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AIR QUALITY DISPERSION MODELING PROTOCOL
WESTLINE 2335
TOM GREEN COUNTY, TEXAS

by
Haley & Aldrich, Inc.

for
Westline TX Holdings LLC
Tom Green County, Texas

File No. 214923
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WESTLINE 2335
TOM GREEN COUNTY, TEXAS

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List of Acronyms/Abbreviations

Acronym/Abbreviation	Definition
µg/m^3	micrograms per cubic meter
AQA	Air Quality Analysis
AQRV	Air Quality-Related Value
BACT	Best Available Control Technology
Beacon	Beacon Services (US) LLC
bhp	brake horsepower
BPIP	Building Profile Input Program
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
EPA	U.S. Environmental Protection Agency
ESL	Effects Screening Level
Facility	Westline 2335, a proposed data center and energy generation facility
GEP	Good Engineering Practice
GHG	greenhouse gas
H1H	highest first high
H2H	highest second high
H_2S	hydrogen sulfide
H_2SO_4	sulfuric acid (mist)
H4H	highest fourth high
H8H	highest eighth high, or 98th percentile
hp	horsepower
JouleGrid	JouleGrid Corp.
km	kilometer
m	meter
MERA	Modeling and Effects Review Applicability
MERP	Modeled Emission Rates for Precursors
MMBtu/hr	million British thermal units per hour
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum of 1983
NLCD	National Land Cover Data

Acronym/Abbreviation	Definition
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSR	New Source Review
O_3	ozone
OLM	Ozone-Limiting Method
Pb	lead
PM	particulate matter
PM_{10}	particulate matter with a diameter equal to or less than 10 microns
$PM_{2.5}$	particulate matter with a diameter equal to or less than 2.5 microns
ppb	parts per billion
ppbv	parts per billion by volume
ppmv	parts per million by volume
Project	Westline 2335, a proposed data center and energy generation facility
PSD	Prevention of Significant Deterioration
PVMRM	Plume Volume Molar Ratio Method
Q/d	screening equation, annual emissions divided by distance
RICE	reciprocating internal combustion engine
ROI	Radius of Impact
SCR	selective catalytic reduction
SER	Significant Emission Rate
SIA	Significant Impact Area
SIL	Significant Impact Level
Site	1,767-acre property in Tom Green County, Texas
SMC	significant monitoring concentration
SO_2	sulfur dioxide
SU/SD	startup and shutdown
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
tpy	tons per year
ULSD	ultra-low-sulfur distillate
USGS	U.S. Geological Survey
VOC	volatile organic compound
Westline	Westline TX Holdings LLC

1. Introduction

Westline TX Holdings LLC (Westline) proposes to construct the Westline 2335 facility (Facility), a data center and associated energy-generation facility. The proposed data center project will be powered by a "behind-the-meter" energy-generation facility consisting of natural gas-fired reciprocating internal combustion engines (RICEs). The Facility will be located on an approximately 1,767-acre site in Tom Green County, Texas (Site). The Site, shown on Figures 1, 2, and 3, is within an area designated as attainment with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. The proposed general arrangement of the Facility is provided as Exhibit 1.

1.1 FACILITY OVERVIEW

The proposed Facility is a data center and associated energy-generation facility that will use RICE engine technology to provide a nominal 2,409-megawatt (MW) net-generating capacity. A total of 240 RICE engines will be arranged in 20 engine halls (12 engines per engine hall). Operation of the RICE engines will be supported by 40 engine heaters and 20 line heaters.

- Each of the 240 RICE engines has a gross mechanical output capacity of 12.32 MW and a net electrical output of 12.045 MW. The typical operating scenario provides for concurrent operation of 10 engines per engine hall (with two engines per engine hall being idle) and a maximum concurrent operation of 200 RICE engines for the Facility.
- Each of the 40 engine heaters (two per engine hall) will have a maximum heat input capacity of 5.02 million British thermal units per hour (MMBtu/hr) (i.e., 1.47 MW), and each engine heater will be limited to no more than 72 hours of operation per year, averaged across all engine heaters.
- The 20 line heaters (one per engine hall) will each have a maximum heat input capacity of 5.2 MMBtu/hr, and each line heater will be permitted to operate 8,760 hours per year.
- The 40 emergency generators each have a rated capacity of 1,341 horsepower (hp) and will be limited to 100 hours of non-emergency operation per year (per generator). These 40 identical units will be designated as 20 "black start" generators and 20 emergency generators (one of each type per engine hall).
- The 60 emergency fire water pumps (three per engine hall) will each have a rated capacity of 84 brake-horsepower (bhp) and will be limited to 100 hours of non-emergency operation per year (per fire water pump).

Emissions from the Facility will be minimized by using natural gas as the only fuel to be fired in the RICE engines, engine heaters, and line heaters. Each RICE engine will be equipped with selective catalytic reduction (SCR) to reduce emissions of nitrogen oxides (NO_X) and catalytic oxidation to reduce carbon monoxide (CO) and volatile organic compound (VOC) emissions. The emergency generators and emergency fire water pumps will be fired using only ultra-low-sulfur distillate (ULSD).

The proposed data center will be powered by a "behind-the-meter" energy-generation facility described above that will operate up to 8,760 hours per year. The typical operating scenario for the Facility includes concurrent operation of a maximum of 200 RICE engines (i.e., typically 10 engines per engine hall), with each engine typically running at or near 80 percent load.

The modeling evaluation for the Facility will consist of a single operating scenario that includes concurrent operation of 200 RICE engines (i.e., 10 engines per engine hall), with each engine running at worst-case conditions of 100 percent load. By evaluating this worst-case scenario, Westline intends to manage energy

demand for the data center by establishing a 12-month rolling average limit of 1,752,000 “engine-hours” for the Facility (i.e., 200 engines x 8,760 hours), rather than per-engine operating limits.

Air emissions from the proposed Facility will primarily consist of products of combustion from the RICE engines and ancillary equipment. This includes carbon dioxide (CO_2), a greenhouse gas (GHG).

Because Tom Green County is in attainment with respect to the NAAQS for all criteria pollutants, the Facility is subject to Prevention of Significant Deterioration (PSD) requirements. The Facility has at least one criteria pollutant that exceeds PSD major source thresholds. Pollutants that are regulated under federal and Texas state programs include: CO; NO_X; sulfur dioxide (SO_2); particulate matter (PM); PM with a diameter equal to or less than 10 microns (PM_{10}); PM with a diameter equal to or less than 2.5 microns ($PM_{2.5}$); VOCs; GHGs; lead (Pb); and sulfuric acid (H_2SO_4) mist. PSD review is triggered for CO, NO_X, PM_{10}, $PM_{2.5}$, VOCs, SO_2, H_2SO_4, and GHGs.

This Protocol presents the proposed methodology for the air dispersion modeling analysis. This analysis will be performed to support the PSD New Source Review (NSR) permit application and presented in the Air Quality Analysis (AQA). Modeling methods and assumptions, including model selection, model options, meteorological data, receptor information, and source parameters, are presented in this document for review by the Texas Commission on Environmental Quality (TCEQ). This Protocol has been prepared in accordance with TCEQ’s Air Permit Division Guidelines (TCEQ, 2025) to document the assumptions and selections intended for use to demonstrate that the Project will not cause or contribute to a NAAQS or PSD increment violation or adversely affect public health and welfare.

1.2 SUMMARY OF ANNUAL POTENTIAL EMISSIONS

The proposed potential annual emissions from the Project are summarized in Table 1. Potential annual emissions are based on the following operating assumptions:

- full-load operation of 200 Bergen RICE engines (1,752,000 “engine-hours” for the Facility);
- full-load operation of the line heaters;
- incorporation of Facility startup and shutdown (SU/SD) events, based on a representative scenario that reflects maximum emissions;
- an annual restriction of 72 hours per engine heater (used for SU events only); and
- an annual restriction of 100 non-emergency hours each at maximum rated power for the annual maintenance for the emergency generators and fire pump engines.

Table 1. Project-Wide Annual Potential Emissions

Pollutant	Emissions (tpy[a])
PM	642.9
PM_{10}	642.9
$PM_{2.5}$	642.9
SO_2	117.2
NO_X	419.3
CO	1,177.2
VOCs	446.8

Pollutant	Emissions (tpy[a])
H_2SO_4	17.9
Pb	0.0002
GHG (as CO_2e[b])	9,758,937
Ammonia	570.0
Maximum Individual HAP	347.9
Total HAPs	697.4
Notes: [a] *tpy = tons per year* [c] *CO_{2e} = carbon dioxide equivalents*	

1.3 PERMITTING CONTACTS

To facilitate TCEQ's review, individuals familiar with the Facility and this Protocol are identified below.

Matt Molina Westline TX Holdings LLC 5900 Balcones Drive Suite 100 Austin, Texas 78731 Phone: 206.609.4047 E-mail: matt@beacondatacenters.com	Adam Carcache Beacon Data Centers 5900 Balcones Drive Suite 100 Austin, Texas 78731 Phone: 787.414.7470 E-mail: adam@beacondatacenters.com

1.4 PROTOCOL PREPARATION

Haley & Aldrich was retained by Beacon Services (US) LLC (Beacon) to prepare this Protocol. JouleGrid Corp. (JouleGrid) provided the technical specifications for the Facility emission units. Beacon retained JouleGrid separately. JouleGrid prepared Exhibit 1.

2. Air Quality Analysis Model and Inputs

2.1 MODEL SELECTION

The U.S. Environmental Protection Agency (EPA)-recommended AERMOD modeling system (version 24142) will be used to conduct the dispersion modeling.

2.2 PLANNED MODELING ANALYSES

2.2.1 Ambient Air Quality Regulatory Criteria

The EPA has promulgated regulations that establish NAAQS and PSD increments. The NAAQS are established in 40 Code of Federal Regulations (CFR) Part 50 and incorporate Texas air pollution control regulations in Title 30 of the Texas Administrative Code (TAC). The PSD regulations are established in 40 CFR Part 52 and are incorporated by reference in Texas' air pollution control regulations. These regulations and guidelines provide the basis for evaluating the potential impacts of proposed facilities on air quality.

2.2.2 National Ambient Air Quality Standards

The EPA has developed NAAQS for six air contaminants, known as criteria pollutants, for the protection of public health and welfare. These criteria pollutants are SO_2, PM (PM_{10}/$PM_{2.5}$), nitrogen dioxide (NO_2), CO, ozone (O_3), and Pb. TCEQ has also adopted these limits. The NAAQS for different pollutants can have differing averaging periods, including for short-term periods of 24 hours or less and up to multi-year annual averages. The NAAQS include both "primary" and "secondary" standards, where the primary standards are set to protect human health, allowing an adequate margin of safety. Secondary standards are set to protect public welfare from any known or anticipated adverse effects associated with the presence of air pollutants in ambient air.

One of the primary goals of federal and state air pollution regulations is to ensure that ambient air quality complies with the NAAQS. Every area of the United States has been designated as attainment, unclassifiable, or nonattainment for each criteria pollutant. In areas designated as attainment, the air quality with respect to the pollutant is equal to or better than the NAAQS. These areas are under a mandate to maintain, i.e., prevent significant deterioration of, such air quality. In areas designated as unclassifiable, there are limited air quality data, and these areas are treated as attainment areas for regulatory purposes. In areas designated as nonattainment for a particular pollutant, the air quality with respect to that pollutant is worse than the NAAQS. These areas are required to take actions to improve air quality and attain compliance with the NAAQS within a certain time frame.

If a new major source of air pollution is proposed, it must undergo NSR air permitting. NSR air permitting regulations contain two distinct programs, one for sources proposed in attainment/unclassifiable areas and one for sources in nonattainment areas. The NSR program for sources proposed in attainment/unclassifiable areas is known as the PSD program. The NSR program for sources proposed in non-attainment areas is known as Nonattainment New Source Review. The Project is located in an area classified as "attainment" or "attainment/unclassifiable" for all criteria pollutants. Therefore, emissions of criteria pollutants from the Project are evaluated under the PSD program. The PSD program requirements are discussed in the following subsection.

2.2.3 Prevention of Significant Deterioration Review

The PSD Air Quality Program, which is implemented by TCEQ, is a federally mandated program review of major new sources of criteria and other PSD-regulated pollutants primarily designed to maintain attainment with the

NAAQS and prevent degradation of air quality in attainment/unclassifiable areas. Under the PSD program, the Facility is considered a major source if its emissions of any single criteria pollutant are greater than 250 tpy.

As shown in Table 2, the Project will have potential emissions greater than 250 tpy for one or more criteria pollutants; therefore, it will be subject to the PSD program requirements.

Once a facility exceeds one of the PSD major source thresholds, PSD regulations also apply to each criteria pollutant that is emitted in excess of its respective defined Significant Emission Rate (SER). Table 2 presents a comparison of the Project's potential emissions to the PSD major source and SER thresholds. As shown in Table 2, the Project is subject to PSD review for CO, NO_X, SO_2, PM, PM_{10}/$PM_{2.5}$, VOCs, H_2SO_4, and GHGs (see Section 1.3 for the assumptions used in determining annual potential emissions).

Table 2. Prevention of Significant Deterioration Regulatory Threshold Evaluation

Pollutant	Facility (tons per year [tpy])	PSD Major Source Threshold (tpy)	PSD SER (tpy)	PSD Review Applies?
PM_{10}	642.9	250	15	Yes
$PM_{2.5}$	642.9	250	10	Yes
SO_2	117.2	250	40	Yes
NO_X	419.3	250	40	Yes
CO	1,177.2	250	100	Yes
VOC (O_3 precursor)	446.8	250	40	Yes
H_2SO_4	17.9	250	7	Yes
Pb	0.0002	10	0.6	No
GHG as CO_2e	9,758,937	N/A	75,000	Yes

The key requirements for obtaining a PSD permit include a demonstration that Best Available Control Technology (BACT) requirements are satisfied and an air quality impact analysis to document compliance with NAAQS and PSD increments. Other requirements are discussed in Section 4.

An air dispersion modeling analysis will be conducted in accordance with EPA and TCEQ guidance as described in this Protocol, and an AQA will be submitted to TCEQ. Modeling will be conducted for Project emissions of PM_{10}, $PM_{2.5}$, SO_2, NO_x, and CO, because these pollutants are subject to PSD review, and NAAQS for those pollutants have been established. VOCs will not be modeled, because there are no NAAQS for those pollutants; however, because VOCs are a precursor to the formation of photochemical oxidants, O_3 impacts will be assessed. Total PM and GHGs will also not be modeled, because there are no NAAQS for these pollutants. While H_2SO_4 has no NAAQS, it will be modeled as part of the state property line standard analysis.

2.2.4 Hazardous Air Pollutants

TCEQ requires a Modeling and Effects Review Applicability (MERA) assessment of air toxics for which Effects Screening Levels (ESLs) have been established. The Project will follow the tiered MERA process as outlined in TCEQ's guidance (TCEQ, 2018). It is expected that the Project will use refined dispersion modeling to demonstrate compliance with ESLs, as has been presented in the application.

2.3 SURFACE CHARACTERISTICS OF MODELING DOMAIN

2.3.1 Terrain

Terrain elevations and hill heights at receptors will be obtained using Lakes Environmental's AERMOD View program and U.S. Geological Survey (USGS) digital terrain data. AERMOD View implements the AERMAP model (version 24142), which includes processing routines that extract National Elevation Data at 10-meter (m) spacing based on the North American Datum of 1983 (NAD83). The base elevations of off-property sources included in the NAAQS and PSD Increment Analysis will also be determined using AERMAP. Facility design elevations were used for on-property sources and buildings. Due to the terrain of the surrounding area, it is not expected that the modeling domain will require unique customization to exclude prominent terrain features.

2.3.2 Land Use Determination

TCEQ requires applicants to use the Auer land use procedure described in Section 7.2.1.1(b)(i) of EPA's Guideline on Air Quality Models (EPA, 2017). Section 5 of the AERMOD Implementation Guide dated November 2024 provides more details about the urban/rural determination (EPA, 2024).

A land use determination has been made following the classification technique suggested by Auer in accordance with EPA and TCEQ modeling guidance. The classification determination was conducted by assessing land-use categories within a 3-kilometer (km) radius of the proposed Project Site. Figure 4 provides a land use map with a 3-km radius. Review of the 3-km area indicates that nearly the entire area is open land traversed by Spring Creek and roadways. Limited development occurs within 3 km of the Project Site. As shown in Table 3, AERSURFACE (version 20060) was run with National Land Cover Data (NLCD, 2021) and mapped to the Auer Land Use Classifications. The land use analysis shows that over 99 percent of land uses within a 3-km radius are considered rural; therefore, rural dispersion coefficients will be used for the air quality modeling.

Table 3. Land Cover Classification

NLCD Code	NLCD 2016 Description	Auer's Code	Auer's Classification	Percent within 3 km radius
11	Open Water	A5	Rural	0.39
21	Developed, Open Space	A1/R4	Rural	1.54
22	Developed, Low Intensity	R1	Rural	2.36
23	Developed, Medium Intensity	R2/R3	Urban	0.21
41	Deciduous Forest	A4	Rural	0.07
42	Evergreen Forest	A4	Rural	0.08
43	Mixed Forest	A4	Rural	0.06
52	Shrub/Scrub	A2	Rural	78.67
82	Cultivated Crops	A2	Rural	16.20
90	Woody Wetlands	A4	Rural	0.42
			Total Rural:	99.79
			Total Urban:	0.21

2.4 ON-SITE SOURCES AND CASES

The air dispersion modeling will be conducted for a range of different operating cases centered around performance data for the Bergen engines under a range of load conditions. The modeling will include emissions from Bergen engine SU/SD to capture maximum impact potential impact concentrations from these engines, which account for the majority of the Project's annual emissions. Appendix A summarizes the stack characteristics and emissions for all modeled sources, including RICE engine parameters for multiple operating loads and SU/SD conditions. Stack parameters have been developed for SU/SD conditions for each applicable pollutant and averaging period. Some averaging periods may include emissions from both a SU/SD event and steady-state operation. In addition to the RICE engines, the following equipment will be modeled:

- operation of engine heaters during SU/SD events;
- non-emergency operation (primarily maintenance and readiness testing) for the Facility emergency diesel generator engines and the emergency fire pump engines; and
- full-time operation of the line heaters.

Considerations for the emissions calculations and impact assessment include the following techniques and assumptions:

- Engine halls are designed to house several engines to take advantage of common infrastructure elements. One of those elements is structural support for engine stacks. In designing the stack configurations associated with each engine hall, engine stacks were configured into groups of three. This allows for use of common structural support elements, while minimizing the amount ductwork rerouting from the engines. Since a maximum of 10 Bergen engines will operate concurrently per engine hall, the worst-case configuration is three structures emitting three Bergen engine emissions each and one structure emitting one Bergen engine emissions (i.e., 3x3x3x1). Stacks are designed to be in a triangle formation and within one stack diameter of each other. When grouped engines are operating, they will operate at the same load, temperature, and flow rate. Therefore, for operating scenarios where grouped engines are operating, the Facility proposes to model these stacks as a merged equivalent stack, consistent with the 1986 EPA memorandum, Site Specific Study Requirements to Determine Plume Enhancement from Multiple Plumes. Because grouped engines will operate at the same temperature, the merged equivalent stack temperature will equal the individual stack temperature. The equivalent merged stack flow rate will be the sum of both stacks' flow rates. The equivalent merged stack diameter will be the square root of the sum of squared diameters shown below, where D_m is the merged equivalent stack diameter and the D_i represents the individual stack diameters.

$$D_m = \sqrt{\sum_{i}^{n} D_i^2}$$

- The conversion of NO_X emission rates to modeled NO_2 emission rates will be performed first using the Tier 1 (total conversion), followed if needed by Tier 2 and Tier 3 NO_X-to-NO_2 conversion assumptions as discussed in Section 3.3.
- Consistent with TCEQ's Air Quality Modeling Guidelines (TCEQ, 2025), the emergency diesel generators and emergency diesel fire pump are considered intermittent sources whose emissions can be annualized for modeling under 1-hour standards. Maximum annual non-emergency operation will be limited to 100 hours per year. Therefore, emissions during SU/SD events will be annualized for modeling under 1-hour standards. For 24-hour averaging times, it is assumed that each engine will operate for one hour per day for non-emergency operation. For annual averaging, the units will typically only operate for operational

testing of no more than one hour per week. The emission rates have been annualized for 100 hours per year.

- Westline is proposing SU/SD event scenarios that will result in SU/SD operation for less than 500 hours per year (see Appendix A). TCEQ guidance indicates that intermittent emissions can be defined as emergency generators, SU/SD operations, or from any intermittent/infrequent emission scenarios that are random in nature and are not scheduled. Similarly, the EPA's Tyler Fox memo (EPA, 2011) indicates that a source permitted to operate less than 500 hours per year, but that typically operates less than that, could be considered intermittent for evaluation of 1-hour standards. Consistent with this guidance, SU/SD events that are random in nature and would occur for less than 500 hours per year can be considered intermittent sources. For the remaining hours of the year, emission rates represent steady-state conditions. Therefore, emissions during SU/SD events will be annualized for modeling under 1-hour standards. Some averaging periods may include emissions and stack parameters from both a SU/SD event and steady-state operation.

2.5 STRUCTURE DOWNWASH/GEP STACK HEIGHT ANALYSIS

Structures near an emission source may impact pollutant dispersion via building-induced turbulence. Plumes can become entrained in the turbulence wake, reducing the overall rise of the plume. This effect (downwash) inhibits dispersion of stack emissions and has the potential to cause higher ground-level pollutant concentrations. The Project's stack emission sources will be evaluated in terms of their proximity to nearby structures. The evaluation will determine whether and how stack discharges will be influenced by the turbulent wakes of the structures.

The EPA's Building Profile Input Program (BPIP; version 04274[1]) that is appropriate for use with the PRIME algorithms in AERMOD has been used to evaluate downwash effects in the model. The building dimensions and coordinates for each potentially influencing structure were input to BPIP to determine direction-specific building dimension data. The PRIME algorithms calculate the dimensions of the structure's wake from the cavity immediately downwind of the building to the far wake. Building and structures data are provided in Appendix B. Structures associated with the Facility are shown in Exhibit 1. Structures as they are represented in AERMOD is depicted in Figures 5 and 6.

The tallest structure for the Facility is 14 meters (46 feet); therefore, the calculated Good Engineering Practice (GEP) height is the minimum value of 65 meters (213 feet). However, the Facility's Bergen engine stacks will be a lower height (180 feet) that appropriately disperses emissions.

Since the proposed stack heights are less than the GEP heights, the BPIP-generated direction-specific building dimensions will be input to AERMOD to assess potential downwash conditions for predicted concentrations. The height for the structures reflected in the downwash analysis will be provided in the AQA, and locations of the modeled downwash structures will be provided in a plot plan.

2.6 METEOROLOGICAL DATA

Meteorological data to support dispersion modeling are available from TCEQ that have been preprocessed using AERMET (version 24142). Datasets from 2019 through 2023 will be used. For a project located in Tom Green County, TCEQ recommends using surface observations from San Angelo Mathis Field Airport (Surface Station ID 23043) and upper air observations obtained from Del Rio (Upper Air Station ID 22010). TCEQ has processed the meteorological dataset using the Albedo and Bowen Ratio of 0.31 and 1.49, respectively.

[1] https://www.epa.gov/scram/air-quality-dispersion-modeling-related-model-support-programs#bpip

The TCEQ preprocessed data comes with three different files for each dataset, each representing a different surface roughness category:

- Low, representing low surface roughness (0.05 m is used to represent surface roughness from 0.001 to 0.1 m);
- Medium, representing medium surface roughness (0.5 m is used to represent surface roughness from 0.1 m to 0.7 m); and
- High, representing high surface roughness (1.0 m is used to represent surface roughness from 0.7 m to 1.5 m).

The analysis used the EPA's latest version of AERSURFACE to confirm the appropriate surface roughness meteorological dataset for the Project's location. AERSURFACE used land cover data from USGS NLCD 2021 archives. The analysis indicates that the resulting surface roughness for a 1-km radius from the Facility is estimated at 0.24 m, which corresponds to the medium surface roughness category. Therefore, that dataset will be used in the modeling analysis. An electronic copy of the AERSURFACE input and output files will be provided with the AQA.

2.7 RECEPTORS

Westline proposes to use the standardized receptor spacing described in TCEQ's Air Quality Modeling Guidelines (TCEQ, 2025). The first set of receptors will be set around the fence line (ambient air boundary). Receptors spaced 25 m along the fence line will be used. The proposed receptor grid is outlined below:

- grid containing 25-m receptor spacing along the fence line;
- grid containing 25-m receptor spacing from the Project property boundary to 300 m;
- grid containing 100-m receptor spacing from 300 m to 1 km;
- grid containing 500-m receptor spacing from 1 to 5 km; and
- grid containing 1,000-m receptor spacing from 5 to 50 km.

Terrain elevations at receptors will be obtained using Lakes Environmental's AERMOD View program and USGS's digital terrain data. AERMOD View implements the AERMAP model (which includes processing routines that extract NED) at 10-m spacing based on NAD83. The four nearest data points surrounding each receptor will be used to determine receptor terrain elevations (by interpolation) for air quality model input.

Further receptor placement (i.e., finer-nested grid) may be necessary for adequate receptor density and should provide adequate coverage for determining the Project's maximum concentration. EPA (2019) provided a revised policy on Exclusions for "Ambient Air." EPA revised its ambient air policy by replacing "a fence or other physical barriers" with "measures, which may include physical barriers that are effective in deterring or precluding access to the land by the general public." The "ambient air" boundary selected for modeling will use the anticipated Project fence line.

If a full impact assessment is required, only the receptors with modeled impacts greater than the Significant Impact Level (SIL; i.e., the significant receptors) will be modeled for the specific pollutant and averaging period that is above the SIL. When applicable, secondary formation will be included to determine the significant receptors. More detail on the full impact assessment is provided in Section 3.7.

3. Project Source Modeling Analyses

3.1 SOURCE MODELING THRESHOLDS

The dispersion modeling analyses for the Project will be conducted in accordance with the EPA's Guideline on Air Quality Models (EPA, 2017), as amended, and TCEQ's Air Quality Modeling Guidelines (TCEQ, 2019).

As described in Section 2.2, the Project will be subject to PSD due to emissions of CO, NO_X, SO_2, PM, PM_{10}/$PM_{2.5}$, VOCs, H_2SO_4, and GHGs. As a result, dispersion modeling will be conducted for CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ to demonstrate compliance with NAAQS and PSD increments. Because there is no NAAQS for VOCs, total PM, H_2SO_4, or GHGs, these pollutants are not subject to dispersion modeling.

The dispersion modeling for the Project will evaluate maximum-impact case operating conditions by modeling impacts under a range of loads and ambient conditions. The identified maximum impact operating conditions will then be modeled with appropriate ancillary equipment to predict the appropriate maximum ground-level concentration for each pollutant and averaging period for which a SIL has been established. The appropriate maximum concentrations from the worst-case scenarios will be compared to the SILs for each pollutant.

If the maximum concentration is below the corresponding SILs, then compliance is demonstrated, and no additional analysis is necessary. However, if the maximum predicted concentration is equal to or greater than the SILs, a full impact analysis will be conducted that includes comparison to the NAAQS (including background concentration) and PSD Class II increments.

Table 4 provides the SILs, NAAQS, and PSD Class II increments, as well as the modeling rank basis used for the assessment of compliance with the various criteria.

EPA adopted final SILs, PSD increments, and significant monitoring concentrations (SMCs) for $PM_{2.5}$ on September 29, 2010. Due to the January 22, 2013 decision from the U.S. Court of Appeals on the use of $PM_{2.5}$ SILs, EPA recommends the following procedure to be used prior to using the SIL. Because the court decision did not preclude using the SILs, EPA recommends taking the difference between the NAAQS and the representative monitoring background data. If the difference is greater than or equal to the SIL, then EPA believes it would be sufficient in most cases to use the SIL value as a screening tool.

EPA released the final Guidance on Significant Impact Levels for Ozone and Fine Particles in the PSD Program (EPA, 2018b) and related Supplement to the Guidance on Significant Impact Levels for Ozone and Fine Particulates in the Prevention of Significant Deterioration Permitting Program (EPA, 2024) demonstrating a new approach for developing SILs for $PM_{2.5}$ and O_3. Although EPA's guidance is non-binding, TCEQ prescribes using the suggested SIL values. For $PM_{2.5}$ annual, impacts falling between the recommended SIL and the SIL listed in 40 CFR §51.165(b)(2) should be discussed with TCEQ before submitting the AQA. The Facility does not anticipate that a value within this range will be used to determine the significance of the Project emissions.

Table 4. SILs, NAAQS, and PSD Increments

Pollutant	Averaging Period	Rank for SIL Assessment	SIL (µg/m³)[a]	NAAQS (µg/m³)	PSD Class II Increment (µg/m³)	Rank for NAAQS/PSD Assessment
NO_2	1-hour	H1H[b] (5-year Average)	7.5	188	N/A	H8H[c] (5-year Average)
	Annual	H1H	1	100	25	H1H
CO	1-hour	H1H	2,000	40,000	N/A	H2H[d]
	8-hour	H1H	500	10,000	N/A	H2H
SO_2	1-hour	H1H (5-year Average)	7.8	196	N/A	H4H (5-year Average)
	3-hour	H1H	25	1,300[g]	512	H2H
	24-hour	H1H	5	-	91	H2H
	Annual	H1H	1	10 ppb[g]	20	H1H
PM_{10}	24-hour	H1H	5	150	30	NAAQS: H6H (5-year Average) PSD: H2H (5-year Average)
	Annual	H1H	1	N/A	17	H1H
$PM_{2.5}$	24-hour	NAAQS: H1H (5-year Average) PSD: H1H	1.2[e]	35	9	NAAQS: H8H (5-year Average) PSD: H2H
	Annual	NAAQS: H1H (5-year Average) PSD: H1H	0.13[e]	9	4	NAAQS: H1H (5-year Average) PSD: H1H

Notes:
[a] µg/m³ = micrograms per cubic meter; [b] H1H = highest first high; [c] H8H = highest eighth high; [d] H2H = highest second high; H4H = highest fourth high; [e] See text above
[g] Secondary NAAQS

3.2 SIL ANALYSIS

The source impact analysis assesses predicted impacts from the Project for those criteria pollutants with net emissions increases above SERs. If predicted impacts from the proposed source are greater than the SILs, then a cumulative impact analysis is required. If predicted maximum impacts from the Project are less than SILs for a particular pollutant, no additional modeling is required.

If the Project exceeds a SIL, both a Significant Impact Area (SIA) and a Radius of Impact (ROI) will be determined. The ROI is defined by a circle centered at the source. The circle's radius will extend from the Project source to the location of the farthest distance where the model-predicted impact exceeds the PSD modeling SIL (the farthest distance of the SIA). The ROI will then be used to develop the cumulative emissions inventory for the NAAQS and PSD increment inventory (see Section 3.7.4). The SIA reflects area within which the actual modeled concentrations exceed the SIL, where receptors will be modeled for the NAAQS and increment assessments. For the evaluation of $PM_{2.5}$, secondary $PM_{2.5}$ impacts will be considered in determining the SIA and ROI, discussed further in Section 3.5.

3.3 NO_2 MODELING METHODS

The NO_2 impact analysis will be consistent with EPA guidance (2011 and 2014). The guidance describes a three-tiered screening approach for modeling 1-hour NO_2. In most cases, NO_X emissions are released primarily in the form of nitric oxide (NO), and these emissions convert to NO_2 in the atmosphere. Tier 1 in the three-tiered screening approach assumes that all NO_X converts to NO_2 prior to impacting each receptor. Tier 2 assumes NO_X converts to NO_2 at a rate consistent with a conservative NO_2/NO_X ambient ratio. Tier 3 uses a detailed refined modeling method on a case-by-case basis, such as the Ozone-Limiting Method (OLM) or Plume Volume Molar Ratio Method (PVMRM).

If compliance is not demonstrated at Tier 1, then a default Tier 2 ARM2 NO_2 to NO_x minimum ratio of 0.5 and maximum ratio of 0.9 will be applied consistent with TCEQ's Air Quality Modeling Guidelines (TCEQ, 2019). However, if Tier 3 OLM or PVMRM techniques are needed, this Protocol will be supplemented with a formal request letter to TCEQ, which will provide justification, as well as additional information for PVMRM or OLM modeling, including assumptions for ambient O_3 data to be used, source NO_2/NO_X in-stack ratios, and ambient equilibrium ratios for PVMRM or OLM.

3.4 SINGLE SOURCE SECONDARY O_3 ANALYSIS

Air pollutants formed through chemical reactions in the atmosphere are referred to as secondary pollutants. An analysis of the formation of secondary O_3 is necessary when emissions from a new major PSD source will exceed the PSD significance emission rates for O_3 precursors (i.e., 40 tpy increases for either VOCs or NO_x). If a source triggers PSD for O_3 based on either NO_x or VOC emissions exceeding the PSD SER, then the Modeled Emission Rates for Precursors (MERP) analysis must consider both NO_x and VOC emissions. The ozone impact analysis will follow TCEQ guidelines and EPA guidance (EPA, 2022).

Since O_3 is formed from precursor emissions, it cannot be modeled using a traditional point source model such as AERMOD. As part of the most recent revision to the EPA Guideline on Air Quality Modeling (40 CFR Part 51, Appendix W), EPA promulgated a two-tier approach for addressing single-source impacts on O_3.

- Tier 1 – The first tier involves use of appropriate and technically credible relationships between emissions and ambient impacts developed from existing modeling studies deemed sufficient for evaluating a project's impact. EPA has developed MERPs as a Tier 1 demonstration tool for O_3.
- Tier 2 – The second tier involves a more sophisticated case-by-case application of chemical transport modeling.

The assessment of O_3 formation from the Project's precursor emissions will be conducted using EPA's Tier 1 demonstration tool for estimating single-source secondary impacts, the EPA MERPs. In TCEQ's Modeling Guidance, modeled impacts from hypothetical industrial sources located in Texas are presented for use in a MERP analysis, as obtained from EPA's MERP guidance. Tables Q-2 and Q-3 of TCEQ's Modeling Guidance lists hypothetical MERP values for the hypothetical industrial sources located in Texas. The MERP values for Source 5 (Terry County) with NO_x/VOC emissions of 500 tpy and a higher release height were chosen as the hypothetical source, as shown in Table 5. Terry County has the lowest percentage of urban land cover in western Texas of the available counties (EPA, 2019a), which is the most comparable to the rural conditions surrounding the Project. Per Table 2, the Project's potential annual emissions for NO_x and VOCs are each approaching about 450 tpy, making the MERP corresponding to emissions of 500 tons per year, which represents a conservative estimate. The Project's tallest stack is approximately 54.9 m; therefore, the source release type "H," representing sources modeled at 90 m, was used (EPA, 2019a). Source release type "L" represents sources modeled with a stack height of 10 m and is not considered representative of the Project.

As described in the TCEQ Modeling Guidelines, the proposed emissions of O_3 precursors can be expressed as a percent of their respective MERP and then summed. A value less than 100 percent indicates that the SIL will not be exceeded.

$$\left[\frac{NO_x\ Project\ Emissions}{NO_x\ MERP} + \frac{VOC\ Project\ Emissions}{VOC\ MERP}\right] * 100 < 100\%$$

Table 5 provides the precursor emissions, MERPs, and the calculated O_3 contribution.

Table 5. Project Ozone Analysis

Pollutant	Precursors Emissions (tpy)	8-Hour Ozone MERP (tpy)
NOx	419.3	428
VOC	446.8	16,666
MERP Critical Threshold (ppb)[a]		1.0
Project Ozone Impact (% of SIL)		100.6%
Note: *[a] Critical threshold corresponds to the ozone SIL.*		

In the cumulative NAAQS analysis, secondary formation of O_3 will be accounted for by evaluating the cumulative concentration with the following:

$$Background\ concentration + \left[\frac{NO_x\ Project\ Emissions}{NO_x\ MERP} + \frac{VOC\ Project\ Emissions}{VOC\ MERP}\right] * SIL < NAAQS$$

3.5 SECONDARY $PM_{2.5}$ FORMATION ANALYSIS

In addition to direct $PM_{2.5}$ emissions, NO_X and SO_2 emissions can lead to the formation of $PM_{2.5}$ downwind where photochemical reactions can transform these pollutants into nitrate and sulfate particulates, called secondary $PM_{2.5}$. Direct $PM_{2.5}$ emission from the Project are above the SER of 10 tpy, and precursor emissions of SO_2 or NO_X exceed the precursor SER of 40 tpy. Therefore, per EPA's guidance (EPA, 2022) and TCEQ Modeling Guidance, secondary formation of $PM_{2.5}$ will be addressed.

Since secondary $PM_{2.5}$ is formed from precursor emissions, it is not modeled using a traditional point-source model such as AERMOD. As part of the most recent revision to the EPA Guideline on Air Quality Modeling (40 CFR Part 51, Appendix W), EPA promulgated a two-tier approach for addressing single-source impacts on secondary $PM_{2.5}$.

- Tier 1 – The first tier involves using appropriate and technically credible relationships between emissions and ambient impacts developed from existing modeling studies considered sufficient for evaluating a project's impact. EPA has developed MERPs as a Tier 1 demonstration tool for $PM_{2.5}$ (EPA, 2019b; TCEQ, 2019). The term MERP describes a precursor emission rate that is expected to result in a change in ambient $PM_{2.5}$ that is less than a specific air quality concentration threshold.
- Tier 2 – The second tier involves a more sophisticated case-by-case application of chemical transport modeling.

In TCEQ's Modeling Guidance (TCEQ, 2019), modeled impacts from hypothetical industrial sources located in Texas are presented for use in a MERP analysis, as obtained from EPA's MERP guidance. Table R-1 of TCEQ's Modeling Guidance lists the worst-case MERP values from all hypothetical industrial sources located in Texas. Tables R-2 and R-3 of TCEQ's Modeling Guidance lists hypothetical MERP values from all hypothetical industrial sources located in Texas. The MERP values for Source 5 (Terry County) with NO_x/SO_2 emissions of 500 tpy and a higher release height were chosen as the hypothetical source, as shown in Table 6. Terry County has the lowest percentage of urban land cover in western Texas of the available counties (EPA, 2019a), which is the most comparable to the rural conditions surrounding the Project. Per Table 2, the Project's potential annual emissions for NO_x and VOCs are each approaching about 450 tpy, making the MERP corresponding to emissions of 500 tons per year a conservative estimate. The Project's tallest stack is approximately 54.9 m; therefore, the source release type "H," representing sources modeled at 90 m, was used (EPA, 2019a). Source release type "L" represents sources modeled with a stack height of 10 m and is not considered representative of the Project. These MERP values will be used as a conservative representation for the Project.

Table 6. Hypothetical Sources for Secondary Demonstration and Precursor Emissions

Metric	Precursor	Precursor Emissions	TCEQ Calculated MERP (tons per year)
Annual $PM_{2.5}$	NO_x	419.3	56,872
	SO_2	117.2	34,463
Daily $PM_{2.5}$	NO_x	419.3	15,789
	SO_2	117.2	8,823

As described in the TCEQ Modeling Guidelines, the evaluation includes both direct $PM_{2.5}$ emissions and secondary $PM_{2.5}$ precursor emissions. Direct $PM_{2.5}$ emissions are represented as the modeled impact expressed as a percent of the SIL. Secondary $PM_{2.5}$ emissions are represented with both precursors, NO_x and SO_2, expressed as a percentage of their respective MERP. A value less than 100 percent indicates that the SIL will not be exceeded. The determination of the $PM_{2.5}$ area of impact, where receptor results exceed the SIL, will include secondary formation of $PM_{2.5}$.

$$\left[\frac{Modeled\ value}{SIL} + \frac{NO_x\ Project\ Emissions}{NO_x\ MERP} + \frac{SO_2\ Project\ Emissions}{SO_2\ MERP}\right] * 100 < 100\%$$

Secondary $PM_{2.5}$ will be evaluated as follows for the 24-hour SIL:

$$\left[\frac{Modeled\ value}{SIL} + 0.0398\right] * 100 < 100\%$$

Secondary $PM_{2.5}$ will be evaluated as follows for the annual SIL:

$$\left[\frac{Modeled\ value}{SIL} + 0.0108\right] * 100 < 100\%$$

If a cumulative NAAQS analysis is required, the total concentration will include secondary formation of $PM_{2.5}$ as follows:

$$Background\ concentration + modeled\ value + \left[\frac{NO_x\ Project\ Emissions}{NO_x\ MERP} + \frac{SO_2\ Project\ Emissions}{SO_2\ MERP}\right] * SIL < NAAQS$$

3.6 PRE-CONSTRUCTION MONITORING

PSD review may require projects to conduct pre-construction ambient monitoring to characterize existing ambient air quality. However, if dispersion model predicted impacts are less than EPA's Monitoring *De Minimis* Concentrations (also called SMCs), as shown in Table 7, pre-construction monitoring would be waived.

Preliminary modeling shows that Project impacts will be below the SMCs for all pollutants. The DC Circuit Court vacated the $PM_{2.5}$ SMC in its 2013 ruling (Sierra Club vs. EPA), ruling that the EPA could not waive the pre-construction monitoring requirement for $PM_{2.5}$. Subsequent EPA guidance indicates that existing air quality monitoring data, if deemed representative, can be used to satisfy pre-construction monitoring requirements.

Table 7. Monitoring *De Minimis* Levels

Pollutant	Averaging Period	Monitoring *De Minimis* Concentration ($\mu g/m^3$)
NO_2	Annual	14
PM_{10}	24-hour	10
CO	8-hour	575
$PM_{2.5}$	24-hour	--[a]
Ozone	8-Hour	--[b]
SO_2	24-Hour	13

Notes:

[a] Per Sierra Club vs. EPA, the pre-construction requirement cannot be waived for $PM_{2.5}$.

[b] Ozone ambient impact analysis is required, including pre-construction monitoring, when the project proposes a net emission increase of 100 tpy or more of NO_x or VOCs.

Based on preliminary modeling, it is expected that the modeled impact for the specified averaging periods for the pollutants subject to PSD review for the Project will be less than the applicable PSD monitoring *de minimis* concentrations listed in Table 7, and pre-construction monitoring will not be required for these pollutants.

Existing representative monitoring data are available for the Project as discussed in Section 3.7.3. Therefore, in lieu of gathering pre-construction monitoring data for background ambient air concentrations, the observed concentration data from local and regional ambient air quality monitors presented in Table 8 are proposed. The AQA will provide the comparison to SMCs.

Since O_3 precursor NO_X and VOC emissions are greater than 100 tpy, pre-construction O_3 monitoring and an O_3 impact analysis is required. Existing TCEQ monitoring data will be used to satisfy the preconstruction monitoring requirement, as discussed in Section 3.7.3.4. The O_3 impact analysis is discussed in Section 3.4.

Table 8. Representative Ambient Air Background Monitors and Data

Pollutant	Averaging Time	Monitor	Location	Background Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	1-hour	AQS ID 48-029-052	Camp Bullis, San Antonio, TX (Bexar County)	26.95	188
	Annual			3.37	100
$PM_{2.5}$	24-hour	AQS ID 48-135-1014	Odessa, TX (Ector County)	19	35
	Annual			7.5	9
PM_{10}	24-hour	AQS ID 48-029-1087	San Antonio Bulverde Parkway (Bexar County)	127	150
O_3	8-hour	AQS ID 48-453-0020	Austin-Round Rock, TX	0.0677 ppbv	0.07 ppmv

Notes: *ppbv = parts per billion by volume; ppmv = parts per million by volume*

3.7 CLASS II IMPACT ANALYSIS

3.7.1 NAAQS Impact Analysis

If the Project exceeds one or more of the SILs, additional modeling impact analyses will be conducted and will include emissions from the Project, emissions from off-site sources within the ROI, and background concentrations. Based upon preliminary modeling, it appears that the Project could require additional modeling impact analysis for NO_X, $PM_{2.5}$, and PM_{10} for all averaging periods.

