 9.1.3-1 Emissions from Construction Equipment

	Emissions (tons)							
	Criteria Pollutants							
Emission Source	**NO_x**	**CO**	**VOC**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**	**Total for All HAPs**
Engine Emissions	12.49	2.41	0.94	0.02	0.61	0.59	5,418.06	0.14
Unpaved Roads	0.00	0.00	0.00	0.00	1.86	0.19	0.00	0.00
On-Road Commuting	0.08	1.29	0.02	0.00	0.02	0.00	236.91	0.00
Earthmoving	0.00	0.00	0.00	0.00	93.15	9.81	0.00	0.00
Venting/Blowdown	0.00	0.00	0.39	0.00	0.00	0.00	1,132.69	0.37
Project Total Emissions	**12.57**	**3.70**	**1.35**	**0.02**	**95.63**	**10.59**	**6,787.67**	**0.14**

Note: No_x = nitrous oxides; CO = carbon monoxide; VOC = volatile organic compound; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less; CO_2e = carbon dioxide equivalent; HAP = Hazardous Air Pollutant.

The Project construction schedule will determine the period of time during which construction-related emissions will occur and also the total quantity of emissions. Construction is scheduled to begin August 2027 and be completed by May 2028.

9.1.3.2 Operational Emissions

This section provides information on emissions and air quality impacts associated with operation of the Project. A summary of equipment at the Hobbs compressor station is provided in Table 9.1.3-2, below. The Hobbs compressor station will receive natural gas via a pipeline from an upstream compressor station, compress it using a natural gas-powered compressor turbine, and transmit via pipeline to a downstream compressor station. The Hobbs compressor station will be covered by Standard Industrial Classification 4922 and is intended to provide reliability and to meet peak demand.

The Project will not be subject to major source permitting requirements; therefore, a PSD ambient air quality analysis is not required.

9.1.3.3 Potential to Emit

Except as indicated below, potential emissions for each source are based on the following emission factors:

- Potential CO_2e emissions, including CO_2, CH_4, and nitrous oxide (N_2O), are based on emission factors and the global warming potentials specified in 40 CFR Part 98.
- Annual SO_2 emissions are based on 0.25 grams of sulfur per 100 scf of natural gas, and maximum hourly emissions are based on 20 grains of sulfur per 100 scf.
- Emissions of formaldehyde and total HAPs are based on the EPA's Compilation of Air Pollutant Emission Factors (AP-42) emission factors.
- All boiler and heater emissions are based on AP-42 emission factors.
- Condensate tank emissions estimates are determined using the AP-42 5th Edition, Chapter 7.1, June 2020.

Hobbs Compressor Station

Hobbs compressor station is a proposed facility located in Lea County, New Mexico, which is classified as in attainment or unclassified for all criteria pollutants. Northern is proposing to install one natural gas-powered unit at approximately 7,700 ISO-rated hp and one natural gas-fired emergency generator at the facility. Venting emissions include facility blowdowns. Potential emissions from the proposed emergency engine are expected to meet the applicable NSPS standards.

Potential emissions from the Hobbs compressor station are summarized in Table 9.1.3-2. Operational emission calculations are provided as Appendix 9C provide additional detail including emissions basis.

Table 9.1.3-2 Hobbs Compressor Station Operating Emissions

Emission Unit	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10}/ $PM_{2.5}$ (tpy)	SO_2 (tpy)	Total HAPs (tpy)
Solar Taurus 60 Turbine	16.03	6.48	5.61	1.53	0.79	0.12
Fuel Gas Heater	0.20	0.16	0.01	0.01	0.01	<0.01
Fugitive Leaks	-	-	6.22	-	-	0.03
Startup, Shutdown, Maintenance	-	-	10.00	-	-	-
Malfunctions	-	-	10.00	-	-	-
Condensate Tank	-	-	0.07	-	-	<0.01
Generator	0.21	0.25	0.33	0.01	0.01	0.04
Condensate Loadout	-	-	<0.01	-	-	<0.01
TOTAL	**16.44**	**6.89**	**32.24**	**1.55**	**0.81**	**0.19**
Title V Threshold	100	100	100	100	100	25
PSD Major Source Threshold [1]	250	250	250	250	250	N/A

[1] Excludes fugitive emissions (equipment leaks) as compressor stations are not one of the 28 listed source categories.

Table 9.1.3-2 Hobbs Compressor Station Operating Emissions

Emission Unit	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10}/ $PM_{2.5}$ (tpy)	SO_2 (tpy)	Total HAPs (tpy)

Note: Short tons (2,000 pounds), not long or metric tons, are used in PSD applicability calculations. Metric tons are used in the greenhouse gas (GHG) reporting rule.
NO_x = nitrogen oxides; CO = carbon monoxide; VOC= volatile organic compound; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less; SO_2 = sulfur dioxide; CO_2e = carbon dioxide equivalent; HAP = hazardous air pollutant; tpy = tons per year; PSD = prevention of significant deterioration; N/A= not applicable.

Pipeline Fugitive and Vented Emissions

Additional sources of operational emissions for the Project include fugitives associated with aboveground components and vented emissions (blowdowns) from pigging operations along the pipeline.

Table 9.1.3-3 provides estimated annual operational emissions for the proposed pipeline operations. Detailed operational emission calculations are included as Appendix 9C. Fugitive and vented emissions from pipeline operation will be insignificant and therefore exempt from NSR permitting procedures.

Table 9.1.3-3 Project Operational Emissions from Pipeline Fugitives and Venting

Project Component	VOC (tpy)	HAPs (tpy)	CH_4 (tpy)	CO_2 (tpy)	CO_2e (tpy)	CO_2e (metric tpy)
Pipeline Facility Fugitives [1]	3.92E-05	9.59E-07	0.00	0.00	0.11	0.10
Aboveground Facility Fugitives [2]	1.09E-01	2.67E-03	11.36	0.02	318.01	288.50
Hobbs Compressor Station Venting	2.12E-02	5.19E-04	2.21	0.01	61.84	56.10

[1] Includes Segments 1 and 2. The data is based on the emission factor of protected steel in Table W-3A to Subpart W of Part 98 – Default Total Hydrocarbon Leaker Emission Factors for Onshore Natural Gas Transmission Compression.

[2] Project components include the Hobbs compressor station, Transwestern - Lea County interconnect, Hobbs-Plains bi-directional receiver, Plains recycle valve, and Gaines County Generating Station

Note: VOC = volatile organic compound; HAP = hazardous air pollutant; CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; tpy = tons per year.

9.1.4 Air Quality Mitigation Measures

Fugitive dust emissions during construction will be mitigated, as necessary, by following the work practices listed below.

- Cover or treat surfaces disturbed by construction activities with a dust suppressant until completion of activities at each site of disturbance.
- Stabilize on-site unpaved roads and off-site unpaved access roads (e.g., using water or chemical stabilizer/suppressant).
- Restrict on-road vehicle speeds on unpaved roadways to 15 miles per hour.
- Add construction stone to unpaved areas or pave workspaces. Use gravel tracking pads at egress points to remove dirt from tires and tracks.
- Restore disturbed areas following construction.

- Sweep paved roads.

Through the implementation of the work practices described above and the short duration of the construction activities, the temporary emissions during construction of the Project will be minimal and the impact of these emissions will be localized.

In addition, construction equipment will be properly tuned and operated only on an as-needed basis to minimize the combustion emissions from diesel and gasoline engines. Therefore, it is anticipated that these emissions will not have a significant impact on air quality.

9.2 NOISE

This section describes the potential noise effects associated with the Project. Construction activities related to the Project are expected to have a noise impact on the ambient environment. The preconstruction noise surveys and the results of the acoustical analysis are summarized below.

9.2.1 Applicable Noise Guidelines

Sound is caused by vibrations that generate waves of pressure fluctuations in the surrounding medium. Sound levels are typically measured using a logarithmic decibel (dB) scale because pressure fluctuations caused by sound sources can vary by several orders of magnitude. The logarithmic dB scale facilitates the comparison of different sound levels. Unwanted sound or sound that causes disturbance or annoyance is often called noise. The terms sound and noise are used interchangeably in this report.

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 (dBA) is the most widely used for this purpose.

The equivalent continuous sound level (L_{eq}) is the steady sound energy level recorded and averaged over a specific period of interest such as hourly, daytime, nighttime, or a 24-hour period. FERC defines daytime hours as the hours between 7 a.m. and 10 p.m. and nighttime hours as the hours between 10 p.m. and 7 a.m.

FERC regulations also refer to the day-night sound level (L_{dn}) to evaluate the noise impact of operation and construction activities on a nearby noise sensitive area (NSA). The L_{dn} is the L_{eq} plus 10 dB added to nighttime levels to account for greater human sensitivity to noise during nighttime hours.

The L_{dn} is calculated according to the following formula:

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

FERC regulations at 18 CFR § 380.12(k)(2) require that any applicable state or local noise regulations be identified. Regulations further require, at 18 CFR § 380.12 (k)(4)(v), that an

operator specify how the Project will meet the regulations. In the absence of any applicable state or local noise regulation, FERC requires that 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 an L_{dn} of 55 dBA at any pre-existing NSA.

FERC guidance states that construction activities that could or may occur during nighttime hours should be performed with the goal that the activity contributes noise levels at or below 55 dBA L_{dn} and 48.6 L_{eq} over 24 hours, or no more than 10 dBA over background if ambient noise levels are above 55 dBA L_{dn}. The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise.

No applicable noise regulations were identified for the states of New Mexico or Texas. Additionally, no applicable local noise regulations were found for Gaines or Yoakum counties, Texas, or Lea County, New Mexico.

9.2.2 Existing NSAs

In accordance with 18 CFR 38.12(k), FERC requires applicants to identify and assess operational impacts for all NSAs located within 1 mile of a compressor station, meter station, or similar facility. For 24-hour construction-related noise, such as HDD, FERC guidance establishes a 0.5-mile evaluation radius for identifying NSAs that could experience noise increases. Using a combination of desktop review, aerial imagery, and field verification, NSAs were identified and are summarized in Section 9.2.2.

Hobbs Compressor Station

The two NSAs within 1 mile of the Hobbs compressor station were identified using aerial imagery and confirmed on-site, as shown in the Ambient Sound Survey and Acoustic Analysis reports provided as Appendix 9D. Table 9.2.2-1 lists the nearby NSAs and their approximate distance and direction relative to Hobbs compressor station. All distances refer to the new compressor building, as that will be the acoustic center of the station.

Table 9.2.2-1 Nearby Noise Sensitive Areas for Hobbs Compressor Station

Noise Sensitive Area	Description	Distance (feet)	Direction from Hobbs Compressor Station
1	Residence	3,142	South-Southeast
2	Residence	4,078	South-Southeast

HDD P4-1 - US Highway 62

There were two NSAs identified within 0.5 mile of the HDD P4-1 crossing of US Highway 62 located in Lea County, NM. NSAs were identified using a desktop review and confirmed during the ambient noise survey. These NSA locations are described in Table 9.2.2-2.

Table 9.2.2-2 Nearby Noise Sensitive Areas for HDD P4-1

Noise Sensitive Area	Description	Distance and Direction from HDD Entry (feet)	Distance and Direction from HDD Exit (feet)
1	Residence	1,663 East	1,957 Northeast

Table 9.2.2-2 Nearby Noise Sensitive Areas for HDD P4-1			
Noise Sensitive Area	**Description**	**Distance and Direction from HDD Entry (feet)**	**Distance and Direction from HDD Exit (feet)**
2	Residence	2,035 Southeast	1,670 East

HDD P4-2 – State Highway 8

There were no NSAs identified within 0.5 mile of the HDD P4-2 crossing of State Highway 8 located in Lea County, NM. NSAs were identified using a desktop review and confirmed during the ambient noise survey.

HDD P4-3 – Texas and New Mexico Railway

There are 12 NSAs associated with the HDD P4-3 crossing of the Texas and New Mexico Railway located in Lea County, NM. NSAs were identified using a desktop review and confirmed during the ambient noise survey. These NSA locations are described in Table 9.2.2-3.

Table 9.2.2-3 Nearby Noise Sensitive Areas for HDD P4-3			
Noise Sensitive Area	**Description**	**Distance and Direction from HDD Entry (feet)**	**Distance and Direction from HDD Exit (feet)**
3	Residence	1600 South	2435 Southeast
4	Residence	1568 South-Southeast	2,611 Southeast
5	Residence	1,672 South-Southeast	2,810 Southeast
6	Residence	1,762 Southeast	2,956 Southeast
7	Residence	2,988 Southeast	3,254 Southeast
8	Residence	1,881 South-Southeast	3,036 Southeast
9	Residence	2,208 Southeast	3,424 Southeast
10	Residence	2,089 Southeast	3,267 Southeast
11	Residence	2,201 Southeast	3,348 Southeast
12	Residence	2,394 Southeast	3,501 Southeast
13	Residence	2,187 South-Southeast	3,231 Southeast
14	Residence	2,013 South-Southeast	3,109 Southeast

HDD P4-4 – State Highway 18

There are 13 NSAs associated with the HDD P4-4 crossing of S Eunice Highway located in Lea County, NM. NSAs were identified using a desktop review and confirmed during the ambient noise survey. These NSA locations are described in Table 9.2.2-4.

Table 9.2.2-4 Nearby Noise Sensitive Areas for HDD P4-4			
Noise Sensitive Area	**Description**	**Distance and Direction from HDD Entry (feet)**	**Distance and Direction from HDD Exit (feet)**
7	Residence	3,725 West-Southwest	2,303 West-Southwest
15	Residence	2,883 West-Southwest	1,753 Southwest
16	Residence	2,606 West-Southwest	1,579 Southwest
17	Residence	2,257 West-Southwest	1,380 Southwest
18	Residence	3,022 Southwest	2,078 Southwest
19	Residence	3,203 Southwest	2,201 Southwest
20	Residence	2,917 Southwest	2021 Southwest
21	Residence	3,275 Southwest	2,315 Southwest
22	Residence	3,034 Southwest	2,212 Southwest

Table 9.2.2-4 Nearby Noise Sensitive Areas for HDD P4-4

Noise Sensitive Area	Description	Distance and Direction from HDD Entry (feet)	Distance and Direction from HDD Exit (feet)
23	Residence	3,375 Southwest	2,523 Southwest
24	Residence	3,104 Southwest	2,353 Southwest
25	Residence	1,719 Southwest	1,629 Southeast
26	Residence	1,957 Northeast	3,207 East-Northeast

There are additional NSAs within 0.5 mile of the South Eunice Highway Crossing HDD entry and exit sites that are not summarized in the table above. These additional NSAs are farther from the HDD. As such, estimating sound attributable to the Project at the closer NSAs identified in Table 9.2.2-4 ensures that HDD activities will not exceed the applicable noise guidelines at any other NSA.

9.2.3 Existing Noise Levels

Hobbs Compressor Station

Sound level measurements were conducted at locations selected to characterize the existing ambient sound levels near each of the NSAs in the vicinity of Hobbs compressor station. Ambient sound measurements were conducted from March 23 through March 25, 2026. The NSAs and measurement locations are shown in the Ambient Sound Survey and Acoustic Analysis reports provided as Appendix 9D.

The measurements were taken using a TSI Quest SP-DL-2 level meter that meets the requirements of the American National Standards Institute requirements for Type 1 instruments. All instruments have current laboratory certification. The sound level meters were calibrated before and after each measurement period using a precision acoustic calibrator. Measurements were conducted with the microphone positioned approximately 5 feet above ground level. The primary driver for ambient noise was vehicle traffic from nearby roadways.

The preconstruction sound level measurement results are presented in Table 9.2.3-1, with the ambient L_d, L_n, and the resulting L_{dn} summarized for the measurement location. The NSAs and measurement locations associated with the Hobbs compressor station is presented in the Ambient Sound Survey and Acoustic Analysis reports provided as Appendix 9D.

Table 9.2.3-1 Measured Ambient Sound Levels for Hobbs Compressor Station

Measurement Location	Corresponding Noise Sensitive Areas	Existing Ambient L_d	Existing Ambient L_n	Average L_{dn}
A	1,2	74.3	73.3	79.8

Note: L_d = daytime equivalent sound level; L_n = nighttime equivalent sound level; L_{dn} = day-night sound level.

HDD P4-1

Sound level measurements were conducted to characterize the existing ambient sound levels near the planned HDD in Lea County. Ambient measures were conducted from March 23 through March 25, 2026. The NSAs and measurement locations associated with HDD P4-1 is shown in the Ambient Sound Survey and Acoustic Analysis reports provided as Appendix 9D.

The measurements were taken using a TSI Quest SP-DL-2 level meter that meets the requirements of the American National Standards Institute requirements for Type 1 instruments. All instruments have current laboratory certification. The sound level meters were calibrated before and after each measurement period using a precision acoustic calibrator. Measurements were conducted with the microphone positioned approximately 5 feet above ground level. The primary driver for ambient noise was vehicle traffic from nearby roadways.

The preconstruction ambient sound level measurement results are presented in Table 9.2.3-2, with the ambient L_d, L_n, and the resulting L_{dn} summarized for each measurement location.

Table 9.2.3-2 Measured Ambient Sound Levels for HDD P4-1

Measurement Location	Corresponding Noise Sensitive Areas	Existing Ambient L_d	Existing Ambient L_n	Average L_{dn}
A	1,2	74.3	73.3	79.8

Note: L_d = daytime equivalent sound level; L_n = nighttime equivalent sound level; L_{dn} = day-night sound level.

HDD P4-3

Sound level measurements were conducted to characterize the existing ambient sound levels near the planned HDD in Lea County. Ambient measures were conducted from March 23 through March 25, 2026. The NSAs and measurement locations associated with HDD P4-3 are shown in the Ambient Sound Survey and Acoustic Analysis report provided as Appendix 9D.

The measurements were taken using a TSI Quest SP-DL-2 level meter that meets the requirements of the American National Standards Institute requirements for Type 1 instruments. All instruments have current laboratory certification. The sound level meters were calibrated before and after each measurement period using a precision acoustic calibrator. Measurements were conducted with the microphone positioned approximately 5 feet above ground level. The primary driver for ambient noise was vehicle traffic from nearby roadways.

The preconstruction ambient sound level measurement results are presented in Table 9.2.3-3, with the ambient L_d, L_n, and the resulting L_{dn} summarized for each measurement location.

Table 9.2.3-3 Measured Ambient Sound Levels for HDD P4-3

Measurement Location	Corresponding Noise Sensitive Areas	Existing Ambient L_d	Existing Ambient L_n	Average L_{dn}
B	3-14	67.5	62.3	69.9

Note: L_d = daytime equivalent sound level; L_n = nighttime equivalent sound level; L_{dn} = day-night sound level.

HDD P4-4

Sound level measurements were conducted to characterize the existing ambient sound levels near the planned HDD in Lea County. Ambient measures were conducted from March 23 through March 25, 2026. The NSAs and measurement locations associated with HDD P4-4 is shown in the Ambient Sound Survey and Acoustic Analysis reports provided as Appendix 9D.

The measurements were taken using a TSI Quest SP-DL-2 level meter that meets the requirements of the American National Standards Institute requirements for Type 1 instruments. All instruments have current laboratory certification. The sound level meters were calibrated before and after each measurement period using a precision acoustic calibrator. Measurements were conducted with the microphone positioned approximately 5 feet above ground level. The primary driver for ambient noise was vehicle traffic from nearby roadways.

The preconstruction ambient sound level measurement results are presented in Table 9.2.3-4, with the ambient L_d, L_n, and the resulting L_{dn} summarized for each measurement location.

Table 9.2.3-4 Measured Ambient Sound Levels for HDD P4-4

Measurement Location	Corresponding Noise Sensitive Areas	Existing Ambient L_d	Existing Ambient L_n	Average L_{dn}
C	15-25	64.4	59.9	67.3
D	26, 27	69.8	69.6	76.1

Note: L_d = daytime equivalent sound level; L_n = nighttime equivalent sound level; L_{dn} = day-night sound level.

9.2.4 Construction Noise Impacts

Noise-generating activities associated with construction activities are expected to be short-term at any given location and will vary depending on the phase of construction in progress at any one time (see Resource Report 1). For typical pipeline construction, the highest level of construction noise is assumed to occur during earthwork and HDD activities. During construction, limited venting or blowdown activities may occur. These events are intermittent and short in duration, typically lasting only a few minutes. Because these events are temporary and occur infrequently at any given location, they are not included in the quantitative construction noise analysis.

Typical construction activities will be performed with standard heavy equipment such as track-excavators, trackhoes, bulldozers, dump trucks, welding trucks, and pick-up trucks. Construction equipment noise levels will typically be less than 85 dBA at 50 feet when equipment is operating at full load. People at nearby residences and buildings will hear the construction noise, but the overall impact will be short term. Construction noise will be mitigated by the attenuating effect of distance and the intermittent and short-lived character of the noise. Additionally, construction will be limited to daytime hours unless nighttime construction (e.g., extended workdays) is required to maintain the Project schedule or ensure that an HDD is properly completed once the pullback of the HDD has started.

Northern will use the HDD method to install the pipeline at four locations. These HDD locations contain NSAs within 0.5 mile of the entry and exit points. The primary noise generating equipment at the HDD entry sites will be the:

- drilling rig, which includes power unit, mud pump, and drilling mechanism on the rig skid;
- mud mixing/cleaning system and associated engine-driven generator;
- small cranes, trackhoe, front loader, and/or sideboom;
- welding machine(s); and
- engine-driven light plants (if needed for nighttime operation).

The primary noise generating equipment that may be present at the HDD exit sites are:

- trackhoe, sideboom, and/or trucks;
- engine-driven generator;
- small engine-driven pump; and
- engine-driven plant lights (for nighttime operation).

HDD operations, including drilling and pullback, will typically occur during daytime hours, but may extend into nighttime hours to ensure the success of the drill (e.g., during critical times such as pipe pullback). The noise generated by the HDD equipment was analyzed to estimate the 24-hour noise impact at the nearest NSAs. Tables 9.2.4-1, 9.2.4-2, and 9.2.4-3 summarize the estimated sound level increases at each of the nearest NSAs located within 0.5 mile for the drill entry/exit points. For each HDD, NSAs identified within 0.5 mile of the activity are included in the Ambient Sound Survey and Acoustic Analysis reports provided as Appendix 9D.

