EXHIBIT 16

PLAQUEMINES

PLAQUEMINES EXPANSION, LLC
AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT

Resource Report 9

Air and Noise Quality

Docket No.
CP26-__-000

Prepared by
Burns & McDonnell Engineering Company, Inc.

November 2025

PLAQUEMINES EXPANSION, LLC AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT
RESOURCE REPORT 9 – AIR AND NOISE QUALITY

Resource Report 9 – Air and Noise Quality	
Full Filing Requirements	
Information	**Report Section Reference**
This report is required for applications involving compressor facilities at new or existing stations, and for all new liquefied natural gas (LNG) facilities. It must identify the effects of the project on the existing air quality and noise environment and describe proposed measures to mitigate the effects. Resource Report 9 must:	
☐ 1. Describe the existing air quality, including background levels of nitrogen dioxide and other criteria pollutants which may be emitted above U.S. Environmental Protection Agency-identified significance levels.	Section 9.2.2
☐ 2. Quantitatively describe existing noise levels at noise-sensitive areas, such as schools, hospitals, or residences and include any areas covered by relevant state or local noise ordinances. (i) Report existing noise levels as the L_{eq} (day), L_{eq} (night), and L_{dn} and include the basis for the data or estimates. (ii) For existing compressor stations, include the results of a sound level survey at the site property line and nearby noise-sensitive areas while the compressors are operated at full load. (iii) For proposed new compressor station sites, measure or estimate the existing ambient sound environment based on current land uses and activities. (iv) Include a plot plan that identifies the locations and duration of noise measurements, the time of day, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement.	Sections 9.3.4 and 9.3.5
☐ 3. Estimate the impact of the project on air quality, including how existing regulatory standards would be met. (i) Provide the emission rate of nitrogen oxides from existing and proposed facilities, expressed in pounds per hour and tons per year for maximum operating conditions, include supporting calculations, emission factors, fuel consumption rates, and annual hours of operation. (ii) For major sources of air emissions (as defined by the Environmental Protection Agency), provide copies of applications for permits to construct (and operate, if applicable) or for applicability determinations under regulations for the prevention of significant air quality deterioration and subsequent determinations.	Sections 9.2.3, 9.2.4, 9.2.5
☐ 4. Provide a quantitative estimate of the impact of the project on noise levels at noise-sensitive areas, such as schools, hospitals, or residences. (i) Include step-by-step supporting calculations or identify the computer program used to model the noise levels, the input and raw output data and all assumptions made when running the model, far-field sound level data for maximum facility operation, and the source of the data. (ii) Include sound pressure levels for unmuffled engine inlets and exhausts, engine casings, and cooling equipment; dynamic insertion loss for all mufflers; sound transmission loss for all compressor building components, including walls, roof, doors, windows and ventilation openings; sound attenuation from the station to nearby noise- sensitive areas; the manufacturer's name, the model number, the performance rating; and a description of each noise source and noise control component to be employed at the proposed compressor station. For proposed compressors the initial filing must include at least the proposed horsepower, type of compression, and energy source for the compressor. (iii) Far-field sound level data measured from similar units in service elsewhere, when available, may be substituted for manufacturer's far-field sound level data. (iv) If specific noise control equipment has not been chosen, include a schedule for submitting the data prior to certification. (v) The estimate must demonstrate that the project will comply with applicable noise regulations and show how the facility will meet the following requirements: a. (A) The noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not	Sections 9.3.5 and 9.3.6

Resource Report 9 – Air and Noise Quality	
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exceed a day-night sound level (L_{dn}) of 55 decibels on the A-weighted scale at any pre-existing noise-sensitive area (such as schools, hospitals, or residences). b. (B) New compressor stations or modifications of existing stations shall not result in a perceptible increase in vibration at any noise-sensitive area.	
☐ 5. Describe measures and manufacturer's specifications for equipment proposed to mitigate impact to air and noise quality, including emission control systems, installation of filters, mufflers, or insulation of piping and buildings, and orientation of equipment away from noise-sensitive areas.	Sections 9.2.4, 9.2.5, 9.3.4, and 9.2.5.

Federal Energy Regulatory Commission Comments dated September 30, 2025 on Draft Resource Report 9		
Number	**Comment**	**Response/Report Section Reference**
1	Provide the following related to operational emissions for all emissions-generating equipment, including, but not limited to, engines, turbines, dehydrators, generators, tanks, fugitive emissions, flares, heaters, meters, regulator facilities, pig launcher/receiver, etc.: a. completed table 9.2-2, presenting the total facility emissions; b. completed table 9.2-6, presenting the operational emissions summary; c. provide appendix 9C, Emission Calculations for Operation of Expansion Facilities; and d. provide appendix 9D, Emission Calculations for Marine Vessel and On-road Vehicle Operation and Air Quality Modeling for Expansion Facilities.	Tables 9.2-2 and 9.2-7 (formerly table 9.26) have been revised to present the total facility operational emissions for the Expansion Facilities, the incremental emissions increases at the Authorized Facilities associated with the Expansion Facilities, and the total combined emissions. See appendix 9C for Emission Calculations for Operation of the Expansion Facilities. See appendix 9D for Emission Calculations for Marine Vessels and On-road Vehicle emissions during operations for the Expansion Facilities. The air quality modeling analyses will be provided in a future supplemental filing.
2	Provide the completed table 9.2-3, presenting the U.S. Environmental Protection Agency (EPA) design values for areas near the Project. Provide a list of monitoring stations that identifies the criteria pollutant(s) it measures; monitor number; the owner/controller; location; distance and direction; and land use in the area (rural, suburban, urban), and indicate the years of valid data and the monitor type (SLAMS, NCore, etc.). Provide an appropriateness analysis to justify the selection of the monitoring stations.	Table 9.2-3 has been revised for the design values at the proposed monitoring stations. Section 9.2.3.1, Preconstruction Air Quality Monitoring, has been updated to include the justification for the selection of the proposed monitoring stations.
3	Provide the completed table 9.2-4, presenting the Project emissions and Q/d ratios. Include all correspondence with the Federal Land Manager regarding air quality effects from the facilities.	Table 9.2-4 has been revised for the Expansion Facilities, the incremental emissions increases at the Authorized Facilities associated with the Expansion Facilities, and the total combined emissions. All correspondence with the Federal Land Manager will be provided in a future supplemental filing.
4	Provide the completed table 9.2-5, presenting the Expansion Facilities Operational Emissions.	Table 9.2-6 (formerly table 9.2-5) has been revised for the Expansion Facilities, the incremental emissions increases at the Authorized Facilities associated with the Expansion Facilities, and the total combined emissions.
5	Provide quantified emissions of criteria pollutants (NOx, CO, SO2, PM10, PM2.5), volatile organic compounds, total hazardous air pollutants, and greenhouse gases in tons per year from all aboveground facilities, delivery, and commuting activities. This includes, but is not limited to, earthmoving/site grading, windblown and fugitive dust, excavation, pile-driving, delivery vehicles, delivery barge, clean/pigging activities, cement mixing, on-site power generation, and tailpipe emissions from all construction equipment. Provide an inventory of the emissions by calendar year demonstrating when the construction emissions would likely occur. Include supporting calculations, emission factors, fuel consumption rates, vehicle power ratings, utilization rates, and hours of operation.	This information is provided in table 9.2-5, Construction Emissions for the Expansion Facilities in section 9.2.4.1.

Federal Energy Regulatory Commission Comments dated September 30, 2025 on Draft Resource Report 9		
Number	**Comment**	**Response/Report Section Reference**
6	Provide a copy of the Title V and prevention of significant deterioration (PSD) air permit application for the Project.	The Title V and PSD permit application will be provided in a future supplemental filing.
7	Develop a refined air quality modeling analysis (AERMOD or U.S. Environmental Protection Agency [EPA]-approved alternative) that addresses compliance with short-term and long-term average National Ambient Air Quality Standards (NAAQS) for the entire Plaquemines LNG Terminal and mobile sources. This modeling should identify existing emission rates of criteria pollutants from the Plaquemines LNG Terminal and ships, and provide modeling results to identify existing local effect levels of criteria pollutants; identify proposed emission rates of criteria pollutants from the Plaquemines LNG Terminal; provide modeling results to identify the local effects of the new equipment in addition to the existing equipment or additional ships at the LNG Terminal; and include mobile ship emissions (e.g., LNG carrier, tugs, escort vessels) for the air quality model for the moored safety zone. This should have three scenarios: transiting through the moored safety zone, hoteling within the moored safety zone, and unloading/loading within the moored safety zone.	The air quality modeling analyses and supporting information will be provided in a future supplemental filing.
8	Provide all source input parameters (e.g., emission rate, stack height, stack temperature, exit velocity), and justify the basis for any assumptions. Provide a description of how the modeling was performed (e.g., identify the specific model number, meteorological data source, terrain data, source parameters, building information, receptor grids, nitrogen dioxide/ nitrogen oxides conversion, post-processing assumptions). Provide input data, as well as output data showing maximum effects outside the fence line (i.e., the EPA-defined ambient air boundary) and at sensitive receptors in the area (e.g., schools, hospitals, nursing homes).	The air quality modeling analyses and supporting information will be provided in a future supplemental filing.
9	Provide a summary table indicating the maximum effect level for each NAAQS averaging period and the largest Radius of Impact (ROI) for any pollutant that exceeds the Significant Impact Levels (SIL). For Prevention of Significant Deterioration (PSD) major facilities that exceed any SILs, provide a PSD cumulative modeling analysis following the methodology in Appendix W of Part 51 Title 40, provide the source inventory provided by the state agency, and include proposed and approved FERC jurisdictional Major Source facilities within the ROI. If cumulative modeling indicates that NAAQS are exceeded, provide a cause and contribute analysis demonstrating that the Project would not cause or contribute to any NAAQS exceedance.	The air quality modeling analyses and supporting information will be provided in a future supplemental filing.
10	Provide a narrative of the air dispersion modeling required for LDEQ's air permitting process of the Plaquemines LNG Terminal expansion. If air dispersion modeling is not required per the state's permitting process, explain the information, criteria, or methodology that LDEQ will require of the Applicant to demonstrate compliance with the Clean Air Act.	The air quality modeling analyses and supporting information will be provided in a future supplemental filing.
11	Provide the input and output files in a form such that staff or staff contractors can reproduce the analysis. The Applicants should contact FERC staff for directions on how to submit the modeling files.	The air quality modeling analyses and supporting information will be provided in a future supplemental filing.
12	Identify what construction activities might occur at night and calculate the resultant sound levels at NSAs within 0.5 mile associated with those nighttime construction activities. Provide the sound levels in nighttime ambient equivalent (Leq) and day-night average (Ldn). Provide the Project noise mitigation plan.	A Nighttime Construction Noise Mitigation Plan is provided in appendix 9F.
13	Provide sound contour figures displaying the predicted received sound levels associated with pile-driving activities detailed in table 9.3-5. If pile driving may occur in conjunction with general construction activities, potential cumulative noise effects should be evaluated at the closest NSAs.	This information is provided in table 9.3-6 and figures 9.3.3-2 and 9.3.3-4.

Federal Energy Regulatory Commission Comments dated September 30, 2025 on Draft Resource Report 9		
Number	**Comment**	**Response/Report Section Reference**
14	Evaluate and quantify noise effects from pile driving operations at the nearest NSAs in the maximum sound level (Lmax). Identify the type and number of piles, installation method, and the length of time pile driving would occur. Indicate any mitigation measures such as shrouds, enclosures, pile blocks, etc. Provide supporting documents, calculations, and a list of all assumptions used to estimate the noise effects.	This has been addressed in section 9.3.5. Details on the type and number of piles, installation method, and length of time pile driving will occur will be provided in the Implementation Plan.
15	Table 9.3-3 notes nighttime ambient Leq sound levels higher than the daytime ambient Leq sound levels. Typical nighttime sound levels are lower than daytime sound levels. Provide a copy of the noise survey report with further details explaining the elevated nighttime sound levels.	This issue is addressed in table 9.3-3.
16	Table 9.3-3 references ambient sound levels for NSA 9, which were collected in March 2019. Provide an updated ambient noise survey. In addition, provide the summer ambient sound levels listed as “TBD.”	This has been addressed in table 9.3-3 and section 9.3.4.
17	The Plaquemines LNG Terminal is currently under construction. Clarify if the ambient sound data collected and presented in resource report 9 includes construction noise from the nearby Plaquemines LNG Terminal.	See section 9.3.3.
18	Per the commitment in section 9.3.6, provide the Operational Noise Analysis for the Expansion Facilities including the following information. Noise sources should include all noise-producing equipment at the facility including engines, turbines, electric motors, compressors, boilers, gas coolers, oil coolers, vent fans, liquefaction equipment, vaporization equipment, flares, pumps and pumping activities, ship noise, intake and exhaust noise, and all appurtenant equipment. The data should represent the maximum load/noise of the proposed equipment. a. A description of the acoustic modeling analysis approach, assumptions, inputs, data sources, and basis for any calculations or noise models used to generate the noise estimates. b. A detailed listing of the sound pressure level (and reference distances) and/or sound power level details for each piece of onsite operational noise-generating equipment in tabular format. c. Manufacturer’s name, the model number, the performance rating; and a description of each noise source and noise control component to be employed at the Project. d. Information regarding operational sound effects associated with flaring activities (i.e., one warm flare, one cold flare, one spare flare, one low pressure flare, and one marine flare). e. For the noise mitigation measures required, provide the expected sound reduction associated with any mufflers, silencers, pipe lagging, etc. Also provide sound transmission loss for all building components, including walls, roof, doors, windows and ventilation openings. f. Frequency of LNG carriers visiting the facility and the potential noise effects associated with the vessels when moving and when docked when loading. g. Sound contour figures displaying the predicted received sound levels associated with Project operations (e.g., liquefaction facilities, pretreatment facilities, LNG carrier loading dock, and power generation facilities, as well as various supporting facilities).	The Operational Noise Analysis is provided in appendix 9G.
19	Provide a description and specifications of all noise control measures (such as intake and exhaust silencers, building and pipe insulation) that would be added to the proposed turbine units; boil-off, flash, and gas relief systems; flare systems; and liquefaction blocks.	This is addressed in the Operation Noise Analysis provided in appendix 9G.
20	Provide the completed table 9.3-7, which presents the cumulative noise analysis for the operation of the Plaquemines Expansion facility and operation of the Plaquemines LNG Terminal, which is currently under construction. Append supporting data showing the calculated potential noise effects of the Plaquemines LNG Terminal (under construction), as needed to support the cumulative noise analysis results.	Table 9.3-7 has been updated, and the Operational Noise Analysis is provided in appendix 9G.

PLAQUEMINES EXPANSION, LLC AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT
RESOURCE REPORT 9 – AIR AND NOISE QUALITY

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AQCR	Air Quality Control Region
Applicants	Plaquemines Expansion, LLC and Venture Global Plaquemines LNG, LLC
application	The application to the Federal Energy Regulatory Commission of the Applicants for authorization to site, construct, and operate natural gas liquefaction and export facilities.
Authorized Facilities	The permanent land- and marine-based Plaquemines LNG natural gas liquefaction, storage, and export facilities
BACT	Best Available Control Technology
BOG	boil off gas
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
dB	decibels
dBA	A-weighted decibel
EPA	U.S. Environmental Protection Agency
Expansion Facilities	The permanent land- and marine-based Plaquemines Expansion natural gas liquefaction, storage, and export facilities
Expansion Site	land-based footprint of the Expansion Facilities within the storm surge wall
FERC	Federal Energy Regulatory Commission
Plaquemines Expansion	Plaquemines Expansion, LLC
Plaquemines LNG	Venture Global Plaquemines LNG, LLC
GHG	greenhouse gas
GHGRP	GHG Reporting Program
GWP	Global Warming Potential
HAP	hazardous air pollutant
LAAS	Louisiana Ambient Air Standards
LAC	Louisiana Administrative Code
LDEQ	Louisiana Department of Environmental Quality
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LNG	liquefied natural gas
marine berth	LNG loading dock on the Mississippi River
MER	minimum emission rates
mph	miles per hour
MTPA	million metric tonnes per annum
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCEI	National Centers for Environmental Information
NEPA	National Environmental Policy Act

NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NWR	National Wildlife Refuge
O_3	ozone
PM_{10}	inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	inhalable particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
ppb	parts per billion
ppm	parts per million
Project	Plaquemines Expansion Project
PSD	Prevention of Significant Deterioration
PTE	potential to emit
Q/d	ratio of emissions of nitrogen oxides, particulate matter with an aerodynamic diameter less than or equal to 10 microns, sulfur dioxide, and sulfuric acid to the distance in kilometers from a source to a Class I area
RCNM	Federal Highway Administration's Roadway Construction Noise Model
SER	significant emissions rate
SO_2	sulfur dioxide
TAP	Toxic Air Pollutant
tpy	tons per year
Venture Global	Venture Global LNG, Inc.
VOC	volatile organic compound

PLAQUEMINES EXPANSION, LLC AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT

9.0 RESOURCE REPORT 9 – AIR AND NOISE QUALITY

9.1. INTRODUCTION

Plaquemines Expansion, LLC ("Plaquemines Expansion") and Venture Global Plaquemines LNG, LLC ("Plaquemines LNG"), together referred to as the "Applicants" and both wholly owned subsidiaries of Venture Global LNG, Inc. ("Venture Global"), propose the expansion ("Project") of the Plaquemines LNG Terminal that is currently under construction and commissioning in Plaquemines Parish, Louisiana.

On September 30, 2019, the Commission authorized Plaquemines LNG to site, construct and operate a new liquefied natural gas ("LNG") export terminal and associated facilities along the Mississippi River in Plaquemines Parish, Louisiana.[1] The Authorized Facilities at the Plaquemines LNG export terminal include: (a) one natural gas gate station; (b) six pretreatment facilities; (c) 18 liquefaction blocks; (d) four full containment above ground storage tanks; (e) boil-off, flash, and gas relief systems; (f) three LNG loading berths; (g) two 710-megawatt electric power generation plants; (h) one warm flare, one cold flare, one spare flare, one low pressure flare, and one marine flare; (i) safety and security systems; and (j) other appurtenant facilities. The Authorized Facilities are under construction and commissioning, and Plaquemines LNG has commenced the export of commissioning cargos.[2]

As part of this Project, Plaquemines Expansion proposes to build, own, and operate additional liquefaction facilities capable of producing an average annual capacity of 26.5 million metric tonnes per annum ("MTPA") with a peak capacity of up to 31 MTPA, and other facilities detailed below. The Expansion Facilities will be situated on an approximately 587-acre permanent site immediately adjacent to the approximately 632-acre site on which the Authorized Facilities are located. A new approximately 500-acre Temporary Workspace and an approximately 77-acre Existing Workspace from the Authorized Facilities will be utilized during construction of the Expansion Facilities.

The Project facilities will include (a) one natural gas gate station; (b) five pretreatment facilities; (c) 16 liquefaction blocks capable of producing an average annual capacity of approximately 26.5 MTPA; (d) seven LNG expanders; (e) boil-off, flash, and gas relief systems; (f) one LNG loading berth for ocean-going vessels; (g) one warm flare, one cold flare, one spare flare, and one marine flare; (h) two 710-megawatt natural gas-fired combined cycle electric generation facilities; (i) safety and security systems; and (j) other appurtenant facilities. The Applicants expect to begin construction of the Project upon receipt of all required regulatory approvals, as detailed below. The Project will be interconnected with the Plaquemines LNG terminal and will share in the utilization of certain Authorized Facilities, including treated gas, utilities, LNG storage tanks, low pressure flare, LNG loading berths, marine flare, electrical power generation, and other appurtenant facilities. The Project will not include any new FERC-

[1] Venture Global Plaquemines LNG, LLC and Venture Global Gator Express, LLC, 168 FERC ¶ 61,204 (2019) ("2019 Order"). The LNG terminal facilities authorized by the 2019 Order are collectively referred to herein as "Authorized Facilities." The 2019 Order also authorized Venture Global Gator Express, LLC to construct and operate a new natural gas pipeline system within Plaquemines Parish. The Commission recently authorized the increase in the maximum liquefaction capacity of the Authorized Facilities without any new facilities, construction activities, or facility modifications. Venture Global Plaquemines LNG, LLC, 190 FERC ¶ 61,113 (2025).

[2] The Commission approved Plaquemines LNG's request to load the first LNG export cargo on December 20, 2024. Accession No. 20241220-3027, Delegated Order issued in Docket No. CP17-66-000. Plaquemines LNG files both monthly construction reports and weekly commissioning reports with the Commission in that docket.

jurisdictional interstate pipeline facilities; rather, feed gas for the Project will be delivered by a non-jurisdictional intrastate natural gas transmission pipeline system that will be constructed by an affiliate of the Applicants that will connect the Project to the existing natural gas pipeline network in northern Louisiana, and will provide feed gas to the liquefaction and power generation facilities. This pipeline is further described in section 1.8.[3]

Resource Report 9 describes the Project's direct, indirect, and cumulative impacts to existing air quality and noise conditions. This report characterizes and quantifies existing air quality and noise, identifies potential noise sensitive areas ("NSAs"), and includes discussions of potential impacts on air quality and noise from construction and operation of the facilities. The report also summarizes federal, state, and local air quality and noise regulations applicable to the Project and, as appropriate, discusses forms of mitigation that may be used to reduce impacts during Project construction and operation. Information contained in this resource report was obtained from federal, state, and local regulations, equipment vendor data sheets, desktop analysis, and review of technical reports and literature.

9.2. AIR QUALITY

Construction and operation of the Project could affect air quality in the Project vicinity. Aboveground facilities associated with the Expansion Facilities will generate emissions in Plaquemines Parish.

9.2.1 Regional Climate

Plaquemines Expansion accessed information from the nearest National Weather Service meteorological station to the Expansion Facilities to determine representative climate information for the Project.

The Expansion Facilities will be located in Plaquemines Parish, Louisiana, where the climate is humid and subtropical with long, hot summers, and short, mild winters. The humidity in the vicinity of the Expansion Facilities is relatively high due to the proximity to the Gulf of America[4] and the Mississippi River (National Oceanic and Atmospheric Association National Centers for Environmental Information ["NCEI"], 2021). Temperature and precipitation data was obtained from the Louisiana State University Citrus Research Station (USC00165624) in Port Sulphur, Louisiana due to its proximity to the Expansion Facilities (approximately 2.8 miles east) (NCEI, 2021). The station reports an annual average of 63.9 inches of rain. The average maximum temperature is 77.9 degrees Fahrenheit ("°F"), and the average minimum temperature is 61.8°F. Long-term temperature and precipitation values used the annual and seasonal climate normals that were calculated for the 30-year period from 1991 through 2020. Historical wind summaries are substantiated by analysis of wind data from the New Orleans Alvin Callender Field meteorological station (Weather Bureau Army Navy - 12958) for 1991 through 2020 (about 17.5 miles northwest). The wind direction near the Expansion Facilities was primarily from the southeast quadrant, followed closely by the northeast quadrant. Over that period, hourly wind speeds varied from 1 to 67 miles per hour ("mph"), with gusts ranging from 11 to 83 mph. The average wind speed, excluding periods of calm, was 7.6 mph. Calm periods (e.g., no wind) occurred 23.7 percent of the time (NCEI, 2021).

[3] The new intrastate natural gas pipeline is expected to consist of approximately 300 miles of 48-inch-diameter pipeline, with firm transportation capacity of approximately 4.5 billion cubic feet per day.

[4] On January 20, 2025, President Trump issued Executive Order renaming the Gulf of Mexico as the Gulf of America.

9.2.2 Existing Air Quality

9.2.2.1 Ambient Air Quality Standards

As required by the Clean Air Act ("CAA") of 1970, the U.S. Environmental Protection Agency ("EPA") has established National Ambient Air Quality Standards ("NAAQS") to protect public health and welfare, referred to as primary standards, and to protect plant and animal life, buildings, and other features in the public interest, referred to as secondary standards. These standards set allowable limits on the concentration of specific air pollutants in the outdoor air. When pollutant levels exceed these standards, it may trigger additional regulatory requirements, including more stringent air permitting requirements for new or modified sources (see section 9.2.3). States have the authority to adopt ambient air quality standards if they are more stringent than the NAAQS. Louisiana has adopted all federal primary and secondary ambient air quality NAAQS and has an additional, more stringent, sulfur dioxide ("SO_2") standard.[5] On December 10, 2024, the EPA replaced its 3-hour secondary SO_2 standard with an annual standard of 10 parts per billion ("ppb");[6] Louisiana still retains the more stringent 3-hour secondary SO_2 standard of 0.5 parts per million ("ppm") in addition to the annual 10 ppb standard in Louisiana Ambient Air Standards ("LAAS").

NAAQS have been established for six principal pollutants, called "criteria pollutants." These criteria pollutants are ground-level ozone, carbon monoxide ("CO"), nitrogen dioxide ("NO_2"), SO_2, respirable and fine particulate matter (inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns ["PM_{10}"] and less than or equal to 2.5 microns ["$PM_{2.5}$"]), and airborne lead.

Ozone forms as a result of a photochemical reaction between nitrogen oxides ("NO_X") and volatile organic compounds ("VOCs") in the presence of sunlight. Accordingly, NO_X and VOCs are often referred to as ozone precursors. $PM_{2.5}$ may be directly emitted from combustion and industrial processes and can also be secondarily formed in the atmosphere as a result of SO_2 and NO_X emissions. SO_2 and NO_X are also referred to as $PM_{2.5}$ precursors. Table 9.2-1 lists the NAAQS for the six criteria pollutants.

[5] La. Admin. Code tit. 33, pt. III, §711, Tables 1 and 1a.
[6] 89 Fed. Reg. 105,692 (Dec. 27, 2024).

TABLE 9.2-1

Plaquemines Expansion Project
National Ambient Air Quality Standards and Louisiana Ambient Air Quality Standards

Criteria Pollutant	Primary/ Secondary	Averaging Time	Level	Form of Air Quality Standard
CO	Primary	8 hours	9 ppm	Not to be exceeded more than once per year
	Primary	1 hour	35 ppm	Not to be exceeded more than once per year
Lead (Pb)	Primary and Secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
NO_2	Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	1 year	53 ppb [a]	Annual mean
Ozone (O_3)	Primary and Secondary	8 hours	0.070 ppm [b]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution				
$PM_{2.5}$	Primary	1 year	9 µg/m^3	Annual mean, averaged over 3 years
	Secondary	1 year	15 µg/m^3	Annual mean, averaged over 3 years
	Primary and Secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
PM_{10}	Primary and Secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
SO_2	Primary	1 hour	75 ppb [c]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	1 year	10 ppb	Annual mean, averaged over 3 years
	Secondary	3 hours	0.5 ppb [d]	Not to be exceeded more than once per year

Sources: EPA, 2024, LDEQ n.d.

µg/m^3 = micrograms per cubic meter; ppb = parts per billion; ppm = parts per million

[a] The annual NO_2 standard is 0.053 ppm. This standard is shown here in terms of parts per billion for the purposes of clearer comparison to the 1-hour standard level.

[b] Final rule published October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and the transition to the current (2015) standards will be addressed in the implementation rule for the current standards.

[c] The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of an EPA State Implementation Plan call under the previous SO_2 standards (40 CFR § 50.4(3)). A State Implementation Plan call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

[d] This requirement is a more stringent Louisiana Ambient Air Standard. The EPA revised the secondary SO_2 NAAQS in December 2024, replacing the 3-hour 0.5 ppm standard with an annual 10 ppb standard averaged over 3 years. However, the LDEQ retains the 3-hour 0.5 ppm secondary SO_2 standard under state regulations, resulting in a more stringent requirement than the current federal standard.

9.2.2.2 Air Quality Control Region and Attainment Status

An air quality control region ("AQCR") is defined under 42 United State Code § 7407(c) as "any interstate area or major intrastate area which the Administrator of the EPA deems necessary or appropriate for the attainment and maintenance of ambient air quality standards." The EPA designates all areas of the United States into an AQCR based on regional air quality patterns and geography to facilitate coordination of monitoring, planning and control of air pollution problems. Each AQCR, or portion(s) of an AQCR, is classified as "attainment," "nonattainment," "unclassifiable," or "maintenance" with respect to the NAAQS.

Areas where ambient air concentrations of the criteria pollutants are below the levels listed in the NAAQS are considered in attainment. If ambient air concentrations of criteria pollutants are above the NAAQS levels, then the area is considered a nonattainment area. Areas that were designated nonattainment for one or more criteria pollutants but have since demonstrated compliance with the NAAQS are designated as a maintenance area for the specified pollutant(s). Maintenance areas are treated similarly to attainment areas for permitting stationary sources; however, specific provisions may be incorporated through the state's EPA-approved maintenance plan to ensure that air quality remains in compliance with the NAAQS for that pollutant. Maintenance areas retain the classification for 20 years before being reclassified as attainment areas. Areas where air quality data are not available are considered to be unclassifiable and are treated as attainment areas.

The Project will be located in Plaquemines Parish, which is in the Southern Louisiana–Southeast Texas Interstate AQCR (AQCR 106). Plaquemines Parish is designated as an attainment area for all criteria pollutants.

9.2.2.3 Greenhouse Gases

In April 2007, the U.S. Supreme Court ruled that greenhouse gases ("GHGs") fall within the CAA's definition of "air pollutant" and directed the EPA to consider whether the emission of GHGs from new motor vehicles causes or contributes to air pollution, which may reasonably be anticipated to endanger public health or welfare. On December 7, 2009, the EPA concluded that GHG emissions from new motor vehicles may reasonably be anticipated to endanger public health and welfare (EPA, 74 Fed. Reg. 66,496 (Dec. 15, 2009))[7]. The finding identified the following six GHGs in the atmosphere:

- carbon dioxide (CO_2);
- methane;
- nitrous oxide (N_2O);
- hydrofluorocarbons;
- perfluorocarbons; and
- sulfur hexafluoride.

Although the EPA's findings were based on emissions associated with new motor vehicles, the EPA has expanded its regulations to include the emission of GHGs from major stationary sources under its Prevention of Significant Deterioration ("PSD") program, as codified in 40 Code of Federal Regulations ("CFR") § 52.21 and discussed in section 9.2.3.1. There are no NAAQS established for GHGs.

GHG emissions are often represented by an aggregate number expressed in units of CO_2 equivalents ("CO_2e"). The use of CO_2e allows different greenhouse gases to be compared on a common scale based on their climate impact. For each GHG, the EPA has determined a global warming potential factor ("GWP"), which is a relative measure of a GHG's ability to absorb and hold solar radiation in the atmosphere compared to that of CO_2. According to 40 CFR § 98(A), Table A-1, CO_2 has a global warming potential of 1, whereas methane, for example, has a global warming potential of 28 and N_2O has a global warming potential of 265. Individual GHG estimates for the Project are multiplied by its GWP factor to calculate CO_2e of the total project.

[7] On March 12, 2025, the EPA announced that it would initiate a formal reconsideration of its 2009 Endangerment Finding for Greenhouse Gases. As of the submittal date of this document, the 2009 Endangerment Finding remains in effect.

9.2.3 Applicable Regulations and Permitting

The Project contains aboveground facilities that, for purposes of air permitting and air regulatory compliance, are stationary sources and are reviewed independently under air quality regulations. A stationary source, as defined by the EPA, is any building, structure, facility, or installation that emits or may emit any regulated air pollutant.

This section summarizes the federal regulatory requirements for PSD, New Source Performance Standards ("NSPS"), National Emission Standards for Hazardous Air Pollutants ("NESHAP"), and Title V Operating Permits. The applicable Louisiana air quality regulations are also summarized.

9.2.3.1 Federal Regulations

New Source Review—Prevention of Significant Deterioration

New Source Review ("NSR") refers to the federal preconstruction permitting programs under Parts C and D of the CAA. NSR must be addressed before construction can begin on new major sources or major modifications to existing major sources. The PSD program is the NSR permitting program under Part C that applies to new major sources or major modifications at existing sources in attainment areas or in areas that are unclassifiable. The PSD program is intended to keep new air emission sources from causing the existing air quality to deteriorate beyond acceptable levels.

Under the PSD program, any new major source or major modification of an existing source of air pollutants is required to obtain an air quality permit before beginning construction. Because the Project is located in a parish that is in attainment for all criteria pollutant standards, the Project will be subject to PSD permitting if any of the proposed emission sources exceed applicable PSD major source or major modification thresholds.

The definition of a PSD major source is any stationary source that emits, or has the potential to emit, 250 tons per year ("tpy") of a regulated NSR pollutant; or is listed as belonging to one of 28 specifically-listed industrial source categories that have a 100 tpy applicability threshold (40 CFR § 52.21(b)(1)(i)(a)). Regulated NSR pollutants primarily include the six criteria pollutants but also includes pollutants regulated under the CAA that is subject to NSR permitting as defined in 40 CFR § 52.21(b)(50). If a source emits even one criteria pollutant in major amounts, the source is considered a major source for PSD purposes.

Under the PSD program, a modification at an existing major stationary source is considered a major modification if the modification results in a net emissions increase of any regulated NSR pollutant equal to or exceeding the applicable Significant Emissions Rate ("SER"). Once a modification is determined to be major, each regulated NSR pollutant is evaluated individually for PSD applicability based on its respective SER. The Project will be located on contiguous or adjacent property and under common control with the Plaquemines LNG Terminal, which is an existing PSD major stationary source. Therefore, the Project will be evaluated as a potential major modification, and each regulated pollutant will be reviewed for PSD applicability based on its SER.

The U.S. Supreme Court has held that the EPA lacked the authority to apply the PSD program to a source that would be a major stationary source only as a result of its GHG emissions (*Utility Air Regulatory Group v. Environmental Protection Agency*, 134 S.Ct. 2427, 2437, 2446 (2014)). The United States Court of Appeals for the District of Columbia issued an amended judgment on April 10, 2015, vacating those parts of the EPA's GHG PSD rules that were inconsistent with the Supreme Court's holding (*Coalition for Responsible Regulation, Inc. v. EPA*, No. 11-1428 (D.C. Cir., Apr. 10, 2015)). Under the current EPA regulations, if a project requires PSD review for a non-GHG pollutant and the project results in a net increase of GHG emissions equal to or greater than 75,000 tpy of CO_2e, the source must also address GHGs in its PSD review.

The Applicants conducted a PSD applicability analysis, and determined the Project constitutes a major modification under the PSD program. The Applicants plan to file a Title V and PSD air permit application with the Louisiana Department of Environmental Quality ("LDEQ") for the Project, and the PSD applicability analysis will be included in that submittal which will be provided in a future supplemental filing. Estimated operational emissions including specific emission sources (units) for the Expansion Facilities, the incremental emissions increases at the Authorized Facilities associated with the Expansion Facilities (specifically, emissions at the low pressure flare), and both facilities combined are provided in table 9.2.2.

TABLE 9.2-2

Plaquemines Expansion Project
Prevention of Significant Deterioration Applicability Analysis for the Expansion Facilities

NSR Regulated Pollutant	Expansion Facilities Emissions [a,b] (tpy)	Authorized Facilities Emissions Increase [c] (tpy)	Total Project Emissions (tpy)	Major Stationary Source Threshold Level (tpy)	Significant Emission Rate (tpy)
PM_{10}	402.34.5	4.5	406.8	250	15
$PM_{2.5}$	402.34.5	4.5	406.8	250	10
NO_X	1,376.5	41.0	1,417.6	250	40
SO_2	184.8	0.3	185.1	250	40
CO	2,280.2	187.1	2,467.3	250	100
Total VOC	381.8	19.6	401.4	250	40
H_2S [d]	0.7	0.0	0.7	N/A	10
CO_2e	9,213,596 [e]	86,104	9,299,700	N/A	75,000

Source: 40 CFR § 52.21(b)(1)(i)(b)

N/A = not applicable

[a] In determining PSD permitting applicability, NO_x, CO, CO_2e, and $PM_{10}/PM_{2.5}$ emissions are based on an alternate operating scenario. Further details regarding alternate operating scenarios will be provided in the Title V and PSD permit application for the Expansion Facilities that will be provided in a future supplemental filing.

[b] The Expansion Facilities will be part of Venture Global Plaquemines LNG, LLC's LNG Terminal stationary source due to common ownership and location on adjacent/contiguous property. Because Venture Global Plaquemines LNG, LLC's LNG Terminal is an existing major stationary source, emissions associated with the Expansion Facilities are compared to their respective PSD Significant Emission Rate thresholds.

[c] The emissions from the Authorized Facilities are the incremental emissions increases at Venture Global Plaquemines LNG, LLC's LNG Terminal associated with the Expansion Facilities.

[d] hydrogen sulfide

[e] Expansion Facilities CO_2e emissions do not reflect the additional CO_2 reductions through carbon capture.

Expansion Facilities PSD Requirements

The following PSD requirements will apply to the Expansion Facilities for non-GHG NSR regulated pollutants that exceed the significant emission rate:

- Determine and apply Best Available Control Technology ("BACT") to identify the maximum degree of emissions reduction for NO_X, CO, SO_2, PM_{10}, $PM_{2.5}$, VOC, and CO_2e, taking into account technical feasibility, energy, environmental, and economic impacts (40 CFR § 52.21(j) and Louisiana Administrative Code [LAC] 33.III.509.J).

- Conduct a source impact analysis showing that increases of regulated NSR pollutants in excess of the relevant significance levels from the Project will not cause or contribute to air pollution in violation of any NAAQS (40 CFR § 52.21(k)(1)(i), LAC 33:III.509.K, and LAC 33:III.509.M).

- Conduct a source impact analysis showing that increases of regulated NSR pollutants in excess of the relevant significance levels from the Project will not cause or contribute to air pollution in violation of any applicable maximum allowable increase over the baseline concentration in any area (i.e., the "PSD increment analysis") (40 CFR § 52.21(k)(1)(ii), LAC 33:III.509.K, and LAC 33:III.509.M).

- Gather preconstruction air quality monitoring information (40 CFR § 52.21(m)(1)) and, where necessary, conduct post-construction air quality monitoring (40 CFR § 52.21(m)(2) and LAC 33:III.509.M.2).

- Provide specified information for Project sources in order to perform any necessary analysis (this information will include details such as source location, design capacity, and typical operating schedule [40 CFR § 52.21(n) and LAC 33:III.509.N]).

- Conduct additional impact analyses describing impairments to visibility and soils and vegetation, as well as those arising from growth associated with the Project (40 CFR § 52.21(o) and LAC 33:III.509.O).

- Conduct an analysis as may be required by a federal land manager of the impact on air quality related values—including visibility—at nearby federal Class I areas (40 CFR § 52.21(p) and LAC 33:III.509.P).

- Allow for public participation in the PSD permitting process (40 CFR § 52.21(q) and LAC 33:III.509.Q).

- Comply with source obligations (40 CFR § 52.21(r) and LAC 33:III.509.R).

- Cooperate in the EPA review of a PSD permit application in parallel with the National Environmental Policy Act ("NEPA") review that may be required of other federal agencies (40 CFR § 52.21(s)).

For GHG pollutants, only the BACT analysis, public participation, and cooperation in separate NEPA analyses are required (EPA, 2011). Each of these requirements is described in more detail below.

BACT Analysis

BACT is an emissions limitation based on the maximum degree of reduction for each NSR-regulated pollutant that will be emitted in significant amounts from the Project, which the EPA on a case-by-case basis determines is achievable, while taking into account energy, environmental, and economic impacts and other costs. BACT can be add-on control equipment, or modification of the production processes or methods (this includes fuel cleaning or treatment and innovative fuel combustion techniques). BACT may be a design, equipment, work practice, or operational standard if imposition of an emissions standard is infeasible.

Further information regarding the BACT analysis to be completed for the Project will be included in the Title V and PSD air permit application that will be provided in a future supplemental filing.

Source Impact Analysis

In accordance with LAC 33:III.509.K and 40 CFR § 52.21, a source must demonstrate that significant net emission increases of an NSR-regulated pollutant from a project will not cause or contribute to the violation of a primary or secondary NAAQS. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. In addition, a source must demonstrate that significant net emission increases of an NSR-regulated pollutant will not cause or contribute to an increase in ambient concentrations in excess of the relevant PSD Class II increment for any criteria pollutant in any attainment or unclassifiable area. Air quality dispersion modeling analyses for each PSD pollutant emitted from the Project in excess of its Significant Emissions Rate will be conducted to demonstrate compliance with the NAAQS and PSD increment standards. In addition, the Applicants will perform a Tier 1 assessment using the latest EPA Modeled Emission Rates for Precursors (MERPs) guidance to demonstrate compliance with the ozone NAAQS. The Project's source impact analysis results will be included in the Title V and PSD air permit application that will be provided in a future supplemental filing.

Source Information and Compliance Obligations

A source must provide certain information to the permitting authority and agree to comply with obligations set forth in LAC 33:III.509.N and 40 CFR § 52.21 (n) and (r). This information is generally provided in the permit application forms and the compliance obligations are generally set forth in the final permit. A summary of the BACT limits for the Project will be provided in the Title V and PSD air permit application that will be provided in a future supplemental filing.

Preconstruction Air Quality Monitoring

A source must establish representative baseline ambient air quality in the area around the facility that is subject to PSD permitting when conducting air dispersion modeling. The Project is proposing to use existing monitoring data available through LDEQ's Ambient Air Monitoring Program in lieu of any preconstruction monitoring for demonstrating compliance with the NAAQS. Ambient air quality concentrations near the Project are presented in table 9.2-3 and will be included in the Title V and PSD air permit application that will be provided in a future supplemental filing.

Monitoring stations for the forthcoming NAAQS analysis will be selected based on representativeness of the project site. Selection of the existing monitoring station data that is "representative" of the ambient air quality in the area surrounding the proposed facility is determined based on the following three criteria: 1) proximity to the facility, 2) the surrounding area (e.g., land use and terrain), and 3) the availability of data (including data quality and currentness). Key considerations for the selection of a monitoring station include proximity to the significant impact area of the proposed facility, similarity of emission sources impacting the monitoring station to the emission sources impacting the airshed surrounding the proposed facility, and the similarity of the land use and land cover ("LULC") surrounding the monitoring location and proposed facility. Data quality refers to the monitor being an approved State or Local Air Monitoring Stations ("SLAMS") Network or similar monitor type subject to the quality assurance requirements in 40 CFR Part 58 Appendix A. Data currentness refers to the fact that the most recent three complete years of quality-assured data are generally preferred.

The ambient monitoring data proposed reflect the latest three years of data (2022 through 2024) available through the EPA's design value monitoring workbooks.[8] The locations and relevant information for each monitor selected for the NAAQS analyses are provided in table 9.2-3, as mentioned. The proposed monitoring stations are located in New Orleans, Kenner, Marrero, and Meraux, Louisiana within the limits of Greater New Orleans. Each of these monitoring station locations has either a similar or a more conservative industrial emissions portfolio compared to the proposed facility for the modeled pollutants. Non-industrial emissions sources, such as on-road vehicles and other anthropogenic-based emissions (e.g., cooking, off-road vehicles) are also anticipated to be more prevalent near the monitoring stations compared to the area surrounding the Project. In particular, the land-use surrounding the Kenner monitor is substantially more industrialized than the area surrounding the Project.

[8] EPA, "Air Quality Design Values" webpage, Design Values Report, *available at:* https://www.epa.gov/air-trends/air-quality-design-values. Accessed November 2025. See the 2022 through 2024 Design Value Report for each pollutant.

TABLE 9.2-3

Plaquemines Expansion Project
Ambient Air Quality Concentrations for Areas near the Project

Pollutant	Averaging Period	Rank [a]	Location	2022-2024 Monitor Design Value	Units	Air Quality System (AQS) ID	Monitor Type	Distance / Direction from the Project
CO	1-hour	2nd	New Orleans, Louisiana	2,749.4	µg/m³	22-071-0021	SLAMS	~50 km NW
	8-hour	2nd		1,947.5				
NO_2	Annual	Mean	Kenner, Louisiana	10.7	µg/m³	22-051-1001	SLAMS	~62 km NW
	1-hour	98th percentile		76.0				
Ozone	8-hour	4th	Meraux, Louisiana	63.7	ppb	22-087-0004	SPM	~38 km NW
$PM_{2.5}$	24-hour	98th percentile	Marrero, Louisiana	16.5	µg/m³	22-051-2001	SLAMS	~40 km NW
	Annual	Mean		7.8				
SO_2	1-hour	99th percentile	Meraux, Louisiana	37.6	µg/m³	22-087-0004	SPM	~38 km NW

µg/m³ = micrograms per cubic meter; ppb = parts per billion; ppm = parts per million

[a] Averaging periods and values displayed for these monitors will be as close to matching the relevant NAAQS averaging periods as possible. These monitors are certified by the EPA as suitable for NAAQS-compliance data gathering. The averaging periods used by these monitors may be used to calculate data expressed in accordance with the NAAQS averaging periods.

Source: EPA, "Air Quality Design Values" webpage, Design Values Report, *available at* https://www.epa.gov/air-trends/air-quality-design-values. Accessed November 2025. See the 2022 through 2024 Design Value Report for each pollutant.

For all applicable pollutant-averaging periods, the concentrations were converted from ppb or ppm to µg/m³. The monitor design values are calculated based on the NAAQS standards for each pollutant and its averaging period listed in this table. Note that information is not provided for the PM_{10} 24-hour or the SO_2 3-hour, 24-hour, or Annual averaging periods because the EPA workbooks do not have design values for these standards.

Additional Impact Analyses (Class I Areas, Soil and Vegetation, and Growth Impact)

Plaquemines Expansion will be required to follow the Federal Land Managers' Air Quality Related Values Work Group Phase I Report—Revised (National Park Service, 2010) to assess potential impacts from the Project to Federal Class I areas. Federal Class I areas are areas of special national or regional natural, scenic, recreational, or historical value for which the PSD regulations provide special protection. There are 156 mandatory Class I areas in the United States. If a new source or major modification of an existing source is subject to the PSD program requirements and is: (1) within 100 kilometers (62 miles) of a Class I area; or (2) farther than 50 kilometers (31 miles) from a Class I area and the ratio of emissions of SO_2, $PM_{2.5}$, NO_X, or sulfuric acid (Q) to the distance in kilometers (d) is greater than 10 (Q/d > 10), the facility must notify the appropriate federal officials and assess the impacts of a proposed project on the Class I area.

Breton National Wildlife Refuge ("NWR") is the nearest Class I area to the Project. The estimated distance from the Expansion Facilities to the nearest Class I area receptor in the Breton NWR is about 83 kilometers (51.6 miles) northeast of the Project. The federal land manager for the Breton NWR is the U.S. Fish and Wildlife Service.

A Q/d analysis was completed for the Expansion Facilities and is presented in table 9.2-4 and will be included as part of the Title V and PSD air permit application. A copy of the air permit application must be submitted to the Federal Land Manager for the Breton NWR. To assess the impact of the Project Facility emissions on the Breton NWR, a modeling analysis may be required. If required, the results of this analysis will be included in the Title V and PSD air permit application that will be provided in a future supplemental filing.

For most types of soil and vegetation, ambient concentrations of criteria pollutants below the secondary NAAQS will not result in harmful effects (EPA, 1990). The Applicants will use the NAAQS compliance modeling analysis to evaluate the effects of the proposed Project on soil and vegetation.

The elements of the growth analysis will include a projection of the associated industrial, commercial, and residential growth that will occur in the area of impact due to the proposed Project, including the potential impact on ambient air resulting from this growth.