Off-site sources will be selected from an inventory provided by TCEQ within 50 km of the Project site, as further discussed in Section 3.7.4. These will be modeled together and evaluated with appropriate ambient background concentrations to determine overall air quality impacts.

As has been accepted by the EPA (EPA, 1989), the Project's significant receptors that are located on the property of an off-site source will not consider the contributions of that off-site source. In accordance with this procedure, modeling will be first be completed for: 1) all significant receptors, except those located within the off-site sources being included in the model, with emissions from the Project plus all off-site sources; and then 2) the Project's significant receptors that are located within off-site sources being included in the model, with emissions from the Project and all sources, except for that off-site source.

It is expected that this additional modeling impact analysis may be required for NO_2, PM_{10}, and $PM_{2.5}$ for all averaging periods.

3.7.2 PSD Increment Compliance Analysis

If the Project exceeds one or more of the SILs (which could occur for NO_2, PM_{10}, and $PM_{2.5}$ for all averaging periods), a PSD increment compliance assessment will be required. Major source actual emission changes that occur after the major source baseline date affect the amount of available increment. The major source baseline dates are: January 6, 1975 for PM; January 6, 1975 for SO_2; February 8, 1988 for NO_2; and October 20, 2010 for $PM_{2.5}$.

A PSD increment is the maximum increase in ambient concentrations allowed to occur above a baseline concentration for a pollutant. For the PSD Increment analysis, PSD Increment-consuming emission sources in the area near the Project will be modeled with the proposed Project sources to demonstrate compliance with PSD increments.

A PSD increment consumer is defined as: 1) any new major stationary source that has been constructed since, or any existing major stationary source that has been modified after the major source baseline date; and 2) any new stationary source that has been constructed, or any existing stationary source that has been modified after the minor source baseline date. For a given pollutant, the major source baseline date is the date after which actual emissions associated with construction at major stationary sources consumes the available PSD increment. Increases or decreases in actual emissions at major sources after the major source baseline date as a result of construction of a new source, a physical or operational change (i.e., modification) to an existing source, or shutdown of an existing source affect the available Increment and must be included in an increment analysis.

If required, Westline will complete a full impacts PSD increment modeling analysis in accordance with procedures outlined in TCEQ's Modeling Guidelines. As a conservative estimate, the off-site source inventory used for the NAAQS evaluation may be used for the PSD increment modeling rather than refining the inventory emissions increases and decreases since the applicable baseline date. Off-site sources will be selected from an inventory provided by TCEQ within 50 km of the Project Site, as further discussed in Section 3.7.4.

The predicted short-term impacts will be reported as the maximum H2H modeled concentrations at any receptor of the five years of meteorological data. For annual averaging times, the predicted impacts will be reported as the maximum H1H concentration at any receptor for each year based on five years of meteorological data.

3.7.3 Ambient Background Monitor Selection

Ambient background monitors are proposed for NO_2, $PM_{2.5}$, PM_{10}, and O_3, as further discussed below. There are no monitors in Tom Green County or in any adjacent counties for the pollutants listed above. Therefore, monitors in Bexar, Travis, or Ector counties in Texas are proposed for specific pollutants.

3.7.3.1 NO_2 Ambient Monitor Selection

The Hobbs, New Mexico monitor and Camp Bullis, Texas monitors are both around 270 km from the Project site. However, the area around the Hobbs monitor is dominated by oil and gas activities. This is not the case in Tom Green County, which has a mixture of industries, such as healthcare, manufacturing, oil and gas, and agriculture. The Camp Bullis monitor is located near the San Antonio area, which has a mixture of multiple industries that appears to better represent the area near the Project. As shown in Table 9 below, the population near the Camp Bullis monitor (i.e., Bexar County) is much greater than that near the Project. Therefore, NO_2 concentrations at the Camp Bullis monitor are a conservative representation of background concentrations near the Project. The Camp Bullis monitor (AQS ID 48-029-052) is proposed for NO_2 background concentrations. Table 9 presents a justification analysis for the Camp Bullis monitor for use as representative for the Project Site, comparing the point source and overall emissions in each of the counties and the populations of each county. The Camp Bullis monitor meets the data completeness criterion of 75 percent.

Note that the monitors near Killeen and Austin, Texas do not have valid design values for 1-hour NO_2 standards.

Table 9. NO_2 Background Monitor Justification Analysis

Location	Distance to Project (km)	NO_x Emissions (tpy)		Population[c]
		Point Sources within County	All Sources Within County	
Project	N/A	5.18[a]	2,188[b]	120,003 Tom Green County
Hobbs, NM Monitor AQS ID 35-025-008	274	10,693[b]	32,710[b]	74,455 Lea County
Camp Bullis, San Antonio, TX Monitor AQS ID 48-029-052	271	10,355[a]	23,663[b]	2,009,324 Bexar County

Notes:
a. 2024 TCEQ Point Source Emissions Inventory
b. 2020 Emissions from National Emission Inventory
c. 2020 Population.

For the 1-hour average NO_2 background concentration, the most recent three-year average (2023 to 2025) of the annual 98th percentile daily maximum 1-hour concentration is proposed for the NAAQS compliance demonstration. For the annual average NO_2 NAAQS background concentration, the most recent three-year average (2023 to 2025) of the annual monitoring concentration from the most recent complete year of the annual averaging time is proposed. The resulting proposed background concentrations are presented in Table 8 (Section 3.6).

3.7.3.2 $PM_{2.5}$ Ambient Monitor Selection

The Odessa, Texas monitor in Ector County (AQS ID 48-135-1014) is proposed as the representative background monitor for $PM_{2.5}$ background concentrations. This monitor is located in an area primarily driven by oil and gas-related activities. That is not the case in Tom Green County, which has a mixture of various industries. However, the monitor is the closest to the Project and can provide a conservative representation of background concentrations. Table 10 below presents a justification analysis for the Odessa monitor for use as representative for the Project Site, comparing the point-source and overall emissions in each of the counties and the populations of each county. The Odessa monitor meets the data completeness criterion of 75 percent.

Table 10. $PM_{2.5}$ Background Monitor Justification Analysis

Location	Distance to Project (km)	$PM_{2.5}$ Emissions (tpy)[a]		Population[b]
		Point Sources within County	All Sources Within County	
Project	N/A	22	1,275	120,003 Tom Green County
Odessa Monitor	165	200	889	165,171 Ector County

Notes:
a. 2020 Emissions from National Emission Inventory
b. 2020 Population.

For the 24-hour average $PM_{2.5}$ background concentration, the most recent three-year average (2023 to 2025) of the annual 98th percentile of the daily concentrations is proposed for the NAAQS compliance demonstration. For the annual average $PM_{2.5}$ NAAQS background concentration, the most recent three-year average (2023 to 2025) of the annual concentrations is proposed. The resulting proposed background concentrations are presented in Table 8 (Section 3.6).

3.7.3.3 PM_{10} Ambient Monitor Selection

The San Antonio Bulverde Parkway monitor (AQS ID 48-029-1087) in Bexar County is proposed for PM_{10} background concentrations. Table 11 presents a justification analysis for the San Antonio Bulverde Parkway monitor for use as representative for the Project site, comparing the point-source and overall emissions in each of the counties and the populations of each county. The San Antonio Bulverde Parkway monitor meets the data completeness criterion of 75 percent for years 2024 and 2025. However, does not seem to satisfy the completeness requirement for 2023. The closest monitors that seem to satisfy the completeness criterion for 2023 seem to be in Harris or El Paso counties. However, both counties are significantly farther from Tom Green County, and the background concentrations in those counties would not represent the Project site. Therefore, the San Antonio Bulverde Parkway monitor is proposed.

Table 111. PM_{10} Background Monitor Justification Analysis

Location	Distance to Project (km)	PM_{10} Emissions (tpy)[a]		Population[b]
		Point Sources within County	All Sources Within County	
Project	N/A	0.48	7.9	120,003 Tom Green County
San Antonio Bulverde Parkway Monitor	284	614	722	2,009,324 Bexar County

Notes:
a. 2024 TCEQ Point Source Emissions Inventory
b. *2020 Population*

As shown in Table 11, the population of Bexar County is much greater than those near the Project and the emissions are also much higher. Therefore, PM_{10} concentrations at the San Antonio Bulverde Parkway monitor are a conservative representation of background concentrations near the Project.

For the 24-hour average PM_{10} background concentration, the most recent three-year average (2023 to 2025) of the highest second-high daily concentrations is proposed for the NAAQS compliance demonstration. The resulting proposed background concentration is presented in Table 8 (Section 3.6).

3.7.3.4 O_3 Ambient Monitor Selection

The Austin Round Rock, Texas monitor (AQS ID 48-453-0020) is proposed for ozone background concentrations. Table 12 presents a justification analysis for the Austin Round Rock monitor vs. the Project site, comparing NO_x and VOC emissions from point sources and overall emissions in each of the counties, and the populations of each county. The monitor meets the data completeness criteria of 75%.

Table 122. Ozone Background Monitor Justification Analysis

Location	Distance to Project (km)	NO_x Emissions (tpy)		VOC Emissions (tpy)		Population[b]
		Point Sources within County	All Sources Within County	Point Sources within County	All Sources Within County	
Project	N/A	N//A[a]	N/A[a]	0.0694[a]	0.6594[a]	120,003 Tom Green County
Austin Round Rock Monitor	283	0.0642[a]	0.0642[a]	83[a]	95[a]	1,290,188 Travis County

Notes:
a. 2024 TCEQ Point Source Emissions Inventory
b. *2020 Population*

As shown in Table 12, the population of Travis County is much greater than that near the Project; therefore, O_3 concentrations at the Austin Round Rock monitor are a conservative representation of background concentrations near the Project.

For the O_3 background concentration, the most recent three-year average (2023 to 2025) of the fourth-highest 8-hour values is proposed. The resulting proposed background concentration is presented in Table 8 (Section 3.6).

3.7.4 Off Property Source Identification

Emission and source parameters for off-site sources within the modeling domain have been obtained from TCEQ through an initial request, and available information from other TCEQ documentation or standard assumptions will be used to fill in data gaps. Sources provided by TCEQ and intended to be evaluated for use in the off-property modeling assessment are shown in Appendix C. To determine which of the provided off-site sources are included in the modeling, the "20D" approach may be used, whereby off-site sources whose potential allowable emissions (in tpy) are less than 20 times the distance (in km) between the off-site source in question and the Project may be excluded from modeling. The 20D approach screens off-property sources on the likelihood of a substantial impact from other facilities based the quantity of emissions and their distance from the site, but does not imply if other facilities' impacts are accounted for in ambient monitoring data. Therefore, the 20D analysis is proposed for both the NAAQS impact and the PSD increment compliance analysis. If the results of the NAAQS impact analysis are above applicable increments, the off-property source data may undergo further refinement. When available, actual emission rates may replace allowable emission rates. Furthermore, emission rates may be updated to represent the difference between emissions in the two years preceding the baseline date to the emissions from the two years preceding the modeling effort.

3.7.4.1 Data Requested and Received from TCEQ

A request was made on May 18, 2026 for both NAAQS and PSD increment sources for all averaging times for NO_x, $PM_{2.5}$, and PM_{10}. A summary of the data received from TCEQ is provided in Appendix C. Westline is not aware of other sources located within the 50-km study area.

Missing source modeling parameters from Air Permit Allowable Database data may be determined by permit application and/or other details using the TCEQ Records Online system. Where details to support modeling parameters cannot be found, it is assumed that TCEQ standard assumptions will be used.

3.7.4.2 Application of 20D Method

For the sources for which annual emissions were available, the 20D method was applied (Appendix C), as outlined below.

- Facility-wide emissions were predicted using emission rates provided by TCEQ for off-site sources. All sources were conservatively assumed to operate 8,760 hours per year.
- Total facility-wide emissions (in tpy) were compared to 20 times the distance (in km) between the facility in question and the Project.
- For each of the PM_{10} annual, PM_{10} 24-hour, $PM_{2.5}$ 24-hour, $PM_{2.5}$ annual averaging periods, 20D was completed, and all facilities were below the 20D threshold.
- One facility for NO_2 annual was above the 20D threshold.

Therefore, given the distance and limited emissions demonstrated through use of the 20D method, we propose to include only the one facility referenced above in the cumulative modeling analysis, as shown in Table 13.

Table 133. Proposed Off-Property Facilities for Cumulative Modeling Analysis

Pollutant	Averaging Time	Regulated Entity Number	Site	Distance (km)
NO_2	Annual	RN100229467	Mertzon Gas Processing Plant	25.75

Background information regarding sources for modeling assumptions will be included in the AQA.

3.8 TCEQ STATE PROPERTY LINE STANDARD ANALYSIS

TCEQ has implemented a state-specific procedure for evaluation of ground-level concentrations of SO_2, hydrogen sulfide (H_2S), and H_2SO_4. The analysis should include all new and/or modified sources at the Facility. Since Westline is proposing an entirely new facility, all relevant sources will be included in the State Property Line Standard Analysis. Modeled impacts will be compared to the appropriate state standard.

State standards for both SO_2 and H_2S vary by location within Texas. SO_2 standards are determined by county and H_2S standards are determined by using property downwind of the Project Site. For Tom Green County, this analysis defaults to the state's minimum standard. Additionally, since the Project Site is surrounded by largely undeveloped or agricultural land, it is expected that the less stringent H_2S standard will be applicable. Both standards are based on a 30-minute averaging time. However, since preferred models used for regulatory demonstrations typically have a minimum of 1-hour averaging time, the modeled impacts from with a 1-hour averaging time may be used. H_2SO_4 is based on a 1-hour and 24-hour averaging time. This analysis has been completed and submitted with the application.

3.9 HEALTH EFFECTS ANALYSIS

TCEQ has also implemented a state-specific procedure to evaluate off-property, ground-level concentrations of pollutants that do not have a federal or state-level standard. These pollutants are compared against the state's ESLs, which are updated regularly to incorporate new toxicology data. Westline will conduct the health effects analysis according to TCEQ's MERA guidance (TCEQ, 2019a). If there is a net increase of any pollutant listed in the Texas Air Monitoring Information System, a series of screening steps must be completed. This begins by comparing emission rates from both routine production and planned maintenance, startup, and shutdown activities to state *de minimis* levels. If neither the Project's emission rates nor estimated concentrations are below applicable guidance thresholds, refined modeling may be required. This analysis has been completed and submitted with the application.

4. Additional Impacts Analysis

In accordance with federal PSD regulations, additional impacts must be addressed for projects subject to PSD review. The additional PSD impact analyses involving modeling are discussed below.

4.1.1 PSD Class I Area Impact Analysis

Class I Areas are locations that are designated with additional protections under the PSD provisions of the Clean Air Act due to special natural, scenic, recreational, or historic interest to the public. The closest Class I Areas to the Project are Big Bend National Park, Guadalupe Mountains Wilderness Area, and Carlsbad Caverns National Park, which are all located over 300 km from the Project Site (Figure 4). TCEQ requires Class I Area evaluations if a PSD source is less than 100 km from a Class I Area.

There are no PSD Class I Areas within either 100 km or 300 km of the proposed Site. The nearest PSD Class I areas to the Site are Big Bend National Park (300.38 km), Carlsbad Caverns National Park (363.03 km), and Guadalupe Mountains National Park (393.23 km) from the Project site. Therefore, no further impact analysis is required due to the proximity of PSD Class I Areas.

In October 2010, the *Federal Land Managers Air Quality-Related Values (AQRV) Workgroup (FLAG) Phase I Report – Revised* was issued (National Park Service 2010), which established a threshold ratio of emissions to distance (the 10 D Rule), below which AQRV review is not required. Specifically, if

$$Q/d < 10, \text{ no AQRV analysis is required,}$$

Where "Q" is the emissions increase of SO_2, NO_X, PM_{10}, and H_2SO_4, combined, in tpy and based on the maximum 24-hour emission rates, and "d" is the nearest distance to a Class I Area in km. A resulting value less than 10 presumes no adverse impact; therefore, there is no need for a Class I AQRV analysis. If the result is 10 or greater, a Class I AQRV analysis is required.

Table 14 provides a summary of values for the Project based on normal operation for 8,760 hours per year using 24-hour emission rates. Note that this overstates the annual emissions associated with the Project, which will be limited in accordance with its permit, once approved.

Table 144. Project Emissions Summary for Q/d Analysis

Pollutant	Maximum 24-Hour Emission Rate (pounds/hour)	Projected Annual Emissions Based on Maximum 24-Hour Emissions (tpy)
SO_2	27.03	118.37
NO_X	146.79	642.94
PM_{10}	147.78	647.27
H_2SO_4	4.04	17.72
	Total	**1,426.30**

Table 15 shows the calculation for Class I Areas closest to the Project.

Table 155. Project Q/d Analysis

Class I Area	Q (tpy)	Distance (km)	Q/d
Big Bend National Park	1,426.30	300.38	4.75
Guadalupe Mountains Wilderness Area	1,426.30	393.23	3.63
Carlsbad Caverns National Park	1,426.30	363.03	3.93

Therefore, additional Class I impact analysis is not expected to be required.

4.1.2 Soils and Vegetation Analysis

EPA developed the secondary NAAQS to protect certain AQRVs (i.e., soil and vegetation). The secondary NAAQS for which modeling comparisons will be provided (Table 16) represent ambient air concentrations below which most types of soils and vegetation are unaffected by criteria pollutants. If the predicted ambient air concentrations are less than the secondary NAAQS, emissions from proposed sources are presumed to not result in harmful effects to either soil or vegetation. If the predicted ambient concentrations of speciated compounds (e.g., speciated PM or speciated VOCs), if any, are acceptable per the TCEQ Health Effects Evaluation, the sources are presumed to not result in adverse effect on the environment, including on soils and vegetation.

Table 166. Secondary NAAQS

Pollutant	Averaging Time	Level	Form
NO_2	Annual	100 µg/m^3	Annual mean
$PM_{2.5}$	Annual	15.0 µg/m^3	Annual mean, averaged over three years
	24 hours	35 µg/m^3	98th percentile, averaged over three years
PM_{10}	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over three years
SO_2	3 hours	1,300 µg/m^3	Not to be exceeded more than once per year
	Annual	10 ppb	Not to be exceeded more than once per year on average over three years
O_3	8-hour	137 µg/m^3	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years

Note: *ppb = parts per billion*

4.1.3 Visibility Impairment Analysis

The Project, located in a Class II area, will comply with the visibility and opacity requirements in 30 TAC Chapter 111, and no additional visibility impairment analysis for Class II areas is planned.

4.1.4 Growth

The growth analysis considers potential industrial, commercial, and residential development in the area of impact. While the Project may generate incremental economic activity, any associated growth is expected to remain consistent with Tom Green County's Comprehensive Plan and its steady, diversified economic trajectory. Operational staffing will be drawn from the existing regional workforce; therefore, no material residential expansion is anticipated. Any indirect commercial or industrial activity is expected to be limited in scale and within the County's projected growth patterns and will have a limited impact with emissions.

5. References

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3. Texas Commission on Environmental Quality, 2018. Air Permit Reviewer Reference Guide APDG 5874v5. Modeling and Effects Review Applicability (MERA) Air Permits Division, Texas Commission on Environmental Quality. March.

4. Texas Commission on Environmental Quality, 2019. Air Quality Modeling Guidelines APDG 6232v4. Air Permits Division, Texas Commission on Environmental Quality. November.

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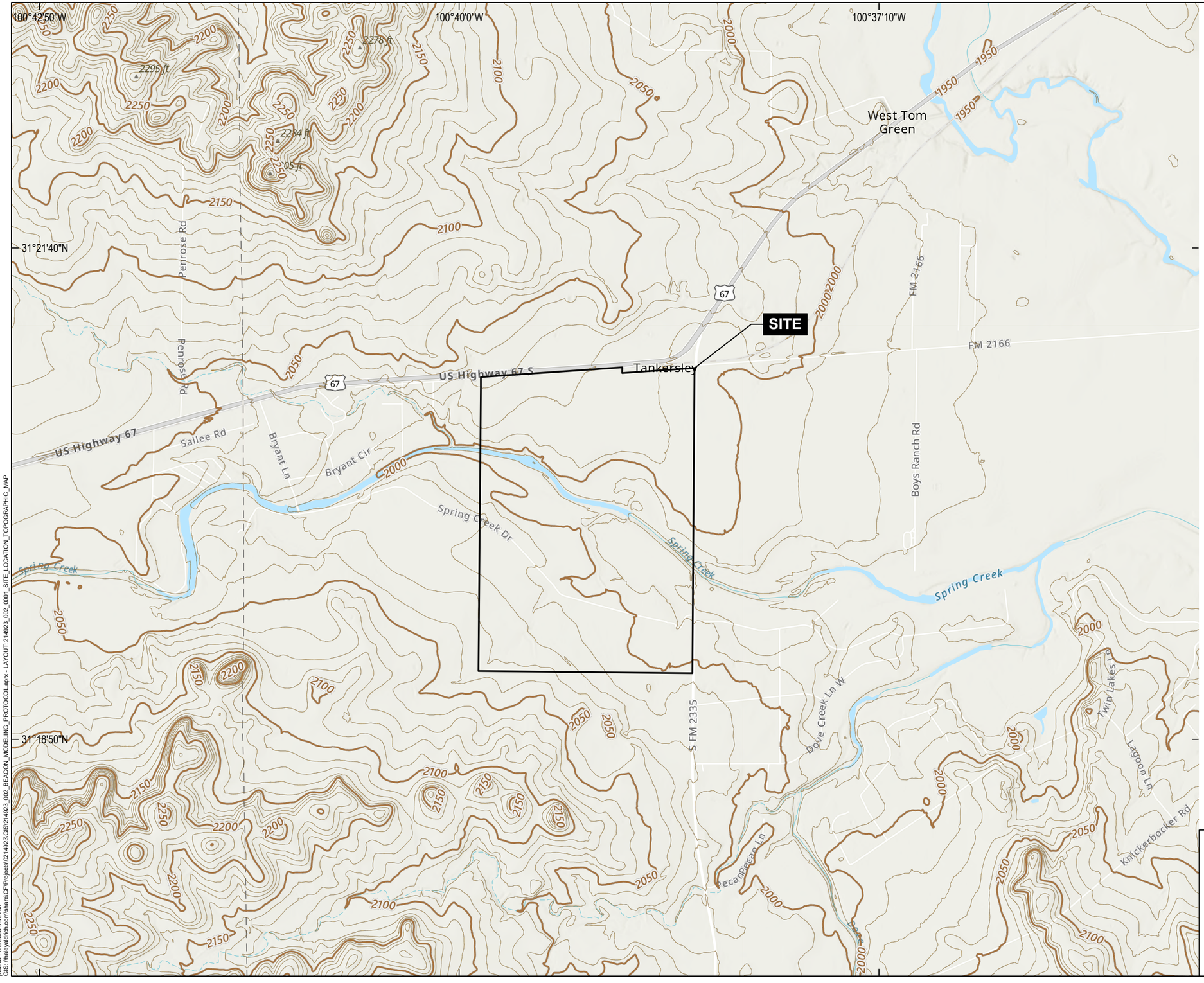
16. U.S. Environmental Protection Agency, 2019b. *Revised Policy on Exclusions from "Ambient Air."* Andrew R. Wheeler, EPA Administrator to Regional Administrators. December 2.

17. U.S. Environmental Protection Agency, 2020. National Emissions Inventory. https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei. Updated May 26, 2023.

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FIGURES



LEGEND

- TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. TOPOGRAPHIC CONTOURS SOURCE: U.S. GEOLOGICAL SURVEY (USGS), THE NATIONAL MAP ELEVATION CONTOURS SERVICE
3. TOPOGRAPHIC MAP SOURCE: ESRI

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0 4,000 8,000
SCALE IN FEET

HALEY ALDRICH

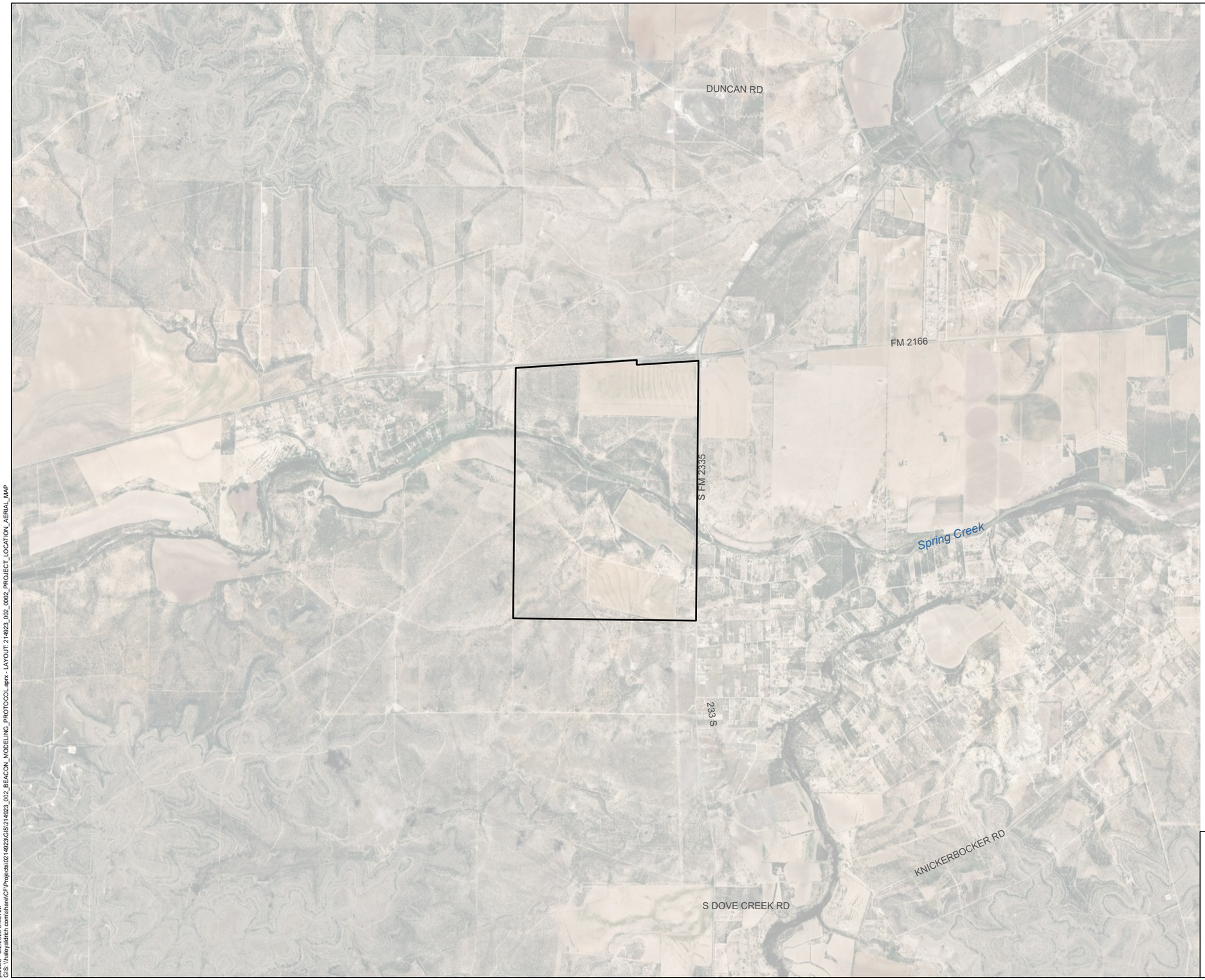
WESTLINE 2335
TOM GREEN COUNTY, TEXAS

PROJECT LOCATION, TOPOGRAPHIC MAP

JUNE 2026

FIGURE 1

pdfinfo - 6/2/2026 9:42 AM
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LEGEND

SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: GOOGLE EARTH

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SCALE IN FEET

HALEY ALDRICH

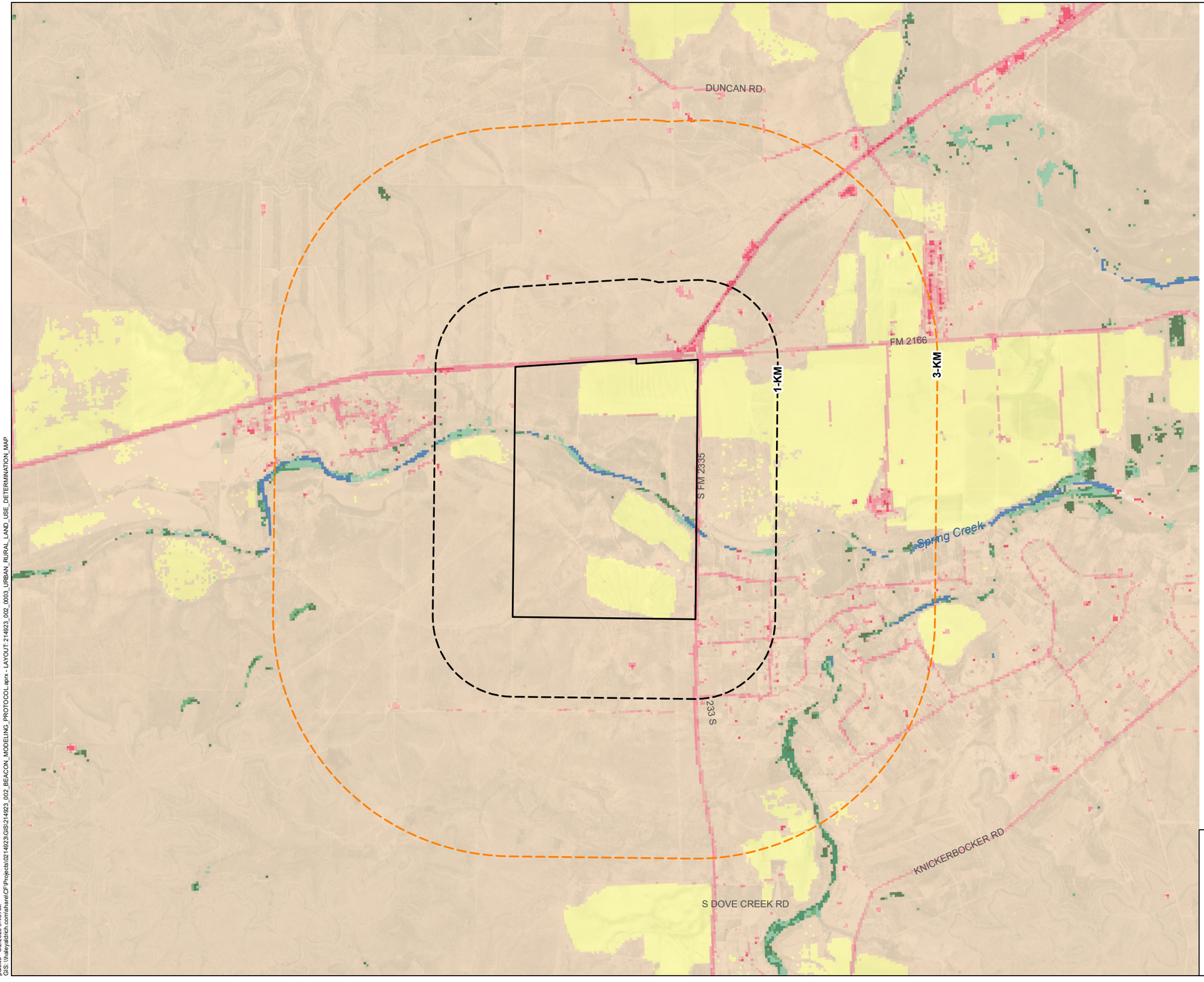
WESTLINE 2335
TOM GREEN COUNTY, TEXAS

PROJECT LOCATION, AERIAL MAP

JUNE 2026

FIGURE 2

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LEGEND

- 1-KM BUFFER OF SITE BOUNDARY
- 3-KM BUFFER OF SITE BOUNDARY
- SITE BOUNDARY

LAND USE/LAND COVER CLASSIFICATION

- Open Water
- Developed Open Space
- Developed Low Intensity
- Developed Medium Intensity
- Developed High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. LAND USE DATA SOURCE: USGS NLCD, 2024
3. AERIAL IMAGERY SOURCE: GOOGLE EARTH

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SCALE IN FEET

HALEY ALDRICH

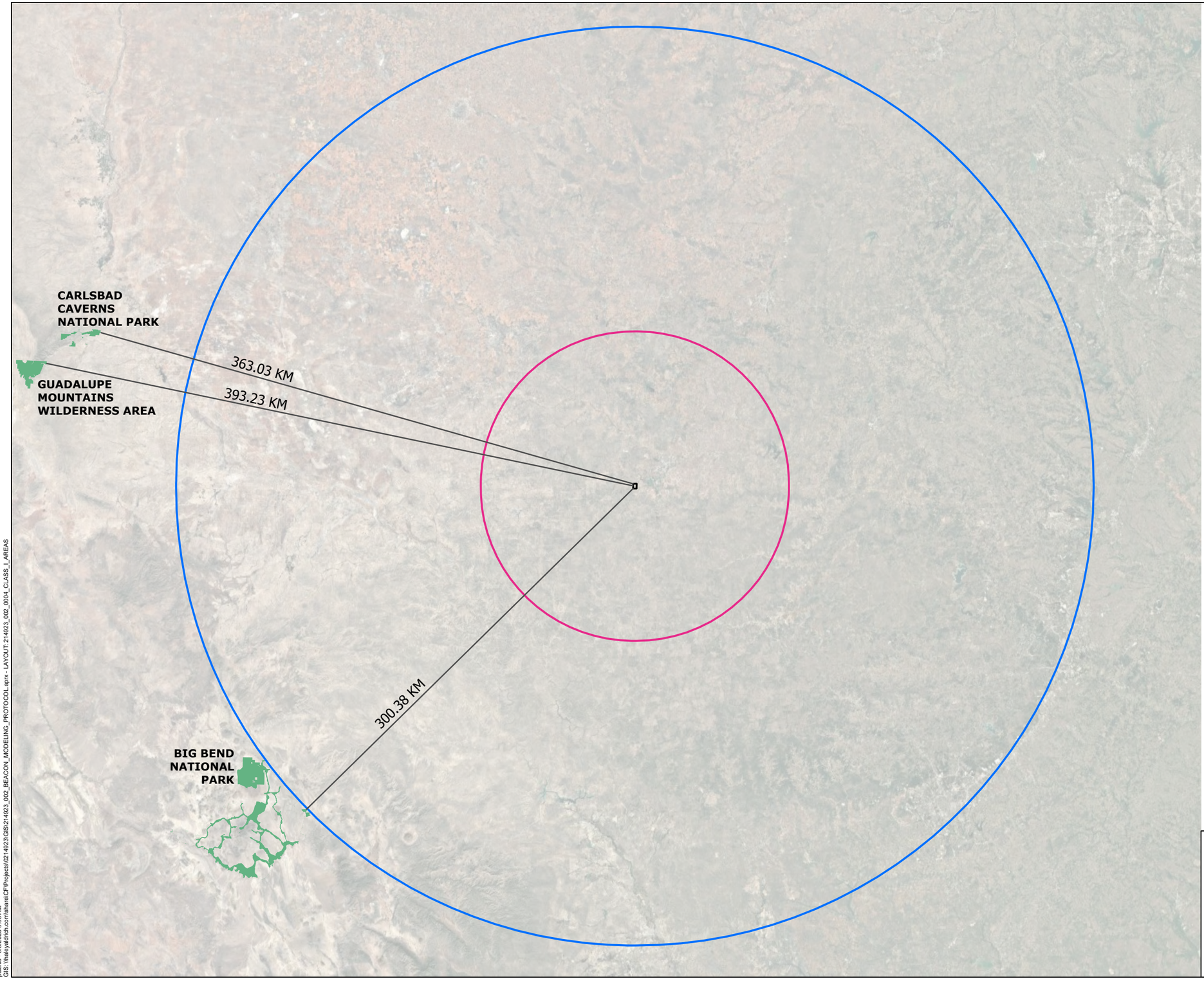
WESTLINE 2335
TOM GREEN COUNTY, TEXAS

URBAN/RURAL LAND USE DETERMINATION MAP

JUNE 2026

FIGURE 3

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GIS: \\haleyaldrich.com\share\CF\Projects\021423\GIS\214923_002_BEACON_MODELING_PROTOCOL.aprx - LAYOUT: 214923_002_0003_URBAN_RURAL_LAND_USE_DETERMINATION_MAP



LEGEND

- SITE BOUNDARY
- 100 KILOMETER BUFFER
- 300 KILOMETER BUFFER
- CLASS I AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. CLASS I AREA SOURCE: USGS, GAP ANALYSIS PROJECT (GAP), PROTECTED AREAS DATABASE OF THE UNITED STATES (PAD-US)

3. AERIAL IMAGERY SOURCE: GOOGLE EARTH

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0 210,000 420,000

SCALE IN FEET

HALEY ALDRICH

WESTLINE 2335
TOM GREEN COUNTY, TEXAS

CLASS I AREAS

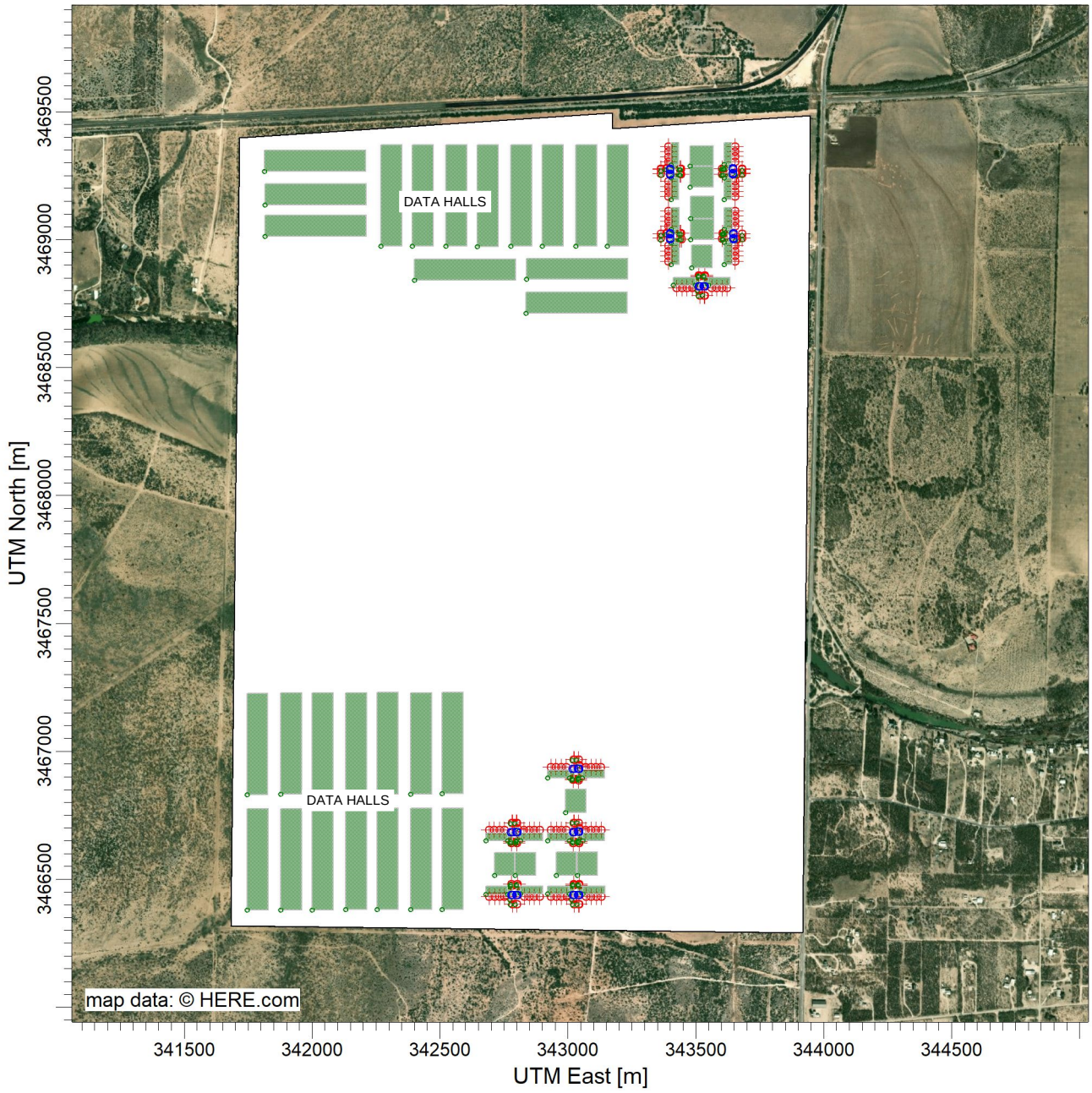
JUNE 2026

FIGURE 6

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PROJECT TITLE:

Westline 2335
Site Layout



COMMENTS:

Westline 2335

Figure 5

SCALE: 1:25,000

0 1 km

HALEY ALDRICH

PROJECT NO.:

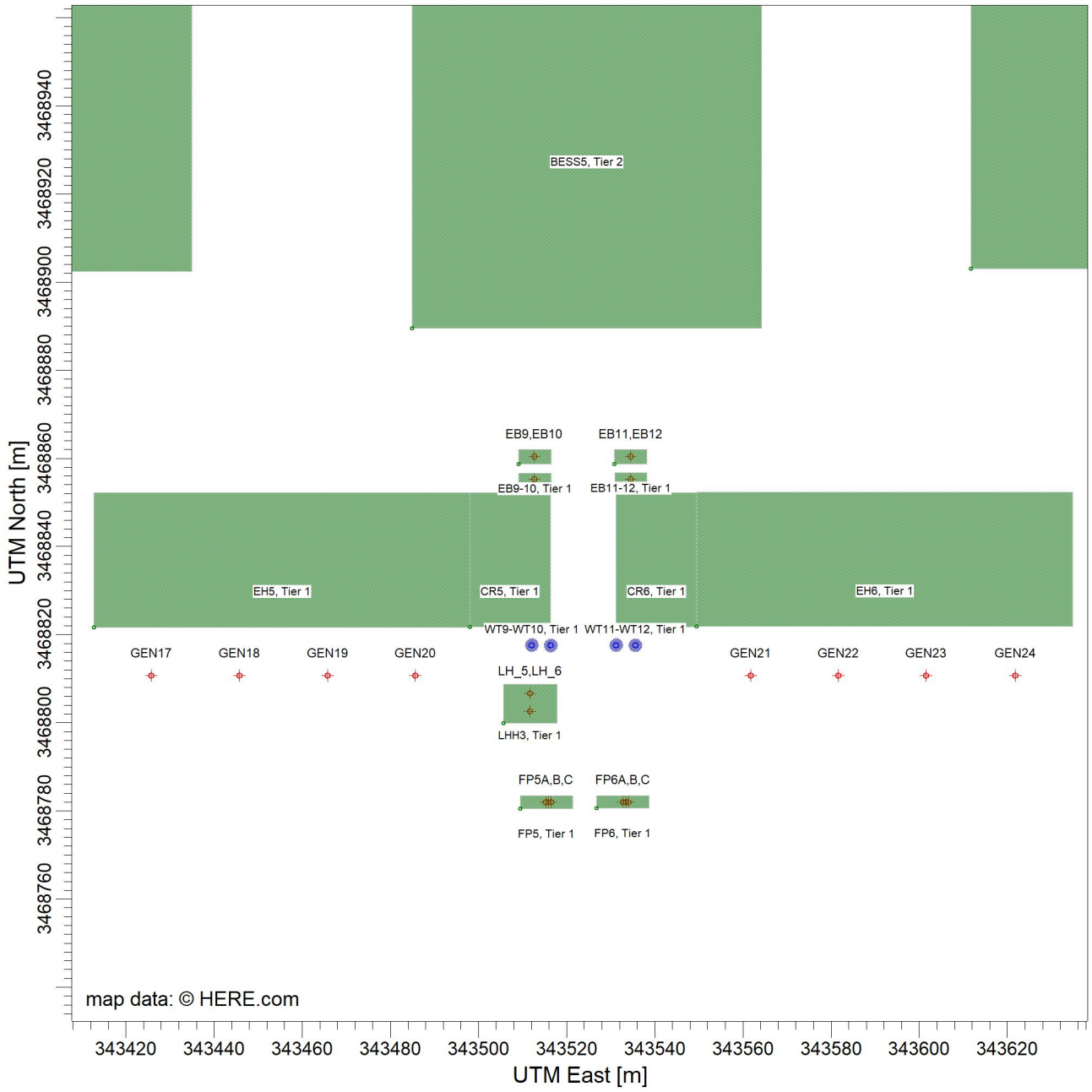
0214923-002

AERMOD View - Lakes Environmental Software

D:\Beacon\State Property Line\SPL_H2SO4_1-HR\SPL_H2SO4_1-HR.isc

PROJECT TITLE:

Westline 2335
Site Layout Detail



COMMENTS:

Westline 2335

Figure 6

SCALE: 1:1,450

0 0.05 km

PROJECT NO.:

0214923-002

APPENDIX A
Emissions and Stack Parameter Data

APPENDIX A: EMISSION AND STACK PARAMETER DATA

MODELING PARAMETERS - BERGEN ENGINES

INFORMATION IS FOR EACH ENGINE

Operating Case		Case 1	Case 2	Start Up	Shutdown
Case Description		Load 100%	Load 75%		
Stack Parameters					
Stack Height (m)	m	54.86	54.86	54.86	54.86
Stack Diameter (m)	m	1.2	1.2	1.2	1.2
Stack Temperature (^{o}F)	°F	653	725	653	653
exhaust vol flow (1-hr) (acfm)	acfm	72,177	57,641	57,641	57,641
exhaust vol flow (24-hr) (acfm)	acfm	72,177	57,641	71,874	71,874
exhaust vol flow (annual) (acfm)	acfm	72,177	57,641	72,171	72,171
Max Hourly Emission Rates (lb/hr)		.			
NO_2		0.43	0.33	0.0023	0.000030
CO		1.30	0.98	7.35	1.44
SO_2		0.13	0.10		
PM_{10}		0.73	0.60		
$PM_{2.5}$		0.73	0.60		
8- Hr Average Emission Rates (lb/hr)					
NO_2		0.43	0.33		
CO		1.30	0.98	2.06	1.32
SO_2		0.13	0.10		
PM_{10}		0.73	0.60		
$PM_{2.5}$		0.73	0.60		
24- Hr Average Emission Rates (lb/hr)					
NO_2		0.43	0.33		
CO		1.30	0.98		
SO_2		0.13	0.10		
PM_{10}		0.73	0.60	0.80	0.73
$PM_{2.5}$		0.73	0.60	0.80	0.73
Annual Average Emission Rates (lb/hr)					
NO_2		0.43	0.33	0.44	0.438
CO		1.30	0.98		
SO_2		0.13	0.10		
PM_{10}		0.73	0.60	0.731	0.731
$PM_{2.5}$		0.73	0.60	0.731	0.731
Hourly Emission Rates (g/s)					
NO_2		0.05	0.04	0.00029	0.0000038
CO		0.16	0.12	0.93	0.18
SO_2		0.02	0.01		
PM_{10}		0.09	0.08		
$PM_{2.5}$		0.09	0.08		
8- Hr Average Emission Rates (g/s)					
NO_2		0.05	0.04		
CO		0.16	0.12	0.26	0.17
SO_2		0.02	0.01		
PM_{10}		0.09	0.08		
$PM_{2.5}$		0.09	0.08		
24- Hr Average Emission Rates (g/s)					
NO_2		0.05	0.04		
CO		0.16	0.12		
SO_2		0.02	0.01		
PM_{10}		0.09	0.08	0.101	0.092
$PM_{2.5}$		0.09	0.08	0.101	0.092
Annual Average Emission Rates (g/s)					
NO_2		0.05	0.04	0.06	0.06
CO		0.16	0.12		
SO_2		0.02	0.01		
PM_{10}		0.09	0.08	0.092	0.092
$PM_{2.5}$		0.09	0.08	0.092	0.092

Notes

Modeling will include 200 Bergen engines operating concurrently.

m = meter

^{o} F = degrees Fahrenheit

lb = pound

h = hour

acfm = actual cubic feet per minute

APPENDIX A: EMISSION AND STACK PARAMETER DATA

MODELING PARAMETERS - ANCILLARY EQUIPMENT

INFORMATION IS FOR EACH PIECE OF EQUIPMENT

Equipment Use		Start Up	Emergency	Emergency	Full time oepration
Ancillary Equipment	**Units**	**Engine Heater**	**EG or Blk Start**	**Emergency Fire Pump**	**Line Heaters**
Single Stack Parameters					
Stack Height	m	18.3	15	15	15.0
Stack Diameter	m	0.36	0.381	0.1	0.5
Stack Temperature	K	350.0	749.6	738.2	773.0
Exit Velocity	m/s	5.8	33.4	30.1	5.0
Exhaust volumetric flowrate	acfm	1222.3	8065.3	520	2078.6
Max Hourly Emission Rates (lb/hr)					
NO_2		0.05	0.16	0.00740	0.05
CO		0.19	7.72	0.69	0.19
SO_2		0.01	0.000186	0.0000116	0.00728
PM_{10}		0.02	0.44	0.056	0.025
$PM_{2.5}$		0.02	0.44	0.056	0.025
8- Hr Average Emission Rates (lb/hr)					
NO_2		0.05	14.19	0.56	0.05
CO		0.19	7.72	0.69	0.19
SO_2		0.01	0.00	0.0000116	0.00728
PM_{10}		0.02	0.44	0.056	0.025
$PM_{2.5}$		0.02	0.44	0.056	0.025
24- Hr Average Emission Rates (lb/hr)					
NO_2		0.05	0.59	0.56	0.05
CO		0.19	0.32	0.69	0.19
SO_2		0.01	0.00	0.000	0.00728
PM_{10}		0.0100	0.0185	0.00231	0.0250
$PM_{2.5}$		0.0100	0.0185	0.002	0.0250
Annual Average Emission Rates (lb/hr)					
NO_2		0.0004	0.162	0.0074	0.05
CO		0.0015	0.08808	0.0078	0.19
SO_2		0.00006	0.00019	0.00001	0.007
PM_{10}		0.00020	0.00506	0.0006	0.0250
$PM_{2.5}$		0.00020	0.00506	0.0006	0.0250
Hourly Emission Rates (g/s)					
NO_2		0.0063	0.0204	0.0009	0.0066
CO		0.0234	0.9722	0.0863	0.0242
SO_2		0.000886	0.000023	0.000001	0.0009
PM_{10}		0.0030	0.0559	0.0070	0.0031
$PM_{2.5}$		0.0030	0.0559	0.0070	0.0031
8- Hr Average Emission Rates (g/s)					
NO_2		0.0063	1.7880	0.0700	0.0066
CO		0.0234	0.9722	0.0863	0.0242
SO_2		0.0009	0.0000	0.0000	0.0009
PM_{10}		0.0030	0.0559	0.0070	0.0031
$PM_{2.5}$		0.0030	0.0559	0.0070	0.0031
24- Hr Average Emission Rates (g/s)					
NO_2		0.0063	0.0745	0.0700	0.0066
CO		0.0234	0.0405	0.0863	0.0242
SO_2		0.0009	0.0000	0.0000	0.0009
PM_{10}		0.0013	0.0023	0.0003	0.0031
$PM_{2.5}$		0.00127	0.0023	0.000292	0.0031
Annual Average Emission Rates (g/s)					
NO_2		0.0001	0.0204	0.0009	0.0066
CO		0.0002	0.0111	0.0010	0.0242
SO_2		0.000007	0.0000	0.0000	0.0009
PM_{10}		0.000025	0.0006	0.0001	0.0031
$PM_{2.5}$		0.000025	0.000638	0.0000799	0.0031

Notes

Modeling will include the following equipment:

40 engine heaters (start up and shutdown only)

20 line heaters

40 emergency generators

60 emergency fire water pumps

m = meter

^{o}F = degrees Fahrenheit

lb = pound

h = hour

acfm = actual cubic feet per minute

APPENDIX B
Structure Data

Building ID	Description	Base Elevation (feet)	Height (feet)	Diameter (feet)	East-West Dimension (feet)	North-South Dimension (feet)
BESS1	Battery Energy Storage System	2018	30	0	295	260
BESS2	Battery Energy Storage System	2018	30	0	295	260
BESS3	Battery Energy Storage System	2018	30	0	295	285
BESS4	Battery Energy Storage System	2018	30	0	295	260
BESS5	Battery Energy Storage System	2014	30	0	260	295
BESS5	Battery Energy Storage System	2014	30	0	260	295
BESS7	Battery Energy Storage System	2014	30	0	260	295
BESS8	Battery Energy Storage System	2014	30	0	260	295
BESS9	Battery Energy Storage System	2014	30	0	260	295
BESS10	Battery Energy Storage System	2014	30	0	260	295
CR1	Control Room	2018	46	0	100	60
CR2	Control Room	2018	46	0	100	60
CR3	Control Room	2018	46	0	100	60
CR4	Control Room	2018	46	0	100	60
CR5	Control Room	2018	46	0	60	100
CR6	Control Room	2018	46	0	60	100
CR7	Control Room	2018	46	0	100	60
CR8	Control Room	2018	46	0	100	60
CR9	Control Room	2018	46	0	100	60
CR10	Control Room	2018	46	0	100	60
CR11	Control Room	2014	46	0	60	100
CR12	Control Room	2014	46	0	60	100
CR13	Control Room	2014	46	0	60	100
CR14	Control Room	2014	46	0	60	100
CR15	Control Room	2014	46	0	60	100
CR16	Control Room	2014	46	0	60	100
CR17	Control Room	2014	46	0	60	100
CR18	Control Room	2014	46	0	60	100
CR19	Control Room	2014	46	0	60	100
CR20	Control Room	2014	46	0	60	100
DH1	Data Hall	2018	31	0	1300	270
DH2	Data Hall	2018	31	0	1300	270
DH3	Data Hall	2018	31	0	1300	270
DH4	Data Hall	2018	31	0	270	1300
DH5	Data Hall	2018	31	0	270	1300
DH6	Data Hall	2018	31	0	270	1300
DH7	Data Hall	2018	31	0	270	1300
DH8	Data Hall	2018	31	0	270	1300
DH9	Data Hall	2018	31	0	270	1300
DH10	Data Hall	2018	31	0	270	1300
DH11	Data Hall	2018	31	0	270	1300
DH12	Data Hall	2018	31	0	1300	270
DH13	Data Hall	2018	31	0	1300	270
DH14	Data Hall	2018	31	0	1300	270
DH15	Data Hall	2014	31	0	270	1300
DH16	Data Hall	2014	31	0	270	1300
DH17	Data Hall	2014	31	0	270	1300

Building ID	Description	Base Elevation (feet)	Height (feet)	Diameter (feet)	East-West Dimension (feet)	North-South Dimension (feet)
DH18	Data Hall	2014	31	0	270	1300
DH19	Data Hall	2014	31	0	270	1300
DH20	Data Hall	2014	31	0	270	1300
DH21	Data Hall	2014	31	0	270	1300
DH22	Data Hall	2014	31	0	270	1300
DH23	Data Hall	2014	31	0	270	1300
DH24	Data Hall	2014	31	0	270	1300
DH25	Data Hall	2014	31	0	270	1300
DH26	Data Hall	2014	31	0	270	1300
DH27	Data Hall	2014	31	0	270	1300
DH28	Data Hall	2014	31	0	270	1300
EB1	EG/Black Start	2018	10	0	11	24
EH1	Engine Hall	2018	46	0	100	280
EB2	EG/Black Start	2018	10	0	11	24
EH2	Engine Hall	2018	46	0	100	280
EB3	EG/Black Start	2018	10	0	11	24
EH3	Engine Hall	2018	46	0	100	280
EB4	EG/Black Start	2018	10	0	11	24
EH4	Engine Hall	2018	46	0	100	280
EB5	EG/Black Start	2018	10	0	11	24
EH5	Engine Hall	2018	46	0	280	100
EB6	EG/Black Start	2018	10	0	11	24
EH6	Engine Hall	2018	46	0	280	100
EB7	EG/Black Start	2018	10	0	11	24
EH7	Engine Hall	2018	46	0	100	280
EB8	EG/Black Start	2018	10	0	11	24
EH8	Engine Hall	2018	46	0	100	280
EB9	EG/Black Start	2018	10	0	24	11
EH9	Engine Hall	2018	46	0	100	280
EB10	EG/Black Start	2018	10	0	24	11
EH10	Engine Hall	2018	46	0	100	280
EB11	EG/Black Start	2018	10	0	24	11
EH11	Engine Hall	2014	46	0	280	100
EB12	EG/Black Start	2018	10	0	24	11
EH12	Engine Hall	2014	46	0	280	100
EB13	EG/Black Start	2018	10	0	11	24
EH13	Engine Hall	2014	46	0	280	100
EB14	EG/Black Start	2018	10	0	11	24
EH14	Engine Hall	2014	46	0	280	100
EB15	EG/Black Start	2018	10	0	11	24
EH15	Engine Hall	2014	46	0	280	100
EB16	EG/Black Start	2018	10	0	11	24
EH16	Engine Hall	2014	46	0	285	100
EB17	EG/Black Start	2018	10	0	11	24
EH17	Engine Hall	2014	46	0	280	100
EB18	EG/Black Start	2018	10	0	11	24
EH18	Engine Hall	2014	46	0	280	100

Building ID	Description	Base Elevation (feet)	Height (feet)	Diameter (feet)	East-West Dimension (feet)	North-South Dimension (feet)
EB19	EG/Black Start	2018	10	0	11	24
EH19	Engine Hall	2014	46	0	280	100
EB20	EG/Black Start	2018	10	0	11	24
EH20	Engine Hall	2014	46	0	280	100
EB21	EG/Black Start	2014	10	0	24	11
EB22	EG/Black Start	2014	10	0	24	11
EB23	EG/Black Start	2014	10	0	24	11
EB24	EG/Black Start	2014	10	0	24	11
EB25	EG/Black Start	2014	10	0	24	11
EB26	EG/Black Start	2014	10	0	24	11
EB27	EG/Black Start	2014	10	0	24	11
EB28	EG/Black Start	2014	10	0	24	11
EB29	EG/Black Start	2014	10	0	24	11
EB30	EG/Black Start	2014	10	0	24	11
EB31	EG/Black Start	2014	10	0	24	11
EB32	EG/Black Start	2014	10	0	24	11
EB33	EG/Black Start	2014	10	0	24	11
EB34	EG/Black Start	2014	10	0	24	11
EB35	EG/Black Start	2014	10	0	24	11
EB36	EG/Black Start	2014	10	0	24	11
EB37	EG/Black Start	2014	10	0	24	11
EB38	EG/Black Start	2014	10	0	24	11
EB39	EG/Black Start	2014	10	0	24	11
EB40	EG/Black Start	2014	10	0	24	11
FP1	Fire pump house	2018	16	0	10	39
FP2	Fire pump house	2018	16	0	10	39
FP3	Fire pump house	2018	16	0	10	39
FP4	Fire pump house	2018	16	0	10	39
FP5	Fire pump house	2018	16	0	39	10
FP6	Fire pump house	2018	16	0	39	10
FP7	Fire pump house	2018	16	0	10	39
FP8	Fire pump house	2018	16	0	10	39
FP9	Fire pump house	2018	16	0	10	39
FP10	Fire pump house	2018	16	0	10	39
FP11	Fire pump house	2014	16	0	39	10
FP12	Fire pump house	2014	16	0	39	10
FP13	Fire pump house	2014	16	0	39	10
FP14	Fire pump house	2014	16	0	39	10
FP15	Fire pump house	2014	16	0	39	10
FP16	Fire pump house	2014	16	0	39	10
FP17	Fire pump house	2014	16	0	39	10
FP18	Fire pump house	2014	16	0	39	10
FP19	Fire pump house	2014	16	0	39	10
FP20	Fire pump house	2014	16	0	39	10
LHH1	Line heater house	2018	10	0	29	40
LHH2	Line heater house	2018	10	0	29	40
LHH3	Line heater house	2018	10	0	40	29

Building ID	Description	Base Elevation (feet)	Height (feet)	Diameter (feet)	East-West Dimension (feet)	North-South Dimension (feet)
LHH4	Line heater house	2018	10	0	29	40
LHH5	Line heater house	2018	10	0	29	40
LHH6	Line heater house	2014	10	0	40	29
LHH7	Line heater house	2014	10	0	40	29
LHH8	Line heater house	2014	10	0	40	29
LHH9	Line heater house	2014	10	0	40	29
LHH10	Line heater house	2014	10	0	40	30
WT10	Water tank	2018	20	10	0	0
WT1	Water tank	2018	20	10	0	0
WT2	Water tank	2018	20	10	0	0
WT3	Water tank	2018	20	10	0	0
WT4	Water tank	2018	20	10	0	0
WT5	Water tank	2018	20	10	0	0
WT6	Water tank	2018	20	10	0	0
WT7	Water tank	2018	20	10	0	0
WT8	Water tank	2018	20	10	0	0
WT9	Water tank	2018	20	10	0	0
WT11	Water tank	2018	20	10	0	0
WT12	Water tank	2018	20	10	0	0
WT13	Water tank	2018	20	10	0	0
WT14	Water tank	2018	20	10	0	0
WT15	Water tank	2018	20	10	0	0
WT16	Water tank	2018	20	10	0	0
WT17	Water tank	2018	20	10	0	0
WT18	Water tank	2018	20	10	0	0
WT19	Water tank	2018	20	10	0	0
WT20	Water tank	2018	20	10	0	0
WT21	Water tank	2014	20	10	0	0
WT22	Water tank	2014	20	10	0	0
WT23	Water tank	2014	20	10	0	0
WT24	Water tank	2014	20	10	0	0
WT25	Water tank	2014	20	10	0	0
WT26	Water tank	2014	20	10	0	0
WT27	Water tank	2014	20	10	0	0
WT28	Water tank	2014	20	10	0	0
WT29	Water tank	2014	20	10	0	0
WT30	Water tank	2014	20	10	0	0
WT31	Water tank	2014	20	10	0	0
WT32	Water tank	2014	20	10	0	0
WT33	Water tank	2014	20	10	0	0
WT34	Water tank	2014	20	10	0	0
WT35	Water tank	2014	20	10	0	0
WT36	Water tank	2014	20	10	0	0
WT37	Water tank	2014	20	10	0	0
WT38	Water tank	2014	20	10	0	0
WT39	Water tank	2014	20	10	0	0
WT40	Water tank	2014	20	10	0	0

APPENDIX C
Off Site Source Information

APPENDIX C: OFF-SITE SOURCE ENVENTORY 20D ANALYSIS

Company	Site	Approximate Distance (km)	Approx distance (miles)	20D	Sum of Facility-Wide Emission Rates lb/hr					
					Total PM-10 Annual Averaging Time	Total PM-2.5 Annual Averaging Time	Total PM-2.5 24-Hour Averaging Time	Total PM-10 24-Hour Averaging Time	Nitrogen Dioxide Annual Averaging Time	Nitrogen Dioxide 1- hour Averaging Time
CARRIZO WOOD PRODUCTS, INC.	CARRIZO WOOD PRODUCTS	19.31	12	386.2416	0.12			0.1		
DARLING INGREDIENTS INC	HTC INDUSTRIES	25.75	16	514.9888	1.19	1.19	0.3	0.3	1.91	0.72
DELEK MARKETING & SUPPLY, LP	DELEK SAN ANGELO TERMINAL	28.97	18	579.3624					3.26	1.41
ENERFIN GAS PROCESSING CORP	SCHEUBER COMP STATION	17.70	11	354.0548					44.1	10.069
ETHICON INC	ETHICON SAN ANGELO PLANT	25.75	16	514.9888	0.63	0.47	1.45	1.59	3.16	9.91
JEFFERSON ENTERPRISE ENERGY LLC	JEFFERSON ENTERPRISE ENERGY	6.44	4	128.7472	0.68	0.68	0.15	0.15		
KNAUF INSULATION INC	MCGREGOR FACILITY	304.17	189	6083.3052	184.41	184.35	42.1	42.11	69.75	15.93
MOBIL PRODUCING TEXAS & NEW	MUNSON RANCH TB	43.45	27	869.0436					0.38	0.0867
SMYRNA READY MIX CONCRETE LLC	INGRAM CONCRETE SAN ANGELO PLANT 1	19.31	12	386.2416	1.96			0.93		
TARGA MIDSTREAM SERVICES LLC	MERTZON GAS PROCESSING PLANT	25.75	16	514.9888	4.7			1.07	219.47	57.87
WALL CO-OPERATIVE GIN	WALL COOPERATIVE GIN PLANT 1	28.97	18	579.3624	12.54	0.77	1.14	18.48	4.09	4.02
WALL CO-OPERATIVE GIN	COTTON GIN AND ELEVATOR	25.75	16	514.9888	1.74	0.33	3.24	19.25		
WEST FRASER WOOD PRODUCTS	ANGELINA FOREST PRODUCTS SAWMILL	3.22	2	64.3736	0.01	0.01	0.01	0.01		
WILDCAT GAS TRANSMISSION CO	VERIBEST GAS PLANT	38.62	24	772.4832					48.8	11.1421
WTG SOUTH PERMIAN MIDSTREAM LLC	BAILEY GAS PROCESSING PLANT	32.19	20	643.736					109.06	24.9006

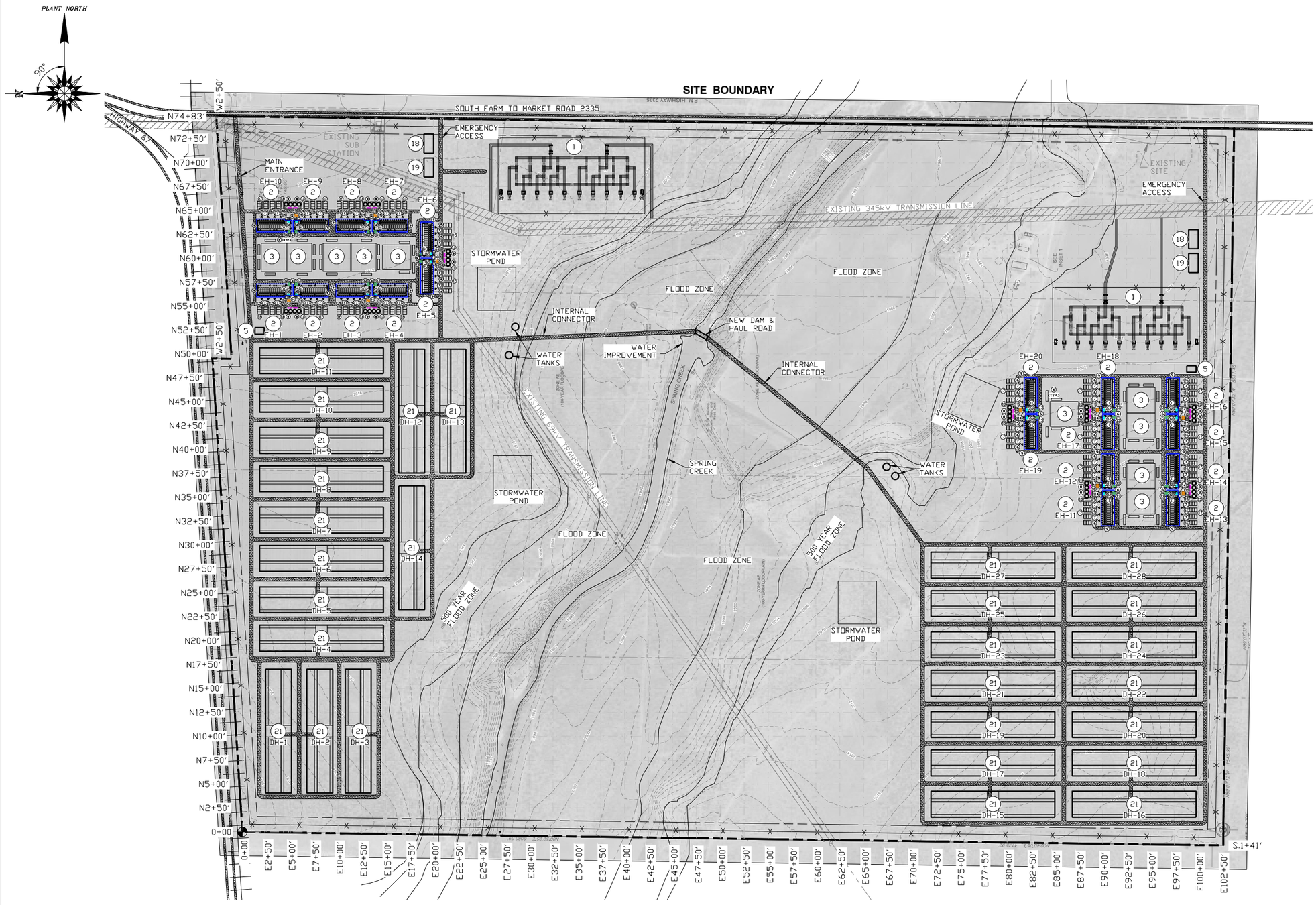
Notes

Location determined by UTM coordinates provided by TCEQ, except for the McGregor Facility which was determined to be located 189 miles away per the TCEQ 2024 Emission Inventory and Google Earth.
km = kilometers
TPY = ton per year

APPENDIX C: OFF-SITE SOURCE ENVENTORY 20D ANALYSIS

Site	Total PM-10 Annual Averaging Time		Total PM-2.5 Annual Averaging Time		Total PM-2.5 24-Hour Averaging Time		Total PM-10 24-Hour Averaging Time		Nitrogen Dioxide Annual Averaging Time		Nitrogen Dioxide 1-hour Averaging Time	
	Facility Emissions TPY	Below 20D?	Facility Emissions TPY	Below 20D?	Facility Emissions TPY	Below 20D?	Facility Emissions TPY	Below 20D?	Facility Emissions TPY	Below 20D?	Facility Emissions TPY	Below 20D?
CARRIZO WOOD PRODUCTS	0.5256	Yes		Yes		Yes	0.438	Yes		Yes		Yes
HTC INDUSTRIES	5.2122	Yes	5.2122	Yes	1.314	Yes	1.314	Yes	8.4	Yes	3.2	Yes
DELEK SAN ANGELO TERMINAL		Yes		Yes		Yes		Yes	14.3	Yes	6.2	Yes
SCHEUBER COMP STATION		Yes		Yes		Yes		Yes	193.2	Yes	44.1	Yes
ETHICON SAN ANGELO PLANT	2.7594	Yes	2.0586	Yes	6.351	Yes	6.9642	Yes	13.8	Yes	43.4	Yes
JEFFERSON ENTERPRISE ENERGY	2.9784	Yes	2.9784	Yes	0.657	Yes	0.657	Yes		Yes		Yes
MCGREGOR FACILITY	807.7158	Yes	807.453	Yes	184.398	Yes	184.4418	Yes	305.5	Yes	69.8	Yes
MUNSON RANCH TB		Yes		Yes		Yes		Yes	1.7	Yes	0.4	Yes
INGRAM CONCRETE SAN ANGELO PLANT 1	8.5848	Yes		Yes		Yes	4.0734	Yes		Yes		Yes
MERTZON GAS PROCESSING PLANT	20.586	Yes		Yes		Yes	4.6866	Yes	961.3	No	253.5	Yes
WALL COOPERATIVE GIN PLANT 1	54.9252	Yes	3.3726	Yes	4.9932	Yes	80.9424	Yes	17.9	Yes	17.6	Yes
COTTON GIN AND ELEVATOR	7.6212	Yes	1.4454	Yes	14.1912	Yes	84.315	Yes		Yes		Yes
ANGELINA FOREST PRODUCTS SAWMILL	0.0438	Yes	0.0438	Yes	0.0438	Yes	0.0438	Yes		Yes		Yes
VERIBEST GAS PLANT		Yes		Yes		Yes		Yes	213.7	Yes	48.8	Yes
BAILEY GAS PROCESSING PLANT		Yes		Yes		Yes		Yes	477.7	Yes	109.1	Yes

EXHIBIT 1
Facility General Arrangement (Site Plan)



EQUIPMENT LIST		
ITEM	EQUIPMENT TAG	DESCRIPTION
1	TBD	345 kV SUBSTATION
2	TBD	100 MW RICE POWER PLANT (EH)
3	TBD	60 MW BESS
4	TBD	SWITCHGEAR BUILDING
5	TBD	FUEL GAS RISER
6	TBD	EMERGENCY GENSET & BLACK START
7	TBD	EXHAUST STACK (GROUP OF 3)
8	TBD	FIRE WATER TANKS & PUMP HOUSE
9	TBD	POWER BLOCK
10	TBD	FUEL GAS LINE HEATER
11	TBD	PUMPS & COMPRESSORS
12	TBD	BOILERS
13	TBD	DIESEL TANKS
14	TBD	WATER & LUBE OIL TANKS
15	TBD	SCR & UREA TANK
16	TBD	CEMS
17	TBD	RADIATORS
18	TBD	OFFICE/ADMIN. BUILDING
19	TBD	WAREHOUSE/SHOP BUILDING
20	TBD	ELECTRICAL SUBSTATION BUILDING
21	TBD	DATA HALL (DH)

LEGEND FOR EMISSION SOURCES
EMERGENCY GENSET & BLACK START
EXHAUST STACK
FIRE PUMP STATION
FUEL GAS LINE HEATER
BOILERS

Notes:

1. LOCATIONS OF PONDS AND WATER TANKS ARE ESTIMATES AND NOT TO SCALE. EQUIPMENT SIZING AND LOCATIONS ARE PRELIMINARY.
2. ENGINE HALLS HAVE BEEN SIMPLIFIED FOR CLARITY. PLEASE REFER TO DETAILED PLOT PLANS (26020-001-PRO-PLN-012-01 & 26020-001-PRO-PLN-013-01) FOR MORE DETAIL.

NOT FOR CONSTRUCTION

Rev	Date	Issue	Description	Project No	By
D	2026-06-08	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
C	2026-05-05	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
B	2026-05-01	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
A	2026-04-22	IFR	ISSUED FOR REVIEW	26020-001	VJ

Drafting Checked by:
Engineering Checked by:
Approved for Issue by:
Applies to Current Revision Only

JOULEGRID
PROACTIVE POWER-AUTOMATION

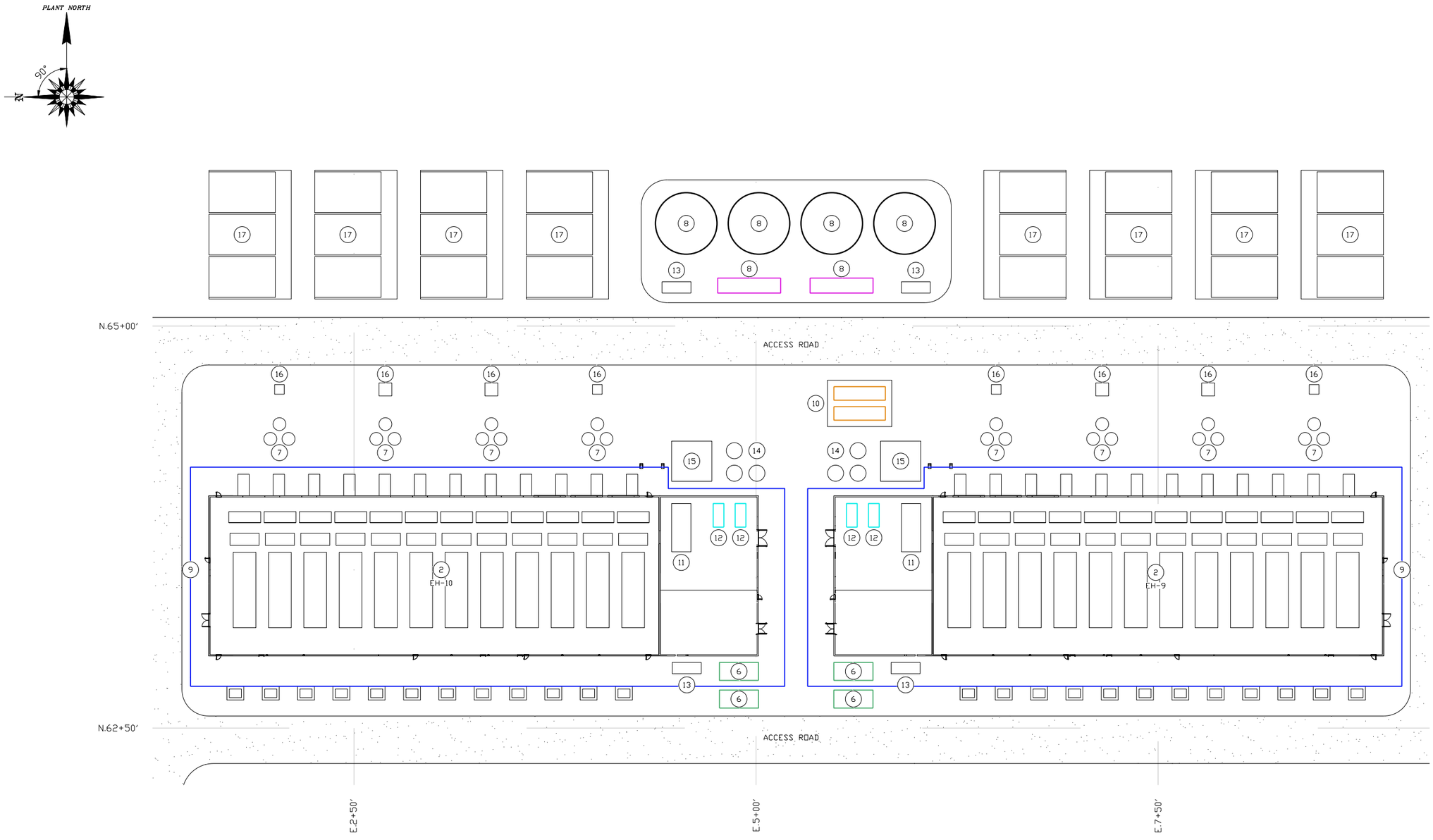
WESTLINE 2335

31.34838101950303, -100.6424063783624

WESTLINE 2335
OVERALL SITE PLAN – AIR EMISSIONS
PLOT PLAN

Scale	Size	Drawing Number	Rev
1/512"=1'-0"	D	26020-001-PRO-PLN-011-01	D

PLOTTED: Jun 10, 2026 1:09 AM USER: VJANZEN
FILE: U:\PROJECTS\DRAFT\26020-001\PIPING\PLN\26020-001-PRO-PLN-011-01.DWG



EQUIPMENT LIST		
ITEM	*EQUIPMENT TAG*	*DESCRIPTION*
2	TBD	100 MW RICE POWER PLANT
6	TBD	EMERGENCY GENSET & BLACK START
7	TBD	EXHAUST STACK (GROUP OF 3)
8	TBD	FIRE WATER TANKS & PUMP HOUSE
9	TBD	POWER BLOCK
10	TBD	FUEL GAS LINE HEATER
11	TBD	PUMPS & COMPRESSORS
12	TBD	BOILERS
13	TBD	DIESEL TANKS
14	TBD	WATER & LUBE OIL TANKS
15	TBD	SCR & UREA TANK
16	TBD	CEMS
17	TBD	RADIATORS

LEGEND FOR EMISSION SOURCES	
	EMERGENCY GENSET & BLACK START
	EXHAUST STACK
	FIRE PUMP STATION
	FUEL GAS LINE HEATER
	BOILERS

Notes:
1. EQUIPMENT SIZING AND LOCATIONS ARE PRELIMINARY.

NOT FOR CONSTRUCTION

Rev	Date	Issue	Description	Project No	By
B	2026-06-08	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
A	2026-05-05	IFR	ISSUED FOR REVIEW	26020-001	KC

Drafting Checked by:
Engineering Checked by:
Approved for Issue by:
Applies to Current Revision Only

JOULEGRID
PROACTIVE POWER AUTOMATION

WESTLINE 2335
31.34838101950303, -100.6424063783624

WESTLINE 2335
MAJOR EQUIPMENT LOCATION – ENGINE HALLS 9 & 10
DETAIL PLAN

Scale	Size	Drawing Number	Rev
1/32"=1'-0"	D	26020-001-PRO-PLN-014-01	B

PLOTTED: Jun 10, 2026 11:07 AM USER: VJANZEN
FILE:\\PROJECTS\DRAFT\26020-001\PIPING\PLN\26020-001-PRO-PLN-011-01.DWG

Air Permit Division Air Permit Support (APD-APS) Air Permitting Surcharge Payment
Texas Commission on Environmental Quality

To process a permit application as part of the expedited permit program, Air Permits Division (APD) requires a surcharge to cover expenses incurred to expedite the processing of an application using additional resources. The surcharge must be submitted along with the expedited request to Texas Commission on Environmental Quality (TCEQ).

Instructions

I. Contact Information

List the legal name of the company, corporation, partnership, or person who is requesting to expedite the processing of the application. List the Customer Reference Number (CN) and the Regulated Entity Number (RN). Provide the name, title, mailing address, telephone number, and e-mail address of the company official or technical contact. This person must have the authority to make binding agreements and representations on behalf of the applicant. Make sure all contact information matches the information provided on the application form associated with this request (e.g., PI-1).

II. Project Information

List the facility name, permit number, and project number, as applicable. This information should match Form Expedited Permit Request (APD-EXP).

III. Surcharge Payment

The fee amount for the various air permit projects are listed as follows:

Project Type	Fee Amount
Standard Permit (with public notice requirements)	$3,000
Title V General Operating Permit (GOP)	$3,000
Title V Site Operating Permit (SOP)	$10,000
NSR case-by-case permit	$10,000
Federal NSR permits	$20,000

NSR case-by-case permit that accompanies a federal NSR permit does not have an additional surcharge.

Permits by rule (PBRs) and Standard Permit (which do not require public notice) must use the ePermits system and pay $500 (**non-refundable**, flat surcharge). Surcharge will be collected through the ePermits system.

Mail the completed Form APD-APS Air Permitting Surcharge Payment and payment to:

TX Commission on Environmental Quality, Cashier's Office MC 214
P.O. Box 13088, Austin, TX 78711-3088

Air Permit Division Air Permit Support (APD-APS) Air Permitting Surcharge Payment
Texas Commission on Environmental Quality

I. Contact Information
Company or Other Legal Customer Name: Westline TX Holdings LLC
Customer Reference Number (CN): XXXX
Regulated Entity Number (RN): XXXX
Company Official or Technical Contact Information
☒ Mr. ☐ Mrs. ☐ Ms. ☐ Dr. ☐ Other:
Name: Adam Carcache
Title: Project Analyst
Mailing Address: 5900 Balcones Drive Suite 100
City: Austin
State: Texas
ZIP Code: 78731
Telephone Number: 786-414-7470
E-mail Address: adam@beacondatacenters.com
II. Project Information
Facility Name: Westline 2335
Permit Number: XXXX
Project Number: XXXX
III. Surcharge Payment
Project Type: Federal NSR Permit
Fee Amount: $ 20,000
Check, Money Order, Transaction Number, and/or ePay Voucher Number: *(below)*
Transaction No. 12053491043
Paid Online: ☒ YES ☐ NO
Company Name on Check:

HALEY ALDRICH

www.haleyaldrich.com

PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
WESTLINE 2335
TOM GREEN COUNTY, TEXAS

by
Haley & Aldrich, Inc.
Bedford, New Hampshire

for
Westline TX Holdings LLC
Tom Green County, Texas

File No. 0214923
June 2026



HALEY & ALDRICH, INC.
3 BEDFORD FARMS DRIVE
BEDFORD, NH 03110
603.625.5353

SIGNATURE PAGE FOR

PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
WESTLINE 2335
TOM GREEN COUNTY, TEXAS

PREPARED FOR
WESTLINE TX HOLDINGS LLC
TOM GREEN COUNTY, TEXAS

ROLE	SECTIONS 1, 2, 3, 4, 5; APPENDIX C	APPENDICES A, B
Prepared by:		
	Steve Rakowski Sr. Associate | Chemical Engineer Haley & Aldrich, Inc.	**Tina Berceli-Boyle** Senior Air Engineer Haley & Aldrich, Inc.
Reviewed and Approved by:		
	Tina Berceli-Boyle Senior Air Engineer Haley & Aldrich, Inc.	**Steve Rakowski** Sr. Associate | Chemical Engineer Haley & Aldrich, Inc.
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2	Places of Interest Map
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List of Acronyms and Abbreviations

Acronym/Abbreviation	Definition
°F	degrees Fahrenheit
AP-42	EPA's compilation of air pollution emission factors
AQRV	air quality-related value
BACT	Best Available Control Technology
Beacon	Beacon Services (US) LLC
bhp	brake horsepower
C	carbon
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent(s)
CSAPR	Cross-State Air Pollution Rule
EPA	U.S. Environmental Protection Agency
EPN	emission point number
Facility	Westline 2335 facility
g/bhp-hr	grams per brake horsepower per hour
g/hp-hr	grams per horsepower-hour
g/kw-hr	grams per kilowatt-hour
GHG	greenhouse gas
H_2O	water
H_2SO_4	sulfuric acid (mist)
Haley & Aldrich	Haley & Aldrich, Inc.
HAP	Hazardous Air Pollutant
HHV	higher heating value
hp	horsepower
JouleGrid	JouleGrid Corp.
km	kilometer
kW	kilowatt
LAER	Lowest Achievable Emission Rate
lb/hr	pounds per hour
lb/MW-hr	pounds per megawatt-hour
LDAR	leak detection and repair
MACT	Maximum Achievable Control Technology
MECL	minimum emissions compliance load
MMBtu	million British thermal units
MMBtu/hr	million British thermal units per hour
MW	megawatt
N_2	nitrogen gas
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH_3	ammonia

Acronym/Abbreviation	Definition
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
O_2	oxygen
O_3	ozone
P.E.	Professional Engineer
Pb	lead
PFD	process flow diagram
PM	particulate matter
$PM_{2.5}$	particulate matter with a diameter equal to or less than 2.5 microns
PM_{10}	particulate matter with a diameter equal to or less than 10 microns
ppmv	pounds per million by volume
ppmvdc	parts per million by volume dry basis corrected to 15 percent oxygen
ppmw	parts per million wet
PSD	Prevention of Significant Deterioration
psia	pounds per square inch absolute
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
RICE engine	reciprocating internal combustion engine
scf	standard cubic feet
SCR	selective catalytic reduction
SER	Significant Emission Rate
SF_6	sulfur hexafluoride
Site	approximately 1,767-acre site in Tom Green County, Texas
SO_2	sulfur dioxide
SO_3	sulfur trioxide
SU/SD	startup/shutdown
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
tpy	tons per year
ULSD	ultra-low sulfur distillate
VOC	volatile organic compound
Westline	Westline TX Holdings LLC

1. Introduction

Westline TX Holdings LLC (Westline) is proposing to construct the Westline 2335 facility (Facility), a data center and associated energy-generation facility. The proposed data center project will be powered by a "behind-the-meter" energy-generation facility consisting of natural gas-fired reciprocating internal combustion engines (RICE engines). The Facility will be located on an approximately 1,767-acre site in Tom Green County, Texas (Site). The Site, shown on Figures 1, 2, and 3, is within an area designated as attainment with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. The proposed general arrangement (Site Plan) of the Facility is provided as Exhibit 1. The map showing nearby developments is provided as Exhibit 2.