Table 9.2.4-1 Estimated Noise Levels for NSAs within 0.5 Mile of HDD P4-1

Noise Sensitive Area	Measured Ambient (L_{dn} dBA)	Calculated Sound Attributable to Drilling (dBA)	Calculated Total Sound Level + Ambient (L_{dn} dBA)	Calculated Increase Over Existing Sound Level (dBA)
1	79.8	50.1	79.8	0.0
2	79.8	49.8	79.8	0.0

Note: HDD = horizontal directional drilling; Ldn = day-night sound level; dBA = A-weighted decibel.

Table 9.2.4-2 Estimated Noise Levels for NSAs within 0.5 Mile of HDD P4-3

Noise Sensitive Area	Measured Ambient (L_{dn} dBA)	Calculated Sound Attributable to Drilling (dBA)	Calculated Total Sound Level + Ambient (L_{dn} dBA)	Calculated Increase Over Existing Sound Level (dBA)
3	69.9	49.8	69.9	0.0
4	69.9	50.0	69.9	0.0
5	69.9	49.7	69.9	0.0
6	69.9	49.6	69.9	0.0
7	69.9	48.6	69.9	0.0
8	69.9	48.9	69.9	0.0
9	69.9	47.7	69.9	0.0
10	69.9	48.1	69.9	0.0
11	69.9	47.6	69.9	0.0
12	69.9	46.6	69.9	0.0
13	69.9	47.2	69.9	0.0
14	69.9	48.1	69.9	0.0

Note: HDD = horizontal directional drilling; Ldn = day-night sound level; dBA = A-weighted decibel.

Table 9.2.4-3 Estimated Noise Levels for NSAs within 0.5 Mile of HDD P4-4

Noise Sensitive Area	Measured Ambient (L_{dn} dBA)	Calculated Sound Attributable to Drilling (dBA)	Calculated Total Sound Level + Ambient (L_{dn} dBA)	Calculated Increase Over Existing Sound Level (dBA)
7	69.9	44.4	69.9	0.0
15	67.3	46.7	67.3	0.0

Table 9.2.4-3 Estimated Noise Levels for NSAs within 0.5 Mile of HDD P4-4

Noise Sensitive Area	Measured Ambient (L_{dn} dBA)	Calculated Sound Attributable to Drilling (dBA)	Calculated Total Sound Level + Ambient (L_{dn} dBA)	Calculated Increase Over Existing Sound Level (dBA)
16	67.3	47.6	67.3	0.0
17	67.3	48.8	67.4	0.1
18	67.3	45.8	67.3	0.0
19	67.3	45.1	67.3	0.0
20	67.3	46.1	67.3	0.0
21	67.3	44.9	67.3	0.0
22	67.3	45.5	67.3	0.0
23	67.3	45.2	67.3	0.0
24	67.3	48.2	67.4	0.1
25	76.1	50.6	76.1	0.0
26	76.1	49.7	76.1	0.0
27	76.1	48.9	76.1	0.0

Note: HDD = horizontal directional drilling; Ldn = day-night sound level; dBA = A-weighted decibel.

As noted in Tables 9.2.4-1, 9.2.4-2, and 9.2.4-3, the sound attributable to the operation of the HDD equipment is below 55 dBA. The ambient noise at all locations is greater than 55dBA and the increase above ambient from the HDD is less than 10 dBA above ambient. As such, no sound mitigation measures are required. Because of the temporary nature of construction noise, no adverse or long-term effects are anticipated. Northern will take steps to minimize engine idling, ensuring that sound muffling devices that are provided as standard equipment by the construction equipment manufacturer are kept in good working order, and reduce other non-essential noise impacts. Northern will inform nearby residents of the Project and the upcoming construction activities and will respond to and investigate concerns.

9.2.5 Operational Noise Impacts

In addition to normal operation noise sources, the Project may include intermittent blowdown and venting events. These events involve the controlled release of high-pressure natural gas and can generate elevated, broadband noise levels for a short duration. Because these events are not a part of routine operational conditions, they are not expected to result in sustained increases in ambient noise levels or exceed the FERC limit of 55 dBA L_{dn} at the identified NSAs.

Hobbs Compressor Station

One 7,700 ISO-rated hp Solar Taurus 60 compressor unit will be installed at Hobbs compressor station. In order to determine operational noise due to the construction of Hobbs compressor station, a three-dimensional noise model was developed to analyze the contributions expected from the proposed future station equipment. The model was developed using SoundPLAN version 9.1, a commercial modeling package developed by SoundPLAN GmbH. The software considers spreading losses, ground and atmospheric effects, shielding from barriers and buildings, reflections from surfaces, and other sound propagation properties. Local topography was imported into the three-dimensional model from U.S. Geological Survey topographic maps. The SoundPLAN software is based on published engineering standards.

The future station equipment was modeled using the latest provided equipment list and plot plans. Manufacturer's specifications were used to determine sound power levels for the proposed equipment.

Table 9.2.5-1 summarizes the estimated change in total noise levels due to the Project at each identified NSA.

Table 9.2.5-1 Estimated Total Sound Levels at NSAs – Hobbs Compressor Station Prior to and Post-Modification, Unmitigated

Noise Sensitive Area	Total Measured Ambient Sound Level Prior to Modification (dBA)	Total Modeled Sound Level Post Construction (dBA L_{dn}), Unmitigated	Calculated Total Sound Level + Ambient (L_{dn} dBA)	Estimated change due to the Project (dB)
1	79.8	47.5	79.8	0.0
2	79.8	45.1	79.8	0.0

Note: NSA = Noise Sensitive Area; Ldn = day-night sound level; dBA = A-weighted decibel; dB = decibel.

With the proposed noise mitigation measures discussed in Appendix 9D, the noise contribution from the new compressor station is predicted to comply with all FERC noise criteria at the identified NSAs.

9.2.6 Construction Noise Mitigation Measures

Construction

Construction will occur primarily during daytime hours, which will mitigate the perceived noise impacts on nearby NSAs. Northern will take steps to minimize engine idling and other non-essential noise generating activities. Northern will equip combustion engine-driven machinery with mufflers. Northern will inform nearby residents of the Project and the upcoming construction activities and will respond to and investigate concerns. Construction noise, while varying according to equipment in use, will be mitigated by the attenuating effect of distance and the intermittent and short-lived character of the noise.

As shown in Tables 9.2.4-1, 9.2.4-2, and 9.2.4-3, the sound level attributable to HDD operations at all NSAs is below 55 dBA L_{dn}. As such, the predicted noise increase due to the HDD construction operations is expected to meet the FERC noise guideline for all HDD activities.

9.2.7 Operation Noise Mitigation Measures

Hobbs Compressor Station

Operational noise at the Hobbs compressor station will be mitigated by the design of the Project, which includes insulating the compressor building and providing silencers on the turbine inlet and exhaust. Access doors will be insulated and self-closing. If deemed necessary, acoustical pipe insulation may be used on above-grade, outdoor gas piping.

Since Project noise sources that could cause perceptible vibration, such as turbine exhaust noise, will be adequately mitigated and located more than 3,000 feet from the nearest NSA to the Hobbs

compressor station, there will not be any perceptible increase in vibration during operation of the Project.

9.3 REFERENCES

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APPENDIX 9A

Potential to Emit Calculations

Northern Natural Gas

Northern Natural Gas Company - Hobbs Station

Emission Summary

Uncontrolled Emissions																	
Unit	Description	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		H_2S		Total HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TUR-1	Solar Taurus 60-7800S Turbine	3.66	16.03	1.48	6.48	1.28	5.61	0.18	0.79	0.35	1.53	0.35	1.53	-	-	0.026	0.12
HTR-1	Fuel Gas Heater	0.045	0.20	0.038	0.16	2.46E-03	0.011	2.61E-03	0.011	3.40E-03	0.015	3.40E-03	1.47E-04	-	-	8.41E-04	3.68E-03
FUG-1	Fugitives	-	-	-	-	1.42	6.22	-	-	-	-	-	-	-	-	6.71E-03	0.029
SSM	Startup, Shutdown, Maintenance	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-
M	Malfunctions	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-
Total Emissions:		**3.70**	**16.23**	**1.52**	**6.65**	**2.70**	**31.84**	**0.18**	**0.80**	**0.35**	**1.54**	**0.35**	**1.53**	**-**	**-**	**0.034**	**0.15**

Controlled Emissions																	
Unit	Description	NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		H_2S		Total HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TUR-1	Solar Taurus 60-7800S Turbine	3.66	16.03	1.48	6.48	1.28	5.61	0.18	0.79	0.35	1.53	0.35	1.53	-	-	0.026	0.12
HTR-1	Fuel Gas Heater	0.045	0.20	0.038	0.16	2.46E-03	0.011	2.61E-03	0.011	3.40E-03	0.015	3.40E-03	0.015	-	-	8.41E-04	3.68E-03
FUG-1	Fugitives	-	-	-	-	1.42	6.22	-	-	-	-	-	-	-	-	6.71E-03	0.029
SSM	Startup, Shutdown, Maintenance	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-
M	Malfunctions	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-
Total Emissions:		**3.70**	**16.23**	**1.52**	**6.65**	**2.70**	**31.84**	**0.18**	**0.80**	**0.35**	**1.54**	**0.35**	**1.54**	**-**	**-**	**0.034**	**0.15**
Total Emissions w/o Fugitives:		**3.70**	**16.23**	**1.52**	**6.65**	**1.28**	**25.62**	**0.18**	**0.80**	**0.35**	**1.54**	**0.35**	**1.54**	**-**	**-**	**0.027**	**0.12**

Northern Natural Gas

Northern Natural Gas Company - Hobbs Station

HAP Emission Summary

Controlled HAP Emissions																	
Unit	**Description**	**Formaldehyde**		**Acetaldehyde**		**Acrolein**		**Benzene**		**Toluene**		**Ethylbenzene**		**Xylenes**		**n-Hexane**	
		lb/hr	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
TUR-1	Solar Taurus 60-7800S Turbine	0.012	0.051	2.07E-03	9.05E-03	3.31E-04	1.45E-03	6.20E-04	2.72E-03	6.72E-03	0.029	1.65E-03	7.24E-03	3.31E-03	0.014	-	-
HTR-1	Fuel Gas Heater	3.35E-05	1.47E-04	-	-	-	-	9.39E-07	4.11E-06	1.52E-06	6.66E-06	-	-	-	-	8.05E-04	3.52E-03
FUG-1	Fugitives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.71E-03	0.029
SSM	Startup, Shutdown, Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	Malfunctions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Emissions:	**0.012**	**0.052**	**2.07E-03**	**9.05E-03**	**3.31E-04**	**1.45E-03**	**6.21E-04**	**2.72E-03**	**6.72E-03**	**0.029**	**1.65E-03**	**7.24E-03**	**3.31E-03**	**0.014**	**7.51E-03**	**0.033**

Northern Natural Gas Company - Hobbs Station

Inputs

Site-Wide		
Description	**Value**	**Unit**
Gas Throughput	452	MMscf/day
Annual Operating Hours	8,760	hr
Daily Operating Hours	24	hr
Site Elevation	3,719	ft MSL

Fuel Gas			
	Value	**Unit**	**Notes**
Fuel Heat Value	996.78	Btu/scf	Gas Analysis
Fuel Sulfur Content	2.0	gr S / 100 sc	Engineering Estimate

Turbine Input Information			
	Value	**Unit**	**Notes**
Units:	TUR-1		
Description:	Solar Taurus 60-7800S Natural Gas Turbine		
Rating:	7685	hp	Manufacturer Spec Sheet @ Max Rating
Fuel Usage:	7965	Btu/hp-hr	Manufacturer Spec Sheet @ Max Rating

Generator Input Information			
	Value	**Unit**	**Notes**
Units:	GEN-1		
Description:	Caterpillar CG18 Natural Gas Generator		
Rating:	760	hp	Manufacturer Spec Sheet @ Max Rating
Fuel Usage:	6928	Btu/hp-hr	Manufacturer Spec Sheet @ Max Rating

Gunbarrel Tanks			
	Value	**Unit**	**Notes**
Unit:	TK-1		
Description:	8820 Gallon Pipeline Liquids Tank		
Number of Tanks	1		Client Specification
Volume	210	bbl	
Height (Shell)	15	ft	
Diameter	10	ft	
Hourly Throughput	6.65	bbl/hr	
Annual Throughput	58,263.59	bbl/yr	

Northern Natural Gas Company - Hobbs Station

Solar Taurus 60-7800S 6534 hp Turbine

Emission Unit:	TUR-1
Source Description:	Solar Taurus 60-7800S Natural Gas Turbine
Manufacturer:	Solar Turbines
Model:	Taurus 60-7800S
Type:	Natural Gas

Fuel Consumption @ Worst Case Hourly 59 °F

Net Output Power	5,731	kW	Manufacturer Rating
Fuel Heat Value[1]	996.78	Btu/scf	Fuel Gas Analysis HHV
Fuel Rate	884.18	scfm	Calculated
Heat Input	52.88	MMBtu/hr	Manufacturer Specs
Hourly Fuel Rate	53.05	Mscf/hr	
Annual Fuel Rate	464.73	MMScf/yr	
Hours of Operation	8,760	hrs/yr	

Uncontrolled Emissions

	NO_x[2,3]	CO[2,3]	VOC[2,3,4]	SO_2[5]	PM[6]	rmaldehyd	Total HAPs	Units	Notes
Molecular Weight						30.03		lb/lbmol	
Emission Factors	15.00	10.00	3.00					ppm	Manufacturer expected emission performance, PIL 168
						0.091		ppm	Solar PIL 168 Revision 11
	0.000	0.000	0.000			2.22E-04		lb/MMBtu	Calculated value[3]
				3.40E-03	6.60E-03			lb/MMBtu	AP-42 Table 3.1-2a
Emissions	**3.66**	**1.48**	**1.28**	**0.18**	**0.35**	**0.012**	**0.026**	lb/hr	
	16.03	**6.48**	**5.61**	**0.79**	**1.53**	**0.051**	**0.12**	tpy	

Controlled Emissions

	NO_x[3]	CO[3]	VOC[2,3,4]	SO_2[5]	PM[6]	rmaldehyd	Total HAPs	Units	Notes
Molecular Weight						30.03		lb/lbmol	
Emission Factors	15.0	10.0	3.00					ppm	Manufacturer expected emission performance, PIL 168
						0.091		ppm	Solar PIL 168 Revision 11
	0.00E+00	0.00E+00	0.00E+00			2.22E-04		lb/MMBtu	Calculated value[3]
	0%	0%	0%			0%		%	% Reduction
				3.40E-03	6.60E-03			lb/MMBtu	AP-42 Table 3.1-2a
Emissions	**3.66**	**1.48**	**1.28**	**0.18**	**0.35**	**0.012**	**0.026**	lb/hr	
	16.03	**6.48**	**5.61**	**0.79**	**1.53**	**0.051**	**0.12**	tpy	

Speciated HAP Emission Calculations

	Acetaldehyde[8]	Acrolein[8]	Benzene[8]	thylbenzen	Xylenes[8]	Toluene[8]	Units	Notes
Emission Factors	4.00E-05	6.40E-06	1.20E-05	3.20E-05	6.40E-05	1.30E-04	lb/MMBtu	AP-42 Table 3.1-3
	3.91E-05	6.25E-06	1.17E-05	3.13E-05	6.25E-05	1.27E-04	lb/MMBtu	Adjusted based on fuel heat value
Emissions	**2.07E-03**	**3.31E-04**	**6.20E-04**	**1.65E-03**	**3.31E-03**	**6.72E-03**	lb/hr	
	9.05E-03	**1.45E-03**	**2.72E-03**	**7.24E-03**	**0.014**	**0.029**	tpy	

NOTES

[1] This value is based on the average HHV Btu/scf of the inlet gas calculated using ProMax.

[2] Inlet NO_x and CO emission factors are taken from the manufacturer expected performance report (April 28, 2026).

[3] Emission factors (lb/MMBtu) = ppmv / 10^6 / molar volume * MW (HCHO) * F_d Factor * 20.9 / (20.9 - $\%O_2$)
Molar Volume (dscf/lb-mol) = 379.5
MW (lb/lb-mol) = 46.01 NO_x & 28.01 CO & 44.10 VOC & 30.031 HCHO
F_d (dscf/MMBtu) = 8710 (40 CFR 60 Appendix A Method 19 Table 19-2)
%O2 (Dry) = 15 %

[4] The manufacturer specification sheet contains emissions for UHCs (unburned hydrocarbons) which includes Methane and Ethane. VOC (volatile organic carbon) emissions are based on 20% of the UHC for natural gas fired turbines according to PIL 168, Rev 11, from November

[5] SO_2 emissions are based on AP-42 Table 3.1-2a

[6] Assumes PM (Filterable + Condensable) = PM_{10} = $PM_{2.5}$

[7] Formaldehyde is calculated using the emission factor of 91 ppb @15% O2 provided by Solar Turbines Incorporated within PIL 168 Revision 11.

[8] AP-42 Table 3.1-3 & adjusted for 996.78 Btu/scf

Northern Natural Gas Company - Hobbs Station

0.456 MMBtu/Hr Fuel Gas Heater

Unit:	HTR-1	
Heat Input:	0.456	MMBTU/hr
Fuel Heat Value:	996.78	BTU/scf
Fuel Sulfur Content:	2	gr/100 scf
Operating Hours:	8,760	hours/yr
Fuel Usage:	457.47	scf/hr
Fuel Usage:	4.01	MMscf/yr

Criteria Pollutant Emission Rates per Unit							
	NO_x	**CO**	**VOC**	**SO_2[1]**	**PM^2**	**Units**	**Notes**
Emission Factors	100	84	5.5	-	7.6	lb/MMscf	AP-42 Table 1.4-1 & 2
	97.72	82.09	5.37	-	7.43	lb/MMscf	Adjusted EF, per footnote a in Tables 1.4-1 and 1.4-2
				2.00		gr / 100 scf	
Emissions	**0.045**	**0.038**	**2.46E-03**	**2.61E-03**	**3.398E-03**	lb/hr[3]	
	0.20	**0.16**	**0.011**	**0.011**	**0.015**	tons/year[4]	

HAP Emission Rates per Unit							
	n-Hexane	**Benzene**	**Toluene**	**HCHO**	**Total HAPs[5]**	**Units**	**Notes**
Emission Factors	1.80	2.1E-03	3.4E-03	0.075	-	lb/MMscf	AP-42 Table 1.4-3
	1.76	2.05E-03	3.32E-03	0.073	-	lb/MMscf	Adjusted EF, per footnote a in Table 1.4-3
Emissions	**8.05E-04**	**9.39E-07**	**1.52E-06**	**3.35E-05**	**8.41E-04**	lb/hr[3]	
	3.52E-03	**4.11E-06**	**6.66E-06**	**1.47E-04**	**3.68E-03**	tons/year[4]	

Notes:

[1] SO_2 emissions based on fuel sulfur (gr/100 scf)

[2] Assumes $PM_{10} = PM_{2.5}$

[3] lb/hr emissions calculated using the following methods:
Criteria and HAPs lb/hr = EF (lb/MMscf) * Rating (MMBtu/hr) / Heat value (Btu/scf)

[4] For all pollutant calculations, tons/year = lb/hr * Operating hours * 1ton/2000lb

[5] Total HAP emissions are the sum of all individual HAPs calculated.

Northern Natural Gas Company - Hobbs Station

Fugitives

Emission unit number(s): FUG-1
Source description: Facility-wide Fugitive Emissions
Total Operating Hours 8,760

Component		ission fact b/hr/sourc	VOC Content[2]	HAP Content[2]	H_2S Content[2]	Subcomponent Count[3]	VOC Emissions[4,5] lb/hr	VOC Emissions[4,5] tpy	HAP Emissions[4,5] lb/hr	HAP Emissions[4,5] tpy	H_2S Emissions[4,5] lb/hr	H_2S Emissions[4,5] tpy
Valves	Inlet Gas	9.92E-03	86.75%	0.37%	0.00%	158	1.36	5.96	5.87E-03	0.03	-	-
	Light Liquid	5.51E-03	0.00%	0.00%	0.00%	0	-	-	-	-	-	-
Connectors	Inlet Gas	4.41E-04	86.75%	0.37%	0.00%	97	0.04	0.16	1.601E-04	7.012E-04	-	-
	Light Liquid	4.63E-04	0.00%	0.00%	0.00%	0	-	-	-	-	-	-
Flanges	Inlet Gas	8.60E-04	0.00%	0.37%	0.00%	180	-	-	5.79E-04	2.54E-03	-	-
	Light Liquid	2.43E-04	0.00%	0.00%	0.00%	0	-	-	-	-	-	-
Open-ended Lines	Inlet Gas	2.00E-03	86.75%	0.37%	0.00%	3	5.205E-03	0.02	2.25E-05	9.837E-05	-	-
	Light Liquid	1.40E-03	0.00%	0.00%	0.00%	0	-	-	-	-	-	-
Pump Seals	Inlet Gas	5.29E-03	86.75%	0.37%	0.00%	4	0.02	0.08	7.922E-05	3.470E-04	-	-
	Light Liquid	2.87E-02	0.00%	0.00%	0.00%	0	-	-	-	-	-	-
						Total:	**1.42**	**6.22**	**6.71E-03**	**0.029**	**-**	**-**

Component		ission fact b/hr/sourc	Hexane Content[2]	Benzene Content[2]	Toluene Content[2]	Xylenes Content[2]	Ethylbenzene	2,2,4-TMP	Subcomponent	Hexane Emissions[4,5] lb/hr	Hexane Emissions[4,5] tpy	Benzene lb/hr	Benzene tpy
Valves	Inlet Gas	9.92E-03	0.374%	0.000%	0.000%	0.000%	0.000%	0.000%	158	5.87E-03	0.03	-	-
	Light Liquid	5.51E-03	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0	-	-	-	-
Connectors	Inlet Gas	4.41E-04	0.374%	0.000%	0.000%	0.000%	0.000%	0.000%	97	1.60E-04	7.01E-04	-	-
	Light Liquid	4.63E-04	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0	-	-	-	-
Flanges	Inlet Gas	8.60E-04	0.374%	0.000%	0.000%	0.000%	0.000%	0.000%	180	5.79E-04	2.54E-03	-	-
	Light Liquid	2.43E-04	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0	-	-	-	-
Open-ended Lines	Inlet Gas	2.00E-03	0.374%	0.000%	0.000%	0.000%	0.000%	0.000%	3	2.246E-05	9.84E-05	-	-
	Light Liquid	1.40E-03	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0	-	-	-	-
Pump Seals	Inlet Gas	5.29E-03	0.374%	0.000%	0.000%	0.000%	0.000%	0.000%	4	7.92E-05	3.47E-04	-	-
	Light Liquid	2.87E-02	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0	-	-	-	-
									Total:	**6.71E-03**	**0.029**	**-**	**-**

[1] Emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, 1995.
[2] Weight percent of gas and liquid components from site specific liquids and gas analyses.
[3] Component counts are based on facility design.
[4] Hourly Emissions [lb/hr] = Emissions Factor [lb/hr/component] * Weight Content of Chemical Component [%] * Subcomponent Count.
[5] Annual Emissions [ton/yr] = Hourly Emissions [lb/hr] * Operating Hours [hr/yr] * 1/2000 [ton/lb].