Public Participation and NEPA Coordination for PSD Permitting

The LDEQ has detailed public participation requirements that satisfy the requirements of the federal PSD rules; the Applicants will follow these requirements to obtain a preconstruction permit for the Expansion Facilities. A public participation timeframe of no less than 30 days is required for a PSD permit, except for minor modifications that do not require public participation. For initial permits, permit renewals, and significant modifications to existing permits, an EPA comment period of no less than 45 days is also required. Generally, these periods overlap such that the total period is 45 days. If sufficient interest is generated, a public hearing may also be required.

The Applicants anticipate that the LDEQ will act as a cooperating state agency in the FERC proceedings for the Project and that EPA Region 6 will coordinate its review of any draft PSD permits with its review of any NEPA documents.

New Source Performance Standards

Section 111 of the CAA authorized the EPA to develop technology-based standards that apply to specific categories of stationary sources. These standards, referred to as NSPS, are found in 40 CFR Part 60. The NSPS applies 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.

The following NSPS may apply to emission units at the Project:

- 40 CFR Part 60 Subpart A – General Provisions. The general provisions listed in Subpart A of 40 CFR Part 60 include broader definitions of applicability and various methods for maintaining compliance with requirements listed in the subsequent subparts of 40 CFR Part 60. Subpart A also specifies the state agencies to which the EPA has delegated authority to implement and enforce standards of performance. The LDEQ has been delegated authority for all 40 CFR Part 60 standards promulgated by the EPA, except for Subpart AAA – Standards of Performance for New Residential Wood Heaters, which is not applicable to the Project (40 CFR § 60.4(e)(2)). The natural gas-fired turbines, emergency generators, and hot oil heaters will comply with this NSPS.

- 40 CFR Part 60 Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. The hot oil heaters will comply with this NSPS only while combusting fuel that meets the definition of natural gas as defined in 40 CFR Part 60 Subpart Db.

- 40 CFR Part 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. The emergency generators and fire water pumps will comply with this NSPS.

- 40 CFR Part 60 Subpart KKKK – Standards of Performance for Stationary Combustion Turbines establishes standards for SO2 and NOX from gas turbines. The natural gas-fired turbines will comply with this NSPS.

National Emission Standards for Hazardous Air Pollutants

The NESHAPs, codified in 40 CFR Parts 61 and 63, regulate the emissions of HAPs from new and existing sources. The 1990 CAA Amendments established a list of 189 HAPs, resulting in the promulgation of Part 63, also known as the Maximum Achievable Control Technology standards. Part 63 regulates HAPs from major sources of HAPs and specific source categories emitting HAPs. Some NESHAPs may apply to non-major sources (area sources) of HAPs. Major source thresholds for NESHAPs are 10 tpy of any single HAP or 25 tpy of total HAPs.

- 40 CFR Part 63 Subpart A – General Provisions: Subpart A outlines general provisions applicable to all NESHAP standards under 40 CFR Part 63, including definitions, notification requirements, performance testing, recordkeeping, reporting, and monitoring obligations. These provisions apply to affected sources unless explicitly excluded by a source-specific subpart. The general provisions also address delegation of NESHAP authority to states; in Louisiana, the LDEQ has been delegated authority for the NESHAP standards applicable to this Project, as listed under 40 CFR § 63.99(a)(19). All affected sources of a subpart are subject to the general provisions of NESHAP Subpart A unless specifically excluded by the source-specific NESHAP. NESHAP Subpart A requires initial notification, performance testing, recordkeeping, and monitoring; additionally, it provides reference methods and mandates general control device requirements for all other subparts as applicable. The natural gas-fired turbines, emergency generators, and hot oil heaters will comply with this NESHAP.

- 40 CFR Part 63 Subpart EEEE – National Emission Standards for Hazardous Air Pollutants Organic Liquids Distribution (Non-Gasoline) establishes standards to minimize organic HAPs. The condensate truck loading activities will comply with this NESHAP.

- 40 CFR Part 63 Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines establishes standards to minimize HAPs, including formaldehyde, toluene, benzene, and acetaldehyde. The gas turbines will comply with this NESHAP.

- 40 CFR Part 63 Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines establishes standards to minimize HAP emissions through control of formaldehyde and/or CO as surrogates. The emergency generators and fire water pumps will comply with this NESHAP.

- 40 CFR Part 63 Subpart DDDDD – National Emission Standards for Hazardous Air for Major Sources: Industrial, Commercial, Institutional Boilers and Process Heaters establishes standards to minimize HAP emissions (for units firing gas, these standards are work practice standards). The hot oil heaters will comply with this NESHAP.

Title V Operating Permits

In Louisiana, the EPA has delegated its 40 CFR Part 70 Operating Permit Program authority to issue Title V permits to the LDEQ, which has incorporated the program in LAC 33:III.507. The threshold levels for determining the applicability for a Title V permit are:

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

Based on current estimates, the Expansion Facilities will be subject to Title V permitting requirements.

General Conformity

A General Conformity applicability analysis will be required for any part of the Project occurring in nonattainment or maintenance areas for criteria pollutants. Section 176(c) of the CAA requires federal agencies to ensure that federally approved or funded projects conform to the applicable approved State Implementation Plan. Such activities must not:

- cause or contribute to any new violation of any standard in any area;
- increase the frequency or severity of any existing violation of any standard in any area; or
- delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The Project area is classified as being in attainment for all criteria pollutant standards; therefore, General Conformity requirements do not apply to the Project.

Stratospheric Ozone Protection

The stratospheric ozone protection provisions are codified under 40 CFR 82. The Project will comply with all applicable provisions of 40 CFR Part 82.

Greenhouse Gas Reporting Rule

The EPA issued and signed the Mandatory Reporting of Greenhouse Gases Rule in September 2009 with the goal of collecting accurate GHG emissions data. These regulations, referred to as the GHG Reporting Program ("GHGRP"), are codified in 40 CFR Part 98. The rule requires large sources and suppliers in the United States to report GHG data, including information on how emissions are to be monitored, calculated, and quality assured for each source category applicable to each facility. The GHGRP was published in the Federal Register in October of 2009 and became effective in December of 2009. On November 30, 2010, the EPA published a rule that finalized reporting requirements for the petroleum and natural gas industry under 40 CFR Part 98, Subpart W.

A facility is required to report GHG emissions under the GHGRP if the aggregated maximum rated heat input from all combustion sources is greater than 30 million British thermal units per hour and the facility emits more than 25,000 metric tons of CO_2e in a calendar year.

Based on current estimates, the Project will be subject to the GHGRP under subpart W as well as subpart C for combustion emissions.

Plaquemines Expansion will capture and sequester an estimated 500,000 tpy of CO_2 emissions from the facility subject to regulatory approvals. The CO_2 will be compressed and then transported to be injected into saline aquifers. By capturing and storing CO_2 emissions from the Project, Plaquemines Expansion will be meeting the market demand for LNG with a lower carbon intensity.

Class I Areas

The CAA designated certain areas (e.g., wilderness areas, national parks) of the United States as Mandatory Federal Class I areas, based on their air quality being considered a special feature. Class I areas are protected against several types of pollution, including elevated levels of criteria pollutant concentrations, visibility degradation, and acid deposition. If a PSD project is within 62 miles (100 kilometers) of a Class I area, the project is required to notify the appropriate federal land manager and to assess potential impacts of that project on the nearby Class I area.

As discussed in section 9.2.3, in accordance with LAC 33:III.509 and 40 CFR § 52.21, a source subject to PSD permitting (e.g., the Expansion Facilities) must demonstrate that significant net emission increases of an NSR-regulated pollutant will not cause or contribute to an increase in ambient concentrations in excess of the relevant PSD Class I increments for any criteria pollutant in the Class I area.

If a new source or major modification of an existing source is subject to the PSD program requirements and is: (1) within 100 kilometers (62 miles) of a Class I area; or (2) farther than 50 kilometers (31 miles) from a Class I area and the ratio of emissions of SO_2, $PM_{2.5}$, NO_X, or sulfuric acid (Q) to the distance in kilometers (d) is greater than 10 (Q/d > 10), the facility is required to notify the appropriate federal officials and assess the impacts of the proposed Project on the Class I area.

A Q/d analysis was completed for the Expansion Facilities and is presented in table 9.2-4. Because the calculated ratio of Q/d is greater than 10, notification of the federal land manager or assessment of the impact to the Class I area is required.

TABLE 9.2-4

Plaquemines Expansion Project
Q/d Analysis for the Expansion Facilities

Project Component / Pollutant [a]	Emissions [b] (tpy)	Distance to Nearest Class I Area (km)	Q/d ratio
Expansion Facilities			
SO_2	693.8	83	8.4
PM_{10}	574.0	83	6.9
NO_X	2,397.4	83	28.9
Authorized Facilities [c]			
SO_2	0.3	83	0.0
PM_{10}	4.5	83	0.1
NO_X	41.0	83	0.5
Total Project			
SO_2	694.1	83	8.4
PM_{10}	578.5	83	7.0
NO_X	2,438.4	83	29.4

[a] It is anticipated that all sulfur emitted by the Project will be emitted as SO_2; therefore, H_2SO_4 has not been included in the Q/d analysis.
[b] Per Federal Land Management guidance, 24-hour maximum emissions for the worst-case operating scenario were used to calculate annual emissions for completion of the Q/d analysis. Further details regarding alternate operating scenarios will be provided in the Title V and PSD permit application for the Expansion Facilities that will be provided in a future supplemental filing.
[c] The emissions from the Authorized Facilities are the incremental emissions increases at Venture Global Plaquemines LNG, LLC's LNG Terminal associated with the Expansion Facilities.

9.2.3.2 Chemical Accident Prevention Provisions

The chemical accident prevention provisions, codified in 40 CFR Part 68, are federal regulations designed to prevent the release of hazardous materials in the event of an accident, and to minimize potential impacts if a release does occur. The regulations contain a list of substances (including methane, propane, and ethylene) and threshold quantities for determining applicability to stationary sources. If a stationary source stores, handles, or processes one or more substances on this list in a quantity equal to or greater than the amount specified in the regulation, the facility must prepare and submit a risk management plan. A risk management plan is not required to be submitted to the EPA until the chemicals are stored on site at the facility.

If a facility does not have a listed substance on site or the quantity of a listed substance is below the applicability threshold, the facility does not have to prepare a risk management plan. However, if there is any regulated substance or other extremely hazardous substance on site, the facility must still comply with the requirements of the General Duty Clause in Section 112(r)(1) of the CAA.

Stationary sources are defined in 40 CFR Part 68 as any buildings, structures, equipment, installations, or substance-emitting stationary activities from which an accidental release may occur and that belong to the same industrial group, are on one or more contiguous properties, and are under control of the same person (or persons under common control). However, the definition also states that the term "stationary source" does not apply to transportation, including storage incidental to transportation, of any regulated substance or any other extremely hazardous substance. The term "transportation" includes transportation subject to oversight or regulation under the federal safety standards for LNG facilities at 49 CFR Parts 192, 193, or 195. Based on

these definitions, the Expansion Facilities' LNG facility, which is subject to 49 CFR Part 193, will not be required to prepare a risk management plan. An analysis of the design's compliance with 49 CFR Part 193, including overpressure modeling, is included in Resource Report 11.

9.2.3.3 State of Louisiana Regulations

The LDEQ is the lead air permitting authority for the Project. The LDEQ's air quality regulations are codified in LAC Title 33, Part III, Chapters 1 through 59. The regulations incorporate the federal program requirements listed in 40 CFR Parts 50 through 99 and establish permit review procedures for all facilities that can emit pollutants to the ambient air. New facilities are required to obtain an air quality permit prior to initiating construction. LAC Title 33, Part III, Chapters 1 through 59 set forth the air quality regulations for emission sources in Louisiana. In addition, LAC Title 33, Part III, Chapter 1 delegates authority to the LDEQ to maintain air quality resources in Louisiana and enforce LDEQ air quality regulations. The following regulations are applicable to the Project:

- Chapter 2—Rules and Regulations for the Fee System of the Air Quality Control Program
- Chapter 5—Permit Procedures
- Chapter 9—General Regulations on Control of Emissions and Emission Standards
- Chapter 11—Control of Air Pollution from Smoke
- Chapter 13—Emission Standards for Particulate Matter (including standards for some specific facilities)
- Chapter 15—Emission Standards for Sulfur Dioxide
- Chapter 21—Control of Emission of Organic Compounds
- Chapter 29—Odor Regulations
- Chapter 51—Comprehensive Toxic Air Pollutant Emission Control Program
- Chapter 56—Prevention of Air Pollution Emergency Episodes
- Chapter 59—Chemical Accident Prevention and Minimization of Consequences

Louisiana also requires an applicant for an air quality permit to prepare an environmental assessment statement pursuant to state-only requirements set forth in Louisiana Revised Statutes 30:2018.A. The Applicants will prepare this environmental assessment statement as part of the Title V and PSD air permit application that will be provided in a future supplemental filing.

Louisiana Air Toxic Air Pollutant Regulations

Louisiana Toxic Air Pollutant ("LTAP") regulations are codified in LAC 33:III.Chapter 51 (Comprehensive Toxic Air Pollutant Emission Control Program) and include both TAPs as well as HAPs under Section 112 of the federal CAA. The LDEQ has incorporated NESHAP standards under 40 CFR Parts 61 and 63 by reference. In addition to these technology-based standards,

LDEQ has established Louisiana Ambient Air Standards for at least 100 HAPs/LTAPs that set forth the maximum allowable ambient concentration at the fence-line in the form of 8-hour standards for HAPs/LTAPs with potential acute effects and annual average standards for HAPs/LTAPs with potential chronic effects. These standards are applicable to facilities emitting greater than a Minimum Emission Rate ("MER") for an LTAP. HAP/LTAP emissions from the Project will be included in the Title V and PSD air permit application that will be provided in a future supplemental filing.

If any of the TAPs for the Project exceed their corresponding MERs listed in Table 51.1 of LAC 33:III. Chapter 51, additional analysis will be required for those pollutants and will be included in the Title V and PSD air permit application that will be provided in a future supplemental filing.

9.2.4 Air Quality Analysis—Construction

Project construction emissions will include combustion-related emissions from diesel and gasoline-fired construction equipment as well as cars, trucks, and marine vessels traveling to and from the construction site(s) transporting workers, equipment, and supplies. Emissions will also include fugitive dust from the use of unpaved roads and construction areas and earthmoving activities. Project construction is expected to last for approximately 47 months with operations expecting to occur 7 days a week. Construction equipment is generally expected to operate for 9, 10, or 12 hours per operating day.

9.2.4.1 Construction Emissions Impacts

Construction activities associated with the Project will result in air quality impacts that include emissions from fossil-fueled construction equipment and fugitive dust. The emissions will be temporary in nature and are not expected to significantly affect regional air quality.

Emissions from construction equipment will depend on the duration and type of construction activity, together with the number and type of vehicles and engine-powered equipment (including generators) in use at any point in time. Earth-moving equipment and other mobile sources may be powered by diesel or gasoline engines, which are sources of combustion-related emissions that include CO, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOCs, GHGs, and minimal amounts of Lead and HAPs. Equipment will be operational on an as-needed basis; therefore, emissions will vary from day to day over the Project duration and will depend on the number and type of vehicles driven on site and engine-powered equipment in use at any point in time.

A summary of estimated air emissions for Project construction is provided in table 9.2-5. These emission estimates were calculated based on the anticipated construction schedule, equipment lists, and operational hours. Details of the construction-related air pollutant emission calculations for the Project are provided in appendix 9B.

TABLE 9.2-5

Plaquemines Expansion Project
Construction Emissions for the Expansion Facilities

Total Emissions	Pollutant (tpy)							
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Year 1 – 2027 Emissions								
Diesel non-road construction equipment	128.59	36.39	7.88	5.89	5.71	0.24	86,124	3.88
Diesel and gasoline on-road equipment	7.15	44.35	5.75	1.52	0.35	0.10	50,745.97	1.00E-01
Construction activity fugitive dust	---	---	---	183.63	38.19	---	---	---
Unpaved roads fugitive dust	---	---	---	12.60	1.26	---	---	---
Marine vessels	58.92	9.59	3.09	1.55	1.50	0	7,152	---
2027 Total	**194.67**	**90.33**	**16.71**	**205.19**	**47.02**	**0.34**	**144,021.98**	**3.98**
Year 2 – 2028 Emissions								
Diesel non-road construction equipment	136.09	35.05	7.71	5.68	5.51	0.28	101,736	3.81
Diesel and gasoline on-road equipment	23.19	518.10	53.91	16.38	3.74	1.45	172,584	1.21E+00
Construction activity fugitive dust	---	---	---	73.82	15.35	---	---	---
Unpaved roads fugitive dust	---	---	---	32.25	3.23	---	---	---
Marine vessels	125.15	17.70	6.45	2.89	2.81	2	12,515	
2028 Total	**284.43**	**570.85**	**68.08**	**131.03**	**30.63**	**3.50**	**286,834.80**	**5.02**
Year 3 – 2029 Emissions								
Diesel non-road construction equipment	222.44	56.60	12.81	9.15	8.87	0.48	176,835	6.31
Diesel and gasoline on-road equipment	17.08	507.30	53.40	16.65	3.67	1.45	167,056	1.20E+00
Construction activity fugitive dust	---	---	---	29.53	6.14	---	---	---
Unpaved roads fugitive dust	---	---	---	17.24	1.72	---	---	---
Marine vessels	125.15	17.70	6.45	2.89	2.81	2	12,515	
2029 Total	**364.67**	**581.60**	**72.66**	**75.46**	**23.22**	**3.70**	**356,406.46**	**7.51**
Year 4 – 2030 Emissions								
Diesel non-road construction equipment	119.83	29.21	6.72	4.83	4.68	0.30	108,996.82	0.48
Diesel and gasoline on-road equipment	16.94	292.69	29.76	9.71	2.03	0.81	99,147	6.79E-01
Construction activity fugitive dust	---	---	---	4.56	0.95	---	---	---
Unpaved roads fugitive dust	---	---	---	28.40	2.84	---	---	---
Marine vessels	105.70	14.53	5.43	2.38	2.31	1.77	10,153.95	--
2030 Total	**242.46**	**336.43**	**41.91**	**49.88**	**12.81**	**2.87**	**218,298.10**	**1.16**
Year 5 – 2031 Emissions								
Diesel non-road construction equipment	8.55	1.98	0.48	0.33	0.32	0.02	8,700.67	0.04
Diesel and gasoline on-road equipment	1.41	160.10	16.33	5.30	1.11	0.44	8,737	3.73E-01

TABLE 9.2-5

Plaquemines Expansion Project
Construction Emissions for the Expansion Facilities

Total Emissions	Pollutant (tpy)							
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Construction activity fugitive dust	---	---	---	0.00	0.00	---	---	---
Unpaved roads fugitive dust	---	---	---	14.20	1.42	---	---	---
2031 Total	**9.97**	**162.08**	**16.81**	**19.83**	**2.85**	**0.47**	**17,437.98**	**0.41**
Project Total Emissions	**NO_X**	**CO**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO_2e**	**HAPs**
2027-2031	1,096.19	1,741.29	216.18	481.39	116.52	10.88	1,022,999.32	18.07

Impacts are not expected to be significant since the Project will operate within compliance of any applicable state and federal air quality regulations. Emissions from fossil-fueled equipment and fugitive dust will be temporary and managed using best management practices, such as dust control measures and the use of Tier-rated engines, to minimize air quality impacts.

9.2.4.2 Construction Emissions Mitigation

Mitigation of engine exhaust and dust from construction activities will be implemented, in accordance with EPA emission standards for nonroad engines and established best management practices to maintain air quality and minimize temporary impacts. Workers will minimize emissions by maintaining diesel and gasoline-fired construction equipment and vehicles in accordance with the manufacturer's recommendations, and, to the extent feasible, limiting the idling time of engines and operating at lower speeds. All engines will be required to meet applicable EPA emission standard and inspection requirements.

Fugitive emissions of particulate matter (dust) during construction will be controlled in accordance with Louisiana's air quality regulations at LAC Title 33, Part III, Chapter 13. Specific reasonable precautions for the prevention of particulate matter becoming airborne include, but are not limited to:

1. use of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land;

2. application of asphalt, water, or suitable dust suppressant chemicals on dirt roads, material stockpiles, and other surfaces that can give rise to airborne dusts;

3. installation and use of dust collectors to enclose and vent the handling of dusty materials;

4. use of adequate containment methods during sandblasting or similar operations;

5. covering of open-bodied trucks in the process of transporting materials likely to give rise to airborne dust;

6. paving of roadways and maintenance of roadways in a clean condition; and

7. for paved streets, prompt removal of earth or other material originating from trucks or earth-moving equipment, sedimentation from erosion of surrounding land, or other sources.

The Applicants developed a fugitive dust control plan for the Project that is consistent with the precautions for fugitive dust control listed in LAC Title 33, Part III, Chapter 13 (see appendix 9E).

9.2.5 Air Quality Analysis—Operation

Operational emission sources at the Project during are identified in tables 9.2-6 and 9.2-7 and are discussed below. More detailed information, including air dispersion modeling, will be included with the Title V and PSD air permit application that will be provided in a future supplemental filing.

9.2.5.1 Stationary Sources

The Project will include liquefaction facilities, pretreatment facilities, an LNG carrier loading dock, and power generation facilities, as well as various supporting facilities. Estimated operational emissions including specific emission sources (units) for the Expansion Facilities, the incremental emissions increases at the Authorized Facilities associated with the Expansion Facilities (specifically, emissions at the low pressure flare), and both facilities combined are provided in table 9.2-6.

TABLE 9.2-6

Plaquemines Expansion Project
Operational Emissions for the Expansion Facilities [a]

Project Component / Emission Unit	NO_X (tpy)	CO (tpy)	VOC (tpy)	$PM_{10}/PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)	Largest Individual HAP (n-Hexane) [b] (tpy)	Total HAPs [b] (tpy)
Expansion Facilities								
Combined Cycle Combustion Turbines	505.7	593.5	107.5	279.8	55.2	6,366,860	12.6	20.9
Aeroderivative Combustion Turbines	23.5	189.2	4.5	39.5	1.9	342,324	0.1	1.6
Emergency Generators	23.3	12.7	23.3	0.7	0.1	2,411	N/A	0.1
Hot Oil Heaters	202.6	439.4	28.6	39.7	46.1	624,687	9.4	9.9
Acid Gas Thermal Oxidizers	213.6	128.1	9.0	11.6	81.0	1,649,494	2.7	4.0
Warm, Cold, and Spare Flare	61.8	281.7	185.1	6.8	0.2	120,948	0.3	0.4
Marine Flare	25.9	118.0	6.6	2.8	0.1	52,468	0.1	0.2
Fire Water Pumps	0.8	0.4	0.8	0.0	0.2	90	N/A	N/A
Equipment Leaks	N/A	N/A	8.1	N/A	N/A	6,525	0.1	0.1
Organic and Inorganic Liquid Storage Tanks	N/A	N/A	0.0	N/A	N/A	N/A	N/A	N/A
Diesel Fuel Storage Tanks	N/A	N/A	0.1	N/A	N/A	N/A	N/A	0.0
Condensate Truck Loading	N/A	N/A	8.2	N/A	N/A	N/A	0.5	0.8
Total PTE	**1,057.2**	**1,763.1**	**381.8**	**380.9**	**184.8**	**9,165,806 [c]**	**25.8**	**37.9**

TABLE 9.2-6

Plaquemines Expansion Project
Operational Emissions for the Expansion Facilities [a]

Project Component / Emission Unit	NO_X (tpy)	CO (tpy)	VOC (tpy)	$PM_{10}/PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)	Largest Individual HAP (n-Hexane) [b] (tpy)	Total HAPs [b] (tpy)
Authorized Facilities [d]								
LP Flare	41.0	187.1	19.6	4.5	0.3	86,104	0.2	0.4
Total PTE	**41.0**	**187.1**	**19.6**	**4.5**	**0.3**	**86,104**	**0.2**	**0.4**
Total Project								
Combined Cycle Combustion Turbines	505.7	593.5	107.5	279.8	55.2	6,366,860	12.6	20.9
Aeroderivative Combustion Turbines	23.5	189.2	4.5	39.5	1.9	342,324	0.1	1.6
Emergency Generators	23.3	12.7	23.3	0.7	0.1	2,411	N/A	0.1
Hot Oil Heaters	202.6	439.4	28.6	39.7	46.1	624,687	9.4	9.9
Acid Gas Thermal Oxidizers	213.6	128.1	9.0	11.6	81.0	1,649,494	2.7	4.0
Warm, Cold, and Spare Flare	61.8	281.7	185.1	6.8	0.2	120,948	0.3	0.4
LP Flare	41.0	187.1	19.6	4.5	0.3	86,104	0.2	0.4
Marine Flare	25.9	118.0	6.6	2.8	0.1	52,468	0.1	0.2
Fire Water Pumps	0.8	0.4	0.8	0.0	0.2	90	N/A	N/A
Equipment Leaks	N/A	N/A	8.1	N/A	N/A	6,525	0.1	0.1
Organic and Inorganic Liquid Storage Tanks	N/A	N/A	0.0	N/A	N/A	N/A	N/A	N/A
Diesel Fuel Storage Tanks	N/A	N/A	0.1	N/A	N/A	N/A	N/A	0.0
Condensate Truck Loading	N/A	N/A	8.2	N/A	N/A	N/A	0.5	0.8
Total PTE	**1,098.2**	**1,950.2**	**401.4**	**385.4**	**185.1**	**9,251,910 [c]**	**26.1**	**38.3**
Title V Threshold	100	100	100	100	100	N/A	10	25
PSD Major Source Threshold	250	250	250	250	250	100,000	N/A	N/A
PSD Significant Emission Rate [e]	40	100	40	15/10	40	75,000	N/A	N/A

N/A = Not Applicable; PTE = potential to emit

[a] Based on all permanent sources in operation.

[b] HAP Total emissions are aggregated for all air emission sources.

[c] Expansion Facilities CO_2e emissions do not reflect the additional CO_2 reductions through carbon capture.

[d] The emissions from the Authorized Facilities are the incremental emissions increases at Venture Global Plaquemines LNG, LLC's LNG Terminal associated with the Expansion Facilities.

[e] The Expansion Facilities will be part of Venture Global Plaquemines LNG, LLC's LNG Terminal stationary source due to common ownership and location on adjacent/contiguous property. Because Venture Global Plaquemines LNG, LLC's LNG Terminal is an existing major stationary source, emissions associated with the Expansion Facilities are compared to their respective PSD Significant Emission Rate thresholds.

9.2.5.2 Marine Vessels and Vehicle Operation

Mobile sources do not require air permits from the EPA or the LDEQ. Emissions from mobile sources were calculated in conformance with FERC guidance. Mobile sources that will be associated with the Project during operations are:

- LNG carriers at berth (hoteling emissions)
- Escort pilot boats
- Tugboats
- LNG carriers within the exclusion zone; and
- On-road mobile vehicles (e.g., passenger vehicles, maintenance trucks, and other support vehicles used on site).

The summary of marine vessel and on-road vehicle operation emissions is presented in table 9.2-7. Ambient air quality modeling from the Expansion Facilities including the LNG carriers and tugboats at berth and directly adjacent to the marine berth will be included in a future supplemental filing. Emission calculation details for marine vessel and on-road vehicle operation are included in appendix 9D.

9.2.5.3 Project Operational Environmental Impacts

The Project will have a permanent, minor impact on existing air quality. Impacts are not expected to be significant since the Project's continued operations will comply with all state and federal air quality regulations such that the expected emission increases from the Project will not exceed NAAQS or LAAS. Operational emissions estimates for the Expansion Facilities, the incremental emissions increases at the Authorized Facilities associated with the Expansion Facilities, and both facilities combined are summarized in table 9.2-7. Emission calculation details for the operational emissions are included in appendix 9C. Additional details for operational emissions from stationary sources at the Expansion Facilities, including emission factors and emission source specifications and the impacts of such emissions, will be provided in the Title V and PSD air permit application that will be provided in a future supplemental filing.

TABLE 9.2-7

Plaquemines Expansion Project
Operational Emissions Summary for the Expansion Facilities (tpy)

Project Component / Source	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	HAPs	CO_2e
Expansion Facilities [a]	1,057.2	1,763.1	381.8	380.9	380.9	184.8	37.9	9,165,806 [b]
Authorized Facilities [c]	41.0	187.1	19.6	4.5	4.5	0.3	0.4	86,104
Marine Vessels and On-Road Vehicles [d]	258.2	135.1	21.2	29.5	20.2	0.6	0.1	71,394
Total	**1,356.4**	**2,085.3**	**422.6**	**414.9**	**405.6**	**185.7**	**38.4**	**9,323,304**

N/A = Not Applicable

[a] Based on all permanent sources in operation.

[b] Expansion Facilities CO_2e emissions do not reflect the additional CO_2 reductions through carbon capture.

[c] The emissions from the Authorized Facilities are the incremental emissions increases at Venture Global Plaquemines LNG, LLC's LNG Terminal associated with the Expansion Facilities.

[d] Marine vessels and on-road vehicle emissions estimates per Appendix 9D.

9.2.5.4 Mitigation

A BACT analysis will be performed to support the Title V and PSD air permit application for the Expansion Facilities. The stationary sources at the Expansion Facilities will implement BACT pursuant with compliance with the LAC 33:III.509.J to reduce the emission rate of pollutants at the Expansion Facilities. The analysis will identify appropriate control technologies and practices to minimize emissions from stationary sources at the Project. BACT determinations and supporting documentation will be included in the Title V and PSD air permit application that will be provided in a future supplemental filing.

9.3. NOISE QUALITY

An acoustical assessment was conducted to analyze potential noise quality impacts from the Project by estimating the sound contribution of the proposed facilities at nearby noise sensitive areas ("NSAs"). NSAs include residences, hospitals, churches, and schools. The following sections describe the principles of noise, applicable regulations, specific NSAs near the Project, existing ambient noise levels, and the impact analysis.

9.3.1 Principles of Noise

Sound is a sequence of waves of pressure that propagate through compressible media such as air or water. When sound becomes excessive, annoying, or unwanted, it is often referred to as noise. The Project has the potential to affect existing ambient noise conditions in surrounding areas during construction and operation.

The ambient sound level of a region is defined by the total noise generated within the specific environment and usually comprises natural and anthropogenic sounds. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of a day and throughout the week. This variation may be caused in part by changing weather conditions and the effect of seasonal changes in vegetative cover.

Two measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level ("L_{eq}") and the day-night sound level ("L_{dn}"). The L_{eq} is a sound level over a specific period corresponding to the same sound energy as measured for an instantaneous sound level, assuming it is a constant noise source. Sound levels, measured in decibels ("dB"), are perceived differently depending on the length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, in the calculation of the L_{dn}, late night and early morning (10 PM to 7 AM) noise exposures are increased by 10 dB to account for people's greater sensitivity to sound during nighttime hours. To account for the human ear's sensitivity to low-level noises, decibel levels are corrected using the A-weighted scale ("dBA"). The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies.

Table 9.3-1 demonstrates the relative dBA levels of common sounds measured in the environment and industry. A 3 dB change of sound level is considered to be barely perceivable by the human ear. A 6 dB change of sound level is considered clearly noticeable, and a 10 dB increase is perceived as if the sound level intensity doubled (FERC, 2017).

TABLE 9.3-1

Plaquemines Expansion Project
Common Sound Levels and Relative Loudness

Description of Sound	Sound Level (dBA)	Relative Loudness (dBA) [a]
Threshold of pain	140	256
Jet Taking Off (200 feet away)	130	128
Operating Heavy Equipment	120	64
Night Club (with music)	110	32
Construction Facilities	100	16
Boiler Room	90	8
Freight Train (100 feet away)	80	4
Classroom Chatter	70	2
Conversation (3 feet away)	60	1
Urban Residence	50	1/2
Soft Whisper (5 feet away)	40	1/4
North Rim of Grand Canyon	30	1/8
Silent Study Room	20	1/16
Threshold of Human Hearing (1,000 Hz)	0	1/64

Source: Adapted from U.S. Department of Labor, 2016
[a] Relative loudness is how the sound is perceived by the human ear. Higher decibels are perceived as louder.

9.3.2 Applicable Regulations

9.3.2.1 Federal Regulations

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety* (EPA, 1974), which evaluated the effects of environmental noise with respect to health and safety. As set forth in this publication, the EPA determined that noise levels should not exceed an L_{dn} of 55 dBA, which is the level that protects the public from indoor and outdoor activity interference. This noise level has been used by state and federal agencies to establish noise limitations for various noise sources. A 55 dBA L_{dn} noise level equates to an L_{eq} of 48.6 dBA (i.e., a facility that does not exceed a continuous noise impact of 48.6 dBA will not exceed 55 dBA L_{dn}).

FERC has adopted the following criterion described in 18 CFR § 380.12(k) for new compression and associated facilities and for all new LNG facilities:

> *The noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed an L_{dn} of 55 dBA at any pre-existing NSAs such as schools, hospitals, or residences.*
>
> *If construction activity would or may occur during nighttime hours, you should provide the L_{dn} of existing noise levels at all NSAs within 0.5 mile, the estimated noise impacts at those NSAs from the construction activity, and the estimated increase in background noise. Construction activity that would or may occur during nighttime hours should be performed with the goal that the activity contribute noise levels below 55 dBA L_{dn} and 48.6*

dBA L_{eq}, or no more than 10 dBA over background if ambient noise levels are above 55 dBA L_{dn}.

These criteria were used to assess the potential noise impacts from the construction and operation of the Project. Based upon this criterion, the Project operations should be limited to 55 dBA L_{dn} at any pre-existing NSAs. Nighttime construction activities should be limited to 48.6 dBA L_{eq}.

9.3.2.2 State and Local Regulations

The State of Louisiana has not adopted noise regulations applicable to Project construction and operation. However, Plaquemines Parish maintains noise regulations within its Code of Ordinances, Part 1, Chapter for Local Self Government for Plaquemines Parish, Louisiana, Chapter 17, Article IX, Noise (Plaquemines Parish, 2015). The maximum permissible sound level (L_{eq}) at NSAs during daytime hours is 60 dBA, and during nighttime hours is 55 dBA. The maximum permissible sound level (L_{eq}) for industrial areas at all times is 75 dBA.

9.3.2.3 Regulatory Summary

Operational noise associated with the Project operations are applicable to both the Plaquemines Parish daytime limit of 60 dBA and nighttime limit of 55 dBA at the nearest NSAs. The FERC requirement is the most restrictive of the applicable limits with a 55 dBA L_{dn}, which implies a 48.6 dBA L_{eq} nighttime limit for continuously operating noise sources such as the Project's operational facilities. For construction, FERC limits construction noise to a nighttime sound level of 48.6 dBA L_{eq} at the nearest NSAs.

9.3.3 Noise Sensitive Areas

The Expansion Facilities will be constructed in a mixed industrial and rural area with NSAs within one mile of the boundary of the Expansion Facilities. NSAs were previously identified during the FERC review of the Plaquemines LNG Terminal, and similar NSA numbering is used here (see Docket No. CP17-66). As shown on figure 9.3.3-1 in appendix 9A, the closest NSAs are NSAs 1, 2, 6, and 9, which are all residences (or clusters of residences) located west, east and north of the Expansion Facilities. Table 9.3-2 and figures 9.3.3-1 and 9.3.3-2 provide a summary of these NSAs in each direction and their proximity to the Expansion Facilities.

TABLE 9.3-2

Plaquemines Expansion Project
Noise Sensitive Areas Near the Expansion Facilities Boundary

Facility	NSA Name (type)	Direction of Nearest NSA	Distance from center of the facility to Nearest NSA (feet)	Distance from closest pile driver to Nearest NSA (feet)
Expansion Facilities	NSA 1 (residential)	West	9,044	6,857
	NSA 2 (residential)	West	8,010	5,227
	NSA 6 (residential)	East	10,960	7,262
	NSA 9 (residential)	North	6,435	2,867

Noise generated during the Expansion Facilities' construction has the potential to affect terrestrial and aquatic fish and wildlife species. Specifically, pile driving during construction will result in increased underwater noise levels within the Mississippi River and nearshore

environment. Detailed information regarding noise impacts on fish and wildlife species is provided in resource report 3.

9.3.4 Existing Ambient Noise Levels

Burns and McDonnell Engineering Company, Inc. conducted pre-construction ambient (baseline) noise surveys for NSA 2, NSA 6, and NSA 9 in 2025. The ambient survey at NSA 2 and NSA 6 collected sound level data over two, 7-day periods; one in January and one in June 2025. The ambient sound levels for NSA 9 were collected continuously over a 6-day period between October 29 and November 3, 2025. These data were assumed to be representative of both summer and winter seasons. NSA 1 is located in proximity to NSA 2 and in a similar acoustic environment; therefore, the NSA 2 measurements are assumed to representative of NSA 1. The noise survey results for the Expansion Facilities NSAs are presented in table 9.3-3. The surveys were conducted during the commissioning phase of the Authorized Facilities. Further, noise from activities conducted at the Authorized Facilities was not audible during review of the audio files, which is likely attributed to the presence of the storm surge wall acting as a sound barrier to the surrounding area.

TABLE 9.3-3

Plaquemines Expansion Project
Expansion Facilities Ambient Noise Survey Results

Noise Sensitive Area	Summer			Winter		
	Daytime Noise Level (L_{eq}) dBA	Nighttime Noise Level (L_{eq}) dBA	Noise Level (L_{dn}) dBA	Daytime Noise Level (L_{eq}) dBA	Nighttime Noise Level (L_{eq}) dBA	Noise Level (L_{dn}) dBA
NSA 1	56	60	66	55	55	62
NSA 2	56	60	66	55	55	62
NSA 6	54	56	62	52	54	60
NSA 9	65	58	67	65	58	67

Note: Review of audio files showed the elevated sound levels measured during nighttime hours were the result of high-frequency noise associated with frogs and insects.

9.3.5 Noise Quality Analysis—Construction

The most prevalent noise-generating activity and equipment during construction of the Expansion Facilities is anticipated to be pile driving and the operation of combustion-engine driven construction equipment. The noise levels at NSAs will depend on the type of equipment used; the mode of operation of the equipment; the length of time the equipment is in use; the amount of equipment used simultaneously; the distance between the sound generation source and the receptor; and existing ambient noise in the area, which is industrial in nature. Estimates of Project construction noise levels at NSAs are provided below.

9.3.5.1 Anticipated Construction Noise Levels

Noise levels during construction activities will vary over time and will depend on the number of noise-generating sources operating simultaneously and existing industrial noise in the area. The majority of construction activities at the Expansion Facilities will generally occur between the hours of 7 AM and 7 PM, varying with the season and light availability.

Sound modeling was performed using the industry-accepted sound modeling software Computer Aided Noise Abatement (“CadnaA”), version 2025. The software is a scaled, three-

dimensional program that takes into account air absorption, terrain, ground absorption, reflections, and shielding for each piece of sound-emitting equipment and predicts SPLs. The model calculates sound propagation based on the International Organization of Standardization ("ISO") 9613-2:2024, General Method of Calculation. ISO 9613-2 assesses the sound level propagation based on the octave band center-frequency range from 31.5 to 8,000 Hz.

The ISO standard considers sound propagation and directivity. The software calculates sound propagation using omnidirectional, downwind sound propagation, and worst-case directivity factors. In other words, the model assumes that each piece of equipment propagates its maximum sound level in all directions at all times. Empirical studies accepted within the industry have demonstrated that modeling may over-predict sound levels in certain directions, and as a result, modeling results generally are considered a conservative measure of the Project's actual sound level. The acoustic parameters that will be used as inputs for the acoustic model for the Project are summarized in table 9.3-4.

TABLE 9.3-4

Plaquemines Expansion Project
Key Acoustic Modeling Parameters

Parameter	Setting	Rationale
Project Area Ground Absorption	0.5	Accounts for mixed acoustically reflective and non-reflective surfaces. Large bodies of water were set to be acoustically reflective (0.0).
Temperature	50°F	Assumed standard weather conditions.
Relative Humidity	70%	Assumed standard weather conditions.
Wind Speed	6.7 mph	Assumed downwind in all directions.
Maximum Order of Reflection	2	Accounts for building reflections.
Terrain	Site Specific Topography	Topographical data has been input into the noise model to be representative of the terrain at each modeling location and the surrounding areas.
Barrier	Storm surge walls and levees	Existing and future project-related storm surge walls of about 30-feet and the 13-foot levee were included in the model.

Construction equipment will differ depending on the construction phase. The Applicants analyzed the construction schedule to identify the maximum construction activity to provide a conservative assessment of potential noise levels associated with construction activities. Facility construction equipment sound level data were obtained from the Federal Highway Administration's Roadway Construction Noise Model ("RCNM"). Two modeling scenarios were considered to identify maximum construction noise levels. Scenario 1 assumes facility-wide construction prior to completion of the storm surge wall with construction pile drivers operating simultaneously at the closest locations to NSA 2 and NSA 6. Scenario 2 assumes the same facility-wide construction with a pile driver operating at the port location closest to NSA 9 after the storm surge wall has been constructed. The modeling inputs for the construction sources are summarized below in table 9.3-5.

TABLE 9.3-5

Plaquemines Expansion Project
Modeling Inputs for Daytime Construction Sources

Scenario[a]	Equipment	RCNM ID Number	Quantity	Total Sound Power Level (dBA)	Barriers
1	Excavator	LAeq_1022	150	129	Existing storm surge walls (about 30 feet) and existing levees (13 feet)
	Pile Driver	LAsmax_1066	2	134	
2	Excavator	LAeq_1022	150	129	Existing and future storm surge walls (about 30 feet) and existing levees (13 feet)
	Pile Driver	LAsmax_1066	1	131	

[a] Pile driving associated with the marine berth (Scenario 2) will not begin until construction of the storm surge wall (Scenario 1) is complete.

The estimated maximum daytime construction noise levels (L_{eq}) compared to the lowest ambient daytime noise levels (L_{eq}) are presented in table 9.3-6 and illustrated in figure 9.3.3-3 for scenario 1 and figure 9.3.3-4 for scenario 2. The comparison uses the lowest ambient noise levels since that will be the most impactful and therefore most conservative scenario for comparison.

TABLE 9.3-6

Plaquemines Expansion Project
Modeled Daytime Noise Levels for Expansion Facilities Construction (dBA) – Maximum Construction

NSA	Lowest Measured Ambient Daytime Noise Level (L_{eq})	Maximum Facility Construction Noise Level (L_{eq})	Maximum Pile Driver Noise Level (L_{eq})	Pile Driving + Facilities Construction[a]
NSA 1	55	42	41	45
NSA 2	55	44	42	46
NSA 6	52	49	47	51
NSA 9	65	50	60	60

[a] Maximum noise level from construction modeling scenarios presented as L_{eq} as the loudest construction activities will occur during the daytime.

The modeled noise levels are expected to be conservative and be reached only for short periods of time. Nighttime construction noise levels are expected to be substantially lower than those calculated for maximum daytime construction. The Applicants have developed a Nighttime Construction Noise Mitigation Plan, which is provided in appendix 9F.

9.3.5.2 Noise Mitigation

Based on the noise analysis presented above, no noise mitigation measures are proposed associated with pile driving or daytime facility construction of the Expansion Facilities. If nighttime construction occurs, FERC's guidance limit of an L_{dn} of 55 dBA at impacted NSA locations would have to be met. The Applicants have prepared a Nighttime Construction Noise Mitigation Plan (see appendix 9F) which outlines the mitigation measures to be implemented during construction activities at night to manage construction activities and minimize noise contributions at NSAs to 48.6 dBA L_{eq}. To meet this requirement, the Applicants will monitor construction noise and minimize construction activities and the number of equipment working at night in the vicinity of the NSAs until the storm surge wall is complete.

9.3.6 Noise Quality Analysis—Operation

Operation of the Expansion Facilities will produce noise on a continuous basis but is expected to remain within applicable FERC limits. The primary noise-generating sources will be:

- Five pretreatment system ("PTS") trains with refrigerant compressors and associated air coolers;
- 32 liquefaction train systems ("LTS") equipped with mixed refrigerant ("MR") compressor blocks with air coolers;
- Five gas booster compressors with associated air coolers;
- Six boil-off gas ("BOG") compressors with associated air coolers;
- Six hot oil furnaces;
- Four thermal oxidizers;
- 10 combined-cycle gas-fired General Electric ("GE") 7E.03 combustion turbine generators ("CTGs") with heat recovery steam generators ("HRSGs");
- Two steam turbine generators ("STGs") with four air-cooled condensers ("ACCs"); and
- Two auxiliary GE LM2500 simple-cycle combustion turbine generators with selective catalytic reduction ("SCR") systems

In order to evaluate predicted Project noise levels at nearby NSAs and identify the extent of mitigation measures that will be required to comply with FERC standards, a three-dimensional, computer-generated acoustical model was created using SoundPLAN 9.1, an internationally distributed software package specifically designed for estimating noise emissions from industrial facilities. The model is based on provided site plans operating under normal 24-hour continuous operations. Additional details regarding calculation methodologies are presented in appendix 9G.

As presented in table 9.3-7, the noise attributable to the operation of the Expansion Facilities, including the noise mitigation measures, will be less than 55 dBA L_{dn} at nearby NSAs.

TABLE 9.3-7

Plaquemines Expansion Project
Noise Analysis for the Expansion Facilities with Mitigation

NSAs	Surveyed Ambient Noise Level (L_{dn}) (dBA)[a]	Estimated L_{dn} of the Facility at Full Load[a] (dBA)	L_{dn} of Facility + Ambient L_{dn} (dBA)	Potential Noise Increase (dBA)
NSA 1	62	45	62	0
NSA 2	62	45	62	0
NSA 6	60	52	61	1
NSA 9	67	49	67	0

Source: Operational Noise Analysis for the Expansion Facilities (appendix 9G)
[a] Lowest seasonal L_{dn}
[b] Noise levels calculated by noise model

9.3.6.1 Operational Noise Mitigation

Preliminary modeling revealed that noise control measures would be required to achieve compliance with FERC criteria at the NSA locations beyond what is included in the base design. Noise level prediction calculations were iteratively run using various types and amounts of additional noise controls to determine effective and efficient means of reducing combined noise levels to an acceptable level. The evaluated noise control measures included:

- Acoustical shrouds on the CTG exhaust ducts and HRSG inlet ducts
- Acoustical insulation on gas metering and regulating yard piping and valves
- Acoustical barriers and louvers fitted on air cooled condensers
- Enclosures for power island system pumps

The noise mitigation measures and their acoustic performance specifications are outlined in appendix 9G.

9.3.6.2 Vibration

Operation of the Expansion Facilities is not anticipated to result in noticeable vibration at any NSAs because the two potential vibrations sources, combustion turbines and cooling fans, are highly balanced and do not typically generate significant ground-borne vibration. The noise modeling analysis included an evaluation of low frequency noise (31.5 Hz and 63 Hz octave bands). The modeling analysis results revealed that low frequency noise during operation would not result in noise-induced vibration at any NSA.

9.4. CUMULATIVE IMPACTS

9.4.1 Non-Greenhouse Gas Pollutants

The Class II air dispersion modeling that will be performed as part of the Title V and PSD permit application process will be performed in accordance with EPA and LDEQ guidance[9,10] and will assess whether any localized air quality impacts above significant impact levels ("SILs") will require the preparation of a cumulative impacts analysis.