1.1 FACILITY OVERVIEW

The proposed Facility is a data center and associated energy-generation facility that will use RICE engine technology to provide a nominal 2,409-megawatt (MW) net-generating capacity. A total of 240 RICE engines will be arranged in 20 engine halls (12 engines per engine hall). Operation of the RICE engines will be supported by 40 engine heaters and 20 line heaters.

- Each of the 240 RICE engines has a gross mechanical output capacity of 12.32 MW and a net electrical output of 12.045 MW. The typical operating scenario provides for concurrent operation of 10 engines per engine hall (with two engines per engine hall being idle) and a maximum concurrent operation of 200 RICE engines for the Facility.
- The 40 engine heaters (two per engine hall) will each have a maximum heat input capacity of 5.02 million British thermal units per hour (MMBtu/hr) (i.e., 1.47 MW), and each engine heater will be limited to no more than 72 hours of operation per year, averaged across all engine heaters.
- The 20 line heaters (one per engine hall) will each have a maximum heat input capacity of 5.2 MMBtu/hr, and each line heater will be permitted to operate 8,760 hours per year.
- The 40 emergency generators each have a rated capacity of 1,341 horsepower (hp) and will be limited to 100 hours of non-emergency operation per year (per generator). These 40 identical units will be designated as 20 "black start" generators and 20 emergency generators (one of each type per engine hall).
- The 60 emergency fire water pumps (three per engine hall) will each have a rated capacity of 84 brake-horsepower (bhp) and will be limited to 100 hours of non-emergency operation per year (per fire water pump).

Emissions from the Facility will be minimized via use of natural gas as the only fuel to be fired in the RICE engines, engine heaters, and line heaters. Each RICE engine will be equipped with selective catalytic reduction (SCR) to reduce emissions of nitrogen oxides (NO_X) and catalytic oxidation to reduce emissions of carbon monoxide (CO) and volatile organic compounds (VOCs). The emergency generators and emergency fire water pumps will be fired using only ultra-low sulfur distillate (ULSD).

The proposed data center will be powered by a "behind-the-meter" energy-generation facility (described above) that will operate up to 8,760 hours per year. The typical operating scenario for the Facility includes concurrent operation of a maximum of 200 RICE engines (i.e., typically 10 engines per engine hall), with each engine typically running at or near 80 percent load.

The Facility modeling evaluation will consist of a single operating scenario that includes concurrent operation of 200 RICE engines (i.e., 10 engines per engine hall), with each engine running at worst-case conditions of 100 percent load. By evaluating this worst-case scenario, Westline intends to manage energy demand for the data

center by establishing a 12-month rolling average limit of 1,752,000 “engine-hours” for the Facility (i.e., 200 engines x 8,760 hours), rather than per-engine operating limits.

Air emissions from the proposed Facility will primarily consist of products of combustion from the RICE engines and ancillary equipment. This includes carbon dioxide (CO_2), a greenhouse gas (GHG).

Because Tom Green County is in attainment with respect to the NAAQS for all criteria pollutants, the Facility is subject to Prevention of Significant Deterioration (PSD) requirements. The Facility has at least one criteria pollutant that exceeds PSD major source thresholds. Pollutants that are regulated under federal and Texas state programs include: CO; NO_X; sulfur dioxide (SO_2); particulate matter (PM); PM with a diameter equal to or less than 10 microns (PM_{10}); PM with a diameter equal to or less than 2.5 microns ($PM_{2.5}$); VOCs; GHGs; lead (Pb); and sulfuric acid (H_2SO_4) mist. PSD review is triggered for CO, NO_X, PM_{10}, $PM_{2.5}$, VOCs, SO_2, H_2SO_4, and GHGs.

1.2 SCHEDULE

Construction of emission units associated with the Facility is currently planned to commence January 2027, pending the permit issuance schedule. Construction of Site infrastructure (not including emission units) is anticipated to begin in advance of permit issuance, consistent with Texas Commission on Environmental Quality (TCEQ) and U.S. Environmental Protection Agency (EPA) guidance that pertains to “Begin Actual Construction.”[1] The projected start of operation is March 2028.

1.3 APPLICATION ORGANIZATION

1.3.1 Application Organization

This permit application includes five sections. Section 1 provides an overview of the Facility, as well as information regarding the permit application organization and points of contact. Section 2 provides a detailed description of the proposed Facility, including calculated emissions. Section 3 provides a review of regulations applicable to the proposed Facility. Section 4 provides the Best Available Control Technology (BACT) evaluations for the Facility. A list of references pertinent to this application is provided in Section 5.

The completed TCEQ air permit application forms are provided in Appendix A. Emission calculation spreadsheets providing supporting calculations for the application are provided in Appendix B. Appendix C presents information supporting the BACT analyses. Exhibits 1, 2, and 3 provide the Facility general arrangement, places of interest map, and process flow diagrams (PFDs), respectively.

Because the Facility capital cost will exceed $2 million, a Professional Engineer (P.E.) reviewed this permit application. The P.E. seal is included on the signature page of this document.

1.3.2 Permit Application Fee

Pursuant to 30 Texas Administrative Code (TAC) §116.163, the permit fee for a construction permit application subject to the federal PSD program is based on the capital cost of the proposed project. The permit fee is based on 1.0 percent of the capital cost of the proposed project, with a minimum fee of $3,000 and a maximum fee of $75,000. The total estimated capital cost of the Facility is over $7.5 million; the associated permit application fee is $75,000. Accordingly, Westline has submitted payment in this amount to the TCEQ revenue section.

[1] https://www.tceq.texas.gov/permitting/air/newsourcereview/before.html

In addition, since Westline is requesting that this application be expedited under 30 TAC §101.600, a surcharge of $20,000 is required for federal New Source Review (NSR) permits. Westline has submitted the corresponding payment to the TCEQ Revenue Section.

1.3.3 Application Contacts

To facilitate TCEQ's review of this application, individuals familiar with the Facility and this application are identified below.

Matt Molina Westline TX Holdings LLC 5900 Balcones Drive Suite 100 Austin, Texas 78731 Phone: 206.609.4047 E-mail: matt@beacondatacenters.com	Adam Carcache Beacon Data Centers 5900 Balcones Drive Suite 100 Austin, Texas 78731 Phone: 787.414.7470 E-mail: adam@beacondatacenters.com

1.4 APPLICATION PREPARATION

Haley & Aldrich, Inc. (Haley & Aldrich) was retained by Beacon Services (US) LLC (Beacon) to prepare this permit application. Technical specifications presented in this application for the emission units constituting the Facility were provided by JouleGrid Corp. (JouleGrid), which was separately retained by Beacon. JouleGrid also prepared Exhibits 1 and 3. Beacon retained SKS Engineering LLC to prepare Exhibit 2.

2. Facility Description

2.1 FACILITY SUMMARY

The proposed Facility is a data center and associated energy-generation facility that will use RICE engine technology to provide a nominal 2,409-MW net generating capacity. A total of 240 RICE engines will be arranged in 20 engine halls (12 engines per engine hall). Operation of the RICE engines will be supported by 40 engine heaters and 20 line heaters.

- Each of the 240 RICE engines has a gross mechanical output capacity of 12.32 MW and a net electrical output of 12.045 MW. The typical operating scenario provides for concurrent operation of 10 engines per engine hall (with two engines per engine hall being idle) and a maximum concurrent operation of 200 RICE engines for the Facility.
- Each of the 40 engine heaters (two per engine hall) have a maximum heat input capacity of 5.02 MMBtu/hr (i.e., 1.47 MW) and each engine heater will be limited to no more than 72 hours of operation per year, averaged across all engine heaters.
- The 20 line heaters (one per engine hall) will each have a maximum heat input capacity of 5.2 MMBtu/hr, and each line heater will be permitted to operate 8,760 hours per year.
- The 40 emergency generators each have a rated capacity of 1,341 hp and will be limited to 100 hours of non-emergency operation per year (per generator). These 40 identical units will be designated as 20 "black start" generators and 20 emergency generators (one of each type per engine hall).
- The 60 emergency fire water pumps (three per engine hall) will each have a rated capacity of 84 bhp and will be limited to 100 hours of non-emergency operation per year (per fire water pump).

Emissions from the Facility will be minimized via use of natural gas as the only fuel to be fired in the RICE engines, engine heaters, and line heaters. Each RICE engine will be equipped with SCR to reduce emissions of NO_X and catalytic oxidation to reduce emissions of CO and VOCs. The emergency generators and emergency fire water pumps will be fired using only ULSD.

The proposed data center will be powered by a "behind-the-meter" energy-generation facility (described above) that will operate up to 8,760 hours per year. The typical operating scenario for the Facility includes concurrent operation of a maximum of 200 RICE engines (i.e., typically 10 engines per engine hall), with each engine typically running at or near 80 percent load.

Exhibits 1 and 3 provide the Facility general arrangement (Site Plan) and PFDs, respectively.

2.2 DESCRIPTION OF RICE ENGINES

The RICE engines will be manufactured by Bergen Engines; the specified Model No. is B36:45V20AG. This engine model is a stationary, spark ignition, four-stroke, lean burn unit. Each RICE engine has a gross mechanical output capacity of 12.32 MW and a net electrical output of 12.045 MW. The RICE engines will fire natural gas only.

2.3 AIR POLLUTION CONTROL EQUIPMENT

The add-on emission control technologies proposed for exhaust gases associated with the RICE engines include SCR to control NO_X emissions and oxidation catalyst to control CO and VOC emissions. Emissions of SO_2, $PM_{10}/PM_{2.5}$, and H_2SO_4 will be minimized through using natural gas as the sole fuel in the RICE engines. Other controls include using ULSD and good combustion controls.

The SCR and oxidation catalyst controls are discussed further below.

2.3.1 Selective Catalytic Reduction

SCR catalyst will be installed in the exhaust of the RICE engines to control NO_X emissions. The SCR process will use an aqueous urea solution injected into the engine exhaust stream, where it will undergo hydrolysis to form ammonia (NH_3) and CO_2 as shown in the following reaction:

$$CO(NH_2)_2 + H_2O \rightarrow 2NH_3 + CO_2$$

The NH_3 will mix with NO_X in the exhaust gas upstream of the SCR catalyst. The exhaust mixture will pass over the SCR catalyst, where NO_X will react with NH_3 and O_2 per the following standard SCR reaction to form nitrogen gas (N_2) and water vapor (H_2O):

$$4NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O$$

The SCR will reduce NO_X concentrations to no more than 1.2 parts per million by volume dry basis corrected to 15 percent O_2 (ppmvdc) during steady-state operation at all ambient temperatures, down to 50 percent load. A small amount of unreacted NH_3, referred to as "ammonia slip," will remain in the exhaust gas stream after passing through the catalyst. Ammonia slip will be limited to 5.0 ppmvdc during all steady-state operating conditions.

SCR operations will begin during RICE engine startup when the flue gas temperature has reached the allowable SCR temperature range at the catalyst bed.

2.3.2 Oxidation Catalyst

An oxidation catalyst system will be installed in the exhaust of the RICE engines to control emissions of CO and VOCs. Engine exhaust gases will flow through the catalyst beds where excess oxygen in the exhaust will oxidize CO and VOCs to form CO_2 and H_2O. The oxidation catalyst system will reduce CO concentrations to 6.05 ppmvdc during steady-state operation at all ambient temperatures, down to 50 percent load. During steady-state operating conditions, VOC concentrations in the exhaust gas will be limited to 4.2 ppmvdc.

2.4 ANCILLARY EQUIPMENT

The proposed Facility will use ancillary support equipment, including 40 engine heaters, 20 fuel line heaters, 40 emergency generators, 60 emergency fire water pumps, storage tanks for lube oil, and other small, dedicated or integrated storage tanks providing ULSD for the emergency engines and emergency fire water pumps. This equipment is further discussed in the following sections.

2.4.1 Engine Heaters

Engine heaters are small boilers that will use natural gas as the sole fuel and will typically operate for two hours prior to startup of any RICE engine. Engine heaters are necessary for multiple reasons, including ensuring that engine lube oil and jacket water are at optimal temperature prior to startup and lessening the period when the RICE engines are operating at conditions under their minimum emissions compliance load (MECL). The latter reason reduces the period of startup emissions for the RICE engines.

The 40 engine heaters (two per engine hall) will each have a maximum heat input capacity of 5.02 MMBtu/hr (i.e., 1.47 MW), and will each be limited to no more than 72 hours of operation per year, averaged across all engine heaters. This limit is based on an anticipated six startups per year for each RICE engine.

2.4.2 Line Heaters

The line heaters are classified as "heaters" that will use natural gas as the sole fuel, operating as needed to regulate the temperature of the fuel for optimal RICE engine performance.

The 20 line heaters (one per engine hall) will each have a maximum heat input capacity of 5.2 MMBtu/hr, and will each be permitted to operate 8,760 hours per year.

2.4.3 Emergency Diesel Generators

The Facility will have 40 emergency generators. These 40 identical units will be designated as 20 "black start" generators and 20 emergency generators (one of each type per engine hall). Black start generators are intended to provide the necessary power to start RICE engines when existing generating capacity may not be sufficient. Emergency generators are intended to provide on-site emergency power capabilities to the Facility when existing generating capacity may not be sufficient.

The emergency generators will be Cat Model No. C32 (or similar), with each unit having a rated capacity of 1,341 hp. A dedicated ULSD storage tank (3,600 gallons) will be integrated into each unit. The emergency generator engines will be fueled with ULSD and will typically operate only for maintenance and readiness testing, with less frequent operation is expected for actual emergencies. Non-emergency generator operation will be limited to less than 100 hours per rolling 12-month period.

2.4.4 Emergency Diesel Fire Pumps

The Facility will have 60 emergency fire pump engines (84 bhp each) to provide on-site firefighting capabilities. Each engine hall will have an associated fire pump house that will contain three emergency fire water pumps and three separate, 250-gallon ULSD storage tanks; each ULSD storage tank will supply one emergency fire water pump. The emergency fire pump will be fueled with ULSD and will typically operate only for maintenance and readiness testing, with less frequent operation expected for actual emergencies. Non-emergency operation of each fire pump will be limited to less than 100 hours per rolling 12-month period.

2.4.5 Storage Tanks

Each of the 40 emergency generators will have an integral tank to store a maximum of 3,600 gallons of ULSD at ambient conditions. Each of the 60 emergency fire pump engines has a separate and dedicated tank to store a maximum of 250 gallons of ULSD at ambient conditions.

Each engine hall will have a heated and recirculating new lube oil storage tank (horizontal), with a 17,000-gallon capacity). Each engine hall will also have a used lube oil storage tank (horizontal 6,600-gallon capacity at ambient conditions) that will not be heated or recirculating. This tank will be used for batch storage of waste oil generated from maintenance activities for the engines and will be emptied as needed.

2.5 EMISSIONS ESTIMATES

2.5.1 RICE Engines Only

Emissions from the Facility primarily consist of products of combustion from the RICE engines; the ancillary equipment is a smaller source of overall Facility emissions. The RICE engines will typically operate at 80 percent load; however, the RICE engines can operate at steady-state loads ranging from the MECL (50 percent load) to a maximum of 100 percent load (full capacity), depending upon the data center's energy demand.

RICE engine performance and emissions are relatively unaffected by ambient conditions because engine manufacturer data are specified for ambient temperatures "up to 100F" and the RICE engines will be located within engine halls that are climate controlled.

Table 2-1 presents a summary of the proposed limits for pollutants emitted from the RICE engines at steady-state, 100 percent load operation. Note that all emissions are based on gross fuel heating value (HHV), as specified by the engine manufacturer, unless otherwise stated. The limits incorporate BACT as applicable (see Section 4).

Table 2-1. Summary of Proposed Steady-State Emission Limits[a]

Pollutant	Maximum Emission Rate		Emission Rate (ppmvdc)
	lb/MMBtu	Units as Specified[b,c]	
NO_X	n/a	n/a	1.2
CO	n/a	n/a	6.05
$PM_{10}/PM_{2.5}$	0.0077	n/a	n/a
SO_2	n/a	0.5[b]	n.a
VOC	n/a	n/a	4.2
H_2SO_4	n/a	0.5[b]	n/a
CO_2	n/a	898[c]	n/a

Notes:

[a] The Facility may exceed these limits during defined periods of startup/shutdown (SU/SD).

[b] The maximum emission rate for both SO_2 and H_2SO_4 are expressed in units of grains sulfur per 100 standard cubic feet of natural gas.

[c] BACT for GHG is expressed as pounds of CO_2 with an efficiency-based limit (pounds per megawatt hour [lb/MW-hr] gross) at 100 percent load. This is an annual average limit.

SU/SD conditions for the RICE engines are addressed in Section 2.5.1.2.

The following sections provide estimated emissions from the RICE engines and ancillary equipment. Emissions of PSD-regulated air pollutants from these sources are based upon equipment vendor emission guarantees, vendor literature, or TCEQ (2019) Tier I BACT requirements. Criteria pollutant emission rates for all sources are provided in Appendix B.

Emissions of non-criteria pollutant emissions and HAPs from the RICE engines and ancillary equipment were estimated using EPA's Compilation of Air Pollution Emission Factors (AP-42; EPA, 2000), except for formaldehyde. Emissions of formaldehyde from the RICE engines were estimated based on control equipment (i.e., oxidation catalyst) vendor guarantees.

2.5.1.1 RICE engine Emissions – Steady-State Operation

Table 2-2 presents proposed maximum short-term (pounds per hour [lb/hr]) emissions estimates for PSD-regulated air pollutants for all steady-state operating loads developed from vendor performance data. The $PM_{10}/PM_{2.5}$ emissions estimates include filterable and condensable $PM_{10}/PM_{2.5}$. Emission rates for all steady-state operating conditions are provided in Appendix B.

Table 2-2. Summary of Maximum Short-Term Emission Rates from Each RICE Engine

Pollutant	100% Load (maximum pounds per hour [lb/hr])
NO_X	0.43
CO	1.30
$PM_{10}/PM_{2.5}$	0.73
SO_2	0.13
VOC	0.50
H_2SO_4	0.02
CO_2	11,057
CO_2e	11,068.4

2.5.1.2 RICE engines – SU/SD Operations

Emissions during startup may, for some pollutants, result in an increase in short-term lb/hr emission rates. Potential emissions associated with SU/SD of the RICE engines were developed based on similar engine data, except the $PM_{10}/PM_{2.5}$ emission rate during shutdown, which is conservatively assumed to be the same as steady-state conditions.

The anticipated number of SU/SD events for each RICE engine annually are presented in Table 2-3. The indicated minimum downtime preceding startup is associated with the duration of engine heater operation.

Table 2-3. Durations and Downtimes Associated with SU/SD Events

	Number of Events per Year	Minimum Downtime Preceding Event (hours)	Duration of Event Until MECL (minutes)
Startup	6	2	30
Shutdown	6	0	5

Generally, emissions from these events are not “self-correcting” on an annual basis. In other words, the emissions for each SU/SD sequence, incorporating the minimum downtime required to define that type of startup, are greater than the corresponding full-load, steady-state emission rate. $PM_{10}/PM_{2.5}$ emissions during shutdown are self-correcting and SO_2 emissions are considered self-correcting because they are based on fuel consumption. Table 2-4 provides the emissions associated with each event and indicates which pollutants are self-correcting on an annual basis.

Table 2-4. Emissions Associated with Startup and Shutdown Events

Pollutant	Startup	Shutdown
Emissions per Event (pounds)		
NO_X	6.5	0.13
CO	6.7	0.25
VOC	1.5	0.25
$PM_{10}/PM_{2.5}$	2.0	0.37
Self-Correcting?		
NO_X	no	no
CO	no	no
VOC	no	no
$PM_{10}/PM_{2.5}$	no	yes

The impacts of SU/SDs on the annual potential emissions of criteria pollutants from the RICE engines have been included. These calculations are provided in Appendix B.

2.5.2 Ancillary Equipment

This section presents estimated criteria pollutant emissions from the ancillary equipment associated with the Facility. The proposed ancillary equipment, which is incorporated in the evaluation of potential emissions, includes 40 engine heaters, 20 line heaters, 40 emergency generators, and 60 emergency fire water pumps. The following assumptions were used in evaluating emissions from this equipment:

- The engine heaters will each have a maximum heat input capacity of 5.02 MMBtu/hr, and each engine heater will be limited to no more than an average of 72 hours of operation per year, averaged across all engine heaters.
- The line heaters will each have a maximum heat input capacity of 5.2 MMBtu/hr, and each line heater will be permitted to operate 8,760 hours per year.
- The black start and emergency diesel generators will each have a rated capacity of 1,341 hp and will be limited to 100 hours of non-emergency operation per year (per generator).
- The emergency fire water pumps will each have a rated capacity of 84 bhp and will be limited to 100 hours of non-emergency operation per year (per fire water pump).

Potential emissions from the ancillary equipment were estimated based on vendor-supplied information, except for SO_2 emissions from the emergency equipment, which use the maximum sulfur content of ULSD. Table 2-5 summarizes annual emissions of criteria pollutants from ancillary equipment. Supporting calculations, including short-term emission rates and hazardous air pollutant (HAP) emissions, are provided in Appendix B.

Table 2-5. Potential Annual Emissions from Ancillary Equipment

Pollutant	Potential Emissions (**tons per year [**tpy**]**) per Each			
	Engine Heater	**Line Heater**	**Emergency Generator**	**Emergency Fire Pump**
$PM_{10}/PM_{2.5}$	0.00087	0.109	0.022	0.0028
SO_2	0.00025	0.032	0.001	0.00005
NO_X	0.0018	0.248	0.710	0.032
CO	0.0067	0.843	0.386	0.034
VOC	0.0010	0.123	0.050	0.010
H_2SO_4	3.88E-05	4.88E-03	1.25E-04	7.80E-06
Pb	8.72E-08	1.12E-05	0	0
CO_2e	21.17	2,667.5	76.71	4.81

2.5.3 Fugitive Emission Sources

Fugitive emissions from leaking valves, flanges, and other components (emission point number [EPN] NG FUG) were calculated using factors from the TCEQ Fugitives Emissions Workbook for the Oil and Gas Production Operation (2025). The factors were multiplied by the respective fugitive equipment component count that have the potential to leak (i.e., valves, sampling points, pumps, relief valves, and flanges) and the service type associated to each identified component (i.e., gas/vapor, light liquid, and heavy liquid). The component emissions were summed to obtain the total expected pollutant emissions.

Sulfur hexafluoride (SF_6) emissions from the SF_6 circuit breakers associated with the proposed units are calculated using an estimate of circuit breaker capacity and a predicted SF_6 annual leak rate of 0.5 percent by weight. The global warming potential factors used to calculate carbon dioxide equivalent (CO_2e) emissions are based on Table A-1 of the Mandatory Greenhouse Gas Reporting Rules (40 Code of Federal Regulations [CFR] Part 98).[2]

There will be periods during Facility operation when natural gas will need to be purged from the piping system. The emissions from natural gas from this purging were estimated using the predicted capacities of several piping systems and a maximum number of purges per year. The global warming potential factors used to calculate CO_2e emissions are based on Table A-1 of the Mandatory Greenhouse Gas Reporting Rules.

Calculations for these fugitive emission sources are provided in Appendix B, excluding the TCEQ Fugitive Emissions Workbook which is provided only in Excel format.

2.5.4 Tank Emissions

Hourly and annual emissions from the aboveground diesel storage tanks (EPNs DTANK-1 through DTANK-100) were calculated based on the methodology described in AP-42 section 7.1 (Organic Liquid Storage Tanks) with the tank specifications provided in Section 2.4.5. The maximum filling rate used to estimate hourly emissions assumes that the tank could be filled in one hour. Annual throughput of diesel in the tanks was estimated using

[2] https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98

the maximum hourly fuel use for each unit and assuming 100 hours per year of operation. Calculations for the tanks are provided in Appendix B.

2.5.5 Potential Annual Emissions

Potential annual emissions from the Facility are based on the following operating assumptions:

- On average, the energy facility will operate at an annual capacity of approximately 83 percent, which is equivalent to 7,300 operating hours per year per engine.
- The 40 engine heaters will operate for 2 hours during each engine startup event. Assuming a facility average of six startup events per year per engine, this is equivalent to each engine heater operating 72 hours per year.
- The 20 line heaters will each be permitted to operate 8,760 hours per year (per heater).
- The 40 emergency generators will be limited to 100 hours of non-emergency operation per year (per generator).
- The 60 emergency fire water pumps (three per engine hall) will be limited to 100 hours of non-emergency operation per year (per fire water pump).

The Facility will use closed-loop, inhibited water circuits for cooling, and there will be no PM emissions resulting from the cooling system.

The proposed potential annual emissions for the Facility are summarized in Table 2-6. Supporting calculations are provided in Appendix B.

Table 2-6. Summary of Potential Annual Emissions for the Facility

Pollutant	RICE engines (tpy)	Ancillary Equipment and Other Sources (tpy)	Total (tpy)
PM/PM_{10}	639.6	3.3	642.9
$PM_{2.5}$	639.6	3.3	642.9
SO_2	116.5	0.7	117.2
NO_X	384.0	35.3	419.3
CO	1,142.6	34.6	1,177.2
VOC	440.3	6.45	446.8
H_2SO_4	17.8	0.1	17.9
Pb	0	0.0002	0.0002
GHG (as CO_2e)	9,695,910	63,027	9,758,937
NH_3	570.0	0	570.0
Maximum Individual HAP	347.9[a]	0.8[b]	347.9[a]
Total HAPs	696.5	0.9	697.4

Notes:
[a] The maximum individual HAP is acetaldehyde.
[b] The maximum individual HAP is hexane.

3. Regulatory Applicability Evaluation

This section contains an analysis of the applicability of federal and state air quality regulations to the Facility. The specific regulations and programs that are included in this review include:

- PSD;
- Nonattainment New Source Review;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP);
- Federal operating permits;
- Federal Acid Rain Program;
- Cross-State Air Pollution Rule (CSAPR); and
- Other TCEQ requirements.

3.1 PREVENTION OF SIGNIFICANT DETERIORATION

The Facility has potential emissions greater than 250 tpy of one or more criteria pollutants and is considered a new major stationary source under the PSD program. As shown in Table 3-1, the Facility's potential emissions of NO_X, CO, $PM_{10}/PM_{2.5}$, and VOCs will exceed this threshold. Therefore, the proposed Facility is subject to PSD NSR. Under PSD regulations, once a major source threshold is triggered, PSD review must be completed for all regulated PSD pollutants whose potential emissions exceed their respective Significant Emission Rate (SER). As presented in Table 3-1, the Facility will have potential emissions of $PM_{10}/PM_{2.5}$, SO_2 NO_X, CO, VOCs, H_2SO_4, and GHGs above their respective SERs. Therefore, the Facility will be subject to PSD requirements for these pollutants.

Table 3-1. Summary of Proposed Potential Emissions and PSD Applicability Thresholds

Pollutant	Facility Potential Annual Emissions (tpy)	PSD Major Source Threshold (tpy)	PSD SER (tpy)	PSD Applies? (Yes/No)
PM_{10}	642.9	250	15	Yes
$PM_{2.5}$	642.9	250	10	Yes
SO_2	117.2	250	40	Yes
NO_X	419.3	250	40	Yes
CO	1,177.2	250	100	Yes
VOC	446.8	250	40	Yes
H_2SO_4	17.9	250	7	Yes
Pb	0.0002	10	0.6	No
GHGs[b]	9,758,937	n/a	75,000	Yes

Notes:
[a] VOC is evaluated as an O_3 precursor.
[b] GHGs are expressed as CO_2e.

PSD requirements include application of BACT, an ambient air quality modeling analysis demonstrating compliance with NAAQS and PSD increments, and additional impacts analyses. TCEQ has been delegated PSD review authority by EPA.

3.1.1 Best Available Control Technology

Pollutants subject to PSD review are required to apply BACT controls for those pollutants. BACT is defined as an emission limitation based on the maximum degree of reduction, on a case-by-case basis, taking into account energy, environmental, and economic considerations. TCEQ uses a "Three-Tier" approach to identify levels of cost-effective control that have been established through recent permit reviews and which meet BACT requirements for PSD and minor NSR permits issued in Texas. The evaluation begins at the first tier and progresses in sequence to the second and third tiers only if necessary. In each tier, BACT is evaluated on a case-by-case basis for technical practicability and economic reasonableness. In establishing the final BACT limit, agencies may consider any new information, including recent permit decisions, subsequent to submittal of a complete application. The BACT evaluation for NO_X, CO, VOCs, SO_2, H_2SO_4, PM_{10}/$PM_{2.5}$, and GHG emissions associated with the Facility is presented in Section 4.

3.1.2 Air Quality Impact Analysis

An ambient air quality analysis must be performed to demonstrate compliance with the NAAQS and PSD increments. Proposed new sources subject to PSD review may not cause or significantly contribute to a violation of the NAAQS or exceed available PSD increments. An air dispersion modeling analysis will be conducted in accordance with EPA and TCEQ guidance as described in the Westline 2335 Air Quality Dispersion Modeling Protocol (Haley & Aldrich, 2026). The results will be provided in an Air Quality Analysis that will be submitted to TCEQ for review.

3.1.3 PSD Class I Area Impact Analysis

PSD regulations require that proposed major sources within 100 kilometers (km) of a PSD Class I Area perform an assessment of potential impacts in the PSD Class I Area. PSD Class I Areas are specifically designated areas of special national or regional value from a natural, scenic, recreational, or historic perspective. These areas are administered by the National Park Service, U.S. Fish and Wildlife Service, or the U.S. Forest Service. Federal Land Managers are responsible for evaluating proposed projects' air quality impacts in Class I Areas and may make recommendations to the permitting agency to approve or deny permit applications.

PSD Class I Area impact analyses may consist of:

- An air quality impact analysis;
- A visibility impairment analysis; and
- An analysis of impacts on other air quality-related values (AQRVs), such as impacts to flora, fauna, water, and cultural resources.

There are no PSD Class I Areas within either 100 or 300 km of the proposed Site. The nearest PSD Class I areas to the Site are Big Bend National Park (300.38 km), Carlsbad Caverns National Park (363.03 km), and Guadalupe Mountains National Park (393.23 km) from the Facility. Therefore, the Facility does not require further impact analysis based on proximity of PSD Class I Areas.

3.2 NONATTAINMENT NSR APPLICABILITY

The Facility will be located in Tom Green County, which is classified as an attainment or unclassified area for all criteria pollutants. Therefore, the Facility is not subject to the nonattainment NSR program.

3.3 NEW SOURCE PERFORMANCE STANDARDS

NSPS are technology-based standards promulgated under 40 CFR §60 that are applicable to new and modified stationary sources depending upon the type and size of the source. NSPS have been established for approximately 70 source categories. Based upon a review of the NSPS, several standards are applicable to the proposed Facility. A summary of the Facility's compliance with the applicable standards is provided below.

3.3.1 40 CFR 60 – Subpart A – General Provisions

Any source subject to a NSPS is also subject to the general provisions under Subpart A. Since the Facility is subject to other subparts of the regulation, the requirements of Subpart A will also apply. These requirements include notifications for the start of construction and operation, performance emissions testing, monitoring, recordkeeping, and reporting. The Facility will comply with the applicable notifications, performance testing, recordkeeping, and reporting requirements specified in Subpart A.

3.3.2 40 CFR §60 – Subpart IIII – Stationary Compression Ignition Internal Combustion Engines

For new fire pump engines (model year 2010 and later), with a displacement less than 30 liters per cylinder and an energy rating between 75 and 100 hp, this Subpart IIII imposes the following emission limits:

- 4.7 grams per kilowatt-hour (g/kW-hr; 3.5 grams per horsepower-hour [g/hp-hr]) of the sum of NO_X and VOCs;
- 5.0 g/kW-hr (3.7 g/hp-hr) of CO; and
- 0.40 g/kW-hr (0.30 g/hp-hr) of PM.

The Facility will install 84-hp fire pump engines that meet these emission standards.

For new emergency generator engines (model year 2007 and later) with a displacement less than 30 liters per cylinder, this subpart requires that the engine meet the emission standards pursuant to 40 CFR §60.4205(b). For emergency engines rated greater than 37-kilowatts (kW) mechanical and less than or equal to 2,237-kW mechanical, the engine must meet the emission standards under 40 CFR §89.112. Pursuant to 40 CFR §89.112, the applicable limits for new 1,341-hp emergency generator engines are EPA's Tier 2 limits, which are as follows:

- 6.4 g/kW-hr (4.8 g/hp-hr) of the sum of NO_X and VOCs;
- 3.5 g/kW-hr (2.6 g/hp-hr) of CO; and
- 0.2 g/kW-hr (0.15 g/hp-hr) of PM.

The Facility will install emergency generator engines meeting these emission standards.

3.3.3 40 CFR 60 – Subpart JJJJ – Stationary Spark Ignition Combustion Engines

The RICE engines will be subject to NSPS under 40 CFR §60 Subpart JJJJ, within the category of stationary spark ignition internal combustion engines with maximum engine power greater than or equal to 500 hp (except lean

burn 500 to 1,350 hp). For the proposed RICE engines, the NSPS emission limitations are specified in Table 1 of Subpart JJJJ, under the subcategory of non-emergency, lean burn:

- NO_x: 1.0 g/hp-hr or 82 ppmvdc;
- CO: 2.0 g/hp-hr or 270 ppmvdc; and
- VOCs: 0.7 g/hp-hr or 60 ppmvdc.

Subpart JJJJ also requires owners and operators to develop and implement a written maintenance plan and operate the engine consistent with good air pollution control practices. If the engine manufacturer participates in a voluntary manufacturer certification program, performance testing is not required for the RICE engines if the owner/operator implements the manufacturer's maintenance requirements, retains relevant records, and otherwise complies with applicable portions of Subpart JJJJ.

As described in Section 4.2, BACT requirements for the RICE engines are more stringent than the Table 1 emission limitations listed above. The Facility will comply with NSPS for the RICE engines by implementing BACT requirements and complying with other applicable requirements of Subpart JJJJ.

3.4 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (40 CFR PARTS 61 AND 63)

The Clean Air Act of 1970 required the EPA to identify HAPs and promulgate standards for each HAP. Between 1971 and 1990, EPA identified and published standards for eight HAPs (asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride). EPA has since published more than 100 standards under 40 CFR §63 in accordance with the Clean Air Act Amendments of 1990. The 40 CFR §61 standards are based on the HAPs that are being emitted, whereas the 40 CFR §63 standards are based on the source type. Each is addressed further below.

3.4.1 40 CFR §61

The Facility does not have sources that are covered under 40 CFR §61; therefore, these standards are not applicable.

3.4.2 40 CFR §63

Several Subparts reflect NESHAP standards affecting various Facility sources, as outlined below.

3.4.2.1 40 CFR §63 – Subpart A – General Provisions

Any source subject to a source-specific NESHAP is also subject to the general provisions of NESHAP Subpart A. Unless specifically excluded by the source-specific NESHAP, Subpart A generally requires initial construction notification, initial startup notification, performance tests, performance test date initial notification, general monitoring requirements, general recordkeeping requirements, and semiannual monitoring and excess emission reports.

3.4.2.2 40 CFR §63 – Subpart DDDDD – National Emission Standards for HAPs for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

Boiler MACT covers industrial, commercial, and institutional boilers and process heaters at major sources. While the engine heaters and line heaters are subject to this rule, the majority of its requirements apply only to boilers firing solid fuel, liquid fuel, and gases that may contain mercury. The Facility will fire only pipeline-quality natural gas (which does not contain mercury) and will comply with those portions of the rule that are applicable.

3.4.2.3 40 CFR §63 – Subpart ZZZZ – Reciprocating Internal Combustion Engines

The RICE engines will be subject to NESHAP under 40 CFR §63 Subpart ZZZZ because the RICE engines meet one of the affected categories (i.e., any new and reconstructed four-stroke, lean-burn stationary RICE engine greater than or equal to 250 hp located at a major source of HAP emissions). For the proposed RICE engines, the emission limitations and operating limitations defined in Tables 2a and 2b of Subpart ZZZZ are applicable:

1. Table 2a requires the following emission limitations (except during periods of startup):
    a. *Reduce CO emissions by 93 percent or more; or*
    b. *Limit concentration of formaldehyde in the stationary RICE exhaust to 14 ppmvd or less at 15 percent O_2.*
2. Table 2b defines the following operating limitations, depending upon which Table 2a standard is used:
    a. Limit concentration of formaldehyde in the stationary RICE exhaust and using an oxidation catalyst:
        i. *maintain your catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and*
        ii. *maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450°F and less than or equal to 1350°F. (Sources may petition pursuant to 40 CFR §63.8(f) for a different temperature range.*
    b. Reduce CO emissions and <u>not</u> using an oxidation catalyst:
        i. *Comply with any operating limitations specified by TCEQ.*

As discussed in this application, the Facility will use an oxidation catalyst to control emissions of CO and VOCs and will comply with the emission limitations and operating limitations specified for limiting the concentration of formaldehyde in the RICE engine exhaust gases.

The proposed emergency generator engines and emergency fire pump engines will also be subject to NESHAP under 40 CFR §63 Subpart ZZZZ, which applies to all new emergency engines, regardless of the major or minor HAP source status of the Facility. For new emergency units, NESHAP requirements are satisfied if a unit complies with NSPS Subpart IIII. As stated in Section 3.3.2, the proposed emergency generator engines and emergency fire pump engine will comply with NSPS Subpart IIII and are therefore compliant with Subpart ZZZZ.

3.5 FEDERAL OPERATING PERMITS

The Facility will be a major source with respect to the Title V program. Westline will apply for a Federal Operating Permit according to the schedule and requirements in 30 TAC Chapter 122.

3.6 FEDERAL ACID RAIN PROGRAM

The Facility is not subject to the Acid Rain Program (Title IV of the Clean Air Act Amendments) because the RICE engines are not “utility units” under the program definition. Utility units include units that produce electricity for sale. Rather, the RICE engines will generate electricity solely for on-site use by the proposed data center.

3.7 CROSS-STATE AIR POLLUTION RULE

The Facility is not subject to CSAPR because the RICE engines are not utility boilers or combustion turbines, which are the two unit types that are addressed by the rule. Further, the Facility will not be producing electricity for sale.

3.8 STATE OF TEXAS REGULATIONS

In addition to regulations already discussed in preceding sections, state regulations that potentially apply to the Facility are listed in Table 3-2.

Table 3-2. Applicable TCEQ Regulations

Rule	Description
30 TAC §116.111	Form PI-1 General Application Requirements
30 TAC Chapter 101	General Air Quality Rules
30 TAC Chapter 111	Control of Air Pollution from Visible Emissions and Particulate Matter
30 TAC Chapter 112	Control of Air Pollution from Sulfur Compounds
30 TAC Chapter 113	Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants
30 TAC Chapter 116	Control of Air Pollution by Permits for New Construction or Modification
30 TAC Chapter 118	Control of Air Pollution Episodes
30 TAC Chapter 122	Federal Operating Permits

It is noted that 30 TAC Chapter 117 (Control of Pollution from Nitrogen Compounds) does not appear to be applicable to the Facility. Most of the provisions of Chapter 117 are contingent upon the Facility being in an O_3 nonattainment area or various specified counties that do not include Tom Green County. For provisions that apply to attainment areas, any potentially affected units (i.e., engine heaters and line heaters) exceed the maximum applicability of 2.0 MMBtu/hr and therefore are not subject to Chapter 117.

Federal authority is delegated to Texas, and all permit applications will be submitted to TCEQ. As explained in preceding sections, the following list of air permits is applicable to the Facility:

- PSD: Initial
- HAP Major Source (Federal Clean Air Act Section 112(g)): Initial
- GHG PSD: Initial

4. Best Available Control Technology Evaluation

Control technology evaluations for new major stationary sources involve an evaluation of PSD BACT for pollutants subject to PSD review. A control technology analysis has been performed for the proposed Facility based upon the EPA guidance document New Source Review Workshop Manual (EPA, 1990). The PSD BACT requirements for each pollutant were outlined in Section 3 of this application and are summarized in the sections below. The Facility triggers PSD review for CO, NO_X, PM_{10}, $PM_{2.5}$, VOCs, SO_2, H_2SO_4, and GHGs.

In addition, to be granted a permit, an applicant must demonstrate compliance with the requirements of 30 TAC §116.111(a)(2)(C), which states that "Best Available Control Technology (BACT) must be evaluated for all facilities subject to the Texas Clean Air Act (TCAA.)" Under this regulation, minor pollutants are also subject to BACT requirements. There are no additional criteria pollutants that are considered minor; however, NH_3 is included in the evaluation for the RICE engines.

The emission units associated with the Facility and their corresponding source categories are provided in Table 4-1. The control technology analyses for these sources are provided in individual sections.

Table 4-1. Emission Units and Pollutants Associated with the Generating Facility

EPN/Source	Source Category	Pollutants
BERG1 – BERG240	RICE engine, Natural Gas	CO, NO_X, PM_{10}, $PM_{2.5}$, VOCs, SO_2, H_2SO_4, GHGs and NH_3
EHEATER1 – EHEATER40	Boiler: Natural Gas, less than or equal to ≤ 40 MMBtu/hr	CO, NO_X, PM_{10}, $PM_{2.5}$, VOCs, SO_2, H_2SO_4, and GHGs
LHEATER1 – LHEATER20	Heater, less than or equal to 40 MMBtu/hr	CO, NO_X, PM_{10}, $PM_{2.5}$, VOCs, SO_2, H_2SO_4, and GHGs
EGEN1 – EGEN40 FPUMP1 – FPUMP60	Engine: Emergency, Diesel	CO, NO_X, PM_{10}, $PM_{2.5}$, VOCs, SO_2, H_2SO_4, and GHGs
SF6 FUG	Fugitives: Piping and Equipment Leaks	GHGs
NG FUG	Fugitives: Piping and Equipment Leaks	Methane (CH_4)
DTANK1 – DTANK100	Storage Tank (1): Fixed roof with capacity less than 25,000 gallons or total vapor pressure less than 0.50 pounds/square inch absolute (psia)	VOCs
LUBE1 – LUBE20	Other	PM_{10}, $PM_{2.5}$, VOCs

4.1 BACT ANALYSIS APPROACH

TCEQ uses a "Three-Tier" approach to identify levels of cost-effective control that have been established through recent permit reviews and which meet BACT requirements for PSD and minor NSR permits issued in the state of Texas. The evaluation begins at the first tier and progresses in sequence to the second and third tiers only if necessary. In each tier, BACT is evaluated on a case-by-case basis for technical practicability and economic reasonableness.