Northern Natural Gas Company - Hobbs Station

Pipeline Liquids Tanl (Exempt per 20.2.72.202.B.5 NMAC)

Emission unit number(s):	TK-1	
Source description:	8820 Gallon Pipeline Liquids Tank	
Normal Operating Hours:	8,760	
Number of Tanks:	1	
Capacity of Tanks:	210	bbl
Max Hourly Cond Throughput:	6.65	bbl/hr
Daily Throughput:	159.63	bbl/d
Annual Throughput:	58,263.59	bbl/yr

Pipeline Liquids Tank Emissions[1]

Component	Uncontrolled Emissions					Controlled Emissions	
	Flash (lb/hr)	Breathing (lb/hr)	Working (lb/hr)	Total per Tank (lb/hr)	Total Emissions Per Tank (tpy)	Total per Tank (lb/hr)	Total Emissions Per Tank (tpy)
H2S	-	-	-	-	-	-	-
Oxygen, Diatomic	2.52E-03	7.32E-08	1.52E-06	2.52E-03	0.01	2.52E-03	0.01
Helium	1.55E-04	6.11E-11	1.27E-09	1.55E-04	6.81E-04	1.55E-04	6.81E-04
N2	0.12	1.13E-06	2.34E-05	0.12	0.51	0.12	0.51
CO2	0.08	4.99E-05	1.04E-03	0.08	0.34	0.08	0.34
Methane	2.36	6.35E-05	1.32E-03	2.37	10.36	2.36	10.36
Ethane	0.22	6.85E-06	1.42E-04	0.22	0.98	0.22	0.98
Propane	0.01	7.59E-08	1.57E-06	0.01	0.06	0.01	0.06
i-Butane	7.35E-04	9.33E-10	1.94E-08	7.35E-04	3.22E-03	7.35E-04	3.22E-03
n-Butane	6.36E-04	7.16E-10	1.49E-08	6.36E-04	2.78E-03	6.36E-04	2.78E-03
i-Pentane	2.39E-05	7.13E-12	1.48E-10	2.39E-05	1.05E-04	2.39E-05	1.05E-04
n-Pentane	1.85E-05	1.63E-12	3.37E-11	1.85E-05	8.12E-05	1.85E-05	8.12E-05
Isohexane	-	-	-	-	-	-	-
Heptane	-	-	-	-	-	-	-
Octane	-	-	-	-	-	-	-
Nonane	8.40E-08	9.63E-18	2.00E-16	8.40E-08	3.68E-07	8.40E-08	3.68E-07
Decane	2.51E-08	2.36E-19	4.89E-18	2.51E-08	1.10E-07	2.51E-08	1.10E-07
Benzene	-	-	-	-	-	-	-
Toluene	-	-	-	-	-	-	-
Ethylbenzene	-	-	-	-	-	-	-
m-Xylene	-	-	-	-	-	-	-
p-Xylene	-	-	-	-	-	-	-
o-Xylene	-	-	-	-	-	-	-
n-Hexane	5.968E-06	1.019E-13	2.11E-12	5.97E-06	2.61E-05	5.97E-06	2.61E-05
2,2,4-Trimethylpentane	-	-	-	-	-	-	-
H2O	0.10	1.84E-03	0.04	0.14	0.63	0.10	0.63
EG	-	-	-	-	-	-	-
TEG	-	-	-	-	-	-	-
Propylene Glycol	-	-	-	-	-	-	-
VOC	**0.016**	**7.75E-08**	**1.61E-06**	**0.016**	**0.070**	**0.016**	**0.070**
Total HAPS	**5.968E-06**	**1.019E-13**	**2.113E-12**	**5.968E-06**	**2.61E-05**	**5.97E-06**	**2.61E-05**
Total H_2S	**-**	**-**	**-**	**-**	**-**	**-**	**-**

[1] Hourly and annual loading emissions are calculated using BR&E ProMax.

AECT Inputs	
Flash	Units
0.02	lb/hr
0.07	tpy

Northern Natural Gas Company - Hobbs Station

Caterpillar CG18 Natural Gas Ger (Exempt per 20.2.72.202.B.3 NMAC)

Emission Unit:	GEN-1
Source Description:	Caterpillar CG18 Natural Gas Generator
Manufacturer:	Caterpillar
Model:	CG18
Type:	4SLB
Number of Units:	1

Fuel Consumption

Site horsepower	760	hp	Manufacturer Rating
Fuel heat value	996.78	Btu/scf	Fuel Gas Analysis
Heat input	5.3	MMBtu/hr	Fuel consumption * HP
Fuel consumption	5.3	Mscf/hr	Heat input / fuel heat value
Hours of Operation[1]	500.0	hrs/yr	
Annual fuel usage	2.6	MMscf/yr	500 hrs/yr operation
Fuel Consumption	6928	Btu/hp-hr	Manufacturer Spec Sheet @ Max Rating

Emission Calculations

Uncontrolled	NO_x	CO	VOC^2	$SO_2{}^3$	HCHO	$PM_{10}{}^4$	$PM_{2.5}{}^4$	Total $HAPs^3$	Units	Notes
Emission Factors	2.00	4.00	1.00						g/hp-hr	Manufacturer Specifica
					0.053	9.99E-03	9.99E-03		lb/MMBtu	AP-42 Table 3.2-2
				0.020					gr S/scf	Engineering Estimate
Emissions	**3.35**	**6.70**	**1.68**	**0.03**	**0.28**	**0.05**	**0.05**	**0.36**	lb/hr	
	0.84	**1.68**	**0.42**	**7.55E-03**	**0.07**	**0.01**	**0.01**	**0.09**	tpy	

Controlled	NO_x	CO	VOC^2	$SO_2{}^3$	HCHO	$PM_{10}{}^4$	$PM_{2.5}{}^4$	Total $HAPs^3$	Units	Notes
Emission Factors	0.50	0.60	0.70						g/hp-hr	20.2.50 NMAC Table 2
	75.00%	85%	30%		0.00%					% Reduction
					0.053	9.99E-03	9.99E-03		lb/MMBtu	AP-42 Table 3.2-2
				0.020					gr S/scf	Engineering Estimate
Emissions	**0.84**	**1.01**	**1.30**	**0.030**	**0.09**	**0.05**	**0.05**	**0.17**	lb/hr	
	0.21	**0.25**	**0.33**	**7.55E-03**	**0.02**	**0.01**	**0.01**	**0.042**	tpy	

Acetaldehyde	Acrolein[5]	Benzene[5]	E-Benzene[5]	n-Hexane[5]	Toluene[5]	Xylene[5]	Units	Notes
8.36E-03	5.15E-03	4.40E-04	3.97E-05	1.11E-03	4.08E-04	1.95E-04	lb/MMBtu	AP-42 Table 3.2-2
8.17E-03	5.03E-03	4.30E-04	3.88E-05	1.08E-03	3.99E-04	1.91E-04	lb/MMBtu	AP-42 Table 3.2-2 (adj
0.043	**0.026**	**2.264E-03**	**2.04E-04**	**5.711E-03**	**2.10E-03**	**1.00E-03**	lb/hr	
0.01	**6.62E-03**	**5.660E-04**	**5.11E-05**	**1.428E-03**	**5.248E-04**	**2.508E-04**	tpy	

NOTES

[1] This generator is an emergency generator and only operates during the unavoidable loss of commercial utilty power up to 500 hr/yr.

[2] Controlled VOC emissions include aldehyde emissions.

[3] SO_2 emissions are based on fuel consumption and fuel sulfur content of 2 grains of sulfur per 100 scf

2 gr S/100 scf * fuel scf/hr * 1 lb/7000 gr * 64 lb-mol SO_2/ 32 lb-mol S = lb/hr SO_2

[4] Assumes PM (Filterable + Condensable) = PM_{10} = $PM_{2.5}$

[5] HAPs emissions factors are referenced from AP-42 Table 3.2-2 (except formaldehyde: provided in mfg spec sheet).

[6] AP-42 Table 3.2-2 & adjusted for 996.78 Btu/scf

Northern Natural Gas

Northern Natural Gas Company - Hobbs Station

Condensate Loading (Exempt per 20.2.72.202.B.5 NMAC)

Equation[1]:

$$L_L = \frac{12.46 * SPM}{T}$$

Variables[1]:

L_L - Loading Loss (lbs/1000 gal loaded)
S - Saturation Factor (From Table 5.2-1 of AP-42, Section 5.2)
P - True Vapor Pressure of Loaded Liquid (psia)
M - Molecular Weight of Vapor (lb/lb mol)
T- Temperature of Bulk Liquid (°R = [°F + 460])

																CONDLOAD					
Unit	**Material Loaded [2]**	**Loading Method**	**S**	**P_{max} [6] (psia)**	**M [6] (lb/lbmol)**	**T_{max} [4] (°R)**	**L_L (lbs/1000 gal)**	**Hourly Throughput [5] (gal/hr)**	**Capture Efficiency (%)**	**VOC Wt %**	**HAP Wt %**	**H_2S Wt %[3]**	**VOC Vapor Loading Losses (lb/hr)**	**HAP Vapor Loading Losses (lb/hr)**	**H_2S Vapor Loading Losses (lb/hr)**	**Uncontrolled Hourly VOC Emission**	**Uncontrolled Hourly HAP Emission**	**Uncontrolled Hourly H_2S Emissions [3] (lb/hr)**	**Controlled Hourly VOC Emissions[4] (lb/hr)**	**CONDLOAD**	**Controlled Hourly H_2S Emissions [3] (lb/hr)**
CONDLOAD	Condensate	Submerge	0.6	0.83	5.00	555.00	0.06	9,240.0	0%	0.40%	0.00%	0.00%	2.04E-03	2.69E-09	--	**2.04E-03**	**2.69E-09**	**--**	**2.04E-03**	**2.69E-09**	**--**
						95.00															

																CONDLOAD					
Unit	**Material Loaded [2]**	**Loading Method**	**S**	**P_{avg} [7] (psia)**	**M [7] (lb/lbmol)**	**T_{avg} [4] (°R)**	**L_L (lbs/1000 gal)**	**Annual Throughput [7] (gal/yr)**	**Capture Efficiency (%)**	**VOC Wt %**	**HAP Wt %**	**H_2S Wt %[3]**	**VOC Vapor Loading Losses (tpy)**	**HAP Vapor Loading Losses (tpy)**	**H_2S Vapor Loading Losses (tpy)**	**Uncontrolled Annual VOC Emission**	**Uncontrolled Annual HAP Emission**	**Uncontrolled Annual H_2S Emissions [3] (tpy)**	**Controlled Annual VOC Emissions (tpy)**	**Controlled Annual HAP Emissions (tpy)**	**Controlled Annual H_2S Emissions [3] (tpy)**
CONDLOAD	Condensate	Submerge	0.6	0.46	5.00	535.80	0.03	110,880.0	0%	0.40%	0.00%	0.00%	0.00	0.00	--	**6.99E-06**	**9.18E-12**	**--**	**6.99E-06**	**9.18E-12**	**--**

[1] Loading loss equation and variables are from AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids.
[2] Material loaded is a mixture of condensate and produced water.
[3] H_2S content is conservatively assumed.
[4] Worst case scenario temperature is approximately 95° F and the average temperature is approximately 75.8° F.
[5] The maximum hourly throughput is based on the assumption that one truck with a 180 bbl capacity can be loaded in an hour.
[6] TVP and MW pulled from Max Hourly ProMax
[7] TVP, MW, and annual throughput pulled from Annual Average promax
[8] Annual emissions are based on 12 loads per year.

For AECT		
Facility Produced Water Throughput	110880	gal/yr
Max Hourly Loading Rate	9240	gal/hr
Molecular Weight	5.00	lb/lbmol
Pressure Annual	0.46	psia
Pressure Hourly	0.83	psia
Temperature Annual	76.20	F
Temperature Hourly	95.40	F

APPENDIX 9B

Construction Emission Calculations

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Summary of Construction Emissions

Project Summary of Construction Emissions, in tons

Description	Criteria Pollutants						Total HAPs	GHG				CO_2e (metric tpy)
	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$		CO_2	CH_4	N_2O	CO_2e [a]	
Diesel and gasoline off-road equipment	2.41	12.49	0.02	0.94	0.61	0.59	0.14	5,655.65	0.38	0.01	5,418.06	4,837.55
Diesel and gasoline on-road equipment	1.29	0.08	0.00	0.02	0.02	0.00	0.00	214.21	0.01	0.00	236.91	211.53
Construction activity fugitive dust	--	--	--	--	93.15	9.81	--	--	--	--	--	--
Roadway fugitive dust	--	--	--	--	1.86	0.19	--	--	--	--	--	--
Venting/Blowdown/Pigging	--	--	--	0.39	--	--	--	0.23	40.45	--	1,132.69	1,011.33
TOTAL	**3.70**	**12.57**	**0.02**	**1.35**	**95.63**	**10.59**	**0.14**	**5,870.09**	**40.84**	**0.02**	**6,787.67**	**6,060.42**

Summary of Construction Emissions by County, in tons

Lea County, New Mexico

Description	Criteria Pollutants						Total HAPs	GHG				CO_2e (metric tpy)
	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$		CO_2	CH_4	N_2O	CO_2e [a]	
Diesel and gasoline off-road equipment	1.92	9.97	0.01	0.83	0.53	0.51	0.12	4,537.68	0.33	0.01	4,549.61	4,062.16
Diesel and gasoline on-road equipment	1.22	0.07	0.00	0.02	0.02	0.00	0.00	205.08	0.01	0.00	226.82	202.52
Construction activity fugitive dust	--	--	--	--	84.45	8.90	--	--	--	--	--	--
Roadway fugitive dust	--	--	--	--	1.69	0.17	--	--	--	--	--	--
Venting/Blowdown/Pigging	--	--	--	0.13	--	--	--	0.08	13.48	--	377.56	337.11
TOTAL	**3.14**	**10.05**	**0.01**	**0.98**	**86.69**	**9.58**	**0.13**	**4,742.84**	**13.83**	**0.01**	**5,154.00**	**4,601.78**

Yoakum County, Texas

Description	Criteria Pollutants						Total HAPs	GHG				CO_2e (metric tpy)
	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$		CO_2	CH_4	N_2O	CO_2e [a]	
Diesel and gasoline off-road equipment	0.02	0.10	0.00	0.01	0.01	0.01	0.00	53.81	0.00	0.00	53.89	48.11
Diesel and gasoline on-road equipment	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	1.06	0.95
Construction activity fugitive dust	--	--	--	--	2.16	0.23	--	--	--	--	--	--
Roadway fugitive dust	--	--	--	--	0.04	0.00	--	--	--	--	--	--
Venting/Blowdown/Pigging	--	--	--	0.13	--	--	--	0.08	13.48	--	377.56	337.11
TOTAL	**0.03**	**0.10**	**0.00**	**0.14**	**2.20**	**0.24**	**0.00**	**54.85**	**13.48**	**0.00**	**432.52**	**386.17**

Gaines County, Texas

Description	Criteria Pollutants						Total HAPs	GHG				CO_2e (metric tpy)
	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$		CO_2	CH_4	N_2O	CO_2e [a]	
Diesel and gasoline off-road equipment	0.46	2.42	0.00	0.09	0.07	0.06	0.01	1,064.15	0.05	0.00	814.56	727.29
Diesel and gasoline on-road equipment	0.06	0.00	0.00	0.00	0.00	0.00	0.00	8.16	0.00	0.00	9.03	8.06
Construction activity fugitive dust	--	--	--	--	6.54	0.69	--	--	--	--	--	--
Roadway fugitive dust	--	--	--	--	0.14	0.01	--	--	--	--	--	--
Venting/Blowdown/Pigging	--	--	--	0.13	--	--	--	0.08	13.48	--	377.56	337.11
TOTAL	**0.53**	**2.43**	**0.00**	**0.22**	**6.75**	**0.77**	**0.01**	**1,072.39**	**13.53**	**0.00**	**1,201.15**	**1,072.46**

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations

Emission Factors for Construction Engines - Total Project

Lea County, New Mexico

Equipment	Fuel Type	Quantity [a]	Hours per per week [b]	Weeks [b]	Total Days [b]	Total Hours Used [b]	Max Power [a] (HP)	Load Factor [c]	Loaded Power (HP)	Emission Factors [d,e] (g/hp-hr)									
										CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O
Air Compressor A	Diesel	2	60	16	96	1,920	310	0.56	174	0.92372	3.14546	0.00186	0.22177	0.11425	0.11083	0.18430	589.723	0.020	0.002
ATV/UTV	Gasoline	4	60	16	96	3,840	20	0.5	10	1.09282	3.22911	0.00195	0.27336	0.12442	0.12069	0.22850	586.250	0.025	0.002
Backhoe	Diesel	1	60	16	96	960	75	0.21	16	0.12496	0.56816	0.00160	0.07272	0.03998	0.03878	0.02013	539.756	0.002	0.002
Bending Machine	Diesel	1	60	16	96	960	200	0.59	118	0.60335	1.84113	0.00163	0.12070	0.10701	0.10380	0.08720	551.461	0.006	0.002
Bulldozer	Diesel	2	60	16	96	1,920	250	1	250	0.12496	0.56816	0.00160	0.07272	0.03998	0.03878	0.02013	539.756	0.002	0.002
Concrete Mixer Truck B	Diesel	2	2	5	30	20	150	0.8	120	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002
Concrete Pump A	Diesel	2	10	4	24	80	300	1	300	0.14760	1.21189	0.00145	0.03315	0.02685	0.02605	0.02621	536.736	0.003	0.002
Cutting Cleaner Sstem	Diesel	2	60	16	96	1,920	300	0.59	177	0.14760	1.21189	0.00145	0.03315	0.02685	0.02605	0.02621	536.736	0.003	0.002
Dozers A	Diesel	2	10	6	36	120	215	0.59	127	0.12496	0.56816	0.00160	0.07272	0.03998	0.03878	0.02013	539.756	0.002	0.002
Dump Truck A	Diesel	4	10	6	36	240	325	0.59	192	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002
Excavator B	Diesel	3	10	6	36	180	300	0.59	177	0.06842	0.35035	0.00156	0.06962	0.05463	0.05299	0.01465	541.908	0.001	0.002
Fork Lift A	Diesel	1	10	6	36	60	120	1	120	0.44296	1.42035	0.00159	0.10655	0.07598	0.07370	0.06424	530.728	0.060	0.002
Front End Loaders A	Diesel	1	10	6	36	60	300	0.59	177	0.06842	0.35035	0.00156	0.06962	0.05463	0.05299	0.01465	541.908	0.001	0.002
Generator A	Diesel	1	60	16	16	960	430	0.59	254	0.07296	0.49666	0.00143	0.01697	0.01522	0.01477	0.01203	539.772	0.001	0.002
Generator B	Diesel	1	60	16	16	960	250	0.59	148	0.07296	0.49666	0.00143	0.01697	0.01522	0.01477	0.01203	539.772	0.001	0.002
Generator D	Gasoline	3	60	16	96	2,880	20	0.43	9	0.07296	0.49666	0.00143	0.01697	0.01522	0.01477	0.01203	539.772	0.001	0.002
Grader	Diesel	2	60	16	96	1,920	175	0.8	140	0.04987	0.18208	0.00195	0.27336	0.12442	0.12069	0.02581	537.679	0.001	0.002
HDD - Equip - Rig	Diesel	1	60	16	96	960	500	0.43	215	1.49500	2.56571	0.00198	0.31986	0.24391	0.23659	0.75760	1064.642	0.677	0.002
HDD - Mudd Unit	Diesel	2	60	16	96	1,920	200	0.8	160	0.14760	1.21189	0.00145	0.03315	0.02685	0.02605	0.02621	536.736	0.003	0.002
HDD - Cleaner	Diesel	2	60	16	96	1,920	200	1	200	0.14760	1.21189	0.00145	0.03315	0.02685	0.02605	0.02621	536.736	0.003	0.002
H-VAC Truck	Diesel	1	60	16	96	960	300	0.59	177	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002
Light Plant B	Diesel	4	60	12	72	2,880	13.1	0.59	8	0.11800	3.30127	0.00145	0.02331	0.02236	0.02169	0.99731	1109.244	0.862	0.002
Off-Highway Tractor	Diesel	1	60	16	96	960	120	0.59	71	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002
Pickup Truck	Diesel	12	60	16	96	11,520	250	0.59	148	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002
Piping truck	Diesel	2	60	16	96	1,920	300	0.59	177	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002
Sideboom	Diesel	4	60	16	96	3,840	300	0.59	177	0.62400	1.59957	0.00207	0.33016	0.21249	0.20612	0.16047	737.322	0.128	0.002
Skid Steer	Diesel	2	60	16	96	1,920	75	0.43	32	0.87500	2.86937	0.00185	0.21147	0.14291	0.13862	0.44117	833.918	0.309	0.002
Tampers/Rammers (small)	Gasoline	2	60	16	96	1,920	20	0.43	9	0.36600	4.17259	0.00152	0.09082	0.06798	0.06595	11.12359	696.998	1.129	0.002
Trackhoe A	Diesel	4	60	16	96	3,840	320	0.59	189	0.06842	0.35035	0.00156	0.06962	0.05463	0.05299	0.01465	541.908	0.001	0.002
Water Truck	Diesel	2	60	16	96	1,920	200	0.59	118	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002
Welding Machine B	Diesel	4	60	16	96	3,840	25	0.21	5	1.74796	2.71048	0.00206	0.42636	0.26262	0.25474	0.31115	653.049	0.020	0.002
Welding Rig	Diesel	4	60	16	96	3,840	10	0.21	2	1.74796	2.71048	0.00206	0.42636	0.26262	0.25474	0.31115	653.049	0.020	0.002
X-Ray Truck/Machine	Diesel	2	60	16	96	1,920	50	0.21	11	0.06280	1.38195	0.00155	0.05082	0.03153	0.03058	0.02256	536.755	0.002	0.002