First, the Applicants will use the SILs in the Significant Impact Analysis to determine whether refined, cumulative modeling is necessary. At this first step, the proposed facility's predicted impact on air quality is compared to the SILs; if the predicted impact is less than the SILs, the LDEQ concludes that the facility would not cause or contribute to an exceedance of the NAAQS and, therefore, no cumulative modeling is needed. However, if the impact of the proposed project exceeds the SILs, then the LDEQ requires cumulative modeling. If such cumulative modeling predicts NAAQS exceedances, then the LDEQ requires a "culpability analysis" to determine whether the proposed project is at fault. In the culpability analysis, the LDEQ compares the impact of the proposed project within the cumulative impact analysis (i.e., the project's impact to the modeled exceedance) to the SILs and if that impact is less than the

[9] 40 CFR Part 51, Appendix W – Section 9.2.3c, *available at* https://www.epa.gov/system/files/documents/2024-11/appendix_w-2024.pdf. Accessed November 2025.

[10] LDEQ, "Air Quality Modeling Procedures," (Aug. 2006), Sections 2.2 and 2.3, *available at* https://www.deq.louisiana.gov/assets/docs/Air/ModelingProcedures0806.pdf. Accessed November 2025.

SILs, the LDEQ concludes that the proposed project does not cause or contribute to a NAAQS violation. Results of this evaluation will be included as an attachment to the Title V and PSD air permit application that will be provided in a future supplemental filing. An impact analysis inclusive of the marine mobile sources that are not required for the Title V and PSD air permit application will be provided in a future supplemental filing.

In addition to the Class II Area air dispersion modeling analysis, the Applicants will prepare an ambient ozone analysis to determine the impacts of the Expansion Facilities' emissions on ambient ozone concentrations in the region. The EPA Tier 1 Modeled Emission Rates for Precursors approach will be used (EPA, 2019). Results of this evaluation will be included as an attachment to the Title V and PSD air permit application that will be provided in a supplemental filing.

Due to the proximity of the Breton NWR to the Expansion Facilities, the Applicants will complete a Class I Area air dispersion modeling analysis to demonstrate that the Project will not cause or contribute to a cumulative impact that will exceed Class I PSD increments in the Breton NWR. Results of this evaluation will be included as an attachment to the Title V and PSD permit application that will be provided in a future supplemental filing.

9.4.2 Greenhouse Gas Pollutants

On January 9, 2023, the Council on Environmental Quality issued interim guidance on the consideration of greenhouse gas emissions and requested comments. The 2023 interim guidance suggested that federal agencies should evaluate: (1) the impact of future climate change on the federal action; and (2) the impact of the federal action on future climate change. Pursuant to Executive Order 14154, *Unleashing American Energy*, CEQ's interim 2023 climate change guidance was withdrawn. 90 Fed. Reg. 22,472 (May 28, 2025). On May 5, 2025, the White House's Office of Management and Budget issued guidance, advising agencies to "limit their analysis and consideration of [GHG] emissions only to that plainly required in their governing statutes subject to an exception" involving consultation with the U.S. Department of Justice.

9.4.3 Noise Quality

FERC's noise restrictions inherently address cumulative effects by accounting for both Project noise and existing noise within the evaluation area for NSAs. No future compressor station or other industrial facilities, either planned or under construction, were identified that would affect NSAs within one mile of the Expansion Facilities, other than the Plaquemines LNG Terminal, as discussed below.

The potential exists for cumulative noise at NSAs near the Expansion Facilities due to noise from operation of the Expansion Facilities and operation of the Authorized Facilities, which is currently under construction and commissioning. A cumulative analysis of potential noise impacts at the NSAs near the Expansion Facilities that may be affected by noise associated with both the Expansion Facilities and the Authorized Facilities is presented in table 9.3-8, which shows that the noise impacts associated with the operation of the Expansion Facilities and the Authorized Facilities will be less than 55 dBA L_{dn} at the nearby NSAs. Further details regarding the noise modeling analysis are included in appendix 9G, Operational Noise Level Evaluation.

TABLE 9.3-8

Plaquemines Expansion Project
Cumulative Noise Analysis for the Expansion Facilities with Mitigation

NSAs	Distance and Direction of NSA from Center of Project (feet)	Surveyed Ambient Noise Level Daytime (L_{dn}) (dBA)	Estimated L_{dn} of Plaquemines Expansion at Full Load[a] (dBA)	Estimated L_{dn} of Plaquemines LNG at Full Load[a] (dBA)	Cumulative L_{dn} of Plaquemines Expansion + Plaquemines LNG	L_{dn} of Plaquemines Expansion + Plaquemines LNG + Ambient L_{dn} (dBA)	Potential Cumulative Noise Increase (dBA)
NSA 1	9,044 west	62	53	45	54	63	1
NSA 2	8,010 west	62	54	45	55	63	1
NSA 6	10,960 east	60	46	52	53	61	1
NSA 9	6,453 northeast	67	45	49	51	67	0

[a] Noise levels calculated by noise model; see appendix 9G.

9.5. REFERENCES

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Resource Report 9
APPENDIX 9A – Figures

Sources: Esri; Garmin International, Inc., Source: U.S. Census Bureau, Esri, USDA Farm Service Agency

Phase I/II Facilities

Expansion Facilities

PLAQUEMINES

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Figure 9.2-1
Authorized and Expansion Facilities
Plaquemines Expansion
Plaquemines Parish, Louisiana

Source: Burns & McDonnell

Issued: 11/6/2025

Sources: Esri; Garmin International, Inc., Source: U.S. Census Bureau, Esri, USDA Farm Service Agency

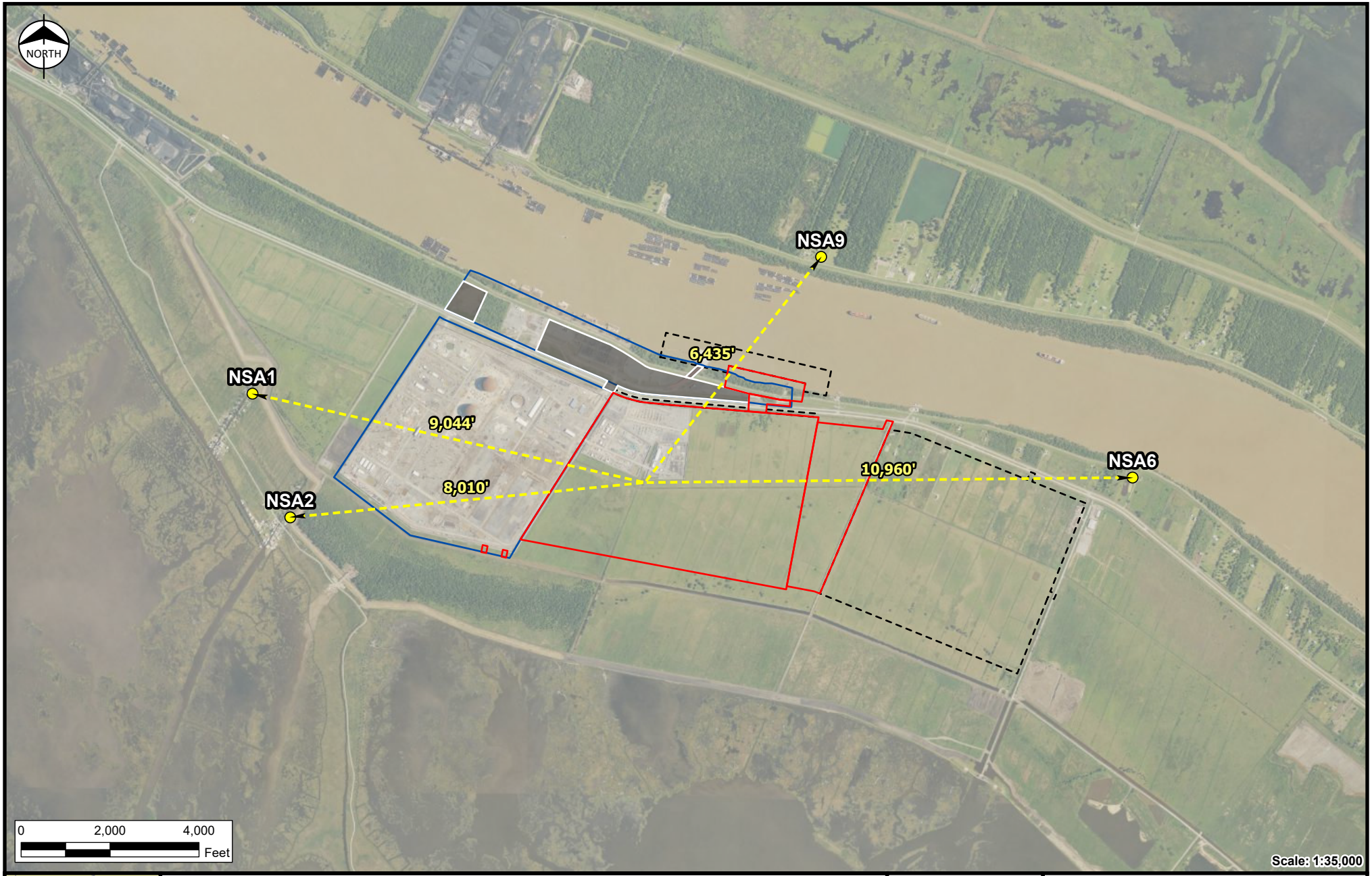
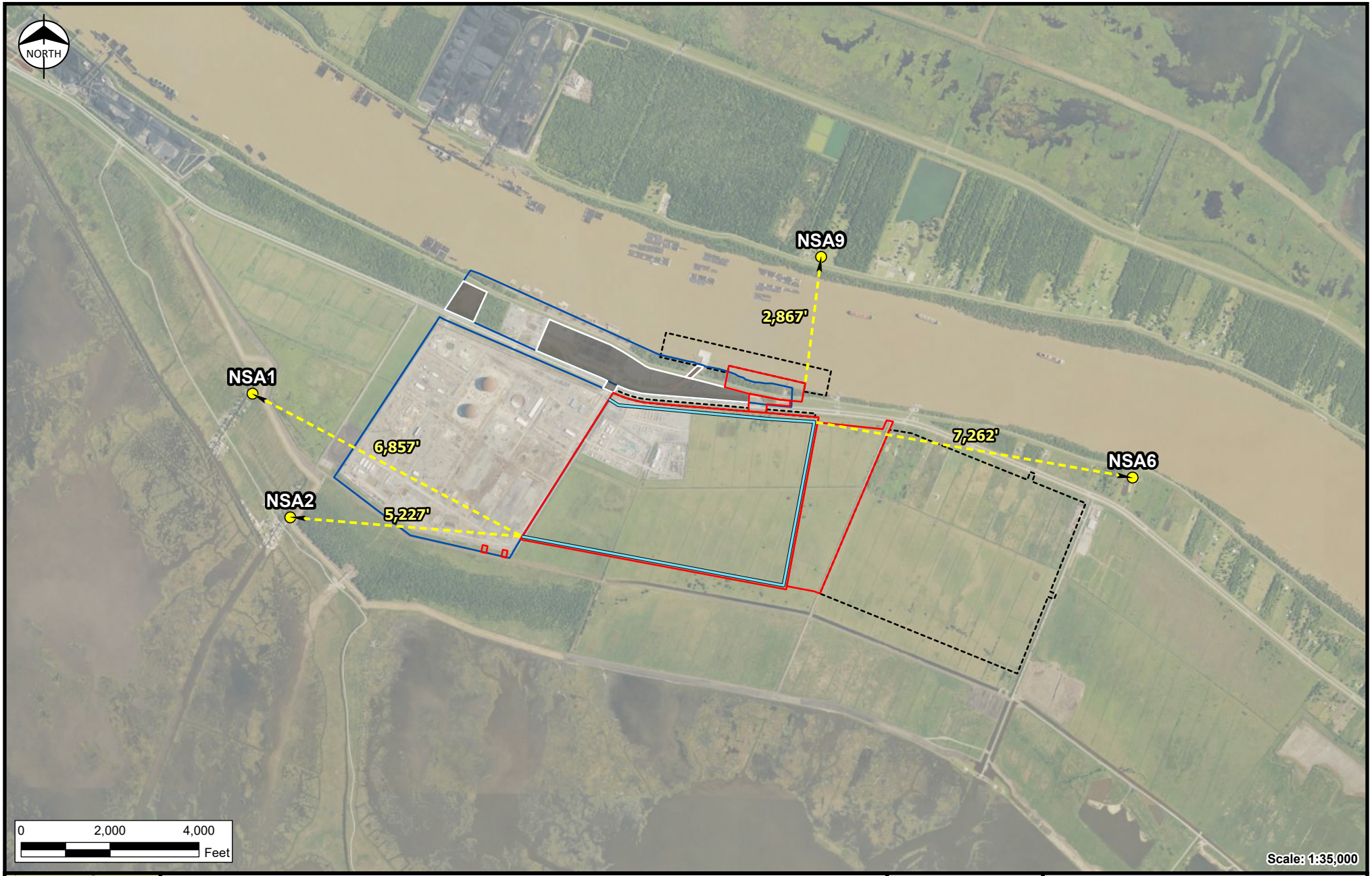


Figure 9.3.3-1
NSAs in Proximity
of Plaquemines Expansion
Plaquemines Expansion
Plaquemines Parish, Louisiana

Source: Burns & McDonnell

Issued: 11/6/2025

Sources: Esri; Garmin International, Inc., Source: U.S. Census Bureau, Esri, USDA Farm Service Agency



Phase I/II Facilities
Expansion Facilities
Temporary Workspace
Existing Workspace
Storm Wall
Noise Receptor
Distance from Pile Driving

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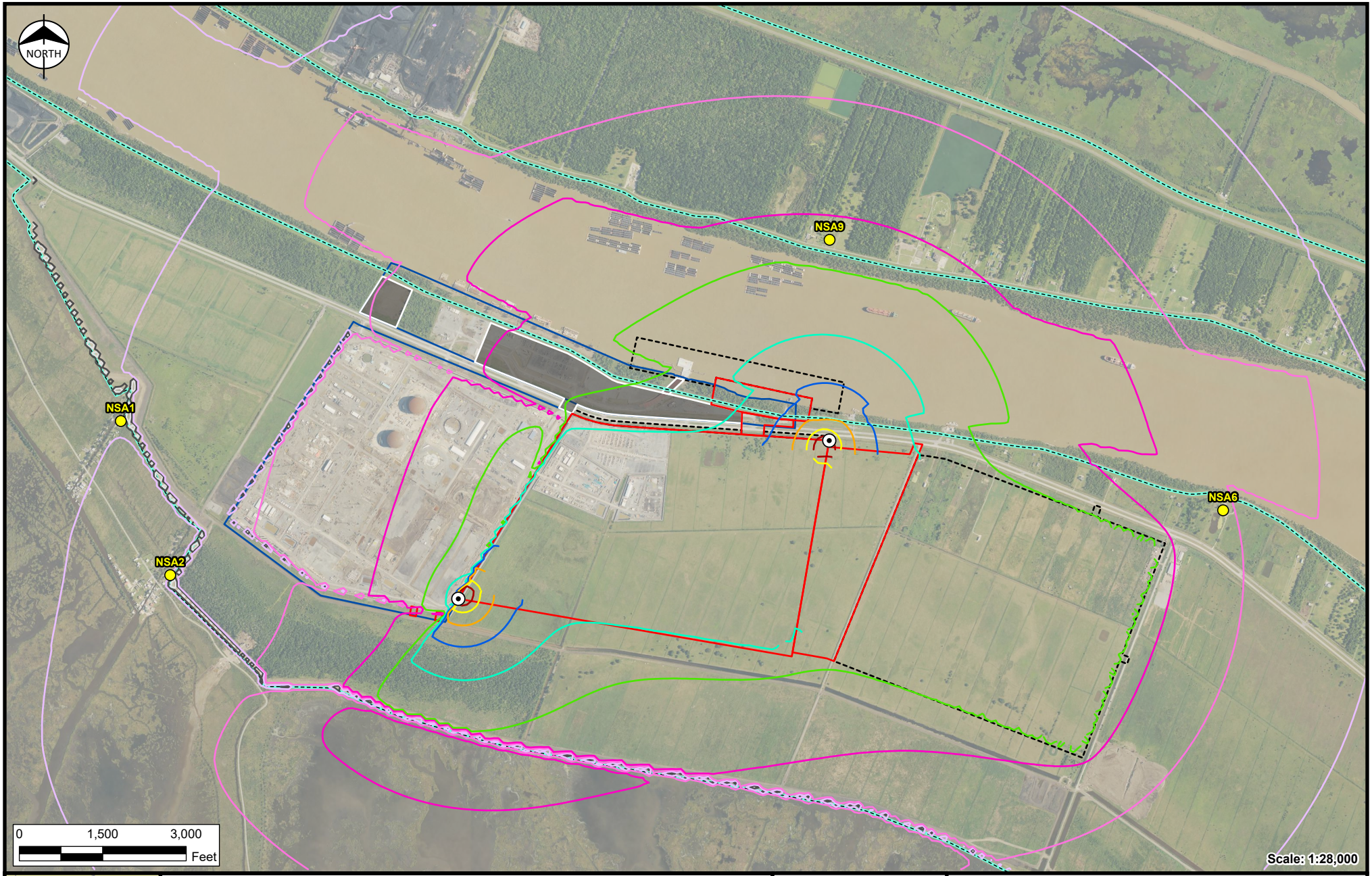
Figure 9.3.3-2
Pile Driving Distance to NSAs
Plaquemines Expansion
Plaquemines Parish, Louisiana

Source: Burns & McDonnell

Issued: 11/6/2025

Sources: Esri; Garmin International, Inc., Source: U.S. Census Bureau, Esri, USDA Farm Service Agency



Phase I/II Facilities
Expansion Facilities
Temporary Workspace
Existing Workspace
Levee

Noise Receptor
Closest Pile Driver

Sound Contours
35 dBA
40 dBA
45 dBA
50 dBA
55 dBA
60 dBA
65 dBA
70 dBA
75 dBA
80 dBA
85 dBA

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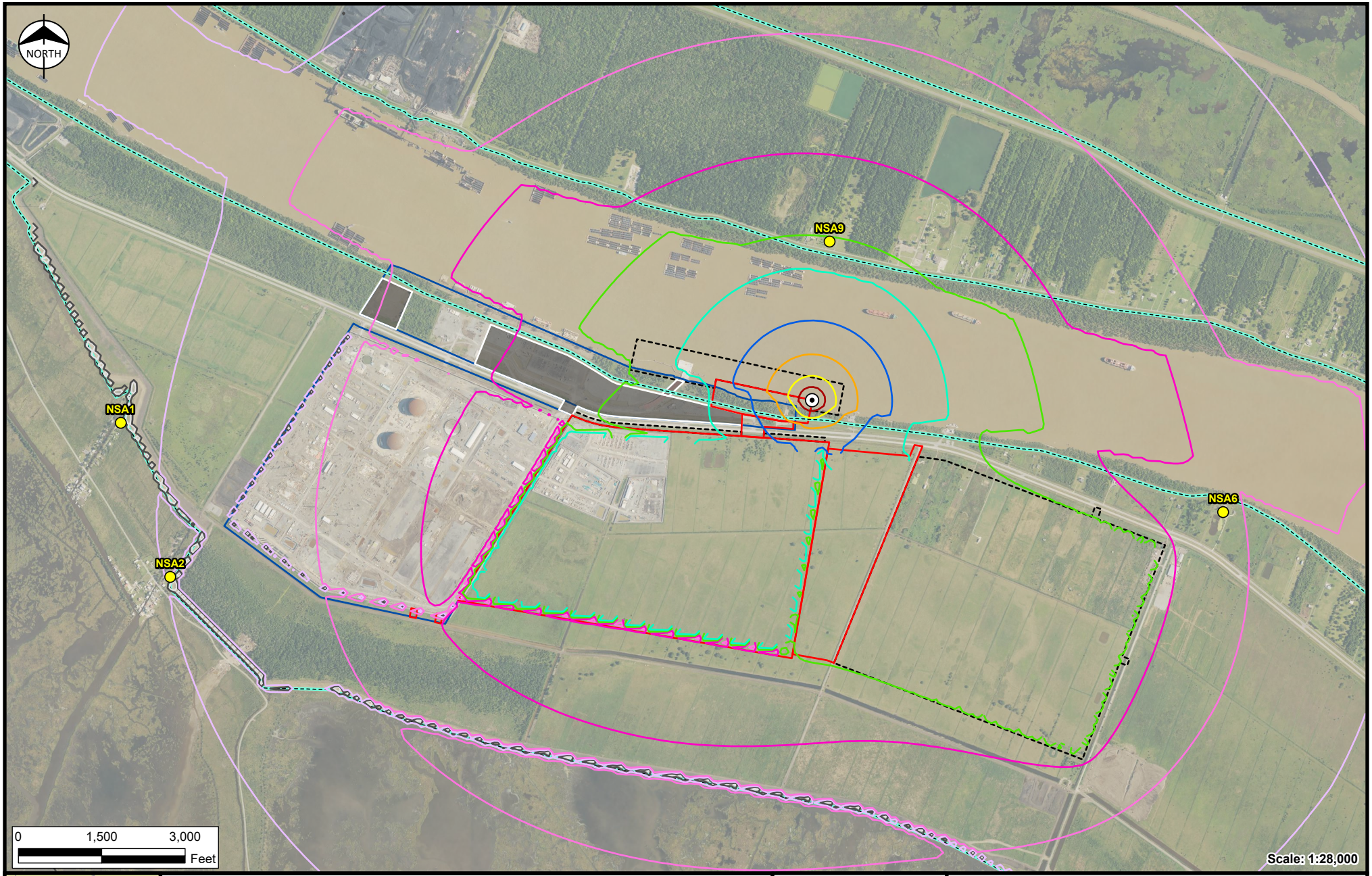
Figure 9.3.3-3
Construction Sound Contours - Scenario 1
Plaquemines Expansion
Plaquemines Parish, Louisiana

Source: Burns & McDonnell

Issued: 11/4/2025

Sources: Esri; Garmin International, Inc., Source: U.S. Census Bureau, Esri, USDA Farm Service Agency



Phase I/II Facilities
Expansion Facilities
Temporary Workspace
Existing Workspace
Levee
Noise Receptor
Closest Pile Driver

Sound Contours
35 dBA
40 dBA
45 dBA
50 dBA
55 dBA
60 dBA
65 dBA
70 dBA
75 dBA
80 dBA
85 dBA

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Figure 9.3.3-4
Construction Sound Contours - Scenario 2
Plaquemines Expansion
Plaquemines Parish, Louisiana

Source: Burns & McDonnell

Issued: 11/4/2025

Sources: Esri; Garmin International, Inc., Source: U.S. Census Bureau, Esri, USDA Farm Service Agency

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Figure 9.3.5-1
Closest Receptors to
Expansion Facilities
Plaquemines Expansion
Plaquemines Parish, Louisiana

Source: Burns & McDonnell

Issued: 11/4/2025

PLAQUEMINES EXPANSION PROJECT
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APPENDIX 9B

Total Construction-Related Air Pollutant Emission Calculations for the Expansion Facilities

Table 9.B.1
Diesel Non-Road Equipment Information

Equipment Type	SCC	Fuel Type	Load Factor[a]	Engine Rating	Total Operating Hours for Project Year[b]	MOVES Emission Factors[c]								
						NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAP
				(hp)	hrs/year	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)
2027														
Air Compressors	2270006015	Diesel	0.43	5	5,198	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Air Compressors	2270006015	Diesel	0.43	13	45	3.76	1.49	0.35	0.17	0.16	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Air Compressors	2270006015	Diesel	0.43	35	810	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	49	6,525	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	75	56	2.65	0.37	0.07	0.04	0.04	1.6E-03	6.0E+02	1.0E-02	3.8E-02
Air Compressors	2270006015	Diesel	0.43	130	56	0.39	0.14	0.03	0.03	0.03	1.4E-03	5.4E+02	2.2E-03	1.5E-02
Air Compressors	2270006015	Diesel	0.43	300	107,663	1.11	0.44	0.07	0.06	0.06	1.5E-03	5.4E+02	3.3E-03	3.1E-02
Air Compressors	2270006015	Diesel	0.43	475	45	1.11	0.44	0.07	0.06	0.06	1.5E-03	5.4E+02	3.3E-03	3.1E-02
Concrete / Industrial Saws	2270002039	Diesel	0.59	11	1,350	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Cranes	2270002045	Diesel	0.43	155	39,893	0.27	0.09	0.02	0.02	0.02	1.4E-03	5.3E+02	1.3E-03	8.5E-03
Cranes	2270002045	Diesel	0.43	450	226,958	0.67	0.16	0.04	0.03	0.03	1.5E-03	5.3E+02	2.3E-03	1.7E-02
Cranes	2270002045	Diesel	0.43	550	78,705	0.67	0.16	0.04	0.03	0.03	1.5E-03	5.3E+02	2.3E-03	1.7E-02
Dozers	2270002069	Diesel	0.59	70	5,670	2.56	0.22	0.05	0.02	0.02	1.6E-03	6.0E+02	9.2E-03	2.9E-02
Excavators	2270002036	Diesel	0.59	97	203,731	0.88	0.08	0.01	0.02	0.02	1.6E-03	6.0E+02	7.0E-04	4.6E-03
Excavators	2270002036	Diesel	0.59	138	263,153	0.19	0.06	0.01	0.01	0.01	1.4E-03	5.4E+02	7.1E-04	4.6E-03
Excavators	2270002036	Diesel	0.59	204	486	0.13	0.03	0.01	0.01	0.01	1.4E-03	5.4E+02	4.7E-04	3.9E-03
Excavators	2270002036	Diesel	0.59	207	745	0.13	0.03	0.01	0.01	0.01	1.4E-03	5.4E+02	4.7E-04	3.9E-03
Excavators	2270002036	Diesel	0.59	393	4,147	0.19	0.06	0.02	0.01	0.01	1.4E-03	5.4E+02	8.7E-04	6.5E-03
Excavators	2270002036	Diesel	0.59	476	3,780	0.19	0.06	0.02	0.01	0.01	1.4E-03	5.4E+02	8.7E-04	6.5E-03
Forklifts	2270003020	Diesel	0.59	74	30,983	2.55	0.19	0.05	0.02	0.02	1.6E-03	6.0E+02	8.9E-03	2.7E-02
Generators	2270006005	Diesel	0.43	14	50,760	3.76	1.49	0.35	0.17	0.16	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	20	146,985	3.76	1.49	0.35	0.17	0.16	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	36	14,310	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Generators	2270006005	Diesel	0.43	100	15,120	1.09	0.30	0.03	0.04	0.04	1.6E-03	6.0E+02	2.3E-03	1.7E-02
Generators	2270006005	Diesel	0.43	270	15,120	0.32	0.10	0.03	0.02	0.02	1.4E-03	5.4E+02	1.8E-03	1.3E-02
Generators	2270006005	Diesel	0.43	2,346	900	3.08	0.52	0.12	0.09	0.09	1.5E-03	5.4E+02	4.2E-03	5.6E-02
Graders	2270002048	Diesel	0.59	69	34,830	2.56	0.21	0.05	0.02	0.02	1.6E-03	6.0E+02	9.1E-03	2.9E-02
Graders	2270002048	Diesel	0.59	74	49,545	2.56	0.21	0.05	0.02	0.02	1.6E-03	6.0E+02	9.1E-03	2.9E-02
Graders	2270002048	Diesel	0.59	80	43,155	0.91	0.11	0.01	0.02	0.02	1.6E-03	6.0E+02	8.8E-04	5.6E-03
Graders	2270002048	Diesel	0.59	100	473	0.22	0.07	0.01	0.02	0.02	1.4E-03	5.4E+02	8.5E-04	5.5E-03
Graders	2270002048	Diesel	0.59	145	85,478	0.22	0.07	0.01	0.02	0.02	1.4E-03	5.4E+02	8.5E-04	5.5E-03
Other General Equipment	2270003040	Diesel	0.43	10	135	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Other General Equipment	2270003040	Diesel	0.43	20	83,160	3.76	1.49	0.35	0.17	0.16	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	22	56	3.76	1.49	0.35	0.17	0.16	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	85	169	1.09	0.30	0.03	0.04	0.04	1.6E-03	6.0E+02	2.3E-03	1.7E-02
Pumps	2270006010	Diesel	0.43	58	32,423	3.87	2.54	0.52	0.35	0.34	2.1E-03	6.9E+02	2.3E-02	2.4E-01
Skid Steer Loader	2270002072	Diesel	0.21	58	32,423	4.55	4.14	0.83	0.61	0.59	2.2E-03	6.9E+02	3.1E-02	3.8E-01
Tampers / Rammers	2270002006	Diesel	0.43	3	91,373	4.21	2.54	0.83	0.26	0.25	2.2E-03	5.9E+02	7.3E-02	4.6E-01
Tractors / Backhoes	2270002066	Diesel	0.21	90	1,088	2.00	1.67	0.31	0.25	0.24	2.0E-03	7.0E+02	1.2E-02	1.4E-01
Tractors / Backhoes	2270002066	Diesel	0.21	157	11,688	1.39	0.74	0.23	0.15	0.14	1.8E-03	6.3E+02	1.2E-02	1.1E-01
Tractors / Backhoes	2270002066	Diesel	0.21	160	101,525	1.39	0.74	0.23	0.15	0.14	1.8E-03	6.3E+02	1.2E-02	1.1E-01
Tractors / Backhoes	2270002066	Diesel	0.21	230	49,125	1.26	0.61	0.20	0.12	0.12	1.8E-03	6.3E+02	9.8E-03	9.4E-02

[a] Load Factor for equipment is assumed based on EPA "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling," Appendix A.
[b] Estimated hours.

[c] Emission factors for all equipment are from EPA MOVES5.0.0 for Plaquemines Parish Louisiana, MOVES ran September 2025 HAPS emissions is the sum of benzene, formaldehyde, acetaldehyde, acrolein, 2,2,4-Trimethlypentane, ethyl benzene, hexane, propionaldehyde, toluene, xylenes

Table 9.B.1
Diesel Non-Road Equipment Information
(Continued)

Equipment Type	SCC	Fuel Type	Load Factor[a]	Engine Rating	Total Operating Hours for Project Year[b]	MOVES Emission Factors[c]								
						NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAP
				(hp)	hrs/year	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)
2028														
Air Compressors	2270003010	Diesel	0.43	5	6,188	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Air Compressors	2270003010	Diesel	0.43	13	56	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Air Compressors	2270003010	Diesel	0.43	35	945	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	49	7,875	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	75	56	2.62	0.32	0.07	0.03	0.03	1.6E-03	6.0E+02	9.8E-03	3.5E-02
Air Compressors	2270006015	Diesel	0.43	130	56	0.33	0.12	0.02	0.03	0.03	1.4E-03	5.4E+02	1.8E-03	1.2E-02
Air Compressors	2270006015	Diesel	0.43	300	129,319	0.96	0.38	0.06	0.05	0.05	1.5E-03	5.4E+02	2.9E-03	2.7E-02
Air Compressors	2270006015	Diesel	0.43	475	56	0.96	0.38	0.06	0.05	0.05	1.5E-03	5.4E+02	2.9E-03	2.7E-02
Cranes	2270006015	Diesel	0.43	155	47,790	0.23	0.07	0.01	0.02	0.02	1.4E-03	5.3E+02	1.0E-03	6.6E-03
Cranes	2270006015	Diesel	0.43	450	271,136	0.57	0.13	0.03	0.02	0.02	1.5E-03	5.3E+02	2.0E-03	1.5E-02
Cranes	2270002045	Diesel	0.43	550	186,626	0.57	0.13	0.03	0.02	0.02	1.5E-03	5.3E+02	2.0E-03	1.5E-02
Excavators	2270002045	Diesel	0.59	97	203,731	0.87	0.07	0.01	0.01	0.01	1.6E-03	6.0E+02	6.3E-04	4.2E-03
Excavators	2270002045	Diesel	0.59	138	263,153	0.18	0.06	0.01	0.01	0.01	1.4E-03	5.4E+02	6.5E-04	4.3E-03
Excavators	2270002036	Diesel	0.59	204	486	0.13	0.03	0.01	0.01	0.01	1.4E-03	5.4E+02	4.7E-04	3.9E-03
Excavators	2270002036	Diesel	0.59	207	745	0.13	0.03	0.01	0.01	0.01	1.4E-03	5.4E+02	4.7E-04	3.9E-03
Excavators	2270002036	Diesel	0.59	393	4,147	0.19	0.06	0.02	0.01	0.01	1.4E-03	5.4E+02	8.7E-04	6.5E-03
Excavators	2270002036	Diesel	0.59	476	3,780	0.19	0.06	0.02	0.01	0.01	1.4E-03	5.4E+02	8.7E-04	6.5E-03
Forklifts	2270002069	Diesel	0.59	74	119,723	2.55	0.19	0.05	0.02	0.02	1.6E-03	6.0E+02	8.9E-03	2.7E-02
Generators	2270002036	Diesel	0.43	14	60,840	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270002036	Diesel	0.43	20	176,505	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270002036	Diesel	0.43	36	17,280	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Generators	2270002036	Diesel	0.43	100	18,060	1.03	0.24	0.03	0.04	0.04	1.6E-03	6.0E+02	1.8E-03	1.3E-02
Generators	2270002036	Diesel	0.43	270	18,060	0.26	0.08	0.02	0.02	0.02	1.4E-03	5.4E+02	1.4E-03	1.0E-02
Generators	2270002036	Diesel	0.43	2,346	1,080	2.95	0.45	0.11	0.08	0.08	1.5E-03	5.4E+02	4.0E-03	5.0E-02
Graders	2270003020	Diesel	0.59	145	10,766	0.21	0.06	0.01	0.01	0.01	1.4E-03	5.4E+02	7.7E-04	5.0E-03
Other General Equipment	2270003020	Diesel	0.43	10	158	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Other General Equipment	2270003020	Diesel	0.43	20	99,495	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270006005	Diesel	0.43	22	56	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270006005	Diesel	0.43	85	203	1.03	0.24	0.03	0.04	0.04	1.6E-03	6.0E+02	1.8E-03	1.3E-02
Pumps	2270006005	Diesel	0.43	58	15,716	3.66	2.20	0.45	0.30	0.29	2.1E-03	6.9E+02	2.1E-02	2.1E-01
Skid Steer Loader	2270006005	Diesel	0.21	58	11,385	4.30	3.69	0.73	0.54	0.52	2.2E-03	6.9E+02	3.0E-02	3.4E-01
Tampers / Rammers	2270006005	Diesel	0.43	3	70,099	4.20	2.53	0.84	0.25	0.25	2.2E-03	5.9E+02	7.3E-02	4.6E-01
Tractors / Backhoes	2270006005	Diesel	0.21	160	121,288	1.21	0.63	0.19	0.13	0.12	1.8E-03	6.3E+02	1.0E-02	9.5E-02
Tractors / Backhoes	2270002048	Diesel	0.21	230	1,875	1.09	0.52	0.17	0.10	0.10	1.8E-03	6.3E+02	8.5E-03	8.1E-02

[a] Load Factor for equipment is assumed based on EPA "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling," Appendix A.
[b] Estimated hours.
[c] Emission factors for all equipment are from EPA MOVES5.0.0 for Plaquemines Parish Louisiana, MOVES ran September 2025. HAPS emissions is the sum of benzene, formaldehyde, acetaldehyde, acrolein, 2,2,4-Trimethlypentane, ethyl benzene, hexane, propionaldehyde, toluene, xylenes

Table 9.B.1
Diesel Non-Road Equipment Information
(Continued)

Equipment Type	SCC	Fuel Type	Load Factor[a]	Engine Rating	Total Operating Hours for Project Year[b]	MOVES Emission Factors[c]								
						NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAP
				(hp)	hrs/year	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)
2029														
Aerial Lifts	2270003010	Diesel	0.21	49	2,790	2.53	0.28	0.09	0.02	0.02	1.6E-03	5.9E+02	1.2E-02	5.1E-02
Aerial Lifts	2270003010	Diesel	0.21	51	76,725	2.55	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.8E-02
Aerial Lifts	2270003010	Diesel	0.21	74	405	2.55	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.8E-02
Air Compressors	2270006015	Diesel	0.43	5	11,385	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Air Compressors	2270006015	Diesel	0.43	13	101	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Air Compressors	2270006015	Diesel	0.43	35	1,755	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	49	14,400	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	75	113	2.59	0.28	0.06	0.03	0.03	1.6E-03	6.0E+02	9.5E-03	3.2E-02
Air Compressors	2270006015	Diesel	0.43	130	113	0.28	0.10	0.02	0.02	0.02	1.4E-03	5.4E+02	1.4E-03	9.4E-03
Air Compressors	2270006015	Diesel	0.43	300	236,981	0.84	0.32	0.05	0.05	0.05	1.5E-03	5.4E+02	2.6E-03	2.3E-02
Air Compressors	2270006015	Diesel	0.43	475	101	0.84	0.32	0.05	0.05	0.05	1.5E-03	5.4E+02	2.6E-03	2.3E-02
Cranes	2270002045	Diesel	0.43	155	87,683	0.21	0.07	0.01	0.02	0.01	1.4E-03	5.3E+02	8.9E-04	5.8E-03
Cranes	2270002045	Diesel	0.43	285	11	2.55	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.8E-02
Cranes	2270002045	Diesel	0.43	340	10,148	0.49	0.11	0.03	0.02	0.02	1.5E-03	5.3E+02	1.8E-03	1.3E-02
Cranes	2270002045	Diesel	0.43	400	50,344	0.49	0.11	0.03	0.02	0.02	1.5E-03	5.3E+02	1.8E-03	1.3E-02
Cranes	2270002045	Diesel	0.43	450	498,960	0.49	0.11	0.03	0.02	0.02	1.5E-03	5.3E+02	1.8E-03	1.3E-02
Cranes	2270002045	Diesel	0.43	500	1,710	0.49	0.11	0.03	0.02	0.02	1.5E-03	5.3E+02	1.8E-03	1.3E-02
Cranes	2270002045	Diesel	0.43	510	61,335	0.49	0.11	0.03	0.02	0.02	1.5E-03	5.3E+02	1.8E-03	1.3E-02
Cranes	2270002045	Diesel	0.43	550	265,928	0.49	0.11	0.03	0.02	0.02	1.5E-03	5.3E+02	1.8E-03	1.3E-02
Dozers	2270002069	Diesel	0.59	70	5,670	2.55	0.20	0.05	0.02	0.02	1.6E-03	6.0E+02	9.0E-03	2.8E-02
Excavators	2270002036	Diesel	0.59	97	203,731	0.86	0.06	0.01	0.01	0.01	1.6E-03	6.0E+02	5.8E-04	3.9E-03
Excavators	2270002036	Diesel	0.59	138	263,153	0.17	0.05	0.01	0.01	0.01	1.4E-03	5.4E+02	6.1E-04	4.0E-03
Excavators	2270002036	Diesel	0.59	204	486	0.11	0.02	0.01	0.01	0.01	1.4E-03	5.4E+02	3.9E-04	3.5E-03
Excavators	2270002036	Diesel	0.59	207	745	0.11	0.02	0.01	0.01	0.01	1.4E-03	5.4E+02	3.9E-04	3.5E-03
Excavators	2270002036	Diesel	0.59	393	4,147	0.14	0.04	0.01	0.01	0.01	1.4E-03	5.4E+02	5.7E-04	4.6E-03
Excavators	2270002036	Diesel	0.59	476	3,780	0.14	0.04	0.01	0.01	0.01	1.4E-03	5.4E+02	5.7E-04	4.6E-03
Forklifts	2270003020	Diesel	0.59	7	56	3.77	1.51	0.35	0.18	0.17	2.2E-03	6.0E+02	3.1E-02	2.0E-01
Forklifts	2270003020	Diesel	0.59	74	151,088	2.54	0.19	0.05	0.02	0.02	1.6E-03	6.0E+02	8.9E-03	2.7E-02
Forklifts	2270003020	Diesel	0.59	80	34	0.86	0.05	0.01	0.01	0.01	1.6E-03	6.0E+02	5.4E-04	3.7E-03
Forklifts	2270003020	Diesel	0.59	99	5,288	0.86	0.05	0.01	0.01	0.01	1.6E-03	6.0E+02	5.4E-04	3.7E-03
Generators	2270006005	Diesel	0.43	14	111,600	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	20	323,490	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	36	17,280	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Generators	2270006005	Diesel	0.43	100	33,180	0.98	0.19	0.02	0.03	0.03	1.6E-03	6.0E+02	1.5E-03	1.0E-02
Generators	2270006005	Diesel	0.43	270	18,060	0.22	0.06	0.02	0.02	0.01	1.4E-03	5.4E+02	1.1E-03	8.2E-03
Generators	2270006005	Diesel	0.43	1,200	1,980	2.85	0.39	0.10	0.07	0.07	1.5E-03	5.4E+02	3.9E-03	4.6E-02
Graders	2270002048	Diesel	0.59	69	34,830	2.55	0.20	0.05	0.02	0.02	1.6E-03	6.0E+02	9.0E-03	2.8E-02
Graders	2270002048	Diesel	0.59	74	49,590	2.55	0.20	0.05	0.02	0.02	1.6E-03	6.0E+02	9.0E-03	2.8E-02
Graders	2270002048	Diesel	0.59	80	43,155	0.88	0.08	0.01	0.02	0.02	1.6E-03	6.0E+02	6.9E-04	4.5E-03
Graders	2270002048	Diesel	0.59	100	473	0.19	0.06	0.01	0.01	0.01	1.4E-03	5.4E+02	7.0E-04	4.6E-03
Graders	2270002048	Diesel	0.59	145	85,478	0.19	0.06	0.01	0.01	0.01	1.4E-03	5.4E+02	7.0E-04	4.6E-03
Other General Equipment	2270003040	Diesel	0.43	10	293	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Other General Equipment	2270003040	Diesel	0.43	20	182,655	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	22	113	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	85	371	0.98	0.19	0.02	0.03	0.03	1.6E-03	6.0E+02	1.5E-03	1.0E-02
Pumps	2270006010	Diesel	0.43	58	32,423	3.46	1.85	0.38	0.25	0.24	2.0E-03	6.9E+02	1.9E-02	1.8E-01
Skid Steer Loader	2270002072	Diesel	0.21	58	32,423	4.03	3.19	0.63	0.46	0.45	2.1E-03	6.9E+02	2.7E-02	2.9E-01
Tampers / Rammers	2270002006	Diesel	0.43	3	91,373	4.19	2.50	0.84	0.25	0.24	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Tractors / Backhoes	2270002066	Diesel	0.21	48	1,988	1.71	1.24	0.23	0.19	0.18	2.0E-03	7.0E+02	9.1E-03	1.1E-01
Tractors / Backhoes	2270002066	Diesel	0.21	90	1,088	1.06	0.54	0.17	0.11	0.11	1.8E-03	6.3E+02	9.1E-03	8.2E-02
Tractors / Backhoes	2270002066	Diesel	0.21	157	11,688	1.06	0.54	0.17	0.11	0.11	1.8E-03	6.3E+02	9.1E-03	8.2E-02
Tractors / Backhoes	2270002066	Diesel	0.21	160	155,775	1.06	0.54	0.17	0.11	0.11	1.8E-03	6.3E+02	9.1E-03	8.2E-02
Tractors / Backhoes	2270002066	Diesel	0.21	230	49,125	0.95	0.44	0.15	0.09	0.09	1.8E-03	6.3E+02	7.5E-03	7.0E-02

[a] Load Factor for equipment is assumed based on EPA "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling," Appendix A.

[b] Estimated hours.