In the first tier, an applicant's BACT determination is compared to the emission reduction performance levels accepted as BACT in recent NSR permit reviews for the same process and/or industry. Since the technical practicability and economic reasonableness of a particular emission reduction option may have already been evaluated in prior reviews for the same process and/or industry, a formal evaluation of cost-effectiveness data and technical feasibility is not required for a first-tier review. However, the BACT evaluation may also take into consideration any new technical developments, which may indicate that additional emission reductions are economically or technically reasonable.

Progression to Tier II is warranted if compelling technical differences exist between the applicant's process and others within the same industry or if no recent BACT determinations are available for a particular industry. Tier II compares the overall emission reduction performance level of the applicant's BACT proposal to those accepted as BACT in recent permit reviews for other process/industry types with similar emission streams. If insufficient data is available to complete a Tier II analysis or if there are compelling technical differences between the proposed process and the process/industry types identified at Tier II, then the analysis progresses to Tier III.

A Tier III BACT evaluation involves a detailed technical and quantitative economic analysis of all emission reduction options available for the process/industry under review. While technical practicability is established through the demonstrated success of an emission reduction option based on previous use and/or an engineering evaluation of a new technology, economic reasonableness is determined by the cost-effectiveness of controlling emissions (expressed as dollars per ton of pollutant reduced) and does not consider the effect of emission reduction costs on corporate economics.

The emission units proposed for the Facility meet Tier I BACT as described in the sections below. The following sources of information were considered in the Tier I analysis:

- Current Tier I BACT Requirements: Combustion Sources (June 4, 2019);
- Current Tier I BACT Requirements: Chemical Sources (March 19, 2019); and
- Control Technologies contained within the EPA's Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC).

4.2 RICE ENGINE – BACT ANALYSIS

The following sections present a BACT analysis using the TCEQ three-tier framework. The RICE engines satisfy the Tier I BACT limits (as presented in the *Current Tier I BACT Requirements: Combustion Sources*) for all applicable pollutants. Copies of RBLC entries also used in the analysis are provided in Appendix C.

Table 4-2. Summary of Proposed BACT Emission Limits and Control Technologies for the RICE engine

Pollutant	Proposed Emission Rate	Units	Control Technology
NO_X	1.2	ppmvdc	Good combustion practices and SCR
VOCs	4.2	ppmvdc	Good combustion practices and oxidation catalyst
CO	6.05	ppmvdc	Good combustion practices and oxidation catalyst
$PM_{10}/PM_{2.5}$	0.0077	lb/MMBtu	Good combustion practices and pipeline-quality natural gas

Pollutant	Proposed Emission Rate	Units	Control Technology
SO_2/ H_2SO_4	0.5	grains sulfur per 100 standard cubic feet (scf) natural gas	Pipeline-quality natural gas
NH_3	5	ppmvdc	Effective process control
GHGs	898[a]	lb/MW-hr	Thermally efficiency technology and pipeline-quality natural gas
Notes: *[a] BACT for GHG is expressed as an efficiency-based limit (lb/MW-hr gross) for CO_2 emissions at 100 percent load conditions (12-month rolling average).*			

4.2.1 Nitrogen Oxides

For RICE engines, NO_X is formed during the combustion of fuel and is generally classified as either thermal NO_X, fuel-related NO_X, or prompt NO_X. Thermal NO_X results when atmospheric nitrogen is oxidized at high temperatures to produce nitric oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen. The major factors influencing the formation of thermal NO_X are peak combustion temperatures, air-fuel ratio, and residence time within the combustion zone. Fuel-related NO_X is formed from the oxidation of chemically bound nitrogen in the fuel. Fuel-related NO_X is generally minimal for natural gas combustion. Prompt NO_X forms through reactions between hydrocarbon radicals and atmospheric nitrogen during the early stages of combustion; however, for premixed lean-burn natural gas RICE engines, prompt NO_X is negligible due to the absence of significant fuel-rich combustion zones. Therefore, NO_X formation in RICE engines is due mostly to thermal NO_X formation.

Reduction in NO_X formation can be achieved using good combustion practices. Modern stationary natural gas RICE engines generally employ lean-burn combustion as the primary combustion control strategy for NO_X reduction. In lean-burn engines, the air-fuel mixture is premixed at ratios significantly above stoichiometric, which dilute the fuel-air charge and lower peak in-cylinder combustion temperatures, thereby reducing thermal NO_X formation. Operating lean also minimizes fuel-rich combustion zones, further suppressing prompt NO_X formation. Using this approach, lean-burn RICE engines are designed to operate with substantial excess air, thereby reducing thermal NO_X formation during combustion.

Additionally, the exhaust gases from the RICE engines will pass through a SCR system (discussed below) to further reduce NO_X emissions. The combination of lean-burn combustion controls and SCR will limit NO_X emissions to 1.2 ppmvdc, averaged over one hour, during all steady-state operating conditions.

4.2.1.1 Emission Reduction Options

Below is a list of emission reduction options for controlling NO_X from RICE engines. The technologies identified below are the only NO_X control technologies that have been applied to natural gas-fired, lean-burn RICE engines based on recent permit decisions referenced below.

- *SCR*: This is a catalytic reduction technology using NH_3 as a reagent that has been in widespread use on new lean-burn RICE engines for over 20 years. SCR is widely recognized as the most stringent available post-combustion control technology for NO_X emissions from RICE engines.
- *Good equipment design and operation*: In lieu of add-on controls, lean-burn combustion, use of natural gas as fuel, good equipment design, and proper combustion techniques serve to minimize effects of NO_X formation mechanisms.

The Facility will use SCR to control NO_X emissions from RICE engines.

A SCR catalyst will be installed in the exhaust of the RICE engines to control NO_X emissions. The SCR process will use an aqueous urea solution injected into the engine exhaust stream, where it will undergo hydrolysis to form NH_3 and CO_2. The NH_3 will mix with NO_X in the exhaust gas upstream of the SCR catalyst. The exhaust mixture will pass over the SCR catalyst, where NO_X will react with NH_3 and O_2 to form N_2 and H_2O.

The SCR will reduce NO_X concentrations to no more than 1.2 parts ppmvdc at all steady-state load conditions and ambient temperatures down to the MECL. A small amount of unreacted NH_3, referred to as "ammonia slip" will remain in the exhaust gas stream after passing through the catalyst. Ammonia slip will be limited to 5.0 ppmvdc during all steady-state operating conditions.

SCR operations will commence during RICE engine startup when the flue gas temperature has reached the allowable SCR temperature range at the catalyst bed.

4.2.1.2 Tier I Analysis

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), BACT for NO_x emissions for internal combustion engines greater than or equal to 500 hp is 0.5 grams per brake horsepower per hour (g/bhp-hr), although 0.7 g/bhp-hr is considered acceptable with a vendor guarantee. Current preliminary design for the Facility indicates that SCR equipment vendors can ensure NO_X emission levels of 1.2 ppmvdc or 0.013 g/bhp-hr.

A review of the RBLC was conducted to identify air permits that have been recently issued for RICE engines. Several projects were identified. A summary of NO_X emission limits for recently permitted RICE engines projects firing natural gas is provided in Appendix C, Table C-1. A review of these permits indicated that the most recently approved BACT emission limits for NO_X range from 0.044 to 0.5 g/hp-hr. Concentration-based limits are limited to a single project at 5 ppmvdc.

4.2.1.3 Proposed BACT

A NO_X emission limit of 1.2 ppmvdc during all steady-state operating conditions down to the MECL is proposed as BACT for the RICE engines. This level of emissions will be achieved through the application of good combustion practices and SCR. This emission level is consistent with the TCEQ Tier I limit and the most stringent level of control that has been recently identified and demonstrated in practice for RICE engines.

4.2.2 Volatile Organic Compounds

VOC emissions from RICE engines occur as a result of incomplete fuel combustion. In an ideal combustion process, all carbon and hydrogen contained within the fuel are oxidized to form CO_2 and water. Areas of incomplete combustion (e.g., crevice volumes, such as the gaps between the piston, rings, and cylinder wall) result in unburned or partially oxidized hydrocarbons in the exhaust. VOC emissions can be minimized by using good combustion practices and add-on controls as described below.

The RICE engines proposed for the Facility will use good combustion controls and exhaust through an oxidation catalyst to further reduce VOC emissions to a limit of 4.2 ppmvdc.

4.2.2.1 Emission Reduction Options

Below is a list of emission reduction options for controlling VOCs from RICE engines. The technologies identified below are the only VOC control technologies that have been applied to natural gas-fired, lean burn RICE engines, based on recent permit decisions referenced below.

- *Oxidation Catalyst*: An oxidation catalyst system oxidizes carbon-containing compounds at temperatures through using a catalyst. An oxidation catalyst system is widely recognized as the most stringent available post-combustion control technology for VOC emissions for RICE engines.
- *Combustion Controls*: RICE engines include advanced combustion management systems designed to optimize the fuel-air ratio, ignition timing, and cylinder-by-cylinder combustion performance. These controls are effective at minimizing incomplete combustion at the source and are considered standard equipment on modern four-stroke, lean-burn engines. However, combustion controls alone are less effective than a combined system of combustion controls and an oxidation catalyst and do not achieve equivalent emission reductions as a stand-alone control strategy.

An oxidation catalyst system will be installed in the exhaust of the RICE engines to control emissions of CO and VOCs. Engine exhaust gases will flow through the catalyst beds where excess oxygen in the exhaust will oxidize CO and VOCs to form CO_2 and H_2O. During steady-state operating conditions down to the MECL, VOC concentrations in the exhaust gas will be limited to 4.2 ppmvdc during steady-state operation.

4.2.2.2 Tier I Analysis

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), BACT for VOC emissions for internal combustion engines greater than or equal to 500 hp is 1.0 g/bhp-hr, achieved through good combustion practices. Current preliminary design for the Facility indicates that oxidation catalyst equipment vendors can ensure VOC emission levels of 4.2 ppmvdc or 0.015 g/bhp-hr.

A review of the RBLC was conducted to identify air permits that have been recently issued for RICE engines. Several projects were identified. A summary of VOC emission limits for recently permitted RICE engines projects firing natural gas is provided in Appendix C, Table C-2. A review of these permits indicated that the most recently approved BACT emission limits for VOCs included a minimum value of 0.089 g/hp-hr (for Pecos Power in Reeves, Texas) cited as equivalent to an engine exhaust VOC concentration of 26 ppmvdc) to a maximum value of 0.7 g/hp-hr, which are more stringent than the Tier I limit. Other BACT limits were based on engine exhaust VOC concentrations ranging from 25 ppmvdc to 42 ppmvdc.

4.2.2.3 Proposed BACT

A VOC emission limit of 4.2 ppmvdc during steady-state operating conditions is proposed as BACT. This level of emissions will be achieved through the application of good combustion practices and an oxidation catalyst. This emission level is more stringent than the TCEQ Tier I limit and the most stringent level of control that has been identified and demonstrated in practice.

4.2.3 Carbon Monoxide

Similar to VOC emissions, emissions of CO from RICE engines occur as a result of incomplete fuel combustion. CO emissions are minimized by using proper equipment design, good combustion practices, and add-on controls. The RICE engines proposed for the Facility will use good combustion controls and exhaust through an oxidation catalyst to further reduce CO emissions to a limit of 6.05 ppmvdc.

4.2.3.1 Emission Reduction Options

Below is a list of emission reduction options for controlling CO from RICE engines. The technologies identified below are the only CO control technologies that have been applied to natural gas-fired, lean-burn RICE engines based on recent permit decisions referenced below.

- *Oxidation Catalyst*: An oxidation catalyst system oxidizes carbon-containing compounds at temperatures using a catalyst. An oxidation catalyst system is widely recognized as the most stringent available post-combustion control technology for VOC emissions for RICE engines.
- *Combustion Controls*: RICE engines include advanced combustion management systems designed to optimize the fuel-air ratio, ignition timing, and cylinder-by-cylinder combustion performance. These controls are effective at minimizing incomplete combustion at the source and are considered standard equipment on modern four-stroke, lean-burn engines. However, combustion controls alone are less effective than a combined system of combustion controls and an oxidation catalyst and do not achieve equivalent emission reductions as a stand-alone control strategy.

An oxidation catalyst system will be installed in the exhaust of the RICE engines to control CO and VOC emissions. Engine exhaust gases will flow through the catalyst beds where excess oxygen in the exhaust will oxidize CO and VOCs to form CO_2 and H_2O. The oxidation catalyst system will reduce CO concentrations to 6.05 ppmvdc under all steady-state conditions.

4.2.3.2 Tier I Analysis

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), BACT for CO emissions is limiting emissions to 3.0 g/hp-hr achieved through good combustion practices. Current preliminary design for the Facility indicates that oxidation catalyst equipment vendors can ensure CO emission levels of 6.05 ppmvdc or 0.038 g/bhp-hr.

A review of the RBLC was conducted to identify air permits that have been recently issued for RICE engines. Several projects were identified. A summary of CO emission limits for recently permitted RICE engines projects firing natural gas is provided in Appendix C, Table C-3. A review of these permits indicated that the most recently approved BACT emission limits for CO range from 0.09 to 0.3 g/hp-hr, which are more stringent than the Tier I limit. Other BACT limits were based on engine exhaust CO concentrations ranging from 14 to 54 ppmvdc. These levels are achieved through use of an oxidation catalyst and good combustion controls.

4.2.3.3 Proposed BACT

A CO emission limit of 6.05 ppmvdc during all steady-state operating conditions is proposed as BACT. This level of emissions will be achieved through the application of good combustion practices and an oxidation catalyst. This emission level is more stringent than the TCEQ Tier I limit and the most stringent level of control that has been identified and demonstrated in practice.

4.2.4 Particulate Matter ($PM_{10}/PM_{2.5}$)

Emissions of $PM_{10}/PM_{2.5}$ from RICE engine combustion can occur because of trace inert solids contained in the fuel and from the combustion of lube oil consumed during normal engine operation. $PM_{10}/PM_{2.5}$ emissions can also result from ammonia slip associated with the SCR system, where unreacted ammonia reacts with sulfur trioxide (SO_3) in the exhaust to form ammonium sulfate and ammonium bisulfate salts that condense as fine particulates. All $PM_{10}/PM_{2.5}$ emitted from the RICE engines is conservatively assumed to be less than 2.5 microns in diameter; therefore, the PM, PM_{10}, and $PM_{2.5}$ emission rates are assumed to be the same.

The RICE engines proposed for the Facility will use natural gas as the sole fuel to minimize $PM/PM_{10}/PM_{2.5}$ emissions, which is the most effective means for controlling particulate emissions from combustion equipment; however, lube oil consumption remains a primary source of particulate emissions from large-bore natural gas RICE engines, and ammonia slip from the SCR system represents an additional particulate precursor. During normal operation, $PM/PM_{10}/PM_{2.5}$ emissions from the RICE engines will be limited to 0.0077 lb/MMBtu (HHV).

4.2.4.1 Emission Reduction Options

Use of natural gas and good combustion practices are the primary emission reduction methods for particulate emissions from RICE engines. There are no practically feasible post-combustion control technologies available to reduce $PM/PM_{10}/PM_{2.5}$ emissions from large-bore natural gas RICE engines. Post-combustion $PM/PM_{10}/PM_{2.5}$ control technologies such as fabric filters (baghouses), electrostatic precipitators, and wet scrubbers are designed for solid and liquid fuel combustion sources that generate substantially higher particulate loadings than natural gas RICE engines. These technologies are not technically suited for application to RICE engine exhaust streams due to the high exhaust flow velocities and the relatively low PM concentrations characteristic of natural gas firing. Furthermore, the addition of such equipment would impose back-pressure on the engine exhaust system that could adversely affect engine performance and combustion stability.

4.2.4.2 Tier I Analysis

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), BACT for $PM/PM_{10}/PM_{2.5}$ is use of good combustion practices and limiting fuel to firing pipeline-quality natural gas. A $PM/PM_{10}/PM_{2.5}$ emission limit of 0.0077 lb/MMBtu (HHV) is proposed as BACT; this value converts to 0.0205 g/hp-hr (using a heat input of 95 MMBtu/hr [HHV]) when emissions are expressed based on engine output power.

A review of the RBLC was conducted to identify air permits that have been recently issued for RICE engines. Several projects were identified. A summary of $PM/PM_{10}/PM_{2.5}$ emission limits for recently permitted RICE engines projects firing natural gas is provided in Appendix C, Table C-4. A review of these permits indicated that the most recently approved BACT emission limit for $PM/PM_{10}/PM_{2.5}$ emissions is 0.038 g/hp-hr (i.e., Pecos Power in Reeves, Texas). All limits, (except for one outlier) that are expressed on a lb/hr basis exceed the corresponding value for the proposed RICE engines (0.73 lb/hr at 100 percent load).

The above-referenced outlier is in connection with 12 RICE engines (5,000-hp each) permitted in 2016 at the Holbrook Compressor Station in Calcasieu, Louisiana, where a BACT limit of 0.003 lb/hr was established. Listed

controls are limited to use of natural gas, good equipment design, and proper combustion techniques. Although this could not be confirmed, this emission rate for this size engines appears to be unrealistically low, and possibly not achieved in practice, especially given the nature of controls used.

4.2.4.3 Proposed BACT

A $PM/PM_{10}/PM_{2.5}$ emission limit of 0.0077 lb/MMBtu (HHV) is proposed as BACT; this value converts to 0.0205 g/hp-hr (using a heat input of 95 MMBtu/hr [HHV]) when emissions are expressed based on engine output power. This level of emissions will be achieved through the application of good combustion practices and combustion of natural gas. The proposed BACT is consistent with the TCEQ Tier I limit and the levels of control that have been recently identified and demonstrated in practice, except for the above-noted apparent outlier.

4.2.5 SO_2 and H_2SO_4

Emissions of SO_2 will occur as a result of oxidation of sulfur compounds in the natural gas fired in the RICE engines. Nearly all the sulfur in the fuel will oxidize, with the vast majority oxidizing to SO_2, and a small portion of the SO_2 may further oxidize to SO_3 prior to being emitted. SO_3 formed during combustion reacts with water vapor in the exhaust to form sulfuric acid (H_2SO_4), which may subsequently condense or react with available bases to form sulfate PM.

Key considerations in the development of SO_2/H_2SO_4 emissions from RICE engines are the sulfur content of the fuel and the allowance for oxidation of fuel sulfur to SO_3. All SO_3 is presumed to further react with water in the exhaust to form H_2SO_4. To minimize emissions, the RICE engines will use pipeline-quality natural gas with a fuel sulfur content not exceeding 0.5 grains per 100 dry scf of natural gas.

4.2.5.1 Emission Reduction Options

Use of natural gas as a low-sulfur fuel is the primary emission reduction method for SO_2 and H_2SO_4 emissions from RICE engines. There are no post-combustion control technologies readily available for these emissions from RICE engines. Post-combustion SO_2/H_2SO_4 control technologies, such as dry or wet scrubbers that are commonly used on solid fuel boilers, are not technically feasible for RICE engines. The pulsating, high-velocity exhaust flow characteristic of reciprocating engines creates significant back-pressure sensitivity. Elevated exhaust back-pressure on a RICE engine reduces volumetric efficiency, increases fuel consumption, raises exhaust temperatures, and can cause engine damage, making the installation of scrubbing systems impractical from both a technical and operational standpoint.

4.2.5.2 Tier I Analysis

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), BACT for SO_2/H_2SO_4 is use of good combustion practices and limiting fuel to firing pipeline-quality natural gas.

A review of the RBLC was conducted to identify air permits that have been recently issued for RICE engines. Several projects were identified and are summarized in Appendix C, Table C-5. It is noted that all identified projects used RICE engines in an emergency capacity. This search confirms that the only SO_2/H_2SO_4 BACT technology identified for RICE engines is the use of clean fuel (i.e., natural gas). There were no cases identified of any post-combustion controls used to control these emissions from RICE engines.

4.2.5.3 Proposed BACT

Combusting pipeline-quality natural gas with a fuel sulfur content of 0.5 grains per 100 dry scf of natural gas is proposed as BACT. Utilizing good combustion practices, nearly all sulfur compounds contained in the fuel will oxidize. The proposed BACT is consistent with the TCEQ Tier I limit and controls that have been recently identified and demonstrated in practice for RICE engines.

4.2.6 Ammonia

SCR involves the injection of an aqueous urea solution into the exhaust gas upstream of a catalyst bed where it undergoes hydrolysis to form NH_3. On the catalyst surface, NH_3 reacts with the NO_X (NO and NO_2) contained within the flue gas to form N_2 and H_2O. The amount of NH_3 present is controlled to be greater than stoichiometric amounts to achieve optimal conversion of NO_X. Excess NH_3 that is not reacted in the catalyst is emitted through the stack; this is called "ammonia slip." Control of the urea injection system and associated operating parameters will be maintained to control ammonia slip in the RICE engine exhaust stream to levels not exceeding 5 ppmvdc. As SCR catalyst nears its end of life, replacement catalyst will be installed to ensure 5 ppmvdc levels are not exceeded.

4.2.6.1 Tier I Analysis

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), no BACT for NH_3 is provided in connection with SCR used for RICE engines. Note that the Tier I BACT for NH_3 in connection with SCR used for turbines (combined-cycle and simple-cycle) is 7 to 10 ppmvdc, which is achieved by controlling the ammonia injection system to minimize ammonia slip.

A review of the RBLC was conducted to identify air permits that have been recently issued for RICE engines. Only one project was identified, involving an "other case-by-case" analysis for an internal combustion engine, which specified an ammonia limit of 5.0 ppmvdc. Refer to Appendix C, Table C-6.

4.2.6.2 Proposed BACT

An ammonia emission limit of 5.0 ppmvdc is proposed as BACT for the RICE engines. This level of emissions will be achieved through effective process control. This emission level is more stringent than the TCEQ Tier I limit for SCR applied to turbine combustion sources and the most stringent level of control that has been identified and demonstrated in practice.

4.2.7 Greenhouse Gases

This section presents the BACT analysis for GHG emissions using methodology presented in the EPA document *PSD and Title V Permitting Guidance for Greenhouse Gases* (EPA, 2011).

The principal GHG associated with the RICE engines is CO_2, with relative trace amounts of CH_4 and nitrous oxide (N_2O). Because these gases differ in their ability to trap heat, 1 ton of CO_2 in the atmosphere has a different effect on global warming than 1 ton of CH_4 or 1 ton of N_2O. For example, pursuant to 40 CFR Part 98 Table A-1, CH_4 and N_2O have 28 times and 265 times, respectively, the global warming potential of CO_2. GHG emissions from the Facility are primarily due to combustion of natural gas in RICE engines. There will also be minor GHG emissions from fuel combustion in the engine heaters, line heaters, emergency generator engines, and the emergency fire pump engines, as well as fugitive releases of natural gas (primarily CH_4) from the natural gas delivery system and SF_6 from circuit breakers. The greatest proportion of potential GHGs emissions associated with the Facility (over 99 percent) will be CO_2 emissions resulting from the combustion of natural gas in RICE

engines. Trace amounts of CH_4 and N_2O will be emitted during combustion in varying quantities depending on operating conditions; however, they will be negligible compared to CO_2 emissions. Therefore, this BACT analysis for GHG emissions from RICE engines focuses on the options for reducing and controlling emissions of CO_2.

4.2.7.1 Emission Reduction Options

CO_2 is a product of combustion for any carbon-containing fuel. All fossil fuel contains significant amounts of carbon (C), including natural gas. During complete combustion, the fuel carbon is oxidized into CO_2 via the following reaction:

$$C + O_2 \rightarrow CO_2$$

Full oxidation of carbon in fuel is desirable because CO, a product of partial combustion, has long been a regulated PSD pollutant and because full combustion results in more useful energy. In fact, emission control technologies required for CO emissions (oxidation catalysts) increase CO_2 emissions by oxidizing CO to CO_2.

4.2.7.1.1 Power-Generation Efficiency

Emissions of CO_2 are directly related to the amount of fuel combusted; therefore, an effective means of reducing GHG emissions is through efficient power-generation technologies. By utilizing more efficient technology, less fuel is required to produce the same amount of electrical output. The Facility is proposing to use natural gas-fired RICE engines, which represent a highly efficient commercially available fossil fuel electricity-generation technology.

The Facility will use state-of-the-art, natural gas-fired Bergen RICE engine technology operating in a lean-burn configuration. Lean-burn RICE engine technology achieves high thermal efficiency by operating with excess air, which promotes more complete combustion of the fuel charge and reduces fuel consumption per unit of electrical output. Bergen engines are designed with optimized combustion chamber geometry, precision fuel injection, and advanced engine management systems that together maximize fuel conversion efficiency. The proposed Bergen engines achieve thermal efficiencies of 43.3 and 42.1 percent on a HHV basis, operating at 100 percent load and 75 percent load, respectively. On an LHV basis, the Bergen engines achieve electrical efficiencies of 46 and 45 percent, operating at 100 percent load and 75 percent load, respectively.

4.2.7.1.2 Low-Emission Fuels

Another effective method to reduce GHG emissions is pollution prevention, or the use of inherently low-emitting fuels. The RICE engines will combust natural gas as the sole fuel, which is the lowest CO_2-emitting fossil fuel. Table 4-2 presents a comparison of the lb/MMBtu of CO_2 of fuel combusted for the primary fossil fuels. This comparison shows that natural gas has the lowest CO_2 emission factor among the fossil fuels listed.

Table 4-3. Comparison of CO_2 Emissions from Different Fuels (lb/MMBtu of CO_2)

Pollutant	Emission Factor
Natural Gas[a]	117
Distillate Fuel No. 2[a]	163
Coal[b]	210

Notes:
[a] 40 CFR §98 Table C-1
[b] 40 CFR §98 Table C-1 for mixed coal (electric power sector)

4.2.7.2 Tier I Analysis

There are no Tier I limits provided in the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), BACT for GHGs. However, a search of the RBLC has identified several recent determinations for RICE engines that are representative of current BACT for GHGs as described below. Recent BACT determinations for RICE engines have focused on reducing emissions of CO_2 through thermally efficient RICE engine technology combined with good combustion and maintenance practices. The results of the search of the RBLC for GHG BACT precedents are presented in Appendix C, Table C-7.

4.2.7.3 Proposed BACT

The Facility will use thermally efficient Bergen RICE engines and will burn natural gas as the sole fuel. Westline is proposing an annual average BACT limit of 897.5 lb/MW-hr gross CO_2 at 100 percent load.

4.3 ENGINE HEATERS

This section presents the BACT analysis for the engine heaters (as auxiliary boilers) associated with the RICE engines. The EPNs and sizes for these sources are provided in Table 4-4. Each engine heater will be limited to no more than 72 hours of operation per year, averaged across all engine heaters.

Table 4-4. Engine Heater Information

EPN/Source	Source Category	Maximum Input Capacity
EHEATER1 – EHEATER40	Boiler: Natural Gas, less than or equal to 40 MMBtu/hr	5.02 MMBtu/hr (each)

The Facility is subject to PSD review for NO_X, VOCs, CO, $PM_{10}/PM_{2.5}$, SO_2, H_2SO_4, and GHGs. Proposed BACT limits for the Facility boilers are provided in Table 4-5.

Table 4-5. Summary of Proposed BACT Emission Limits and Control Technologies for the Engine Heaters (Boilers)

Pollutant	Emission Rate (lb/MMBtu)	Control Technology
NO_X	0.01	Ultra-Low NO_X burner
CO	0.037	Good combustion controls
$PM_{10}/PM_{2.5}$	0.0048	Pipeline-quality natural gas
SO_2	0.0014	Pipeline-quality natural gas
VOC	0.0054	Good combustion controls
H_2SO_4	0.00021	Pipeline-quality natural gas
CO_2e (GHG)	See Table 2-5	Pipeline-quality natural gas

4.3.1 Emission Reduction Options

The technically feasible control technologies identified for the Engine Heaters (as auxiliary boilers) are as follows:

- *SCR*: SCR systems are offered for gas-fired boilers and provide the most stringent level of NO_X control available.
- *Oxidation Catalyst*: Oxidation catalyst systems provide the most stringent level of control available for CO/VOC emissions for gas-fired boilers.
- *Combustion Controls*: Boiler vendors provide ultra-low NO_X and low NO_X burners for gas-fired boilers that also provide a high degree of fuel oxidation to control VOCs, CO, and $PM_{10}/PM_{2.5}$.
- *Low-Emitting Fuels:* Natural gas is the lowest emitting fuel for all PSD-subject pollutants emitted from auxiliary boilers.

4.3.2 Tier I Analysis

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), a case-by-case analysis is required for boilers less than or equal to 40 MMBtu/hr. The results of the search of the RBLC on auxiliary boilers is presented in Appendix C, Table C-8. A summary of search results for each pollutant is provided below.

- For NO_X, levels of control range from 0.01 to 0.10 lb/MMBtu, except for one outlier. The most stringent control of 0.0085 lb/MMBtu is for an auxiliary boiler (60 MMBtu/hr) equipped with flue-gas recirculation and low-NO_X burners. Auxiliary boiler projects with controls ranging from 0.01 to 0.10 lb/MMBtu were equipped with low NO_X or ultra-low NO_X burners, generally reported the use of good combustion practices, and several used flue-gas recirculation. The Facility proposes using ultra-low NO_x burners and good combustion practices to achieve a proposed BACT limit of 0.01 lb/MMBtu for the engine heaters. This is well within the range of recent BACT determinations and consistent with the level of emissions associated with an ultra-low NOx boiler.
- VOC determinations range from 0.0036 to 0.054 lb/MMBtu, except for two outliers. The most stringent level of control for VOCs from an auxiliary boiler is Lincoln Land Energy Center at 0.0015 lb/MMBtu. Lincoln Land Energy Center does not propose any add-on controls, but plans to achieve this limit through combustion controls. However, the facility has received an extension to the deadline to begin construction by January 2027; therefore, this limit has not been achieved in practice. It is also important to note that this determination is for a much larger boiler (80 MMBtu/hr) that will likely be operating more frequently than the engine heaters associated with this Facility. The Facility proposes to use good combustion controls to maintain a VOC emission limit of 0.0054 lb/MMBtu, which is consistent with the precedents listed in Appendix C, Table C-8.
- Levels of control for CO range for auxiliary boilers not utilizing add-on controls ranged from 0.036 to 0.084 lb/MMBtu. These projects generally reported use of good combustion practices and pipeline-quality natural gas. A single facility (Nemadji Trail Energy Center in Douglas County, Wisconsin) established a BACT limit of 0.0037 lb/MMBtu/hr using an oxidation catalyst control. However, this project has not been constructed; therefore, this limit has not been achieved in practice. No other recent auxiliary boiler projects with add-on controls were identified. The proposed BACT limit for CO for the engine heaters is 0.037 lb/MMBtu, which is consistent with the precedents listed in Appendix C, Table C-8.
- $PM_{10}/PM_{2.5}$ BACT determinations range from 0.00068 to 0.008 lb/MMBtu. Most of the lowest values are associated with various boilers (53.7 MMBtu/hr each) at Big River Steel (Mississippi, Arkansas; permitted in 2022) based on use of natural gas and good combustion practices. The most recent Texas decisions

(2025) cite the use of pipeline-quality natural gas or good combustion practices with clean gaseous fuel, both without specifying a numerical limit. Additionally, it appears that several of the PM emission limits provided in the RBLC at the lower end of this range (0.0019 lb/MMBtu) are only representing the filterable PM and not total PM. The Facility proposes to combust natural gas with good combustion controls to maintain a total PM emission limit of 0.0048 lb/MMBtu, which is consistent with the precedents listed in Appendix C, Table C-8.

- For SO_2, BACT limits in the RBLC are provided in a range of forms, including lb/hr, grains of sulfur per 100 dry scf, and lb/MMBtu. For SO_2, the levels of control range vary widely from 0.0006 to 0.002 lb/MMBtu. This is not surprising because a project's SO_2 emissions can vary greatly depending on the maximum sulfur content of the fuel and assumptions related to conversion of SO_2 to H_2SO_4, which is indicated by the wide range of emission limits. The Facility proposes to combust natural gas with a sulfur content of 0.5 grains per 100 scf of natural gas with SO_2 and H_2SO_4 emission limits of 0.0014 lb/MMBtu and 0.00021 lb/MMBtu, respectively. The H_2SO_4 emission limit is based on allowance for 10 percent conversion of SO_2 to H_2SO_4. These limits are consistent with the precedents listed in Appendix C, Table C-8.
- For GHGs, many auxiliary boilers have only an annual tpy limit specified based on annual gas use. The control technologies provided for these determinations are the use of low-carbon fuels and good operating and maintenance procedures. The auxiliary boilers will use natural gas, which is the lowest carbon fuel available. Therefore, formation of CO_2 from combustion of the fuel will be minimized. Good operating and maintenance practices for the boilers include: following the manufacturer's recommended operating and maintenance procedures; maintaining good fuel mixing in the combustion zone; and maintaining the proper air-to-fuel ratio so that sufficient oxygen is provided to provide complete combustion of the fuel while at the same time preventing introduction of more air than is necessary into the boilers. The Facility will combust natural gas with good combustion control, resulting in annual GHG emissions presented in Table 2-6.

4.3.3 Proposed BACT

The emission limits and associated control techniques provided in Table 4-5 are proposed as BACT for the auxiliary boilers. The proposed BACT is consistent with the TCEQ Tier I limit and the levels of control that have been recently identified and demonstrated in practice.

4.4 LINE HEATERS

This section presents the BACT analysis for the line heaters associated with the RICE engines. The EPNs and sizes for the sources are provided in Table 4-6. Each line heater will be permitted to operate 8,760 hours per year.

Table 4-6. Line Heater Information

EPN/Source	Source Category	Maximum Input Capacity
LHEATER1 – LHEATER20	Heater, ≤ 40 MMBtu/hr	5.2 MMBtu/hr

The Facility is subject to PSD review for NO_x, VOCs, CO, $PM_{10}/PM_{2.5}$, SO_2, H_2SO_4, and GHGs. Proposed BACT limits for the line heaters are provided in Table 4-7.

Table 4-7. Summary of Proposed BACT Emission Limits and Control Technologies for the Line Heaters

Pollutant	Emission Rate (lb/MMBtu)	Control Technology
NO_X	0.0109	Ultra-Low NO_X burner
CO	0.037	Good combustion controls
$PM_{10}/PM_{2.5}$	0.0048	Pipeline-quality natural gas
SO_2	0.0014	Pipeline-quality natural gas
VOCs	0.0054	Good combustion controls
H_2SO_4	0.00021	Pipeline-quality natural gas
CO_2e (GHGs)	See Table 2-5	Pipeline-quality natural gas

4.4.1 Emission Reduction Options

The technically feasible control technologies identified for the line heaters are as follows:

- *Combustion Controls*: Boiler vendors provide ultra-low NO_X and low NO_X burners for fuel gas heaters that also provide a high degree of fuel oxidation to control VOCs, CO, and $PM_{10}/PM_{2.5}$.
- *Low-Emitting Fuels:* Natural gas is the lowest emitting fuel for all PSD-subject pollutants emitted from fuel gas heaters.

Because the Facility is in an area of attainment for all pollutants, add-on control equipment is generally not required or cost-effective for units of this size. As such, the Facility will be using combustion controls and low-emitting fuels to control emissions.

4.4.2 Tier I Analysis

The line heaters satisfy the Tier I BACT limits for heaters less than or equal to 40 MMBtu/hr (as presented in the Current Tier I BACT Requirements: Combustion Sources) for all applicable pollutants. NO_X emissions associated with the heater will be controlled using an ultra-low NO_X burner to an emission rate of 0.0109 lb/MMBtu. This is the emission limit achievable with an ultra-low NO_X burner for this size and type of equipment. Emissions of CO will be limited to 50 parts per million by volume dry basis at 3 percent O_2 using good combustion practices. Emissions of VOCs, particulate matter, and sulfur compounds will be controlled through use of good combustion practices and firing pipeline-quality natural gas with a sulfur content of 0.5 grains per 100 scf. These control techniques are consistent with other units of this size.

For GHG control, the line heaters will use natural gas, which is the lowest carbon fuel available. Therefore, formation of CO_2 from fuel combustion will be minimized. Good operating and maintenance practices for the fuel gas heater include following the manufacturer's recommended operating and maintenance procedures; maintaining good fuel mixing in the combustion zone, and maintaining the proper air-to-fuel ratio so that sufficient oxygen is provided to provide complete combustion of the fuel while at the same time preventing introduction of more air than is necessary into the heater. The fuel gas heater will be combusting natural gas using good combustion control, resulting in the annual GHG emissions presented in Table 2-9.

4.4.3 Proposed BACT

The emission limits and associated control techniques as provided in Table 4-7 are proposed as BACT for the fuel gas heater. Westline proposes that these measures and proper operations and maintenance constitute BACT for this unit.

4.5 EMERGENCY ENGINES

This section presents the BACT analysis for the emergency engines associated with the Facility. The EPNs and sizes for these engines are provided in Table 4-8. The engines will all be limited to 100 hours per year of non-emergency operation and will combust ULSD.

Table 4-8. Emergency Engine Information

EPN/Source	Source Category	Engine Size
EGEN1 – EGEN40	Engine: Emergency, Diesel	1,341 hp
FPUMP1 – FPUMP60	Engine: Emergency, Diesel	84 bhp

The Facility is subject to PSD review for NO_X, VOCs, CO, $PM_{10}/PM_{2.5}$, H_2SO_4, and GHGs.

The proposed BACT limits for the engines are provided in Table 4-9. These limits are consistent with the requirements under 40 CFR §60 Subpart IIII.

Table 4-9. Summary of Proposed BACT Emission Limits and Associated Control Technologies for the Emergency Engines

Pollutant	Emergency Generator Emission Rate	Fire Pump Emission Rate	Control Technology
NMHC[a] +NO_X	4.8 g/hp-hr	3.5 g/hp-hr	Good combustion design
CO	2.61 g/hp-hr	3.7 g/ hp-hr	Good combustion design
$PM_{10}/PM_{2.5}$	0.15 g/hp-hr	0.30 g/hp-hr	Good combustion design
SO_2	15 ppmw[b] S in fuel	15 ppmw S in fuel	Low-sulfur fuel
H_2SO_4	15 ppmw S in fuel	15 ppmw S in fuel	Low-sulfur fuel
CO_2e (GHG)	See Table 2-5	See Table 2-5	Good combustion design

Notes:

a. NMHC = non-methane hydrocarbons

b. *ppmw = pounds per million, wet*

4.5.1 Emission Reduction Options

The technically feasible control technologies identified for diesel-fired emergency engines are as follows:

- *SCR*: SCR systems are offered for larger diesel generator engines and provide the most stringent level of NO_X control available.
- *Oxidation Catalyst*: Oxidation catalyst systems are offered for larger diesel generator engines and provide the most stringent level of control available for CO/VOC emissions.

- *Diesel Particulate Filter:* Post-combustion devices similar to oxidation catalysts are also offered for diesel generator engines, known as diesel particulate filters. This is the most stringent level of control for diesel particulates.
- *Combustion Controls*: Diesel engine vendors provide engine combustion designs which meet the federal off-road standards known as "Tier 2" standards for new engines greater than 560-kW mechanical.
- *Low-Emitting Fuels:* ULSD is normally used for emergency generator engines since a stand-alone fuel supply stored in an on-site tank is typically required for emergency use engines.

Add-on control equipment is not generally required or cost-effective for emergency engines which will have limited annual operation.

4.5.2 Tier I Analysis and Proposed BACT

According to the TCEQ Current Tier I BACT Requirements: Combustion Sources (2019), emergency diesel engines are required to meet 40 CFR §60 Subpart IIII, be limited to 100 hours per year of non-emergency operation, and have a non-resettable runtime meter. The limits and associated control techniques provided in Table 4-9 are compliant with the NSPS requirements. The engines will meet these limits through the proposed BACT of proper operations and maintenance of the engines and the burning of ULSD.

GHG emissions will be controlled through the use of good combustion practices. The purpose of emergency engines is to provide a power source during emergencies, which includes outages of the RICE engines, natural gas supply outages, and natural disasters, such as floods and hurricanes. As such, the emergency engines must be available during emergencies. Electricity and natural gas may not be available during an emergency; therefore, the engine must be powered by a liquid fuel that can be stored on site in a tank and supplied to the engines on demand, such as diesel fuels. The Facility will control GHG emissions by combusting diesel and following manufacturers' recommendations and implementing good operating and maintenance procedures. These procedures will include operating with the manufacturers' recommended air-to-fuel ratios and implementing proper maintenance procedures, such as periodic readiness testing. Implementation of these procedures and limited annual hours of operation are proposed as BACT for GHGs.

4.6 OTHER ANCILLARY SOURCES

4.6.1 SF_6 (GHG) Fugitive Emissions

The circuit breakers associated with the proposed Facility will be insulated with SF_6. It is a colorless, odorless, non-flammable gas with an extremely stable molecular structure. The unique chemical properties of SF_6 make it an efficient electrical insulator. SF_6 is only used in sealed and safe systems, which under normal circumstances do not leak gas. However, there is the potential for negligible leakage of SF_6 from circuit breakers, and the Facility will have numerous circuit breakers incorporated into its design. SF_6 has a global warming potential of 23,500 times that of CO_2 and is therefore considered a GHG.

The most common method for reducing fugitive emissions from circuit breakers is the use of state-of-the-art SF_6 technology with leak detection to limit fugitive emissions. In comparison to older SF_6 circuit breakers, modern breakers are designed as a totally enclosed-pressure system with far lower potential for SF_6 emissions. In addition, the effectiveness of leak-tight closed systems can be enhanced by equipping them with a density alarm that provides a warning when SF_6 has escaped. The use of an alarm identifies potential leak problems before a significant amount of SF_6 has escaped, so it can be addressed proactively to prevent further release of the gas.

TCEQ does not provide a Tier I BACT recommendation for GHG emissions from fugitive equipment leaks. However, as detailed above, the Facility will use state-of-the-art, pressurized SF_6 circuit breakers with leak detection, which is consistent with BACT for other similar recently approved projects.

4.6.2 Other Equipment Leaks

This section presents the BACT analysis for the other fugitive equipment leaks associated with the Facility. The relevant EPN and emitted pollutant is listed in Table 4-10.

Table 4-10. Fugitive Equipment Leaks Information

EPN/Source	Source Category	Emitted Pollutant
NGFUG	Fugitives: Piping and Equipment Leaks	CH_4

Westline proposes use of the TCEQ "28VHP" leak detection and repair (LDAR) program to minimize fugitive CH_4 leaks from process piping for piping components. This LDAR program requires quarterly inspection of accessible valves, pump, compressor, and agitator seals in vapor and light liquid service using a portable hydrocarbon analyzer with a leak definition of 500 parts per million by volume (ppmv) VOCs for valves and 2,000 ppmv VOCs for pump, compressor, and agitator seals. Flanges and other connectors must be monitored quarterly with a portable hydrocarbon analyzer with a leak definition of 500 ppmv VOC. A first attempt must be made to repair leaks within five days, and repairs must be completed within 15 days.

The 28VHP program will meet the requirements of TCEQ's technical guidance package for chemical source equipment leak fugitives. Therefore, the proposed program will meet or exceed the BACT requirements.

4.6.3 Storage Tanks

This section presents the BACT analysis for the storage tanks. The EPNs and stored materials are provided in Table 4-11.