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations

Emission Factors for Construction Engines - Total Project

Yoakum County, Texas

Equipment	Fuel Type	Quantity [a]	Hours per week [b]	Weeks	Total Days [b]	Total Hours Used [b]	Max Power [a] (HP)	Load Factor [c]	Loaded Power (HP)	Emission Factors [d,e] (g/hp-hr)									
										CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O
Air Compressor A	Diesel	2	60	1	6	120	310	0.56	174	0.38532	1.41547	0.00156	0.06986	0.05288	0.05129	0.05404	554.973	0.005	0.002
Backhoe	Diesel	1	60	1	6	60	75	0.21	16	0.10817	0.55680	0.00211	0.42518	0.26024	0.25243	0.04127	539.762	0.002	0.002
Bulldozer	Diesel	1	60	1	6	60	250	1	250	0.10817	0.55680	0.00211	0.42518	0.26024	0.25243	0.04127	539.762	0.002	0.002
Concrete Mixer Truck B	Diesel	1	10	0	2	3	150	0.8	120	0.06467	1.38558	0.00185	0.14761	0.13192	0.12797	0.02979	536.754	0.002	0.002
Concrete Pump A	Diesel	1	10	0	2	3	300	1	300	0.22949	0.90309	0.00152	0.05378	0.03350	0.03249	0.04414	556.680	0.005	0.002
Fork Lift A	Diesel	1	60	1	6	60	120	1	120	0.62387	1.46714	0.00159	0.13986	0.13414	0.13011	0.06922	537.728	0.061	0.002
Generator B	Diesel	1	60	1	6	60	250	0.59	148	0.15244	0.80805	0.00150	0.03231	0.02343	0.02273	0.02583	559.631	0.003	0.002
Grader	Diesel	2	60	1	6	120	175	0.8	140	0.05216	0.19342	0.00145	0.02273	0.02122	0.02058	0.00842	537.676	0.001	0.002
Light Plant B	Diesel	1	60	1	6	60	13.1	0.59	8	0.11800	3.27975	0.00147	0.02201	0.01458	0.01414	1.00611	1110.768	0.868	0.002
Pickup Truck	Diesel	2	60	1	6	120	250	0.59	148	0.06467	1.38558	0.00185	0.14761	0.13192	0.12797	0.02979	536.754	0.002	0.002
Welding Machine B	Diesel	1	20	1	6	20	25	0.21	5	1.09349	3.23089	0.00195	0.27376	0.12425	0.12052	0.23155	586.276	0.025	0.002
Welding Rig	Diesel	1	20	1	6	20	10	0.21	2	1.09349	3.23089	0.00195	0.27376	0.12425	0.12052	0.23155	586.276	0.025	0.002
X-Ray Truck/ Machine	Diesel	1	20	1	6	20	50	0.21	11	0.06467	1.38558	0.00185	0.14761	0.13192	0.12797	0.02979	536.754	0.002	0.002

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations

Emission Factors for Construction Engines - Total Project

Gaines County, Texas

Equipment	Fuel Type	Quantity [a]	Hours per week	Weeks	Total Days [b]	Total Hours Used [b]	Max Power [a] (HP)	Load Factor [c]	Loaded Power (HP)	Emission Factors [d,e] (g/hp-hr)									
										CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O
Air Compressor A	Diesel	2	60	4	24	480	310	0.56	174	0.20122	1.34651	0.00155	0.03906	0.03001	0.02911	0.03162	574.246	0.005	0.002
ATV/UTV	Gasoline	2	60	4	24	480	20	0.5	10	0.09264	0.67769	0.00147	0.02201	0.01460	0.01416	0.01703	553.024	0.002	0.002
Backhoe	Diesel	1	60	4	24	240	75	0.21	16	0.10817	0.55679	0.00143	0.01697	0.01522	0.01477	0.01491	539.762	0.002	0.002
Bending Machine	Diesel	1	60	4	24	240	200	0.59	118	0.08921	0.97533	0.00142	0.02633	0.01761	0.01708	0.02030	532.828	0.002	0.002
Bulldozer	Diesel	1	60	4	24	240	250	1	250	0.10817	0.55679	0.00143	0.01697	0.01522	0.01477	0.01491	539.762	0.002	0.002
Concrete Mixer Truck B	Diesel	2	10	1	6	20	150	0.8	120	0.06467	1.38558	0.00141	0.02530	0.01700	0.01649	0.02093	536.754	0.002	0.002
Concrete Pump A	Diesel	1	10	1	6	10	300	1	300	0.76205	2.27595	0.00170	0.17699	0.11948	0.11590	0.13838	568.348	0.013	0.002
Cutting Cleaner Sstem	Diesel	2	60	4	24	480	300	0.59	177	0.76205	2.27595	0.00170	0.17699	0.11948	0.11590	0.13838	568.348	0.013	0.002
Dozers A	Diesel	2	60	4	24	480	215	0.59	127	0.10817	0.55679	0.00143	0.01697	0.01522	0.01477	0.01491	539.762	0.002	0.002
Dump Truck A	Diesel	4	60	4	24	960	325	0.59	192	0.06467	1.38558	0.00141	0.02530	0.01700	0.01649	0.02093	536.754	0.002	0.002
Excavator B	Diesel	3	60	4	24	720	300	0.59	177	0.06486	0.34596	0.00143	0.01409	0.01102	0.01069	0.01059	541.909	0.001	0.002
Fork Lift A	Diesel	1	60	4	24	240	120	1	120	0.22050	1.45981	0.00153	0.04295	0.03932	0.03814	0.05976	560.261	0.061	0.002
Front End Loaders A	Diesel	1	10	2	12	20	300	0.59	177	0.06486	0.34596	0.00143	0.01409	0.01102	0.01069	0.01059	541.909	0.001	0.002
Generator A	Diesel	1	60	4	24	240	430	0.59	254	0.73319	2.31989	0.00170	0.17289	0.11087	0.10754	0.13586	568.787	0.013	0.002
Generator B	Diesel	1	60	4	24	240	250	0.59	148	0.73319	2.31989	0.00170	0.17289	0.11087	0.10754	0.13586	568.787	0.013	0.002
Generator D	Gasoline	1	60	4	24	240	20	0.43	9	0.73319	2.31989	0.00170	0.17289	0.11087	0.10754	0.13586	568.787	0.013	0.002
H-VAC Truck	Diesel	1	60	4	24	240	300	0.59	177	0.06467	1.38558	0.00141	0.02530	0.01700	0.01649	0.02093	536.754	0.002	0.002
Light Plant B	Diesel	1	60	4	24	240	13.1	0.59	8	0.11800	3.27975	0.00212	0.33022	0.16144	0.15659	1.02725	1110.769	0.867	0.002
Off-Highway Tractor	Diesel	1	60	4	24	240	120	0.59	71	0.06467	1.38558	0.00141	0.02530	0.01700	0.01649	0.02093	536.754	0.002	0.002
Pickup Truck	Diesel	12	60	4	24	2,880	250	0.59	148	0.06467	1.38558	0.00141	0.02530	0.01700	0.01649	0.02093	536.754	0.002	0.002
Sideboom	Diesel	4	60	4	24	960	300	0.59	177	0.87500	1.75466	0.00157	0.08052	0.07575	0.07347	0.15386	737.700	0.136	0.002
Skid Steer	Diesel	2	60	4	24	480	75	0.43	32	0.87500	3.15663	0.00169	0.18258	0.12807	0.12423	0.52743	833.986	0.314	0.002
Tampers/Rammers (small)	Gasoline	2	60	4	24	480	20	0.43	9	0.36600	4.18888	0.00184	0.20306	0.13675	0.13265	11.12992	697.042	1.129	0.002
Trackhoe A	Diesel	4	60	4	24	960	320	0.59	189	0.06486	0.34596	0.00143	0.01409	0.01102	0.01069	0.01059	541.909	0.001	0.002
Water Truck	Diesel	2	60	4	24	480	200	0.59	118	0.06467	1.38558	0.00141	0.02530	0.01700	0.01649	0.02093	536.754	0.002	0.002
Welding Machine B	Diesel	4	60	4	24	960	25	0.21	5	1.56492	3.05821	0.00208	0.31500	0.21202	0.20566	0.24180	693.887	0.021	0.002
Welding Rig	Diesel	4	60	4	24	960	10	0.21	2	1.56492	3.05821	0.00208	0.31500	0.21202	0.20566	0.24180	693.887	0.021	0.002
X-Ray Truck/Machine	Diesel	2	60	4	24	480	50	0.21	11	0.06467	1.38558	0.00141	0.02530	0.01700	0.01649	0.02093	536.754	0.002	0.002

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations

Emission Estimates from Construction Engines

Lea County, New Mexico	**Emissions (tons)**										
Equipment	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O	CO_2e
Air Compressor A	0.34	1.16	0.00	0.08	0.04	0.04	0.07	216.67	0.01	0.00	217.02
ATV/UTV	0.05	0.14	0.00	0.01	0.01	0.01	0.01	24.82	0.00	0.00	24.86
Backhoe	0.00	0.01	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.00	9.00
Bending Machine	0.08	0.23	0.00	0.02	0.01	0.01	0.01	68.86	0.00	0.00	68.94
Bulldozer	0.07	0.30	0.00	0.04	0.02	0.02	0.01	285.59	0.00	0.00	285.85
Concrete Mixer Truck B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	1.42
Concrete Pumps A	0.00	0.03	0.00	0.00	0.00	0.00	0.00	14.20	0.00	0.00	14.21
Cutting Cleaner System	0.06	0.45	0.00	0.01	0.01	0.01	0.01	201.07	0.00	0.00	201.26
Dozers A	0.00	0.01	0.00	0.00	0.00	0.00	0.00	9.06	0.00	0.00	9.07
Dump Truck A	0.00	0.07	0.00	0.00	0.00	0.00	0.00	27.23	0.00	0.00	27.25
Excavator B	0.00	0.01	0.00	0.00	0.00	0.00	0.00	19.03	0.00	0.00	19.05
Fork Lift A	0.00	0.01	0.00	0.00	0.00	0.00	0.00	4.21	0.00	0.00	4.23
Front End Loaders A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.34	0.00	0.00	6.35
Generator A	0.02	0.13	0.00	0.00	0.00	0.00	0.00	144.91	0.00	0.00	145.04
Generator B	0.01	0.08	0.00	0.00	0.00	0.00	0.00	84.25	0.00	0.00	84.33
Generator D	0.00	0.01	0.00	0.00	0.00	0.00	0.00	14.74	0.00	0.00	14.75
Grader	0.01	0.05	0.00	0.08	0.04	0.04	0.01	159.32	0.00	0.00	159.46
HDD - Equip - Rig	0.34	0.58	0.00	0.07	0.06	0.05	0.17	242.22	0.15	0.00	246.18
HDD - Mudd Unit	0.05	0.41	0.00	0.01	0.01	0.01	0.01	181.75	0.00	0.00	181.93
HDD - Cleaner	0.06	0.51	0.00	0.01	0.01	0.01	0.01	227.19	0.00	0.00	227.41
H-VAC Truck	0.01	0.26	0.00	0.01	0.01	0.01	0.00	100.54	0.00	0.00	100.63
Light Plant B	0.00	0.08	0.00	0.00	0.00	0.00	0.02	27.22	0.02	0.00	27.76
Off-Highway Tractor	0.00	0.10	0.00	0.00	0.00	0.00	0.00	40.21	0.00	0.00	40.25
Pickup Truck	0.12	2.59	0.00	0.10	0.06	0.06	0.04	1005.37	0.00	0.00	1006.32
Piping truck	0.02	0.52	0.00	0.02	0.01	0.01	0.01	201.07	0.00	0.00	201.26
Sideboom	0.47	1.20	0.00	0.25	0.16	0.15	0.12	552.42	0.10	0.00	555.15
Skid Steer	0.06	0.20	0.00	0.01	0.01	0.01	0.03	56.92	0.02	0.00	57.48
Tampers/Rammers (small)	0.01	0.08	0.00	0.00	0.00	0.00	0.20	12.69	0.02	0.00	13.21
Trackhoe A	0.05	0.28	0.00	0.06	0.04	0.04	0.01	433.07	0.00	0.00	433.46
Water Truck	0.02	0.35	0.00	0.01	0.01	0.01	0.01	134.05	0.00	0.00	134.18
Welding Machine B	0.04	0.06	0.00	0.01	0.01	0.01	0.01	14.51	0.00	0.00	14.53
Welding Rig	0.02	0.02	0.00	0.00	0.00	0.00	0.00	5.80	0.00	0.00	5.81
X-Ray Truck/Machine	0.00	0.03	0.00	0.00	0.00	0.00	0.00	11.93	0.00	0.00	11.94
TOTAL	**1.92**	**9.97**	**0.01**	**0.83**	**0.53**	**0.51**	**0.78**	**4,537.68**	**0.33**	**1.2E-02**	**4,549.61**

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations

Emission Estimates from Construction Engines

Yoakum County, Texas	**Emissions (tons)**										
Equipment	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O	CO_2e
Air Compressor A	0.01	0.03	0.00	0.00	0.00	0.00	0.00	12.74	0.00	0.00	12.76
Backhoe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.56
Bulldozer	0.00	0.01	0.00	0.01	0.00	0.00	0.00	8.92	0.00	0.00	8.93
Concrete Mixer Truck B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.18
Concrete Pumps A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.46
Fork Lift A	0.00	0.01	0.00	0.00	0.00	0.00	0.00	4.27	0.00	0.00	4.28
Generator B	0.00	0.01	0.00	0.00	0.00	0.00	0.00	5.46	0.00	0.00	5.46
Grader	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.96	0.00	0.00	9.97
Light Plant B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.58
Pickup Truck	0.00	0.03	0.00	0.00	0.00	0.00	0.00	10.47	0.00	0.00	10.48
Welding Machine B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.07
Welding Rig	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03
X-Ray Truck/ Machine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.12
TOTAL	**0.02**	**0.10**	**0.00**	**0.01**	**0.01**	**0.01**	**0.00**	**53.81**	**0.00**	**1.5E-04**	**53.89**

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations

Emission Estimates from Construction Engines

Gaines County, Texas	**Emissions (tons)**										
Equipment	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O	CO_2e
Air Compressor A	0.02	0.12	0.00	0.00	0.00	0.00	0.00	52.75	0.00	0.00	52.80
ATV/UTV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.93	0.00	0.00	2.93
Backhoe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	2.25
Bending Machine	0.00	0.03	0.00	0.00	0.00	0.00	0.00	16.63	0.00	0.00	16.65
Bulldozer	0.01	0.04	0.00	0.00	0.00	0.00	0.00	35.70	0.00	0.00	35.73
Concrete Mixer Truck B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	1.42
Concrete Pumps A	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	1.88
Cutting Cleaner System	0.07	0.21	0.00	0.02	0.01	0.01	0.01	53.23	0.00	0.00	53.30
Dozers A	0.01	0.04	0.00	0.00	0.00	0.00	0.00	36.23	0.00	0.00	36.26
Dump Truck A	0.01	0.28	0.00	0.01	0.00	0.00	0.00	108.91	0.00	0.00	109.02
Excavator B	0.01	0.05	0.00	0.00	0.00	0.00	0.00	76.13	0.00	0.00	76.19
Fork Lift A	0.01	0.05	0.00	0.00	0.00	0.00	0.00	17.79	0.00	0.00	17.85
Front End Loaders A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.11	0.00	0.00	2.12
Generator A	0.05	0.16	0.00	0.01	0.01	0.01	0.01	38.18	0.00	0.00	38.23
Generator B	0.03	0.09	0.00	0.01	0.00	0.00	0.01	22.20	0.00	0.00	22.23
Generator D	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	1.30
H-VAC Truck	0.00	0.06	0.00	0.00	0.00	0.00	0.00	25.13	0.00	0.00	25.16
Light Plant B	0.00	0.01	0.00	0.00	0.00	0.00	0.00	2.27	0.00	0.00	2.32
Off-Highway Tractor	0.00	0.03	0.00	0.00	0.00	0.00	0.00	10.05	0.00	0.00	10.06
Pickup Truck	0.03	0.65	0.00	0.01	0.01	0.01	0.01	251.34	0.00	0.00	0.00
Sideboom	0.16	0.33	0.00	0.02	0.01	0.01	0.03	138.17	0.03	0.00	138.90
Skid Steer	0.01	0.05	0.00	0.00	0.00	0.00	0.01	14.23	0.01	0.00	14.37
Tampers/Rammers (small)	0.00	0.02	0.00	0.00	0.00	0.00	0.05	3.17	0.01	0.00	3.30
Trackhoe A	0.01	0.07	0.00	0.00	0.00	0.00	0.00	108.27	0.00	0.00	108.37
Water Truck	0.00	0.09	0.00	0.00	0.00	0.00	0.00	33.51	0.00	0.00	33.54
Welding Machine B	0.01	0.02	0.00	0.00	0.00	0.00	0.00	3.85	0.00	0.00	3.86
Welding Rig	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.54	0.00	0.00	1.54
X-Ray Truck/Machine	0.00	0.01	0.00	0.00	0.00	0.00	0.00	2.98	0.00	0.00	2.98
TOTAL	**0.46**	**2.42**	**0.00**	**0.09**	**0.07**	**0.06**	**0.15**	**1,064.15**	**0.05**	**2.9E-03**	**814.56**

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations

Emission Estimates from Construction Engines

	Total Project Emissions from Construction Emissions (tons)										
	CO	NOx	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O	CO_2e
TOTAL	**2.41**	**12.49**	**0.02**	**0.94**	**0.61**	**0.59**	**0.93**	**5655.65**	**0.38**	**0.01**	**5418.06**

Global Warming Potential	
CO_2	1
CH_4	28
N_2O	265

40 CFR 98 Subpart A Global Warming Potentials.

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Diesel and Gas On-Road Equipment Information

Lea County, New Mexico

Equipment Type	Quantity [a]	Total Days [a]	Miles per Day [a]	Total Miles per Project	Fuel Usage gal	Fuel Usage MMBtu	Emission Factors [b,c,d]									
							CO	NO_X	SO_2	VOC	PM10	$PM_{2.5}$	HAP	CO_2	CH_4	N_2O
							(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(lb/MMBtu)	(kg/MMBtu)	(kg/MMBtu)
Construction & Delivery Vehicles - Diesel	66	40	40	105,600	7,040	964	4.258	0.271	0.004	0.089	0.076	0.015	0.013	164.000	0.003	0.001
Workers Commuter Vehicles - Gasoline	60	96	30	172,800	7,200	936	0.954	0.023	0.001	0.006	0.022	0.003	0.001	154.000	0.003	0.001
Workers Commuter Vehicles - Diesel	40	96	30	115,200	4,800	658	4.258	0.271	0.004	0.089	0.076	0.015	0.013	164.000	0.003	0.001

Yoakum County, Texas

Equipment Type	Quantity [a]	Total Days [a]	Miles per Day [a]	Total Miles per Project	Fuel Usage gal	Fuel Usage MMBtu	Emission Factors [b,c,d]									
							CO	NO_X	SO_2	VOC	PM10	$PM_{2.5}$	HAP	CO_2	CH_4	N_2O
							(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(lb/MMBtu)	(kg/MMBtu)	(kg/MMBtu)
Construction & Delivery Vehicles - Diesel	2	2	40	160	11	1	4.258	0.271	0.004	0.089	0.076	0.015	0.013	164.000	0.003	0.001
Workers Commuter Vehicles - Gasoline	7	12	30	2,520	105	14	0.954	0.023	0.001	0.006	0.022	0.003	0.001	154.000	0.003	0.001
Workers Commuter Vehicles - Diesel	5	12	30	1,800	75	10	4.258	0.271	0.004	0.089	0.076	0.015	0.013	164.000	0.003	0.001

Gaines County, Texas

Equipment Type	Quantity [a]	Total Days [a]	Miles per Day [a]	Total Miles per Project	Fuel Usage gal	Fuel Usage MMBtu	Emission Factors [b,c,d]									
							CO	NO_X	SO_2	VOC	PM10	$PM_{2.5}$	HAP	CO_2	CH_4	N_2O
							(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(g/VMT)	(lb/MMBtu)	(kg/MMBtu)	(kg/MMBtu)
Construction & Delivery Vehicles - Diesel	16	10	40	6,400	427	58	4.258	0.271	0.004	0.089	0.076	0.015	0.013	164.000	0.003	0.001
Workers Commuter Vehicles - Gasoline	15	24	30	10,800	450	59	0.954	0.023	0.001	0.006	0.022	0.003	0.001	154.000	0.003	0.001
Workers Commuter Vehicles - Diesel	10	24	30	7,200	300	41	4.258	0.271	0.004	0.089	0.076	0.015	0.013	164.000	0.003	0.001

Assumptions and Conversion Factors	
construction & delivery vehicle, hp	400
hp to gallon of diesel	55
Btu/gallon diesel [c]	137,000
construction, delivery & removal vehicle, miles/gal	15.0
Btu/gallon diesel [e]	137,000
commuter vehicles, miles/gal	24
Btu/gallon gasoline [e]	130,000
lb/kg	2.20
g/lb	453.59
lb/ton	2,000
Btu/hp-hour [d]	7,000
Btu/MMBtu	1,000,000

Notes

[a] Equipment counts and milage based on preliminary construction plan.
[b] Emission factors based on EPA MOVES5.0.
[c] Emission factor: AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1, 10/96.
[d] Emission factor from 40 CFR Part 98 Table C-.2, CH_4 3.0 10-3 kg/MMBtu, N_2O 6.0 x 10-4 kg/MMBtu.
[e] Btu/gallon from USEPA AP-42 Appendix A Typical Parameters of Various Fuels

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Diesel and Gasoline On-Road Equipment Emissions

Lea County, New Mexico

	Emissions (tons)										
Equipment Type	**CO**	**NO_X**	**SO_2**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Construction & Delivery Vehicles - Diesel	0.50	0.03	0.00	0.01	0.01	0.00	0.00	79.09	0.00	0.00	87.46
Workers Commuter Vehicles - Gasoline	0.18	0.00	0.00	0.00	0.00	0.00	0.00	72.07	0.00	0.00	79.72
Workers Commuter Vehicles - Diesel	0.54	0.03	0.00	0.01	0.01	0.00	0.00	53.92	0.00	0.00	59.63
Total	**1.22**	**0.07**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**205.08**	**0.01**	**0.00**	**226.82**

Yoakum County, Texas

	Emissions (tons)										
Equipment Type	**CO**	**NO_X**	**SO_2**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Construction & Delivery Vehicles - Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.13
Workers Commuter Vehicles - Diesel	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.00	0.00	0.93
Total	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.96**	**0.00**	**0.00**	**1.06**

Gaines County, Texas

	Emissions (tons)										
Equipment Type	**CO**	**NO_X**	**SO_2**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Construction & Delivery Vehicles - Diesel	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4.79	0.00	0.00	5.30
Workers Commuter Vehicles - Diesel	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.37	0.00	0.00	3.73
Total	**0.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**8.16**	**0.00**	**0.00**	**9.03**

Total Project Emissions from Construction Emissions

	Emissions (tons)										
Equipment Type	**CO**	**NO_X**	**SO_2**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**HAP**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Total	**1.29**	**0.08**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**214.21**	**0.01**	**0.00**	**236.91**

Conversion Factors	
g/lb	453.59
lb/kg	2.20
lb/ton	2,000
lb/metric ton	2,205
ratio of metric ton to US ton	1.10
Global Warming Potential [a]	
CO_2	1
CH_4	28
N_2O	265

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Fugitive Dust Emissions from Earthmoving Activities

Summary of Soil Disturbance			
County	**Total (Acres)**	**Soil Volume [a] (yd^3)**	**Soil Weight [a] (ton)**
Lea County, New Mexico	324.08	522,849	653,561
Yoakum County, Texas	8.27	13,342	16,678
Gaines County, Texas	25.10	40,495	50,618

Summary of Fugitive Dust Emissions From Earthmoving Activities [b,c]								
	Soil Excavation		Soil Backfill		Wind Erosion [d]			
County/Pollutant	**Emission Factor (lb/ton)**	**Project Emissions (ton)**	**Emission Factor (lb/ton)**	**Project Emissions (ton)**	**Emission Factor (ton/acre/yr)**	**Control Efficiency (%)**	**Project Emissions (ton)**	**Total Projet Emissions (ton)**
Lea County, New Mexico								
PM_{10}	0.058	18.95	0.012	3.92	0.38	50%	61.58	**84.45**
$PM_{2.5}$	0.0061	1.99	0.0013	0.42	0.0400	50%	6.48	**8.90**
Yoakum County, Texas								
PM_{10}	0.058	0.48	0.012	0.10	0.38	50%	1.57	**2.16**
$PM_{2.5}$	0.0061	0.05	0.0013	0.01	0.0400	50%	0.17	**0.23**
Gaines County, Texas								
PM_{10}	0.058	1.47	0.012	0.30	0.38	50%	4.77	**6.54**
$PM_{2.5}$	0.0061	0.15	0.0013	0.03	0.0400	50%	0.50	**0.69**
PROJECT TOTAL								
							PM_{10}	**93.15**
							$PM_{2.5}$	**9.81**

[a] Assumes the entire workspace is cleared to 1 foot deep, 1.25 tons per cubic yard. This is highly conservative, as only areas required for construction will be disturbed.