[c] Emission factors for all equipment are from EPA MOVES5.0.0 for Plaquemines Parish Louisiana, MOVES ran September 2025. HAPS emissions is the sum of benzene, formaldehyde, acetaldehyde, acrolein, 2,2,4-Trimethlypentane, ethyl benzene, hexane, propionaldehyde, toluene, xylenes

Table 9.B.1
Diesel Non-Road Equipment Information
(Continued)

Equipment Type	SCC	Fuel Type	Load Factor[a]	Engine Rating	Total Operating Hours for Project Year[b]	MOVES Emission Factors[c]								
						NO_x	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAP
				(hp)	hrs/year	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)
2030														
Aerial Lifts	2270003010	Diesel	0.21	49	1,170	2.53	0.28	0.09	0.02	0.02	1.6E-03	5.9E+02	1.2E-02	5.1E-02
Aerial Lifts	2270003010	Diesel	0.21	51	6,435	2.54	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.7E-02
Aerial Lifts	2270003010	Diesel	0.21	74	585	2.54	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.7E-02
Air Compressors	2270006015	Diesel	0.43	5	6,806	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Air Compressors	2270006015	Diesel	0.43	13	56	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Air Compressors	2270006015	Diesel	0.43	35	1,080	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	49	8,438	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	75	68	2.57	0.24	0.06	0.02	0.02	1.6E-03	6.0E+02	9.3E-03	3.0E-02
Air Compressors	2270006015	Diesel	0.43	130	68	0.23	0.08	0.01	0.02	0.02	1.4E-03	5.4E+02	1.0E-03	6.9E-03
Air Compressors	2270006015	Diesel	0.43	300	139,838	0.73	0.27	0.04	0.04	0.04	1.5E-03	5.4E+02	2.3E-03	2.0E-02
Air Compressors	2270006015	Diesel	0.43	475	56	0.73	0.27	0.04	0.04	0.04	1.5E-03	5.4E+02	2.3E-03	2.0E-02
Cranes	2270002045	Diesel	0.43	155	51,840	0.20	0.06	0.01	0.01	0.01	1.4E-03	5.3E+02	8.1E-04	5.3E-03
Cranes	2270002045	Diesel	0.43	285	293	2.54	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.7E-02
Cranes	2270002045	Diesel	0.43	340	3,218	0.42	0.10	0.02	0.02	0.02	1.4E-03	5.3E+02	1.6E-03	1.2E-02
Cranes	2270002045	Diesel	0.43	400	6,885	0.42	0.10	0.02	0.02	0.02	1.4E-03	5.3E+02	1.6E-03	1.2E-02
Cranes	2270002045	Diesel	0.43	450	294,525	0.42	0.10	0.02	0.02	0.02	1.4E-03	5.3E+02	1.6E-03	1.2E-02
Cranes	2270002045	Diesel	0.43	500	2,318	0.42	0.10	0.02	0.02	0.02	1.4E-03	5.3E+02	1.6E-03	1.2E-02
Cranes	2270002045	Diesel	0.43	510	8,258	0.42	0.10	0.02	0.02	0.02	1.4E-03	5.3E+02	1.6E-03	1.2E-02
Cranes	2270002045	Diesel	0.43	550	202,725	0.42	0.10	0.02	0.02	0.02	1.4E-03	5.3E+02	1.6E-03	1.2E-02
Excavators	2270002036	Diesel	0.59	97	203,731	0.86	0.06	0.01	0.01	0.01	1.6E-03	6.0E+02	5.8E-04	3.9E-03
Excavators	2270002036	Diesel	0.59	138	263,153	0.17	0.05	0.01	0.01	0.01	1.4E-03	5.4E+02	6.1E-04	4.0E-03
Excavators	2270002036	Diesel	0.59	204	486	0.11	0.02	0.01	0.01	0.01	1.4E-03	5.4E+02	3.9E-04	3.5E-03
Excavators	2270002036	Diesel	0.59	207	745	0.11	0.02	0.01	0.01	0.01	1.4E-03	5.4E+02	3.9E-04	3.5E-03
Excavators	2270002036	Diesel	0.59	393	4,147	0.14	0.04	0.01	0.01	0.01	1.4E-03	5.4E+02	5.7E-04	4.6E-03
Excavators	2270002036	Diesel	0.59	476	3,780	0.14	0.04	0.01	0.01	0.01	1.4E-03	5.4E+02	5.7E-04	4.6E-03
Forklifts	2270003020	Diesel	0.59	7	293	3.77	1.51	0.35	0.18	0.17	2.2E-03	6.0E+02	3.1E-02	2.0E-01
Forklifts	2270003020	Diesel	0.59	74	130,050	2.55	0.19	0.05	0.02	0.02	1.6E-03	6.0E+02	8.9E-03	2.7E-02
Forklifts	2270003020	Diesel	0.59	80	293	0.86	0.05	0.01	0.01	0.01	1.6E-03	6.0E+02	5.4E-04	3.7E-03
Forklifts	2270003020	Diesel	0.59	99	1,463	0.86	0.05	0.01	0.01	0.01	1.6E-03	6.0E+02	5.4E-04	3.7E-03
Generators	2270006005	Diesel	0.43	14	66,240	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	20	190,650	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	36	1,170	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Generators	2270006005	Diesel	0.43	100	19,740	0.92	0.13	0.01	0.02	0.02	1.6E-03	6.0E+02	1.1E-03	7.2E-03
Generators	2270006005	Diesel	0.43	270	1,470	0.17	0.05	0.01	0.01	0.01	1.4E-03	5.4E+02	7.9E-04	6.1E-03
Generators	2270006005	Diesel	0.43	1,200	1,125	2.75	0.34	0.09	0.06	0.06	1.5E-03	5.4E+02	3.8E-03	4.2E-02
Graders	2270002048	Diesel	0.59	145	10,766	0.18	0.05	0.01	0.01	0.01	1.4E-03	5.4E+02	6.5E-04	4.3E-03
Other General Equipment	2270003040	Diesel	0.43	10	180	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Other General Equipment	2270003040	Diesel	0.43	20	107,516	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	22	68	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	85	236	0.92	0.13	0.01	0.02	0.02	1.6E-03	6.0E+02	1.1E-03	7.2E-03
Other General Equipment	2270003040	Diesel	0.43	265	743	0.17	0.05	0.01	0.01	0.01	1.4E-03	5.4E+02	7.9E-04	6.1E-03
Pumps	2270006010	Diesel	0.43	58	15,716	3.27	1.51	0.32	0.21	0.20	2.0E-03	7.0E+02	1.7E-02	1.5E-01
Skid Steer Loader	2270002072	Diesel	0.21	58	11,385	3.77	2.65	0.53	0.39	0.38	2.1E-03	6.9E+02	2.3E-02	2.4E-01
Tampers / Rammers	2270002006	Diesel	0.43	3	70,099	4.18	2.47	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Tractors / Backhoes	2270002066	Diesel	0.21	48	975	1.58	1.06	0.19	0.16	0.15	1.9E-03	7.0E+02	8.0E-03	9.1E-02
Tractors / Backhoes	2270002066	Diesel	0.21	160	121,675	0.93	0.46	0.14	0.09	0.09	1.7E-03	6.3E+02	8.0E-03	7.1E-02
Tractors / Backhoes	2270002066	Diesel	0.21	230	1,875	0.83	0.37	0.12	0.08	0.07	1.7E-03	6.3E+02	6.6E-03	6.0E-02

[a] Load Factor for equipment is assumed based on EPA "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling," Appendix A.
[b] Estimated hours.
[c] Emission factors for all equipment are from EPA MOVES5.0.0 for Plaquemines Parish Louisiana, MOVES ran September 2025. HAPS emissions is the sum of benzene, formaldehyde, acetaldehyde, acrolein, 2,2,4-Trimethlypentane, ethyl benzene, hexane, propionaldehyde, toluene, xylenes

Table 9.B.1
Diesel Non-Road Equipment Information
(Continued)

Equipment Type[a]	SCC	Fuel Type	Load Factor[a]	Engine Rating	Total Operating Hours for Project Year[b]	MOVES Emission Factors[c]								
						NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAP
				(hp)	hrs/year	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)
2031														
Aerial Lifts	2270003010	Diesel	0.21	49	1170	2.53	0.28	0.09	0.02	0.02	1.6E-03	5.9E+02	1.2E-02	5.1E-02
Aerial Lifts	2270003010	Diesel	0.21	51	6435	2.54	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.7E-02
Aerial Lifts	2270003010	Diesel	0.21	74	585	2.54	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.7E-02
Air Compressors	2270006015	Diesel	0.43	5	619	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Air Compressors	2270006015	Diesel	0.43	35	135	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	49	563	2.53	0.28	0.09	0.02	0.02	1.6E-03	6.0E+02	1.2E-02	5.1E-02
Air Compressors	2270006015	Diesel	0.43	75	11	2.56	0.21	0.05	0.02	0.02	1.6E-03	6.0E+02	9.1E-03	2.9E-02
Air Compressors	2270006015	Diesel	0.43	130	11	0.20	0.07	0.01	0.02	0.01	1.4E-03	5.4E+02	8.2E-04	5.5E-03
Air Compressors	2270006015	Diesel	0.43	300	10519	0.64	0.23	0.04	0.03	0.03	1.5E-03	5.4E+02	2.1E-03	1.7E-02
Cranes	2270002045	Diesel	0.43	155	4050	0.19	0.06	0.01	0.01	0.01	1.4E-03	5.3E+02	7.6E-04	5.0E-03
Cranes	2270002045	Diesel	0.43	285	293	2.54	0.19	0.05	0.02	0.02	1.6E-03	5.9E+02	8.9E-03	2.7E-02
Cranes	2270002045	Diesel	0.43	340	3218	0.36	0.08	0.02	0.02	0.02	1.4E-03	5.3E+02	1.4E-03	1.0E-02
Cranes	2270002045	Diesel	0.43	400	7313	0.36	0.08	0.02	0.02	0.02	1.4E-03	5.3E+02	1.4E-03	1.0E-02
Cranes	2270002045	Diesel	0.43	450	22523	0.36	0.08	0.02	0.02	0.02	1.4E-03	5.3E+02	1.4E-03	1.0E-02
Cranes	2270002045	Diesel	0.43	500	2340	0.36	0.08	0.02	0.02	0.02	1.4E-03	5.3E+02	1.4E-03	1.0E-02
Cranes	2270002045	Diesel	0.43	510	8483	0.36	0.08	0.02	0.02	0.02	1.4E-03	5.3E+02	1.4E-03	1.0E-02
Cranes	2270002045	Diesel	0.43	550	15503	0.36	0.08	0.02	0.02	0.02	1.4E-03	5.3E+02	1.4E-03	1.0E-02
Forklifts	2270003020	Diesel	0.59	7	293	3.77	1.51	0.35	0.18	0.17	2.2E-03	6.0E+02	3.1E-02	2.0E-01
Forklifts	2270003020	Diesel	0.59	74	9945	2.55	0.19	0.05	0.02	0.02	1.6E-03	6.0E+02	8.9E-03	2.7E-02
Forklifts	2270003020	Diesel	0.59	80	293	0.86	0.05	0.01	0.01	0.01	1.6E-03	6.0E+02	5.4E-04	3.7E-03
Forklifts	2270003020	Diesel	0.59	99	1463	0.86	0.05	0.01	0.01	0.01	1.6E-03	6.0E+02	5.4E-04	3.7E-03
Generators	2270006005	Diesel	0.43	14	5400	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	20	14145	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Generators	2270006005	Diesel	0.43	100	1680	0.89	0.09	0.01	0.02	0.02	1.6E-03	6.0E+02	8.2E-04	5.6E-03
Other General Equipment	2270003040	Diesel	0.43	10	23	4.18	2.46	0.84	0.24	0.23	2.2E-03	5.9E+02	7.4E-02	4.6E-01
Other General Equipment	2270003040	Diesel	0.43	20	8539	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	22	11	3.76	1.49	0.35	0.17	0.17	2.2E-03	6.0E+02	3.1E-02	1.9E-01
Other General Equipment	2270003040	Diesel	0.43	85	34	0.89	0.09	0.01	0.02	0.02	1.6E-03	6.0E+02	8.2E-04	5.6E-03
Tractors / Backhoes	2270002066	Diesel	0.21	48	975	1.48	0.91	0.17	0.14	0.13	1.9E-03	7.0E+02	7.1E-03	7.8E-02

[a] Load Factor for equipment is assumed based on EPA "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling," Appendix A.

[b] Estimated hours.

[c] Emission factors for all equipment are from EPA MOVES5.0.0 for Plaquemines Parish Louisiana, MOVES ran September 2025. HAPS emissions is the sum of benzene, formaldehyde, acetaldehyde, acrolein, 2,2,4-Trimethlypentane, ethyl benzene, hexane, propionaldehyde, toluene, xylenes

Table 9.B.2 - Plaquemines Expansion
Diesel Non-Road Equipment Emissions

Equipment Type	Pollutant (TPY) [a]									
	NO_x	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAPs	CO_2e
2027 Emissions										
Air Compressors	17.44	6.86	1.04	0.97	0.94	2.39E-02	8,329.93	0.05	0.49	8,331.44
Concrete / Industrial Saws	0.04	0.02	0.01	2.30E-03	2.23E-03	2.11E-05	5.73	7.13E-04	4.48E-03	5.75
Cranes	46.68	11.04	2.53	1.90	1.84	1.06E-01	38,152.60	0.16	1.23	38,157.17
Dozers	0.66	0.06	0.01	0.01	0.01	4.07E-04	153.84	2.37E-03	0.01	153.91
Excavators	16.34	2.59	0.38	0.57	0.55	5.71E-02	21,625.54	0.03	0.18	21,626.32
Forklifts	3.79	0.28	0.08	0.03	0.03	2.34E-03	888.69	0.01	0.04	889.06
Generators	11.57	3.56	0.83	0.46	0.45	9.64E-03	3,170.22	0.07	0.44	3,172.06
Graders	13.93	1.66	0.32	0.26	0.25	2.13E-02	8,034.64	0.04	0.17	8,035.90
Other General Equipment	2.98	1.18	0.28	0.13	0.13	1.74E-03	473.95	0.02	0.15	474.63
Pumps	3.45	2.26	0.46	0.31	0.30	1.90E-03	619.03	0.02	0.22	619.60
Skid Steer Loader	1.98	1.80	0.36	0.27	0.26	9.65E-04	301.93	0.01	0.16	302.31
Tampers / Rammers	0.58	0.35	0.12	0.04	0.03	3.00E-04	81.49	0.01	0.06	81.77
Tractors / Backhoes	9.15	4.73	1.47	0.94	0.91	1.22E-02	4,272.38	0.07	0.71	4,274.48
2027 Total	**128.59**	**36.39**	**7.88**	**5.89**	**5.71**	**0.24**	**86,109.99**	**0.52**	**3.88**	**86,124.41**

Equipment Type	Pollutant (TPY) [a]									
	NO_x	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAPs	CO_2e
2028 Emissions										
Air Compressors	18.27	7.00	1.07	1.00	0.97	2.83E-02	10,005.81	0.06	0.51	10,007.41
Cranes	61.71	14.42	3.40	2.54	2.46	1.61E-01	58,403.05	0.22	1.64	58,409.26
Excavators	15.89	2.33	0.36	0.52	0.50	5.71E-02	21,625.61	0.03	0.17	21,626.33
Forklifts	14.66	1.09	0.29	0.10	0.10	9.04E-03	3,434.08	0.05	0.16	3,435.51
Generators	13.55	4.09	0.96	0.53	0.51	1.15E-02	3,797.72	0.08	0.51	3,799.88
Graders	0.21	0.06	0.01	0.02	0.01	1.44E-03	545.01	0.00	0.01	545.03
Other General Equipment	3.56	1.41	0.33	0.16	0.16	2.08E-03	566.98	0.03	0.18	567.80
Pumps	1.58	0.95	0.19	0.13	0.12	9.03E-04	300.15	0.01	0.09	300.41
Skid Steer Loader	0.66	0.56	0.11	0.08	0.08	3.32E-04	106.07	4.52E-03	0.05	106.19
Tampers / Rammers	0.45	0.27	0.09	0.03	0.03	2.30E-04	62.52	0.01	0.05	62.73
Tractors / Backhoes	5.55	2.87	0.89	0.58	0.56	8.14E-03	2,874.56	0.05	0.43	2,875.88
2028 Total	**136.09**	**35.05**	**7.71**	**5.68**	**5.51**	**0.28**	**101,721.55**	**0.53**	**3.81**	**101,736.43**

Table 9.B.2 - Plaquemines Expansion
Diesel Non-Road Equipment Emissions (Continued)

Equipment Type	Pollutant (TPY) [a]									
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAPs	CO_2e
2029 Emissions										
Aerial Lifts	2.40	0.18	0.05	0.02	0.02	1.47E-03	557.38	0.01	0.03	557.62
Air Compressors	29.43	11.00	1.71	1.58	1.54	5.14E-02	18,336.88	0.09	0.81	18,339.52
Cranes	100.74	23.40	5.72	4.23	4.11	3.02E-01	110,764.01	0.37	2.73	110,774.39
Dozers	0.66	0.05	0.01	4.71E-03	4.57E-03	4.06E-04	153.84	2.33E-03	0.01	153.91
Excavators	15.49	2.06	0.33	0.47	0.45	5.70E-02	21,625.68	0.02	0.16	21,626.32
Forklifts	18.80	1.39	0.37	0.13	0.13	1.19E-02	4,537.87	0.06	0.20	4,539.69
Generators	20.23	6.61	1.54	0.82	0.79	1.63E-02	5,208.94	0.13	0.84	5,212.58
Graders	13.58	1.43	0.30	0.22	0.21	2.12E-02	8,036.00	0.04	0.16	8,037.19
Other General Equipment	6.54	2.59	0.61	0.30	0.29	3.82E-03	1,040.92	0.05	0.34	1,042.43
Pumps	3.08	1.65	0.34	0.22	0.21	1.83E-03	619.40	0.02	0.16	619.88
Skid Steer Loader	1.76	1.39	0.27	0.20	0.19	9.24E-04	302.18	0.01	0.13	302.51
Tampers / Rammers	0.58	0.35	0.12	0.03	0.03	3.00E-04	81.49	0.01	0.06	81.77
Tractors / Backhoes	9.14	4.51	1.43	0.92	0.89	1.56E-02	5,545.20	0.08	0.70	5,547.35
2029 Total	**222.44**	**56.60**	**12.81**	**9.15**	**8.87**	**0.48**	**176,809.78**	**0.91**	**6.31**	**176,835.16**

Equipment Type	Pollutant (TPY) [a]									
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAPs	CO_2e
2030 Emissions										
Aerial Lifts	0.25	0.02	0.01	0.00	0.00	1.54E-04	58.58	9.30E-04	3.03E-03	58.61
Air Compressors	15.15	5.51	0.88	0.80	0.78	3.01E-02	10,819.94	0.05	0.42	10,821.34
Cranes	51.02	11.74	2.99	2.20	2.13	1.78E-01	65,783.77	0.19	1.40	65,789.15
Excavators	15.49	2.06	0.33	0.47	0.45	5.70E-02	21,625.68	0.02	0.16	21,626.32
Forklifts	16.03	1.19	0.32	0.11	0.11	1.00E-02	3,796.26	0.06	0.17	3,797.82
Generators	11.11	3.68	0.86	0.45	0.43	7.62E-03	2,343.60	0.07	0.47	2,345.64
Graders	0.18	0.06	0.01	0.01	0.01	1.44E-03	545.01	6.57E-04	4.32E-03	545.03
Other General Equipment	3.87	1.53	0.36	0.18	0.17	2.38E-03	663.24	0.03	0.20	664.12
Pumps	1.41	0.65	0.14	0.09	0.09	8.69E-04	300.32	0.01	0.06	300.52
Skid Steer Loader	0.58	0.41	0.08	0.06	0.06	3.16E-04	106.15	3.51E-03	0.04	106.25
Tampers / Rammers	0.44	0.26	0.09	0.03	0.02	2.30E-04	62.52	0.01	0.05	62.74
Tractors / Backhoes	4.28	2.10	0.66	0.44	0.42	8.05E-03	2,891.75	0.04	0.33	2,892.79
2030 Total	**119.83**	**29.21**	**6.72**	**4.83**	**4.68**	**0.30**	**108,996.82**	**0.48**	**3.30**	**109,010.34**

Equipment Type	Pollutant (TPY) [a]									
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	HAPs	CO_2e
2031 Emissions										
Aerial Lifts	0.25	0.02	0.01	1.74E-03	1.69E-03	1.54E-04	58.58	9.29E-04	3.02E-03	58.61
Air Compressors	1.00	0.35	0.06	0.05	0.05	2.25E-03	813.40	3.41E-03	0.03	813.50
Cranes	4.95	1.12	0.30	0.22	0.21	1.96E-02	7,272.82	0.02	0.14	7,273.35
Forklifts	1.32	0.10	0.03	0.01	0.01	9.26E-04	351.22	4.36E-03	0.01	351.35
Generators	0.71	0.26	0.06	0.03	0.03	4.95E-04	147.99	5.30E-03	0.03	148.14
Other General Equipment	0.31	0.12	0.03	0.01	0.01	1.80E-04	49.12	2.52E-03	0.02	49.19
Tractors / Backhoes	0.02	0.01	1.79E-03	1.48E-03	1.44E-03	2.08E-05	7.53	7.70E-05	8.44E-04	7.54
2031 Total	**8.55**	**1.98**	**0.48**	**0.33**	**0.32**	**0.02**	**8,700.67**	**0.04**	**0.23**	**8,701.67**

Conversion Factors	
g/lb	453.59
lb/ton	2,000.00

[a] CO2e emissions are based on global warming potential from Table A-1 to Subpart A of Part 98—Global Warming Potential, CO2 GWP=1, CH4 GWP=28 NO2= 265

Table 9.B.3 - Plaquemines Expansion
Diesel and Gasoline On-road Equipment Emissions

Stage of Construction & Workforce [a]	
Peak Total Estimated Workforce	9,000
2027: Max Estimated Number of Workforce	3,500
2028: Avg Estimated Number of Workforce	9,000
2029: Avg Estimated Number of Workforce	9,000
2030: Avg Estimated Number of Workforce	5,000
2031: Avg Estimated Number of Workforce	2,750
2027: Duration of Construction (days)	275
2028: Duration of Construction (days)	366
2029: Duration of Construction (days)	365
2030: Duration of Construction (days)	365
2031: Duration of Construction (days)	59
Percent passenger cars[b]	38%
Percent passenger trucks[b]	62%
Percent gasoline vehicles[c]	83%
Percent diesel vehicles[c]	16%

Vehicle Type		Fuel	Percentage	Quantity	Estimated Travel Distance (miles/vehicle/day)[d]	Criteria Pollutant Emission Factors [e,f,g,h]										
						NO_x	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O	CO_2e[f]
						(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/mile)
2027	Passenger Car	Gasoline	32%	1104	130	0.021	1.016	0.130	0.002	0.035	0.008	2.30E-03	266.877	5.00E-03	4.00E-03	268.077
		Diesel	6%	213	130	0.016	1.209	0.081	0.003	0.034	0.007	3.77E-03	305.706	0.00	1.00E-03	305.971
	Passenger Truck	Gasoline	51%	1801	130	0.025	0.984	0.107	0.003	0.035	0.008	2.30E-03	379.786	6.00E-03	5.00E-03	381.279
		Diesel	10%	347	130	0.013	1.559	0.117	0.005	0.034	0.006	3.77E-03	435.043	0.00	1.00E-03	435.308
	Haul/Delivery Trucks	Diesel	100%	68	100	2.015	3.137	0.119	0.019	0.016	0.019	3.77E-03	1,696.667	0.02	3.00E-03	1,697.966
2028	Passenger Car	Gasoline	32%	2839	130	0.021	1.016	0.130	0.002	0.035	0.008	2.30E-03	266.877	5.00E-03	4.00E-03	268.077
		Diesel	6%	547	130	0.016	1.209	0.081	0.003	0.034	0.007	3.77E-03	305.706	0.00	1.00E-03	305.971
	Passenger Truck	Gasoline	51%	4631	130	0.025	0.984	0.107	0.003	0.035	0.008	2.30E-03	379.786	6.00E-03	5.00E-03	381.279
		Diesel	10%	893	130	0.013	1.559	0.117	0.005	0.034	0.006	3.77E-03	435.043	0.00	1.00E-03	435.308
	Haul/Delivery Trucks	Diesel	100%	159	100	2.015	3.137	0.119	0.000	0.016	0.019	3.77E-03	1,696.667	0.02	3.00E-03	1,697.966
2029	Passenger Car	Gasoline	32%	2839	130	0.021	1.016	0.130	0.002	0.035	0.008	2.30E-03	266.877	5.00E-03	4.00E-03	268.077
		Diesel	6%	547	130	0.016	1.209	0.081	0.003	0.034	0.007	3.77E-03	305.706	0.00	1.00E-03	305.971
	Passenger Truck	Gasoline	51%	4631	130	0.025	0.984	0.107	0.003	0.035	0.008	2.30E-03	379.786	6.00E-03	5.00E-03	381.279
		Diesel	10%	893	130	0.013	1.559	0.117	0.005	0.034	0.006	3.77E-03	435.043	0.00	1.00E-03	435.308
	Haul/Delivery Trucks	Diesel	100%	85	100	2.000	3.123	0.116	0.000	0.122	0.019	3.77E-03	1,696.667	0.02	3.00E-03	1697.94
2030	Passenger Car	Gasoline	32%	1577	130	0.021	1.011	0.128	0.002	0.035	0.007	2.30E-03	266.877	5.00E-03	4.00E-03	268.08
		Diesel	6%	304	130	0.015	1.205	0.080	0.003	0.034	0.007	3.77E-03	305.706	0.00	1.00E-03	305.97
	Passenger Truck	Gasoline	51%	2573	130	0.025	0.982	0.106	0.003	0.035	0.008	2.30E-03	379.786	6.00E-03	5.00E-03	381.28
		Diesel	10%	496	130	0.013	1.557	0.116	0.005	0.034	0.006	3.77E-03	435.043	0.00	1.00E-03	435.31
	Haul/Delivery Trucks	Diesel	100%	140	100	2.000	3.123	0.116	0.000	0.122	0.019	3.77E-03	1,696.667	0.02	3.00E-03	1697.94
2031	Passenger Car	Gasoline	32%	867	130	0.021	1.011	0.128	0.002	0.035	0.007	2.30E-03	266.877	5.00E-03	4.00E-03	268.08
		Diesel	6%	167	130	0.015	1.205	0.080	0.003	0.034	0.007	3.77E-03	305.706	0.00	1.00E-03	305.97
	Passenger Truck	Gasoline	51%	1415	130	0.025	0.982	0.106	0.003	0.035	0.008	2.30E-03	379.786	6.00E-03	5.00E-03	381.28
		Diesel	10%	273	130	0.013	1.557	0.116	0.005	0.034	0.006	3.77E-03	435.043	0.00	1.00E-03	435.31
	Haul/Delivery Trucks	Diesel	100%	70	100	2.000	3.123	0.116	0.000	0.122	0.019	3.77E-03	1,696.667	0.02	3.00E-03	1697.94

Table 9.B.3 - Plaquemines Expansion
Diesel and Gasoline On-road Equipment Emissions (Continued)

Vehicle Type		Pollutant (TPY) [i]										
		NO_x	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	HAPs	CO_2	CH_4	N_2O	CO_2e
2027	Passenger Car	0.91	44.20	5.66	9.89E-02	1.52	0.35	0.10	11,609.71	0.22	0.17	11,661.91
		0.13	0.00	0.01	1.81E-05	7.59E-06	1.54E-05	1.70E-06	0.07	0.00	0.00E+00	2,565.86
	Passenger Truck	1.77	0.01	0.06	1.89E-04	6.18E-05	1.53E-04	1.01E-05	0.48	1.24	1.64E-05	27,062.12
		0.18	0.00	0.02	6.06E-05	1.76E-05	2.15E-05	2.38E-06	0.17	0.00	0.00	5,956.03
	Haul/Delivery Trucks	4.15	0.13	0.01	4.71E-05	6.21E-06	6.15E-06	1.48E-06	0.13	0.63	1.11E-06	3,500.06
2028	Passenger Car	3.13	151.26	19.35	3.38E-01	5.21	1.19	0.34	39,732.35	0.74	0.60	39,911.00
		0.46	34.70	2.32	9.93E-02	0.98	0.20	0.11	8,773.62	0.00	2.87E-02	8,781.22
	Passenger Truck	6.07	239.02	25.99	7.86E-01	8.50	1.94	0.56	92,253.04	1.46	1.21	92,615.70
		0.61	73.00	5.48	2.31E-01	1.59	0.28	0.18	20,371.13	0.00	4.68E-02	20,383.54
	Haul/Delivery Trucks	12.93	20.12	0.76	3.69E-04	0.10	0.12	0.02	10,883.77	0.12	1.92E-02	10,892.10
2029	Passenger Car	3.12	150.85	19.30	3.38E-01	5.20	1.19	0.34	39,623.79	0.74	0.59	39,801.95
		0.46	34.60	2.32	9.90E-02	0.97	0.20	0.11	8,749.65	0.00	0.03	8,757.23
	Passenger Truck	6.06	238.37	25.92	7.84E-01	8.48	1.94	0.56	92,000.98	1.45	1.21	92,362.65
		0.61	72.80	5.46	2.30E-01	1.59	0.28	0.18	20,315.47	0.00	0.05	20,327.85
	Haul/Delivery Trucks	6.84	10.68	0.40	1.97E-04	0.42	0.06	0.01	5,802.47	0.06	0.01	5,806.82
2030	Passenger Car	1.73	83.39	10.56	1.88E-01	2.89	0.58	0.19	22,013.21	0.41	0.33	22,112.20
		0.24	19.16	1.27	5.50E-02	0.54	0.11	0.06	4,860.91	0.00	1.59E-02	4,865.13
	Passenger Truck	3.36	132.16	14.27	4.35E-01	4.71	1.08	0.31	51,111.66	0.81	0.67	51,312.58
		0.34	40.39	3.01	1.28E-01	0.88	1.56E-01	9.79E-02	11,286.37	0.00	0.03	11,293.25
	Haul/Delivery Trucks	11.27	17.59	0.65	3.24E-04	0.69	1.07E-01	2.13E-02	9,557.01	0.10	0.02	9,564.17
2031	Passenger Car	0.15	45.87	5.81	1.03E-01	1.59	0.32	0.10	12,107.27	0.23	0.18	1,965.87
		0.02	10.54	0.70	3.03E-02	0.30	6.12E-02	3.30E-02	2,673.50	0.00	0.01	432.53
	Passenger Truck	0.30	72.69	7.85	2.39E-01	2.59	0.59	0.17	28,111.41	0.44	0.37	4,561.90
		0.03	22.22	1.66	7.02E-02	0.49	0.09	0.05	6,207.51	0.00	0.01	1,004.02
	Haul/Delivery Trucks	0.91	8.80	0.33	1.62E-04	0.34	0.05	0.01	4,778.51	0.05	0.01	772.99
	Total Emissions Per Project Year											
	2027 Total	7.15	44.35	5.75	0.10	1.52	0.35	0.10	11,610.57	2.09	0.17	50,745.97
	2028 Total	23.19	518.10	53.91	1.45	16.38	3.74	1.21	172,013.90	2.32	1.90	172,583.56
	2029 Total	17.08	507.30	53.40	1.45	16.65	3.67	1.20	166,492.36	2.25	1.89	167,056.50
	2030 Total	16.94	292.69	29.76	0.81	9.71	2.03	0.68	98,829.17	1.32	1.06	99,147.33
	2031 Total	1.41	160.10	16.33	0.44	5.30	1.11	0.37	53,878.19	0.72	0.58	8,737.31

[a] Workforce estimates are based on the Traffic Impact Study for Plaquemines Expansion, LLC and Venture Global Plaquemines LNG, Inc., dated October 2025. The estimated employee traffic represents the total projected count for each project stage. Traffic plan is organized by project stages rather than by calendar years. Stage 1 is assumed to correspond to Year 1 (2027), Stage 2 to Year 2 (2028), Stage 3 to Year 3 (2029), and Stage 4 to Year 4 (2030). Year 2031 is assumed to be the average of the maximum and minimum traffic flow values for Stage 4.

[b] Vehicle type distribution estimated based on U.S. fleet trends for new vehicle production in 2023 from US EPA Report 2024 (EPA 2024 Automotive Trends Report, Fig. ES-3).

[c] Fuel distribution for gasoline vehicles is based on the most recent data from the U.S. DOE Alternative Fuels Data Center, Vehicle Registration Counts by State for Louisiana, remaining % was conservatively assumed as diesel with 1% assumed as EV and unknown fuel (https://afdc.energy.gov/vehicle-registration), accessed October 2025.

[d] Estimated travel distance reflects a round trip from the community expected to contribute the largest portion of the workforce (New Orleans) based on information from Resource Report 5.

[e] PM_{10}, $PM_{2.5}$,CO, NOx, VOC, CH_4 and N_2O emission factors in grams/mile from "Updated Emission Factors of Air Pollutants from Vehicle Operations in GREETTM Using MOVES3.0" (2021)

[f] SO_2 emissions calculated from fuel sulfur content. Fuel sulfur regulated by the U.S. EPA: gasoline average ≤10ppm S (Tier 3, effective 2017), on-road diesel ≤15 ppm S (ULSD, effective 2006). Sulfur content converted to SO_2 using the molecular weight ratio (×64/32) and fuel densities of 3.785kg/gal for gasoline and 3.84kg/gal for diesel, then divided by weighted fuel economy for passenger cars and light-duty trucks. Sources: U.S. EPA, Gasoline Sulfur and Diesel Fuel Standards; U.S. EPA, Automotive Trends Report, 2022.

[g] CO2 emission factors calculated based on EPA tailpipe carbon coefficients (gasoline = 8,887 g CO_2/gal; diesel = 10,180 g CO_2/gal) divided by fuel economy mpg for MY2022 passenger cars & light-duty trucks/pickups.
Sources Greenhouse Gas Emissions from a Typical Passenger Vehicle". Fuel economy values for passenger cars and light-duty pickup trucks are based on the U.S. Environmental Protection Agency's 2022 Automotive Trends Report

Gasoline CO2	*8,887*	*g CO2/ gallon.*
Diesel CO2	*10,180*	*g CO2 / gallon.*
Passenger Car	*33.3*	*mpg*
Light Duty Trucks	*23.4*	*mpg*
Combination Short-haul heavy duty trucks	*6*	*mpg*

[h] HAP Emission factors in pounds per mile derived from US EPA Moves 2014b Model

[i] CO_2e emissions calculated based on global warming potential from Table A-1 to Subpart A of Part 98—Global Warming Potential, CO2 GWP=1, CH4 GWP=28 NO_2= 265

conversion factors used

grams/lbs= 453.592
lbs/tons= 2,000

Table 9.B.4 - Plaquemines Expansion
Particulate Matter on Unpaved Roads

Delivery Trucks Volume [a]	
Truck Volume Data	**Trucks per day**
2027	68
2028	159
2029	85
2030	140
2031	70

Table 13.2.2-2 - Values for Equation 1a		
Constant[b]	**PM2.5**	**PM10**
k (lb/VMT)	0.15	1.50
a	0.90	0.90
b	0.45	0.45
Mean Vehicle Weight [c]	22	
Surface Silt (s) content based on Table 13.2.2-1 - construction sites		
s =	8.50	
Control Efficiency:	75%	

Emission Factors (lb/VMT)[d]		
PM10	**PM2.5**	Units
0.67	0.07	(lb/VMT)

Emission factors are controlled based on the applied control efficiency of 75%

Estimated Emissions (tons per year)

Project Stage	Equipment	Construction Duration (days)	Miles per Day per Vehicle [e]	Average Number of Vehicles per year	Total Vehicle Miles Traveled per year (VMT)	Emissions[f] (tons)	Emissions[f] (tons)
						PM_{10}	$PM_{2.5}$
2027	Haul Trucks, Delivery Trucks & Concrete Trucks	275	2	18,700	37,400	12.60	1.26
2028	Haul Trucks, Delivery Trucks & Concrete Trucks	301	2	47,859	95,718	32.25	3.23
2029	Haul Trucks, Delivery Trucks & Concrete Trucks	301	2	25,585	51,170	17.24	1.72
2030	Haul Trucks, Delivery Trucks & Concrete Trucks	301	2	42,140	84,280	28.40	2.84
2031	Haul Trucks, Delivery Trucks & Concrete Trucks	301	2	21,070	42,140	14.20	1.42

Notes

[a] Assumed 100% of project occurs on unpaved roads that are graveled and haul trucks/delivery will occur only Monday - Saturday and not on any federal holidays. Delivery Truck Volumes are from October 2025 Traffic Management Plan Plaquemines Expansion, LLC and Venutre Global Plaquemines LNG, Inc.Traffic plan is organized by project stages rather than by calendar years. Stage 1 is assumed to correspond to Year 1 (2027), Stage 2 to Year 2 (2028), Stage 3 to Year 3 (2029), and Stage 4 to Year 4 (2030). Year 2031 is assumed to be half of Stage 4(Year 4)

[b] Constants are used to calculate emission factors from Unpaved Roads emission factor from AP-42, Section 13.2.2: Unpaved Roads (11/06); Equations 1a

[c] Mean truck weight (22 tons) is an assumed default value based on "Gap-Filling PM10 Emission Factors for Selected Open Area Dust," U.S. EPA AP-42, Chapter 1, Section 3, Reference Document (Bref47), 1993, Page 36.

[d] Emission Factors are estimated using equation 1a and include a control efficiency of 75%

$$E = k\,(s/12)^{a}(W/3)^{b} \qquad (1a)$$

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight

[e] Distance from truck entrance to active work area and laydown yard is estimated at 1 mile therefore trucks on site are assumed to trave a total round trip of 2 miles

[f] A 75% control efficiency is assumed based on use of watering and gravel road base on site (basic road surface maintenance), per Utah Division of Air Quality document DAQ-2015-020242.

Table 9.B.5 - Plaquemines Expansion
Particulate Matter - Construction Activities

Impacted Areas				
Total Area Impacted by Expansion Site, acres	462.00			
Total Area Impacted by temporary parking/laydown, acres	444.90			
Total Area Impacted by permanent parking/laydown, acres	104.80			
Total Area Impacted by utility, acres	7.50			
Total Impacted area*	1,019.20			
Construction Activities	**2027**	**2028**	**2029**	**2030**
Assumptions:				
Total Project Area Impacted, acres [a]	611.52	254.80	101.92	50.96
Construction Start Date	46,478.00	46,753.00	47,119.00	47,119.00
Construction End Date	46,752.00	47,118.00	47,483.00	47,483.00
Assumed average months of land disturbance [a]	10.00	10.00	10.00	10.00
Wind blown dust erosion, ft^2	26,637,811.20	11,099,088.00	4,439,635.20	2,219,817.60
Average excavation depth, ft	3.00	3.00	3.00	3.00
Excavation total volume, ft^3	79,913,433.60	33,297,264.00	13,318,905.60	6,659,452.80
Excavation, cy [b]	147,987.84	61,661.60	24,664.64	12,332.32
$PM_{2.5}/PM_{10}$ Ratio (construction & Demolition Fraction) [c]	0.21	0.21	0.21	0.21
Water Control Efficiency	0.74	0.74	0.74	0.74
Conversion Factors:				
1 acre to ft	43,560.00			
Soil Density lb/ft^3	100.00			
cubic yard/cubic feet	27.00			

Project Stage	**Construction Activity**	**Excavation Volume (tons)**	**Excavation PM_{10} Emission Factor[d] (ton/acre-month)**	**Cut/Fill PM_{10} Emission Factor[d] (ton/1,000 cy)**	**PM_{10} Emissions (tons)**	**$PM_{2.5}$ Emissions (tons)**
2027	Excavation/earth moving	3,995,671.68	0.11	-	174.89	36.38
	Onsite filling	-	-	0.059	8.73	1.82
2028	Excavation/earth moving	554,954.40	0.11	-	72.87	15.16
	Onsite filling	-	-	0.059	0.95	0.20
2029	Excavation/earth moving	221,981.76	0.11	-	29.15	6.06
	Onsite filling	-	-	0.059	0.38	0.08
2030	Excavation/earth moving	332,972.64	0.11	-	4.37	0.91
	Onsite filling	-	-	0.059	0.19	0.04
				Total Emissions Per Project Year		
				Total 2027	183.63	38.19
				Total 2028	73.82	15.35
				Total 2029	29.53	6.14
				Total 2030	4.56	0.95

Notes

[a] Expansion site, laydown space, and parking lot will disturb total of 1022.9 acres. Assumed 60% of area disturbed in 2027, 24% in 2028, 10% in 2029 and 5% in 2030 and none in 2031. Impacted area excludes water-based marine berth areas as material is wet and will not generate particulate emissions. Assumes 10 months of active land disturbance per year

[b] Excavation and backfilling assumes acres disturbed up to 3 foot depth and soil density is assumed to be 100 lb/ft^3 based on the Engineering ToolBox (2010). Dirt and Mud - Densities

[c] $PM_{2.5}$ emissions were calculated following the SCAQMD Particulate Matter PM2.5 Significance Thresholds and Calculation Methodology (2006), Appendix A,

Updated CEIDARS Table with $PM_{2.5}$ Fractions 0.212 PM2.5 fraction of PM_{10} for construction and demolition fugitive dust was used and calculated as follows

Example calculation PM2.5= PM 10 emission x 0.212 (PM 2.5 fraction of PM10)

[d] Emission factors and 75% control efficiency for watering are based on the WRAP Fugitive Dust Handbook (Countess Environmental, 2006), Table 3-2, Level 1 for excavation/earth moving and Level 2 for on-site filling activity

Table 9.B.6 - Plaquemines Expansion
Marine Construction Equipment Emissions

Activity	Emissions (TPY)								
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_X	CO_2	CH_4	N_2O
2027 Emissions									
Barge Activity									
Tugs/barge travels from origin upriver to Project (average distance away)	28.83	4.69	1.51	0.76	0.73	3.19E-03	3,471.56	1.38E-02	0.10
Maneuvering into dock	0.38	0.06	0.02	0.01	0.01	4.25E-05	46.29	1.84E-04	1.36E-03
Alongside holding while lines are made fast	0.14	0.02	0.01	3.78E-03	3.67E-03	1.60E-05	17.36	6.90E-05	5.11E-04
Hoteling while cargo unloading	0.40	0.07	0.02	0.01	0.01	4.47E-05	48.60	1.93E-04	1.43E-03
Alongside holding while releasing lines	0.05	0.01	2.52E-03	1.26E-03	1.22E-03	5.32E-06	5.79	2.30E-05	1.70E-04
Maneuvering away from dock	0.29	0.05	0.02	0.01	0.01	3.19E-05	34.72	1.38E-04	1.02E-03
Tugs/barge travels from Project to origin upriver (average distance away)	28.83	4.69	1.51	0.76	0.73	3.19E-03	3,471.56	1.38E-02	0.10
2027 Total	58.92	9.59	3.09	1.55	1.50	0.01	7,095.87	0.03	0.21

Activity	Emissions (TPY)								
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_X	CO_2	CH_4	N_2O
2028 Emissions									
Barge Activity									
Tugs/barge travels from origin upriver to Project (average distance away)	38.34	6.24	2.01	1.01E+00	9.76E-01	4.24E-03	4,617.51	1.83E-02	1.36E-01
Maneuvering into dock	0.51	0.08	0.03	1.34E-02	1.30E-02	5.66E-05	61.57	2.45E-04	1.81E-03
Alongside holding while lines are made fast	0.19	0.03	1.00E-02	5.03E-03	4.88E-03	2.12E-05	23.09	9.17E-05	6.80E-04
Hoteling while cargo unloading	0.54	0.09	2.81E-02	1.41E-02	1.37E-02	5.94E-05	64.65	2.57E-04	1.90E-03
Alongside holding while releasing lines	0.06	0.01	3.35E-03	1.68E-03	1.63E-03	7.07E-06	7.70	3.06E-05	2.27E-04
Maneuvering away from dock	0.38	0.06	2.01E-02	1.01E-02	9.76E-03	4.24E-05	46.18	1.83E-04	1.36E-03
Tugs/barge travels from Project to origin upriver (average distance away)	38.34	6.24	2.01	1.01	9.76E-01	4.24E-03	4,617.51	1.83E-02	1.36E-01
RO-RO Activity									
RO-RO travels from the state water line to jetties	0.96	0.10	0.05	0.02	0.02	3.68E-02	60.37	9.19E-04	2.66E-03
Maneuvering from jetties through the river to outside of Project	15.91	1.67	0.80	0.28	0.27	6.07E-01	996.15	0.02	0.04
Tug boat travels from base to RO-RO at river outside of Project	0.12	0.02	6.52E-03	3.26E-03	3.17E-03	1.38E-05	14.98	5.95E-05	4.41E-04
Maneuvering into dock	2.12	0.23	0.11	0.04	0.04	0.07	143.22	1.93E-03	5.99E-03
Alongside holding while lines are made fast	0.94	0.10	0.05	0.02	0.02	0.03	62.76	8.60E-04	2.65E-03
Hoteling while cargo unloading	7.81	0.82	0.39	0.14	0.13	2.98E-01	489.02	7.44E-03	2.16E-02
Alongside holding while releasing lines	0.31	0.03	0.02	0.01	0.01	0.01	20.92	2.87E-04	8.82E-04
Maneuvering away from dock	1.59	0.17	0.08	0.03	0.03	0.06	107.41	1.44E-03	4.49E-03
Tug boat travels from RO-RO at river outside of Project to base	0.12	2.03E-02	6.52E-03	3.26E-03	3.17E-03	1.38E-05	14.98	5.95E-05	4.41E-04
Maneuvering from Project through the river and to jetties	15.91	1.67	0.80	0.28	0.27	6.07E-01	996.15	1.52E-02	4.40E-02
RO-RO travels from jetties to the state water line	0.96	0.10	0.05	0.02	0.02	3.68E-02	60.37	9.19E-04	2.66E-03
2028 Total	125.15	17.70	6.45	2.89	2.81	1.77	12,404.53	0.08	0.41

Table 9.B.6 - Plaquemines Expansion
Marine Construction Equipment Emissions (Continued)

Activity	Emissions (TPY)								
	NO_X	CO	VOC	PM_{10}	$PM_{2.5}$	SO_X	CO_2	CH_4	N_2O
2029 Emissions									
Barge Activity									
Tugs/barge travels from origin upriver to Project (average distance away)	38.34	6.24	2.01	1.01	0.98	4.24E-03	4,617.51	0.02	0.14
Maneuvering into dock	0.51	0.08	0.03	1.34E-02	1.30E-02	5.66E-05	61.57	2.45E-04	1.81E-03
Alongside holding while lines are made fast	0.19	0.03	0.01	5.03E-03	4.88E-03	2.12E-05	23.09	9.17E-05	6.80E-04
Hoteling while cargo unloading	0.54	0.09	2.81E-02	1.41E-02	1.37E-02	5.94E-05	64.65	2.57E-04	1.90E-03
Alongside holding while releasing lines	0.06	0.01	3.35E-03	1.68E-03	1.63E-03	7.07E-06	7.70	3.06E-05	2.27E-04
Maneuvering away from dock	0.38	0.06	2.01E-02	1.01E-02	9.76E-03	4.24E-05	46.18	1.83E-04	1.36E-03
Tugs/barge travels from Project to origin upriver (average distance away)	38.34	6.24	2.01E+00	1.01E+00	9.76E-01	4.24E-03	4,617.51	1.83E-02	1.36E-01
RO-RO Activity									
RO-RO travels from the state water line to jetties	0.96	0.10	0.05	0.02	0.02	0.04	60.37	9.19E-04	2.66E-03
Maneuvering from jetties through the river to outside of Project	15.91	1.67	0.80	0.28	0.27	0.61	996.15	0.02	0.04
Tug boat travels from base to RO-RO at river outside of Project	0.12	0.02	0.01	3.26E-03	3.17E-03	1.38E-05	14.98	5.95E-05	4.41E-04
Maneuvering into dock	2.12	0.23	0.11	0.04	0.04	0.07	143.22	1.93E-03	5.99E-03
Alongside holding while lines are made fast	0.94	0.10	0.05	0.02	0.02	0.03	62.76	8.60E-04	2.65E-03
Hoteling while cargo unloading	7.81	0.82	0.39	0.14	0.13	0.30	489.02	7.44E-03	2.16E-02
Alongside holding while releasing lines	0.31	0.03	0.02	5.76E-03	5.59E-03	1.10E-02	20.92	2.87E-04	8.82E-04
Maneuvering away from dock	1.59	0.17	0.08	0.03	0.03	0.06	107.41	1.44E-03	4.49E-03
Tug boat travels from RO-RO at river outside of Project to base	0.12	0.02	6.52E-03	3.26E-03	3.17E-03	1.38E-05	14.98	5.95E-05	4.41E-04
Maneuvering from Project through the river and to jetties	15.91	1.67	0.80	0.28	0.27	0.61	996.15	1.52E-02	4.40E-02
RO-RO travels from jetties to the state water line	0.96	0.10	0.05	0.02	0.02	0.04	60.37	9.19E-04	2.66E-03
2029 Total	125.15	17.70	6.45	2.89	2.81	1.77	12,404.53	0.08	0.41

Table 9.B.7 - Plaquemines Expansion
Marine Equipment Construction Information

Marine Vessel Information	
Assumptions:	
Number of barges for 2027[a]	103
Number of barges for 2028[a]	137
Number of barges for 2029[a]	137
Number of barges for 2030[a]	103
Number of barges for 2031[a]	0
Tug boat power, kW	3,000
Number of Roll-on/Roll-off trips for 2027[a]	0
Number of RO-RO trips for 2028[a]	50
Number of RO-RO trips for 2029[a]	50
Number of RO-RO trips for 2030[a]	50
Number of RO-RO trips for 2031[a]	0
RO-RO power, kW	20,000
Conversions:	
kW/hp	0.75
g/lb	453.59
lb/ton	2,000
min/hr	60
CO_2 to CO_2e[b]	1
CH_4 to CO_2e[b]	28
N_2O to CO_2e[b]	265

Barge Activity	Distance (nm)	Duration (min)	Duration (hr)	Tug Boat [d]	
				% Power	kW
Tugs/barge travels from origin upriver to Terminal (average distance away)	150.00	1125	18.75	80%	2,400
Maneuvering into dock	N/A	20	0.33	60%	1,800
Alongside holding while lines are made fast	N/A	30	0.50	15%	450
Hoteling while cargo unloading	N/A	180	3.00	7%	210
Alongside holding while releasing lines	N/A	10	0.17	15%	450
Maneuvering away from dock	N/A	15	0.25	60%	1,800
Tugs/barge travels from Terminal to origin upriver (average distance away)	150.00	1125	18.75	80%	2,400

Table 9.B.7 - Plaquemines Expansion
Marine Equipment Construction Information (Continued)

RO-RO Activity	Distance (nm)	Duration[c] (min)	Duration (hr)	RO-RO [d]		Tug Boat	
				% Power	kW	% Power	kW
RO-RO travels from the state water line to jetties	9.00	10	0.17	50%	10,000	N/A	N/A
Maneuvering from jetties through the river to outside of Terminal	65.10	330	5.50	25%	5,000	N/A	N/A
Tug boat travels from base to RO-RO at river outside of Terminal	1.00	10	0.17	N/A	N/A	80%	2,400
Maneuvering into dock	N/A	20	0.33	50%	10,000	60%	1,800
Alongside holding while lines are made fast	N/A	30	0.50	15%	3,000	15%	450
Hoteling while cargo unloading	N/A	2,160	36.00	2%	375	N/A	N/A
Alongside holding while releasing lines	N/A	10	0.17	15%	3,000	15%	450
Maneuvering away from dock	N/A	15	0.25	50%	10,000	60%	1,800
Tug boat travels from RO-RO at river outside of Terminal to base	1.00	10	0.17	N/A	N/A	80%	2,400
Maneuvering from Terminal through the river and to jetties	65.10	330	5.50	25%	5,000	N/A	N/A
RO-RO travels from jetties to the state water line	9.00	10	0.17	50%	10,000	N/A	N/A

Emission Type	NO_X (g/kW-hr)	CO (g/kW-hr)	VOC (g/kW-hr)	PM_{10} (g/kW-hr)	$PM_{2.5}$ (g/kW-hr)	SO_X (g/kW-hr)	CO_2 (g/kW-hr)	CH_4 (g/kW-hr)	N_2O (g/kW-hr)
Tug Boats[e]	5.64	0.92	0.30	0.15	0.14	0.0006	679.47	0.003	0.02
RO-RO [f]	10.50	1.10	0.53	0.19	0.18	0.4008	657.23	0.010	0.03

[a] Estimated total vessel delivery trips are 630 based on one delivery expected every other day for first 42 months of construction. In Year 1, all deliveries will be by barges. Starting in Year 2, 50 of the total deliveries per year are estimated to be Roll-On/Roll-Off (RO-RO) carriers, with the remaining 137 deliveries by barges and will continue through Years 2 to 4

[b] CO_2e emissions are based on global warming potential from Table A-1 to Subpart A of Part 98—Global Warming Potential

[c] Tug boats assumed to operate at 8 knots. RO-RO assumed to operate at 12 knots.