Table 4-11. Storage Tank Information

EPN/Source	Source Category	Stored Material
DTANK1 – DTANK100	Storage Tanks (1): Fixed roof with capacity less than 25,000 gal or true vapor pressure less than 0.50 psia	Diesel Fuel

Except for labels and logos not to exceed 15 percent of the tank total surface area, uninsulated tank exterior surfaces exposed to the sun will be white or unpainted aluminum. Storage tanks will be equipped with permanent submerged fill pipes. The use of fixed roof tanks is limited to products whose true vapor pressure is less than 0.5 psia at 95°F or actual storage conditions, or which have a working volume of less than 25,000 gallons. The foregoing requirements are consistent with control requirements in the majority of recently issued permits covering low vapor pressure liquid storage tanks, TCEQ Current Tier I BACT Requirements: Chemical Sources and meet BACT requirements for VOC emissions.

5. References

1. Haley & Aldrich, Inc., 2026. *Air Quality Dispersion Modeling Protocol, Westline 2335, Tom Green County, Texas*. June.

2. Texas Commission on Environmental Quality, 2019a. *Current Tier I BACT Requirements: Chemical Sources*. Version APDG6497v1. March 19.

3. Texas Commission on Environmental Quality, 2019b. *Current Tier I BACT Requirements: Combustion Sources*. Version APDG6498v2. June 4.

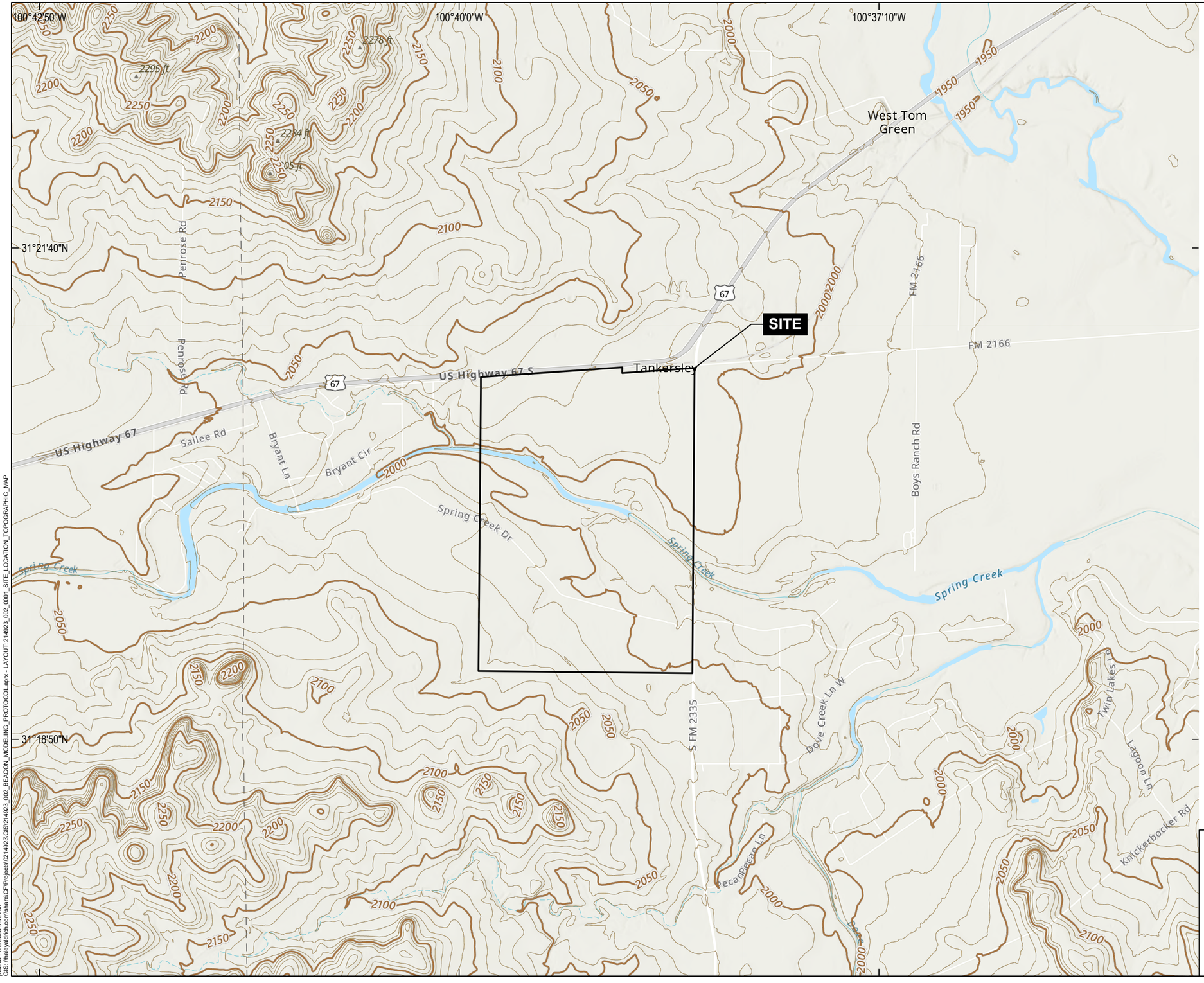
4. U.S. Environmental Protection Agency, 1990. *New Source Review Workshop Manual – Prevention of Significant Deterioration and Nonattainment Area Permitting*. Draft. October.

5. U.S. Environmental Protection Agency, 2000. *Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources*.

6. U.S. Environmental Protection Agency, 2009. *Final Rule for Mandatory Reporting of Greenhouse Gases*. Vol. 74, No. 209. October 30.

7. U.S. Environmental Protection Agency, 2011. *PSD and Title V Permitting Guidance for Greenhouse Gases*. March.

FIGURES



LEGEND

- TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. TOPOGRAPHIC CONTOURS SOURCE: U.S. GEOLOGICAL SURVEY (USGS), THE NATIONAL MAP ELEVATION CONTOURS SERVICE
3. TOPOGRAPHIC MAP SOURCE: ESRI

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SCALE IN FEET

HALEY ALDRICH

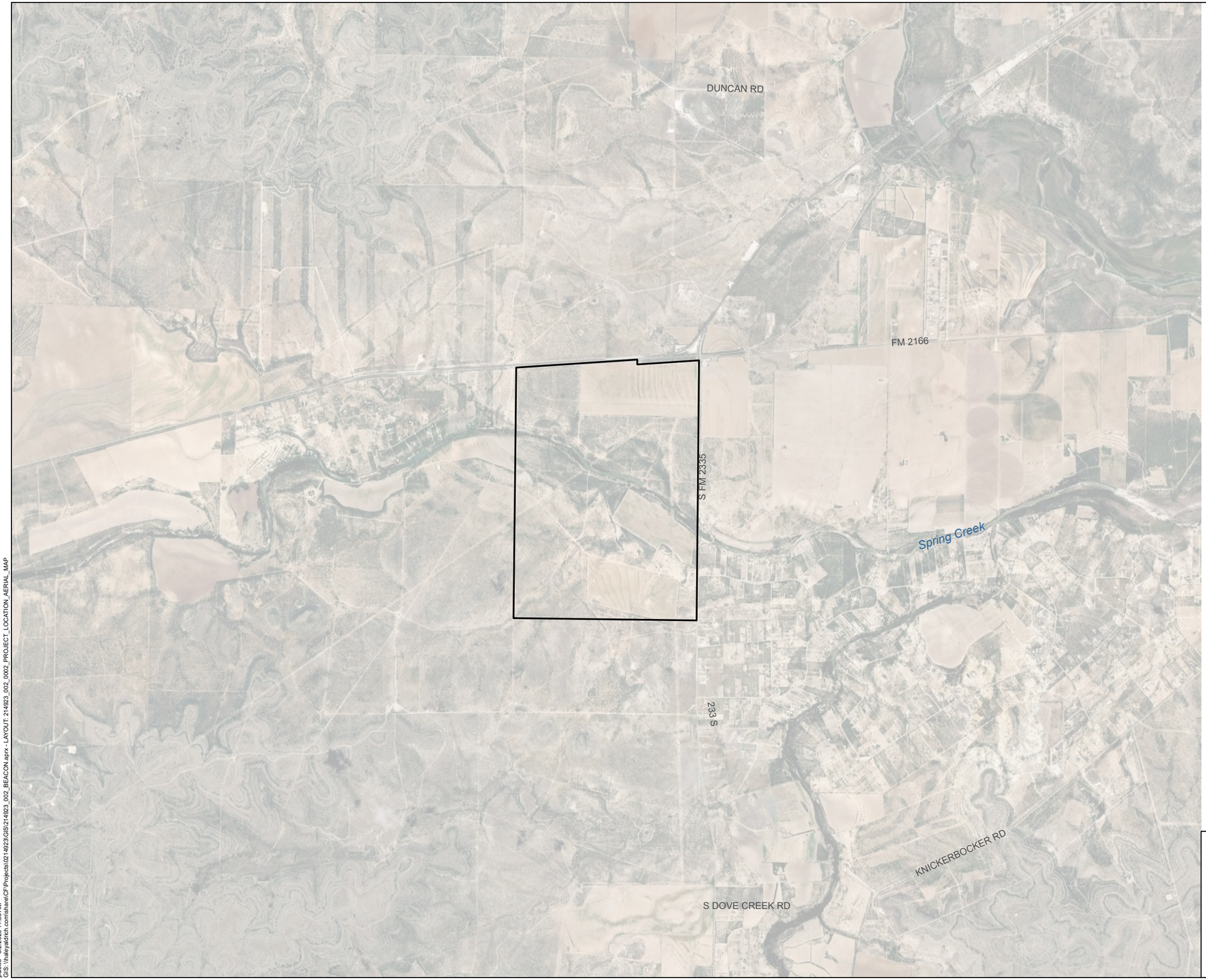
WESTLINE 2335
TOM GREEN COUNTY, TEXAS

PROJECT LOCATION, TOPOGRAPHIC MAP

JUNE 2026

FIGURE 1

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GIS: \\haleyaldrich.com\share\CF\Projects\214923\GIS\214923_002_BEACON_MODELING_PROTOCOL.aprx - LAYOUT: 214923_002_0001_SITE_LOCATION_TOPOGRAPHIC_MAP



LEGEND

SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: GOOGLE EARTH

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SCALE IN FEET

HALEY ALDRICH

WESTLINE 2335
TOM GREEN COUNTY, TEXAS

PROJECT LOCATION, AERIAL MAP

JUNE 2026

FIGURE 2

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DUNCAN RD

FM 2166

S FM 2335

233 S

Spring Creek

KNICKERBOCKER RD

S DOVE CREEK RD

LEGEND

STREAM CLASSIFICATION

- PERENNIAL
- INTERMITTENT
- ARTIFICIAL PATH
- CONNECTOR
- 3000-FT BUFFER OF SITE BOUNDARY
- SITE BOUNDARY

WETLAND CLASSIFICATION

- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND
- RIVERINE

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. HYDROGRAPHY DATA SOURCE: USGS NATIONAL HYDRGROGRAPHY DATASET (NHD)

3. WETLAND DATA SOURCE: US FISH AND WILDLIFE SERVICE, NATIONAL WETLANDS INVENTORY (NWI)

4. AERIAL IMAGERY SOURCE: GOOGLE EARTH

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SCALE IN FEET

HALEY ALDRICH

WESTLINE 2335
TOM GREEN COUNTY, TEXAS

AREA MAP

JUNE 2026

FIGURE 3

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GIS: \\haleyaldrich.com\share\CF\Projects\0214923\GIS\214923_002_BEACON.aprx - LAYOUT: 214923_002_0003_AREA_MAP

APPENDIX A
TCEQ Permit Application Forms

The Permit Application Forms (PI-1) are being submitted electronically with this application. Should a hard copy be needed, it can be provided upon request.

As directed by TCEQ. two PI-1 forms are submitted because the total number of EPNs at the proposed Facility exceeds the limit (400 EPNs) for a single PI-1 form.

APPENDIX B
Emission Calculations

All emission calculations are being submitted electronically with this application. Printouts of all emission calculations are provided in this Appendix, except for TCEQ's Fugitive Emissions Workbook.

Westline 2335 Project

OPERATING ASSUMPTIONS	Per Engine Hall	Total Units
Number of Engine Halls	20	
Bergen Engines	12	240
Engine Heaters	**2**	40
Line Heaters	1	20
Emergency Generators	2	40
Emergency Fire Pump	3	60

83.3% average annual engine operating capacity (i.e., 10 of 12 engines running)
1,752,000 total engine operating hours per year

Annual Emission Rate Summary (TPY) [ALL UNITS]														Facility	PSD	PSD
Pollutant	HAZARDOUS AIR POLLUTANT (HAP)?	Bergen Engine	Engine Heater	Line Heater	Emergency Generators	Emergency Fire Pump	Lube Oil Mist	MSS Anal Eq	MSS Low VP Equip	SF6 Fugitive	NG Purges	Diesel Tanks	Piping Fugitives	Wide PTE (TPY)	Major Source Threshold (TPY)	SER (TPY)
Particulate Matter (PM_{10})	*no*	639.6	0.0347	2.19	0.89	0.17	0.015							642.9	250	15
Particulate Matter ($PM_{2.5}$)	*no*	639.6	0.0347	2.19	0.89	0.17	0.015							642.9	250	10
Sulfur Oxides (SO_x)	*no*	116.5	0.0101	0.64	0.0325	0.0031								117.2	250	40
Nitrogen Oxides (NO_x)	*no*	384.0	0.0723	4.97	28.38	1.94								419.3	250	40
Carbon Monoxide (CO)	*no*	1,142.6	0.2675	16.85	15.43	2.06								1,177.2	250	100
Volatile Organic Compound (VOC)	*no*	440.3	0.0390	2.46	2.01	0.62	0.015	2.90E-05	1.47E-02		1.27	0.0220		446.8	250	40
Sulfuric Acid Mist (SAM)	*no*	17.8	0.0016	0.098	0.0050	0.0005								17.9	250	7
Lead	*yes*	0.0000	3.49E-06	2.23E-04	0	0								0.0002	250	0.6
Carbon Dioxide (CO2)	*no*	9,685,932	846	53,296	3,058	287								9,743,419	100,000	75,000
Greenhouse Gas (CO_2e)	*no*	9,695,910	846.6	53,350.57	3,068.47	288.31				3,910.99	502.72		1,059.24	9,758,937	100,000	75,000
Ammonia	*no*	570.0												570.0		
1,1,2,2-Tetrachloroethane	*yes*	1.66														
1,1,2-Trichloroethane	*yes*	1.32														
1,1-Dichloroethane	*yes*	0.98														
1,2,3-Trimethylbenzene	*no*	0.96														
1,2,4-Trimethylbenzene	*no*	0.60														
1,2-Dichloroethane	*yes*	0.98														
1,2-Dichloropropane	*yes*	1.12														
1,3,5-Trimethylbenzene	*no*	1.41														
1,3-Butadiene	*yes*	11.11														
1,3-Dichloropropene	*yes*	1.10														
2,2,4-Trimethylpentane	*yes*	10.40														
2-Methylnaphthalene	*no*	0.00	1.67E-07	1.07E-05												
Acenaphthene	*no*	0.00	1.26E-08	8.04E-07	8.79E-05	2.50E-06										
Acenaphthylene	*no*	0.00	1.26E-08	8.04E-07	1.73E-04	8.93E-06										
Acetaldehyde	*yes*	347.86			4.73E-04	1.35E-03								347.9		
Acroleink	*yes*	53.47			1.48E-04	1.63E-04										
Benzene	*yes*	18.31	1.47E-05	9.38E-04	1.46E-02	1.65E-03										
Benzo[b]fluoranthene	*no*	0.00	8.37E-09	5.36E-07	2.08E-05	1.75E-07										
Benzo[e]pyrene	*no*	0.00			4.82E-06	3.32E-07										
Benzo[g,h,i]perylene	*no*	0.00	8.37E-09	5.36E-07	1.04E-05	8.63E-07										
Biphenyl	*no*	0.00														
Butane	*no*	22.51														
Butyr/Isobutyraldehyde	*no*	4.20														
Carbon Tetrachloride k	*yes*	1.53														
Chlorobenzene k	*yes*	1.26														
Chloroethane	*yes*	0.08														
Chloroform k	*yes*	1.19														
Chrysene k	*no*	0.03	1.26E-08	8.04E-07	2.87E-05	6.23E-07										
Cyclopentane	*no*	9.45														
Ethylbenzene k	*yes*	1.65														
Ethylene Dibromide k	*yes*	1.84														
Fluoranthene k	*no*	0.00	2.09E-08	1.34E-06	7.57E-05	1.34E-05										
Fluorene k	*no*	0.00	1.95E-08	1.25E-06	2.40E-04	5.15E-05										
Formaldehyde k, l	*yes*	60.00	5.23E-04	3.35E-02	1.48E-03	2.08E-03										
Methanol k	*yes*	104.03														
Methylcyclohexane	*no*	51.18														
Methylene Chloride k	*yes*	0.83														
Naphthalenek	*yes*	0.00	4.26E-06	2.72E-04	2.44E-03	1.50E-04										
Hexane k	*yes*	46.19	1.26E-02	8.04E-01												
n-Nonane	*no*	4.58														
n-Octane	*no*	14.61														
n-Pentane	*no*	108.19														
PAH k	*yes*	2.24			1.98E-04	2.96E-04										
Perchloroethylene k, m	*yes*	0.10														

Annual Emission Rate Summary (TPY) [ALL UNITS]														Facility	PSD	PSD
Pollutant	HAZARDOUS AIR POLLUTANT (HAP)?	Bergen Engine	Engine Heater	Line Heater	Emergency Generators	Emergency Fire Pump	Lube Oil Mist	MSS Anal Eq	MSS Low VP Equip	SF6 Fugitive	NG Purges	Diesel Tanks	Piping Fugitives	Wide PTE (TPY)	Major Source Threshold (TPY)	SER (TPY)
Phenol k	*yes*	1.00														
Pyrene k	*no*	0.00	3.49E-08	2.23E-06	6.97E-05	8.43E-06										
Styrene k	*yes*	0.98														
Toluene k	*yes*	16.98	2.37E-05	1.52E-03	5.28E-03	7.21E-04										
Vinyl Chloride k	*yes*	0.62														
Xylene k	*yes*	7.66			3.62E-03	5.03E-04										
3-Methylchloranthrene	*no*		1.26E-08	8.04E-07												
7,12-Dimethylbenz[a]anthracene	*no*		1.12E-07	7.15E-06												
Anthracene	*yes*		1.67E-08	1.07E-06												
Benzo[a]anthracene	*yes*		1.26E-08	8.04E-07	1.17E-05	2.96E-06										
Dichlorobenzene	*yes*		8.37E-06	5.36E-04												
Indeno[1,2,3-cd]pyrene	*yes*		1.26E-08	8.04E-07	7.77E-06	6.62E-07										
Arsenic	*yes*		1.42E-06	8.93E-05												
Beryllium	*yes*		8.50E-08	5.36E-06												
Cadmium	*yes*		7.80E-06	4.91E-04												
Chromium	*yes*		9.92E-06	6.25E-04												
Cobalt	*yes*		5.95E-07	3.75E-05												
Manganese	*yes*		2.69E-06	1.70E-04												
Mercury	*yes*		1.84E-06	1.16E-04												
Nickel	*yes*		1.49E-05	9.38E-04												
Selenium	*yes*		1.70E-07	1.07E-05												
Vanadium	*yes*		1.63E-05	1.03E-03												
MAXIMUM INDIVIDUAL HAP		347.9	1.26E-02	8.04E-01	5.24E-02	4.55E-03								348.7		
TOTAL HAPS		696.5	1.32E-02	8.44E-01	8.21E-02	1.17E-02								697.4		

Project Name	Westline 2335 Project

Data Inputs for Calculations			
A: Engines (each unit)	**VALUE**	**UNIT**	**REFERENCE**
Number of RICE	240		
Operating Hours			
Facility-Wide Capacity Factor	83.3%		Provided by Joule Grid
Avg operating hours per engine	7,300	hrs/yr	Provided by Joule Grid
Fuel for Engines	Natural Gas		
Steady State Emission Rates	Multiple		Provided by Joule Grid
Engine Heat Input (Nominal)	95.0	MMBtu/hr - HHV	100% Load
Natural Gas Heat Value HHV	1,020	Btu/scf	engineering assumption
Natural Gas Heat Value LHV	919	Btu/scf	Calculation
Natural Gas Sulfur Content	0.5	grains/100 dscf	equivalent to 16.3 ppmw sulfur content in NG
Natural Gas Ratio HHV/LHV	1.11	unitless	Provided by Joule Grid
SO2 to SO3 conversion	10	%	engineering assumption
Stack Exit Conditions			
NOx Concentration	1.2	ppmvd @ 15% O_2	control specs_Miratech SCR_Prelim_Specification_B36-45V20
CO Concentration	6.05	ppmvd @ 15% O_2	control specs_Miratech SCR_Prelim_Specification_B36-45V20
VOC Concentration	4.2	ppmvd @ 15% O_2	control specs_Miratech SCR_Prelim_Specification_B36-45V20
Ammonia Concentration (as Slip from SCR)	5	ppmvd @ 15% O_2	control specs_Miratech SCR_Prelim_Specification_B36-45V20
Startup and Shut down (SUSD) Emissions - Typical Scenario [(1)]	**Value**	**Unit**	**Reference**
Number of Start-up/Shutdown Events			
Startup	6	events/yr/engine	provided by Joule Grid
Shutdown	6	events/yr/engine	provided by Joule Grid
Duration of Start-up/Shutdown Events			
Startup	30	minutes/event	Based on similar engine data provided by JouleGrid via email on 3/26/26
Shutdown	5	minutes/event	Based on similar engine data provided by JouleGrid via email on 3/26/26; shutdown assumed to be 5 minutes

Project Name	Westline 2335 Project

Data Inputs for Calculations				
Minimum Downtime Prior to Events				
Startup		2	hours/event	provided by JouleGrid
Shutdown		0	hours/event	
SUSD EMISSIONS (EACH UNIT)				
Per Engine	**Pounds (lbs) per Event**			
	NOx	**CO**	**VOC**	**PM10/PM2.5**
Warm Start	6.5	6.7	1.5	2
Shutdown	0.13	0.25	0.25	0.06

B: "BLACK START" DIESEL GENERATOR	VALUE	UNIT	REFERENCE
Number of Black Start Diesel Generators	20	each	Milton Maragh email (3/30/26) (1 per engine hall)
Engine Rating	1.0	MW	Milton Maragh email (4/7/26)
Engine Rating	1,341	Hp	calculation
Fuel	diesel	---	Peter Lauser email (3/8/26)
Operating Hours	100	hr/yr	assumption based on NSPS
Stack height	15	meters	Milton Maragh email (3/26/26)
Stack Inner Diameter	0.381	meters	Milton Maragh email (3/26/26)
ACFM	8,065.3	cfm	Milton Maragh email (4/7/26)
Exit velocity	see ACFM	---	Milton Maragh email (4/7/26)
Exit temperature 749.55 K	476.4	C	Milton Maragh email (4/7/26)
NOx emissions	1.84	g/s	Milton Maragh email (4/7/26)
CO emissions	0.048	g/s	Milton Maragh email (4/7/26)
HC emissions	0.004		Milton Maragh email (4/7/26)
PM emissions	0.0075	g/s	Milton Maragh email (4/7/26)
SO2 to SO3 conversion	10%	---	standard modeling assumption

C: EMERGENCY FIRE WATER PUMP	VALUE	UNIT	REFERENCE
Number of Emergency Fire Water Pump	60	each	Peter Lauser/Tom Oldham conversation (5/19/26) (3 per engine hall)
Engine Rating	84	HP	Milton Maragh email (4/2/26)
Fuel	diesel	---	Joule Grid meeting (3/12/26)
Operating Hours			
Stack height	15	meters	Milton Maragh email (3/26/26)

Project Name	Westline 2335 Project

Data Inputs for Calculations			
Stack ID	0.102	meters	Milton Maragh email (4/2/26)
ACFM	520	CFM	Milton Maragh email (4/2/26)
Exit velocity			
Exit temperature 738.15 K	465	C	Milton Maragh email (4/2/26)
NOx emissions	0.0594	g/s	Milton Maragh email (4/2/26)
CO emissions	0.0162	g/s	Milton Maragh email (4/2/26)
NMHC emissions	0.0014	g/s	Milton Maragh email (4/2/26)
PM emissions	0.0021	g/s	Milton Maragh email (4/2/26)
SO2 to SO3 conversion	10%	---	standard modeling assumption
D: EMERGENCY GENERATORS	**VALUE**	**UNIT**	**REFERENCE**
Number of Emergency Generators	20	each	Milton Maragh email (3/26/26)
Engine Rating	1,000.0	kW	Milton Maragh email (4/7/26)
Engine Rating			
Fuel	diesel	---	Peter Lauser email (3/8/26)
Operating Hours			
Stack height	15	meters	Milton Maragh email (3/26/26)
Stack ID	0.381	meters	Milton Maragh email (3/26/26)
ACFM	8,065.3	cfm	Milton Maragh email (4/7/26)
Exit velocity	see ACFM	---	Milton Maragh email (4/7/26)
Exit temperature 749.55 K	476.4	C	Milton Maragh email (4/7/26)
Location			
NOx emissions	1.84	g/s	Milton Maragh email (4/7/26)
CO emissions	0.048	g/s	Milton Maragh email (4/7/26)
HC emissions	0.004	g/s	Milton Maragh email (4/7/26)
PM emissions	0.0075	g/s	Milton Maragh email (4/7/26)
SO2 to SO3 conversion	10%	---	engineering assumption

Project Name	Westline 2335 Project

Data Inputs for Calculations			
E: LINE HEATERS	**VALUE**	**UNIT**	**REFERENCE**
Number of Line Heaters	20	each	Milton Maragh email (3/30/26)
Line Heater Rating	5.2	MMBtu/hr	Milton Maragh email (6/2/26)
Fuel	natural gas	---	Milton Maragh email (3/30/26)
Operating Hours	8,760	hours	Milton Maragh email (3/30/26)
Stack height	15	meters	Milton Maragh email (3/30/26)
Stack ID (internal diameter)	0.50	meters	Milton Maragh email (3/30/26)
ACFM			
Exit velocity	5.0	m/s	Milton Maragh email (3/30/26)
Exit temperature	773	K	Milton Maragh email (3/30/26)
Location		---	
NOx emissions	0.0109	lb/MMBtu	Milton Maragh email (6/2/26)
CO emissions	0.0370	lb/MMBtu	Milton Maragh email (6/2/26)
PM emissions	0.00760	g/s	Milton Maragh email (6/2/26)
SO2 to SO3 conversion	10%	---	standard modeling assumption
F: ENGINE HEATERS	**VALUE**	**UNIT**	**REFERENCE**
Number of Engine Heaters	40	each	Milton Maragh email (3/30/26)
Engine Heater Rating	1.47	MW	Milton Maragh email (3/30/26)
Fuel	natural gas	---	
Heat Input (HHV)	5.28	GJ/h	Milton Maragh email (3/30/26)
Operating Hours	---	---	See SU/SD tab for engine heaters
Stack height	18.3	meters	Milton Maragh email (3/30/26)
Stack ID	0.356	meters	Milton Maragh email (3/30/26)
ACFM			
Exit velocity	5.8	m/s	Milton Maragh email (3/30/26)
Exit temperature	350	K	Milton Maragh email (3/30/26)
Location		---	
NOx emissions	0.0234	g/s	Milton Maragh email (3/30/26)
CO emissions	0.0519	g/s	Milton Maragh email (3/30/26); updated 4/16

Project Name	Westline 2335 Project

Data Inputs for Calculations			
PM emissions	0.000196	g/s	Milton Maragh email (3/30/26)
SO2 to SO3 conversion	10%	---	standard modeling assumption

Westline 2335 Project

SINGLE BERGEN ENGINE

This spreadsheet calculates emissions from a single Bergen engine.

CRITERIA POLLUTANTS

Pollutant	Hourly Emissions (lb/hr)		Hours of Operation 7,300	Steady State and SUSD Operations		
	Maximum	At Design Operating Conditions, 100% Load	Annual Emissions at ISO Conditions (tpy)	Annual Emissions from SUSD (tpy)	Annual Emissions from Steady State (tpy)	Annual Emissions with SUSD and Normal Operation (tpy)
Particulate Matter (PM_{10})		0.73	2.66	0.01	2.66	**2.67**
Particulate Matter ($PM_{2.5}$)		0.73	2.66	0.01	2.66	**2.67**
Sulfur Oxides (SO_x)		0.13	0.49	0.00	0.49	**0.49**
Nitrogen Oxides (NO_x)		0.43	1.58	0.02	1.58	**1.60**
Carbon Monoxide (CO)		1.30	4.75	0.02	4.74	**4.76**
Total Volatile Organic Compounds (VOC)		0.50	1.83	0.01	1.83	**1.83**
Sulfuric acid mist (SAM)		0.02	0.07	NA	NA	**0.07**

GREENHOUSE GASES (GHG)

Pollutant	Hourly Emissions (lb/hr)		Hours of Operation 7,300	Steady State and SUSD Operations		
	Maximum	At Design Operating Conditions, 100% Load	Annual Emissions at ISO Conditions (tpy)	Annual Emissions from SUSD (tpy)	Annual Emissions from Steady State (tpy)	Annual Emissions with SUSD and Normal Operation (tpy)
CO_2		11,057	**40,358**	NA	NA	**40,358**
N_2O		0.02	**0.08**	NA	NA	**0.08**
CH_4		0.21	**0.76**	NA	NA	**1**
CO_2e		11,068.4	**40,400**	NA	NA	**40,400**

Notes:

lbs = pounds

hr = hours

SUSD = Startup and Shut Down

HAP

Air Toxic Pollutant (not all HAPs)	Emissions (lb/hr)		Hours of Operation 7,300	HAP Speciation	
	Maximum	At Design Operating Conditions, 100% Load	HAP Annual Emissions at ISO Conditions (tpy)	HAP? (0 = no; 1 = yes)	Air Toxic Annual Emissions at ISO Conditions (tpy)
Ammonia	6.51E-01	6.51E-01	**0.00**	0	2.375
1,1,2,2-Tetrachloroethane	1.90E-03	1.90E-03	**0.01**	1	0.007
1,1,2-Trichloroethane	1.51E-03	1.51E-03	**0.01**	1	0.006
1,1-Dichloroethane	1.12E-03	1.12E-03	**0.00**	1	0.004
1,2,3-Trimethylbenzene	1.09E-03	1.09E-03	**0.00**	0	0.004
1,2,4-Trimethylbenzene	6.79E-04	6.79E-04	**0.00**	0	0.002
1,2-Dichloroethane	1.12E-03	1.12E-03	**0.00**	1	0.004
1,2-Dichloropropane	1.28E-03	1.28E-03	**0.00**	1	0.005
1,3,5-Trimethylbenzene	1.61E-03	1.61E-03	**0.00**	0	0.006
1,3-Butadiene	1.27E-02	1.27E-02	**0.05**	1	0.046
1,3-Dichloropropene	1.25E-03	1.25E-03	**0.00**	1	0.005
2,2,4-Trimethylpentane	1.19E-02	1.19E-02	**0.04**	1	0.043
2-Methylnaphthalene	0.00E+00	0.00E+00	**0.00**	0	0.000
Acenaphthene	0.00E+00	0.00E+00	**0.00**	0	0.000
Acenaphthylene	0.00E+00	0.00E+00	**0.00**	0	0.000
Acetaldehyde	3.97E-01	3.97E-01	**1.45**	1	1.449
Acroleink	6.10E-02	6.10E-02	**0.22**	1	0.223
Benzene	2.09E-02	2.09E-02	**0.08**	1	0.076
Benzo[b]fluoranthene	0.00E+00	0.00E+00	**0.00**	0	0.000
Benzo[e]pyrene	0.00E+00	0.00E+00	**0.00**	0	0.000
Benzo[g,h,i]perylene	0.00E+00	0.00E+00	**0.00**	0	0.000
Biphenyl	0.00E+00	0.00E+00	**0.00**	0	0.000
Butane	2.57E-02	2.57E-02	**0.00**	0	0.094
Butyr/Isobutyraldehyde	4.80E-03	4.80E-03	**0.00**	0	0.018
Carbon Tetrachloride k	1.74E-03	1.74E-03	**0.01**	1	0.006
Chlorobenzene k	1.44E-03	1.44E-03	**0.01**	1	0.005
Chloroethane	8.88E-05	8.88E-05	**0.00**	1	0.000
Chloroform k	1.35E-03	1.35E-03	**0.00**	1	0.005
Chrysene k	3.29E-05	3.29E-05	**0.00**	0	0.000
Cyclopentane	1.08E-02	1.08E-02	**0.00**	0	0.039
Ethylbenzene k	1.89E-03	1.89E-03	**0.01**	1	0.007
Ethylene Dibromide k	2.10E-03	2.10E-03	**0.01**	1	0.008
Fluoranthene k	0.00E+00	0.00E+00	**0.00**	0	0.000
Fluorene k	0.00E+00	0.00E+00	**0.00**	0	0.000
Formaldehyde k, l	6.85E-02	6.85E-02	**0.25**	1	0.250
Methanol k	1.19E-01	1.19E-01	**0.43**	1	0.433
Methylcyclohexane	5.84E-02	5.84E-02	**0.00**	0	0.213
Methylene Chloride k	9.50E-04	9.50E-04	**0.00**	1	0.003
Naphthalenek	0.00E+00	0.00E+00	**0.00**	1	0.000
n-Hexane k	5.27E-02	5.27E-02	**0.19**	1	0.192
n-Nonane	5.23E-03	5.23E-03	**0.00**	0	0.019
n-Octane	1.67E-02	1.67E-02	**0.00**	0	0.061
n-Pentane	1.24E-01	1.24E-01	**0.00**	0	0.451
PAH k	2.56E-03	2.56E-03	**0.01**	1	0.009
Perchloroethylene k, m	1.18E-04	1.18E-04	**0.00**	1	0.000
Phenanthrene k	0.00E+00	0.00E+00	**0.00**	0	0.000
Phenol k	1.14E-03	1.14E-03	**0.00**	1	0.004
Pyrene k	0.00E+00	0.00E+00	**0.00**	0	0.000
Styrene k	1.12E-03	1.12E-03	**0.00**	1	0.004
Toluene k	1.94E-02	1.94E-02	**0.07**	1	0.071
Vinyl Chloride k	7.08E-04	7.08E-04	**0.00**	1	0.003
Xylene k	8.74E-03	8.74E-03	**0.03**	1	0.032
MAXIMUM INDIVIDUAL HAP	**0.00E+00**		**1.449**		
TOTAL HAPS	**0.00E+00**		**2.902**		

GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES			
	VALUE	UNIT	REFERENCE
CO_2	1	CO_2e	40 CFR Part 98
N_2O	265	CO_2e	40 CFR Part 98
CH_4	28	CO_2e	40 CFR Part 98

Sources:control specs_Miratech SCR_Prelim_Specification_B36-45V20

Provided by JouleGrid (see Project_Westline_Deliverable_Tracker)

FUEL TYPE	**Natural Gas**	**Natural Gas**
ENGINE LOAD LEVEL	100%	75%
NET FUEL HEATING VALUE, Btu/lb_m (LHV)	20,515	20,515
GROSS FUEL HEATING VALUE, Btu/lb_m (HHV)	22,760	22,760
AMBIENT DRY BULB TEMPERATURE, °F	up to 100F	up to 100F
AMBIENT RELATIVE HUMIDITY, %	60	60
BAROMETRIC PRESSURE, psi_a	13.73	13.73
FUEL FLOW, lb_m/hr	4,172	3,211
HEAT INPUT, MMBtu/hr (LHV)	85.6	65.9
HEAT INPUT, MMBtu/hr (HHV)	95	73

ENGINE PERFORMANCE		
POWER OUTPUT (GROSS), kW	12,320	9,240
POWER OUTPUT (NET ELECTRICAL), kWe	12,045	9,025
POWER OUTPUT (NET ELECTRICAL), hp	16,153	12,103
POWERTRAIN EFFICIENCY	97.8%	97.7%
EFFICIENCY, % (LHV)	48.0%	46.7%
EFFICIENCY, % (HHV)	43.3%	42.1%
HEAT RATE, Btu/kWh (LHV)	7,107	7,302
HEAT RATE, Btu/kWh (HHV)	7,887	8,100
HEAT RATE, Btu/bhpWh (HHV)		

STACK EXHAUST GAS		
DILUTION AIR FLOW, lb_m/hr	0	0
TOTAL FLOW, lb_m/hr	150,600	112,900
TOTAL FLOW, ACFM	72,177	57,641
TEMPERATURE, °F	653	725
TOTAL FLOW, SCFM	34,240	25,683

STACK EMISSIONS (Based on USEPA Test Methods):		
NO_X, ppmvd @ 15% O_2 (uncontrolled)	90	80
NO_X, ppmvd @ 15% O_2 (controlled)	**1.2**	**1.2**
NO_X, lb_m/hr as NO_2 (Uncontrolled)	31.1	21.3
NO_X, lb_m/hr as NO_2 (Controlled)	0.43	0.33
NO_X, g/hp hr as NO_2 (Controlled)	0.012	0.012
NH_3, ppmvd @ 15% O_2	**5**	**5**
NH_3, lb_m/hr	0.65	0.49
CO, ppmvd @ 15% O_2 (uncontrolled)	110	120
CO, ppmvd @ 15% O_2 (controlled)	**6.05**	**6.05**
CO, lb_m/hr (uncontrolled)	23.1	19.4
CO, lb_m/hr (controlled)	1.30	1.0
CO, g/ hp hr (controlled)	0.037	0.037
VOC, ppmvd @ 15% O_2 as CH_4	**4.2**	**4.2**
VOC, lb_m/hr as CH_4	0.50	0.38
VOC, g/hp hr as CH_4	0.014	0.014
Particulate Matter, lb_m/hr	0.73	0.60
Particulate Matter, g/hp hr	0.021	0.023
SO2, lbm/hr	0.13	0.10
SO2, g/hp hr	0.0037	0.0029
H_2SO_4, lb_m/hr	0.020	0.016
CO_2, lb_m/hr	11,057	8,508
CO_2, lb_m/MW hr	897	
CH2O, ppmvd @15% O2	**0.30**	**0.30**
CH2O, lb/hr	0.068	0.051

organic hydrocarbon control from CatOx 50%

HAP and Air Toxic Emissions (lb/hr)

	CASE		100%	75%
Sources: AP-42 Chapter 3.2 unless otherwise noted	**Controlled Engine EF (lb/MMBTu)**	**Uncontrolled Engine EF (lb/MMBtu)**	**up to 100F**	**up to 100F**
methane (CH_4)	0.0022	0.0022	0.209	0.161
nitrous oxide (N_2O)	0.00022	0.00022	0.021	0.016
1,1,2,2-Tetrachloroethane	2.00E-05	4.00E-05	0.0019	0.0015
1,1,2-Trichloroethane	1.59E-05	3.18E-05	0.002	0.001
1,1-Dichloroethane	1.18E-05	2.36E-05	0.001	0.001
1,2,3-Trimethylbenzene	1.15E-05	2.30E-05	0.001	0.001
1,2,4-Trimethylbenzene	7.15E-06	1.43E-05	0.001	0.001
1,2-Dichloroethane	1.18E-05	2.36E-05	0.001	0.001
1,2-Dichloropropane	1.35E-05	2.69E-05	0.001	0.001
1,3,5-Trimethylbenzene	1.69E-05	3.38E-05	0.002	0.001
1,3-Butadiene	1.34E-04	2.67E-04	0.013	0.010
1,3-Dichloropropene	1.32E-05	2.64E-05	0.001	0.001
2,2,4-Trimethylpentane	1.25E-04	2.50E-04	0.012	0.009
2-Methylnaphthalene	0.00E+00	0.00E+00	0.000	0.000
Acenaphthene	0.00E+00	0.00E+00	0.000	0.000
Acenaphthylene	0.00E+00	0.00E+00	0.000	0.000
Acetaldehyde	4.18E-03	8.36E-03	0.397	0.306
Acrolein	6.43E-04	1.29E-03	0.061	0.047
Benzene	2.20E-04	4.40E-04	0.021	0.016
Benzo[b]fluoranthene	0.00E+00	0.00E+00	0.000	0.000
Benzo[e]pyrene	0.00E+00	0.00E+00	0.000	0.000
Benzo[g,h,i]perylene	0.00E+00	0.00E+00	0.000	0.000
Biphenyl	0.00E+00	0.00E+00	0.000	0.000
Butane	2.71E-04	5.41E-04	0.026	0.020
Isobutyraldehyde	5.05E-05	1.01E-04	0.005	0.004
Carbon Tetrachloride	1.84E-05	3.67E-05	0.002	0.001
Chlorobenzene	1.52E-05	3.04E-05	0.001	0.001
Chloroethane	9.35E-07	1.87E-06	0.000	0.000
Chloroform	1.43E-05	2.85E-05	0.001	0.001
Chrysene	3.47E-07	6.93E-07	0.000	0.000
Cyclopentane	1.14E-04	2.27E-04	0.011	0.008
Ethylbenzene	1.99E-05	3.97E-05	0.002	0.001
Ethylene Dibromide	2.22E-05	4.43E-05	0.002	0.002
Fluoranthene	0.00E+00	0.00E+00	0.000	0.000
Fluorene	0.00E+00	0.00E+00	0.000	0.000
Formaldehyde	7.21E-04		0.068	0.053
Methanol	1.25E-03	2.50E-03	0.119	0.091
Methylcyclohexane	6.15E-04	1.23E-03	0.058	0.045
Methylene Chloride	1.00E-05	2.00E-05	0.001	0.001
Naphthalene	0.00E+00	0.00E+00	0.000	0.000
n-Hexane	5.55E-04	1.11E-03	0.053	0.041
n-Nonane	5.50E-05	1.10E-04	0.005	0.004
n-Octane	1.76E-04	3.51E-04	0.017	0.013
n-Pentane	1.30E-03	2.60E-03	0.124	0.095
PAH	2.69E-05	2.69E-05	0.003	0.002
Perchloroethylene	1.24E-06	2.48E-06	0.000	0.000
Phenanthrene	0.00E+00	0.00E+00	0.000	0.000
Phenol	1.20E-05	2.40E-05	0.001	0.001
Pyrene	0.00E+00	0.00E+00	0.000	0.000
Styrene	1.18E-05	2.36E-05	0.001	0.001
Toluene	2.04E-04	4.08E-04	0.019	0.015
Vinyl Chloride	7.45E-06	1.49E-05	0.001	0.001
Xylene	9.20E-05	1.84E-04	0.009	0.007

Notes:

assumed to be part of total PAH

assumed control from oxidation catalyst

Based on vendor provided data

Siemens Energy is a trademark licensed by Siemens AG

Westline 2335 Project

Mode	Events/year	Time (min) per event	Min Downtime before or after Event (hr)	Total Time per event (hr)	Total Pounds Per Event				Total Tons Per Year from SU/SD			
					NOx	CO	VOC	PM	NOx	CO	VOC	PM
Startup:	6	30	2	2.50	6.50	6.70	1.50	2.00	0.020	0.020	0.005	0.006
Shutdown:	6	5	0	0.08	0.13	0.25	0.25	0.06	0.000	0.001	0.001	0.000
	Total Time (hr)	**3.5**			6.63	6.95	1.75		**0.02**	**0.02**	**0.01**	**0.01**

Hourly Maximum Emissions (assumes 1 SU and 1 SD in an hour)

Mode	Events/year	Time (min) per event	Min Downtime before or after Event (hr)	Total Time per event (hr)	SU/SD Max Emissions during an hour (lbs)				Steady State Emissions during remaing hour (lbs)				Maximum Hourly Emissions (lbs/hour)			
					NOx	CO	VOC	PM	NOx	CO	VOC	PM	NOx	CO	VOC	PM
Startup:	6	30	2	2.50	6.50	6.70	1.50	2.00	0.22	0.65	0.25	0.37	6.72	7.35	1.75	2.37
Shutdown:	6	5	0	0.08	0.13	0.25	0.25	0.06	0.40	1.19	0.46	0.67	0.52	1.44	0.71	0.73
	Total Time (hr)	**3.5**		**15.5**									7.24	8.79	2.46	3.10

Mode	Events/year	Time (min) per event	Min Downtime before or after Event (hr)	Total Time per event (hr)	SU/SD Average Hourly Emissions (lb/hr)				Steady State Hourly Emissions (lb/hr)			
					NOx	CO	VOC	PM	NOx	CO	VOC	PM
Startup:	6	30	2	2.50	2.60	2.68	0.60	0.80	0.434	1.301	0.502	0.730
Shutdown:	6	5	1	0.08	1.50	3.00	3.00	0.73	0.434	1.301	0.502	0.730
	Total Time (hr)	**3.5**		**15.5**					**0.87**	**2.60**	**1.00**	**1.46**

Annual Average Emissions

SU/SD hrs per year 0.0 w/o downtime
SU/SD hrs per year 15.5 with downtime

Mode	Events/year	Total Time per event (hr) (no downtime)	Annual Hours for SU/SD Events (with downtime)	SU/SD lb per yr (during SU/SD event hours including downtime)				ISO Steady State (lb/yr) (during SU/SD event hours including downtime)				Worst Case Annual Emissions During SU_SD Event Hours (lb/yr) (including downtime)			
				NOx	CO	VOC	PM	NOx	CO	VOC	PM	NOx	CO	VOC	PM
Startup:	6		15.0	39.0	40.2	9.0	12.0	7	20	8	11	39	40	9	12
Shutdown:	6		0.5	0.75	1.50	1.50	0.37	0	1	0	0.37	1	2	2	0
	TOTALS		**15.5**												
SU_SD Event Hours (inc. downtime) (tpy)			15.5									0.020	0.021	0.005	0.006
Steady State Operation Hours (tpy)			7284.5									1.6	4.7	1.8	2.7
TOTAL			7300.0									**1.6**	**4.8**	**1.8**	**2.7**

Notes

A) For pollutants that are self-correcting hourly emissions are during normal operation, for non self correcting pollutants, emissions are during SU/SD event.
B) Incorporates SU/SD emissions for those pollutants that are not self-correcting as indicated with orange shading.
C) Max Hourly Emissions During SU/SD event incorporates assumes steady state operation for the remainder of the hour.