[b] As worst case, PM_{10} is set equal to Total Particulate Matter. $PM_{2.5}$ is set to 0.105 times PM_{10} per AP-42 Section 11.9 Table 11.9-1.

[c] Emission factor: AP-42 Section 11.9 Western Surface Coal Mining, Table 11.9-4, July 1998.

[d] Control efficiency based on project measures to minimize dust utilizing water truck to dampen the right-of-way under dry-dusty conditions, "Control of Open Fugitive Dust Sources", EPA-450/3-38-008, Section 5.3.1.1, September 1988.

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Fugitive Dust Emissions from Unpaved Roads

Lea County, New Mexico

Equipment	Quantity [a]	Total Days Used	VMT [b]	Average Vehicle Weight (tons)	Emission Factor (lb/VMT) [c]		Emissions (tons)	
					PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Air Compressor A	2	96	96	20	1.73	0.17	0.08	0.01
ATV/UTV	4	96	96	0.5	0.33	0.03	0.02	0.00
Backhoe	1	96	96	15	1.52	0.15	0.07	0.01
Bending Machine	1	96	96	22	1.81	0.18	0.09	0.01
Bulldozer	2	96	96	15	1.52	0.15	0.07	0.01
Concrete Mixer Truck B	2	30	30	30	2.08	0.21	0.03	0.00
Concrete Pumps A	2	24	24	25	1.92	0.19	0.02	0.00
Cutting Cleaner System	2	96	96	10	1.27	0.13	0.06	0.01
Dozers A	2	36	36	6	1.01	0.10	0.02	0.00
Dump Truck A	4	36	36	30	2.08	0.21	0.04	0.00
Excavator B	3	36	36	4	0.84	0.08	0.02	0.00
Fork Lift A	1	36	36	1	0.45	0.05	0.01	0.00
Front End Loaders A	1	36	36	1	0.45	0.05	0.01	0.00
Generator A	1	16	16	2	0.62	0.06	0.00	0.00
Generator B	1	16	16	2	0.62	0.06	0.00	0.00
Generator D	3	96	96	2	0.62	0.06	0.03	0.00
Grader	2	96	96	20	1.73	0.17	0.08	0.01
HDD - Equip - Rig	1	96	96	40	2.37	0.24	0.11	0.01
HDD - Mudd Unit	2	96	96	20	1.73	0.17	0.08	0.01
HDD - Cleaner	2	96	96	15	1.52	0.15	0.07	0.01
H-VAC Truck	1	96	96	20	1.73	0.17	0.08	0.01
Light Plant B	4	72	72	1	0.45	0.05	0.02	0.00
Off-Highway Tractor	1	96	96	20	1.73	0.17	0.08	0.01
Pickup Truck	12	96	96	2	0.62	0.06	0.03	0.00
Piping truck	2	96	96	30	2.08	0.21	0.10	0.01
Sideboom	4	96	96	45	2.50	0.25	0.12	0.01
Skid Steer	2	96	96	2	0.62	0.06	0.03	0.00
Tampers/Rammers (small)	2	96	96	0.5	0.33	0.03	0.02	0.00
Trackhoe A	4	96	96	25	1.92	0.19	0.09	0.01
Water Truck	2	96	96	20	1.73	0.17	0.08	0.01
Welding Machine B	4	96	96	3	0.74	0.07	0.04	0.00
Welding Rig	4	96	96	3	0.74	0.07	0.04	0.00
X-Ray Truck/Machine	2	96	96	3	0.74	0.07	0.04	0.00
TOTAL	**--**	**--**	**--**	**--**	**--**	**--**	**1.69**	**0.17**

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Fugitive Dust Emissions from Unpaved Roads

Yoakum County, Texas

Equipment	Quantity [a]	Total Days Used	VMT [b]	Average Vehicle Weight (tons)	Emission Factor (lb/VMT) [c]		Emissions (tons)	
					PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Air Compressor A	2	6	6	20	1.73	0.17	0.01	0.00
Backhoe	1	6	6	15	1.52	0.15	0.00	0.00
Bulldozer	1	6	6	15	1.52	0.15	0.00	0.00
Concrete Mixer Truck B	1	2	2	30	2.08	0.21	0.00	0.00
Concrete Pumps A	1	2	2	25	1.92	0.19	0.00	0.00
Fork Lift A	1	6	6	1	0.45	0.05	0.00	0.00
Generator B	1	6	6	2	0.62	0.06	0.00	0.00
Grader	2	6	6	20	1.73	0.17	0.01	0.00
Light Plant B	1	6	6	1	0.45	0.05	0.00	0.00
Pickup Truck	2	6	6	2	0.62	0.06	0.00	0.00
Welding Machine B	1	6	6	3	0.74	0.07	0.00	0.00
Welding Rig	1	6	6	3	0.74	0.07	0.00	0.00
X-Ray Truck/ Machine	1	6	6	3	0.74	0.07	0.00	0.00
TOTAL	**--**	**--**	**--**	**--**	**--**	**--**	**0.04**	**0.00**

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Fugitive Dust Emissions from Unpaved Roads

Gaines County, Texas

Equipment	Quantity [a]	Total Days Used	VMT [b]	Average Vehicle Weight (tons)	Emission Factor (lb/VMT) [c]		Emissions (tons)	
					PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Air Compressor A	2	24	24	20	1.73	0.17	0.02	0.00
ATV/UTV	2	24	24	0.5	0.33	0.03	0.00	0.00
Backhoe	1	24	24	15	1.52	0.15	0.02	0.00
Bending Machine	1	24	24	22	1.81	0.18	0.02	0.00
Bulldozer	1	24	24	15	1.52	0.15	0.02	0.00
Concrete Mixer Truck B	2	6	6	30	2.08	0.21	0.01	0.00
Concrete Pumps A	1	6	6	25	1.92	0.19	0.01	0.00
Cutting Cleaner System	2	24	24	10	1.27	0.13	0.02	0.00
Dozers A	2	24	24	10	1.27	0.13	0.02	0.00
Dump Truck A	4	24	24	6	1.01	0.10	0.01	0.00
Excavator B	3	24	24	1	0.45	0.05	0.01	0.00
Fork Lift A	1	24	24	1	0.45	0.05	0.01	0.00
Front End Loaders A	1	12	12	1	0.45	0.05	0.00	0.00
Generator A	1	24	24	1	0.45	0.05	0.01	0.00
Generator B	1	24	24	2	0.62	0.06	0.01	0.00
Generator D	1	24	24	2	0.62	0.06	0.01	0.00
H-VAC Truck	1	24	24	15	1.52	0.15	0.02	0.00
Light Plant B	1	24	24	1	0.45	0.05	0.01	0.00
Off-Highway Tractor	1	24	24	20	1.73	0.17	0.02	0.00
Pickup Truck	12	24	24	2	0.62	0.06	0.01	0.00
Sideboom	4	24	24	45	2.50	0.25	0.03	0.00
Skid Steer	2	24	24	45	2.50	0.25	0.03	0.00
Tampers/Rammers (small)	2	24	24	2	0.62	0.06	0.01	0.00
Trackhoe A	4	24	24	25	1.92	0.19	0.02	0.00
Water Truck	2	24	24	20	1.73	0.17	0.02	0.00
Welding Machine B	4	24	24	3	0.74	0.07	0.01	0.00
Welding Rig	4	24	24	3	0.74	0.07	0.01	0.00
X-Ray Truck/Machine	2	24	24	3	0.74	0.07	0.01	0.00
TOTAL	**--**	**--**	**--**	**--**	**--**	**--**	**0.14**	**0.01**

Northern Natural Gas
Permian Basin Expansion Project
Appendix 9B - Construction Emission Calculations
Fugitive Dust Emissions from Unpaved Roads

Total Fugitive Dust Emissions from Unpaved Roads, tpy		
	PM_{10}	$PM_{2.5}$
TOTAL	**1.86**	**0.19**

[a] Equipment counts are estimated based current construction plan.

[b] Each vehicle is assumed to travel 1 mile per day on site.

[c] AP-42 Section 13.2.2 Unpaved Roads, dated November 2006, Equations 1a and 2 TOTALS 11.19 1.12 Surface Silt content based on Table 13.2.2-1

Eq 1a: $E = k * (s/12)^a * (W/3)^b$

Eq 2: $E_{ext} = E * [(365-P)/365]$

where:

VMT = Vehicle Miles Traveled

W = Mean Vehicle Weight, tons

S = Mean Vehicle Speed, mph

P = 120 days with at least 0.01 inches rain, EPA's AP-42 Figure 13.2.2-1

s = 8.5 surface material silt content (%) for construction sites, EPA's AP-42 Table 13.2.2-1

E = size-specific emission factor, lb/ VMT

E_{ext} = annual size-specific emission factor extrapolated for natural migration, lb/VMT

Northern Natural Gas

Permian Basin Expansion Project

Appendix 9B - Construction Emission Calculations

Blowdown Emissions

Component	Event Type	County/State of Release	Estimated Volume of Gas Vented
			scf
Pipeline, Lea County	Blowdown	Lea County, NM	700,000
Pipeline, Gaines County	Blowdown	Gaines County, TX	700,000
Pipeline, Yoakum County	Blowdown	Yoakum County, TX	700,000

Component	Vented Emissions for the Construction Period									
	Total	CH_4 [a]	CO_2 [a]	CH_4 [b]	CO_2 [b]	CH_4	CO_2	CO_2e [c]	VOC [d]	HAPs [d]
	scf	scf	scf	lb	lb	ton	ton	ton	ton	ton
Lea County, NM	700,000	637,000	1,330	26,963	154.23	13.48	0.08	377.56	0.129	0.003
Gaines County, TX	700,000	637,000	1,330	26,963	154.23	13.48	0.08	377.56	0.129	0.003
Yoakum County, TX	700,000	637,000	1,330	26,963	154.23	13.48	0.08	377.56	0.129	0.003
PROJECT TOTAL						**40.45**	**0.23**	**1,132.69**	**0.39**	**0.01**

[a] CH_4 and CO_2 emission rates based on gas composition for the pipeline.

[b] Conversion based on densities of GHG as provided in 40 CFR 98.233(v).

[c] Calculated using 40 CFR 98 Subpart A Global Warming Potentials.

[d] Based on the ratio of VOC to methane and total HAPs to VOC as calculated from estimated gas composition.

Assumptions:

Volume fractions:

0.9100 CH_4

0.0019 CO_2

VOC / Methane Ratio

0.0096

HAP / VOC Mass Ratio

0.0245

Densities per 40 CFR 98.233(v):

0.0192 kg/scf CH_4

0.0526 kg/scf CO_2

Conversion

2.20462 lb/kg

GWP per 40 CFR 98 Subpart A:

28 lb CO_2e/lb CH_4

APPENDIX 9C

Operational Emission Calculations

Northern Natural Gas
Permian Basin Expansion Project
Operating Emission Calculations - Criteria Pollutants, VOCs, GHGs, and HAPs
Summary

Emission Source	NOx (tpy)	CO (tpy)	PM/PM_{10} / $PM_{2.5}$ (tpy)	SO2 (tpy)	VOC (tpy)	HAPs (tpy)	N_2O (tpy)	CH_4 (tpy)	CO_2 (tpy)	CO_2e (tpy)	CO_2e (metric tpy)
Pipeline Emissions	--	--	--	--	3.92E-05	9.59E-07	--	0.00	-	0.11	0.10
Fugitive Components	--	--	--	--	1.09E-01	2.67E-03	--	11.36	0.02	318.01	288.50
Venting	--	--	--	--	2.12E-02	5.19E-04	--	2.21	0.01	61.84	56.10
PROJECT TOTAL	**0.00**	**0.00**	**0.00**	**0.00**	**0.13**	**0.00**	**0.00**	**13.57**	**0.04**	**379.97**	**344.70**

Northern Natural Gas
Permian Basin Expansion Project
Operating Emission Calculations
Pipeline Fugitive Emission Calculations

Fugitive Emissions from Leaks from Pipeline Steel

Pipeline Segment	Miles of Pipeline	CH_4				CO_2e [d,e]		VOC [f]	HAPs [g]
		scf/hr [a]	scf/yr [b]	lb/yr [c]	tpy	tpy	metric tpy	tpy	tpy
NMB26801 Hobbs to SPS Gaines Co. Lateral	14.5	0.3	2,540	108	0.05	1.51	1.37	5.16E-04	1.26E-05
TXB92201 Hobbs to SPS Gaines Co. Lateral	0.6	0.0	105	4	0.00	0.06	0.06	2.14E-05	5.23E-07
NMB26901 Hobbs to Mark West Lateral	1.10	0.0	193	8	0.00	0.11	0.10	3.92E-05	9.59E-07
PROJECT TOTAL	**1.62E+01**	**3.24E-01**	**2.84E+03**	**1.20E+02**	**6.01E-02**	**1.68E+00**	**1.53E+00**	**5.77E-04**	**1.41E-05**

[a] Emission factor of 0.02 scf/hr/mile provided in 40 CFR 98, Subpart W, Table W-3A, Default Total Hydrocarbon Leaker Emission Factors for Onshore Natural Gas Transmission Compression.
[b] Assumes 8760 hours of operation per year.
[c] Converted using 0.0192 kg/scf CH_4 as provided in 40 CFR 98.233(v) and 2.2046 lb/kg.
[d] Calculated using 40 CFR 98 Subpart A Global Warming Potentials.
[e] 1 metric ton = 1.10231 ton (40 CFR 98 Table A-2)
[f] Calculated using the VOC to methane ratio of 0.0096 from gas composition.
[g] Calculated using the HAPs to VOC ratio of 0.0245 from gas composition.
Note: CH_4 = methane; CO_2e = carbon dioxide equivalent; scf = standard cubic feet; hr = hour; yr = year; lb = pound; tpy = tons per year.

Northern Natural Gas
Permian Basin Expansion Project
Operational Emission Calculations
Aboveground Component Emission Calculations

Fugitive Emissions from Leaks at Aboveground Facilities

Project Component / Facility	Component Type	Count [a]	Emission Factor [b] kg/hr/component	Total kg/hr	Total lb/hr	CH_4 lb/hr	CO_2 lb/hr	VOC [c] lb/hr	HAPs [d] lb/hr	CH_4 tpy	CO_2 tpy	CO_2e [e] tpy	CO_2e [e] metric tpy	VOC tpy	HAPs tpy
Hobbs Compressor Station															
	Valves	158	0.0045	0.71	1.57	1.43	2.98E-03	1.37E-02	3.35E-04	6.25	1.30E-02	174.95	158.71	6.00E-02	1.47E-03
	Flanges	180	0.00039	0.07	0.15	0.14	2.94E-04	1.35E-03	3.31E-05	0.62	1.29E-03	17.27	15.67	5.92E-03	1.45E-04
	Connectors	97	0.0002	0.02	0.04	0.04	8.13E-05	3.74E-04	9.15E-06	0.17	3.56E-04	4.77	4.33	1.64E-03	4.01E-05
	Open-Ended Lines	3	0.002	0.01	0.01	0.01	2.51E-05	1.16E-04	2.83E-06	0.05	1.10E-04	1.48	1.34	5.06E-04	1.24E-05
	Other [f]	4	0.0088	0.04	0.08	0.07	1.47E-04	6.78E-04	1.66E-05	0.31	6.46E-04	8.66	7.86	2.97E-03	7.27E-05
Subtotal					1.86	1.69	3.53E-03	1.62E-02	3.97E-04	7.40	1.54E-02	207.13	187.91	7.10E-02	1.74E-03
Transwestern - Lea County Interconnect															
	Valves	18	0.0045	0.08	0.18	0.16	3.39E-04	1.56E-03	3.82E-05	0.71	1.49E-03	19.93	18.08	6.83E-03	1.67E-04
	Flanges	40	0.00039	0.02	0.03	0.03	6.53E-05	3.00E-04	7.36E-06	0.14	2.86E-04	3.84	3.48	1.32E-03	3.22E-05
	Connectors	10	0.0002	0.00	0.00	0.00	8.38E-06	3.85E-05	9.44E-07	0.02	3.67E-05	0.49	0.45	1.69E-04	4.13E-06
	Open-Ended Lines		0.002	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00	0.00	0.00E+00	0.00E+00
	Other [f]	2	0.0088	0.02	0.04	0.04	7.37E-05	3.39E-04	8.30E-06	0.15	3.23E-04	4.33	3.93	1.48E-03	3.64E-05
Subtotal					0.26	0.23	4.87E-04	2.24E-03	5.48E-05	1.02	2.13E-03	28.59	25.94	9.80E-03	2.40E-04
Hobbs-Plains Bi-directional Receiver															
	Valves	13	0.0045	0.06	0.13	0.12	2.45E-04	1.13E-03	2.76E-05	0.51	1.07E-03	14.39	13.06	4.93E-03	1.21E-04
	Flanges	24	0.00039	0.01	0.02	0.02	3.92E-05	1.80E-04	4.42E-06	0.08	1.72E-04	2.30	2.09	7.90E-04	1.93E-05
	Connectors	10	0.0002	0.00	0.00	0.00	8.38E-06	3.85E-05	9.44E-07	0.02	3.67E-05	0.49	0.45	1.69E-04	4.13E-06
	Open-Ended Lines	0	0.002	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00	0.00	0.00E+00	0.00E+00
	Other [f]	0	0.0088	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00	0.00	0.00E+00	0.00E+00
Subtotal					0.15	0.14	2.93E-04	1.35E-03	3.30E-05	0.61	1.28E-03	17.19	15.59	5.89E-03	1.44E-04
Plains Recycle Valve															
	Valves	18	0.0045	0.08	0.18	0.16	3.39E-04	1.56E-03	3.82E-05	0.71	1.49E-03	19.93	18.08	6.83E-03	1.67E-04
	Flanges	10	0.00039	0.00	0.01	0.01	1.63E-05	7.51E-05	1.84E-06	0.03	7.16E-05	0.96	0.87	3.29E-04	8.06E-06
	Connectors	25	0.0002	0.01	0.01	0.01	2.09E-05	9.63E-05	2.36E-06	0.04	9.17E-05	1.23	1.12	4.22E-04	1.03E-05
	Open-Ended Lines	0	0.002	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00	0.00	0.00E+00	0.00E+00
	Other [f]	3	0.0088	0.03	0.06	0.05	1.11E-04	5.08E-04	1.25E-05	0.23	4.84E-04	6.50	5.89	2.23E-03	5.46E-05
Subtotal					0.26	0.23	4.87E-04	2.24E-03	5.49E-05	1.02	2.13E-03	28.62	25.96	9.81E-03	2.40E-04
Gains County Generating Station															
	Valves	24	0.0045	0.11	0.24	0.22	4.52E-04	2.08E-03	5.10E-05	0.95	1.98E-03	26.57	24.11	9.11E-03	2.23E-04
	Flanges	53	0.00039	0.02	0.05	0.04	8.66E-05	3.98E-04	9.75E-06	0.18	3.79E-04	5.09	4.61	1.74E-03	4.27E-05
	Connectors	10	0.0002	0.00	0.00	0.00	8.38E-06	3.85E-05	9.44E-07	0.02	3.67E-05	0.49	0.45	1.69E-04	4.13E-06
	Open-Ended Lines		0.002	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00	0.00	0.00E+00	0.00E+00
	Other [f]	2	0.0088	0.02	0.04	0.04	7.37E-05	3.39E-04	8.30E-06	0.15	3.23E-04	4.33	3.93	1.48E-03	3.64E-05
Subtotal					0.33	0.30	6.21E-04	2.86E-03	7.00E-05	1.30	2.72E-03	36.48	33.10	1.25E-02	3.06E-04
Project Total										**11.36**	**0.02**	**318.01**	**288.50**	**0.11**	**0.00**

[a] Estimate of total component count.
[b] Emission factors from Table 2-4 'Oil and Gas Production Operations Average Emission Factors' from 'Protocol for Equipment Leak Emission Estimates' (EPA-453/R-95-017 - November 1995).
[c] Calculated using the ratio of VOC to methane from gas composition - confirmed by Northern 1/16/2025
[d] Calculated using the ratio of HAPs to VOC from gas composition - confirmed by Northern 1/16/2025
[e] Calculated using 40 CFR 98 Subpart A Global Warming Potentials.
[f] Regulators, gas actuators and pressure relief valves were assumed in the "other" category.
Note: CH_4 = methane; CO_2 = carbon dioxide; VOC = volatile organic compounds; CO_2e = carbon dioxide equivalent; kg = kilogram; hr = hour; lb = pound; tpy = tons per year.