[d] Barge activity and roll-on roll-off activity and power percentage are estimated values to calculate emissions.

[e] Emission factors are from Table H.7: Average Harbor Craft Emission Factors by Engine Tier in the U.S. EPA's Ports Emissions Inventory Guidance (April 2022 edition). Since specific engine data is unavailable, the Tier 2 emission factors are used as a representative

[f] Emission factors are from U.S. EPA, Ports Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions (Apr. 2022). RO-RO vessels assumed Category 3 Tier 2 MSD for conservative measures.
NOx emission factors are from Tables 3.5 Category 3 Tier 2 Engines.
PM_{10} emissions are calculated from Equation 3.3 where PM_{10}=PMbase+(S×BSFC×FSCPM×MWR). PMBase is 0.1545 g/kWh for distillate fuel, actual fuel sulfur is assumed 0.1% based on ECA sulfur standard .Fraction of S that becomes SO_2 is given as =0.97753, and molecular weight ratio of sulfate PM =7. $PM_{2.5}$ emission factor assumed to be 97% of PM_{10} based on guidance document.
SO_2 emission factor calculated according to Equation 3.5 in guidance, BSFC × S × FSC × MWR. Actual Sulfur is assumed 0.1% based on ECA Sulfur limit.
CO_2 emissions calculated using equation 3.4; BSFC x 3.206 (Carbon content factor for diesel fuel oil); brake specific fuel consumption (BSFC) is from Table 3.6 and is 205 g/kw.
VOC emissions are calculated as 1.053 times HC emission factor from Table 3.8 & CH_4 emissions are 2% of HC emissions factor per guidance document.

PLAQUEMINES EXPANSION PROJECT
Resource Report 9
APPENDIX 9C

Emission Calculations for Operation of Expansion Facilities

Plaquemines Expansion, LLC

Power Generation - Combined Cycle Combustion Turbines and Duct Burners

Inputs

Property	Value	Units
Turbine Annual Operating Hours (SU/SD)[1]	54	hr/yr/turbine
Total Turbine Annual Operating Hours (Normal + SU/SD)	8,760	hr/yr/turbine
Number of Turbines	10	number
Average Heat Input Capacity (Duty) per Turbine[1]	1,206.2	MMBtu/hr
Maximum Heat Input Capacity (Duty) per Turbine[1]	1,447.4	MMBtu/hr
Duct Burner Annual Operating Hours[1]	4,000	hr/yr/turbine
Power Rating per Duct Burner[1]	20	MW, each
Maximum Heat Input Capacity (Duty) per Duct Burner[1]	300.00	MMBtu/hr
Number of Duct Burners	10	number
Heat Input Capacity (Duty) for All Duct Burners	3,000	MMBtu/hr
Fuel Gas Higher Heating Value (HHV)[2]	1,049	Btu/scf
Natural Gas Higher Heating Value (HHV)[3]	1,020	Btu/scf
Fuel Used for Turbines	Natural/Fuel gas	-
Fuel Used for Duct Burners	Natural/Fuel gas	-

[1] Based on data provided by Venture Global. Turbine Annual Operating Hours (SU/SD) includes all startup/shutdown activities per turbine per year.

[2] Fuel Gas Higher Heating Value (HHV) based on higher of the basis for similar equipment in operation at Plaquemines LNG and Heat and Material Balance data.

[3] Natural Gas Higher Heating Value (HHV) from U.S. EPA, AP-42, Section 1.4 Natural Gas Combustion.

Emissions Summary

Pollutant	Per Turbine and Duct Burner			
	Average Hourly Emission Rate[1]	Maximum Hourly Emission Rate[2]	Average Annual Emission Rate	SU/SD Scenario Hourly Emission Rate[3]
	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)
ROG (VOC)	2.45	5.70	10.75	7.00
NO_X	11.55	16.60	50.57	127.00
CO	13.55	16.80	59.35	67.00
SO_2	1.26	2.21	5.52	2.21
PM	6.39	8.50	27.98	8.50
PM_{10}	6.39	8.50	27.98	8.50
$PM_{2.5}$	6.39	8.50	27.98	8.50
Ammonia (NH_3)	7.04	10.10	30.82	10.10
CO_2e	-	-	636,686	-

[1] The average hourly emission rate is calculated as follows: Average Hourly Emission Rate (lb/hr) = Average Hourly Emission Rate (tpy) x 2,000 (lb/ton) / 8,760 (hr/yr) per LDEQ guidance.

[2] Maximum hourly emissions during normal operations.

[3] Maximum hourly emissions during SU/SD operations. $PM_{10/2.5}$ and SO_2 emission rates were conservatively assumed to be that of normal operations.

Plaquemines Expansion, LLC

Power Generation - Combined Cycle Combustion Turbines and Duct Burners

Turbine Operations - Startup/Shutdown Emissions

Activity	Duration[1], hrs
Total SU/SD Hours Per Year[2]	**54**

[1] Based on data provided by the vendor.

[2] Based on data provided by Venture Global and includes all startup/shutdown activities per turbine per year.

Hourly Emissions [1], lb/hr

Per Turbine	NO_x	CO	VOC	SO_2 [2]	PM_{10} / $PM_{2.5}$ [3]	NH_3 [3]
Max SU/SD Hourly Emissions [3,4]	127.00	67.00	7.00	2.21	8.50	10.10

[1] Based on data provided by Vendor.

[2] Hourly SO_2 emission rates are based on the fuel sulfur content of 7 ppmv conservatively.

[3] For PM_{10}/$PM_{2.5}$, VOC, and NH_3, SUSD emissions are lower than the normal operation emissions. Therefore, conservatively assumed emissions during normal operations.

[4] NO_x emissions are based on operational data for a similar equipment provided by Venture Global. Emissions for all other pollutants are based on vendor data.

Total Startup/Shutdown Emissions [1], tons/yr

Per Turbine	NO_x	CO	VOC	SO_2 [2]	PM_{10} / $PM_{2.5}$	NH_3
Startup/Shutdown Emissions	3.43	1.81	0.19	0.06	0.23	0.27

[1] Worst-case emission rates among different SU/SD scenarios.

[2] Annual SO_2 emission rates are based on the fuel sulfur content of 4 ppmv.

Startup/Shutdown Emissions, tpy = Max SU/SD Hourly Emissions (lb/hr) * Total SU/SD Hours Per Year (hr/yr) * (1 ton / 2,000 lb).

NOx, tpy = 127 (lb/hr) * 54 (hr/yr) * (1 ton / 2,000 lb) = 3.43 tons/yr

Turbine + Duct Burner Operations - Assume normal operation at 100% load. Assume control devices are effective.

Pollutant	Per Turbine and Duct Burner		
	Avg Hourly	Max Hourly	Annual
	lbs/hr [1]	lbs/hr	ton/yr [2]
ROG (VOC)	2.41	5.70	10.56
NO_X	10.81	16.60	47.35
CO	13.20	16.80	57.80
SO_2 [3,5]	1.26	2.21	5.52
PM_{10}/$PM_{2.5}$	6.39	8.50	27.98
H_2S [4,8]	0.01	0.02	0.06
NH_3	7.04	10.10	30.82
CO_2	-	-	619,613
CH_4 [4]	-	-	671
N_2O [6]	-	-	1.00
CO_2e [7]	-	-	636,686

[1] The average hourly emission rate is calculated as follows: Average Hourly Emission Rate (lb/hr) = Average Hourly Emission Rate (tpy) x 2,000 (lb/ton) / 8,760 (hr/yr) per LDEQ guidance.

[2] Except for CH_4 and N_2O, emission rates are based on vendor data.

[3] Combustion of fuel with a 4 ppmv sulfur content based on Heat and Material Balance for average and annual emission rates.

[4] Based on Heat and Material Balance provided by Venture Global.

[5] Combustion of fuel with a sulfur content no greater than 4 ppmv (average) and 7 ppmv (maximum) inlet concentrations.

[6] Based on N_2O emission factor obtained from 40 CFR 98 Subpart C Table C-2 for natural gas.

[7] Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1. CO_2e emissions based on GWPs for each greenhouse gas pollutant.

[8] Assumed 99% of sulfur in fuel is converted to SO_2 and the remaining 1% of sulfur is a combination of mercaptan and H_2S. Since mercaptan is not a HAP/TAP, the emission calculations conservatively represent the remaining 1% of sulfur as H_2S.

Plaquemines Expansion, LLC

Power Generation - Combined Cycle Combustion Turbines and Duct Burners

HAP Emissions from Turbines

Pollutant	HAP?[1]	TAP?[2]	Emission Factor		Emission Factor - Adjusted[5]	Per Turbine		
						Avg Hourly Emissions[6]	Max Hourly Emissions[7]	Annual Emissions[8]
			(ppbv)[3]	(lb/MMBtu)[4]	(lb/MMBtu)	(lb/hr)	(lb/hr)	(tpy)
1,3-Butadiene	Y	Y	-	4.30E-07	4.42E-07	0.001	0.001	0.002
Acetaldehyde	Y	Y	-	4.00E-05	4.11E-05	0.05	0.06	0.22
Acrolein	Y	Y	-	6.40E-06	6.58E-06	0.008	0.010	0.035
Benzene	Y	Y	-	1.20E-05	1.23E-05	0.01	0.02	0.07
Ethylbenzene	Y	Y	-	3.20E-05	3.29E-05	0.04	0.05	0.17
Formaldehyde[3]	Y	Y	100	-	-	0.04	0.05	0.19
Hexane[9]	Y	Y	-	-	-	0.04	0.09	0.17
Naphthalene	Y	Y	-	1.30E-06	1.34E-06	0.002	0.002	0.01
PAH	Y	Y	-	2.20E-06	2.26E-06	0.003	0.003	0.012
Propylene Oxide	Y	Y	-	2.90E-05	2.98E-05	0.04	0.04	0.16
Toluene	Y	Y	-	1.30E-04	1.34E-04	0.16	0.19	0.71
Xylenes	Y	Y	-	6.40E-05	6.58E-05	0.08	0.10	0.35

[1] Listed US EPA Hazardous Air Pollutants.

[2] Louisiana Toxic Air Pollutants, per LAC:33.III.Chapter 51, Table 51.1.

[3] Installation of an oxidation catalyst is expected to control formaldehyde emissions from the turbines by 85 - 90% and will comply with 40 C.F.R. Part 63 Subpart YYYY emission limit of 91 ppbvd.

[4] Emission factors obtained from U.S. EPA, AP-42, Section 3.1 Stationary Gas Turbines (4/00), Table 3.1-3.

[5] U.S. EPA AP-42 Emission factors adjusted to Fuel Gas HHV by multiplying by (Fuel Gas HHV/Natural Gas HHV).

[6] Avg Hourly emissions = Adjusted Emission Factor (lb/MMBtu) * Average Heat Input Capacity (Duty) per Turbine (MMBtu/hr) OR CH_2O (lb/hr) = 100 ppbv /10^9 * Oxygen Correction Factor ((20.9) / (20.9 - 15))* 30.03 lb CH_2O/lbmole CH_2O * Fd (dscf/MMBtu) / Vm (dscf/lbmole) * Average Heat Input Capacity (Duty) per Turbine (MMBtu/hr) * (1 - Control Efficiency %) .

[7] Max Hourly emissions = Adjusted Emission Factor (lb/MMBtu) * Maximum Heat Input Capacity (Duty) per Turbine (MMBtu/hr) OR CH_2O (lb/hr) = 100 ppbv /10^9 * Oxygen Correction Factor ((20.9) / (20.9 - 15))* 30.03 lb CH_2O/lbmole CH_2O * Fd (dscf/MMBtu) / Vm (dscf/lbmole) * Maximum Heat Input Capacity (Duty) per Turbine (MMBtu/hr) * (1 - Control Efficiency %).

[8] Maximum Potential Annual Emission Rate (tpy) = Hourly Emissions (lb/hr) * Total Turbine Annual Operating Hours (Normal + SU/SD) (hr/yr) * (1 ton / 2,000 lb).

[9] Based on Heat and Material Balance provided by Venture Global.

Plaquemines Expansion, LLC

Power Generation - Combined Cycle Combustion Turbines and Duct Burners

HAP/TAP Emissions from Duct Burners

Pollutant	HAP?	TAP?	Uncontrolled Emission Factor[1]	Adjusted Emission Factor[2]	Per Duct Burner[5]		
					Avg Hourly Emissions [3]	Max Hourly Emissions [3]	Annual Emissions [4]
			(lb/MMBtu)	(lb/MMBtu)	(lb/hr)	(lb/hr)	(tpy)
Benzene	Y	Y	2.06E-06	2.12E-06	0.001	0.001	< 0.01
Dichlorobenzene	Y	Y	1.18E-06	1.21E-06	< 0.001	< 0.001	<0.01
Formaldehyde	Y	Y	7.35E-05	7.56E-05	0.02	0.02	0.05
Hexane	Y	Y	1.76E-03	1.82E-03	0.54	0.54	1.09
Naphthalene	Y	Y	5.98E-07	6.15E-07	< 0.001	< 0.001	< 0.01
PAH	Y	Y	8.63E-08	8.87E-08	< 0.001	< 0.001	< 0.001
Toluene	Y	Y	3.33E-06	3.43E-06	0.001	0.001	< 0.01
Barium	N	Y	4.31E-06	4.44E-06	0.001	0.001	< 0.01
Beryllium	Y	Y	1.18E-08	1.21E-08	< 0.001	< 0.001	< 0.01
Cadmium	Y	Y	1.08E-06	1.11E-06	< 0.001	< 0.001	0.001
Chromium	Y	Y	1.37E-06	1.41E-06	< 0.001	< 0.001	< 0.01
Copper	N	Y	8.33E-07	8.57E-07	< 0.001	< 0.001	0.001
Nickel	Y	Y	2.06E-06	2.12E-06	0.001	0.001	0.001
Selenium	Y	Y	2.35E-08	2.42E-08	< 0.001	< 0.001	< 0.01

[1] Emission factors obtained from U.S. EPA, AP-42, Section 1.4 Natural Gas Combustion Table 1.4-3 and Table 1.4-4.

[2] U.S. EPA AP-42 Emission factors adjusted to Fuel Gas HHV by multiplying by (Fuel Gas HHV/Natural Gas HHV).

[3] Max Hourly Emission Rate (lb/hr) /Avg Hourly Emission Rate (lb/hr) = Adjusted Emission Factor (lb/MMBtu) * Maximum Heat Input Capacity (Duty) per Duct Burner.

[4] Maximum Potential Annual Emission Rate (tpy) = Hourly Emission Rate (lb/hr) * (1 ton / 2,000 lb) * Duct Burner Annual Operating Hours (hr/yr).

[5] Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are included.

Total HAPs/TAPs Emissions from Duct burners and Turbines

Pollutant	Avg Hourly Emissions [3]	Max Hourly Emissions [3]	Annual Emissions [4]
	(lb/hr)	(lb/hr)	(tpy)
1,3-Butadiene	0.001	0.001	0.002
Acetaldehyde	0.05	0.06	0.22
Acrolein	0.008	0.010	0.035
Ammonia (NH_3)	7.04	10.10	30.82
Benzene	0.02	0.02	0.07
Ethylbenzene	0.04	0.05	0.17
Formaldehyde	0.07	0.08	0.24
Hexane	0.58	0.64	1.26
Naphthalene	0.002	0.002	0.01
PAH	0.003	0.003	0.012
Propylene Oxide	0.04	0.04	0.16
Toluene	0.16	0.19	0.71

Xylenes	0.08	0.10	0.35
Dichlorobenzene	< 0.001	< 0.001	< 0.01
Barium	0.001	0.001	0.003
Cadmium	< 0.001	< 0.001	0.001
Chromium	< 0.001	< 0.001	0.001
Copper	< 0.001	< 0.001	0.001
Nickel	0.001	0.001	0.001
Zinc	0.01	0.01	0.02

Plaquemines Expansion, LLC
Power Generation - Simple Cycle Combustion Turbines

Inputs

Property	Value	Units
Turbine Annual Operating Hours (SU/SD)[1]	54	hr/yr/turbine
Total Turbine Annual Operating Hours (Normal + SU/SD)	8,760	hr/yr/turbine
Number of Turbines	6	-
Average Heat Input Capacity (Duty) per Turbine (HHV)[1]	1,206.2	MMBtu/hr
Maximum Heat Input Capacity (Duty) per Turbine (HHV)[1]	1,447.4	MMBtu/hr
Fuel Gas Higher Heating Value (HHV)[2]	1,049	Btu/scf
Natural Gas Higher Heating Value (HHV)[3]	1,020	
Fuel Used for Turbines	Natural/Fuel gas	-

[1] Based on data provided by Venture Global.

[2] Fuel Gas/Natural Gas Higher Heating Value (HHV) based on Heat and Material Balance data.

[3] Natural Gas Higher Heating Value (HHV) from U.S. EPA, AP-42, Section 1.4 Natural Gas Combustion.

Emissions Summary

Pollutant	Per Turbine			
	Average Hourly Emission Rate[1]	Maximum Hourly Emission Rate[2]	Average Annual Emission Rate[3]	SU/SD Scenario Hourly Emission Rate[4]
	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)
ROG (VOC)	2.23	2.64	9.75	6.00
NO_X	35.85	42.00	157.01	121.00
CO	52.91	58.00	231.73	61.00
SO_2	0.81	1.77	3.53	1.77
PM	8.02	8.02	35.13	8.02
PM_{10}	8.02	8.02	35.13	8.02
$PM_{2.5}$	8.02	8.02	35.13	8.02
CO_2e	-	-	652,616	-

[1] Average Hourly Emission Rate = Average Annual Emission Rate * 2,000 (lb/ton) / 8,760 (hr/yr) per LDEQ guidance.

[2] Maximum hourly emission rates for normal operation were provided by Venture Global.

[3] Annual average emissions include 54 hours per year of SU/SD activities for each turbine. $PM_{10}/PM_{2.5}$ hourly emissions during SU/SD activities are equal to the hourly emissions during normal operations. Therefore, annual average emissions for $PM_{10}/PM_{2.5}$ during the 54 hours per year of SU/SD activities are based on the hourly emissions during normal operations.

[4] Maximum hourly emission rates during SU/SD scenario as provided by Venture Global.

Plaquemines Expansion, LLC
Power Generation - Simple Cycle Combustion Turbines

Turbine Operations - Startup/Shutdown Emissions

Activity	Duration[1], hours
Total SU/SD Hours Per Year[2]	**54**

[1] Based on data provided by the vendor.
[2] Based on data provided by Venture Global and includes all startup/shutdown activities per turbine per year.

Hourly Emissions [1], lb/hr

Per Turbine	NOx	CO	VOC	SO_2[2]	PM_{10} / $PM_{2.5}$[3]
Max SU/SD Hourly Emissions	**121**	**61**	**6**	**1.77**	**8.02**

[1] Worst-case emission rates among different SU/SD scenarios.

[2] SO_2 emission rates are based on the fuel sulfur content of 7 ppmv.

[3] For PM_{10}/$PM_{2.5}$, SUSD emissions are lower than the normal operation emissions. Therefore, conservatively assumed emissions during normal operations.

Total Emissions, tons/yr [1]

Per Turbine	NOx	CO	VOC	SO_2	PM_{10} / $PM_{2.5}$
Startup/Shutdown Emissions	3.27	1.65	0.16	0.05	0.22

[1] Based on 54 hours per year of SU/SD activities for each turbine.

Startup/Shutdown Emissions, tpy = Max SU/SD Hourly Emissions (lb/hr) * Total SU/SD Hours Per Year (hr/yr) * (1 ton / 2,000 lb).

NOx, tpy = 121 (lb/hr) * 54 (hr/yr) * (1 ton / 2,000 lb) = 3.27 tons/yr

Turbine Operations - Assume normal operation at 100% load.	Per Turbine		
Pollutant	**Avg Hourly**	**Max Hourly**	**Annual**
	lbs/hr	**lbs/hr[1]**	**ton/yr[1]**
ROG (VOC)	2.20	2.64	9.65
NO_X	35.32	42.00	154.70
CO	52.86	58.00	231.51
SO_2[2,3]	0.81	1.77	3.53
PM_{10}/$PM_{2.5}$	8.02	8.02	35.13
H_2S[3,4]	0.01	0.02	0.04
CO_2[3]	-	-	637,201
CH_4[3]	-	-	602.76
N_2O[5]	-	-	1.2
CO_2e[6]	-	-	652,616

[1] Based on vendor data provided by Venture Global.

[2] Combustion of fuel with a sulfur content no greater than 4 ppmv (average) and 7 ppmv (maximum) inlet concentrations.

[3] Based on Heat and Material Balance provided by Venture Global.

[4] Assumed 99% of sulfur in fuel is converted to SO_2 and the remaining 1% of sulfur is a combination of mercaptan and H_2S. Since mercaptan is not a HAP/TAP, the emission calculations conservatively represent the remaining 1% of sulfur as H_2S.

[5] Based on N_2O emission factor obtained from 40 CFR 98 Subpart C Table C-2 for natural gas.

[6] Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1. CO_2e emissions based on GWPs for each greenhouse gas pollutant.

Plaquemines Expansion, LLC
Power Generation - Simple Cycle Combustion Turbines

HAP Emissions from Turbines

Pollutant	HAP?[1]	TAP?[2]	Emission Factor	Emission Factor	Adjusted Emission Factor	Per Turbine[8]		
						Avg Hourly Emissions[5]	Max Hourly Emissions[6]	Annual Emissions[7]
			(ppbv)	(lb/MMBtu)[3]	(lb/MMBtu)[4]	(lb/hr)	(lb/hr)	(tpy)
1,3-Butadiene	Y	Y		4.30E-07	4.42E-07	0.001	0.001	0.002
Acetaldehyde	Y	Y		4.00E-05	4.11E-05	0.05	0.06	0.22
Acrolein	Y	Y		6.40E-06	6.58E-06	0.008	0.010	0.035
Benzene	Y	Y		1.20E-05	1.23E-05	0.01	0.02	0.07
Ethylbenzene	Y	Y		3.20E-05	3.29E-05	0.04	0.05	0.17
Formaldehyde	Y	Y	91	-	-	0.27	0.32	1.17
Hexane[9]	Y	Y	-	-	-	0.04	0.09	0.17
Naphthalene	Y	Y		1.30E-06	1.34E-06	0.002	0.002	0.01
PAH	Y	Y		2.20E-06	2.26E-06	0.003	0.003	0.012
Propylene Oxide	Y	Y		2.90E-05	2.98E-05	0.04	0.04	0.16
Toluene	Y	Y		1.30E-04	1.34E-04	0.16	0.19	0.71
Xylenes	Y	Y		6.40E-05	6.58E-05	0.08	0.10	0.35

[1] Listed US EPA Hazardous Air Pollutants.

[2] Louisiana Toxic Air Pollutants, per LAC:33.III.Chapter 51, Table 51.1.

[3] Emission factors obtained from U.S. EPA, AP-42, Section 3.1 Stationary Gas Turbines (4/00), Table 3.1-3.

[4] U.S. EPA AP-42 Emission factors adjusted to Fuel Gas HHV by multiplying by (Fuel Gas HHV/Natural Gas HHV).

[5] Avg Hourly emissions = Adjusted Emission Factor (lb/MMBtu) * Average Heat Input Capacity (Duty) per Turbine (MMBtu/hr) OR CH_2O (lb/hr) = 100 ppbv /10^9 * Oxygen Correction Factor ((20.9) / (20.9 - 15))* 30.03 lb CH_2O/lbmole CH_2O * Fd (dscf/MMBtu) / Vm (dscf/lbmole) * Average Heat Input Capacity (Duty) per Turbine (MMBtu/hr) * (1 - Control Efficiency %).

[6] Max Hourly emissions = Adjusted Emission Factor (lb/MMBtu) * Maximum Heat Input Capacity (Duty) per Turbine (MMBtu/hr) OR CH_2O (lb/hr) = 100 ppbv /10^9 * Oxygen Correction Factor ((20.9) / (20.9 - 15))* 30.03 lb CH_2O/lbmole CH_2O * Fd (dscf/MMBtu) / Vm (dscf/lbmole) * Maximum Heat Input Capacity (Duty) per Turbine (MMBtu/hr) * (1 - Control Efficiency %).

[7] Annual Emission Rate (tpy) = Hourly Emissions (lb/hr) * Total Turbine Annual Operating Hours (Normal + SU/SD) (hr/yr) * (1 ton / 2,000 lb).

[8] Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are included.

[9] Based on Heat and Material Balance provided by Venture Global.

Plaquemines Expansion, LLC

Power Generation - Aeroderivative Simple Cycle Combustion Turbines

Inputs

Property	Value	Units
Turbine Annual Operating Hours (SU/SD)[1]	54	hr/yr/turbine
Total Turbine Annual Operating Hours (Normal + SU/SD)	8,760	hr/yr/turbine
Number of Turbines	2	number
Heat Input Capacity (Duty) per turbine [1]	316	MMBtu/hr
Maximum Heat Input Capacity (Duty) per turbine [1]	316	MMBtu/hr
Fuel Gas Higher Heating Value (HHV)[2]	1,049	Btu/scf
Natural Gas Higher Heating Value (HHV)[3]	1,020	Btu/scf

[1] Based on data provided by Venture Global.

[2] Fuel Gas/Natural Gas Higher Heating Value (HHV) based on Heat and Material Balance data.

[3] Natural Gas Higher Heating Value (HHV) from U.S. EPA, AP-42, Section 1.4 Natural Gas Combustion.

Emissions Summary

Pollutant	Per Turbine				
	Average Hourly Emission Rate[1]	Maximum Hourly Emission Rate[2]	Average Annual Emission Rate [4]	SU/SD Scenario Hourly Emission Rate[3]	
	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)	
ROG (VOC)	0.52	0.52	2.26	0.52	
NO_X[5]	2.68	3.22	11.76	31.96	35.130
CO	21.60	22.00	94.59	22.00	
SO_2	0.21	0.39	0.93	0.00	
PM	4.51	4.51	19.73	4.51	
PM_{10}	4.51	4.51	19.73	4.51	
$PM_{2.5}$	4.51	4.51	19.73	4.51	
Ammonia (NH_3)	1.82	1.82	7.99	1.82	
CO_2e	-	-	171,162	-	

[1] The average hourly emission rate is calculated as follows: Average Hourly Emission Rate (lb/hr) = Average Annual Emission Rate (tpy) x 2,000 (lb/ton) / 8,760 (hr/yr) per LDEQ guidance.

[2] Maximum hourly emissions during normal operations.

[3] Maximum hourly emissions during SU/SD operations. Except for NO_x, the maximum hourly emissions during SU/SD are lower than the emissions during normal operations. Therefore, conservatively assumed emissions during normal operations for SU/SD operations.

[4] Annual average emissions include 54 hours per year of SU/SD activities for each turbine. VOC, CO, SO_2, PM, and NH_3 hourly emissions during SU/SD activities are same as the hourly emissions during normal operations. Therefore, annual average emissions for VOC, CO, SO_2, PM, and NH_3 during the 54 hours per year of SU/SD activities are based on the hourly emissions during normal operations.

[5] NO_x Maximum hourly emission rate is based data provided by Venture Global.

Plaquemines Expansion, LLC

Power Generation - Aeroderivative Simple Cycle Combustion Turbines

Cold Start - Assume 1 hour at 30% load and 1 hour at 50% load. Assume control devices become effective after 90 minutes.

Pollutant	Load	Duration of Control During Cold Start	Uncontrolled EF	Controlled EF	Adjusted Hourly	Uncontrolled Hourly	Controlled Hourly	Controlled per Cold Start	Max Hourly During Cold Start	Total Emissions (54 hours per Year per Turbine)
	%	hrs	ppmv[1]	ppmv[1]	lb/hr	lb/hr	lb/hr	lb/2 hrs	lb/ hr	lb/yr[5]
ROG (VOC)	30%	-	1.74	-	-	0.22	-	0.53	0.31	16.71
	50%	-	1.50	-	-	0.31	-			
NO_X [2]	30%	-	90.00	-	-	31.96	-	37.14	31.96	1725.81
	50%	0.50	15.00	2.50	-	8.88	1.48			
CO	30%	-	40.63	-	-	8.78	-	21.75	12.97	700.43
	50%	-	36.00	-	-	12.97	-			
SO_2	30%	-	-	-	0.09	0.09	-	0.23	0.13	7.14
	50%	-	-	-	0.13	0.13	-			
PM_{10}	All	-	-	-	2.16	2.16	-	4.31	2.16	116.43
NH_3 [3,4]	All	0.50	5.00	-	2.19	1.10	-	1.10	1.10	59.15

[1] Based on vendor data provided by Venture Global.

[2] NO_X emissions are assumed to be controlled during the last half hour of the cold start (at 50% load).

[3] NH_3 emissions are based on 5 ppm ammonia slip per good engineering judgement.

[4] NH_3 emissions are assumed to occur only when the control device is effective, during the last half hour of the cold start. Therefore, the NH_3 emission rate calculation for cold start is based on 0.5 hour instead of 2 hours of operation.

lb/MMBtu = ppmv/10^6 * Oxygen Correction Factor ((20.9) / (20.9 - 15)) * MW (lb/lbmole) * Fd (dscf/MMBtu) / Vm (dscf/lbmole)

lb/MMscf = lb/MMBtu * Btu/scf

[5] Total Emissions = Max Hourly During Cold Start (lb/hr) * Total SU/SD Hours Per Year (hr/yr/turbine).

Warm Start - Assume 0.5 hours at 30% load and 0.5 hours at 50% load. Assume control devices become effective after 30 minutes.

Pollutant	Load	Uncontrolled EF	Controlled EF	Adjusted Hourly	Uncontrolled Hourly	Controlled Hourly	Warm Start Event	Total Emissions (54 hours per Year per Turbine)
	%	ppmv[1]	ppmv[1]	lb/hr	lb/hr	lb/hr	lb/hr	lb/yr[5]
ROG (VOC)	30%	1.74	-	-	0.22	-	0.26	14.18
	50%	1.50	-	-	0.31	-		
NO_x [2]	30%	90.00	-	-	31.96	-	16.72	902.85
	50%	-	2.50	-	-	1.48		
CO	30%	40.63	-	-	8.78	-	10.88	587.34
	50%	36.00	-	-	12.97	-		
SO_2	30%	-	-	0.09	0.09	-	0.11	6.11
	50%	-	-	0.13	0.13	-		
PM_{10}	All	-	-	2.16	2.16	-	2.16	116.43
NH_3 [3,4]	All	5.00	-	2.19	1.10	-	1.10	59.15

[1] Based on vendor data provided by Venture Global.

[2] NO_X emissions are assumed to be controlled during the last half hour of the warm start (at 50% load).

[3] NH_3 emissions are based on 5 ppm ammonia slip per good engineering judgement.

[4] NH_3 emissions are assumed to occur only when the control device is effective, during the last half hour of the warm start.

[5] Total Emissions = Warm Start Event (lb/hr) * Total SU/SD Hours Per Year (hr/yr/turbine).

lb/MMBtu = ppmv/10^6 * Oxygen Correction Factor ((20.9) / (20.9 - 15)) * MW (lb/lbmole) * Fd (dscf/MMBtu) / Vm (dscf/lbmole)

lb/MMscf = lb/MMBtu * Btu/scf

Shutdowns - Assume 0.5 hours at 50% load and 0.5 hours at 30% load. Assume control devices become ineffective after 30 minutes.

Pollutant	Load	Uncontrolled EF	Controlled EF	Adjusted Hourly	Uncontrolled Hourly	Controlled Hourly	Shutdown Event	Total Emissions (54 hours per Year per Turbine)
	%	ppmv[1]	ppmv[1]	lb/hr	lb/hr	lb/hr	lb/hr	lb/yr[5]
ROG (VOC)	30%	1.74	-	-	0.22	-	0.26	14.18
	50%	1.50	-	-	0.31	-		
NO_x [2]	30%	90.00	-	-	31.96	-	16.72	902.85
	50%	-	2.50	-	-	1.48		
CO	30%	40.63	-	-	8.78	-	10.88	587.34
	50%	36.00	-	-	12.97	-		
SO_2	30%	-	-	0.09	0.09	-	0.11	6.11
	50%	-	-	0.13	0.13	-		
PM_{10}	All	-	-	2.16	2.16	-	2.16	116.43
NH_3 [3,4]	All	5.00	-	2.19	1.10	-	1.10	59.15

[1] Based on vendor data provided by Venture Global.

[2] NO_X emissions are assumed to be controlled during the last half hour of the warm start (at 50% load).

[3] NH_3 emissions are based on 5 ppm ammonia slip per good engineering judgement.

[4] NH_3 emissions are assumed to occur only when the control device is effective, during the first half hour of shutdown. Therefore, the emission rate calculations for shutdown are based on 0.5 hour instead of 1 hour of operation.

[5] Total Emissions = Shutdown Event (lb/hr) * Total SU/SD Hours Per Year (hr/yr/turbine).

Plaquemines Expansion, LLC

Power Generation - Aeroderivative Simple Cycle Combustion Turbines

Turbine Operations - Assume normal operation at 100% load. Assume control devices are effective.

Pollutant	Avg Hourly	Max Hourly	Annual
	lbs/hr	lbs/hr [1]	ton/yr [1]
ROG (VOC)	0.52	0.52	2.26
NO_X	2.50	3.22	10.97
CO	21.60	22.00	94.59
SO_2 [2]	0.21	0.39	0.93
$PM_{10}/PM_{2.5}$	4.51	4.51	19.73
NH_3	1.82	1.82	7.99
H_2S [3,4]	0.002	0.004	0.01
CO_2 [3]	-	-	167,119
CH_4 [3]	-	-	158
N_2O [5]	-	-	0.30
CO_2e [6]	-	-	171,162

[1] Based on data provided by Venture Global.

[2] Combustion of fuel with a sulfur content no greater than 4 ppmv (average) and 7 ppmv (maximum) inlet concentrations.

[3] Based on Heat and Material Balance provided by Venture Global.

[4] Assumed 99% of sulfur in fuel is converted to SO_2 and the remaining 1% of sulfur is a combination of mercaptan and H_2S. Since mercaptan is not a HAP/TAP, the emission calculations conservatively represent the remaining 1% of sulfur as H_2S.

[5] Based on N_2O emission factor obtained from 40 CFR 98 Subpart C Table C-2 for natural gas.

[6] Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1. CO_2e emissions based on GWPs for each greenhouse gas pollutant.

HAP Emissions from Turbine

Pollutant	HAP?[1]	TAP?[2]	Emission Factor		Adjusted Emission Factor	Per Turbine[7]		
						Avg Hourly Emissions [4]	Max Hourly Emissions [4]	Annual Emissions [5]
			ppmv	(lb/MMBtu)[3]	(lb/MMBtu)[6]	(lb/hr)	(lb/hr)	(tpy)
1,3-Butadiene	Y	Y	-	4.300E-07	4.423E-07	< 0.001	< 0.001	< 0.001
Acetaldehyde	Y	Y	-	4.000E-05	4.115E-05	0.01	0.01	0.06
Acrolein	Y	Y	-	6.400E-06	6.583E-06	0.002	0.002	0.009
Benzene	Y	Y	-	1.200E-05	1.234E-05	0.004	0.004	0.02
Ethylbenzene	Y	Y	-	3.200E-05	3.292E-05	0.01	0.01	0.05
Formaldehyde	Y	Y	91	-	-	0.07	0.07	0.31
Hexane[8]	Y	Y	-	-	-	0.01	0.02	0.04
Naphthalene	Y	Y	-	1.300E-06	1.337E-06	< 0.001	< 0.001	<0.01
PAH	Y	Y	-	2.200E-06	2.263E-06	0.001	0.001	0.003
Propylene Oxide	Y	Y	-	2.900E-05	2.983E-05	0.01	0.01	0.04
Toluene	Y	Y	-	1.300E-04	1.337E-04	0.04	0.04	0.19
Xylenes	Y	Y	-	6.400E-05	6.583E-05	0.02	0.02	0.09

[1] Listed US EPA Hazardous Air Pollutants.

[2] Louisiana Toxic Air Pollutants, per LAC:33.III.Chapter 51, Table 51.1.

[3] Emission factors obtained from U.S. EPA, AP-42, Section 3.1 Stationary Gas Turbines (4/00), Table 3.1-3.

[4] Hourly emissions = Adjusted Emission Factor (lb/MMBtu) * Heat Input Capacity (Duty) per Turbine (MMBtu/hr).

[5] Maximum Potential Annual Emission Rate (tpy) = Hourly Emissions (lb/hr) * Total Turbine Annual Operating Hours (Normal + SU/SD) (hr/yr) * (1 ton / 2,000 lb).

[6] U.S. EPA AP-42 Emission factors adjusted to Fuel Gas HHV by multiplying by (Fuel Gas HHV/Natural Gas HHV).

[7] Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are included.

[8] Based on Heat and Material Balance provided by Venture Global.

Plaquemines Expansion, LLC
Hot Oil Heaters

Inputs

Property	Value	Units
Number of Hot Oil Heaters	6	-
Fuel Gas Higher Heating Value (HHV)[1, 2]	21,414	Btu/lb
Fuel Mass Flow Rate for All Heaters[1, 2]	56,878	lb/hr
Design Heat Rate for All Heaters [1, 3]	1,218	MMBtu/hr
Design Heat Rate per Heater[1,2]	203	MMBtu/hr
Natural Gas Higher Heating Value (HHV)	1,020	Btu/scf
Heating Value of Fuel Gas (HHV)[1, 2]	3,446	Btu/scf
Hours of Operation	8,760	hr/yr
Emission Safety Factor	110%	%

[1] Fuel Gas composition and properties equivalent to that of flashed condensates from condensate storage.

[2] Fuel Gas data provided by Venture Global.

[3] Heating Value (MMBtu/hr) = HHV (Btu/lb) * flow rate (lb/hr) * 1 MMBtu/1000000 Btu

Emissions Summary

Pollutant	Per Unit			Total (6) Hot Oil Heaters		
	Average Hourly Emission Rate	Maximum Hourly Emission Rate	Average Annual Emission Rate	Average Hourly Emission Rate	Maximum Hourly Emission Rate	Average Annual Emission Rate
	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)	(lb/hr)	(tpy)
VOC	1.09	1.68	4.77	6.53	10.08	28.62
NO_X	7.71	8.48	33.77	46.26	50.89	202.62
CO	16.72	25.60	73.23	100.32	153.60	439.38
SO_2[1]	1.75	17.85	7.68	10.52	107.13	46.08
PM	1.51	2.32	6.61	9.05	13.92	39.66
PM_{10}	1.51	2.32	6.61	9.05	13.92	39.66
$PM_{2.5}$	1.51	2.32	6.61	9.05	13.92	39.66
CO_2e	23,770	26,147	104,114	142,621	156,883	624,687

[1] SO_2 emission rates are estimated based on Heat and Material Balance (H&MB) data provided by Venture Global.

Plaquemines Expansion, LLC
Hot Oil Heaters

Fuel Gas External Combustion Criteria Pollutant Emission Factors

Pollutant	Emission Factor[1]	Converted Emission Factor[2]	Adjusted Emission Factor[2]
	(lb/MMscf)	(lb/MMBtu)	(lb/MMBtu)
VOC	5.5	0.0054	0.0075
NO_X[3]	-	0.038	0.038
CO	84.0	0.082	0.1147
SO_2[4]	-	-	-
$PM/PM_{10}/PM_{2.5}$[5]	7.6	0.0075	0.0104

[1] Emission factors obtained from U.S. EPA, AP-42, Section 1.4 *Natural Gas Combustion* , Tables 1.4-1 and 1.4-2 (7/98).

[2] Emission Factor for Natural Gas Combustion converted to lb/MMBtu by dividing by the HHV of Natural gas (Btu/scf).

[3] NO_X emission factor was provided by Venture Global based on vendor guarantee for similar equipment operated by Venture Global.

[4] SO_2 Emission Factor was based on Heat and Material Balance Calculations

[5] All particulate matter is conservatively assumed to be less than 1 µm per AP-42, Table 1.4-1, footnote c.

Fuel Gas External Combustion Criteria Emission Rates - Per Unit

Pollutant	Avg. Hourly Emissions[1]	Max. Hourly Emissions[2]	Annual Emissions[3]
	(lb/hr)	(lb/hr)	(tpy)
VOC	1.09	1.68	4.77
NO_X	7.71	8.48	33.77
CO	16.72	25.60	73.23
SO_2	1.75	17.85	7.68
$PM/PM_{10}/PM_{2.5}$	1.51	2.32	6.61

[2] Average Hourly Emission Rate (lb/hr) = Heat Input Rating (MMBtu/hr) * Emission Factor (lb/MMBtu)
[2] Maximum Hourly Emission Rate (lb/hr) = Maximum Design Heat Rate per Heater (MMBtu/hr) * Adjusted Emission Factor (lb/MMBtu)

[3] Average Annual Emission Rate (tpy) = Hourly Emissions (lb/hr) * Annual Operating Hours (hr/yr) * (1 ton / 2,000 lb)

Fuel Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O
kg/MMBtu [1]	53.06	1.0E-03	1.0E-04
Global Warming Potential (GWP) [2]	1	25	298
EPA Guidance Calculated Factor (lb/MMBtu) [3]	116.98	2.20E-03	2.2E-04

[1] Emission factors obtained from 40 CFR 98 Subpart C Tables C-1 and C-2 for natural gas.

[2] Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1.

[3] Emission factors converted from kg/MMBtu to lb/MMBtu using the following conversion:
Greenhouse Gas Emission Factor (lb/MMBtu) = Greenhouse Gas Emission Factor (kg/MMBtu) * 2.2046 (lb/kg)

Plaquemines Expansion, LLC
Hot Oil Heaters

Fuel Gas External Combustion Greenhouse Gas Emission Rates - Per Unit [1, 2, 3]

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
CO_2	23,746.94	104,011.60
CH_4	0.45	1.97
N_2O	0.04	0.18
CO_2e	23,770.11	104,114.49

[1] Average Hourly Emission Rate (lb/hr) = Heat Input (MMBtu/hr) * Emission Factor (lb/MMBtu)

[2] CO_2e emissions based on GWPs for each greenhouse gas pollutant.

CO_2e Hourly Emission Rate (lb/hr) = CO_2 Emission Rate (lb/hr) * CO_2 GWP + CH_4 Emission Rate (lb/hr) * CH_4 GWP + N_2O Emission Rate (lb/hr) * N_2O GWP

[3] Average Annual Emission Rate (tpy) = Hourly Emissions (lb/hr) * Annual Hours (hr/yr) * (1 ton / 2,000 lb)

Fuel Gas External Combustion HAP Emission Rates

Pollutant	Emission Factor [1]	Natural Gas: Converted Emission Factor [2] (lb/MMBtu)	Adjusted Emission Factor [2]	Per Unit: Average Hourly Emissions [3]	Per Unit: Max Hourly Emissions [4]	Per Unit: Annual Emissions [5]	Hot Oil Heaters Operation Cap: Average Hourly Emissions [3]	Hot Oil Heaters Operation Cap: Annual Emissions [5]
	(lb/MMscf)		(lb/MMBtu)	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Benzene	2.1E-03	2.1E-06	7.0E-06	< 0.001	0.002	< 0.01	0.01	0.06
Dichlorobenzene	1.2E-03	1.2E-06	4.0E-06	< 0.001	0.001	< 0.01	0.01	0.06
Formaldehyde	7.5E-02	7.4E-05	2.5E-04	0.01	0.06	0.07	0.10	0.42
Hexane	1.80	1.8E-03	6.0E-03	0.36	1.33	1.57	2.15	9.42
Naphthalene	6.1E-04	6.0E-07	2.0E-06	< 0.001	< 0.001	< 0.01	0.01	0.06
Toluene	3.4E-03	3.3E-06	1.1E-05	0.001	0.003	< 0.01	0.01	0.06
Barium	4.4E-03	4.3E-06	1.5E-05	0.001	0.003	0.004	0.006	0.024
Cadmium	1.1E-03	1.1E-06	3.6E-06	< 0.001	0.001	0.001	0.001	0.006
Chromium	1.4E-03	1.4E-06	4.6E-06	< 0.001	0.001	0.001	0.001	0.006
Copper	8.5E-04	8.3E-07	2.8E-06	< 0.001	0.001	0.001	0.001	0.006
Nickel	2.1E-03	2.1E-06	7.0E-06	< 0.001	0.002	0.002	0.003	0.012
Zinc	2.9E-02	2.8E-05	9.6E-05	0.01	0.02	0.03	0.04	0.18

[1] Emission factors obtained from U.S. EPA, AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-2, Table 1.4-3, and Table 1.4-4.

[2] The hot oil heaters will combust natural gas, or a mixture of natural gas and vaporized condensate, or vaporized condensate exclusively. For Vaporized Condensate, Natural Gas Emission factors are adjusted to Fuel Gas HHV by multiplying (Fuel Gas HHV/Natural Gas HHV).