	SUSD lb per min (not including downtime)			Steady state lb per min		
	NOx	CO	PM	NOx	CO	PM
Startup:	0.217	0.223	0.067	0.0072	0.0217	0.0122
Shutdown:	0.025	0.050	0.012	0.0072	0.0217	0.0122

Emissions for Modeling (lb/hr)

	Events/year	Total Time per event (min) (no downtime)	Max 1-hour			8-hr			24-hr			Annual Average		
			NOx	CO	PM	NOx	CO	PM	NOx	CO	PM	NOx	CO	PM
Startup:	6	30	6.72	7.35	NA	NA	2.06	NA	NA	NA	0.80	0.438	NA	0.73
Shutdown:	6	5	0.52	1.44	NA	NA	1.32	NA	NA	NA	0.73	0.438	NA	0.73

Operating Scenarios (min of operation)

8-hr scenarios (480 min)	Startup:		Shutdown:		Steady State (minutes)	Minutes in Avg Period
	# of events	total minutes	# of events	total minutes		
Startup:	1	30	0	0	450	480
Shutdown:	0	0	1	5	475	480

24-hr scenarios (1440 min)	Startup:		Shutdown:		Steady State (minutes)	Minutes in Avg Period	Exhaust Flow		
	# of events	total minutes	# of events	total minutes			During event (acfm)	Steady State (acfm)	Time Weighted Average (acfm)
Startup:	1	30	0	0	1,410	1,440	57,641	72,177	71,874
Shutdown:	0	0	1	5	1,435	1,440	57,641	72,177	72,127

Annual Average scenarios	Startup:		Shutdown:		Steady State (minutes)	Minutes in Avg Period	Exhaust Flow		
	# of events	total minutes	# of events	total minutes			During event (acfm)	Steady State (acfm)	Time Weighted Average (acfm)
SUSD Events	6	180	6	30	525,390	525,600	57,641	72,177	72,171

Westline 2335 Project

Engine Heater (Boiler)											
Annual hours of operation assumes 2 hr/engine start, 6 engines/heater, 6 starts/engine = 2*6*6 = 72 hours per year											
Pollutant	**Annual Operation (hrs/yr)**	**Size (MMBTU/hr)**	**Emission Factor**	**Emission Factor Units**	**Emissions (Potential to Emit)**						
					Average (lbs/hr)	**Maximum (lbs/hr)**	**Annual (tons/yr)**				
Particulate Matter (PM_{10})	72	5.02	0.0048	lb/MMBTU	0.024	0.024	0.00087	BACT	0.0241 lb/hr	=	0.0048 lb/MMBTU
Particulate Matter ($PM_{2.5}$)	72	5.02	0.0048	lb/MMBTU	0.024	0.024	0.00087	BACT	0.0241 lb/hr	=	0.0048 lb/MMBTU
Sulfur Oxides (SO_x)	72	5.02	0.0014	lb/MMBTU	0.007	0.007	0.00025	Based on 0.5 gr S /100 scf	0.0070 lb/hr	=	0.0014 lb/MMBTU
Nitrogen Oxides (NO_x)[5]	72	5.02	0.010	lb/MMBTU	0.050	0.050	0.0018	BACT	0.0502 lb/hr	=	0.010 lb/MMBTU
Carbon Monoxide (CO)	72	5.02	0.0370	lb/MMBTU	0.186	0.186	0.0067	BACT	0.186 lb/hr	=	0.0370 lb/MMBTU
Total Volatile Organic Compounds (VOC)[5]	72	5.02	0.0054	lb/MMBTU	0.027	0.027	0.0010	AP-42; Table 1.4-2	0.0271 lb/hr	=	0.0054 lb/MMBTU
Sulfuric Acid Mist (as H_2SO_4)	72	5.02	0.00021	lb/MMBTU	0.0011	0.0011	3.88E-05	SO2 to SO3 Conversion	0.0011 lb/hr	=	0.00021 lb/MMBTU
Lead	72	5.02	4.83E-07	lb/MMBTU	2.42E-06	2.42E-06	8.72E-08	From AP-42; Tables 1.4-2	5.00E-04 lb/MMscf	=	4.83E-07 lb/MMBTU
Carbon Dioxide (CO_2)	72	5.02	1.17E+02	lb/MMBTU	587.340	587.340	21.14	40 CFR 98 Table C-2	5.31E+01 kg/MMBtu	=	117.00 lb/MMBTU
Methane (CH_4)	72	5.02	2.20E-03	lb/MMBTU	0.011	0.011	4.0E-04		1.00E-03 kg/MMBtu	=	2.20E-03 lb/MMBTU
Nitrous Oxide (N_2O)	72	5.02	2.20E-04	lb/MMBTU	0.0011	0.0011	4.0E-05		1.00E-04 kg/MMBtu	=	2.20E-04 lb/MMBTU
CO_2e	72	5.02	--	--	587.94	587.94	21.17	NA	NA		NA
2-Methylnaphthalene	72	5.02	2.32E-08	lb/MMBTU	1.16E-07	1.16E-07	4.19E-09	From AP-42 (4/26); Tables 1.4-3	2.40E-05 lb/MMscf	=	2.32E-08 lb/MMBTU
3-Methylchloranthrene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
7,12-Dimethylbenz[a]anthracene	72	5.02	1.54E-08	lb/MMBTU	7.75E-08	7.75E-08	2.79E-09		1.60E-05 lb/MMscf	=	1.54E-08 lb/MMBTU
Acenaphthene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
Acenaphthylene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
Anthracene	72	5.02	2.32E-09	lb/MMBTU	1.16E-08	1.16E-08	4.19E-10		2.40E-06 lb/MMscf	=	2.32E-09 lb/MMBTU
Benzo[a]anthracene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
Benzene	72	5.02	2.03E-06	lb/MMBTU	1.02E-05	1.02E-05	3.66E-07		2.10E-03 lb/MMscf	=	2.03E-06 lb/MMBTU
Benzo[a]pyrene	72	5.02	1.16E-09	lb/MMBTU	5.81E-09	5.81E-09	2.09E-10		1.20E-06 lb/MMscf	=	1.16E-09 lb/MMBTU
Benzo[b]fluoranthene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
Benzo[g,h,i]perylene	72	5.02	1.16E-09	lb/MMBTU	5.81E-09	5.81E-09	2.09E-10		1.20E-06 lb/MMscf	=	1.16E-09 lb/MMBTU
Benzo[k]fluoranthene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
Chrysene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
Dibenzo[a,h]anthracene	72	5.02	1.16E-09	lb/MMBTU	5.81E-09	5.81E-09	2.09E-10		1.20E-06 lb/MMscf	=	1.16E-09 lb/MMBTU
Dichlorobenzene	72	5.02	1.16E-06	lb/MMBTU	5.81E-06	5.81E-06	2.09E-07		1.20E-03 lb/MMscf	=	1.16E-06 lb/MMBTU
Fluoranthene	72	5.02	2.90E-09	lb/MMBTU	1.45E-08	1.45E-08	5.23E-10		3.00E-06 lb/MMscf	=	2.90E-09 lb/MMBTU
Fluorene	72	5.02	2.70E-09	lb/MMBTU	1.36E-08	1.36E-08	4.88E-10		2.80E-06 lb/MMscf	=	2.70E-09 lb/MMBTU
Formaldehyde	72	5.02	7.24E-05	lb/MMBTU	3.63E-04	3.63E-04	1.31E-05		7.50E-02 lb/MMscf	=	7.24E-05 lb/MMBTU
Hexane	72	5.02	1.74E-03	lb/MMBTU	8.72E-03	8.72E-03	3.14E-04		1.80E+00 lb/MMscf	=	1.74E-03 lb/MMBTU
Indeno[1,2,3-cd]pyrene	72	5.02	1.74E-09	lb/MMBTU	8.72E-09	8.72E-09	3.14E-10		1.80E-06 lb/MMscf	=	1.74E-09 lb/MMBTU
Naphthalene	72	5.02	5.89E-07	lb/MMBTU	2.96E-06	2.96E-06	1.06E-07		6.10E-04 lb/MMscf	=	5.89E-07 lb/MMBTU
Phenanathrene	72	5.02	1.64E-08	lb/MMBTU	8.24E-08	8.24E-08	2.97E-09		1.70E-05 lb/MMscf	=	1.64E-08 lb/MMBTU
Pyrene	72	5.02	4.83E-09	lb/MMBTU	2.42E-08	2.42E-08	8.72E-10		5.00E-06 lb/MMscf	=	4.83E-09 lb/MMBTU
Toluene	72	5.02	3.28E-06	lb/MMBTU	1.65E-05	1.65E-05	5.93E-07		3.40E-03 lb/MMscf	=	3.28E-06 lb/MMBTU
Arsenic	72	5.02	1.96E-07	lb/MMBTU	9.84E-07	9.84E-07	3.54E-08	From AP-42 (4/26); Tables 1.4-4	2.00E-04 lb/MMscf	=	1.96E-07 lb/MMBTU
Beryllium	72	5.02	1.18E-08	lb/MMBTU	5.91E-08	5.91E-08	2.13E-09		1.20E-05 lb/MMscf	=	1.18E-08 lb/MMBTU
Cadmium	72	5.02	1.08E-06	lb/MMBTU	5.41E-06	5.41E-06	1.95E-07		1.10E-03 lb/MMscf	=	1.08E-06 lb/MMBTU
Chromium	72	5.02	1.37E-06	lb/MMBTU	6.89E-06	6.89E-06	2.48E-07		1.40E-03 lb/MMscf	=	1.37E-06 lb/MMBTU
Cobalt	72	5.02	8.24E-08	lb/MMBTU	4.13E-07	4.13E-07	1.49E-08		8.40E-05 lb/MMscf	=	8.24E-08 lb/MMBTU
Manganese	72	5.02	3.73E-07	lb/MMBTU	1.87E-06	1.87E-06	6.73E-08		3.80E-04 lb/MMscf	=	3.73E-07 lb/MMBTU
Mercury	72	5.02	2.55E-07	lb/MMBTU	1.28E-06	1.28E-06	4.61E-08		2.60E-04 lb/MMscf	=	2.55E-07 lb/MMBTU
Nickel	72	5.02	2.06E-06	lb/MMBTU	1.03E-05	1.03E-05	3.72E-07		2.10E-03 lb/MMscf	=	2.06E-06 lb/MMBTU
Selenium	72	5.02	2.35E-08	lb/MMBTU	1.18E-07	1.18E-07	4.25E-09		2.40E-05 lb/MMscf	=	2.35E-08 lb/MMBTU
Vanadium	72	5.02	2.25E-06	lb/MMBTU	1.13E-05	1.13E-05	4.08E-07		2.30E-03 lb/MMscf	=	2.25E-06 lb/MMBTU
				highest individual HAP	8.72E-03		3.14E-04				
				Total HAPs	9.16E-03		3.30E-04				

Notes:

*CO2e emissions = CO2 Emissions *CO2 GWP + CH4 Emissions * CH4 GWP + N2O Emissions * N2O GWP*

GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES			
	VALUE	**UNIT**	**REFERENCE**
CO_2	1	CO_2e	40 CFR Part 98
N_2O	265	CO_2e	40 CFR Part 98
CH_4	28	CO_2e	40 CFR Part 98

Westline 2335 Project

Line Heater Emissions

Pollutant	Annual Operation (hrs/yr)	Size (MMBTU/hr)	Emission Factor	Emission Factor Units	Emissions (Potential to Emit)						
					Average (lbs/hr)	Maximum (lbs/hr)	Annual (tons/yr)				
Particulate Matter (PM_{10})	8,760	5.2	0.0048	lb/MMBTU	0.025	0.025	0.109	BACT	0.0250 lb/hr	=	0.0048 lb/MMBTU
Particulate Matter ($PM_{2.5}$)	8,760	5.2	0.0048	lb/MMBTU	0.025	0.025	0.109		0.0250 lb/hr	=	0.0048 lb/MMBTU
Sulfur Oxides (SO_x)	8,760	5.2	0.0014	lb/MMBTU	0.0073	0.0073	0.032	Based on 0.5 gr S /100 scf	0.0073 lb/hr	=	0.0014 lb/MMBTU
Nitrogen Oxides (NO_x)[5]	8,760	5.2	0.011	lb/MMBTU	0.057	0.057	0.248	BACT	0.0567 lb/hr	=	0.011 lb/MMBTU
Carbon Monoxide (CO)	8,760	5.2	0.0370	lb/MMBTU	0.192	0.192	0.843	BACT	0.1924 lb/hr	=	0.0370 lb/MMBTU
Total Volatile Organic Compounds (VOC)[5]	8,760	5.2	0.0054	lb/MMBTU	0.028	0.028	0.123	AP-42; Table 1.4-2	0.0280 lb/hr	=	0.0054 lb/MMBTU
Sulfuric Acid Mist (as H_2SO_4)	8,760	5.2	0.00021	lb/MMBTU	0.0011	0.0011	4.88E-03	SO2 to SO3 Conversion	0.0011 lb/hr	=	0.00021 lb/MMBTU
Lead	8,760	5.2	4.90E-07	lb/MMBTU	2.55E-06	2.55E-06	1.12E-05	From AP-42 (4/26); Tables 1.4-2	5.00E-04 lb/MMscf	=	4.90E-07 lb/MMBTU
Carbon Dioxide (CO_2)	8,760	5.2	1.17E+02	lb/MMBTU	608.400	608.400	2664.79	40 CFR 98 Table C-2	5.31E+01 kg/MMBtu	=	117.00 lb/MMBTU
Methane (CH_4)	8,760	5.2	2.20E-03	lb/MMBTU	0.011	0.011	5.0E-02		1.00E-03 kg/MMBtu	=	2.20E-03 lb/MMBTU
Nitrous Oxide (N_2O)	8,760	5.2	2.20E-04	lb/MMBTU	0.0011	0.0011	5.0E-03		1.00E-04 kg/MMBtu	=	2.20E-04 lb/MMBTU
CO_2e	8,760	5.2	--	--	609.02	609.02	2667.53	NA	NA		NA
2-Methylnaphthalene	8,760	5.2	2.35E-08	lb/MMBTU	1.22E-07	1.22E-07	5.36E-07	From AP-42 (4/26); Tables 1.4-3	2.40E-05 lb/MMscf	=	2.35E-08 lb/MMBTU
3-Methylchloranthrene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
7,12-Dimethylbenz[a]anthracene	8,760	5.2	1.57E-08	lb/MMBTU	8.16E-08	8.16E-08	3.57E-07		1.60E-05 lb/MMscf	=	1.57E-08 lb/MMBTU
Acenaphthene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
Acenaphthylene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
Anthracene	8,760	5.2	2.35E-09	lb/MMBTU	1.22E-08	1.22E-08	5.36E-08		2.40E-06 lb/MMscf	=	2.35E-09 lb/MMBTU
Benzo[a]anthracene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
Benzene	8,760	5.2	2.06E-06	lb/MMBTU	1.07E-05	1.07E-05	4.69E-05		2.10E-03 lb/MMscf	=	2.06E-06 lb/MMBTU
Benzo[a]pyrene	8,760	5.2	1.18E-09	lb/MMBTU	6.12E-09	6.12E-09	2.68E-08		1.20E-06 lb/MMscf	=	1.18E-09 lb/MMBTU
Benzo[b]fluoranthene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
Benzo[g,h,i]perylene	8,760	5.2	1.18E-09	lb/MMBTU	6.12E-09	6.12E-09	2.68E-08		1.20E-06 lb/MMscf	=	1.18E-09 lb/MMBTU
Benzo[k]fluoranthene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
Chrysene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
Dibenzo[a,h]anthracene	8,760	5.2	1.18E-09	lb/MMBTU	6.12E-09	6.12E-09	2.68E-08		1.20E-06 lb/MMscf	=	1.18E-09 lb/MMBTU
Dichlorobenzene	8,760	5.2	1.18E-06	lb/MMBTU	6.12E-06	6.12E-06	2.68E-05		1.20E-03 lb/MMscf	=	1.18E-06 lb/MMBTU
Fluoranthene	8,760	5.2	2.94E-09	lb/MMBTU	1.53E-08	1.53E-08	6.70E-08		3.00E-06 lb/MMscf	=	2.94E-09 lb/MMBTU
Fluorene	8,760	5.2	2.75E-09	lb/MMBTU	1.43E-08	1.43E-08	6.25E-08		2.80E-06 lb/MMscf	=	2.75E-09 lb/MMBTU
Formaldehyde	8,760	5.2	7.35E-05	lb/MMBTU	3.82E-04	3.82E-04	1.67E-03		7.50E-02 lb/MMscf	=	7.35E-05 lb/MMBTU
Hexane	8,760	5.2	1.76E-03	lb/MMBTU	9.18E-03	9.18E-03	4.02E-02		1.80E+00 lb/MMscf	=	1.76E-03 lb/MMBTU
Indeno[1,2,3-cd]pyrene	8,760	5.2	1.76E-09	lb/MMBTU	9.18E-09	9.18E-09	4.02E-08		1.80E-06 lb/MMscf	=	1.76E-09 lb/MMBTU
Naphthalene	8,760	5.2	5.98E-07	lb/MMBTU	3.11E-06	3.11E-06	1.36E-05		6.10E-04 lb/MMscf	=	5.98E-07 lb/MMBTU
Phenanathrene	8,760	5.2	1.67E-08	lb/MMBTU	8.67E-08	8.67E-08	3.80E-07		1.70E-05 lb/MMscf	=	1.67E-08 lb/MMBTU
Pyrene	8,760	5.2	4.90E-09	lb/MMBTU	2.55E-08	2.55E-08	1.12E-07		5.00E-06 lb/MMscf	=	4.90E-09 lb/MMBTU
Toluene	8,760	5.2	3.33E-06	lb/MMBTU	1.73E-05	1.73E-05	7.59E-05		3.40E-03 lb/MMscf	=	3.33E-06 lb/MMBTU
Arsenic	8,760	5.2	1.96E-07	lb/MMBTU	1.02E-06	1.02E-06	4.47E-06	From AP-42 (4/26); Tables 1.4-4	2.00E-04 lb/MMscf	=	1.96E-07 lb/MMBTU
Beryllium	8,760	5.2	1.18E-08	lb/MMBTU	6.12E-08	6.12E-08	2.68E-07		1.20E-05 lb/MMscf	=	1.18E-08 lb/MMBTU
Cadmium	8,760	5.2	1.08E-06	lb/MMBTU	5.61E-06	5.61E-06	2.46E-05		1.10E-03 lb/MMscf	=	1.08E-06 lb/MMBTU
Chromium	8,760	5.2	1.37E-06	lb/MMBTU	7.14E-06	7.14E-06	3.13E-05		1.40E-03 lb/MMscf	=	1.37E-06 lb/MMBTU
Cobalt	8,760	5.2	8.24E-08	lb/MMBTU	4.28E-07	4.28E-07	1.88E-06		8.40E-05 lb/MMscf	=	8.24E-08 lb/MMBTU
Manganese	8,760	5.2	3.73E-07	lb/MMBTU	1.94E-06	1.94E-06	8.49E-06		3.80E-04 lb/MMscf	=	3.73E-07 lb/MMBTU
Mercury	8,760	5.2	2.55E-07	lb/MMBTU	1.33E-06	1.33E-06	5.81E-06		2.60E-04 lb/MMscf	=	2.55E-07 lb/MMBTU
Nickel	8,760	5.2	2.06E-06	lb/MMBTU	1.07E-05	1.07E-05	4.69E-05		2.10E-03 lb/MMscf	=	2.06E-06 lb/MMBTU
Selenium	8,760	5.2	2.35E-08	lb/MMBTU	1.22E-07	1.22E-07	5.36E-07		2.40E-05 lb/MMscf	=	2.35E-08 lb/MMBTU
Vanadium	8,760	5.2	2.25E-06	lb/MMBTU	1.17E-05	1.17E-05	5.14E-05		2.30E-03 lb/MMscf	=	2.25E-06 lb/MMBTU
				highest individual HAP	9.18E-03		4.02E-02				
				Total HAPs	9.64E-03		4.22E-02				

Notes

*CO2e emissions = CO2 Emissions *CO2 GWP + CH4 Emissions * CH4 GWP + N2O Emissions * N2O GWP*

GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES			
	VALUE	UNIT	REFERENCE
CO_2	1	CO_2e	40 CFR Part 98
N_2O	265	CO_2e	40 CFR Part 98
CH_4	28	CO_2e	40 CFR Part 98

Westline 2335 Project

Emergency Diesel Generator Emission Calculations

Facility will have 40 identical emergency generators. These calculations represent emissions per generator

Pollutant	Annual Operation (hrs/yr)	Engine Size (HP)	Emission Factor [1] (lbs/HP-hr)	Emissions (Potential to Emit) Average [2] (lbs/hr)	Maximum [3] (lbs/hr)	Annual [4] (tons/yr)
Particulate Matter (PM_{10})	100	1,341	0.000331	0.443	0.443	0.022
Particulate Matter ($PM_{2.5}$)	100	1,341	0.000331	0.443	0.443	0.022
Sulfur Oxides (SO_x)	100	1,341	0.000012	0.016	0.016	0.001
Nitrogen Oxides (NO_x)[5]	100	1,341	0.010582	14.19	14.19	0.71
Carbon Monoxide (CO)	100	1,341	0.005754	7.72	7.72	0.386
Total Volatile Organic Compounds (VOC)[5]	100	1,341	0.000750	1.006	1.006	0.050
Sulfuric Acid Mist (as H_2SO_4)	100	1,341	0.000002	0.0025	0.0025	1.25E-04
1,3-Butadiene	100	1,341	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	100	1,341	3.28E-08	4.39E-05	4.39E-05	2.20E-06
Acenaphthylene	100	1,341	6.46E-08	8.66E-05	8.66E-05	4.3E-06
Acetaldehyde	100	1,341	1.76E-07	2.37E-04	2.37E-04	1.18E-05
Acrolein	100	1,341	5.52E-08	7.40E-05	7.40E-05	3.70E-06
Anthracene	100	1,341	8.61E-09	1.15E-05	1.15E-05	5.77E-07
Benzo[a]anthracene	100	1,341	4.35E-09	5.84E-06	5.84E-06	2.92E-07
Benzene	100	1,341	5.43E-06	7.28E-03	7.28E-03	3.64E-04
Benzo[a]pyrene	100	1,341	1.80E-09	2.41E-06	2.41E-06	1.21E-07
Benzo[b]fluoranthene	100	1,341	7.77E-09	1.04E-05	1.04E-05	5.21E-07
Benzo[g,h,i]perylene	100	1,341	3.89E-09	5.22E-06	5.22E-06	2.61E-07
Chrysene	100	1,341	1.07E-08	1.44E-05	1.44E-05	7.18E-07
Fluoranthene	100	1,341	2.82E-08	3.78E-05	3.78E-05	1.89E-06
Fluorene	100	1,341	8.96E-08	1.20E-04	1.20E-04	6.01E-06
Formaldehyde	100	1,341	5.52E-07	7.41E-04	7.41E-04	3.70E-05
Indeno[1,2,3-cd]pyrene	100	1,341	2.90E-09	3.89E-06	3.89E-06	1.94E-07
Naphthalene	100	1,341	9.10E-07	1.22E-03	1.22E-03	6.10E-05
Total PAH	100	84	1.18E-06	9.88E-05	9.88E-05	4.94E-06
Phenanathrene	100	1,341	2.86E-07	3.83E-04	3.83E-04	1.91E-05
Propylene	100	1,341	1.95E-05	2.62E-02	2.62E-02	1.31E-03
Pyrene	100	1,341	2.60E-08	3.48E-05	3.48E-05	1.74E-06
Toluene	100	1,341	1.97E-06	2.64E-03	2.64E-03	1.32E-04
Xylene (mixed isomers)	100	1,341	1.35E-06	1.81E-03	1.81E-03	9.06E-05
Carbon Dioxide (CO_2 or CO_2e)	100	1,341	1.14E+00	1,529.213	1529.213	76.461
Methane (CH_4)	100	1,341	4.63E-05	0.062	0.062	0.003
Nitrous Oxide (N_2O)	100	1,341	9.25E-06	0.012	0.012	0.001
CO_2e	100	1,341	--	1534.24	1534.24	76.71
		highest individual HAP		2.62E-02		1.31E-03
		Total HAPs		4.11E-02		2.05E-03

40 CFR 60 part iiii	0.15 g/HP-hr	=	0.000331 lbs/HP-hr
40 CFR 60 part iiii	0.15 g/HP-hr	=	0.000331 lbs/HP-hr
ULSD sulfur content	15 ppm S in Fuel	=	0.000012 lbs/HP-hr
40 CFR 60 part iiii	4.80 g/HP-hr	=	0.010582 lbs/HP-hr
40 CFR 60 part iiii	2.61 g/HP-hr	=	0.005754 lbs/HP-hr
AP-42 (4/25) Table 3.4-1	0.32 g/HP-hr	=	0.000750 lbs/HP-hr
SO2 to SO3 Conversion	1.86E-06 lbs/HP-hr	=	1.86E-06 lbs/HP-hr
AP-42 (4/25); Tables 3.4-3 and 3.4-4	0.00E+00 lbs/MMBtu	=	0.00E+00lbs/HP-hr
	4.68E-06 lbs/MMBtu	=	3.28E-08lbs/HP-hr
	9.23E-06 lbs/MMBtu	=	6.46E-08lbs/HP-hr
	2.52E-05 lbs/MMBtu	=	1.76E-07lbs/HP-hr
	7.88E-06 lbs/MMBtu	=	5.52E-08lbs/HP-hr
	1.23E-06 lbs/MMBtu	=	8.61E-09lbs/HP-hr
	6.22E-07 lbs/MMBtu	=	4.35E-09lbs/HP-hr
	7.76E-04 lbs/MMBtu	=	5.43E-06lbs/HP-hr
	2.57E-07 lbs/MMBtu	=	1.80E-09lbs/HP-hr
	1.11E-06 lbs/MMBtu	=	7.77E-09lbs/HP-hr
	5.56E-07 lbs/MMBtu	=	3.89E-09lbs/HP-hr
	1.53E-06 lbs/MMBtu	=	1.07E-08lbs/HP-hr
	4.03E-06 lbs/MMBtu	=	2.82E-08lbs/HP-hr
	1.28E-05 lbs/MMBtu	=	8.96E-08lbs/HP-hr
	7.89E-05 lbs/MMBtu	=	5.52E-07lbs/HP-hr
	4.14E-07 lbs/MMBtu	=	2.90E-09lbs/HP-hr
	1.30E-04 lbs/MMBtu	=	9.10E-07lbs/HP-hr
	1.68E-04 lbs/MMBtu		1.18E-06 lbs/HP-hr
	4.08E-05 lbs/MMBtu	=	2.86E-07lbs/HP-hr
	2.79E-03 lbs/MMBtu	=	1.95E-05lbs/HP-hr
	3.71E-06 lbs/MMBtu	=	2.60E-08lbs/HP-hr
	2.81E-04 lbs/MMBtu	=	1.97E-06lbs/HP-hr
	1.93E-04 lbs/MMBtu	=	1.35E-06lbs/HP-hr
40 CFR 98 Table C-2	7.40E+01 kg/MMBtu	=	1.14E+00lbs/HP-hr 1.63E+02 kg/MMBtu
	3.00E-03 kg/MMBtu	=	4.63E-05lbs/HP-hr 6.61E-03 kg/MMBtu
	6.00E-04 kg/MMBtu	=	9.25E-06lbs/HP-hr 1.32E-03 kg/MMBtu

Notes

*CO2e emissions = CO2 Emissions *CO2 GWP + CH4 Emissions * CH4 GWP + N2O Emissions * N2O GWP*

GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES	VALUE	UNIT	REFERENCE
CO_2	1	CO_2e	40 CFR Part 98
N_2O	265	CO_2e	40 CFR Part 98
CH_4	28	CO_2e	40 CFR Part 98

Westline 2335 Project

Emergency Fire Water Pump Emission Calculations						
Pollutant	Annual Operation (hrs/yr)	Engine Size (HP)	Emission Factor [1] (lbs/HP-hr)	Emissions (Potential to Emit) Average [2] (lbs/hr)	Maximum [3] (lbs/hr)	Annual [4] (tons/yr)
Particulate Matter (PM_{10})	100	84	0.000661	0.056	0.056	0.0028
Particulate Matter ($PM_{2.5}$)	100	84	0.000661	0.056	0.056	0.0028
Sulfur Oxides (SO_x)	100	84	0.000012	0.001	0.001	0.00005
Nitrogen Oxides (NO_x)[5]	100	84	0.007716	0.648	0.648	0.032
Carbon Monoxide (CO)	100	84	0.008157	0.685	0.685	0.034
Total Volatile Organic Compounds (VOC)[5]	100	84	0.002470	0.207	0.207	0.010
Sulfuric Acid Mist (as H_2SO_4)	100	84	0.000002	0.0002	0.0002	7.80E-06
1,3-Butadiene	100	84	2.74E-07	2.30E-05	2.30E-05	1.1E-06
Acenaphthene	100	84	9.94E-09	8.35E-07	8.35E-07	4.2E-08
Acenaphthylene	100	84	3.54E-08	2.98E-06	2.98E-06	1.5E-07
Acetaldehyde	100	84	5.37E-06	4.51E-04	4.51E-04	2.3E-05
Acrolein	100	84	6.48E-07	5.44E-05	5.44E-05	2.7E-06
Anthracene	100	84	1.31E-08	1.10E-06	1.10E-06	5.5E-08
Benzo[a]anthracene	100	84	1.18E-08	9.88E-07	9.88E-07	4.9E-08
Benzene	100	84	6.53E-06	5.49E-04	5.49E-04	2.7E-05
Benzo[a]pyrene	100	84	1.32E-09	1.11E-07	1.11E-07	5.5E-09
Benzo[b]fluoranthene	100	84	6.94E-10	5.83E-08	5.83E-08	2.9E-09
Benzo[g,h,i]perylene	100	84	3.42E-09	2.88E-07	2.88E-07	1.4E-08
Chrysene	100	84	2.47E-09	2.08E-07	2.08E-07	1.0E-08
Fluoranthene	100	84	5.33E-08	4.47E-06	4.47E-06	2.2E-07
Fluorene	100	84	2.04E-07	1.72E-05	1.72E-05	8.6E-07
Formaldehyde	100	84	8.26E-06	6.94E-04	6.94E-04	3.5E-05
Indeno[1,2,3-cd]pyrene	100	84	2.63E-09	2.21E-07	2.21E-07	1.1E-08
Naphthalene	100	84	5.94E-07	4.99E-05	4.99E-05	2.5E-06
Total PAH	100	84	1.18E-06	9.88E-05	9.88E-05	4.9E-06
Phenanathrene	100	84	2.06E-07	1.73E-05	1.73E-05	8.6E-07
Propylene	100	84	1.81E-05	1.52E-03	1.52E-03	7.6E-05
Pyrene	100	84	3.35E-08	2.81E-06	2.81E-06	1.4E-07
Toluene	100	84	2.86E-06	2.40E-04	2.40E-04	1.2E-05
Xylene (mixed isomers)	100	84	2.00E-06	1.68E-04	1.68E-04	8.4E-06
Carbon Dioxide (CO_2 or CO_2e)	100	84	1.14	95.8	95.8	4.8
Methane (CH_4)	100	84	4.63E-05	0.004	0.004	0.000194
Nitrous Oxide (N_2O)	100	84	9.25E-06	0.001	0.001	0.0000
CO_2e	100	84	--	96.10	96.10	4.81
			highest individual HAP	1.52E-03		7.59E-05
			Total HAPs	3.89E-03	Total HAPs	1.95E-04

40 CFR 60 IIII -Table 4	0.30 g/HP-hr	=	0.000661 lbs/HP-hr
40 CFR 60 IIII -Table 4	0.30 g/HP-hr	=	0.000661 lbs/HP-hr
ULSD sulfur content	15 ppm S in Fuel	=	0.000012 lbs/HP-hr
40 CFR 60 IIII -Table 4	3.50 g/HP-hr	=	0.007716 lbs/HP-hr
40 CFR 60 IIII -Table 4	3.70 g/HP-hr	=	0.008157 lbs/HP-hr
AP-42 (4/25) Table 3.3-1	1.12 g/HP-hr	=	0.002470 lbs/HP-hr
SO_2 to SO_3 Conversion	1.86E-06 lbs/HP-hr	=	1.86E-06lbs/HP-hr
AP-42 (4/25); Table 3.3-2	3.91E-05 lbs/MMBtu	=	2.74E-07 lbs/HP-hr
	1.42E-06 lbs/MMBtu	=	9.94E-09 lbs/HP-hr
	5.06E-06 lbs/MMBtu	=	3.54E-08 lbs/HP-hr
	7.67E-04 lbs/MMBtu	=	5.37E-06 lbs/HP-hr
	9.25E-05 lbs/MMBtu	=	6.48E-07 lbs/HP-hr
	1.87E-06 lbs/MMBtu	=	1.31E-08 lbs/HP-hr
	1.68E-06 lbs/MMBtu	=	1.18E-08 lbs/HP-hr
	9.33E-04 lbs/MMBtu	=	6.53E-06 lbs/HP-hr
	1.88E-07 lbs/MMBtu	=	1.32E-09 lbs/HP-hr
	9.91E-08 lbs/MMBtu	=	6.94E-10 lbs/HP-hr
	4.89E-07 lbs/MMBtu	=	3.42E-09 lbs/HP-hr
	3.53E-07 lbs/MMBtu	=	2.47E-09 lbs/HP-hr
	7.61E-06 lbs/MMBtu	=	5.33E-08 lbs/HP-hr
	2.92E-05 lbs/MMBtu	=	2.04E-07 lbs/HP-hr
	1.18E-03 lbs/MMBtu	=	8.26E-06 lbs/HP-hr
	3.75E-07 lbs/MMBtu	=	2.63E-09 lbs/HP-hr
	8.48E-05 lbs/MMBtu	=	5.94E-07 lbs/HP-hr
	1.68E-04 lbs/MMBtu		1.18E-06 lbs/HP-hr
	2.94E-05 lbs/MMBtu	=	2.06E-07 lbs/HP-hr
	2.58E-03 lbs/MMBtu	=	1.81E-05 lbs/HP-hr
	4.78E-06 lbs/MMBtu	=	3.35E-08 lbs/HP-hr
	4.09E-04 lbs/MMBtu	=	2.86E-06 lbs/HP-hr
	2.85E-04 lbs/MMBtu	=	2.00E-06 lbs/HP-hr
40 CFR 98 Table C-2	7.40E+01 kg/MMBtu	=	1.14E+00 lbs/HP-hr
	3.00E-03 kg/MMBtu	=	4.63E-05 lbs/HP-hr
	6.00E-04 kg/MMBtu	=	9.25E-06 lbs/HP-hr

Notes:

CO2e emissions = CO2 Emissions *CO2 GWP + CH4 Emissions * CH4 GWP + N2O Emissions * N2O GWP

GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES			
	VALUE	UNIT	REFERENCE
CO_2	1	CO_2e	40 CFR Part 98
N_2O	265	CO_2e	40 CFR Part 98
CH_4	28	CO_2e	40 CFR Part 98

Westline 2335 Project

Lube Oil System Vents

			Emissions Per Engine										Facility-Wide Emissions	
EPN	**Description**	**Pollutant**	**Consumption of Lube Oil (gal/hr/engine)**	**% of Consumed Lube Oil Evaporated**	**Uncontrolled Emissions of Lube Oil Mist (gal/hr)**	**Mist Eliminator Control Effficiency (%)**	**Controlled Emissions of Lube Oil Mist (gal/hr)**	**Approx. Density of Lube Oil (lb/gal)**	**Hourly Emission Rate (lb/hr)**	**Daily Emission Rate (lb/day)**	**Annual Operating Hours (hrs/yr)**	**Annual Emission Rate (tpy)**	**Number of Tank Vents**	**Annual Emissions (tpy)**
LUB-engine	Lube Oil Vent - clean oil	VOC	0.008333333	30%	0.0025	99%	0.000025	6.90	0.00017	0.0041	8760	0.001	20	0.015
		PM/PM10/PM2.5	0.008333333	30%	0.0025	99%	0.000025	6.90	0.00017	0.0041	8760	0.001	20	0.015

Notes:

The heating of recirculating lube oil in the engines generate oil vapor and oil condensate droplets in the oil reservoir compartments. Lube oil mist emissions are controlled by a mist eliminator. There is one lube oil tank per engine hall that feed all of the engines in the hall.

Unloading, storage, and heated recirculation of lube oil for an engine hall is assumed to result in 0.2 gallons per day per tank vent. Per engineering estimates, approximately 30% of the loss is due to evaporation, and the rest are non-volatile losses. The calculated hourly emissions are based on the daily emission rate divided by 24 hours per day.

The waste oil tank is not a recirculating tank and is not generally heated. As such, emissions from oil mist are not antipated from that tank.

Westline 2335 Project

Inspection, Repair, Replacement, Adjusting, Testing, and Calibration of Analytical Equipment, Process Instruments Including Sight Glasses, Meters, and Gauges

Step 1. Clingage Loss Calculation:

Variables			Source/Notes/Assumptions
Lc	**Clingage Loss (lb/activity)**	**0.00135**	
$L_c = A_s \times T_f \times D$			
A_s	Surface Area (feet)	0.31	Based on an average size of the equipment.
T_f	Clingage Film Thickness (feet)	8.33E-05	assumption (0.001 inches)
D	Density of Material (lb/feet^3)	52.46	Based on API Power Regression Analysis for a material with a vapor pressure of 0.15 psia.

Step 2. Splash Loading Loss Calculation:

Variables			Source/Notes/Assumptions
L_l Equipment Draining Loading Loss (lb/10^3 gal loaded)		**0.503**	
$L_l = 12.46\left(\frac{SPM_V}{T}\right)$			Based on U.S. EPA AP-42, 5.2 "Transportation and Marketing of Petroleum Liquids" (Equation 1).
S	Loading Loss Factor	1.45	Per. U.S. EPA AP-42 Table 5.2-1, based on splash loading per TCEQ Gudiance.
P	Vapor Pressure of Liquid Loaded (psia)	0.15	Based on representative material.
M_v	Vapor molecular weight (lb/lb-mole)	103	Molecular Weight based on API Power Regression Analysis for a material with a vapor pressure of 0.15 psia.
T	Average daily temperature (°R)	555.00	95°F per TCEQ Guidance.

Variables			Source/Notes/Assumptions
L_D	**Equipment Draining Loading loss (lb/activity)**	**1.16E-07**	
$L_D = L_l V_t$			
L_l	Loading Loss (lb/10^3 gal loaded)	0.503	See calculation above.
V_t	Volume of liquid drained (gallon/activity)	0.0002	Assumed to be 1% of total volume (0.03 gallons) is left in the equipment and drained to pan/enclosed drain.

Step 3. Evaporative Loss Calculation:

Variables			Source/Notes/Assumptions
L_D	**Equipment Draining Loading loss (lb/activity)**	**0.000097**	
$L_E = 7920 * A\left(\frac{P_a M_w}{RT}\right)\frac{D_{i,a}}{Z_2 - Z_1}\ln\left[\frac{1}{(1-y_{c1})}\right] * t$			Ajay Kumar, N.S. Vatcha, and John Schmelzle, "Estimate Emissions From Atomspheric Releases of Hazardous Substances, "Environmental Engineering World, November-December 1996, pages 20-23.
A	Vessel opening area (m^2)	0.07	Area for a 5 gal bucket (~11.75 in. dia.)
P_a	Atmospheric Pressure (Pa)	101,325	
M_w	Molecular weight (kg/kgmol)	103	Molecular Weight based on API Power Regression Analysis for a material with a vapor pressure of 0.15 psia
R	Universal Gas Constant (J/°K-kgmol)	8314	
T	Temperature (°K)	308.3	95°F per TCEQ Guidance.
$D_{i,a}$	Diffusivity of component through air (m^2/s)	6.28E-06	Assumed diffusivity of diesel fuel
Z_2-Z_1	Empty vapor space above liquid level in vessel (m)	0.37	Assumed 5 gal bucket (14.5 in)
y_{c1}	Volume fraction of component in air	0.01	based on vapor pressure and ideal gas law
t	Time that material sits in pan before removed by vacuum truck (hr)	0.25	assumption

Emission Summary		Source/Notes/Assumptions
Total Emissions per activity (lb/activity)	0.00145	Summation of Steps 1 through 3.
Frequency Routine Maintenance Activity (activity/hour)	4	Based on process knowledge and historical information.
Frequency Routine Maintenance Activity (activity/yr)	40	Based on process knowledge and historical information.