Assumed operating 24 hours a day, 365 days a year for a total of 8760 hours per year
Volume fractions per gas composition

CH_4	0.9100
CO_2	0.0019

VOC / Methane Mass Ratio
0.0096
HAP / VOC Mass Ratio
0.0245
Densities per 40 CFR 98.233(v):

Northern Natural Gas
Permian Basin Expansion Project
Operational Emission Calculations
Aboveground Component Emission Calculations

Fugitive Emissions from Leaks at Aboveground Facilities

Project Component / Facility		Component Type	Count [a]	Emission Factor [b] kg/hr/component	Total kg/hr	Total lb/hr	CH_4 lb/hr	CO_2 lb/hr	VOC [c] lb/hr	HAPs [d] lb/hr	CH_4 tpy	CO_2 tpy	CO_2e [e] tpy	CO_2e metric tpy	VOC tpy	HAPs tpy
	0.0192 kg/scf	CH_4														
	0.0526 kg/scf	CO_2														
	2.20462 lb/kg															
GWP per 40 CFR 98 Subpart A:																
	28 lb CO_2e/lb CH_4	updated from EPA 03/2025														

Northern Natural Gas
Permian Basin Expansion
Operating Emission Calculations
Pipeline Venting Emission Calculations

Project Component	Gas Released [a] scf/yr	CH_4 [b] scf/yr	CO_2 [c] scf/yr	CH_4 [c] lb/yr	CO_2 [c] lb/yr	CH_4 tpy	CO_2 tpy	CO_2e [d] tpy	CO_2e [d] metric tpy	VOC [e] tpy	HAPs [f] tpy
Hobbs CS Operational Blowdowns	114,647	104,329	218	4,416	25.26	2.21	0.01	61.84	56.10	2.12E-02	5.19E-04
PROJECT TOTAL	**--**	**--**	**--**	**--**	**--**	**2.21**	**0.01**	**61.84**	**56.10**	**2.12E-02**	**5.19E-04**

[a] Based on estimates based on information provided by NNG
[b] CH_4 and CO_2 emission rates based on gas composition for the pipeline.
[c] Converted using 0.0192 kg/scf CH_4 as provided in 40 CFR 98.233(v) and 2.2046 lb/kg.
[d] Calculated using 40 CFR 98 Subpart A Global Warming Potentials.
[e] Based on the ratio of VOC to methane as calculated from estimated gas composition.
[f] Based on the ratio of HAPs to VOC as calculated from estimated gas composition.
Note: CH_4 = methane; CO2 = carbon dioxide; CO_2e = carbon dioxide equivalent; scf = standard cubic feet; lb = pound; yr = year; tpy = tons per year.

Assumptions:
Volume fractions:
0.910 CH_4
0.002 CO_2
VOC / Methane Mass Ratio
0.0096
HAP / VOC Mass Ratio
0.0245

Densities per 40 CFR 98.233(v):
0.0192 kg/scf CH_4
0.0526 kg/scf CO_2
Conversion
2.20462 lb/kg
GWP per 40 CFR 98 Subpart A:
28 lb CO_2e/lb CH_4

APPENDIX 9D

Ambient Sound Survey and Acoustic Analysis Reports

Ambient Sound Survey and Acoustical Analysis of HDD Activities

Permian Basin Expansion Project

May 2026

Prepared by:

merjent®

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ACRONYM LIST

dB	decibel
dBA	A-weighted decibel
FERC	Federal Energy Regulatory Commission
FERC Guidance	*February 2017 Guidance for Environmental Report Preparation for Applications Filed Under the Natural Gas Act Volume 1*
HDD	horizontal directional drilling
L1	sound pressure level (dB) at distance r1 from source
L2	sound pressure level (dB) at distance r2 from source
L_{eq}	equivalent continuous sound level
L_d	daytime equivalent sound level
L_{dn}	day-night sound level
L_n	nighttime equivalent sound level
L_w	sound power level in dB
Northern	Northern Natural Gas
NSA	noise-sensitive area
P	sound pressure
P0	reference sound pressure (0.00002 N/m^2)
Project	Permian Basin Expansion Project
SPL	sound pressure level
r	distance in meters from source

1.0 INTRODUCTION

This report summarizes the ambient sound survey, and acoustical assessment for horizontal directional drilling (HDD) as part of Northern Natural Gas' (Northern) Permian Basin Expansion Project (Project). HDD is a trenchless method for installing buried utilities (e.g., pipelines, cables, conduits). Trenchless installation means that it is an alternative to the conventional "open cut" method that requires digging a trench the entire length of the installation path from the ground surface to the final installation depth. Trenchless installation was developed to reduce environmental and socioeconomic impacts (e.g., avoid disturbance of plant or animal species along a river or prevent the closure of a roadway that serves local businesses).

The Project includes four drill sites identified for 24-hour drilling: the U.S. Highway 62 Crossing, State Highway 8 Crossing, the Texas and New Mexico Railway Crossing, and the State Highway 18 Crossing. This acoustical assessment assumes that the HDD drilling will occur 24 hours per day until completed at all four drilling locations. A desktop analysis was completed to identify Noise Sensitive Areas (NSA) within 0.5 mile of the drill entry or exit sites and sound modeling was conducted to quantify the noise level to the construction of the Project at all identified NSAs. One HDD (State Highway 8 Crossing) does not have NSAs located within 0.5 mile.

2.0 SOUND CRITERIA

This section provides a summary discussion of the sound criteria applicable to the Project. The unit of noise measurement is the decibel (dB), which measures the energy of the noise. Because the human ear is not uniformly sensitive to noise frequencies, the "A" weighting frequency scale (dBA) was devised to correspond with the ear's sensitivity. The A-weighted frequency scale uses specific weighting of a sound pressure level for the purpose of determining the human response to sound and the resulting unit of measure is the dBA. Because noise levels can vary over a given time period, they are further quantified using the equivalent continuous sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is an average of the time-varying sound energy for a specified time period. The L_{dn} is an average of the time-varying sound energy for one 24-hour period, with a 10 dB addition to the sound energy for the time period of 10 p.m. to 7 a.m. to account for the increased sensitivity of people to noises that occur at night. If the sound energy does not vary with time, the L_{dn} level will be equal to the L_{eq} level plus 6.4 dB.

For more information about the terminology in this report and description of typical metrics used to measure and regulate environmental noise, see Section 8.0 of the report.

2.1 POTENTIALLY APPLICABLE NOISE REGULATIONS

2.1.1 Federal Criteria

The Federal Energy Regulatory Commission (FERC) *February 2017 Guidance for Environmental Report Preparation for Applications Filed Under the Natural Gas Act Volume 1* (FERC Guidance) requires project applicants that will be completing HDD, direct pipe installation, well drilling or other construction activities that will occur 24 hours per day (i.e., during nighttime hours) to quantify the potential noise levels at nearby NSAs and provide details of any noise mitigation (e.g., propose alternate measures such as temporary relocation, compensation). FERC Guidance states that this work should be

performed with the goal that the activity contributes noise levels below 55 dBA L_{dn} and 48.6 dBA 24-hour L_{eq}, or no more than 10 dB over background if ambient noise levels are above 55 dBA L_{dn}.

2.1.2 State and Local Noise Regulations

A review of applicable state and local noise ordinances identified no quantitative noise regulations applicable to the evaluated HDD crossings.

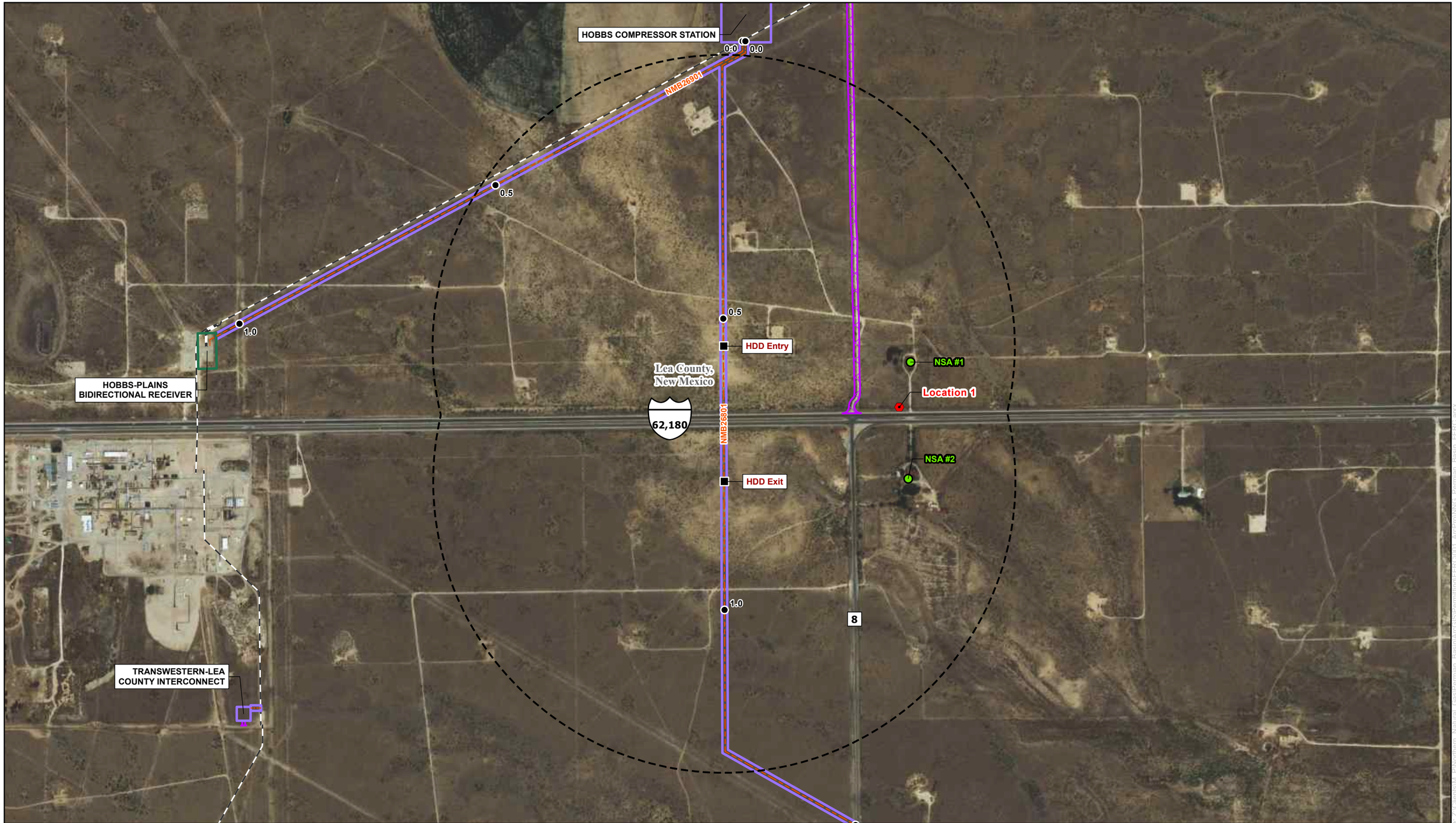
3.0 SITE DESCRIPTION – LOCATION OF NSA

While the Project spans Lea County, New Mexico, and Gaines and Yoakum counties, Texas, all four HDDs associated with the Project are located in Lea County, New Mexico (see table 3.0-1). Merjent performed a desktop review of the area surrounding the HDD entry and exit sites and determined that there are multiple NSAs within 0.5 mile of the sites. The NSA locations were confirmed by field reconnaissance during sound level measurements. These identified NSA locations are shown in the attached Figures 3.0-1, 3.0-2, 3.0-3, and 3.0-4.

Table 3.0-1 provides an overview of the four proposed HDDs with the HDD drawing number, primary feature crossed, beginning and ending mileposts, and approximate length.

Table 3.0-1 HDD Locations

HDD Drawing Number	Primary Feature Crossed	Begin MP	End MP	Length (feet)
P4-1	US Highway 62	0.6	0.8	1,233
P4-2	State Highway 8	1.5	1.5	316
P4-3	Texas and New Mexico Railway	9.6	9.8	1,314
P4-4	State Highway 18	10.5	10.8	1,365



0 400 800 Feet

1:9,600

Northern Natural Gas. | Enerjent

For Environmental Review Purposes Only

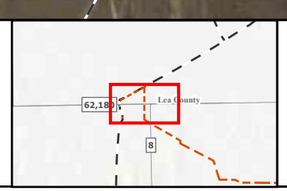
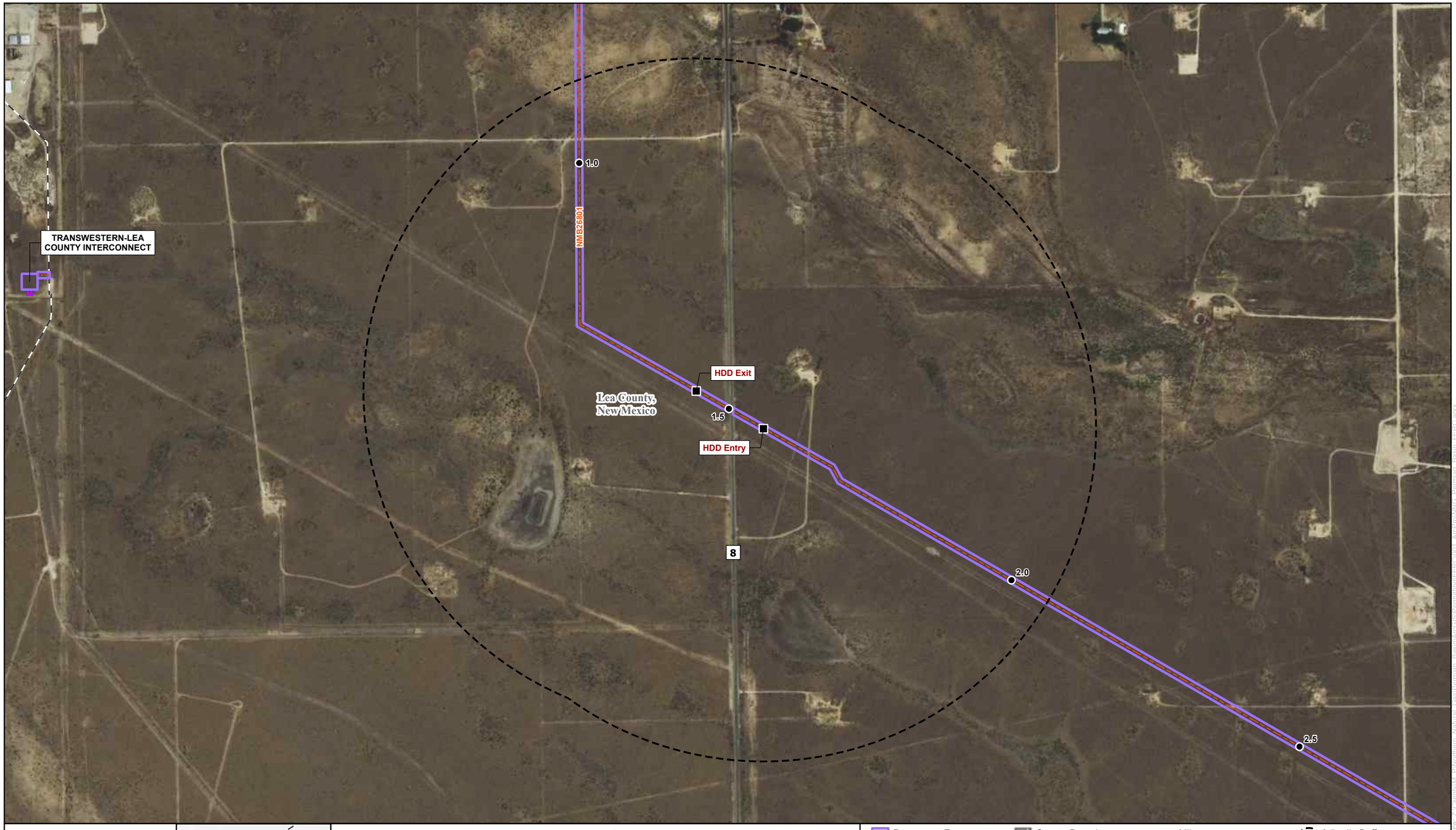


Figure 3.0-1: Noise Sensitive Areas

P4-1 US Highway 62
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

- Existing Easement
- Permanent Easement
- Permanent Access Road
- County Boundary
- Milepost
- HDD Entry/Exit
- Proposed Pipeline
- Existing Pipeline
- Measurement Location
- Noise Sensitive Area
- 0.5-mile Buffer

Source: Z:\Clients\M_P\Northern_Natural_Gas\Permian_Basin\ArcGIS\Permitting\FERC\001_AtoP\roNNG_Permian_Basin_FERC.aprx
Date: 4/27/2026



0 350 700 Feet

1:8,400

Northern Natural Gas. A BERKSHIRE HATHAWAY ENERGY COMPANY

Merjent

For Environmental Review Purposes Only

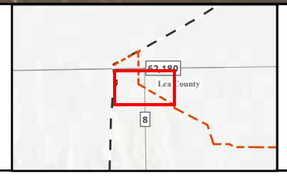


Figure 3.0-2: Noise Sensitive Areas

P4-2 State Highway 8
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

- Permanent Easement
- Permanent Access Road
- County Boundary
- Milepost
- HDD Entry/Exit
- Proposed Pipeline
- Existing Pipeline
- 0.5-mile Buffer

Source: Z:\Clients\M_P\Northern_Natural_Gas\Permian_Basin\ArcGIS\Permitting\FERC\001_ArcPro\NNG_Permian_

Date: (4/27/2026)

9.0
9.5
HDD Exit
NMB26801
HDD Entry
10.0
10.5
Lea County,
New Mexico
Co Rd 42
18
Monument Hwy
Mc Neil St
S Bronco Dr
S Gasper St
Location 2
NSA #3
NSA #4
NSA #5
NSA #6
NSA #7
NSA #8
NSA #9
NSA #10
NSA #11
NSA #12
NSA #13
NSA #14

0 350 700 Feet

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Northern Natural Gas.

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N

Lea County

Figure 3.0-3: Noise Sensitive Areas

P4-3 Texas and New Mexico Railway
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

Permanent Easement
County Boundary
Milepost
HDD Entry/Exit
Proposed Pipeline
Measurement Location
Noise Sensitive Area
0.5-mile Buffer

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Date: (4/27/2026)

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Northern Natural Gas. A BERKSHIRE HATHAWAY ENERGY COMPANY

Kinder Morgan

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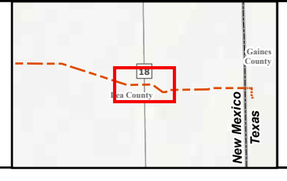

Figure 3.0-4: Noise Sensitive Areas

P4-4 State Highway 18
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

Permanent Easement
County Boundary
Milepost
HDD Entry/Exit
Proposed Pipeline
Measurement Location
Noise Sensitive Area
0.5-mile Buffer

Source: Z:\Clients\NG_PN\Northern_Natural_Gas\Permian_Basin\ArcGIS\Permitting\PERC\001_ArcPro\NNG_Permian_Basin_PERC.aprx

Date: (4/27/2026)

4.0 EXISTING AMBIENT SOUND LEVELS

Pre-construction sound level measurements and verification of the NSA locations near the HDD sites were completed by Behrens and Associates between March 23 and March 25, 2026. The daytime meteorological conditions during the measurements were 65 to 75 degrees Fahrenheit ambient air temperature, with winds generally from the west to southwest at speeds of approximately 10 to 18 miles per hour, and dew point temperatures ranging from 25 to 40 degrees Fahrenheit. The nighttime meteorological conditions during the measurements were characterized by ambient air temperatures ranging from approximately 45 to 60 degrees Fahrenheit, winds from the west to northwest at speeds of approximately 5 to 10 miles per hour, and dew point temperatures ranging from approximately 20 to 35 degrees Fahrenheit. Sound level measurements were taken in ambient A-weighted L_{eq} and ambient unweighted by octave-band sound pressure levels (SPL). The acoustical measurements were completed using a Type 1 TSI Quest SP-DL 2 sound level meter equipped with a 0.5-inch diameter microphone with a windscreen.

Tables 4.0-2, 4.0-3, and 4.0-4 summarize the existing L_{dn} at the identified NSAs for the planned 24-hour drill crossings and the measured ambient daytime equivalent (L_d) and measured ambient nighttime equivalent (L_n) sound levels. There were no NSAs identified within a 0.5 mile of the drill entry or exit point of P4-2 (State Highway 8 crossing); therefore, the construction noise impacts of the 24-hour drilling activity was not included in this analysis.

Table 4.0-1 NSAs and Measured Ambient Sound Levels within 0.5 Mile of P4-1

NSA	Description	Distance and Direction from HDD Entrance	Distance and Direction from HDD Exit	Measured Ambient L_d (dBA)	Measured Ambient L_n (dBA)	Calculated Ambient L_{dn} (dBA)
1	Residence	1,663 ft. East	1,957 ft. Northeast	74.3	73.3	79.8
2	Residence	2,035 ft. Southeast	1,670 ft. East	74.3	73.3	79.8

Note: NSA = Noise Sensitive Area; HDD = horizontal directional drill; Ld = daytime equivalent sound level; Ln = nighttime equivalent sound level; Ld = day-night sound level; dBA = A-weighted decibel; ft. = feet.