[3] Average Hourly Emission Rate (lb/hr) = AP-42 emission factor (lb/MMscf) * Volumentric fuel gas flow rate (MMscf/hr)

[4] Maximum Hourly Emission Rate (lb/hr) = Maximum Design Heat Rate per Heater (MMBtu/hr) * Adjusted Emission Factor (lb/MMBtu)

[5] Average Annual Emission Rate (tpy) = Average Hourly Emissions (lb/hr) * Annual Hours of Operation (hrs/yr) * (1 ton / 2,000 lb)

Plaquemines Expansion, LLC
Acid Gas Thermal Oxidizers

Inputs

Parameter	Acid + Flash Gas Stream	Fuel Gas Stream[2]	Total
Case 1, Holding: 60% Operating Time			
Average Flow Rate (lb/hr)[1]	80,161	4,026	**84,187**
Maximum Flow Rate (lb/hr)[6]	119,830	6,018	**125,848**
Average Flow Rate (scf/hr)	728,291	86,546	**814,837**
Max Flow Rate (scf/hr)	1,088,704	129,376	**1,218,080**
HHV (Btu/lb)[3]	51	22,097	**1,105**
HHV (Btu/scf)[3]	6	1,025	**114**
Average Acid + Flash Gas Flow Rate Heat Rate (MMBtu/hr)[4]	4	89	**93**
Max Acid + Flash Gas Flow Rate Heat Rate (MMBtu/hr)[4]	6	133	**139**
Hours of Operation (hr/yr)	-	-	**5,256**
Case 2, Loading: 40% Operating Time			
Average Flow Rate (lb/hr)[1]	80,161	4,053	**84,213**
Maximum Flow Rate (lb/hr)[6]	119,830	6,058	**125,888**
Average Feed Rate (scf/hr)	728,291	87,969	**816,260**
Max Feed Rate (scf/hr)	1,088,704	131,503	**1,220,207**
HHV (Btu/lb)[3]	51	21,913	**1,103**
HHV (Btu/scf)[3]	6	1,009	**114**
Average Acid + Flash Gas Flow Rate Heat Rate (MMBtu/hr)[4]	4	89	**93**
Max Acid + Flash Gas Flow Rate Heat Rate (MMBtu/hr)[4]	6	133	**139**
Hours of Operation (hr/yr)	-	-	**3,504**
Total Number of Acid + Flash Gas Thermal Oxidizers	-	-	**4**
Natural Gas HHV	-	-	**1,020**
Hours of Operation (hr/yr)	-	-	**8,760**
Sulfur Conversion & Hydrocarbon Destruction Efficiency (%)[5]	-	-	**99.9%**

[1] Average Acid + Flash Gas flow rate is based on vendor information and divided by two to reflect the operation of smaller thermal oxidizers at Plaquemines LNG. The fuel gas stream flow rate is based on vendor specification.

[2] Fuel gas and amine drum flash gas fed to thermal oxidizer burner.

[3] Higher Heating Value (HHV) calculated based on gas composition data provided by vendor.

[4] Heat rate calculated: Feed rate (lb/hr) * Higher Heating Value (Btu/lb)/10^6

[5] Thermal oxidizer destruction efficiency for hydrocarbons and sulfur compounds based on *Air Pollution Control Technology Fact Sheet*, EPA "Typical thermal incinerator design efficiencies range from 98 to 99.99% and above, depending on system requirements. Confirmed 99.9% by vendor specification.

[6] The max flow rate of 119,830 lb/hr per thermal oxidizer and the fuel gas streams are based on vendor specifications and adjusted to reflect operations at Plaquemines LNG.

Emissions Summary

Pollutant	Per Thermal Oxidizer			Phase 1 Total Thermal Oxidizers Emissions		Phase 2 Total Thermal Oxidizers Emissions	
	Average Emission Rate**	Maximum Emission Rate*	Annual Emission Rate**	Average Emission Rate	Annual Emission Rate	Average Emission Rate	Annual Emission Rate
	(lb/hr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
VOC	*	1.48	*	1.03	4.51	1.03	4.51
NO_X	*	36.46	*	24.38	106.80	24.38	106.80
CO	*	21.86	*	14.63	64.07	14.63	64.07
SO_2	*	13.82	*	9.25	40.51	9.25	40.51
PM	*	1.98	*	1.32	5.80	1.32	5.80
PM_{10}	*	1.98	*	1.32	5.80	1.32	5.80
$PM_{2.5}$	*	1.98	*	1.32	5.80	1.32	5.80
CO_2e	-	-	*	-	824,747	-	824,747
H_2S	*	0.01	*	0.005	0.02	0.005	0.02

*Max emission rate is used for individual thermal oxidizer EIQ sheets.

**Average and annual emissions from each AGTO will be included in an emissions CAP for Acid + Flash Gas Thermal Oxidizers, Cold, Warm, Spare Flare, and LP Vent Flare (AGTOSFLRS CAP).

Hourly emission rate for SO_2 and PM are based on vendor specification and multiplied by a ratio of heat input to estimate representative emissions for operations of similar equipement operated by Venture Global.

Case 1, Holding: 60% Operating Time [1,2]

Component	Component MW	Molar (Volume) Fraction (mol%)				Average Feed Rate per Thermal Oxidizer (lb/hr)			Max Feed Rate per Thermal Oxidizer (lb/hr)		
	(lb/lbmole)	Acid + Flash Gas	Fuel Gas	Average Total	Max Total	Acid + Flash Gas	Fuel Gas	Total	Acid + Flash Gas	Fuel Gas	Total
Nitrogen	28.01	0.00053%	2.67502%	0.28460%	0.28460%	0.28	170.94	171.22	0.49	255.53	256.02
CO_2 [4]	44.01	91.35274%	0.80022%	81.73490%	81.73490%	102,956.21	80.34	103,036.55	153,935.40	120.09	154,055.49
H_2S	34.08	0.00347%	0.00016%	0.00312%	0.00312%	2.27	0.01	2.28	3.39	0.02	3.41
Methane	16.04	0.48163%	92.42161%	10.24684%	10.24684%	148.29	3,381.65	3,529.94	222.99	5,055.14	5,278.13
Ethane	30.07	0.01722%	1.67172%	0.19295%	0.19295%	9.94	114.67	124.61	14.90	171.42	186.32
Propane	44.10	0.00673%	0.61839%	0.07170%	0.07170%	5.70	62.21	67.91	8.54	92.99	101.54
i-Butane	58.12	0.00018%	0.26959%	0.02879%	0.02879%	0.20	35.74	35.94	0.31	53.43	53.74
n-Butane	58.12	0.00035%	0.29432%	0.03157%	0.03157%	0.39	39.02	39.41	0.60	58.33	58.93
i-Pentane	72.15	0.00007%	0.24691%	0.02629%	0.02629%	0.10	40.64	40.73	0.16	60.75	60.91
n-Pentane	72.15	0.00011%	0.25275%	0.02694%	0.02694%	0.15	41.60	41.75	0.24	62.18	62.43
22-Mpropane	72.15	0.00000%	0.00344%	0.00037%	0.00037%	0.00	0.57	0.57	0.00	0.85	0.85
n-Hexane	86.18	0.00003%	0.09379%	0.00999%	0.00999%	0.05	18.44	18.49	0.08	27.56	27.64
Benzene	78.11	0.01901%	0.00140%	0.01714%	0.01714%	28.50	0.25	28.75	42.62	0.37	42.99
H_2O	18.01	8.12262%	0.63221%	7.32704%	7.32704%	2,808.13	25.97	2,834.10	4,198.86	38.83	4,237.68
o-Xylene	106.16	0.00761%	0.00062%	0.00686%	0.00686%	15.50	0.15	15.65	23.17	0.22	23.40
Toluene	92.14	0.00978%	0.00074%	0.00882%	0.00882%	17.30	0.16	17.46	25.87	0.23	26.11
m-Mercaptan	48.11	0.00024%	0.00034%	0.00025%	0.00025%	0.22	0.04	0.26	0.33	0.06	0.39
E-Benzene	106.16	0.00086%	0.00000%	0.00077%	0.00077%	1.76	0.00	1.76	2.62	0.00	2.62

Case 2, Loading: 40% Operating Time [1,3]

Component	Component MW	Molar (Volume) Fraction				Average Feed Rate per Thermal Oxidizer (lb/hr)			Max Feed Rate per Thermal Oxidizer (lb/hr)		
	(lb/lbmole)	Acid + Flash Gas	Fuel Gas	Average Total	Max Total	Acid + Flash Gas	Fuel Gas	Total[4]	Acid + Flash Gas	Fuel Gas	Total[4]
Nitrogen	28.01	0.00053%	3.87405%	0.41798%	0.41798%	0.29	251.63	251.91	0.43	376.15	376.58
CO_2	44.01	91.35274%	0.36902%	81.54732%	81.54732%	102,956.81	37.66	102,994.47	153,907.57	56.29	153,963.86
H_2S	34.08	0.00347%	0.00007%	0.00310%	0.00310%	2.27	0.01	2.28	3.39	0.01	3.40
Methane	16.04	0.48163%	92.38741%	10.38642%	10.38642%	148.32	3,435.98	3,584.30	221.72	5,136.37	5,358.09
Ethane	30.07	0.01722%	1.12464%	0.13657%	0.13657%	9.94	78.41	88.35	14.86	117.22	132.08
Propane	44.10	0.00673%	0.54571%	0.06482%	0.06482%	5.70	55.80	61.50	8.52	83.41	91.93
i-Butane	58.12	0.00018%	0.24431%	0.02649%	0.02649%	0.20	32.92	33.12	0.30	49.22	49.52
n-Butane	58.12	0.00035%	0.26864%	0.02926%	0.02926%	0.39	36.20	36.59	0.58	54.12	54.70
i-Pentane	72.15	0.00007%	0.22616%	0.02444%	0.02444%	0.10	37.83	37.93	0.15	56.56	56.70
n-Pentane	72.15	0.00011%	0.23191%	0.02509%	0.02509%	0.15	38.80	38.95	0.23	58.00	58.22
22-Mpropane	72.15	0.00000%	0.00314%	0.00034%	0.00034%	0.00	0.53	0.53	0.00	0.79	0.79
n-Hexane	86.18	0.00003%	0.08599%	0.00929%	0.00929%	0.05	17.18	17.23	0.07	25.69	25.76
Benzene	78.11	0.00477%	0.01075%	0.00541%	0.00541%	7.15	1.95	9.10	10.69	2.91	13.60
H_2O	18.01	8.12262%	0.62047%	7.31410%	7.31410%	2,808.15	25.91	2,834.06	4,197.84	38.73	4,236.57
o-Xylene	106.16	0.00761%	0.00057%	0.00685%	0.00685%	15.50	0.14	15.64	23.17	0.21	23.38
Toluene	92.14	0.00978%	0.00069%	0.00880%	0.00880%	17.30	0.15	17.45	25.87	0.22	26.09
m-Mercaptan	48.11	0.00024%	0.00032%	0.00025%	0.00025%	0.22	0.04	0.26	0.33	0.05	0.38
Benzene	78.11	0.01901%	0.00140%	0.01711%	0.01711%	28.50	0.25	28.75	42.60	0.38	42.98
E-Benzene	106.16	0.00086%	0.00000%	0.00077%	0.00077%	1.76	0.00	1.76	2.62	0.00	2.62

[1] Gas speciation data based on vendor information.

[2] Case 1 = Holding; to occur 60% of the time.

[3] Case 2 = Loading; to occur 40% of the time.

[4] The CO_2 concentration in the natural gas supply can vary from 1.3% to 2.0%. The ammount of CO_2 fed to each AGTO is calculated based on the typical inlet feed gas composition (1.3 mol% CO_2) plus the additional CO_2 based on the maximum inlet feed gas composition (up to 2.0 mol% CO_2).
*Total CO_2 fed to each AGTO (lb/hr) = Total Flow to AGTOs (lb/hr) / MW (lb/lbmole) *Average Original CO_2 Concentration (mol%) *CO_2 MW (lb/lbmol) + Additional CO_2 from Maximum Concentration (lb/hr)*

[5] The additional CO_2 that has the potential to be fed to the AGTO is based on the difference in the amount of CO_2 between the maximum inlet feed gas (2.0%) and the typical inlet feed gas (1.3%):
*Additional CO_2 per AGTO (lb/hr) = Molar Flow into the Facility (lbmol/hr) *[Max CO_2 concentration (mol%) - Original CO_2 concentration (mol%)] * MW CO_2 (lb/lbmol) / 4 AGTOs*

[6] It is assumed that 100% of the additional CO_2 from the "Maximum Inlet Feed Composition" is routed to the Acid + Flash Gas stream without changing the emissions of any other constituents.

[7] The maximum additional CO_2 feed rate is based on a 1.5 ratio of maximum to average acid + flash gas flow to account for each AGTO's maximum capacity.

[8] The "Typical Inlet Feed Composition" is from vendor specification.

Plaquemines Expansion, LLC
Acid Gas Thermal Oxidizers

Emission Calculations

Acid + Flash Gas - Thermal Oxidizer

Component	AP-42 Emission Factor (lb/MMscf)	Adjusted AP-42 Emission Factor (lb/MMBtu)	Average Flow Case Venting Heat Value [a]	Max Flow Case Venting Heat Value [a] (MMBtu/hr)	Destruction Efficiency (%)	Pre-Combustion Average Flow (lb/hr)	Pre-Combustion Max Flow (lb/hr)	Per Thermal Oxidizer		
								Average Emission Rate (lb/hr)	Max Emission Rate (lb/hr)	Annual Emission Rate (tons/yr)
CO_2 [1]	120,000	0.64	4	6	-	103,019.72	154,018.84	103,022.33	154,022.74	451,237.80
CO [2]	-	-	-	-	99.9%	-	-	8.76E-08	1.31E-07	3.84E-07
VOC	-	-	-	-	99.9%	69.87	-	0.07	0.07	0.31
CH_4 [4]	2.3	1.23E-05	4	6	-	-	-	5.00E-05	7.48E-05	2.19E-04
$PM/PM_{10}/PM_{2.5}$ [5]	7.6	4.07E-05	4	6	-	-	-	1.65E-04	2.47E-04	0.001
NO_x [6]	140	7.50E-04	4	6	-	-	-	0.003	0.005	0.01
SO_2 [7]	-	-	-	-	-	-	-	4.56	6.81	19.96
H_2S [3]	-	-	-	-	99.9%	2.27	3.39	0.00227	0.003	0.01
m-Mercaptan	-	-	-	-	99.9%	0.22	0.33	0.00022	3.31E-04	0.001
o-xylene	-	-	-	-	99.9%	15.50	23.17	0.02	0.02	0.07
Toluene	-	-	-	-	99.9%	17.30	25.87	0.02	0.03	0.08
Lead	0.0005	2.68E-09	4	6	-	-	-	1.09E-08	1.63E-08	4.76E-08
Benzene	-	-	-	-	99.9%	28.50	42.61	0.03	0.04	0.12
Ethylbenzene	-	-	-	-	99.9%	1.76	2.62	0.002	0.003	0.01

Fuel Gas - Thermal Oxidizer

Pollutant	AP-42 Emission Factor (lb/MMscf)	AP-42 Emission Factor (lb/MMBtu)	Average Flow Case Firing Rate (MMBtu/hr)	Max Flow Case Firing Rate (MMBtu/hr)	Destruction Efficiency (%)	Pre-Combustion Average Flow (lb/hr)	Pre-Combustion Max Flow (lb/hr)	Per Thermal Oxidizer		
								Average Emission Rate (lb/hr)	Max Emission Rate (lb/hr)	Annual Emission Rate (tons/yr)
NO_x [6]	140	0.14	89	133	-	-	-	12.19	18.22	53.39
CO [9]	84	0.08	89	133	-	-	-	7.31	10.93	32.03
VOC [9]	5.5	0.005	89	133	-	-	-	0.44	0.67	1.95
$PM/PM_{10}/PM_{2.5}$ [9]	7.6	0.007	89	133	-	-	-	6.62E-01	0.99	2.90
Lead [9]	0.0005	4.90E-07	89	133	-	-	-	4.35E-05	6.51E-05	1.91E-04
SO_2 [9]	-	-	-	-	-	-	-	0.07	0.10	0.29
H_2S [3]	-	-	-	-	99.9%	0.01	0.01	0.000010	1.44E-05	4.22E-05
m-Mercaptan	-	-	-	-	99.9%	0.04	0.05	0.000037	5.49E-05	1.61E-04
o-xylene	-	-	-	-	99.9%	0.15	0.22	1.46E-04	2.18E-04	0.001
Toluene	-	-	-	-	99.9%	0.15	0.23	1.52E-04	2.27E-04	0.001
Benzene	-	-	-	-	99.9%	0.25	0.37	2.51E-04	3.75E-04	0.001
Ethylbenzene	-	-	-	-	99.9%	0.00	0.00	0.00E+00	0.00E+00	0.00E+00

[1] CO_2 emissions resulting from CO_2 entering with Acid + Flash Gas stream and hydrocarbons combusted in thermal oxidizer.

[2] CO emissions resulting from incomplete combustion; conservatively assume 1% of methane not combusted in thermal oxidizer undergoes incomplete combustion to form CO or is uncombusted and emitted as CH_4.

[3] Assume combustion efficiency of 99.9%; 99.9% of H_2S and mercaptans are converted to SO_2; the other 0.1% is emitted as H_2S or mercaptans.

[4] Assume combustion efficiency of 99.9%; 99.9% of CH_4 is converted to CO_2; conservatively assume the other 0.1% undergoes incomplete combustion and is emitted as CO or CH_4.

[5] Conservatively assume that PM_{10}=$PM_{2.5}$=TSP.

[6] NOx emission rate based on AP-42 Section 1.4 emission factor (140 lb/MMscf) scaled from 1020 Btu/scf based on gas stream HHV; thermal oxidizer equipped with low-NOx burners, determined as BACT.

[7] SO_2 Emission Rate = H_2S Average Flow Rate (lb/hr)* Destruction Efficiency * (64 lb SO_2/lbmol SO_2) * (1 lbmol SO_2/1 lbmol S) * (1 lbmol S/1 lbmol H_2S) * (1 lbmol H_2S/34 lb H_2S)

[8] Annual Emission Rate (tons/yr) = Average Emission Rate (lb/hr) * Hours of Operation / (2000 lbs / 1 ton)

[9] Emission rates based on AP-42 Section 1.4 emission factors (lb/MMscf) scaled from 1020 Btu/scf based on gas stream HHV. VOC emission rates are adjusted based on H&MB data.

GHG and HAP Emissions

Pollutant	HAP?	TAP?	Average Flow Case Firing Rate (MMBtu/hr)		Max Flow Case Firing Rate (MMBtu/hr)		AP-42 Adjusted Emission Factor [1] (lb/MMBtu)		Per Thermal Oxidizer: Average Emission Rate (lb/hr)		Per Thermal Oxidizer: Max Emission Rate (lb/hr)		Per Thermal Oxidizer: Annual Emission Rate (tons/yr)		Total Emissions Per Phase	Maximum Hourly Emissions Per Thermal Oxidizer	Total Emissions Per Phase
			Fuel Gas	Acid + Flash Gas	Fuel Gas	Acid + Flash Gas	Fuel Gas	Acid + Flash Gas	Fuel Gas	Acid + Flash Gas	Fuel Gas	Acid + Flash Gas	Fuel Gas	Acid + Flash Gas	Avg (lb/hr)	Max (lb/hr)	(tons/yr)
CO_2	-	-	89	-	133	-	117.53	-	10,448	103,022	15,618	154,023	45,762	451,238	113,470	-	823,788
N_2O	-	-	89	4	133	6	2.25E-03	3.43E-06	2.00E-01	1.39E-05	2.99E-01	2.08E-05	8.77E-01	6.10E-05	2.00E-01	-	4.45E-01
CH_4	-	-	89	-	133	-	6.27E-04	-	5.57E-02	5.00E-05	8.33E-02	7.48E-05	2.44E-01	2.19E-04	5.58E-02	-	3.30E+01
CO_2e [2]	-	-	-	-	-	-	-	-	9,862	84,287	-	-	43,194	369,179	188,298	-	824,747
H_2S	N	Y	-	-	-	-	-	-	9.63E-06	2.27E-03	1.44E-05	3.39E-03	4.22E-05	9.94E-03	0.005	0.01	0.02
o-xylene	Y	Y	-	-	-	-	-	-	1.46E-04	1.55E-02	2.18E-04	2.32E-02	6.39E-04	6.79E-02	0.03	0.05	0.14
Toluene	Y	Y	-	-	-	-	-	-	1.52E-04	1.73E-02	2.27E-04	2.59E-02	6.66E-04	7.58E-02	0.03	0.05	0.15
Benzene	Y	Y	-	-	-	-	-	-	2.51E-04	2.85E-02	3.75E-04	4.26E-02	1.10E-03	1.25E-01	0.06	0.09	0.25
Dichlorobenzene	Y	Y	89	4	133	6	1.18E-06	6.43E-09	1.04E-04	2.61E-08	1.56E-04	3.90E-08	4.58E-04	1.14E-07	< 0.001	< 0.001	< 0.01
Formaldehyde	Y	Y	89	4	133	6	7.35E-05	4.02E-07	6.53E-03	1.63E-06	9.76E-03	2.44E-06	2.86E-02	7.15E-06	0.01	0.02	0.06
n-Hexane	Y	Y	89	4	133	6	1.76E-03	9.65E-06	1.57E-01	3.92E-05	2.34E-01	5.85E-05	6.86E-01	1.72E-04	0.31	0.47	1.37
PAH	Y	Y	89	4	133	6	8.64E-08	4.73E-10	7.68E-06	1.92E-09	1.15E-05	2.87E-09	3.36E-05	8.40E-09	< 0.001	< 0.001	< 0.001
Barium	N	Y	89	4	133	6	4.31E-06	2.36E-08	3.83E-04	9.57E-08	5.73E-04	1.43E-07	1.68E-03	4.19E-07	0.001	0.001	0.003
Beryllium	Y	Y	89	4	133	6	1.18E-08	6.43E-11	1.04E-06	2.61E-10	1.56E-06	3.90E-10	4.58E-06	1.14E-09	< 0.001	< 0.001	< 0.001
Cadmium	Y	Y	89	4	133	6	1.08E-06	5.89E-09	9.58E-05	2.39E-08	1.43E-04	3.58E-08	4.19E-04	1.05E-07	< 0.001	< 0.001	0.001
Chromium	Y	Y	89	4	133	6	1.37E-06	7.50E-09	1.22E-04	3.05E-08	1.82E-04	4.55E-08	5.34E-04	1.33E-07	< 0.001	< 0.001	0.001
Cobalt	Y	N	89	4	133	6	8.23E-08	4.50E-10	7.31E-06	1.83E-09	1.09E-05	2.73E-09	3.20E-05	8.00E-09	< 0.001	< 0.001	< 0.001
Copper	N	Y	89	4	133	6	8.32E-07	4.55E-09	7.40E-05	1.85E-08	1.11E-04	2.76E-08	3.24E-04	8.10E-08	< 0.001	< 0.001	0.001
Nickel	Y	Y	89	4	133	6	2.06E-06	1.13E-08	1.83E-04	4.57E-08	2.73E-04	6.83E-08	8.01E-04	2.00E-07	< 0.001	0.001	0.002
Selenium	Y	Y	89	4	133	6	2.35E-08	1.29E-10	2.09E-06	5.22E-10	3.12E-06	7.81E-10	9.15E-06	2.29E-09	< 0.001	< 0.001	< 0.001
Zinc	N	Y	89	4	133	6	2.84E-05	1.55E-07	2.52E-03	6.31E-07	3.77E-03	9.43E-07	1.11E-02	2.76E-06	0.01	0.01	0.02
Ethylbenzene	Y	Y	-	-	-	-	-	-	0.00E+00	1.76E-03	0.00E+00	2.62E-03	0.00E+00	7.69E-03	0.004	0.01	0.02

[1] HAP emission factors from AP-42 Table 1.4-2 and 1.4-3, adjusted based on gas stream HHV.

[2] Acid + Flash Gas CO_2 Emission Rate calculated based on CO_2 throughput and combustion product, shown in table above.

[3] Acid + Flash Gas CH_4 Emission Rate calculated based on combustion residuals, shown in table above.

[2] Acid + Flash Gas CO_2e Emission Rate calculated based on combustion residuals, shown in table above.

Plaquemines Expansion, LLC
Cold Flare

Input Data

Stream ->	0708	0401	0510	0517	2213	2212	0501 and 0505	-
Parameter	Treated Feed Gas	LNG	Mixed Refrigerant	Mixed Refrigerant Liquid	Continuous Flare Pilots	Continuous Flare Purges	Continuous Seal Purges	Ethylene
Flow	Intermittent[1]				Continuous[2]			
Max Flared Gas Flow Rate (lb/hr)	280,272	62,031	280,272	280,272	23.00	83.00	452.60	2.73
Max Flared Gas Flow Rate (lb/yr)	2,195,538	41,546,390	3,608,010	4,690,530	201,480	727,080	7,929,552	47,818
Max Flared Gas Flow Rate (lbmol/hr)	16,143	3,573	9,496	5,805	1.31	4.72	12.51	0.10
Max Flared Gas Flow Rate (scf/hr)	6,125,946	1,355,949	3,603,560	2,203,025	496.80	1,792.81	4,745.68	36.93
Max Flared Gas Flow Rate (lbmol/yr)	126,455	2,393,128	122,242	97,154	11,468	41,384	219,095	1,705
Max Flared Gas Flow Rate (scf/yr)	47,988,223	908,168,310	46,389,536	36,869,035	4,351,981	15,704,974	83,144,256	646,930
Heating Value (BTU/scf)	1,134	1,134	1,530	3,163	992	992	2,009.96	1,601
Max Flare Gas Heating Rate (MMBTU/hr)	6,943.90	1,537.15	5,514.27	6,968.57	0.52	1.78	9.54	0.06
Max Flare Gas Heating Rate (MMBTU/yr)	54,396	1,029,532	70,987	116,624	4,549.03	15,628.99	167,116.32	1,035.72
Average MW of Fuel Gas lb/lbmol	17.36	17.36	29.52	48.28	17.57	17.57	36.19	28.05
Annual Operating Hours	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
DRE	98%							

[1] Based on engineering estimates and best currently available information.

[2] Based on Heat and Material Balance data provided by Venture Global.

Cold Flare Uncontrolled VOC Emissions - Continuous Flow [1]

Component	MW lb/lbmol	Mole Fraction				Uncontrolled Cold Flare Emissions		
		Continuous Flare Pilots	Continuous Flare Purges	Continuous Seal Purges	Ethylene	Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
						lb/hr	lb/hr	tons/yr
Nitrogen	28.01	0.049357	0.049357	0.115159	-	89.03	48.68	389.93
CO_2	44.01	0.010674	0.010674	-	-	2.83	2.83	12.41
H_2S	34.08	0.000002	0.000002	-	-	4.11E-04	4.11E-04	1.80E-03
Methane	16.04	0.952530	0.952530	0.208307	-	175.75	133.97	769.78
Ethane	30.07	0.026177	0.026177	-	-	4.75	4.75	20.80
Propane	44.10	0.005227	0.005227	0.208000	-	230.81	116.10	1,010.95
i-Butane	58.12	0.001307	0.001307	-	-	0.46	0.46	2.01
n-Butane	58.12	0.001307	0.001307	-	-	0.46	0.46	2.01
i-Pentane	72.15	0.000523	0.000523	0.176540	-	318.80	159.51	1,396.34
n-Pentane	72.15	0.000523	0.000523	-	-	0.23	0.23	1.00
Cyclopentane	70.13	0.000010	0.000010	-	-	0.004	0.004	0.02
Neopentane	72.15	0.000006	0.000006	-	-	0.003	0.003	0.011
n-Hexane	86.18	0.000085	0.000085	-	-	0.04	0.04	0.19
Cyclohexane	84.16	0.000015	0.000015	-	-	0.008	0.008	0.03
n-Heptane	100.21	0.000092	0.000092	-	-	0.06	0.06	0.24
n-Octane	114.23	0.000062	0.000062	-	-	0.04	0.04	0.19
n-Nonane	128.25	0.000032	0.000032	-	-	0.02	0.02	0.11
n-Decane	142.28	0.000009	0.000009	-	-	0.008	0.008	0.03
Benzene	78.11	0.000027	0.000027	-	-	0.013	0.013	0.06
Toluene	92.14	0.000015	0.000015	-	-	0.008	0.008	0.04
p-Xylene	106.16	0.000003	0.000003	-	-	0.002	0.002	0.008
o-Xylene	106.16	0.000004	0.000004	-	-	0.003	0.003	0.011
E-Benzene	106.16	0.000001	0.000001	-	-	6.41E-04	6.41E-04	0.003
n-BBenzene	134.22	0.000001	0.000001	-	-	8.10E-04	8.10E-04	0.004

M-Mercaptan	48.11	0.000001	0.000001	-	-	2.90E-04	2.90E-04	1.27E-03
22-Mpropane	72.15	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
H_2O	18.01	0.000080	0.000080	-	-	0.009	0.009	0.04
Ethylene	28.05	-	-	0.350385	1.0000	251.272	125.636	1,100.57
					Total Uncontrolled VOCs	**802.24**	**402.61**	**3,513.82**

[1] Based on the Heat and Material Balance data provided by Venture Global.

Plaquemines Expansion, LLC
Cold Flare

Cold Flare Uncontrolled VOC Emissions - Intermittent MSS Flow [1]

Component	MW lb/lbmol	Mole Fraction				Uncontrolled Cold Flare Emissions		
		Treated Feed Gas	LNG	Mixed Refrigerant	Mixed Refrigerant Liquid	Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
						lb/hr	lb/hr	tons/yr
Nitrogen	28.01	0.005120	0.005120	0.153067	0.016782	106.30	40,716.71	465.60
CO_2	44.01	0.000041	0.000041	-	-	0.52	29.13	2.27
H_2S	34.08	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
Methane	16.04	0.979759	0.979759	0.265281	0.069326	4,591.81	253,685.97	20,112.14
Ethane	30.07	0.051020	0.051020	-	-	441.26	24,765.48	1,932.74
Propane	44.10	0.009983	0.010183	0.161622	0.387765	418.15	99,271.87	1,831.51
i-Butane	58.12	0.002528	0.002528	-	-	42.26	2,371.79	185.10
n-Butane	58.12	0.002528	0.002528	-	-	42.26	2,371.79	185.10
i-Pentane	72.15	0.000947	0.000947	0.048041	0.413157	398.63	173,049.54	1,745.98
n-Pentane	72.15	0.000947	0.000947	-	-	19.65	1,102.96	86.08
Cyclopentane	70.13	0.000015	0.000015	-	-	0.30	16.98	1.33
Neopentane	72.15	0.000012	0.000012	-	-	0.25	13.98	1.09
n-Hexane	86.18	0.000077	0.000077	-	-	1.91	107.12	8.36
Cyclohexane	84.16	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
n-Heptane	100.21	0.000012	0.000012	-	-	0.35	19.41	1.51
n-Octane	114.23	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
n-Nonane	128.25	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
n-Decane	142.28	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
Benzene	78.11	0.000055	-	-	-	0.06	69.35	0.27
Toluene	92.14	0.000030	-	-	-	0.04	44.62	0.17
p-Xylene	106.16	0.000006	-	-	-	0.01	10.28	0.04
o-Xylene	106.16	0.000007	-	-	-	0.01	12.00	0.05
E-Benzene	106.16	0.000003	-	-	-	0.00	5.14	0.02
n-BBenzene	134.22	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
M-Mercaptan	48.11	0.000001	0.000001	-	-	0.014	0.78	6.06E-02
22-Mpropane	72.15	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
H_2O	18.01	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
Ethylene	28.05	-	-	0.409929	0.280123	247.60	109,187.51	1,084.49
					Total Uncontrolled VOCs	**1,171.50**	**387,655.10**	**5,131.16**

[1] Based on the Heat and Material Balance data, engineering estimates, and best currently available information.

Plaquemines Expansion, LLC
Cold Flare

Cold Flare Criteria and Other Pollutants Emissions Summary

Pollutant[5]	Emission Factors [1, 2, 3]		Emission Rates[4]			
			Average Hourly Emissions	Normal Maximum Hourly Emissions	Annual Emissions	SU/SD Scenario Hourly Emission Rate
			lb/hr	lb/hr	tons/yr	lb/hr
$PM_{2.5}$	0.007	lb/MMBtu	1.24	0.09	5.44	52.01
PM_{10}	0.007	lb/MMBtu	1.24	0.09	5.44	52.01
SO_2	-	-	0.02	0.003	0.09	5.97
NO_x	0.068	lb/MMBtu	11.33	0.81	49.64	474.67
CO	0.31	lb/MMBtu	51.66	3.69	226.28	2,163.95
VOC	-	-	39.47	8.05	172.90	7,761.15
Benzene	-	-	0.001	< 0.001	0.01	1.39
n-Hexane	-	-	0.04	0.001	0.17	2.14
Toluene	-	-	0.001	< 0.001	< 0.01	0.89
Xylenes (mixed isomers)	-	-	< 0.001	< 0.001	< 0.01	0.45
Ethylbenzene	-	-	< 0.001	< 0.001	< 0.01	0.10
CO_2	-	-	-	-	86,017	-
CH_4	-	-	-	-	417.64	-
N_2O	0.00022	lb/MMBtu	-	-	0.16	-
CO_2e	-	-	-	-	96,506	-

[1]NOx and CO emission factors are from AP-42, Chapter 13, Tables 13.5-1 and 13.5-2. $PM_{10}/PM_{2.5}$ emission factors are from AP-42, Chapter 1, Table 1.4-2.

[2]The H_2S and M-Mercaptan concentrations from each stream was utilized to calculate the SO_2 emissions assuming 99.9% conversion of H_2S and M-Mercaptan to SO_2. For continuous streams, the maximum hourly SO_2 emissions are based on 7 ppmv of fuel sulfur content for continuous streams.

[3]Emission factors obtained from 40 CFR 98 Subpart C Tables C-1 and C-2 for natural gas. CH_4 emission factor is not used, CH_4 emissions based on stream composition constituents. CO_2 emissions resulting from CO_2 entering with continuous and intermittent streams and hydrocarbons combusted in flare calculated based on the heat and material balance data.

[4]Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1. CO_2 emissions resulting from CO_2 entering with continuous and intermittent streams and hydrocarbons combusted in flare calculated based on the heat and material balance data.

[5]Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are proposed for permitting.

Sample calculations:

Max Hourly Emissions (lb/hr) = Max Flare Gas Heating Rate MMBtu/hr * Emission Factor lb/MMBtu.

Annual Emissions (tons/yr) = Max Flare Gas Heating Rate MMBtu/yr * Emission Factor lb/MMBtu * 1 ton/2,000 lbs.

SO_2 (lb/hr) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/hr * 64 lb/lbmol, where "i" is the stream which consists of H_2S and M-Mercaptan.

SO_2 (tpy) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/yr * 64 lb/lbmol * 1 ton/2,000 lbs, where "i" is the stream which consists of H_2S and M-Mercaptan.

Plaquemines Expansion, LLC
Warm Flare

Input Data [1]

Stream ->	0102	-	-	2213	2212	0501 and 0505
Parameter	**Pipeline Feed Gas**	**Pentane**	**Propane**	**Continuous Flare Pilots**	**Continuous Flare Purges**	**Continuous Seal Purges**
Flow	Intermittent[1]	Continuous				
Max Flared Gas Flow Rate (lb/hr)	182,978	2.40	2.5	23.00	83.00	25.14
Max Flared Gas Flow Rate (lb/yr)	13,694,751	42,128	43,210	201,480	727,080	440,452
Max Flared Gas Flow Rate (lbmol/hr)	10,217.16	0.03	0.06	1.31	4.72	0.69
Max Flared Gas Flow Rate (scf/hr)	3,877,309.50	12.65	21.22	496.80	1,792.81	263.60
Max Flared Gas Flow Rate (lbmol/yr)	764,691.26	583.90	979.83	11,468	41,384	12,169.76
Max Flared Gas Flow Rate (scf/yr)	290,192,684.36	221,584.69	371,835.44	4,351,981	15,704,974	4,618,308.85
Heating Value (BTU/scf)[2]	1,124.75	4,001.00	2,557.00	992.20	992.20	2,009.96
Max Flare Gas Heating Rate (MMBTU/hr)	4,361.01	0.05	0.05	0.52	1.78	0.53
Max Flare Gas Heating Rate (MMBTU/yr)	326,394.95	886.56	950.78	4,549.03	15,628.99	9,282.60
Average MW of Fuel Gas lb/lbmol	17.91	72.15	44.10	17.57	17.57	36.19
Annual Operating Hours	8,760	8,760	8,760	8,760	8,760	8,760
DRE	98%					

[1] Based on engineering estimates and best currently available information.

[2] Based on data provided by Venture Global.

Warm Flare Uncontrolled VOC Emissions - Continuous Flow [1]

Component	MW lb/lbmol	Mole Fraction					Uncontrolled Warm Flare Emissions		
		Pentane	Propane	Continuous Flare Pilots	Continuous Flare Purges	Continuous Seal Purges	Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
							lb/hr	lb/hr	tons/yr
Nitrogen	28.01	-	-	0.049357	0.049357	0.115159	12.82	10.58	56.17
CO_2	44.01	-	-	0.010674	0.010674	-	2.83	2.83	12.41
H_2S	34.08	-	-	0.000002	0.000002	-	4.11E-04	4.11E-04	1.80E-03
Methane	16.04	-	-	0.952530	0.952530	0.208307	96.82	94.50	424.09
Ethane	30.07	-	-	0.026177	0.026177	-	4.75	4.75	20.80
Propane	44.10	-	1.000000	0.005227	0.005227	0.208000	19.07	0.12	83.51
i-Butane	58.12	-	-	0.001307	0.001307	-	0.46	0.46	2.01
n-Butane	58.12	-	-	0.001307	0.001307	-	0.46	0.46	2.01
i-Pentane	72.15	1.000000	-	0.000523	0.000523	0.176540	22.73	11.48	99.57
n-Pentane	72.15	-	-	0.000523	0.000523	-	0.23	0.23	1.00
Cyclopentane	70.13	-	-	0.000010	0.000010	-	0.004	0.004	0.019
Neopentane	72.15	-	-	0.000006	0.000006	-	0.003	0.003	0.011
n-Hexane	86.18	-	-	0.000085	0.000085	-	0.04	0.04	0.19
Cyclohexane	84.16	-	-	0.000015	0.000015	-	0.008	0.008	0.03
n-Heptane	100.21	-	-	0.000092	0.000092	-	0.06	0.06	0.24
n-Octane	114.23	-	-	0.000062	0.000062	-	0.04	0.04	0.19
n-Nonane	128.25	-	-	0.000032	0.000032	-	0.025	0.025	0.11
n-Decane	142.28	-	-	0.000009	0.000009	-	0.008	0.008	0.03
Benzene	78.11	-	-	0.000027	0.000027	-	0.013	0.013	0.06
Toluene	92.14	-	-	0.000015	0.000015	-	0.008	0.008	0.04
p-Xylene	106.16	-	-	0.000003	0.000003	-	1.92E-03	1.92E-03	0.008
o-Xylene	106.16	-	-	0.000004	0.000004	-	2.56E-03	2.56E-03	0.011
E-Benzene	106.16	-	-	0.000001	0.000001	-	6.41E-04	6.41E-04	0.003

n-BBenzene	134.22	-	-	0.000001	0.000001	-	8.10E-04	8.10E-04	0.004
M-Mercaptan	48.11	-	-	0.000001	0.000001	-	2.90E-04	2.90E-04	1.27E-03
22-Mpropane	72.15	-	-	-	-	-	0.00E+00	0.00E+00	0.00E+00
H_2O	18.01	-	-	0.000080	0.000080	-	0.009	0.009	0.04
Ethylene	28.05	-	-	-	-	0.350385	13.654	6.827	59.80
						Total Uncontrolled VOCs	**56.81**	**19.79**	**248.84**

[1] Based on the Heat and Material Balance data provided by Venture Global.

Plaquemines Expansion, LLC
Warm Flare

Warm Flare Uncontrolled VOC Emissions - Intermittent MSS Flow [1]

Component	MW lb/lbmol	Mole Fraction	Uncontrolled Warm Flare Emissions		
		Pipeline feed gas	Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
			lb/hr	lb/hr	tons/yr
Nitrogen	28.01	0.00505	12.35	1,445.66	54.10
CO_2	44.01	0.02000	76.83	8,992.24	336.51
H_2S	34.08	0.00000	8.92E-03	1.04	0.039
Methane	16.04	0.96985	1,357.97	158,941.98	5,947.91
Ethane	30.07	0.05000	131.24	15,360.58	574.82
Propane	44.10	0.01000	38.49	4,505.32	168.60
i-Butane	58.12	0.00250	12.68	1,484.55	55.55
n-Butane	58.12	0.00250	12.68	1,484.55	55.55
i-Pentane	72.15	0.00100	6.30	737.17	27.59
n-Pentane	72.15	0.00100	6.30	737.17	27.59
Cyclopentane	70.13	0.00002	0.12	14.33	0.54
Neopentane	72.15	0.00001	0.076	8.85	0.33
n-Hexane	86.18	0.00017	1.31	153.21	5.73
Cyclohexane	84.16	0.00003	0.22	25.80	0.97
n-Heptane	100.21	0.00019	1.64	192.49	7.20
n-Octane	114.23	0.00013	1.27	148.22	5.55
n-Nonane	128.25	0.00007	0.74	86.48	3.24
n-Decane	142.28	0.00002	0.22	26.17	0.98
Benzene	78.11	0.00006	0.38	43.89	1.64
Toluene	92.14	0.00003	0.24	28.24	1.06
p-Xylene	106.16	0.00001	0.056	6.51	0.24
o-Xylene	106.16	0.00001	0.065	7.59	0.28
E-Benzene	106.16	0.00000	0.028	3.25	0.12
n-BBenzene	134.22	0.00000	0.023	2.74	0.10
M-Mercaptan	48.11	0.00000	4.20E-03	0.49	0.018
22-Mpropane	72.15	0.00000	0.00E+00	0.00E+00	0.00E+00
H_2O	18.01	0.00015	0.23	27.42	1.03
		Total Uncontrolled VOCs	**82.85**	**9,697.02**	**362.88**

[1] Based on the Heat and Material Balance data provided by Venture Global.

Warm Flare Criteria and Other Pollutants Emissions Summary

Pollutant[5]	Emission Factors [1, 2, 3]		Emission Rates[4]			
			Average Hourly Emissions	Normal Maximum Hourly Emissions	Annual Emissions	SU/SD Scenario Hourly Emission Rate
			lb/hr	lb/hr	tons/yr	lb/hr
$PM_{2.5}$	0.007	lb/MMBtu	0.30	0.02	1.33	32.52
PM_{10}	0.007	lb/MMBtu	0.30	0.02	1.33	32.52
SO_2	-	-	0.02	0.003	0.10	4.58
NO_x	0.068	lb/MMBtu	2.78	0.20	12.16	296.75
CO	0.31	lb/MMBtu	12.66	0.91	55.44	1,352.83
VOC	-	-	2.79	0.40	12.23	194.34
Benzene	-	-	0.01	< 0.001	0.03	0.88

n-Hexane	-	-	0.03	0.001	0.12	3.07
Toluene	-	-	0.005	< 0.001	0.02	0.57
Xylenes (mixed isomers)	-	-	0.002	< 0.001	0.01	0.28
Ethylbenzene	-	-	0.001	< 0.001	< 0.01	0.07
CO_2	-	-	-	-	21,244	-
CH_4	-	-	-	-	127.44	-
N_2O	0.00022	lb/MMBtu	-	-	0.039	-
CO_2e	-	-	-	-	24,442	-

[1]NOx and CO emission factors are from AP-42, Chapter 13, Tables 13.5-1 and 13.5-2. $PM_{10}/PM_{2.5}$ emission factors are from AP-42, Chapter 1, Table 1.4-2.

[2]The H_2S and M-Mercaptan concentrations from each stream was utilized to calculate the SO_2 emissions assuming 99.9% conversion of H_2S and M-Mercaptan to SO_2. Maximum hourly SO_2 emissions are based on 7 ppmv of fuel sulfur content.

[3]Emission factors obtained from 40 CFR 98 Subpart C Tables C-1 and C-2 for natural gas. CH_4 emission factor is not used, CH_4 emissions based on stream composition constituents. CO_2 emissions resulting from CO_2 entering with continuous and intermittent streams and hydrocarbons combusted in flare calculated based on the heat and material balance data.

[4]Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1.

[5]Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are proposed for permitting.

Sample calculations:

Max Hourly Emissions (lb/hr) = Max Flare Gas Heating Rate MMBtu/hr * Emission Factor lb/MMBtu.

Annual Emissions (tons/yr) = Max Flare Gas Heating Rate MMBtu/yr * Emission Factor lb/MMBtu * 1 ton/2,000 lbs.

SO_2 (lb/hr) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/hr * 64 lb/lbmol, where "i" is the stream which consists of H_2S and M-Mercaptan.

SO_2 (tpy) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/yr * 64 lb/lbmol * 1 ton/2,000 lbs, where "i" is the stream which consists of H_2S and M-Mercaptan.

Plaquemines Expansion, LLC
Marine Flare

Input Data [1]

Parameter	BOG (Case A4) from Spec Sheet PQ-226000-MEC-DAS-KZV-02005	Continuous Flare Pilots (Stream 2214)
Flow	Intermittent[1]	Continuous[2]
High Heating Value (Btu/lb)	23,640.8	21,530.5
Max Flared Gas Flow Rate (lb/hr)	100,000.0	20.0
Max Flared Gas Flow Rate (lb/yr)	32,036,400	175,200
Max Flared Gas Flow Rate (lbmol/hr)	5,935	1.14
Max Flared Gas Flow Rate (scf/hr)	2,130,526	410.65
Max Flared Gas Flow Rate (lbmol/yr)	1,901,237	10,020
Max Flared Gas Flow Rate (scf/yr)	682,543,989	3,597,262
Max Flare Gas Heating Rate (MMBTU/hr)	2,364	0.43
Max Flare Gas Heating Rate (MMBTU/yr)	757,365	3,772
Average MW of Fuel Gas lb/lbmol	16.85	17.48
Duration Per Event (hours)	10	-
No. of Events Per Year	40	-
DRE	98%	

[1] Based on engineering estimates and best currently available information.

[2] Based on Heat and Material Balance data provided by Venture Global.

Marine Flare Uncontrolled VOC Emissions - Continuous Flow [1]

Component	MW lb/lbmol	Mole Fraction (Stream 2214)	Uncontrolled Marine Flare Emissions		
		Continuous Flare Pilots	Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
			lb/hr	lb/hr	tons/yr
Nitrogen	28.01	0.0372130	1.19	1.19	5.22
CO_2	44.01	0.0104550	0.53	0.53	2.31
H_2S	34.08	0.0000020	7.80E-05	7.80E-05	3.41E-04
Methane	16.04	0.9169030	16.82	16.82	73.68
Ethane	30.07	0.0261770	0.90	0.90	3.94
Propane	44.10	0.0052270	0.26	0.26	1.15
i-Butane	58.12	0.0013070	0.09	0.09	0.38
n-Butane	58.12	0.0013070	0.09	0.09	0.38
i-Pentane	72.15	0.0005230	0.04	0.04	0.19
n-Pentane	72.15	0.0005230	0.04	0.04	0.19
Cyclopentane	70.13	0.0000080	0.001	0.001	0.003
Neopentane	72.15	0.0000060	0.000	0.000	0.002
n-Hexane	86.18	0.0000730	0.01	0.01	0.03
Cyclohexane	84.16	0.0000130	0.001	0.001	0.01
n-Heptane	100.21	0.0000790	0.01	0.01	0.04

n-Octane	114.23	0.0000530	0.01	0.01	0.03
n-Nonane	128.25	0.0000280	0.004	0.004	0.02
n-Decane	142.28	0.0000070	0.001	0.001	0.00
Benzene	78.11	0.0000160	0.001	0.001	0.01
Toluene	92.14	0.0000010	0.000	0.000	0.00
p-Xylene	106.16	0.0000000	0.00E+00	0.00E+00	0.00E+00
o-Xylene	106.16	0.0000010	1.21E-04	1.21E-04	5.32E-04
E-Benzene	106.16	0.0000000	0.00E+00	0.00E+00	0.00E+00
n-BBenzene	134.22	0.0000000	0.00E+00	0.00E+00	0.00E+00
M-Mercaptan	48.11	0.0000010	5.50E-05	5.50E-05	2.41E-04
H_2O	18.01	0.0000770	0.00	0.00	0.01
		Total Uncontrolled VOCs	**0.56**	**0.56**	**2.44**

[1] Based on the Heat and Material Balance data provided by Venture Global.

Plaquemines Expansion, LLC
Marine Flare

Marine Flare Uncontrolled VOC Emissions - Intermittent MSS Flow [1]

Component	MW lb/lbmol	Mole Fraction BOG (Case A4) from Spec Sheet PQ-226000-MEC-DAS-KZV-02005	Uncontrolled Marine Flare Emissions		
			Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
			lb/hr	lb/hr	tons/yr
Nitrogen	28.01	0.0025330	15.400	421.10	67.45
CO_2	44.01	0.0000520	0.497	13.58	2.18
H_2S	34.08	0.0000020	1.48E-02	4.05E-01	6.48E-02
Methane	16.04	0.9521800	3,314.79	90,639.17	14,518.76
Ethane	30.07	0.0385650	251.69	6,882.07	1,102.38
Propane	44.10	0.0039860	3.82E+01	1,043.20	167.102
i-Butane	58.12	0.0009300	1.17E+01	3.21E+02	5.14E+01
n-Butane	58.12	0.0009300	1.17E+01	3.21E+02	5.14E+01
i-Pentane	72.15	0.0001820	2.85E+00	7.79E+01	1.25E+01
n-Pentane	72.15	0.0005230	8.19E+00	2.24E+02	3.59E+01
Cyclopentane	70.13		0.00E+00	0.00E+00	0.00E+00
Neopentane	72.15	0.0000160	2.51E-01	6.85E+00	1.10E+00
n-Hexane	86.18	0.0000470	8.79E-01	2.40E+01	3.85E+00
Cyclohexane	84.16		0.00E+00	0.00E+00	0.00E+00
n-Heptane	100.21		0.00E+00	0.00E+00	0.00E+00
n-Octane	114.23		0.00E+00	0.00E+00	0.00E+00
n-Nonane	128.25		0.00E+00	0.00E+00	0.00E+00
n-Decane	142.28		0.00E+00	0.00E+00	0.00E+00
Benzene	78.11	0.0000470	7.97E-01	2.18E+01	3.49E+00
Toluene	92.14	0.0000080	1.60E-01	4.37E+00	7.01E-01
Xylene	106.16	0.0000000	0.00E+00	0.00E+00	0.00E+00
o-Xylene	106.16		0.00E+00	0.00E+00	0.00E+00
E-Benzene	106.16		0.00E+00	0.00E+00	0.00E+00
n-BBenzene	134.22		0.00E+00	0.00E+00	0.00E+00
M-Mercaptan	48.11		0.00E+00	0.00E+00	0.00E+00
Oxygen	16.00	0.0000000	0.00E+00	0.00E+00	0.00E+00
Argon	39.95	0.0000000	0.00E+00	0.00E+00	0.00E+00
H_2O	18.01	0.0000000	0.00E+00	0.00E+00	0.00E+00
		Total Uncontrolled VOCs	**74.7396**	**2,043.67**	**327.359**

[1] Based on the Heat and Material Balance data provided by Venture Global.

Plaquemines Expansion, LLC
Marine Flare

Marine Flare Criteria and Other Pollutants Emissions Summary

Pollutant[5]	Emission Factors [1, 2, 3]		Emission Rates[4]		
			Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
			lb/hr	lb/hr	tons/yr
$PM_{2.5}$	0.007	lb/MMBtu	0.65	17.62	2.84
PM_{10}	0.007	lb/MMBtu	0.65	17.62	2.84
SO_2	-	-	0.028	0.759	0.12
NO_x	0.068	lb/MMBtu	5.91	160.79	25.88
CO	0.31	lb/MMBtu	26.94	733.00	117.98
VOC	-	-	1.51	40.88	6.60
Benzene	-	-	0.016	0.016	0.07
n-Hexane	-	-	0.02	0.48	0.08
Toluene	-	-	0.003	0.003	0.01
Xylenes (mixed isomers)	-	-	< 0.001	< 0.001	< 0.01
CO_2	-	-	-	-	44,274
CH_4	-	-	-	-	291.85
N_2O	0.00022	lb/MMBtu	-	-	0.08
CO_2e	-	-	-	-	52,468

[1]NOx and CO emission factors are from AP-42, Chapter 13, Tables 13.5-1 and 13.5-2. $PM_{10}/PM_{2.5}$ emission factors are from AP-42, Chapter 1, Table 1.4-2.

[2]The H_2S and M-Mercaptan concentrations from each stream was utilized to calculate the SO_2 emissions assuming 99.9% conversion of H_2S and M-Mercaptan to SO_2.

[3]Emission factors obtained from 40 CFR 98 Subpart C Tables C-1 and C-2 for natural gas. CH_4 emission factor is not used, CH_4 emissions based on stream composition constituents. CO_2 emissions resulting from CO_2 entering with continuous and intermittent streams and hydrocarbons combusted in flare calculated based on the heat and material balance data.

[4]Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1. CO_2 emissions resulting from CO_2 entering with continuous and intermittent streams and hydrocarbons combusted in flare calculated based on the heat and material balance data.

[5]Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are proposed for permitting.

Sample calculations:

Max Hourly Emissions (lb/hr) = Max Flare Gas Heating Rate MMBtu/hr * Emission Factor lb/MMBtu.

Annual Emissions (tons/yr) = Max Flare Gas Heating Rate MMBtu/yr * Emission Factor lb/MMBtu * 1 ton/2,000 lbs.

SO_2 (lb/hr) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/hr * 64 lb/lbmol, where "i" is the stream which consists of H_2S and M-Mercaptan.

SO_2 (tpy) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/yr * 64 lb/lbmol * 1 ton/2,000 lbs, where "i" is the stream which consists of H_2S and M-Mercaptan.

Plaquemines Expansion, LLC
Emergency Diesel Generators

Input Data [1]

Emergency Essential Generators:	Power Generation
Default HHV of Distillate Fuel Oil No.2[2], MMBtu/gal	0.138
Number of Units	12
Power Rating (KW)	2,750
Power Rating (hp)	3,688
Fuel consumption (gal/hr)	178
AP-42 Engine Size	Large
Tier 2/3 Engine Size	Large
Expected hours of operation	100

[1] Based on data provided by Venture Global.

[2] Based on 40 CFR 98 Subpart C, Table C-1 - Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel.

Fuel Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2 [1]	CH_4 [2]	N_2O [2]
kg/MMBtu	73.96	3.00E-03	6.00E-04
Global Warming Potential (GWP) [3]	1	25	298
lb/MMBtu	163	6.60E-03	1.32E-03

[1] CO_2 emission factor from 40 CFR 98 Subpart C Table C-1 for Distillate Fuel Oil No. 2.

[2] CH_4 and N_2O emission factors from 40 CFR 98 Subpart C, Table C-2 for Petroleum (all fuel types).

[3] CO_2e is calculated as follows: $CO_2e = CO_2 * GWP_{CO2} + CH_4 * GWP_{CH4} + N_2O * GWP_{N2O}$.

Plaquemines Expansion, LLC
Emergency Diesel Generators

Emission Calculations - Per Unit

Pollutant[5]	Emission Factors[1]			Emission Factor Basis	2750 kW Engines		
	Large Tier 2 and Large AP-42 Engines [4]	Small Tier 3 Engines	Units		Average Hourly Emissions (lb/hr)	Maximum Hourly Emissions (lb/hr)	Annual Emissions (tpy)
PM	0.20	0.20	g/KW-hr	Tier 2/3 Standard Requirement[2]	1.21	1.21	0.06
PM_{10}	0.20	0.20	g/KW-hr	Tier 2/3 Standard Requirement[2]	1.21	1.21	0.06
$PM_{2.5}$	0.20	0.20	g/KW-hr	Tier 2/3 Standard Requirement[2]	1.21	1.21	0.06
SO_2	0.00001	-	lb/hp-hr	Fuel sulfur content of 15 ppm	0.04	0.04	< 0.01
NO_X	6.4	4.0	g/KW-hr	Tier 2/3 Standard Requirement[2]	38.80	38.80	1.94
VOC	6.4	4.0	g/KW-hr	Tier 2/3 Standard Requirement[2]	38.80	38.80	1.94
CO	3.5	3.5	g/KW-hr	Tier 2/3 Standard Requirement[2]	21.22	21.22	1.06
CO_2	23	-[1]	lb/gal	EPA - 40 CFR 98 Table C-1		-	200
CH_4	9.11E-04	-[1]	lb/gal	EPA - 40 CFR 98 Table C-2		-	0.01
N_2O	1.82E-04	-[1]	lb/gal	EPA - 40 CFR 98 Table C-2		-	< 0.01
CO_2e[6]	23	-	lb/gal	-	-	-	201
Benzene	7.76E-04	-	lb/MMBtu	AP-42, Section 3.4, Table 3.4-3 [3]	0.02	0.02	< 0.01

[1] Large engines are considered greater than 560 kW for Tier 2 emission factor basis and greater than 600 hp for AP-42 emission factor basis. GHG emission factors are the same for all engine sizes.

[2] For emergency, standby power generation Tier 2/3 standards are promulgated by 40 CFR 89.112 Table 1.

[3] HAP emission factors for large engines are from Table 3.4-3 of AP-42 Chapter 3.4 Large Stationary Diesel and All Stationary Dual-fuel Engines (10/96).

[4] Emission factors for PM, NO_X, and CO for Tier 2 large engines are based on requirements for Tier 2 engines as specified in NSPS Subpart IIII for new engines with a displacement less than 10 Liters per cylinder. NSPS Subpart IIII specifies to use emission factors from 40 CFR Part 89 for non-road engines.

[5] Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are proposed for permitting.

[6] CO_2e is calculated as follows: $CO_2e = CO_2 * GWP_{CO2} + CH_4 * GWP_{CH4} + N_2O * GWP_{N2O}$.

Plaquemines Expansion, LLC
Equipment Leaks

Input Data

Property	Value	Units
Hours of Operation	8,760	hr/yr
Non-Cryogenic Services VOC [1]	2.36%	wt%
Non-Cryogenic Services CH_4 [1]	89.28%	wt%
Non-Cryogenic Services Benzene [1]	0.01%	wt%
Non-Cryogenic Services n-Hexane [1]	0.04%	wt%
Cryogenic Services VOC [1]	2.21%	wt%
Cryogenic Services CH_4 [1]	92.34%	wt%
Other Services VOC	100%	wt%
Other Services CH_4	0%	wt%
GWP_{CH4} [2]	25	-
Number of Phases	2	-

Emissions Summary

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (2 Phases) (tpy)
VOC	1.84	8.06
CO_2e [1]	*1489.73*	*6,525*
Benzene	0.01	0.02
n-Hexane	0.02	0.07
Ammonia	0.06	0.25

[1] CO_2e emissions are conservatively estimated to be equal to currently permitted emissions for equipment leaks at Plaquemines LNG.

Emission Calculations

Service System	Component	Product	Component Count	TOC Emission Factor [4] (kg/comp-hr)	Uncontrolled TOC Emission Rate (lb/hr)	Uncontrolled VOC Emission Rate (lb/hr)	Uncontrolled CH_4 Emission Rate (lb/hr)	Hourly VOC Emissions (lb/hr)	Annual VOC Emissions (tpy)	Hourly CH_4 Emissions (lb/hr)	Annual CH_4 Emissions (tpy)	Hourly Benzene Emissions (lb/hr)	Annual Benzene Emissions (tpy)	Hourly n-Hexane Emissions (lb/hr)	Annual n-Hexane Emissions (tpy)	Hourly Ammonia Emissions (lb/hr)	Annual Ammonia emissions (tpy)
NON-CRYOGENIC SERVICES																	
- NG Processing - Refrigerant System -Condensate system	Control + ESD Valves	Gas/Vapor	154	0.00450	1.528	0.036	1.364	0.04	0.16	1.36	5.97	< 0.001	< 0.01	< 0.001	< 0.01		
	Manual Valves	Gas/Vapor	1322	0.00450	13.115	0.310	11.709	0.31	35.13	11.71	51.29	0.002	0.008	0.006	0.02		
	Pressure-Relief Valves	Gas/Vapor	59	0.00880	1.145	0.027	1.022	0.03	0.12	1.02	4.48	< 0.001	< 0.01	< 0.001	< 0.01		
	Connectors (Flanges)	Gas/Vapor	3070	0.00020	1.354	0.032	0.000	0.03	0.14	0.00	0.00	< 0.001	< 0.01	< 0.001	< 0.01		
	Other [3]	Gas/Vapor	62	0.00880	1.203	0.028	1.074	0.03	0.12	1.07	4.70	< 0.001	< 0.01	< 0.001	< 0.01		
	Vapor Recovery Compressors	Gas/Vapor	6	0.00880	0.116	0.003	0.104	0.00	0.01	0.10	0.46	< 0.001	< 0.01	< 0.001	< 0.01		
	Open-ended Lines (Vents)	Gas/Vapor	27	0.00200	0.119	0.003	0.106	0.00	0.01	0.11	0.47	< 0.001	< 0.01	< 0.001	< 0.01		
	Total		**4700**		**18.58**			**0.44**	**35.69**	**15.38**	**67.36**	**0.003**	**0.01**	**0.01**	**0.03**		
CRYOGENIC SERVICES																	
- LNG Processing - Refrigerant System	Control + ESD Valves	Light Liquid	84	0.00250	0.463	-	0.428	-	-	0.43	1.87	-	-	-	-		
	Manual Valves	Light Liquid	1029	0.00250	5.671	-	5.237	-	-	5.24	22.94	-	-	-	-		
	Pressure-Relief Valves	Gas/Vapor	35	0.00880	0.679	-	0.627	-	-	0.63	2.75	-	-	-	-		
	Connectors (Flanges)	Light Liquid	2296	0.00021	1.063	-	0.982	-	-	0.98	4.30	-	-	-	-		
	Other [3]	Light Liquid	52	0.00750	0.860	-	0.794	-	-	0.79	3.48	-	-	-	-		
	Open-ended Lines (Vents)	Light Liquid	21	0.00140	0.065	-	0.060	-	-	0.06	0.26	-	-	-	-		
	Pumps/Pump Seals	Light Liquid	15	0.01300	0.430	-	0.397	-	-	0.40	1.74	-	-	-	-		
	Total		**3532**		**9.23**			**0.20**	**0.89**	**8.52**	**37.33**	**0.00**	**0.00**	**0.00**	**0.00**		
OTHER SERVICES																	
- Diesel System - Condensates	Control + ESD Valves	Heavy Liquid	18	0.00001	0.0003	0.0003	-	< 0.001	< 0.01	-	-	-	-	-	-		
	Manual Valves	Heavy Liquid	392	0.00001	0.007	0.0073	-	0.007	0.032	-	-	-	-	-	-		
	Pressure Relief Valves	Gas/Vapor	13	0.0088	0.2517	0.2517	0.0000	0.2517	1.1024	-	-	-	-	-	-	-	-
	Connectors (Flanges)	Heavy Liquid	846	0.00001	0.0140	0.01399	-	0.014	0.061	-	-	-	-	-	-		
	Other [3]	Heavy Liquid	20	0.00003	0.0014	0.0014	-	0.001	0.006	-	-	-	-	-	-		
	Open-ended Lines (Vents)	Heavy Liquid	8	0.00014	0.002	0.002	-	0.002	0.01	-	-	-	-	-	-		
	Pumps/Pump Seals	Heavy Liquid	27	0.00000	0.000	0.000	-	< 0.001	< 0.001	-	-	-	-	-	-		
	Total		**1324**		**0.28**			**0.28**	**1.21**	**-**	**-**	**0.00**	**0.00**	**0.00**	**0.00**		
Aqueous Ammonia [5]	Manual Valves	Light Liquid	23	0.0025	0.0241	-	-	-	-	-	-	-	-			0.024	0.11
	Connectors (Flanges)	Light Liquid	46	0.0002	0.0040	-	-	-	-	-	-	-	-			0.004	0.02
	Total		**23**	-	**0.0281**	-	-	-	-	-	-	-	-			**0.028**	**0.12**

[1] Weight percent is based on Feed gas composition, Stream 104 and Stream 402 for non-cryogenic and cryogenic services, respectively, from the Heat Material Balance Design Guarantee Case Holding Mode-PQ-000700-PRO-HMB-KZV-0001 Rev 2.

[2] Global Warming Potential for CH_4 from 40 CFR 98 Table A-1.

[3] Other includes, diaphragms, drains, dump arms, hatches, loading arms, meters, polished rods and stuffing boxes.

[4] Emission factors taken from Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995, Table 2-4 (Oil and Gas Production Operations Average Emission Factors).

[5] Using average emission factors according to the EPA-453/R-95-017, November 1995, Page 2-53. Estimated Ammonia emissions are adjusted for 19% Aqueous ammonia as shown below:
Ammonia emissions = Ammonia emissions based on 100% aqueous ammonia x 19%

Plaquemines Expansion, LLC
Diesel Fire Water Pumps

Input Data [1]

Default HHV of Distillate Fuel Oil No.2[2], MMBtu/gal	0.138
Quantity of Fire Pumps	2
Rating (Bhp)	753
Diesel Usage - gal/hr	40
Annual Usage - hours/yr	100

[1] Based on data provided by Venture Global.

[2] Based on 40 CFR 98 Subpart C, Table C-1 - Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel.

Fuel Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2[1]	CH_4[2]	N_2O[2]
kg/MMBtu	73.96	3.00E-03	6.00E-04
Global Warming Potential (GWP) [3]	1	25	298

[1] CO_2 emission factor from 40 CFR 98 Subpart C Table C-1 for Distillate Fuel Oil No. 2.

[2] CH_4 and N_2O emission factors from 40 CFR 98 Subpart C, Table C-2 for Petroleum (all fuel types).

[3] CO_2e is calculated as follows: $CO_2e = CO_2 * GWP_{CO2} + CH_4 * GWP_{CH4} + N_2O * GWP_{N2O}$.

Criteria and Greenhouse Gas Emissions

				Per Pump[5]		
Pollutant[5]	**Emission Factors**		**Emission Factor Basis [1]**	**Average Hourly Emissions (lb/hr)**	**Maximum Hourly Emissions (lb/hr)**	**Annual Emissions (tpy)**
PM	0.15	g/BHP-hr	Table 4 to Subpart IIII of Part 60	0.25	0.25	0.01
PM_{10}	0.15	g/BHP-hr		0.25	0.25	0.01
$PM_{2.5}$	0.15	g/BHP-hr		0.25	0.25	0.01
SO_2	0.04	lb/gal diesel	AP-42, Section 3.3	1.60	1.60	0.08
NO_X	4.8	g/BHP-hr	Tier 2/3 Standard Requirement[6]	7.97	7.97	0.40
VOC	4.8	g/BHP-hr		7.97	7.97	0.40
CO	2.6	g/BHP-hr	Table 4 to Subpart IIII of Part 60	4.32	4.32	0.22
CO_2e[4]	-	-	-	-	-	45

[1] PM, PM_{10}, $PM_{2.5}$, and CO emission factors are based on Table 4 to Subpart IIII of Part 60 - Emission Standards for Stationary Fire Pump Engines.

[2] CO_2 emission factor from 40 CFR 98 Subpart C Table C-1 for Distillate Fuel Oil No. 2 (73.96 kg/CO_2/MMBtu).

[3] CH_4 and N_2O emission factors from 40 CFR 98 Subpart C, Table C-2 for Petroleum (all fuel types), (CH_4 = 0.003 kg CH_4/MMBtu and N_2O = 0.0006 kg N_2O/MMBtu).

[4] CO_2e is calculated as follows: $CO_2e = CO_2 * GWP_{CO2} + CH_4 * GWP_{CH4} + N_2O * GWP_{N2O}$.

[5] Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are proposed for permitting.

[6] Tier 2/3 standards are promulgated by 40 CFR 89.112 Table 1.

Plaquemines Expansion, LLC

Amine (DEA) Solvent Storage Tanks

Inputs

Description	Value	Units
Number of Tanks	2	number
Operating Hours	8,760	hr/yr
Tank Diameter (D)	27	ft
Shell Height	24	ft
Tank Volume	102,792	gallons
Components	Diethanolamine	-

Emissions Summary

	Emissions Per Tank				
	Losses (lb/yr) [1]			Losses (lb/hr)	Losses (tpy) [2]
Pollutant	Working Loss	Breathing Loss	Total Losses		
VOC	0.89	2.98	3.87	< 0.001	< 0.01

Notes:

[1] Losses for each storage tank are determined using the BREEZE TankESP PRO Version 5.3.0 software.

[2] Losses in tons per year are calculated by dividing the losses in pound per year by 2,000 pound per ton.

Plaquemines Expansion, LLC
Diesel Fuel Storage Tanks

Inputs [1]

Description	Value	Units
Number of Tanks	2	number
Operating Hours	8,760	hr/yr
Tank Diameter (D)	42	ft
Shell Height	36	ft
Volume	373,097	gallons
Turnovers	2.00	number
Components	Distillate Fuel Oil Number 2	-

[1] Based on data provided by KBR in April 2022.

Emissions Summary

	Total Emissions per Tank				
	Losses (lb/yr) [1]			Losses (lb/hr)	Losses (tpy) [2]
Pollutant	Working Loss	Breathing Loss	Total Losses		
VOC	20.49	55.94	76.43	0.009	0.04
Toluene	0.47	1.29	1.77	< 0.001	< 0.01
Xylene	1.22	3.34	4.57	0.001	< 0.01

[1] Losses for each Diesel Fuel Storage Tank are determined using the BREEZE TankESP PRO Version 5.3.0 software.

[2] Losses in tons per year are calculated by dividing the losses in pound per year by 2,000 pound per ton.

Plaquemines Expansion, LLC

Aqueous Ammonia Storage Tanks

Inputs

Description	Value	Units
Number of Tanks	2	number
Operating Hours	8,760	hr/yr
Tank Diameter (D)	19	ft
Shell Height	18	ft
Volume	38,177	gallons
Turnovers	15	number
Net Throughput	582,471	gal/yr
Components	19% Aqueous Ammonia	-

Emissions Summary

	Losses (lb/yr) [1,2]			Losses (lb/hr)	Losses per Tank(tpy) [3]	Total Losses (2 Tanks) (tpy)
Pollutant	Working Loss	Breathing Loss	Total Losses			
Ammonia	433.47	19.92	453.38	0.05	0.23	0.46

[1] Losses for each Aqueous Ammonia Storage Tank are determined using the BREEZE TankESP PRO Version 5.3.0 software.

[2] TankESP estimated Ammonia emissions are adjusted for 19% Aqueous ammonia as shown below:

Ammonia emissions (losses) = TankESP emissions (losses) based on 100% aqueous ammonia x 19%

[3] Losses in tons per year are calculated by dividing the losses in pound per year by 2,000 pound per ton.

Plaquemines Expansion, LLC

Condensate Truck Loading

Parameter			Unit
Vapor Recovery Efficiency		95.0	
Vapor Collection Efficiency		98.7	%
Overall Reduction Efficiency		94.0	%
Saturation Factor[1]		1.00	
Temperature of bulk liquid loaded[2]		541.80	R
True Vapor Pressure of liquid loaded[2]		4.09	PSI
Molecular Weight of Vapor[3]		103.06	
Loading Loss Factor = 12.46*S*VP*MW/T			
Loading Loss Factor		9.70	lb/1000 gal
Tank Throughput[4]		28,024,992	gal/yr
Loading Losses (VOC Emissions)	**Average Hourly**	**1.861**	**lb/hr**
	Maximum Hourly	**1.861**	**lb/hr**
	Annual	**8.15**	**TPY**

Speciated HAP/TAP Emissions[5]

Compounds	Vapor Wt. %	Hourly Emission Rate (lb/hr)	Annual Emissions (tpy)
Benzene	1.96%	0.036	0.16
Ethylbenzene	0.02%	< 0.001	< 0.01
Hexane	6.60%	0.123	0.54
Toluene	0.46%	0.01	0.04
Xylene	0.12%	0.002	0.01

[1] Saturation factor from AP-42 Fifth Edition, Table 5.2-1.

[2] AP-42 Fifth Edition, Equation 1-31, Table 7.1-6. Paint Solar Absorptance, and Table 7.1-7. Meteorological Data (T_{AX}, T_{AN}, V, I, P_A) for Selected U.S. Locations (Meteorological data: New Orleans, LA).

[3] AP-42 Fifth Edition, Table 7.1-2. Properties of Selected Petroleum Liquids. Based upon Gasoline RVP 7.

[4] Based on data provided by Venture Global.

[5] Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are proposed for permitting.

Venture Global Plaquemines LNG, LLC - LNG Terminal
LP Flare

These calculations reflect the incremental emissions increases at the Plaquemines LNG Terminal associated with the Plaquemines Expansion Project.

Input Data [1]

Stream ->	1012 and 2213	2213	2212	0501 and 0505
Parameter	**BOG**	**Continuous Flare Pilots**	**Continuous Flare Purges**	**Continuous Seal Purges**
Flow	Intermittent[1]	Continuous[2]		
Max Flared Gas Flow Rate (lb/hr)[3]	111,429	23.0	83.0	25.14
Max Flared Gas Flow Rate (lb/yr)	55,714,500	201,480	727,080	440,452
Max Flared Gas Flow Rate (lbmol/hr)	6,255.14	1.31	4.72	0.69
Max Flared Gas Flow Rate (scf/hr)	2,373,764.06	496.80	1,792.81	263.60
Max Flared Gas Flow Rate (lbmol/yr)	3,127,571.29	11,468	41,384	12,170
Max Flared Gas Flow Rate (scf/yr)	1,186,882,029.52	4,351,981	15,704,974	4,618,309
Heating Value (BTU/scf)	992.20	992	992	2,010
Max Flare Gas Heating Rate (MMBTU/hr)	2,355.25	0.52	1.78	0.53
Max Flare Gas Heating Rate (MMBTU/yr)	1,177,624.35	4,549	15,629	9,283
Average MW of Fuel Gas lb/lbmol	17.81	17.57	17.57	36.19
Annual Operating Hours	8,760	8,760	8,760	8,760
DRE	98%			

[1] Based on engineering estimates and best currently available information.

[2] Based on Heat and Material Balance data provided by Venture Global.

[3] Based on the incremental increase of flow associated with the Plaquemines Expansion Project.

LP Flare Uncontrolled VOC Emissions - Continuous Flow [1]

Component	MW lb/lbmol	Mole Fraction			Uncontrolled LP Flare Emissions		
		Continuous Flare Pilots	Continuous Flare Purges	Continuous Seal Purges	Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
					lb/hr	lb/hr	tons/yr
Nitrogen	28.01	0.049357	0.049357	0.115159	12.82	10.58	56.17
CO_2	44.01	0.010674	0.010674	-	2.83	2.83	12.41
H_2S	34.08	0.000002	0.000002	-	4.11E-04	4.11E-04	0.002
Methane	16.04	0.952530	0.952530	0.208307	96.823	94.50	424.09
Ethane	30.07	0.026177	0.026177	-	4.75	4.75	20.80
Propane	44.10	0.005227	0.005227	0.208000	14.13	7.76	61.91
i-Butane	58.12	0.001307	0.001307	-	0.46	0.46	2.01
n-Butane	58.12	0.001307	0.001307	-	0.46	0.46	2.01
i-Pentane	72.15	0.000523	0.000523	0.176540	17.92	9.08	78.50
n-Pentane	72.15	0.000523	0.000523	-	0.23	0.23	1.00
Cyclopentane	70.13	0.000010	0.000010	-	0.004	0.004	0.02
Neopentane	72.15	0.000006	0.000006	-	0.003	0.003	0.01
n-Hexane	86.18	0.000085	0.000085	-	0.04	0.04	0.19

Venture Global Plaquemines LNG, LLC - LNG Terminal
LP Flare

These calculations reflect the incremental emissions increases at the Plaquemines LNG Terminal associated with the Plaquemines Expansion Project.

Cyclohexane	84.16	0.000015	0.000015	-	0.008	0.008	0.03
n-Heptane	100.21	0.000092	0.000092	-	0.06	0.06	0.24
n-Octane	114.23	0.000062	0.000062	-	0.04	0.04	0.19
n-Nonane	128.25	0.000032	0.000032	-	0.02	0.02	0.11
n-Decane	142.28	0.000009	0.000009	-	0.008	0.008	0.03
Benzene	78.11	0.000027	0.000027	-	0.013	0.01	0.06
Toluene	92.14	0.000015	0.000015	-	0.008	0.008	0.04
p-Xylene	106.16	0.000003	0.000003	-	0.002	0.002	0.008
o-Xylene	106.16	0.000004	0.000004	-	0.003	0.003	0.01
E-Benzene	106.16	0.000001	0.000001	-	6.41E-04	6.41E-04	0.003
n-BBenzene	134.22	0.000001	0.000001	-	8.10E-04	8.10E-04	0.004
M-Mercaptan	48.11	0.000001	0.000001	-	2.90E-04	2.90E-04	1.27E-03
22-Mpropane	72.15	-	-	-	0.00E+00	0.00E+00	0.00E+00
H_2O	18.01	0.000080	0.000080	-	0.009	0.009	0.04
Ethylene	28.05	-	-	0.350385	13.654	6.827	59.80
				Total Uncontrolled VOCs	**47.07**	**25.03**	**206.17**

[1] Based on the Heat and Material Balance data provided by Venture Global.

Venture Global Plaquemines LNG, LLC - LNG Terminal
LP Flare

These calculations reflect the incremental emissions increases at the Plaquemines LNG Terminal associated with the Plaquemines Expansion Project.

LP Flare Uncontrolled VOC Emissions - Intermittent MSS Flow [1]

Component	MW lb/lbmol	Mole Fraction	Uncontrolled LP Flare Emissions		
		BOG	Average Hourly Emissions	Maximum Hourly Emissions	Annual Emissions
			lb/hr	lb/hr	tons/yr
Nitrogen	28.01	0.074539	745.498	13,061.12	3,265.28
CO_2	44.01	0.010674	167.719	2,938.43	734.608
H_2S	34.08	0.000002	2.43E-02	4.26E-01	1.07E-01
Methane	16.04	0.952530	5,454.892	95,569.70	23,892.43
Ethane	30.07	0.026177	281.032	4,923.69	1,230.92
Propane	44.10	0.005227	82.2989	1,441.88	360.4693
i-Butane	58.12	0.001307	2.71E+01	4.75E+02	1.19E+02
n-Butane	58.12	0.001307	2.71E+01	4.75E+02	1.19E+02
i-Pentane	72.15	0.000523	1.35E+01	2.36E+02	5.90E+01
n-Pentane	72.15	0.000523	1.35E+01	2.36E+02	5.90E+01
Cyclopentane	70.13	0.000010	2.50E-01	4.39E+00	1.10E+00
Neopentane	72.15	0.000006	1.55E-01	2.71E+00	6.77E-01
n-Hexane	86.18	0.000085	2.62E+00	4.58E+01	1.15E+01
Cyclohexane	84.16	0.000015	4.51E-01	7.90E+00	1.97E+00
n-Heptane	100.21	0.000092	3.29E+00	5.77E+01	1.44E+01
n-Octane	114.23	0.000062	2.53E+00	4.43E+01	1.11E+01
n-Nonane	128.25	0.000032	1.47E+00	2.57E+01	6.42E+00
n-Decane	142.28	0.000009	4.57E-01	8.01E+00	2.00E+00
Benzene	78.11	0.000027	7.53E-01	1.32E+01	3.30E+00
Toluene	92.14	0.000015	4.93E-01	8.65E+00	2.16E+00
p-Xylene	106.16	0.000003	1.14E-01	1.99E+00	4.98E-01
o-Xylene	106.16	0.000004	1.52E-01	2.66E+00	6.64E-01
E-Benzene	106.16	0.000001	3.79E-02	6.64E-01	1.66E-01
n-BBenzene	134.22	0.000001	4.79E-02	8.40E-01	2.10E-01
M-Mercaptan	48.11	0.000001	1.72E-02	3.01E-01	7.52E-02
22-Mpropane	72.15	-	0.00E+00	0.00E+00	0.00E+00
H_2O	18.01	0.000080	5.14E-01	9.01E+00	2.25E+00
Ethylene	28.05	-	-	-	-
		Total Uncontrolled VOCs	**176.31**	**3,089.01**	**772.253586**

[1] Based on the Heat and Material Balance data provided by Venture Global.

Venture Global Plaquemines LNG, LLC - LNG Terminal
LP Flare

These calculations reflect the incremental emissions increases at the Plaquemines LNG Terminal associated with the Plaquemines Expansion Project.

LP Flare Criteria and Other Pollutants Emissions Summary

Pollutant[5]	Emission Factors [1, 2, 3]		Emission Rates[4]			
			Average Hourly Emissions	Normal Maximum Hourly Emissions	Annual Emissions	SU/SD Scenario Hourly Emission Rate
			lb/hr	lb/hr	tons/yr	lb/hr
$PM_{2.5}$	0.007	lb/MMBtu	1.03	0.02	4.50	17.57
PM_{10}	0.007	lb/MMBtu	1.03	0.02	4.50	17.57
SO_2	-	-	0.070	0.003	0.31	2.93
NO_x	0.068	lb/MMBtu	9.37	0.19	41.04	160.35
CO	0.31	lb/MMBtu	42.72	0.88	187.10	731.01
VOC	-	-	4.47	0.50	19.57	62.28
Benzene	-	-	0.02	< 0.001	0.07	0.26
n-Hexane	-	-	0.05	0.001	0.23	0.92
Toluene	-	-	0.01	< 0.001	0.04	0.17
Xylenes (mixed isomers)	-	-	0.01	< 0.001	0.02	0.09
Ethylbenzene	-	-	0.001	< 0.001	< 0.01	0.01
CO_2	-	-	-	-	73,906	-
CH_4	-	-	-	-	486.33	-
N_2O	0.00022	lb/MMBtu	-	-	0.13	-
CO_2e	-	-	-	-	86,104	-

[1]NOx and CO emission factors are from AP-42, Chapter 13, Tables 13.5-1 and 13.5-2. $PM_{10}/PM_{2.5}$ emission factors are from AP-42, Chapter 1, Table 1.4-2.

[2]The H_2S and M-Mercaptan concentrations from each stream was utilized to calculate the SO_2 emissions assuming 99.9% conversion of H_2S and M-Mercaptan to SO_2. For continuous streams, the maximum hourly SO_2 emissions are based on 7 ppmv of fuel sulfur content for continuous streams.

[3]Emission factors obtained from 40 CFR 98 Subpart C Tables C-1 and C-2 for natural gas. CH_4 emission factor is not used, CH_4 emissions based on stream composition constituents. CO_2 emissions resulting from CO_2 entering with continuous and intermittent streams and hydrocarbons combusted in flare calculated based on the heat and material balance data.

[4]Global warming potentials obtained from 40 CFR 98 Subpart A Table A-1. CO_2 emissions resulting from CO_2 entering with continuous and intermittent streams and hydrocarbons combusted in flare calculated based on the heat and material balance data.

[5]Consistent with LDEQ guidance, only those individual TAP/HAP with a potential to emit of equal to or greater than 1 lb/yr are proposed for permitting.

Sample calculations:

Max Hourly Emissions (lb/hr) = Max Flare Gas Heating Rate MMBtu/hr * Emission Factor lb/MMBtu.

Annual Emissions (tons/yr) = Max Flare Gas Heating Rate MMBtu/yr * Emission Factor lb/MMBtu * 1 ton/2,000 lbs

SO_2 (lb/hr) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/hr * 64 lb/lbmol, where "i" is the stream which consists of H_2S and M-Mercaptan.

SO_2 (tpy) = (H_2S Mole Fraction$_i$ + M-Mercaptan Mole Fraction$_i$) /379.49 scf/lbmol * 99.9/100 * scf/yr * 64 lb/lbmol * 1 ton/2,000 lbs, where "i" is the stream which consists of H_2S and M-Mercaptan.

PLAQUEMINES EXPANSION PROJECT
Resource Report 9
APPENDIX 9D

Emission Calculations for Marine Vessel and On-road Vehicle Operation for Expansion Facilities

PLAQUEMINES

PLAQUEMINES EXPANSION, LLC

Appendix 9D Emission Calculations for Marine Vessel and On-road Vehicle Operation for the Expansion Facilities

Marine Vessel Operational Emissions

Plaquemines Expansion, LLC

Resource Report 9 - Marine Vessel Operational Emissions

Table 9.D.1

Summary of Marine Vessel Operational Emissions

Emission Unit	Annual Emissions (tpy)								
	NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	CO_2e
LNG Carriers	236.93	19.44	105.15	17.38	16.88	0.47	57,987	0.64	58,571
Tugboats	13.11	1.38	6.69	0.29	0.28	0.05	4,947	0.03	5,012
Pilot Boats	6.00	0.17	3.06	0.18	0.18	0.00	422	0.06	427
Total	256.03	20.99	114.90	17.85	17.34	0.52	63,357	0.72	64,010

Table 9.D.1.1
Input Parameters and Basis Used in Calculations

Assumptions

LNG carriers per year [a]	570
Tugboats per LNG carrier	4
Pilot boats per LNG carrier	2
LNG carrier power, kW	22,800
Tugboat power, kW	3,000
Pilot boat power, kW	522
LNG carrier natural gas fuel outside of moored zone, %	50%
LNG carrier oil fuel outside of moored zone, %	50%
LNG carrier natural gas fuel inside of moored zone, %	90%
LNG carrier oil fuel inside of moored zone, %	10%
Average LNG carrier capacity, m^3	185,000
Average LNG carrier loading rate, m^3/hr	12,000

Conversions

grams (g) per pound (lb)	453.59
grams (g) per kilogram (kg)	1,000
pounds (lb) per ton (ton)	2,000
minutes (min) per hour (hr)	60
seconds (sec) per minute (min)	60
miles (mi) to nautical miles (nm)	1.15
miles per hour (mph) to knots (kt)	1.15
meters (m) per mile (mi)	1,609
CO_2 to CO_2e [b]	1
CH_4 to CO_2e [b]	28
N_2O to CO_2e [b]	265
Btu/scf (natural gas)	1,020
kilowatt (kW) to horsepower (HP)	0.75
kilowatt-hour (kW-hr) to million British Thermal Units (MMBtu)	293

[a] Assumes 11 LNG carriers per week.

[b] CO_2e emissions are based on global warming potential of CO_2 = 1, CH_4 = 28, and N_2O = 265, published on April 25, 2024 and effective on January 1, 2025. *See* 40 CFR 98, Subpart A, Table A-1 to Subpart A of Part 98—Global Warming Potentials, 100-Year Time Horizon.

Table 9.D.1.1
Input Parameters and Basis Used in Calculations (continued)

Worst Case Emission Factors

Emission Type	Emission Factor (g/kW-hr)								
	NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O
LNG Carrier Natural Gas [a,b,c]	0.26	0.01	0.04	0.01	0.01	0.001	181.20	0.003	3.41E-04
LNG Carrier Oil [d,e]	3.40	0.30	1.61	0.26	0.25	0.006	679.47	0.006	0.03
Tugboats [d,f]	1.80	0.19	0.92	0.04	0.04	0.006	679.47	0.004	0.03
Pilot Boats [d,g]	9.80	0.27	5.00	0.30	0.29	1.30E-03	690.00	0.09	0.02

[a] All emission factors are based on uncontrolled tangential-fired boilers, U.S. EPA, AP-42 Compilation of Air Emissions Factors from Stationary Sources, Fifth Edition, Volume I, Chapter 1 External Combustion Sources, Chapter 1.4 Natural Gas Combustion, July 1998 (hereinafter, "AP-42"). *See* Table 1.4-1 Emission Factors for Nitrogen Oxides (NO_X) and Carbon Monoxide (CO) from Natural Gas Combustion and Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion.

[b] The CO_2 emission factor is obtained from 40 CFR 98, Subpart C, Table C-1 Table C-1 to Subpart C of Part 98—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel (53.06 kg CO_2/MMBtu), November 29, 2013.

[c] The CH_4 and N_2O emission factors are obtained from 40 CFR 98, Subpart C, Table C-2 to Subpart C of Part 98—Default CH_4 and N_2O Emission Factors for Various Types of Fuel (CH_4 = 0.001 kg CH_4/MMBtu and N_2O = 0.0001 kg N_2O/MMBtu), November 29, 2013.

[d] All emission factors, except for NO_X, are obtained from U.S. EPA, "Ports Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions" (hereinafter, "Ports Emissions Inventory Guidance"), EPA-420-B-22-011, April 2022, *available at:* https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1014J1S.pdf. Accessed November 2025. *See* Table H.7 Average Harbor Craft Emission Factors by Engine Tier (VOC, CO, PM_{10}, $PM_{2.5}$, SO_2, CO_2), Section 4.5.4 Volatile Organic Compounds (VOC), Carbon Monoxide (CO), and Methane (CH_4) (for CH_4), and Section 4.5.5 Nitrous Oxide (N_2O) (for N_2O) for Tier 1 engines.

[e] The NO_X emission factor is obtained from 40 CFR § 1043.60, Table 1 to § 1043.60 Annex VI NO_X Emission Standards (g/kW-hr) for Tier III engines.

[f] The NO_X, VOC, PM_{10}, & PM_{10} emission factors are obtained from 40 CFR § 1042.101, Table 3 to § 1042.101—Tier 4 Standards for Category 2 and Commercial Category 1 Engines at or Above 600 kW for Category 1 engines. The CO, SO_2, and CO_2 emission factors are obtained from the Ports Emissions Inventory Guidance, Table H.7 Average Harbor Craft Emission Factors by Engine Tier for Tier 4 engines. The CH_4 and N_2O emission factors are based on the Ports Emissions Inventory Guidance, Sections 4.5.4 and 4.5.5, respectively.

[g] All emission factors, except for CO, $PM_{2.5}$, and SO_2, are obtained from U.S. EPA, "Current Methodologies in Preparing the Mobile Source Port-Related Emission Inventories, Final Report" (hereinafter, "Current Methodologies in Preparing Port Emission Inventories," April 2009, *available at:* https://www.epa.gov/sites/default/files/2016-06/documents/2009-port-inventory-guidance.pdf. Accessed November 2025. *See* Table 3-8: Harbor Craft Emission Factors (g/kWh) (NO_X, VOC, PM_{10}, CO_2, N_2O, CH_4) for Category 1, Tier 1 engines. The CO emission factor is obtained from 40 CFR Appendix I to Part 1042—Summary of Previous Emission Standards, Table 2 to Appendix I—Primary Tier 2 Emission Standards for Commercial and Recreational Marine Engines at or Above 37 kW (g/kW-hr) for Category 1, Tier 2 standards. The $PM_{2.5}$ emission factor is based on the estimation that $PM_{2.5}$ is 97% of PM_{10} emissions and the SO_2 emission factor is corrected from 1.5% sulfur content to ultra low sulfur diesel at 0.0015% sulfur content for Category 1 Tier 1 engines (*see* Current Methodologies in Preparing Port Emission Inventories, Section 3.4.3 Streamlined/Alternative Approach).

Table 9.D.1.1
Input Parameters and Basis Used in Calculations (continued)

Marine Vessel Operational Activities

Operational Activity [a]	Distance [b] (nm)	Duration [c] (min)	Duration (hr)	LNG Carrier		Tugboat			Pilot Boat	
				%	Power (kW)	Number	% Power	Power (kW / tugboat)	%	Power (kW)
LNG carrier travels from the state water line to picking up Bar pilot	6.00	25	0.42	80%	18,240	N/A	N/A	N/A	N/A	N/A
Bar pilot boat delivers pilot to LNG carrier	5.00	15	0.25	N/A	N/A	N/A	N/A	N/A	80%	418
Maneuvering from Bar pilot pick up through the Southwest Pass to the Head of Passes	20.70	180	3.00	40%	9,120	N/A	N/A	N/A	N/A	N/A
Bar pilot boat picks up pilot from LNG carrier at the Head of Passes	15.84	50	0.83	N/A	N/A	N/A	N/A	N/A	80%	418
River pilot boat delivers pilot to LNG carrier at the Head of Passes	1.56	5	0.08	N/A	N/A	N/A	N/A	N/A	80%	418
Maneuvering from the Head of Passes through the river to outside the terminal	47.40	410	6.83	40%	9,120	N/A	N/A	N/A	N/A	N/A
Tugboats travel from base to LNG carrier at river outside of terminal	1.00	8	0.13	N/A	N/A	4	80%	2,400	N/A	N/A
Maneuvering into terminal	N/A	10	0.17	20%	4,560	4	60%	1,800	N/A	N/A
Alongside holding while lines are made fast	N/A	60	1.00	4%	912	4	15%	450	N/A	N/A
Hoteling while cargo loading	N/A	925	15.42	7%	1,596	1	7%	210	N/A	N/A
Hoteling while on standby	N/A	540	9.00	5%	1,140	1	7%	210	N/A	N/A
Alongside holding while releasing lines	N/A	10	0.17	4%	912	4	15%	450	N/A	N/A
Maneuvering away from terminal	N/A	5	0.08	20%	4,560	4	60%	1,800	N/A	N/A
Tugboats travel from LNG carrier at river outside of terminal to base	1.00	8	0.13	N/A	N/A	4	80%	2,400	N/A	N/A
Maneuvering from outside the terminal through river to the Head of Passes	47.40	410	6.83	40%	9,120	N/A	N/A	N/A	N/A	N/A
River pilot boat picks up pilot from LNG carrier at the Head of Passes	1.56	5	0.08	N/A	N/A	N/A	N/A	N/A	80%	418
Bar pilot boat delivers pilot to LNG carrier at the Head of Passes	15.84	50	0.83	N/A	N/A	N/A	N/A	N/A	80%	418
Maneuvering from the Head of Passes through the Southwest Pass to Bar pilot drop off	20.70	180	3.00	40%	9,120	N/A	N/A	N/A	N/A	N/A
Bar pilot boat picks up pilot from LNG carrier	5.00	15	0.25	N/A	N/A	N/A	N/A	N/A	80%	418
LNG carrier travels from dropping off Bar pilot to the state water line	6.00	25	0.42	80%	18,240	N/A	N/A	N/A	N/A	N/A

[a] Pilot assumed to take ground transportation to and from the Plaquemines Expansion LNG facility during hoteling.

[b] Locations of pick-up and drop-off locations provided by Venture Global for the Plaquemines LNG Terminal on December 28, 2016.

[c] LNG carrier assumed to operate at 16 knots outside of river and 7 knots inside river, tugboats assumed to operate at 8 knots, and pilot boats assumed to operate at 20 knots.