Table 4.0-2 NSAs and Measured Ambient Sound Levels within 0.5 Mile of P4-3

NSA	Description	Distance and Direction from HDD Entrance	Distance and Direction from HDD Exit	Measured Ambient L_d (dBA)	Measured Ambient L_n (dBA)	Calculated Ambient L_{dn} (dBA)
3	Residence	1,600 ft South	2,435 ft Southeast	67.5	62.3	69.9
4	Residence	1,568 ft South-Southeast	2,611 ft Southeast	67.5	62.3	69.9
5	Residence	1,672 ft South-Southeast	2,810 ft Southeast	67.5	62.3	69.9
6	Residence	1,762 ft Southeast	2,956 ft Southeast	67.5	62.3	69.9
7	Residence	2,988 ft Southeast	3,254 ft Southeast	67.5	62.3	69.9
8	Residence	1,881 ft South-Southeast	3,036 ft Southeast	67.5	62.3	69.9
9	Residence	2,208 ft Southeast	3,424 ft Southeast	67.5	62.3	69.9
10	Residence	2,089 ft Southeast	3,267 ft Southeast	67.5	62.3	69.9
11	Residence	2,201 ft Southeast	3,348 ft Southeast	67.5	62.3	69.9
12	Residence	2,394 ft Southeast	3,501 ft Southeast	67.5	62.3	69.9

Table 4.0-2 NSAs and Measured Ambient Sound Levels within 0.5 Mile of P4-3

NSA	Description	Distance and Direction from HDD Entrance	Distance and Direction from HDD Exit	Measured Ambient L_d (dBA)	Measured Ambient L_n (dBA)	Calculated Ambient L_{dn} (dBA)
13	Residence	2,187 ft South-Southeast	3,231 ft Southeast	67.5	62.3	69.9
14	Residence	2,013 ft South-Southeast	3,109 ft Southeast	67.5	62.3	69.9

Note: NSA = Noise Sensitive Area; HDD = horizontal directional drill; Ld = daytime equivalent sound level; Ln = nighttime equivalent sound level; Ld = day-night sound level; dBA = A-weighted decibel; ft = feet.

Table 4.0-3 NSAs and Measured Ambient Sound Levels within 0.5 Mile of P4-4

NSA	Description	Distance and Direction from HDD Entrance	Distance and Direction from HDD Exit	Measured Ambient L_d (dBA)	Measured Ambient L_n(dBA)	Calculated Ambient L_{dn} (dBA)
7	Residence	3,725 ft West-Southwest	2,303 ft West-Southwest	64.4	59.9	67.3
15	Residence	2,883 ft West-Southwest	1,753 ft Southwest	64.4	59.9	67.3
16	Residence	2,606 ft West-Southwest	1,579 ft Southwest	64.4	59.9	67.3
17	Residence	2,257 ft West-Southwest	1,380 ft Southwest	64.4	59.9	67.3
18	Residence	3,022 ft Southwest	2,078 ft Southwest	64.4	59.9	67.3
19	Residence	3,203 ft Southwest	2,201 ft Southwest	64.4	59.9	67.3
20	Residence	2,917 ft Southwest	2,021 ft Southwest	64.4	59.9	67.3
21	Residence	3,275 ft Southwest	2,315 ft Southwest	64.4	59.9	67.3
22	Residence	3,034 ft Southwest	2,212 ft Southwest	64.4	59.9	67.3
23	Residence	3,375 ft Southwest	2,523 ft Southwest	64.4	59.9	67.3
24	Residence	3,104 ft Southwest	2,353 ft Southwest	64.4	59.9	67.3
25	Residence	1,719 ft Southwest	1,629 ft Southeast	64.4	59.9	67.3
26	Residence	1,957 ft Northeast	3,207 ft East-Northeast	69.8	69.6	76.1

Note: NSA = Noise Sensitive Area; HDD = horizontal directional drill; Ld = daytime equivalent sound level; Ln = nighttime equivalent sound level; Ld = day-night sound level; dBA = A-weighted decibel; ft = feet.

5.0 ACOUSTICAL ANALYSIS

This acoustical analysis was performed using SoundPLAN version 9.1, a commercial modeling package developed by SoundPLAN GmbH, which models sound propagation according to the ISO 9613-2 standard to estimate the sound levels attributable to the Project at the NSAs and the estimated increase in sound level at the NSAs. The sound modeling results for both unmitigated and mitigated scenarios are provided in Appendix A of this report.

The acoustical analysis uses noise specifications from HDD equipment at similar projects. Below are the assumed noise generating activities for the entry and exit sites associated with these noise specifications.

Entry Site

- Drilling rig and separate engine-driven hydraulic power unit.
- Mud mixing/cleaning system and associated engine-driven generator.
- High pressure engine-driven pump.
- Small crane, trackhoe, front loader and/or sideboom.
- Frac tanks (i.e., utilized for water & drilling mud storage) and welding machine(s).
- Possibly one (1) additional engine-driven generator set and small engine-driven pump.
- Engine-driven light plants (used for nighttime operation).

Exit Site

- Trackhoe, sideboom and/or trucks.
- Possibly one (1) engine-driven generator set and one (1) “small” engine-driven pump.
- Engine-driven light plants (used for nighttime operation).

Tables 5.0-1, 5.0-2, 5.0-3, and the noise modelling results included as Appendix A summarize the estimated sound levels (L_{dn}) attributable to drilling activities and estimated sound level increase at each of the nearest NSAs.

Table 5.0-1 Estimated Unmitigated NSA Sound Levels at P4-1

NSA	Measured Ambient Sound Level L_{dn} (dBA)	Sound Level L_{dn} Attributable to Project (dBA)	Estimated Total L_{dn} (dBA)	Estimated Increase (dB)
1	79.8	50.1	79.8	0.0
2	79.8	49.8	79.8	0.0

Note: NSA = Noise Sensitive Area; L_{dn} = day-night sound level; dBA = A-weighted decibel; dB = decibel.

Table 5.0-2 Estimated Unmitigated NSA Sound Levels at P4-3

NSA	Measured Ambient Sound Level L_{dn} (dBA)	Sound Level L_{dn} Attributable to Project (dBA)	Estimated Total L_{dn} (dBA)	Estimated Increase (dB)
3	69.9	49.8	69.9	0.0
4	69.9	50	69.9	0.0
5	69.9	49.7	69.9	0.0
6	69.9	49.6	69.9	0.0
7	69.9	48.6	69.9	0.0
8	69.9	48.9	69.9	0.0
9	69.9	47.7	69.9	0.0
10	69.9	48.1	69.9	0.0
11	69.9	47.6	69.9	0.0
12	69.9	46.6	69.9	0.0
13	69.9	47.2	69.9	0.0

Table 5.0-2 Estimated Unmitigated NSA Sound Levels at P4-3

NSA	Measured Ambient Sound Level L_{dn} (dBA)	Sound Level L_{dn} Attributable to Project (dBA)	Estimated Total L_{dn} (dBA)	Estimated Increase (dB)
14	69.9	48.1	69.9	0.0

Note: NSA = Noise Sensitive Level; L_{dn} = day-night sound level; dBA = A-weighted decibel; dB = decibel.

Table 5.0-3 Estimated Unmitigated NSA Sound Levels at P4-4

NSA	Measured Ambient Sound Level L_{dn} (dBA)	Sound Level L_{dn} Attributable to Project (dBA)	Estimated Total L_{dn} (dBA)	Estimated Increase (dB)
7	69.9	44.4	69.9	0.0
15	67.3	46.7	67.3	0.0
16	67.3	47.6	67.3	0.0
17	67.3	48.8	67.4	0.1
18	67.3	45.8	67.3	0.0
19	67.3	45.1	67.3	0.0
20	67.3	46.1	67.3	0.0
21	67.3	44.9	67.3	0.0
22	67.3	45.5	67.3	0.0
23	67.3	45.2	67.3	0.0
24	67.3	48.2	67.4	0.1
25	67.3	50.6	67.4	0.1
26	76.1	49.7	76.1	0.0

Note: NSA = Noise Sensitive Level; L_{dn} = day-night sound level; dBa = A-weighted decibel; dB = decibel.

Tables 5.0-1, 5.0-2, and 5.0-3 and the modelling results in Appendix A show that unmitigated HDD activities at all identified NSAs are not expected to exceed the FERC dBA L_{dn} guideline.

6.0 SOUND MITIGATION MEASURES

As shown in Table 5.0-1, the predicted unmitigated sound level during 24-hour HDD activities will not exceed the FERC guideline of 55 dBA L_{dn} or 10 dB over the measured ambient sound level where ambient levels are over 55 dBA L_{dn}. Based on the predicted HDD-related sound levels and the applicable FERC guidance, no mitigation is currently proposed.

7.0 SUMMARY

The unmitigated sound levels attributable to the HDD activities are estimated to remain in compliance with the FERC guidelines at all identified NSAs. No mitigation is therefore planned for the Project. However, if noise complaints are received during construction, Northern will investigate the complaint to determine whether Project-related activities are the source. If warranted, Northern will implement reasonable and practicable noise control measures to reduce noise levels. Northern will maintain a record of any complaints and resolutions and will coordinate with the affected landowners to address concerns in a timely manner.

8.0 SOUND PRINCIPLES

Decibels

Sound is typically regulated based on the unit of measure called a decibel (dB). A decibel represents a logarithmic correlation between a sound pressure and a reference pressure (0.00002 Newtons/meter^2) as shown in the equation below.

$$dB = 20\,Log_{10}\left(\frac{P}{P_0}\right)$$

where:

P = sound pressure

P_0 = reference sound pressure (0.00002 N/m^2)

A-weighting

Sound is composed of varying pressure at specific frequencies. Because the human ear is more sensitive to pressure at some frequencies and less at others, an A-weighting is often applied to dB sound levels to represent A-weighted decibels (dBA). Most environmental noise standards are written in terms of dBA because the primary purpose of the regulations is to limit impacts to human beings.

Decibel Calculations

In general, the predicted A-weighted sound level contributed by drilling activities was calculated from estimated sound pressure levels measured at another drill rig while in operation. The sound pressure levels generally reduce over distance following the logarithmic function shown below.

$$L_2 = L_1 - \left|20LOG\left(\frac{r1}{r2}\right)\right|$$

Where:

L1 = sound pressure level (dB) at distance r1 from source
L2 = sound pressure level (dB) at distance r2 from source
r = distance in meters from source
All noise levels are in dBA.

Summary of Typical Metrics and Acoustical Terminology

Daytime Equivalent Sound Level (L_d) The daytime equivalent sound level is the level determined to represent the equivalent (average) sound level (in dB) for the time period between 7 a.m. and 10 p.m. for a given location.

Nighttime Equivalent Sound Level (L_n) The nighttime equivalent sound level is the level determined to represent the equivalent (average) sound level (in dB) for the time period between 10 p.m. and 7 a.m. for a given location.

Equivalent Continuous Sound Level (L_{eq}) quantifies the sound as a single value to represent the sound level at a specific location for a specific duration. The L_{eq} is sometimes referred to as the "average" sound level.

Day-Night Sound Level (L_{dn}) The day-night sound level (L_{dn}) is a 24-hour average A-wt. L_{eq} of the measured L_d and L_n with 10 dB added to the sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m. to compensate for enhanced receptor sensitivity during the nighttime. For a source that operates at a continuous sound level over a 24- hour period, such as a compressor station, the L_{dn} is approximately 6.4 dB above the measured L_{eq}.

$$L_{dn} = 10\log_{10}\left(\frac{15}{24}10^{L_d/10} + \frac{9}{24}10^{(L_n+10)/10}\right)$$

Sound Power Level (L_w or PWL) Sound power is the total sound energy radiated by a source, in all directions indexed to a reference power. A reference power of a picowatt or 10-12 watt is conventionally used.

Appendix A

NOISE MODELING RESULTS

HOBBS COMPRESSOR STATION

0.0

0.0

NMB26901

0.5

1.0

HOBBS-PLAINS
BIDIRECTIONAL RECEIVER

65 dba

0.5

HDD Entry

Lea County,
New Mexico

60 dba

62,180

NMB26801

NSA #1

Location 1

55 dba

NSA #2

65 dba

HDD Exit

50 dba

1.0

8

TRANSWESTERN-LEA
COUNTY INTERCONNECT

40 dba

45 dba

40 dba

0 400 800 Feet

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Northern Natural Gas

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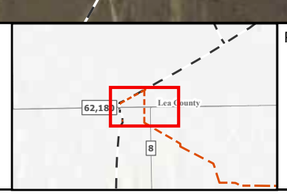

Appendix A: Noise Modeling Results

P4-1 US Highway 62

Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

- Existing Easement
- Permanent Easement
- Permanent Access Road
- County Boundary
- Milepost
- HDD Entry/Exit
- Proposed Pipeline
- Existing Pipeline
- Measurement Location
- Noise Sensitive Area
- Noise Contour (dbas)
- 0.5-mile Buffer

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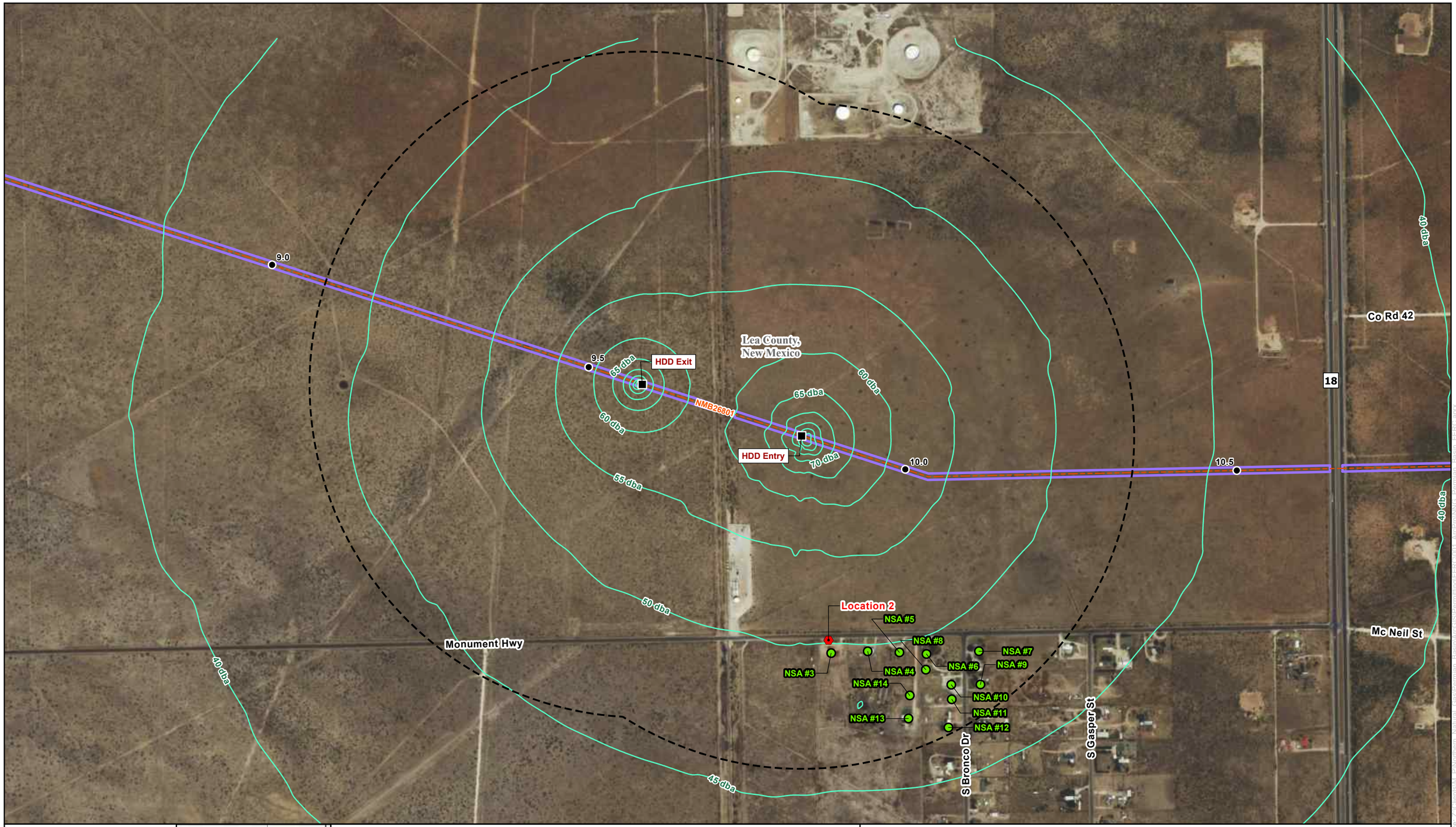
Date: 4/27/2026



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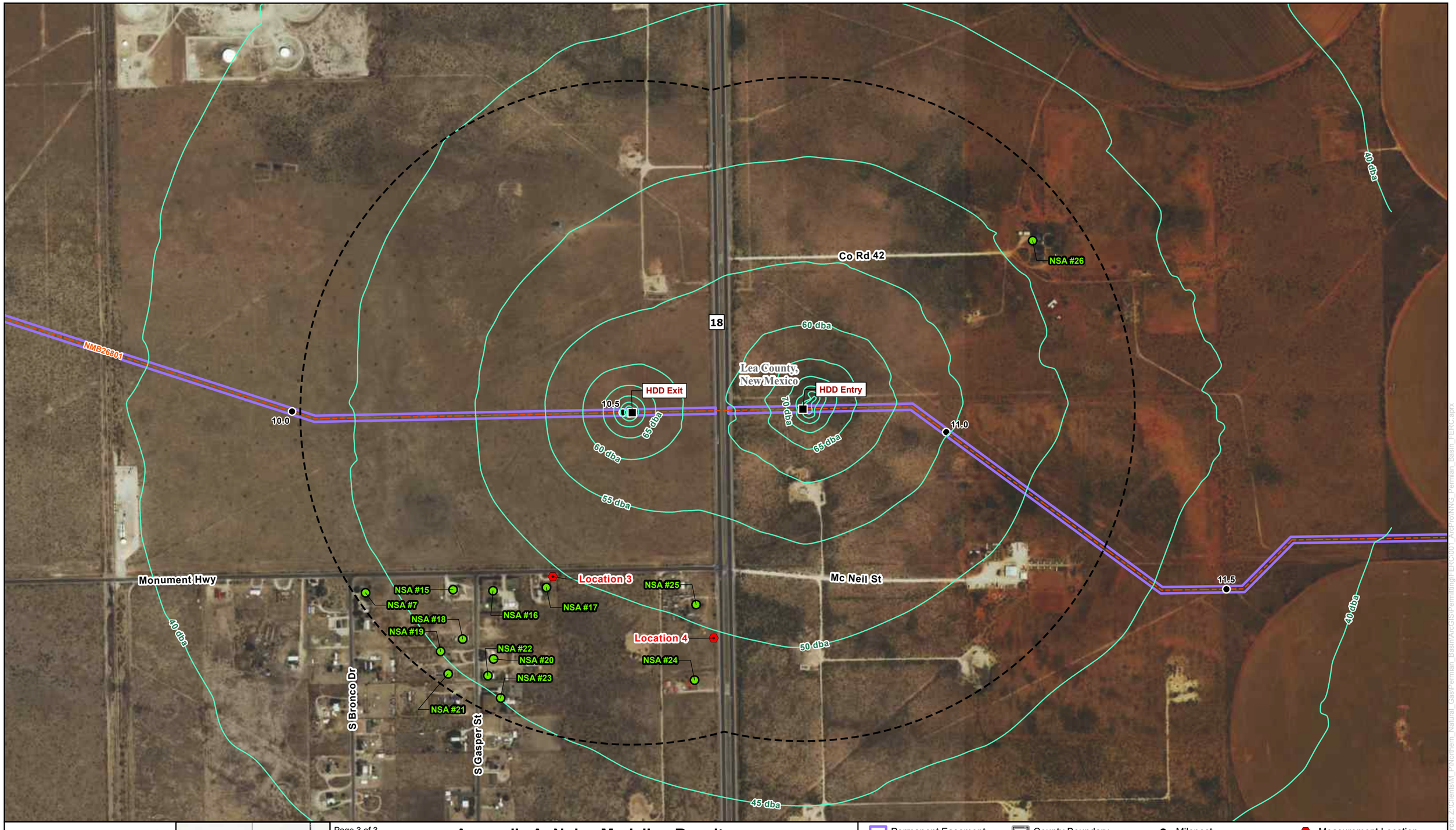
Appendix A: Noise Modeling Results

P4-3 Texas and New Mexico Railway
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

Permanent Easement
County Boundary
Milepost
HDD Entry/Exit
Proposed Pipeline
Measurement Location
Noise Sensitive Area
Noise Contour (dbas)
0.5-mile Buffer

Source: Z:\Clients\NI_P\Northern_Natural_Gas\Permian_Basin\ArcGIS\Permitting\FERC\001_ArcPro\NNG_Permian_Basin_FERC.aprx
Date: (4/27/2026)



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Appendix A: Noise Modeling Results

P4-4 State Highway 18
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

Permanent Easement
County Boundary
Milepost
HDD Entry/Exit
Proposed Pipeline
Measurement Location
Noise Sensitive Area
Noise Contour (dbas)
0.5-mile Buffer

Source: Z:\Clients\M_P\Northern_Natural_Gas\Permian_Basin\ArcGIS\Permitting\FERC\001_ArcPro\NNG_Permian_Basin_FERC.aprx
Date: (4/27/2026)

Ambient Sound Survey and Acoustical Analysis of

Hobbs Compressor Station

Permian Basin Expansion Project

May 2026

Prepared by:

merjent®

TABLE OF CONTENTS

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FIGURES

APPENDICES

ACRONYM LIST

A_{gr}	attenuation due to ground effects
CFR	Code of Federal Regulations
d	distance from source to receiver in meters
dB	decibel
dBA	A-weighted decibel
FERC	Federal Energy Regulatory Commission
FERC Guidance	*February 2017 Guidance for Environmental Report Preparation for Applications Filed Under the Natural Gas Act Volume 1*
h_m	mean height of propagation path in meters
L_d	daytime equivalent sound level
L_{dn}	day-night sound level
L_{eq}	equivalent continuous sound level
L_n	nighttime equivalent sound level
L_p	sound pressure level (dB) at distance r
L_w	sound power level in dB
Northern	Northern Natural Gas Company
NSA	noise-sensitive area
P	sound pressure
P0	reference sound pressure (0.00002 N/m^2)
Project	Permian Basin Expansion Project
Q	directivity factor (full sphere = 1, hemisphere = 2)
r	distance in meters from source
SPL	sound pressure level
STC	Sound Transmission Class

1.0 INTRODUCTION

Northern Natural Gas (Northern) proposes to construct, own, operate, and maintain the Permian Basin Expansion (Project), which includes the construction of a new compressor station, Hobbs Compressor Station, located in Lea County, New Mexico. Hobbs Compressor Station will consist of one Solar Taurus 60 compressor unit rated at 7,700 horsepower and associated equipment. The purpose of this acoustical assessment is to estimate the potential sound contribution of the operation of the new compressor station at noise-sensitive areas (NSA), such as residences, schools, churches, and hospitals located within one mile. The construction noise from the Project will be temporary, intermittent, and limited to daytime hours. Therefore, detailed construction noise modeling is not required per Federal Energy Regulatory Commission (FERC) *February 2017 Guidance for Environmental Report Preparation for Applications Filed Under the Natural Gas Act, Volume 1* (FERC Guidance).