Table 9.D.1.2
Operational Emissions for LNG Carriers

LNG Carrier Emission Rates

Operational Activity [a]	Emission Rate per LNG Carrier [b,c] (lb/hr)								
	NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O
Inbound									
LNG carrier travels from the state water line to picking up Bar pilot	73.55	6.11	33.10	5.44	5.28	0.14	17,305	0.18	0.67
Maneuvering from Bar pilot pick up through the Southwest Pass to the Head of Passes	36.78	3.06	16.55	2.72	2.64	0.07	8,652	0.09	0.34
Maneuvering from the Head of Passes through the river to outside the terminal	36.78	3.06	16.55	2.72	2.64	0.07	8,652	0.09	0.34
Maneuvering into terminal	5.75	0.37	1.95	0.36	0.36	0.01	2,323	0.04	0.04
Alongside holding while lines are made fast	1.15	0.07	0.39	0.07	0.07	0.00	465	0.01	0.01
Hoteling									
Hoteling while cargo loading	2.01	0.13	0.68	0.13	0.12	0.01	813	0.01	0.01
Hoteling while on standby	1.44	0.09	0.49	0.09	0.09	0.00	581	0.01	0.01
Outbound									
Alongside holding while releasing lines	1.15	0.07	0.39	0.07	0.07	0.00	465	0.01	0.01
Maneuvering away from terminal	5.75	0.37	1.95	0.36	0.36	0.01	2,323	0.04	0.04
Maneuvering from outside the terminal through river to the Head of Passes	36.78	3.06	16.55	2.72	2.64	0.07	8,652	0.09	0.34
Maneuvering from the Head of Passes through the Southwest Pass to Bar pilot drop off	36.78	3.06	16.55	2.72	2.64	0.07	8,652	0.09	0.34
LNG carrier travels from dropping off Bar pilot to the state water line	73.55	6.11	33.10	5.44	5.28	0.14	17,305	0.18	0.67

[a] Shading denotes an operational activity that occurs within the moored safety zone.

[b] The emission rate for an operational activity is calculated by multiplying the emission factor (g/kW-hr) for the activity, the operating power of the LNG carrier (kW), and a unit conversion to convert grams to pounds.

[c] The emission rates cannot be summed across all operational activities because they do not occur simultaneously; however, there may be up to three LNG carriers hoteling simultaneously.

Table 9.D.1.2
Operational Emissions for LNG Carriers (continued)

LNG Carrier Annual Emissions

Operational Activity [a]	Annual Emissions [b] (tpy)								
	NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O
Inbound									
LNG carrier travels from the state water line to picking up Bar pilot	8.73	0.73	3.93	0.65	0.63	0.02	2,055	0.02	0.08
Maneuvering from Bar pilot pick up through the Southwest Pass to the Head of Passes	31.44	2.61	14.15	2.32	2.26	0.06	7,398	0.08	0.29
Maneuvering from the Head of Passes through the river to outside the terminal	71.62	5.95	32.23	5.29	5.14	0.14	16,850	0.18	0.66
Maneuvering into terminal	0.27	0.02	0.09	0.02	0.02	0.00	110	0.00	0.00
Alongside holding while lines are made fast	0.33	0.02	0.11	0.02	0.02	0.00	132	0.00	0.00
Hoteling									
Hoteling while cargo loading	8.85	0.57	3.00	0.56	0.55	0.02	3,572	0.06	0.06
Hoteling while on standby	3.69	0.24	1.25	0.23	0.23	0.01	1,489	0.02	0.02
Outbound									
Alongside holding while releasing lines	0.05	0.00	0.02	0.00	0.00	0.00	22	0.00	0.00
Maneuvering away from terminal	0.14	0.01	0.05	0.01	0.01	0.00	55	0.00	0.00
Maneuvering from outside the terminal through river to the Head of Passes	71.62	5.95	32.23	5.29	5.14	0.14	16,850	0.18	0.66
Maneuvering from the Head of Passes through the Southwest Pass to Bar pilot drop off	31.44	2.61	14.15	2.32	2.26	0.06	7,398	0.08	0.29
LNG carrier travels from dropping off Bar pilot to the state water line	8.73	0.73	3.93	0.65	0.63	0.02	2,055	0.02	0.08
Total	**236.93**	**19.44**	**105.15**	**17.38**	**16.88**	**0.47**	**57,987**	**0.64**	**2.14**

[a] Shading denotes an operational activity that occurs within the moored safety zone.

[b] The annual emissions for an operational activity is calculated by multiplying the emission rate (lb/hr) for the activity, the duration of the activity (hr), the number of LNG carriers per year (i.e., 570), and a unit conversion to convert lb to tons.

Table 9.D.1.3
Operational Emissions for Tugboats

Tugboat Emission Rates

Operational Activity [a]	Number of Tugboats	Emission Rate per LNG Carrier [b,c] (lb/hr)								
		NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O
Inbound										
Tugboats travel from base to LNG carrier at river outside of terminal	4	38.10	4.02	19.44	0.85	0.82	0.13	14,381	0.08	0.70
Maneuvering into terminal	4	28.57	3.02	14.58	0.63	0.62	0.10	10,785	0.06	0.53
Alongside holding while lines are made fast	4	7.14	0.75	3.65	0.16	0.15	0.02	2,696	0.01	0.13
Hoteling										
Hoteling while cargo loading	1	0.83	0.09	0.43	0.02	0.02	0.00	315	0.00	0.02
Hoteling while on standby	1	0.83	0.09	0.43	0.02	0.02	0.00	315	0.00	0.02
Outbound										
Alongside holding while releasing lines	4	7.14	0.75	3.65	0.16	0.15	0.02	2,696	0.01	0.13
Maneuvering away from terminal	4	28.57	3.02	14.58	0.63	0.62	0.10	10,785	0.06	0.53
Tugboats travel from LNG carrier at river outside of terminal to base	4	38.10	4.02	19.44	0.85	0.82	0.13	14,381	0.08	0.70

[a] Shading denotes an operational activity that occurs within the moored safety zone.

[b] The emission rate for an operational activity is calculated by multiplying the emission factor (g/kW-hr) for the activity, the operating power for the tugboats (kW), the number of tugboats per activity, and a unit conversion to convert grams to pounds.

[c] The emission rates cannot be summed across all operational activities because they do not occur simultaneously; however, there may be up to three LNG carriers hoteling simultaneously.

Table 9.D.1.3
Operational Emissions for Tugboats (continued)

Tugboat Annual Emissions

Operational Activity [a]	Number of Tugboats	Annual Emissions [b] (tpy)								
		NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O
Inbound										
Tugboats travel from base to LNG carrier at river outside of terminal	4	1.45	0.15	0.74	0.03	0.03	0.01	546	0.00	0.03
Maneuvering into terminal	4	1.36	0.14	0.69	0.03	0.03	0.00	512	0.00	0.03
Alongside holding while lines are made fast	4	2.04	0.21	1.04	0.05	0.04	0.01	768	0.00	0.04
Hoteling										
Hoteling while cargo loading	1	3.66	0.39	1.87	0.08	0.08	0.01	1,382	0.01	0.07
Hoteling while on standby	1	2.14	0.23	1.09	0.05	0.05	0.01	807	0.00	0.04
Outbound										
Alongside holding while releasing lines	4	0.34	0.04	0.17	0.01	0.01	0.00	128	0.00	0.01
Maneuvering away from terminal	4	0.68	0.07	0.35	0.02	0.01	0.00	256	0.00	0.01
Tugboats travel from LNG carrier at river outside of terminal to base	4	1.45	0.15	0.74	0.03	0.03	0.01	546	0.00	0.03
Total		**13.11**	**1.38**	**6.69**	**0.29**	**0.28**	**0.05**	**4,947**	**0.03**	0.24

[a] Shading denotes an operational activity that occurs within the moored safety zone.

[b] The annual emissions for an operational activity is calculated by multiplying the emission rate (lb/hr) for the activity, the duration of the activity (hr), the number of LNG carriers per year (i.e., 570), and a unit conversion to convert lb to tons.

Table 9.D.1.4
Operational Emissions for Pilot Boats

Pilot Boat Emission Rates

Operational Activity	Emission Rate per LNG Carrier [a,b] (lb/hr)								
	NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O
Inbound									
Bar pilot boat delivers pilot to LNG carrier	9.02	0.25	4.60	0.28	0.27	0.00	635	0.08	0.02
Bar pilot boat picks up pilot from LNG carrier at the Head of Passes	9.02	0.25	4.60	0.28	0.27	0.00	635	0.08	0.02
River pilot boat delivers pilot to LNG carrier at the Head of Passes	9.02	0.25	4.60	0.28	0.27	0.00	635	0.08	0.02
Outbound									
River pilot boat picks up pilot from LNG carrier at the Head of Passes	9.02	0.25	4.60	0.28	0.27	0.00	635	0.08	0.02
Bar pilot boat delivers pilot to LNG carrier at the Head of Passes	9.02	0.25	4.60	0.28	0.27	0.00	635	0.08	0.02
Bar pilot boat picks up pilot from LNG carrier	9.02	0.25	4.60	0.28	0.27	0.00	635	0.08	0.02

[a] The emission rate for an operational activity is calculated by multiplying the emission factor (g/kW-hr) for the activity, the operating power of the pilot boat (kW), and a unit conversion to convert grams to pounds.

[b] The emission rates cannot be summed across all operational activities because they do not occur simultaneously; however, there may be up to three LNG carriers hoteling simultaneously.

Table 9.D.1.4
Operational Emissions for Pilot Boats (continued)

Pilot Boat Annual Emissions

Operational Activity	Annual Emissions [a] (tpy)								
	NO_X	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O
Inbound									
Bar pilot boat delivers pilot to LNG carrier	0.64	0.02	0.33	0.02	0.02	0.00	45	0.01	0.00
Bar pilot boat picks up pilot from LNG carrier at the Head of Passes	2.14	0.06	1.09	0.07	0.06	0.00	151	0.02	0.00
River pilot boat delivers pilot to LNG carrier at the Head of Passes	0.21	0.01	0.11	0.01	0.01	0.00	15	0.00	0.00
Outbound									
River pilot boat picks up pilot from LNG carrier at the Head of Passes	0.21	0.01	0.11	0.01	0.01	0.00	15	0.00	0.00
Bar pilot boat delivers pilot to LNG carrier at the Head of Passes	2.14	0.06	1.09	0.07	0.06	0.00	151	0.02	0.00
Bar pilot boat picks up pilot from LNG carrier	0.64	0.02	0.33	0.02	0.02	0.00	45	0.01	0.00
Total	**6.00**	**0.17**	**3.06**	**0.18**	**0.18**	**0.00**	**422**	**0.06**	**0.01**

[a] The emission rate for an operational activity is calculated by multiplying the emission rate (lb/hr) for the activity, the duration of the activity (hr), the number of LNG carriers per year (i.e., 570), and a unit conversion to convert lb to tons.

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Appendix 9D Emission Calculations for Marine Vessel and On-road Vehicle Operation for the Expansion Facilities

On-Road Vehicle Operational Emissions

Table 9.D.2
Summary of On-Road Vehicle Operational Emissions

Pollutant	Commute Annual Emissions [a] (tpy)	On-Site Annual Emissions [a] (tpy)	Fugitive Dust from Paved Roads Annual Emissions [b] (tpy)	Total Annual Emissions (tpy)
Particulate Matter, PM_{10}	0.01	0.01	11.61	**11.63**
Particulate Matter, $PM_{2.5}$	0.01	0.01	2.85	**2.87**
Sulfur dioxide	0.04	0.01	–	**0.05**
Nitrogen dioxide	0.57	1.62	–	**2.19**
Carbon moxide	18.70	1.48	–	**20.18**
Volatile Organic Compounds	0.21	0.04	–	**0.25**
Carbon dioxide	5,139	2,148	–	**7287**
Nitrous oxide	0.03	0.33	–	**0.36**
Methane	0.06	0.01	–	**0.08**
CO_2e [c]	5,149	2,235	–	**7384**
1,3-Butadiene	7.84E-04	1.69E-05	–	**0.00**
2,2,4-Trimethylpentane	5.83E-03	9.36E-05	–	**0.01**
Acetaldehyde	2.04E-03	1.41E-03	–	**0.00**
Acrolein	1.35E-04	1.44E-04	–	**0.00**
Benzene	2.57E-03	3.43E-05	–	**0.00**
Ethyl Benzene	3.33E-03	2.43E-04	–	**0.00**
Formaldehyde	3.00E-03	1.31E-03	–	**0.00**
Hexane	6.23E-03	2.62E-05	–	**0.01**
Naphthalene	7.41E-07	1.19E-08	–	**0.00**
PAH	1.79E-04	3.35E-05	–	**0.00**
Propionaldehyde	1.36E-04	1.09E-04	–	**0.00**
Styrene	1.74E-04	7.42E-06	–	**0.00**
Toluene	0.03	4.18E-04	–	**0.03**
Xylenes	0.01	1.76E-03	–	**0.01**
Arsenic	3.01E-05	3.24E-06	–	**0.00**
Chromium VI	1.57E-07	3.24E-09	–	**0.00**
Mercury	1.57E-06	1.55E-08	–	**0.00**
Nickel	1.96E-05	5.09E-07	–	**0.00**
Total HAPs	**0.06**	**0.01**	–	**0.07**

[a] Emission factors are obtained from EPA MOVES5.

[b] Emission factors are obtained from U.S. EPA, AP-42 Compilation of Air Emissions Factors from Stationary Sources, Fifth Edition, Volume I, Chapter 13 Miscellaneous Sources, Section 13.2.1, Paved Roads, January 2011. *See* Table 13.2.1-2 Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m^2).

[c] CO_2e emissions are based on global warming potential of CO_2 = 1, CH_4 = 28, and N_2O = 265, published on April 25, 2024 and effective on January 1, 2025. See 40 CFR 98, Subpart A, Table A-1 to Subpart A of Part 98—Global Warming Potentials, 100-Year Time Horizon.

Plaquemines Expansion, LLC

Resource Report 9 - On-road Vehicle Operational Emissions

Table 9.D.2.1

Operational Emissions for On-road Vehicles (Employee Commute)

Assumptions

Vehicle Type	Fuel Type
Gasoline Passenger Trucks	Gasoline
Vehicle Miles Traveled [a] (VMT/year)	11,862,500

[a] VMT includes off-site travel miles by workers commuting to the facilty (assuming 250 full-time employees with an average distance traveled to work of 130 miles per day for 365 days per year).

Pollutant	Emission Factor [a] (g/VMT)	Annual Emissions (tpy)
Particulate Matter, PM_{10}	1.13E-03	0.01
Particulate Matter, $PM_{2.5}$	1.00E-03	0.01
Sulfur dioxide	3.29E-03	0.04
Nitrogen dioxide	0.04	0.57
Carbon moxide	1.43	18.70
Volatile Organic Compounds	0.02	0.21
Carbon dioxide	393.03	5,139
Nitrous oxide	2.30E-03	0.03
Methane	4.86E-03	0.06
CO_2e [b]	-	5,149
1,3-Butadiene	6.00E-05	7.84E-04
2,2,4-Trimethylpentane	4.45E-04	5.83E-03
Acetaldehyde	1.56E-04	2.04E-03
Acrolein	1.03E-05	1.35E-04
Benzene	1.96E-04	2.57E-03
Ethyl Benzene	2.55E-04	3.33E-03
Formaldehyde	2.30E-04	3.00E-03
Hexane	4.77E-04	6.23E-03
Naphthalene	5.67E-08	7.41E-07
PAH	1.37E-05	1.79E-04
Propionaldehyde	1.04E-05	1.36E-04
Styrene	1.33E-05	1.74E-04
Toluene	1.97E-03	0.03
Xylenes	9.45E-04	0.01
Arsenic	2.30E-06	3.01E-05
Chromium VI	1.20E-08	1.57E-07
Mercury	1.20E-07	1.57E-06
Nickel	1.50E-06	1.96E-05
Total HAPs	**-**	**0.06**

[a] Based on EPA MOVES5.

[b] CO_2e emissions are based on global warming potential of CO_2 = 1, CH_4 = 28, and N_2O = 265, published on April 25, 2024 and effective on January 1, 2025. See 40 CFR 98, Subpart A, Table A-1 to Subpart A of Part 98—Global Warming Potentials, 100-Year Time Horizon.

Table 9.D.2.2
Operational Emissions for On-road Vehicles (On-site Vehicles)

Assumptions

Vehicle Type	Fuel Type
Diesel Heavy Trucks	Diesel
Vehicle Miles Traveled [a] (VMT/year)	1,277,500

[a] VMT include on-site travel miles within the Plaquemines Expansion facility (assuming 35 vehicles a day for 365 days per year with an average distance traveled of 100 miles per day).

Pollutant	Emission Factor [a] (g/VMT)	Annual Emissions (tpy)
Particulate Matter, PM_{10}	8.16E-03	0.01
Particulate Matter, $PM_{2.5}$	7.51E-03	0.01
Sulfur dioxide	5.10E-03	0.01
Nitrogen dioxide	1.15	1.62
Carbon moxide	1.05	1.48
Volatile Organic Compounds	0.03	0.04
Carbon dioxide	1,525.32	2,148
Nitrous oxide	0.23	0.33
Methane	9.13E-03	0.01
CO_2e [b]	-	2,235
1,3-Butadiene	1.20E-05	1.69E-05
2,2,4-Trimethylpentane	6.65E-05	9.36E-05
Acetaldehyde	9.98E-04	1.41E-03
Acrolein	1.02E-04	1.44E-04
Benzene	2.43E-05	3.43E-05
Ethyl Benzene	1.72E-04	2.43E-04
Formaldehyde	9.27E-04	1.31E-03
Hexane	1.86E-05	2.62E-05
Naphthalene	8.43E-09	1.19E-08
PAH	2.38E-05	3.35E-05
Propionaldehyde	7.76E-05	1.09E-04
Styrene	5.27E-06	7.42E-06
Toluene	2.97E-04	4.18E-04
Xylenes	1.25E-03	1.76E-03
Arsenic	2.30E-06	3.24E-06
Chromium VI	2.30E-09	3.24E-09
Mercury	1.10E-08	1.55E-08
Nickel	3.61E-07	5.09E-07
Total HAPs	**-**	**0.01**

[a] Based on EPA MOVES5.

[b] CO_2e emissions are based on global warming potential of CO_2 = 1, CH_4 = 28, and N_2O = 265, published on April 25, 2024 and effective on January 1, 2025. See 40 CFR 98, Subpart A, Table A-1 to Subpart A of Part 98—Global Warming Potentials, 100-Year Time Horizon.

Table 9.D.2.3
Fugitive Dust from Paved Roads

Assumptions

Vehicle Type	Fuel Type	Vehicle Miles Traveled per Year [a] (VMT/yr)	Average Vehicle Weight [b] (tons)
Diesel Heavy Trucks	Diesel	1,277,500	9.3
Gasoline Passenger Trucks	Gasoline	11,862,500	2.8

[a] Based on data provided by Venture Global on November 3, 2025.

[b] Passenger cars and trucks average vehicle weights are based on engineering estimates and best currently and publicly available information.

Paved Road Data [a]

Road surface silt loading [a], g/m^2	0.2	
Particle size multiplier (k) [a]	PM_{10}	0.0022
	$PM_{2.5}$	0.00054

[a] Emission factors are obtained from U.S. EPA, AP-42 Compilation of Air Emissions Factors from Stationary Sources, Fifth Edition, Volume I, Chapter 13 Miscellaneous Sources, Section 13.2.1, Paved Roads, January 2011 (hereinafter, "AP-42"). For silt loading, no site-specific data is available. Thus, Venture Global utilized the value from Table 13.2.1-2 for ubiquitous baseline with average daily traffic (ADT) ranging between 500 to 5,000 vehicles. *See* Table 13.2.1-2 Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m^2).

Vehicle Emissions

Vehicle Type	Emission Factor [d] (lb/VMT)	
	PM_{10}	$PM_{2.5}$
Diesel Heavy Trucks	4.92E-03	1.21E-03
Gasoline Passenger Trucks	1.43E-03	3.50E-04

[d] PM emission factors determined by methodology from AP-42, Section 13.2.1, *Paved Roads,* Equation 1

$E = k * (sL)^{0.91} * W^{1.02}$

E= particulate emission factor, (lb/VMT)
k= Particle size multiplier for particle size range and units of interest from Table 13.2.1-1
sL= road surface silt loading from Table 13.2.1-2, grams per square meter (g/m^2)
W= average weight of the vehicles traveling the road, tons

Paved Road Emissions

Year	Annual Emissions (tpy)	
	PM_{10}	$PM_{2.5}$
Diesel Heavy Trucks	3.14	0.77
Gasoline Passenger Trucks	8.46	2.08
Total	**11.61**	**2.85**

PLAQUEMINES EXPANSION PROJECT
Resource Report 9
APPENDIX 9E

Fugitive Dust Control Plan

PLAQUEMINES

PLAQUEMINES EXPANSION, LLC
AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT

Fugitive Dust Control Plan

Air and Noise Quality

Docket No.
PF25-007-000

Prepared by
Burns & McDonnell Engineering Company, Inc.

November 2025

PLAQUEMINES EXPANSION, LLC AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT
FUGITIVE DUST CONTROL PLAN

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ACRONYMS AND ABBREVIATIONS

Contractor	Construction Contractor
Plaquemines Expansion	Plaquemines Expansion, LLC
LAC	Louisiana Administrative Code
LNG	liquefied natural gas
Project	Plaquemines Expansion Project
Expansion Facilities	permanent land- and marine-based Plaquemines Expansion natural gas liquification, storage and export facilities
Terminal Facilities	includes the land-based Terminal Site and the Marine Facilities

PLAQUEMINES EXPANSION, LLC AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION LLC

1.0 INTRODUCTION

Plaquemines Expansion, LLC (Plaquemines Expansion) and Venture global Plaquemines LNG, LLC (Plaquemines LNG) propose to build, construct, and operate additional liquefaction facilities capable of producing an average annual capacity of 26.5 million metric tonnes per annum ("MTPA") with a peak capacity of up to 31 MTPA, and other facilities detailed below. The proposed expansion ("Project") will be situated on the west bank of the Mississippi River in Plaquemines Parish, Louisiana. The Expansion Facilities will be situated on an approximately 587-acre permanent site immediately adjacent to the approximately 632-acre site on which the Authorized Facilities are located. A new approximately 500-acre Temporary Workspace and an approximately 77-acre Existing Workspace from the Authorized Facilities will be utilized during construction of the Expansion Facilities. The Project facilities will include (a) one natural gas gate station, (b) five pretreatment facilities, (c) sixteen liquefaction blocks capable of producing approximately 26.5 MTPA, (d) seven (7) LNG expanders, (e) boil-off, flash, and gas relief systems, (f) one (1) LNG loading berth for ocean-going vessels, (g) one warm flare, one cold flare, one spare flare, and one marine flare, (h) two 710-megawatt natural gas-fired combined cycle electric generation facilities, (i) safety and security systems, and (j) other appurtenant facilities.

The Expansion Facilities for the Project will involve site-wide improvements, including clearing, grubbing, grading, and filling to elevate ground surfaces prior to foundation and facility development. Additional laydown yards will be required to support construction activities and material staging. Temporary facility areas will also be installed within the laydown area to support early site activities, including preliminary works and the construction of new site access roads. These areas may include temporary sanitary facilities, parking, and material storage, and will be expanded as needed to meet the evolving demands of construction.

The main construction scope will include installation of four pretreatment systems, liquefaction blocks, refrigerant storage, flare systems, and boil-off gas management systems. Additional support infrastructure such as workshops, warehouses, and utility storage buildings will also be constructed. Contract yards and access roads will be developed to facilitate equipment and materials handling.

2.0 PURPOSE

Dust emissions encountered or generated from the Project and discharged to the atmosphere from open sources are termed fugitive dust. This plan describes the primary sources of fugitive dust, and outlines activity-specific procedures to be implemented by the Construction Contractor (Contractor) to control and mitigate fugitive dust emissions during construction of the Project.

Plaquemines Expansion will ensure that all contractors comply with the methods outlined in this Plan during construction, restoration, and operation of the Project. Contractors will be trained on the requirements of this Plan during mandatory pre-construction environmental training. Compliance with these requirements will be documented in the field in weekly construction inspection reports, which will be submitted to Plaquemines Expansion for review and

comment. This Plan is subject to revisions based on new data or agency recommendations.

3.0 FUGITIVE DUST GENERATING ACTIVITIES

The activities listed below have the greatest potential for generating dust emissions due to the movement of heavy, motorized equipment across the ground. This movement may lift dust particles into the air where the dust can be dispersed by the wind. Construction-related activities that have the potential to generate fugitive dust include, but are not limited, to the following:

- land clearing and vegetation cutting and removal;
- soil disturbing activities, such as clearing, excavation, side casting, and backfilling;
- bulk material loading and unloading, stockpiling, and handling activities;
- open-bodied trucks hauling gravel or other materials to construction area or designated laydown/equipment storage areas;
- wind erosion from exposed surfaces;
- construction vehicle and equipment traffic driving on unpaved surfaces; and
- construction vehicles and equipment traffic driving on paved roads.

4.0 FUGITIVE DUST CONTROL PROCEDURES

During construction, the Contractor must not cause or permit any materials or property to be handled, transported, stored, used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne.

General and specific reasonable precautions, operational controls, and practices to control fugitive dust emissions are outlined in this section. The frequency at which control procedures are implemented will vary based on weather conditions and site activities. More frequency will be required in dry conditions where dust generation is likely and near any residence or public gathering places.

4.1 GENERAL

The following general reasonable precautions, operational controls, and practices could be implemented to control fugitive dust emissions:

- Control of fugitive emissions of particulate matter (inclusive of PM_{10} and $PM_{2.5}$ particulates) as stipulated in Louisiana Administrative Code (LAC) 33:III;1305.
- Apply dust control mitigation measures, as necessary, during all phases and stages of construction and restoration, 24 hours per day, 7 days per week.
- Use dust abatement measures (e.g., apply water or a dust palliative) on unpaved, unvegetated, or disturbed soil areas during construction activities, as necessary, and as determined by Plaquemines Expansion Construction Manager or Environmental Inspectors.
- Apply asphalt, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces that can give rise to airborne dust. Wet suppression is the suggested typical method of suppressing fugitive dust on unpaved roads and gravel pads as it causes finer materials to adhere into larger particles.
- Use water spray trucks as the primary means of dust abatement during construction. Field-determined fill points for the water trucks and obtain permits with local authorities. Watering frequency will be dependent on weather and traffic

conditions. Water spray will be controlled to avoid over-spray and pooling.

- Monitor dust control activities in areas of active construction or in disturbed soil areas on a regular basis to ensure that the measures taken are adequately controlling fugitive dust. Reapply dust control measures (e.g., rewater disturbed areas) as necessary.
- Monitor and control vehicle and equipment speeds where construction activities parallel or cross public roads or approach dwellings or other areas occupied by people.
- Limit speed of motor vehicles, including haul trucks, to less than 15 miles per hour (mph) or as posted, especially in hot, dry conditions.
- Use existing public roads, designated project roads for access to construction areas.
- Decrease limited speeds as necessary during high wind conditions.
- Minimize major dust generation activities during high wind conditions, where feasible.
- Operate and maintain construction equipment to control dust.
- Locate temporary facilities that have the potential to generate significant amounts of dust to minimize potential impacts and to facilitate the implementation of dust control measures.
- Avoid creating emissions that would pass onto or across a public road and create a traffic hazard by impairment of visibility (as defined in LAC 33:III;111); do not intensify an existing traffic hazard condition (per LAC 33;III;1303;B).
- Revise, as warranted, this fugitive dust control plan and methods to address additional issues that develop as the job progresses.

4.2 STAGING AREAS

The following reasonable precautions, operational controls, and practices for staging areas could be implemented to control fugitive dust emissions:

- Limit vehicle speeds in construction staging areas and on unpaved access routes, especially in hot, dry conditions to 15 mph or as posted.
- Apply and maintain dust suppressant as needed on vehicle traffic areas in staging areas and unpaved access routes.
- Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- Apply and maintain a dust palliative to surface soils where support equipment and vehicles will be operated.

4.3 STOCKPILES

The following reasonable precautions, operational controls, and practices for stockpiles could be implemented to control fugitive dust emissions:

- To the extent possible, maintain stockpiles to avoid steep sides or faces.
- Limit the disturbance of stockpiles.
- Limit the height of stockpiles likely to generate airborne dust where feasible.
- Apply a cover or screen to stockpiles or temporarily stabilize uncovered stockpiles by watering or the application of a suitable chemical. Apply temporary seeding to stabilize spoil piles such as topsoil that will be left for an extended period

4.4 EARTHMOVING OPERATIONS

The following reasonable precautions, operational controls, and practices for earthmoving operations could be implemented to control fugitive dust emissions:

- Conduct earthmoving activities at the Project in stages to minimize the amount of disturbed surface present at any one time, where feasible.
- Apply water or another suppressant to active work areas during earthmoving activities in amounts and frequencies that minimize dust generation. The quantity and frequency of water application will be dependent on weather conditions and assessed on a case-by-case basis.
- Monitor earthmoving activities for fugitive dust and reapply dust suppressants, as necessary.
- Implement additional measures, as warranted, to minimize fugitive dust such as further reducing vehicle speeds and spacing equipment farther apart at the Project.
- Restrict motor vehicle and/or off-road vehicles from trespassing on, parking on, and/or accessing non-active disturbed areas.

4.5 BULK MATERIAL HANDLING

Bulk material, in the context of fugitive emissions, is defined as any material capable of producing fugitive dust, including but not limited to, earth, rock, silt, sediment, sand, gravel, gravel, soil, fill, aggregate less than 2 inches in length or diameter, dirt, mud, trash, saw dust, and dry concrete. The following reasonable precautions, operational controls, and practices for bulk material handling could be implemented to control fugitive dust emissions:

- Prevent spillage or loss of bulk material from holes or other openings in the cargo compartment's floor, sides, and/or tailgates.
  Clean, cover, or secure materials with a tarp or other suitable closure to prevent the escape of dust from open-bodied haul trucks that transport material likely to give rise to airborne dust.
- Minimize drop heights when transferring bulk materials during loading, unloading, or stacking operations to reduce dust generation.
- Before loaded haul trucks leave the site, control track-out by means of either a gravel pad, wheel shaker, or wheel washer as required.
- Limit bulk material handling, transfer, or loading activities during periods of high wind when dust control measures are not sufficient to prevent visible emissions
- Before empty haul trucks leave the site, either clean the interior of the cargo compartment or cover it as needed.

4.6 TRACKOUT PREVENTION AND CLEANING

Trackout is soil on paved roadways deposited from vehicles that have passed from a construction site or from an unpaved access route onto a paved surface. The following reasonable precautions, operational controls, and practices to prevent and clean trackout could be implemented to control fugitive dust emissions:

- Install and maintain one of the following trackout control devices at access points where paved and unpaved access or travel routes intersect:

- Install gravel pad(s) at construction entrance/exits used by haul trucks and vehicles that will knock off dirt and potential track out. Re-screen, wash, or apply additional rock in gravel pads to maintain effectiveness.
- Install wheel shakers. Wheel shakers are a device capable of spreading the tread on tires and shaking the wheels and axles of vehicles for the purpose of releasing mud, soil, and rock from the tires and undercarriage to prevent tracking those materials onto paved surfaces. Clean wheel shakers on a regular basis to maintain effectiveness. Install wheel shakers in the event that tracking of mud, soil, and rock cannot be controlled with gravel pads.

- Install wheel washers. Wheel washers are a station or device, either temporary or permanent, that uses a bath or spray of water for the purpose of cleaning mud, soil, and rock from the tires and undercarriage of vehicles to prevent tracking those materials onto paved surfaces. Maintain wheel washers on a regular basis to maintain effectiveness. Install wheel washers in the event that tracking of mud, soil, and rock cannot be controlled with gravel pads and wheel shakers.

- Route exiting traffic over the selected trackout control device.
- Clean trackout from paved surfaces at the end of each work shift/day or as needed.
- Inspect and record trackout conditions, including preventative and corrective measures in daily project records.

4.7 ENCLOSED WORK AREAS

Enclosing work areas is an operational control that could be implemented to control fugitive dust emissions. To contain any fugitive dust and emissions for discreet dust-intensive activities such as abrasive blasting, enclose the work area.

4.8 PAVED HAUL AND PUBLIC ROADS

A reasonable precaution, operational control, and practice to control fugitive dust emissions on paved haul and public roads would be to sweep promptly to remove earth or other material that has been transported by trucking or earth moving equipment, erosion by water, or other means. Trackout control measures and devices installed at construction entrance and exits can further assist in preventing solid and debris deposits on paved roads that could generate fugitive emissions.

4.9 UNPAVED ROADS AND PARKING LOTS

For unpaved roads and parking lots, the following reasonable precautions, operational controls, and practices could be implemented to control fugitive dust emissions:

- Limit vehicle traffic on unpaved haul roads to the extent possible.
- Limit vehicle speeds to minimize dust. The speed limit on the Terminal Site, must not exceed 15 mph, or as posted, especially in hot, dry conditions. Speed limit signs will be posted along the road route, clearly indicating the speed limit. Signs will be placed so they are visible to vehicles entering and leaving the Terminal Site.
- Apply and maintain surface gravel or apply and maintain an effective dust suppressant.

- Apply routine water spraying to unpaved surfaces to suppress dust, especially during dry or windy conditions

4.10 FIELD INSPECTION AND RECORDKEEPING

Field inspection for dust control will occur daily. The Construction Contractor and inspection staff will be responsible for operating in accordance to this Fugitive Dust Control Plan and other applicable regulations. The Construction Contractor will be responsible for recording the following information on a daily basis:

- weather conditions (temperature, wind speed, and wind direction);
- number of water trucks in use;
- cases where visible dust was of such a concentration that abatement measures were implemented and a description of the abatement measures taken, including type of material and application rate (as applicable);
- presence of trackout and when it was cleaned; and
- overall status of dust control compliance.

This information will be incorporated into the Environmental Inspector's daily report.

5.1 PLAN MANAGEMENT

A copy of this Fugitive Dust Control Plan will be retained on-site during Project construction and made available upon request.

The Contractor will periodically assess the effectiveness of this Fugitive Dust Control Plan through review of the field inspection records and will amend the plan where existing control measures are deemed inadequate to address any conditions not originally anticipated. The Contractor is responsible for monitoring construction activities and for taking corrective actions to avoid activities from being non-compliant. The Contractor is responsible for recording the date/time and volume of where water is applied to control fugitive dust. The logs are to be provided to the Construction Manager and Environmental Inspectors.

Plaquemines Expansion will provide appropriate construction oversight to monitor and confirm Contractor compliance with the measures of this plan and requirements of applicable federal, state, and local permits. Plaquemines Expansion Construction Manager and Environmental Inspectors will assist the Contractor in interpreting and implementing the requirements of the plan and verify compliance with these procedures. The Contractor is responsible for:

- identifying sources of potential dust generation;
- monitoring fugitive generation in the different areas of Project construction;
- implementing appropriate dust suppression techniques; and
- sourcing and transportation of water for dust control operations.

PLAQUEMINES EXPANSION PROJECT
Resource Report 9
APPENDIX 9F

Nighttime Construction Noise Mitigation Plan

PLAQUEMINES

PLAQUEMINES EXPANSION, LLC
AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT

Nighttime Noise Mitigation Plan

November 2025

PLAQUEMINES EXPANSION, LLC AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT
NIGHTTIME NOISE MITIGATION PLAN

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ACRONYMS AND ABBREVIATIONS

Applicants	Plaquemines Expansion, LLC and Venture Global Plaquemines LNG, LLC
CFR	Code of Federal Regulations
dBA	decibel
EPA	Environmental Protection Agency
Expansion Facilities	The permanent land- and marine-based Plaquemines Expansion natural gas liquefaction, storage, and export facilities
Expansion Site	land-based footprint of the Expansion Facilities within the storm surge wall
FERC	Federal Energy Regulatory Commission
MTPA	million metric tonnes per annum
NSAs	Noise Sensitive Areas
Plaquemines Expansion	Plaquemines Expansion, LLC
Plaquemines LNG	Venture Global Plaquemines LNG, LLC
Project	Plaquemines Expansion Project
SSW	Storm Surge Wall
Venture Global	Venture Global LNG, Inc.

PLAQUEMINES EXPANSION, LLC AND VENTURE GLOBAL PLAQUEMINES LNG, LLC

PLAQUEMINES EXPANSION PROJECT
NIGHTTIME NOISE MITIGATION PLAN

1.0 INTRODUCTION

Plaquemines Expansion, LLC ("Plaquemines Expansion") and Venture Global Plaquemines LNG, LLC ("Plaquemines LNG"), together referred to as the "Applicants" and both wholly owned subsidiaries of Venture Global LNG, Inc. ("Venture Global"), propose to build, own, and operate additional liquefaction facilities capable of producing peak capacity of approximately 26.5 million metric tonnes per annum ("MTPA") and other facilities ("Project") detailed below. The Expansion Facilities will be situated on an approximately 587-acre permanent site immediately adjacent to the approximately 632-acre site on which the Authorized Facilities are located.

Construction activities at the Expansion Facilities will occur 24 hours per day for the duration of construction. One of the most prevalent noise-generating activities anticipated during Expansion Facilities construction is pile driving. Plaquemines Expansion will not conduct pile driving during nighttime hours between 7:00 PM and 7:00 AM. This document addresses nighttime construction and noise mitigation.

2.0 OBJECTIVE

In 1974, the Environmental Protection Agency ("EPA") published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety* (EPA, 1974), which evaluated the effects of environmental noise with respect to health and safety. As set forth in this publication, the EPA determined that noise levels should not exceed an L_{dn} of 55 A-weighted decibel ("dBA"), which is the level that protects the public from indoor and outdoor activity interference. This noise level has been used by state and federal agencies to establish noise limitations for various noise sources. A 55 dBA L_{dn} noise level equates to an L_{eq} of 48.6 dBA (i.e., a facility that does not exceed a continuous noise impact of 48.6 dBA will not exceed 55 dBA L_{dn}).

The Federal Energy Regulatory Commission ("FERC") has adopted the following criterion described in 18 Code of Federal Regulations ("CFR") § 380.12(k) for new compression and associated facilities and for all new LNG facilities:

> *The noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed an L_{dn} of 55 dBA at any pre-existing NSAs such as schools, hospitals, or residences.*
>
> *If construction activity would or may occur during nighttime hours, you should provide the L_{dn} of existing noise levels at all NSAs within 0.5 mile, the estimated noise impacts at those NSAs from the construction activity, and the estimated increase in background noise. Construction activity that would or may occur during nighttime hours should be performed with the goal that the activity contribute noise levels below 55 dBA L_{dn} and 48.6 dBA L_{eq}, or no more than 10 dBA over background if ambient noise levels are above 55 dBA L_{dn}.*

These criteria were used to assess the potential noise impacts from the construction and operation of the Project. Based upon this criterion, the Project operations should be limited to

55 dBA L_{dn} at any pre-existing Noise Sensitive Areas (“NSAs”). Nighttime construction activities should be limited to 48.6 dBA L_{eq}.

3.0 NOISE SENSITIVE AREAS

The Expansion Facilities will be constructed in a mixed industrial and rural area with NSAs within 1 mile of the boundary of the Expansion Facilities. NSAs were previously identified during the FERC review of the Plaquemines LNG Terminal (FERC Docket No. CP17-66), and similar NSA numbering is used here. The NSAs are shown on figure 9.3.3-1 (resource report 9, appendix 9A), and summarized below.

- NSA 1 is a cluster of residences; approximately 9,044 feet west from the center of the Expansion Site
- NSA 2 is a cluster of residences; approximately 8,010 feet west from the center of the Expansion Site.
- NSA 6 is a cluster of residences; approximately 10,960 feet east from the center of the Expansion Site.
- NSA 9 is a cluster of residences; approximately 6,435 feet north from the center of the Expansion Site.

Noise Sensitive Areas In Proximity of Plaquemines Expansion

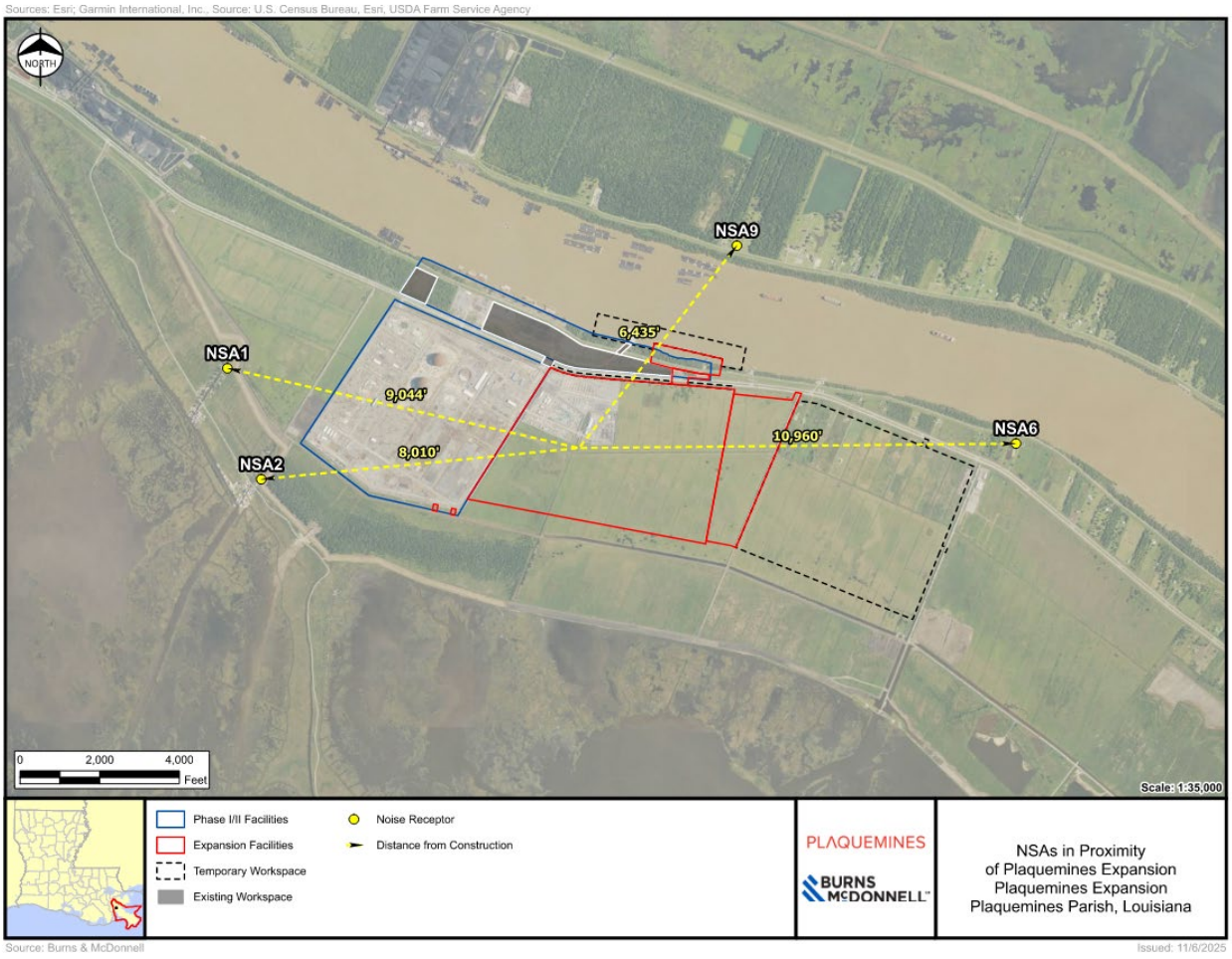

Table 1 below presents the baseline ambient noise levels at each NSA.

TABLE 1

Plaquemines Expansion Project
Expansion Facilities Ambient Noise Survey Results

Noise Sensitive Area	Development	Direction and Distance to NSA	Measured Ambient Daytime Noise Level (dBA L_{eq})[A]	Measured Ambient Nighttime Noise Level (dBA L_{eq})[A]	Calculated Ambient Noise Level (dBA L_{eq})[B]
1	Residences	9,044 feet west	56	60	66
2	Residences	8,010 feet west	56	60	66
6	Residences	10,960 feet west	54	56	62
9	Residences	6,435 feet west	65	58	67

A L_{eq} is the measured equivalent sound level

B L_{dn} is the calculated day-night sound level, where a 10-dBA penalty is applied to the measurement nighttime L_{eq}. The daytime and nighttime measured sound levels are then averaged to provide the calculated day-night sound level.

The residences associated with NSAs 1, 2, 6, and 9 are comprised of a combination of permanent and temporary homes. These residences may be subject to increased noise emissions associated with construction activities.

The calculated noise levels are expected to be conservative and only be reached for short periods of time. Nighttime construction noise levels are expected to be substantially lower than those calculated for peak daytime construction activity.

4.0 NIGHTTIME CONSTRUCTION NOISE MITIGATION

Nighttime noise mitigation measures will be implemented between 7:00 PM and 7:00 AM. The mitigation measures listed below will be considered for nighttime activities:

- Nighttime construction will be limited to activities that will not involve significant noise-producing construction activities.
- Pile driving activities shall be restricted to daytime hours (7 AM to 7 PM).
- Training will be provided to nighttime work crews focused on not over-revving engines, avoiding unnecessary idling, and proper inspection and maintenance of moving parts and mufflers.
- Traffic routes will be planned to limit backing thereby limiting the number of times the back-up alarms are activated.
- Excavator operators will communicate using radios or ground crew.
- Equipment will be turned off when not in use.
- On-road haul trucks will be required to travel on a specified route to the Expansion Site to minimize disturbance to residents.
- Construction activities at night will occur in designated areas only. These designated areas will be reviewed and approved by the Applicants as construction progresses.
- Temporary noise barriers, including noise dampening blankets, will be implemented as applicable.

The Expansion Site will include a 30-foot-tall storm surge wall ("SSW") that will serve as an acoustic barrier between construction activities and NSAs once complete. However, certain nighttime construction activities will begin with initial site preparation activities prior to full development of the SSW. The Applicants anticipate that construction activities throughout most of the Terminal site will not impact NSAs due to the distance between the construction activity and the NSAs. The Applicants anticipate that a reduction of the workforce and equipment (compared to that used during the day) within certain work areas of the Terminal will be necessary to reduce the noise contributions to less than 55 dBA L_{dn} (48.6 dBA L_{eq}) to NSAs. Construction of the SSW will be prioritized at the Terminal. Once completed, the SSW will serve as an acoustic barrier between Terminal construction activities and the NSAs.

5.0 NOISE LEVEL MONITORING

Construction noise contributions to NSAs will vary depending on construction phase and location within the Terminal. Prior to construction the Applicants will prepare nighttime work plans outlining the types and number of equipment allowed to work near NSAs at night, while limiting noise contributions to less than 48.6 dBA L_{eq} at each NSA. This information will be modeled to estimate potential construction noise contributions at NSAs. During construction at the Terminal Facilities, the Applicants will monitor and document the type and number of equipment units operating between 7:00 p.m. and 7:00 a.m. to allow comparison of actual equipment noise outputs with the baseline modeled equipment noise outputs. Monitoring will be conducted until the SSW is completed. The nighttime noise levels will be documented routinely to validate the baseline modeling and included in the construction status report.

6.0 REFERENCES

EPA, 1974. U. S. Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, 1974.

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APPENDIX 9G

Operational Noise Analysis for the Expansion Facilities

(Filed Under Separate Cover as Controlled Unclassified Information/Critical Energy Infrastructure Information [CUI/CEII])