2.0 SOUND CRITIERIA

A summary of applicable acoustical terminology in this report and description of typical metrics used to measure and regulate environmental noise is provided Section 8.0 of the report.

2.1 POTENTIALLY APPLICABLE NOISE REGULATIONS

2.1.1 Federal Criteria

FERC regulation, 18 Code of Federal Regulation (CFR) 380.12(k)(4)(v)(A), limits the noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, to the day-night sound level (L_{dn}) of 55 A-weighted decibels (dBA) at pre-existing NSAs.

FERC Guidance requires project applicants that will be completing horizontal directional drilling, direct pipe installation, well drilling or other construction activities that will occur 24 hours per day (i.e., during nighttime hours) to quantify the potential noise levels at nearby NSAs and provide details of any noise mitigation (or propose alternate measures such as temporary relocation, compensation, etc.). FERC Guidance states that this work should be performed with the goal that any 24-hour construction activity contribute noise levels below 55 dBA L_{dn} and 48.6 dBA equivalent continuous sound level (L_{eq}), or no more than 10 decibels (dB) over background if ambient noise levels are above 55 dBA L_{dn}. Compressor station noise attributable to a new or modified facility must not exceed 55 dBA L_{dn} or if an existing station NSA already has an L_{dn} greater than 55 dBA, an addition or modification must not cause the noise level at the NSA to increase.

3.0 SITE DESCRIPTION – LOCATION OF NSA

Hobbs Compressor Station is located north of U.S. Highway 62, approximately 5 miles west of Hobbs, New Mexico. Two residences were identified within 1 mile of the site. These NSA locations are shown in Figure 3.0-1.

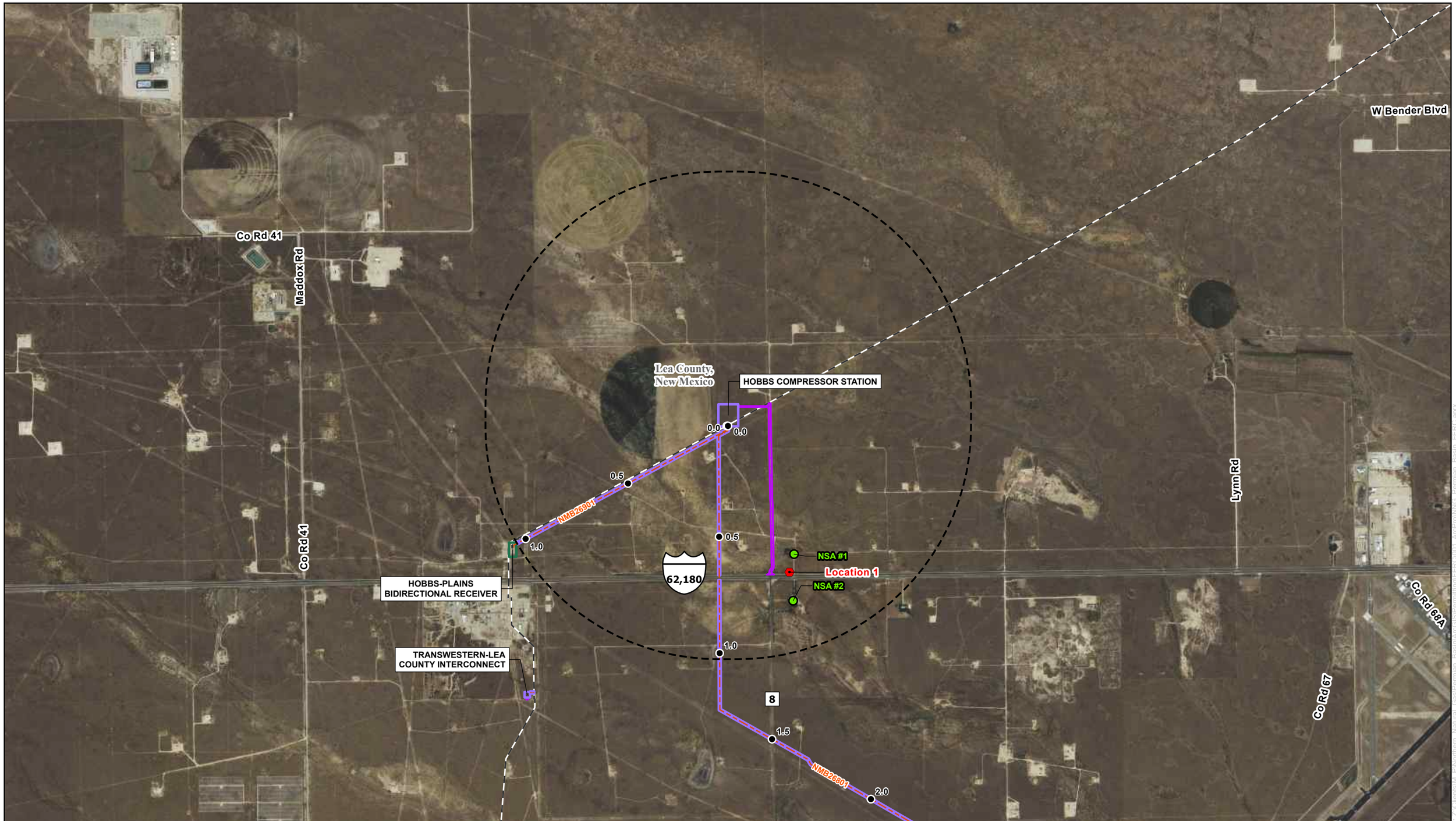

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Figure 3.0-1: Noise Sensitive Areas

Hobbs Compressor Station
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

- Existing Easement
- Permanent Easement
- Permanent Access Road
- County Boundary
- Milepost
- Proposed Pipeline
- Existing Pipeline
- Measurement Location
- Noise Sensitive Area
- 1-mile Buffer

Source: Z:\Clients\...\Natural_Gas\Permian_Basin\ArcGIS\Permitting\FERC\001_ArcPro\NNG_Permian_Basin_FERC.aprx

Date: (4/27/2026)

4.0 EXISTING AMBIENT SOUND LEVELS

Pre-construction sound level measurements and verification of the NSA locations near Hobbs Compressor Station were completed by Behrens and Associates between March 23 and March 25, 2026. The daytime meteorological conditions during the measurements were 65-75 degrees Fahrenheit ambient air temperature, with winds generally from the west to southwest at speeds of approximately 10 to 18 miles per hour, and dew point temperatures ranging from 25 to 40 degrees Fahrenheit. The nighttime meteorological conditions during the measurements were characterized by ambient air temperatures ranging from approximately 45 to 60 degrees Fahrenheit, winds from the west to northwest at speeds of approximately 5 to 10 miles per hour, and dew point temperatures ranging from approximately 20 to 35 degrees Fahrenheit. Sound level measurements were taken in ambient A-weighted L_{eq} and ambient unweighted by octave-band sound pressure levels (SPL). The acoustical measurements were completed using a Type 1 TSI Quest SP-DL 2 sound level meter equipped with a 0.5-inch diameter microphone with a windscreen. The noise in the area was heavily dominated by constant heavy truck traffic on U.S. Highway 62. Table 4.0-1 summarizes the existing L_{eq} and L_{dn} at the nearest NSAs.

TABLE 4.0-1 NSA and Measured Ambient Sound Level within 1 Mile of Hobbs Compressor Station

NSA	Description	Distance and Direction from Hobbs Compressor Station	Measured L_d (dBA)	Measured L_n (dBA)	Calculated L_n (dBA)
1	Residence	3,142 feet South Southeast	74.3	73.3	79.8
2	Residence	4,078 feet South Southeast	74.3	73.3	78.8

Note: NSA = Noise Sensitive Area; L_d = daytime equivalent sound level; L_n = nighttime equivalent sound level; dBA = A-weighted decibel.

5.0 ACOUSTICAL ANALYSIS

This acoustical analysis was performed using SoundPLAN version 9.1, a commercial modeling package developed by SoundPLAN GmbH, which models sound propagation according to the ISO 9613-2 standard to estimate the sound levels attributable to the Project at the NSAs and the estimated increase in sound level at the NSAs. The sound modeling results for both unmitigated and mitigated scenarios are provided in Appendix A of this report.

The acoustical analysis includes the significant noise sources at Hobbs Compressor Station. There may be additional noise sources other than those analyzed; however, it is believed that these sources would not be significant given their sound power levels relative to the sources in this analysis. The noise analysis only calculates the NSAs within 1 mile of the compressor building, considered the acoustic center of the compressor station. The noise modeling results of the Project, represented as sound contour lines, are included as Appendix A of this report.

The following sound sources were considered significant for the purposes of this analysis.

- Combustion turbine casing and compressor noise that is emitted from the compressor building;
- Turbine exhaust stack (point of release);
- Combustion turbine air intake;
- Gas aftercoolers and associated piping; and

- Lube oil cooler and associated piping.

The unmitigated sound model assumes that the engine and gas compressor are located inside an acoustically-insulated metal building, rated to at least a Sound Transmission Class (STC) rating of 40, per building specifications and engineering drawings provided by Northern for the Project.

Table 5.0-1 summarizes the estimated unmitigated sound levels (L_{dn}) attributable to the Hobbs Compressor Station at the identified NSAs.

TABLE 5.0-1 Modeled Sound Level at NSAs – Hobbs Compressor Station, Unmitigated

NSA	Ambient Sound Level L_{dn} (dBA)	Modeled Sound Level L_{dn} Attributable to Station (dBA), unmitigated	Calculated Total Sound Level + Ambient (L_{dn} dBA)	Estimated Increase (dB)	Applicable FERC Limit
1	79.8	47.5	79.8	0.0	55 dBA
2	79.8	45.1	79.8	0.0	55 dBA

Note: NSA = Noise Sensitive Area; L_{dn} = day-night sound level; dBA = A-weighted decibel; dB = decibel; FERC = Federal Energy Regulatory Commission.

The predicted unmitigated sound levels during the operation of Hobbs Compressor Station will not exceed the FERC guideline of 55 dBA L_{dn} or 10 dB over the measured ambient sound level where ambient sound levels are over 55 dBA L_{dn}. Additionally, due to the existing ambient sound levels dominated by highway traffic, the modeled contribution from the Hobbs Compressor Station does not result in a perceptible increase in total sound levels at the identified NSAs. Based on the predicted operational sound levels, no mitigation is currently proposed.

6.0 SOUND MITIGATION MEASURES

As shown in Table 5.0-1, the predicted unmitigated sound level due to the operation of the Hobbs Compressor Station will not exceed the FERC guideline of 55 dBA Ldn or 10 dB over the measured ambient sound level where ambient levels are over 55 dBA Ldn. As such, no sound mitigation measures are required beyond the inherent compressor building design specifications provided by Northern. These building specifications are described below in Section 6.1.

6.1 BUILDING ENCLOSURE

The unmitigated scenario models the engine and gas compressor inside an acoustically-insulated metal building, rated to at least a STC rating of 40. The building design requirements are as follows.

- No windows should be installed in the building walls.
- Doors should be acoustically insulated, designed to meet an STC rating of at least 20. Doors should remain closed when not being passed through, and doors should seal well when closed.

6.2 TURBINE PACKAGE

Sound power levels are based on manufacturer specifications from Solar Turbines for a Solar Taurus 60 Gas Turbine with a sound power rating of 119.6 dBA.

6.3 ENGINE EXHAUST

Sound power levels are based on manufacturer specifications from Solar Turbines for a Solar Taurus 60 Gas Turbine combustion exhaust with a sound power rating of 108.8 dB.

6.4 LUBE OIL COOLER

Sound pressure levels are based on sound pressure specification supplied by Northern. The lube oil cooler has an assumed sound pressure level of 68 dBA at 50 feet.

6.5 ENGINE AIR INTAKE

Sound power levels for the unmitigated air intake are based on manufacturer's specifications from Solar Turbines for a Taurus 60 Gas turbine with a sound power rating of 110.7 dBA.

6.6 GAS AFTERCOOLER

The sound power levels for the two gas aftercoolers were based on manufacturer specifications provided by Northern, with a sound power level of 82.9 dBA each.

6.7 ABOVEGROUND PIPING

For purposes of the sound modeling analysis, any associated piping was conservatively assumed to be unwrapped for the sound model. Piping that penetrates the compressor building should be designed to be tightly sealed, with no gaps between the pipe and the building wall, thereby limiting sound transmission through the compressor building enclosure.

7.0 SUMMARY

As shown in Table 5.0-1, the unmitigated sound levels attributable to the Project will result in no change in noise from the Hobbs Compressor Station at each identified NSA. Therefore, no additional noise mitigation measures are required beyond inherent design features in order to comply with FERC regulations. Northern is committed to achieving full compliance with the FERC regulations and will implement any required mitigation to ensure adherence to the applicable noise limits. Table 5.0-1 shows the operational sound levels and Section 6.0 provides recommended sound mitigation measures.

8.0 SOUND PRINCIPLES

Decibels

Sound is typically regulated based on the unit of measure called a decibel (dB). A decibel represents a logarithmic correlation between a sound pressure and a reference pressure (0.00002 Newtons/meter^2) as shown in the equation below.

$$dB = 20\ LOG_{10}\ (\frac{P}{P_0})$$

Where:

P = sound pressure
P0 = reference sound pressure (0.00002 N/m^2)

A-weighting

Sound is composed of varying pressure at specific frequencies. Because the human ear is more sensitive to pressure at some frequencies and less at others, an A-weighting is often applied to dB sound levels to represent A-weighted decibels (dBA). Most environmental noise standards are written in terms of dBA because the primary purpose of the regulations is to limit impacts on human beings.

Decibel Calculations

In general, the predicted A-weighted sound level contributed by the operation of the Hobbs Compressor Station was calculated from estimated sound power levels according to manufacturer specifications.

The sound power levels are reduced by hemispherical sound propagation (as a function of distance from the Compressor Station) and other effects such as ground effects, atmospheric attenuation, shielding, and vegetation.

The sound levels attributable to the operation of the Hobbs Compressor Station at the nearest NSAs are then logarithmically summed with the background noise levels determined by ambient noise measurement.

Attenuation

Sound attenuation can occur as a result of geometrical divergence (radiation outward from source), atmospheric absorption, ground effects, sound barriers, and other miscellaneous effects. For this Project, the geometrical divergence assumes that the sound will radiate hemispherically (imagine the earth as the floor/plane and the sound radiating in all directions except through the earth's surface). The sound decreases with distance due to hemispherical radiation. Specifically, the sound power levels reduced based on the attenuation distance using the following formula.

$$L_P = L_W - \left|10LOG\left(\frac{Q}{4\pi r^2}\right)\right| \quad (Equation\ 1)$$

Where:

L_p = sound pressure level (dB) at distance r
L_w = sound power level in dB
Q = directivity factor (full sphere = 1, hemisphere = 2)
r = distance in meters from source

Equation 1 can then be simplified to the following form for hemispherical propagation.

$$L_P = L_W - 20LOG(r) - 8 \quad (Equation\ 2)$$

Air molecules absorb sound energy, but the amount of absorption depends on the temperature and relative humidity of air and frequency of sound. For this analysis, atmospheric absorption is calculated using ISO 9613-1 assuming 15 degrees Celsius and 70% relative humidity.

Attenuation due to ground effects can also occur between a low elevation (near ground level) noise source and low elevation receptor (such as a residence). Calculating ground effects can be

completed as a function of the sound frequency or, in the absence of octave band sound level data, ground effects can be calculated for overall dBA levels using the following equation from ISO 9613-2.

$$A_{gr} = 4.8 - \left(\frac{2h_m}{d}\right)\left[17 + \left(\frac{300}{d}\right)\right] \quad (Equation\ 3)$$

Where:

A_{gr} = attenuation due to ground effects
h_m = mean height of propagation path in meters
d = distance from source to receiver in meters

Operational noise due to the Hobbs Compressor Station was completed using SoundPLAN version 9.1, which is based on published engineering standards and uses ISO9613-2 to model sound propagation.

Summary of Typical Metrics and Acoustical Terminology

Daytime Equivalent Sound Level (L_d) The daytime equivalent sound level is the level determined to represent the equivalent (average) sound level (in dB) for the time period between 7 a.m. and 10 p.m. for a given location.

Nighttime Equivalent Sound Level (L_n) The nighttime equivalent sound level is the level determined to represent the equivalent (average) sound level (in dB) for the time period between 10 p.m. and 7 a.m. for a given location.

Equivalent Continuous Sound Level (L_{eq}) quantifies the sound as a single value to represent the sound level at a specific location for a specific duration. The L_{eq} is sometimes referred to as the average sound level.

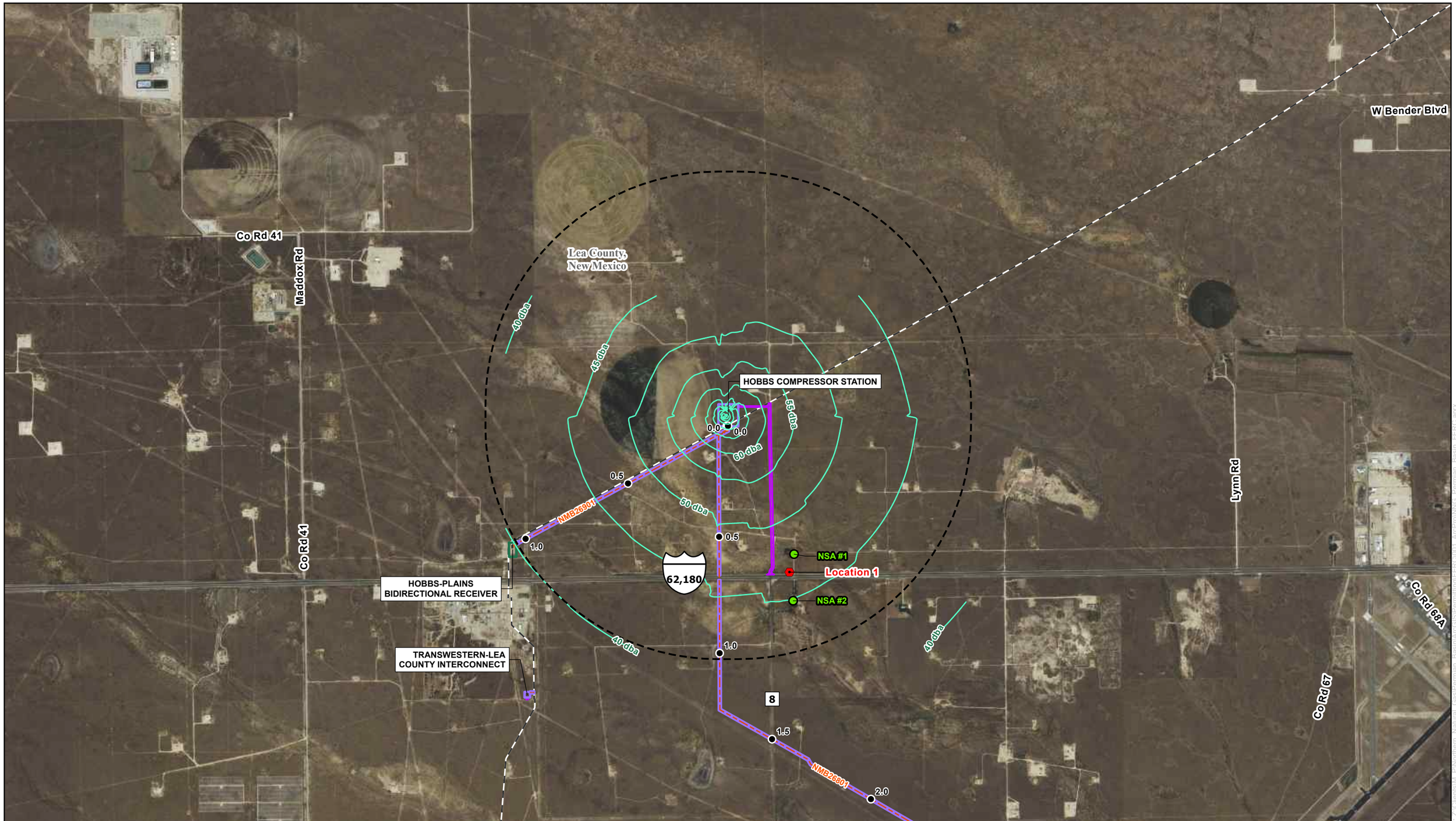
Day-Night Sound Level (L_{dn}) The day-night sound level is a 24-hour average A-wt. L_{eq} of the measured L_d and L_n with 10 dB added to the sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m. to compensate for enhanced receptor sensitivity during the nighttime. For a source that operates at a continuous sound level over a 24-hour period, such as a compressor station, the L_{dn} is approximately 6.4 dB above the measured L_{eq}.

$$L_{dn} = 10\log_{10}\left(\frac{15}{24}10^{L_d/10} + \frac{9}{24}10^{(L_n+10)/10}\right)$$

Sound Power Level (L_w or PWL) Sound power is the total sound energy radiated by a source, in all directions indexed to a reference power. A reference power of a picowatt or 10-12 watt is conventionally used.

APPENDIX A

Noise Modeling Results



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Appendix A: Noise Modeling Results

Hobbs Compressor Station
Permian Basin Expansion Project
Northern Natural Gas
Lea County, New Mexico
Gaines and Yoakum Counties, Texas

- Existing Easement
- Permanent Easement
- Permanent Access Road
- County Boundary
- Milepost
- Proposed Pipeline
- Existing Pipeline
- Measurement Location
- Noise Sensitive Area
- Noise Contour (dbas)
- 1-mile Buffer

Source: Z:\Clients\M_P\Northern_Natural_Gas\Permian_Basin\ArcGIS\Permitting\FERC\001_ArcPro\NNG_Permian_Basin_FERC.aprx

Date: (4/27/2026)