Total VOC Emissions	
lb/hr	**ton/yr**
0.0058	2.90E-05

1.132608379

1.1384

Westline 2335 Project

Low VP Small Equipment & Fugitive Component Maintenance Emissions (VOC Service)

Step 1. Clingage Loss Calculation:

Variables			Source/Notes/Assumptions
Lc	**Clingage Loss (lb/activity)**	**0.01380**	
$L_c = A_s \times T_f \times D$			
A_s	Surface Area (feet)	3.12	Conservatively based on clingage loss from final 5 ft of pipe section being worked on.
T_f	Clingage Film Thickness (feet)	8.33E-05	assumption (0.001 inches)
D	Density of Material (lb/feet^3)	53.11	Based on diesel fuel

Step 2. Splash Loading Loss Calculation:

Variables			Source/Notes/Assumptions
L_l Equipment Draining Loading Loss (lb/10^3 gal loaded)		**0.042**	
$L_l = 12.46\left(\frac{SPM_v}{T}\right)$			Based on U.S. EPA AP-42, 5.2 "Transportation and Marketing of Petroleum Liquids" (Equation 1).
S	Loading Loss Factor	1.45	Per. U.S. EPA AP-42 Table 5.2-1, based on splash loading per TCEQ Gudiance.
P	Vapor Pressure of Liquid Loaded (psia)	0.01	Based on representative material.
M_v	Vapor molecular weight (lb/lb-mole)	130	Molecular Weight based diesel fuel
T	Average daily temperature (°R)	555.00	95°F per TCEQ Guidance.

Variables			Source/Notes/Assumptions
L_D	**Equipment Draining Loading loss (lb/activity)**	**9.94E-02**	
$L_D = L_l V_t$			
L_l	Loading Loss (lb/10^3 gal loaded)	0.042	See calculation above.
V_t	Volume of liquid drained (gallon/activity)	2.35	Assumed to be 1% of total volume (235 gallons) is left in the equipment and drained to pan/enclosed drain.

Step 3. Evaporative Loss Calculation:

Variables			Source/Notes/Assumptions
L_D	**Equipment Draining Loading loss (lb/activity)**	**0.000008**	
$L_E = 7920 * A\left(\frac{P_a M_w}{RT}\right)\frac{D_{i,a}}{Z_2 - Z_1}\ln\left[\frac{1}{(1-y_{c1})}\right] * t$			Ajay Kumar, N.S. Vatcha, and John Schmelzle, "Estimate Emissions From Atomspheric Releases of Hazardous Substances, "Environmental Engineering World, November-December 1996, pages 20-23.
A	Vessel opening area (m^2)	0.02	Opening on a tote (~6 in. dia.)
P_a	Atmospheric Pressure (Pa)	101,325	
M_w	Molecular weight (kg/kgmol)	130	Molecular Weight based diesel fuel
R	Universal Gas Constant (J/°K-kgmol)	8314	
T	Temperature (°K)	308	95°F per TCEQ Guidance.
$D_{i,a}$	Diffusivity of component through air (m^2/s)	6.28E-06	Assumed diffusivity of diesel fuel
Z_2-Z_1	Empty vapor space above liquid level in vessel (m)	0.152	Assumed 6 in
y_{c1}	Volume fraction of component in air	0.001	based on vapor pressure and ideal gas law
t	Time vessel remains open to atmosphere	0.25	assumption

Emission Summary		Source/Notes/Assumptions
Total Emissions per activity (lb/activity)	0.11326	Summation of Steps 1 through 3.
Frequency Routine Maintenance Activity (activity/hour)	10	Assumed
Frequency Routine Maintenance Activity (activity/yr)	260	Assumed

Total Emissions	
lb/hr	**ton/yr**
1.133	0.0147

Westline 2335 Project

Sulfur Hexafluoride (SF_6) Fugitive Emissions		
Insulated Circuit Breaker SF6 Capacity	lb	66,570
Assumed SF_6 Leak Rate	by wght	0.5%
SF6 Global Warming Potential	CO_2e	23,500
Estimated Annual SF_6 Mass Emission Rate	lb/yr	333
Estimated Annual SF_6 Mass Emission Rate	tpy	0.16643
Estimated CO2e Emission Rate	tpy	3910.99

Westline 2335 Project

Natural Gas Purging and Venting Emissions												
Process	Initial Conditions			Final Conditions			Number of Purges per Year		Annual Emissions (cf/yr)	Annual Emissions (lb/yr)	Annual Emissions (tpy)	Maximum Hourly Emissions (lb/hr)
	Volume (ft^3)	Press. (psig)	Temp. (F)	Press. (psig)	Temp. (F)	Volume (ft^3)						
Full piping system purge (HP piping West Side)	4492	1000	59	0	59	381,866	1		381,866			
Full piping system purge (LP piping West Side)	2513	145	59	0	59	28,672	2		57,344			
Full piping system purge (HP piping East Side)	4870	1000	59	0	59	414,045	1		414,045			
Full piping system purge (LP piping East Side)	2513	145	59	0	59	28,672	2		57,344			
					MW	Weight %	Volume %	TOTAL	910,599			853,255
				15.2	16	93%	95%	Methane	865,069	35,904.29	17.95	33,643.26
				0.050612	44.01	0%	0.12%	CO2	1,047	119.55	0.06	112.02
				0.3912	16	2%	2.45%	VOC	22,264	2,546.95	1.27	865.8712
				0.6832	28	4%	2.44%	N2				
				16.32501		100%		CO2e			502.7	942,123.2

Notes:
Natural Gas Composition provided by Whitewater gas volume statement June 2025
GWP for Methane is 28
VOCs in fuel provided as methane
purge data provided by Joule Grid

SUMMARY OF VOC EMISSIONS FROM STORAGE TANKS

EPN			TK-1 through TK-40	TK-41 through TK-100	
FIN			TK-1 through TK-40	TK-41 through TK-100	
Description			EG Diesel Tanks (2 per engine hall)	FP Diesel Tank (3 per engine hall)	
Contents			Diesel Fuel	Diesel Fuel	
TANK TYPE			HORIZONTAL FIXED ROOF	HORIZONTAL FIXED ROOF	
TANK SHELL HEIGHT/LENGTH	**L**	**FT**	26.0	3.3	
TANK WIDTH	**W**	**FT**	6.5	3.3	
TANK HEIGHT	**H**	**FT**	3.0	3.3	
TANK DIAMETER (OR EQ)	**D**	**FT**	4.98	3.70	
NOMINAL TANK CAPACITY		**GAL**	3,600	250	
TURNOVERS PER YEAR		**-**	2.00	6.00	
ANNUAL NET THROUGHPUT		**GAL/YR**	7,190	1,500	
ASSUMED TIME TO FILL TANK		**HRS**	1	1	
MAX HOURLY FILLING RATE	**FR_M**	**GAL/HR**	3,600	250	
NUMBER OF IDENTICAL TANKS		**-**	40	60	
STANDING STORAGE LOSSES	**L_S**	**LB/YR**	0.785	0.055	
WORKING LOSSES	**L_W**	**LB/YR**	0.1794	0.0374	
TOTAL LOSSES	**L_T**	**LB/YR**	0.9641	0.0921	
TOTAL LOSSES	**L_T**	**TPY**	0.000482	0.000046	
MAX HOURLY LOSSES	**L_{MAX}**	**LB/HR**	0.2028	0.0141	
FACILITY WIDE EMISSIONS		**TPY**	0.0193	0.0028	**0.0220**

ESTIMATE OF TANK EMISSIONS FROM FIXED ROOF TANKS

TANK IDENTIFICATION: EG Diesel Tanks (2 per engine hall)
TANK CONTENTS: Diesel Fuel
EMISSION POINT NUMBER (EPN): TK-1 through TK-40

	SYMBOL	INPUT	UNITS	
TANK TYPE	-	HORIZONTAL FIXED ROOF	-	
TANK SHELL HEIGHT/LENGTH	L	26.0	FT	
TANK DIAMETER	D	5.0	FT	
NOMINAL TANK CAPACITY	-	3,600	GAL	
ANNUAL NET THROUGHPUT		7,190.0	GAL/YR	*100 hr/yr at max fuel input 149.1 gal/hr*
SHELL COLOR/SHADE	-	WHITE	-	
SHELL CONDITION	-	AVERAGE	-	
TANK SURFACE SOLAR ABSORPTANCE	α	0.25	-	
DAILY OPERATING SCHEDULE	-	24	HRS/DAY	
ANNUAL OPERATING SCHEDULE	-	365	DAYS/YR	
PRESSURE SETTINGS	P_{BP}	-0.03	PSIG	
VACUUM SETTINGS	P_{BV}	0.03	PSIG	
TANK ABOVE OR UNDERGROUND?	-	ABOVE GROUND	-	
TANK HEATED?	-	AMBIENT	-	
MAXIMUM HOURLY FILLING RATE	FR_M	3600.0	GAL/HR	

METEOROLOGICAL CITY AND STATE	-	MIDLAND, TX	-
HOURLY AVG MIN MBIENT TEMP	T_{AN}	51.4	°F
HOURLY AVG MAX AMBIENT TEMP	T_{AX}	76.7	°F
AVG WIND SPEED	V	11	MI/HR
AVG DAILY TOTAL INSOLATION FACTOR	I	1698	$BTU/FT^2/DAY$
AVG ATMOSPHERIC PRESSURE	P_A	13.26	LB/IN^2

CHEMICAL (SINGLE COMPONENT)	-	NO. 2 FUEL OIL (DIESEL)	-
IF OTHER - IDENTIFY SURROGATE CHEMICAL			
VAPOR MOLECULAR WEIGHT	M_V	130	LB/LB-MOLE
LIQUID MOLECULAR WEIGHT	M_L	188	LB/LB-MOLE
VAPOR PRESSURE	P_{VA}	0.0081	PSIA
VAPOR PRESSURE EQUATION CONSTANT (A)	A	12.101	P => PSIA
VAPOR PRESSURE EQUATION CONSTANT (B)	B	8907	T => RANKINE
VAPOR PRESSURE EQUATION CONSTANT (C)	C	0.006	LN(BASE E)
LIQUID DENSITY	W_L	7.1	LB/GAL
WORKING LOSS PRODUCT FACTOR	K_p	1	

STANDING STORAGE LOSSES	L_S	**0.78**	LB/YR
WORKING LOSSES	L_W	**0.18**	LB/YR
TOTAL LOSSES	L_T	**0.96**	LB/YR
TOTAL LOSSES	L_T	**0.0005**	TPY
MAX HOURLY LOSSES	L_{MAX}	**0.2028**	LB/HR

CELL COLOR KEY	
TBD	INPUT
WIP	DROPDOWN
WIP	LOOKUP TABLE

Table 7.1-6. PAINT SOLAR ABSORPTANCE[a]

Surface Color	Shade or Type	Reflective Condition (see Note 1)		
		New	Average	Aged
White		0.17	0.25	0.34
Aluminum	Specular	0.39	0.44	0.49
Aluminum	Diffuse	0.60	0.64	0.68
Beige/Cream		0.35	0.42	0.49
Black		0.97	0.97	0.97
Brown		0.58	0.62	0.67
Gray	Light	0.54	0.58	0.63
Gray	Medium	0.68	0.71	0.74
Green	Dark	0.89	0.90	0.91
Red	Primer	0.89	0.90	0.91
Rust	red iron oxide	0.38	0.44	0.50
Tan		0.43	0.49	0.55
Aluminum (see Note 2)	mill finish, unpainted	0.10	0.12	0.15

NOTE 1 Reflective condition definitions:

New: For paint, paint still retains the fresh shine of having been recently applied; for mill-finish aluminum, surface is shiny. This was previously labeled "Good."

Average: For paint, paint is in good condition, but the initial shine has faded; for mill-finish aluminum, surface is oxidized but still bright. The value given in each case is the average of the New and the Aged values for that case, and does not represent new data.

Aged: For paint, paint is noticeably faded and dull; for mill-finish aluminum, surface is dull. This was previously labeled "Poor."

NOTE 2 This refers to aluminum as the base metal, rather than aluminum-colored paint.

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Table 7.1-2. PROPERTIES (M_V, M_L, P_{VA}, W_L) OF SELECTED PETROLEUM LIQUIDS

Petroleum Liquid Mixture	Vapor Molecular Weight	Liquid Molecular Weight	Liquid Density	ASTM D86 Distillation Slope	Vapor Pressure Equation Constant	Vapor Pressure Equation Constant	True Vapor Pressure (at 60 °F)
	M_V	M_L	W_L	S	A	B	P_{VA}
	lb/lb-mole	lb/lb-mole	lb/gal	°F/vol %	dimensionless	°R	psia
MIDCONTINENT CRUDE OIL	50	207	7.1	–	Figure 7.1-16	Figure 7.1-16	–
REFINED PETROLEUM STOCKS	–	–	–	–	Figure 7.1-15	Figure 7.1-15	–
MOTOR GASOLINE RVP 13	62	92	5.6	3.0	11.644	5043.6	7.0
MOTOR GASOLINE RVP 10	66	92	5.6	3.0	11.724	5237.3	5.2
MOTOR GASOLINE RVP 7	68	92	5.6	3.0	11.833	5500.6	3.5
LIGHT NAPHTHA RVP 9- 14	–	–	–	3.5	–	–	–
NAPHTHA RVP 2-8	–	–	–	2.5	–	–	–
AVIATION GASOLINE	–	–	–	2.0	–	–	–
JET NAPHTHA (JP-4)	80	120	6.4	–	11.368	5784.3	1.3
JET KEROSENE (JET A)	130	162	7.0	–	12.390	8933.0	0.008
NO. 2 FUEL OIL (DIESEL)	130	188	7.1	–	12.101	8907.0	0.006
NO. 6 FUEL OIL	130	387	7.9	–	10.781	8933.0	0.002
VACUUM RESIDUAL OIL	190	387	7.9	–	10.104	10475.5	0.00004

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Standing losses (lb/yr)	=	$365*V_V*W_V*K_E*K_S$ =	**0.78**
Working losses (lb/yr)	=	$5.614*Q*K_N*K_p*K_B*K_B$ =	**0.18**

	SYMBOL	UNITS	VALUE
TANK SHELL HEIGHT/LENGTH	L	FT	26
TANK DIAMETER	D	FT	4.982787485
TANK SHELL RADIUS	R_S	FT	2.491393743
TANK LIQUID VOLUME		GAL	3792.36
ANNUAL NET THROUGHPUT		GAL/YR	7190
TOTAL ANNUAL TURNOVERS	N	NO/YR	1.90
TANK SURFACE SOLAR ABSORPTANCE	α	-	0.25
ANNUAL OPERATING HOURS		DAYS/YR	8760
PRESSURE SETTINGS	P_{BP}	PSIG	-0.03
VACUUM SETTINGS	P_{BV}	PSIG	0.03
TANK ABOVE OR UNDERGROUND?			ABOVE GROUND
HOURLY AVG MIN AMBIENT TEMP	T_{AN}	°R	511.1
HOURLY AVG MAX AMBIENT TEMP	T_{AX}	°R	536.4
AVG WIND SPEED	V	MI/HR	11
AVG DAILY TOTAL INSOLATION FACTOR	I	$BTU/FT^2/DAY$	1698
AVG ATMOSPHERIC PRESSURE	P_A	LB/IN^2	13.26
VAPOR MOLECULAR WEIGHT	M_V	LB/LB-MOLE	130
VAPOR PRESSURE	P_{VA}	PSIA	0.008133222
VAPOR PRESSURE EQUATION CONSTANT	A		12.101
VAPOR PRESSURE EQUATION CONSTANT	B	°R	8907
VAPOR PRESSURE EQUATION CONSTANT	C		0.006
LIQUID DENSITY	W_L	LB/GAL	7.1
WORKING LOSS PRODUCT FACTOR	K_p	-	1
VENT SETTING CORRECTION FACTOR	K_B	-	1
IDEAL GAS CONSTANT	R	$PSIA•FT^3/LB\text{-}MOLE•°R$	10.731
MAXIMUM HOURLY FILLING RATE	FR_M	GAL/HR	3600
IDEAL GAS CONSTANT	R	PSIA•GAL/LB-MOLE•°R	80.273

$$L_{MAX} = \frac{M_V \times P_{VA}}{R \times T} \times FR_M$$

- L_{MAX} (lb/hr) is the maximum potential short term emission rate at worst case conditions (highest liquid surface temperature, vapor pressure, and fill rate).
- M_V (lb/lbmol) is the vapor molecular weight of the VOC.
- P_{VA} (psia) is the vapor pressure of the tank contents at the worst case temperature.
- FR_M (gal/hr) is the maximum filling rate.
- R ((psia × gal)/(lbmol × °R)) is the ideal gas constant (80.273 for the selected units).
- T (Rankine) is the worst case liquid surface temperature. It is TCEQ practice to use either 95°F (554.67°R) or the actual temperature, whichever is higher.

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		FIXED ROOF
		ABOVEGROUND
Q	BBL/YR	171.19
K_N	-	1.00
H_E	FT	3.91
D_E	FT	12.84
T_{AA}	°R	523.75
T_B	°R	525.02
T_V	°R	527.95
T_{LA}	°R	526.64
ΔT_V	°R	26.20
ΔT_A	°R	25.30
ΔP_V	psia	0.00
ΔP_B	psi	0.06
V_V	FT^3	253.50
H_{VO}	FT	1.96
K_E	-	0.045
K_S	-	1.00
P_{VX}	PSIA	0.0100
P_{VN}	PSIA	0.0066
T_{LX}	°R	533.19
T_{LN}	°R	520.09
W_V	LB/FT^3	0.00019
K_p	-	1.00
K_B	-	1.00
TCEQ MAX HOURLY		
T	R	555.00
P_{VA}	psia	0.0193
FR_M	GAL/HR	3600
L_{MAX}	LB/HR	0.20

ESTIMATE OF TANK EMISSIONS FROM FIXED ROOF TANKS

TANK IDENTIFICATION: FP Diesel Tank(3 per engine hall)
TANK CONTENTS: Diesel Fuel *Source: Email from Kiewit dated 9/22/23*
EMISSION POINT NUMBER (EPN): through TK-100

	SYMBOL	INPUT	UNITS	
TANK TYPE	-	HORIZONTAL FIXED ROOF	-	
TANK SHELL HEIGHT/LENGTH	L	3.3	FT	
TANK DIAMETER	D	3.7	FT	
NOMINAL TANK CAPACITY	-	250	GAL	
ANNUAL NET THROUGHPUT		1,500.0	GAL/YR	*100 hr/yr at max fuel input 13.7 gal/hr*
SHELL COLOR/SHADE	-	WHITE	-	
SHELL CONDITION	-	AVERAGE	-	
TANK SURFACE SOLAR ABSORPTANCE	α	0.25	-	
DAILY OPERATING SCHEDULE	-	24	HRS/DAY	
ANNUAL OPERATING SCHEDULE	-	365	DAYS/YR	
PRESSURE SETTINGS	P_{BP}	-0.03	PSIG	
VACUUM SETTINGS	P_{BV}	0.03	PSIG	
TANK ABOVE OR UNDERGROUND?	-	ABOVE GROUND	-	
TANK HEATED?	-	AMBIENT	-	
MAXIMUM HOURLY FILLING RATE	FR_M	250.0	GAL/HR	

METEOROLOGICAL CITY AND STATE	-	MIDLAND, TX	-
HOURLY AVG MIN MBIENT TEMP	T_{AN}	51.4	°F
HOURLY AVG MAX AMBIENT TEMP	T_{AX}	76.7	°F
AVG WIND SPEED	V	11	MI/HR
AVG DAILY TOTAL INSOLATION FACTOR	I	1698	BTU/FT^2/DAY
AVG ATMOSPHERIC PRESSURE	P_A	13.26	LB/IN^2

CHEMICAL (SINGLE COMPONENT)	-	NO. 2 FUEL OIL (DIESEL)	-
IF OTHER - IDENTIFY SURROGATE CHEMICAL			
VAPOR MOLECULAR WEIGHT	M_V	130	LB/LB-MOLE
LIQUID MOLECULAR WEIGHT	M_L	188	LB/LB-MOLE
VAPOR PRESSURE	P_{VA}	0.0081	PSIA
VAPOR PRESSURE EQUATION CONSTANT (A)	A	12.101	P => PSIA
VAPOR PRESSURE EQUATION CONSTANT (B)	B	8907	T => RANKINE
VAPOR PRESSURE EQUATION CONSTANT (C)	C	0.006	LN(BASE E)
LIQUID DENSITY	W_L	7.1	LB/GAL
WORKING LOSS PRODUCT FACTOR	K_p	1	

STANDING STORAGE LOSSES	L_S	**0.05**	LB/YR
WORKING LOSSES	L_W	**0.04**	LB/YR
TOTAL LOSSES	L_T	**0.09**	LB/YR
TOTAL LOSSES	L_T	**0.0000**	TPY
MAX HOURLY LOSSES	L_{MAX}	**0.0141**	LB/HR

CELL COLOR KEY	
TBD	INPUT
WIP	DROPDOWN
WIP	LOOKUP TABLE

Table 7.1-6. PAINT SOLAR ABSORPTANCE[a]

Surface Color	Shade or Type	Reflective Condition (see Note 1)		
		New	Average	Aged
White		0.17	0.25	0.34
Aluminum	Specular	0.39	0.44	0.49
Aluminum	Diffuse	0.60	0.64	0.68
Beige/Cream		0.35	0.42	0.49
Black		0.97	0.97	0.97
Brown		0.58	0.62	0.67
Gray	Light	0.54	0.58	0.63
Gray	Medium	0.68	0.71	0.74
Green	Dark	0.89	0.90	0.91
Red	Primer	0.89	0.90	0.91
Rust	red iron oxide	0.38	0.44	0.50
Tan		0.43	0.49	0.55
Aluminum (see Note 2)	mill finish, unpainted	0.10	0.12	0.15

NOTE 1 Reflective condition definitions:

New: For paint, paint still retains the fresh shine of having been recently applied; for mill-finish aluminum, surface is shiny. This was previously labeled "Good."

Average: For paint, paint is in good condition, but the initial shine has faded; for mill-finish aluminum, surface is oxidized but still bright. The value given in each case is the average of the New and the Aged values for that case, and does not represent new data.

Aged: For paint, paint is noticeably faded and dull; for mill-finish aluminum, surface is dull. This was previously labeled "Poor."

NOTE 2 This refers to aluminum as the base metal, rather than aluminum-colored paint.

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Table 7.1-2. PROPERTIES (M_V, M_L, P_{VA}, W_L) OF SELECTED PETROLEUM LIQUIDS

Petroleum Liquid Mixture	Vapor Molecular Weight	Liquid Molecular Weight	Liquid Density	ASTM D86 Distillation Slope	Vapor Pressure Equation Constant	Vapor Pressure Equation Constant	True Vapor Pressure (at 60 °F)
	M_V	M_L	W_L	S	A	B	P_{VA}
	lb/lb-mole	lb/lb-mole	lb/gal	°F/vol %	dimensionless	°R	psia
MIDCONTINENT CRUDE OIL	50	207	7.1	–	Figure 7.1-16	Figure 7.1-16	–
REFINED PETROLEUM STOCKS	–	–	–	–	Figure 7.1-15	Figure 7.1-15	–
MOTOR GASOLINE RVP 13	62	92	5.6	3.0	11.644	5043.6	7.0
MOTOR GASOLINE RVP 10	66	92	5.6	3.0	11.724	5237.3	5.2
MOTOR GASOLINE RVP 7	68	92	5.6	3.0	11.833	5500.6	3.5
LIGHT NAPHTHA RVP 9- 14	–	–	–	3.5	–	–	–
NAPHTHA RVP 2-8	–	–	–	2.5	–	–	–
AVIATION GASOLINE	–	–	–	2.0	–	–	–
JET NAPHTHA (JP-4)	80	120	6.4	–	11.368	5784.3	1.3
JET KEROSENE (JET A)	130	162	7.0	–	12.390	8933.0	0.008
NO. 2 FUEL OIL (DIESEL)	130	188	7.1	–	12.101	8907.0	0.006
NO. 6 FUEL OIL	130	387	7.9	–	10.781	8933.0	0.002
VACUUM RESIDUAL OIL	190	387	7.9	–	10.104	10475.5	0.00004

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Standing losses (lb/yr)	=	$365*V_V*W_V*K_E*K_S$ =	**0.05**
Working losses (lb/yr)	=	$5.614*Q*K_N*K_p*K_B*K_B$ =	**0.04**

	SYMBOL	UNITS	VALUE
TANK SHELL HEIGHT/LENGTH	L	FT	3.280839895
TANK DIAMETER	D	FT	3.702031388
TANK SHELL RADIUS	R_S	FT	1.851015694
TANK LIQUID VOLUME		GAL	264.15
ANNUAL NET THROUGHPUT		GAL/YR	1500
TOTAL ANNUAL TURNOVERS	N	NO/YR	5.68
TANK SURFACE SOLAR ABSORPTANCE	α	-	0.25
ANNUAL OPERATING HOURS		DAYS/YR	8760
PRESSURE SETTINGS	P_{BP}	PSIG	-0.03
VACUUM SETTINGS	P_{BV}	PSIG	0.03
TANK ABOVE OR UNDERGROUND?			ABOVE GROUND
HOURLY AVG MIN AMBIENT TEMP	T_{AN}	°R	511.1
HOURLY AVG MAX AMBIENT TEMP	T_{AX}	°R	536.4
AVG WIND SPEED	V	MI/HR	11
AVG DAILY TOTAL INSOLATION FACTOR	I	$BTU/FT^2/DAY$	1698
AVG ATMOSPHERIC PRESSURE	P_A	LB/IN^2	13.26
VAPOR MOLECULAR WEIGHT	M_V	LB/LB-MOLE	130
VAPOR PRESSURE	P_{VA}	PSIA	0.008133222
VAPOR PRESSURE EQUATION CONSTANT	A		12.101
VAPOR PRESSURE EQUATION CONSTANT	B	°R	8907
VAPOR PRESSURE EQUATION CONSTANT	C		0.006
LIQUID DENSITY	W_L	LB/GAL	7.1
WORKING LOSS PRODUCT FACTOR	K_p	-	1
VENT SETTING CORRECTION FACTOR	K_B	-	1
IDEAL GAS CONSTANT	R	$PSIA•FT^3/LB\text{-}MOLE•°R$	10.731
MAXIMUM HOURLY FILLING RATE	FR_M	GAL/HR	250
IDEAL GAS CONSTANT	R	PSIA•GAL/LB-MOLE•°R	80.273

$$L_{MAX} = \frac{M_V \times P_{VA}}{R \times T} \times FR_M$$

- L_{MAX} (lb/hr) is the maximum potential short term emission rate at worst case conditions (highest liquid surface temperature, vapor pressure, and fill rate).
- M_V (lb/lbmol) is the vapor molecular weight of the VOC.
- P_{VA} (psia) is the vapor pressure of the tank contents at the worst case temperature.
- FR_M (gal/hr) is the maximum filling rate.
- R ((psia × gal)/(lbmol × °R)) is the ideal gas constant (80.273 for the selected units).
- T (Rankine) is the worst case liquid surface temperature. It is TCEQ practice to use either 95°F (554.67°R) or the actual temperature, whichever is higher.

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		FIXED ROOF
		ABOVEGROUND
Q	BBL/YR	35.71
K_N	-	1.00
H_E	FT	2.91
D_E	FT	3.93
T_{AA}	°R	523.75
T_B	°R	525.02
T_V	°R	527.95
T_{LA}	°R	526.64
ΔT_V	°R	26.20
ΔT_A	°R	25.30
ΔP_V	psia	0.00
ΔP_B	psi	0.06
V_V	FT^3	17.66
H_{VO}	FT	1.45
K_E	-	0.045
K_S	-	1.00
P_{VX}	PSIA	0.0100
P_{VN}	PSIA	0.0066
T_{LX}	°R	533.19
T_{LN}	°R	520.09
W_V	LB/FT^3	0.00019
K_p	-	1.00
K_B	-	1.00
TCEQ MAX HOURLY		
T	R	555.00
P_{VA}	psia	0.0193
FR_M	GAL/HR	250
L_{MAX}	LB/HR	0.01

APPENDIX C
BACT Supporting Information

TABLE C-1
SUMMARY OF RECENT NOx PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
*TX-1013	Pecos Power	Reeves	TX	03/27/2026	Engines	Wartsila 18V50SG-D Engines - 4SLB @ 19-Megawatt (MW), 25,000-horsepower (HP) 24 Engines	25,000	HP	Each engine will be equipped with a SCR and oxidation catalyst system. The reagent used for the SCR will be urea, which will decompose into NH_3 in the hot exhaust stream where it will then react with NOx across the SCR | Limit 1: 0.044 G/HP HR (15% O_2) | Limit 2: 4.5 parts per million by volume dry basis corrected to 15% oxygen (PPMVD) (15% O_2) | BACT-PSD
*IN-0394	General Motors LLC - Fort Wayne Assembly	Allen	IN	07/05/2024	Gen 1 through Gen 4		2,242	HP	(a) Lean burn technology with good combustion practices (b) Use of natural gas only | Limit 1: 0.5 G Per Brake HP-Hour | Limit 2: 0 | BACT-PSD
MI-0459	Lansing Board of Water and Light-Delta Energy Park	Eaton	MI	06/27/2024	FG Engines	This flexible group (FG-Engines) consists of 6 natural gas-fired reciprocating internal combustion engines (RICEs). Each engine has a maximum throughput capacity of 29,147 brake horsepower (BHP).	29,147	BHP	Selective catalytic reduction, lean burn combustion. | Limit 1: 0.5 G/B-HP-hr (Hourly, Except during startup/shutdown [SU/SD]) | Limit 2: 49.7 lb/hr (Operating hr; During SU/SD) | BACT-PSD
MI-0440	Michigan State University	Ingham	MI	05/22/2019	FG Engines	This flexible group consists of the four (4) natural gas-fired RICEs. The throughput capacity is 16,500 HP per engine.	16,500	HP	Selective catalytic reduction | Limit 1: 0.5 G/HP-hr (Hourly, Except SU/SD) | Limit 2: 1 G/HP-hr (Hourly; See notes below) | BACT-PSD
CA-1240	Gold Coast Packing	Santa Barbara	CA	03/17/2017	Internal Combustion Engine		881	BHP	SCR catalyst-Urea injection | Limit 1: 5 PPMVD (@15%O_2) | Limit 2: 0 | Other cases-by-case
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE electricity generating units (EGUs)	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 MW (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 2.13 lb/hr (1-HR Ave. Period, except during startup) | Limit 2: 14.41 LB/HR (1-hr Ave. Period, during startup) | BACT-PSD
LA-0292	Holbrook Compressor Station	Calcasieu	LA	01/22/2016	Waukesha 16V-275GL Compressor Engines Nos. 1-12		5,000	HP	Lean-burn combustion, use of natural gas as fuel, good equipment design, and proper combustion techniques | Limit 1: 4.96 lb/hr (hourly maximum) | Limit 2: 21.73 tons per year (annual maximum) | BACT-PSD

TABLE C-2
SUMMARY OF RECENT VOC PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
*TX-1013	Pecos Power	Reeves	TX	03/27/2026	Engines	Wartsila 18V50SG-D Engines - 4SLB @ 19 Megawatts (MW), 25,000-horsepower (HP) 24 Engines	25,000	HP	Achieved using an oxidation catalyst that oxidizes volatile organic compounds (VOCs) resulting from incomplete combustion into CO_2 and H_2O vapor. The oxidation catalyst is expected to achieve a DRE of 93% or greater. Startup emissions for the engines have been based on a total of 700 startups per 12-month rolling average with different startup numbers for cold, warm, or hot starts over a 12-month rolling period. The worst case emission rate, generally a cold start, has been assumed for the short-term and annual emission rate. Engine startup is expected to take as few as 10 minutes and up to 30 minutes depending on whether the start is hold, warm, or cold. Emissions of NOx, CO, and VOC during startups are represented to be uncontrolled for the first 30 minutes of each hour and controlled (routine) for the last 30 minutes of each hour. Because these are considered peaking units, the number of startups per year will be based on the requirements of the power grid. | Limit 1: 0.089 G/HP HR (15% O_2) | Limit 2: 26 parts per million by volume dry basis corrected to 15% oxygen (PPMVD) (15% O_2) | BACT-PSD
MI-0459	Lansing Board of Water and Light-Delta Energy Park	Eaton	MI	06/27/2024	FG Engines	This flexible group (FG Engines) consists of 6 natural gas-fired reciprocating internal combustion engines (RICEs). Each engine has a maximum throughput capacity of 29,147 brake horsepower (BHP).	29,147	BHP	Catalytic oxidation, good combustion practices. | Limit 1: 20 lb/hr (Hourly; including formaldehyde) | Limit 2: 0.7 G/B-HP-hr (Hourly) | BACT-PSD
WI-0314	Wisconsin Public Service Corporation - Weston Plant	Marathon	WI	03/10/2022	Reciprocating Internal Combustion Engine (RICE) (P101-P107)	Seven (7) identical natural-gas fired RICE electric generator units(EGUs). 18,817-kilowatt (kW) nominal site rating, engine rating of 25,850 horsepower (HP).	152.3	MMBTU/H	Use of good combustion practices and use of an oxidation catalyst. | Limit 1: 4.49 lb/hr | Limit 2: 0 | BACT-PSD
MI-0440	Michigan State University	Ingham	MI	05/22/2019	FG Engines	This flexible group consists of the four (4) natural gas-fired RICEs. The throughput capacity is 16,500 HP per engine.	16,500	HP	Oxidation catalyst | Limit 1: 11 lb/hr (Each engine/hourly/except during startup/Shutdown [SU/SD]) | Limit 2: 0.7 G/HP-hr (Each engine/hourly) | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1A	Based on the higher heating value (HHV) of natural gas at 100% load	161.4	MMBtu/hour	Oxidation Catalyst for each engine | Limit 1: 26 PPMVD AT 15% O_2 (& 4.92 lb/hour at 70% and 100% load) | Limit 2: 42 PPMVD AT 15% O_2 (& 3.60 lb/hour at 40% load) | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1B	Based on the higher heating value (HHV) of natural gas at 100% load	161.4	MMBtu/hour	Oxidation catalyst on each engine | Limit 1: 26 PPMVD AT 15% O_2 (& 4.92 lb/hour at 70% and 100% load) | Limit 2: 42 PPMVD at 15% O_2 (& 3.60 lb/hour at 40% load) | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1C	Based on the higher heating value (HHV) of natural gas at 100% load	161.4	MMBtu/hour	Oxidation Catalyst for each engine | Limit 1: 26 PPMVD AT 15% O_2 (& 4.92 lb/hour at 70% and 100% load) | Limit 2: 42 PPMVD AT 15% O_2 (& 3.60 lb/hour at 40% load) | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1D	Based on the higher heating value (HHV) of natural gas at 100% load	161.4	MMBtu/hour	Oxidation catalyst on each engine | Limit 1: 26 PPMVD AT 15% O_2 (& 4.92 lb/hour at 70% and 100% load) | Limit 2: 42 PPMVD at 15% O_2 (& 3.60 lb/hour at 40% load) | BACT-PSD

TABLE C-2
SUMMARY OF RECENT VOC PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1E	Based on the higher heating value (HHV) of natural gas at 100% load	161.4	MMBtu/hour	Oxidation Catalyst for each engine | Limit 1: 26 PPMVD AT 15% O_2 (& 4.92 lb/hour at 70% and 100% load) | Limit 2: 42 PPMVD AT 15% O_2 (& 3.60 lb/hour at 40% load) | BACT-PSD
CA-1240	Gold Coast Packing	Santa Barbara	CA	03/17/2017	Internal Combustion Engine		881	bhp	Oxidation catalyst | Limit 1: 25 PPMVD (@15% O_2) | Limit 2: 0 | Other case-by-case
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE electricity generating units (EGUs)	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 megawatts (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 5.82 lb/hr (1-hr Ave. Period, except during startup) | Limit 2: 8.44 lb/hr (3-HR Ave. Period, except during startup) | BACT-PSD
LA-0292	Holbrook Compressor Station	Calcasieu	LA	01/22/2016	Waukesha 16V-275GL Compressor Engines Nos. 1-12		5,000	HP	CO oxidation catalyst, use of natural gas as fuel, good equipment design, and proper combustion techniques | Limit 1: 1.25 lb/hr (hourly maximum) | Limit 2: 5.46 tons per year (TPY-annual maximum) | BACT-PSD

TABLE C-3
SUMMARY OF RECENT CO PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
*TX-1013	Pecos Power	Reeves	TX	03/27/2026	Engines	Wartsila18V50SG-D Engines - 4SLB @ 19-Megawatt (MW), 25,000-horsepower (HP) 24 Engines	25,000	HP	Using an oxidation catalyst that oxidizes CO resulting from incomplete combustion to CO_2. The oxidation catalyst is expected to achieve a DRE of 93% or greater. | Limit 1: 0.09 G/HP hr (15% O_2) | Limit 2: 15 parts per million by volume dry basis corrected to 15% oxygen (PPMVD) (15% O_2) | BACT-PSD
MI-0459	Lansing Board of Water and Light-Delta Energy Park	Eaton	MI	06/27/2024	FG Engines	This flexible group (FG Engines) consists of 6 natural gas-fired RICEs. Each engine has a maximum throughput capacity of 29,147 brake horsepower (BHP).	29,147	BHP	Catalytic oxidation, good combustion practices. | Limit 1: 0.3 G/B-HP-hr (hourly, except during startup/shutdown [SU/SD]) | Limit 2: 36.9 lb/hr (operating hour during SU/SD | BACT-PSD
WI-0314	Wisconsin Public Service Corporation - Weston Plant	Marathon	WI	03/10/2022	Reciprocating Internal Combustion Engine (RICE) (P101-P107)	Seven (7) identical natural-gas fired RICE EGUs. 18,817-kilowatt (kW) nominal site rating, engine rating of 25,850 HP.	152.3	MMBTU/H	Use of good combustion practices and use of oxidation catalyst | Limit 1: 4.43 lb/hr | Limit 2: 14 PPMVD (15% O_2, 1-hr ave. basis) | BACT-PSD
MI-0440	Michigan State University	Ingham	MI	05/22/2019	FG Engines		16,500	HP	Oxidation catalyst | Limit 1: 0.3 G/HP-hr hourly, except during SU/SD) | Limit 2: 2 G/HP-hr (hourly; each engine) | BACT-PSD
CA-1240	Gold Coast Packing	Santa Barbara	CA	03/17/2017	Internal Combustion Engine	This flexible group consists of the four (4) natural gas-fired RICEs. The throughput capacity is 16,500 HP per engine.	881	bhp	Oxidation catalyst | Limit 1: 54 PPMVD (@15%O_2) | Limit 2: 0 | Other case-by-case
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE electricity generating units (EGUs)	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 MW (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 3.86 LB/H (1-hr ave. period except during startup) | Limit 2: 39.23 LB/H (1-hr ave. period during startup) | BACT-PSD

TABLE C-4
SUMMARY OF RECENT PM/PM10/PM2.5 PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
*TX-1013	Pecos Power	Reeves	TX	03/27/2026	Engines	Wartsila 18V50SG-D Engines - 4SLB @ 19 MW, 25000-horsepower (HP) 24 Engines	25,000	HP	Good combustion practices and low-sulfur fuel. Tier 1 BACT, based on the TCEQ's Combustion Spreadsheet, is good combustion practices and engines that are limited to firing fuels which meet the requirements of 40 CFR Â§72.2 or Â§80.1604. Additionally, no visible emissions shall leave the property. Visible emissions shall be determined by a standard of no visible emissions exceeding 30 seconds in duration in any six-minute period as determined using EPA TM 22 or equivalent. | Limit 1: 0.038 G/HP hr | Limit 2: 0 | BACT-PSD
*TX-1013	Pecos Power	Reeves	TX	03/27/2026	Engines	Wartsila 18V50SG-D Engines - 4SLB @ 19 MW, 25000-HP 24 Engines	25,000	HP	Good combustion practices and low-sulfur fuel. Tier 1 BACT, based on the TCEQ's Combustion Spreadsheet, is good combustion practices and engines that are limited to firing fuels which meet the requirements of 40 CFR Â§72.2 or Â§80.1604. Additionally, no visible emissions shall leave the property. Visible emissions shall be determined by a standard of no visible emissions exceeding 30 seconds in duration in any six-minute period as determined using EPA TM 22 or equivalent. | Limit 1: 0.038 G/HP hr | Limit 2: 0 | BACT-PSD
*TX-1013	Pecos Power	Reeves	TX	03/27/2026	Engines	Wartsila 18V50SG-D Engines - 4SLB @ 19 MW, 25000-HP 24 Engines	25,000	HP	Good combustion practices and low-sulfur fuel. Tier 1 BACT, based on the TCEQ's Combustion Spreadsheet, is good combustion practices and engines that are limited to firing fuels which meet the requirements of 40 CFR Â§72.2 or Â§80.1604. Additionally, no visible emissions shall leave the property. Visible emissions shall be determined by a standard of no visible emissions exceeding 30 seconds in duration in any six-minute period as determined using EPA TM 22 or equivalent. | Limit 1: 0.038 G/HP hr | Limit 2: 0 | BACT-PSD
MI-0459	Lansing Board of Water and Light-Delta Energy Park	Eaton	MI	06/27/2024	FG-Engines	This flexible group (FG-Engines) consists of 6 natural gas-fired RICEs. Each engine has a maximum throughput capacity of 29,147 brake horsepower (BHP).	29,147	BHP	Good combustion practices. | Limit 1: 4 LB/hr (hourly) | Limit 2: 0 | BACT-PSD
MI-0459	Lansing Board of Water and Light-Delta Energy Park	Eaton	MI	06/27/2024	FG-Engines	This flexible group (FG-Engines) consists of 6 natural gas-fired RICEs. Each engine has a maximum throughput capacity of 29,147 BHP.	29,147	BHP	Good combustion practices. | Limit 1: 4 LB/hr (hourly) | Limit 2: 0 | BACT-PSD
MI-0459	Lansing Board of Water and Light-Delta Energy Park	Eaton	MI	06/27/2024	FG-Engines	This flexible group (FG-Engines) consists of 6 natural gas-fired RICEs. Each engine has a maximum throughput capacity of 29,147 BHP.	29,147	BHP	Good combustion practices. | Limit 1: 4 LB/hr (hourly) | Limit 2: 0 | BACT-PSD
WI-0314	Wisconsin Public Service Corporation - Weston Plant	Marathon	WI	03/10/2022	Reciprocating Internal Combustion Engine (RICE) (P101-P107)	Seven (7) identical natural-gas fired RICE EGUs. 18,817-kilowatt (kW) nominal site rating, engine rating of 25,850 HP.	152.3	MMBTU/H	Use of good combustion practices and use of pipeline quality natural gas | Limit 1: 2.37 lb/hr | Limit 2: 0 | BACT-PSD
WI-0314	Wisconsin Public Service Corporation - Weston Plant	Marathon	WI	03/10/2022	RICE (P101-P107)	Seven (7) identical natural-gas fired RICE EGUs. 18,817-kW nominal site rating, engine rating of 25,850 HP.	152.3	MMBTU/H	Use of good combustion practices and use of pipeline quality natural gas | Limit 1: 2.37 lb/hr | Limit 2: 0 | BACT-PSD
WI-0314	Wisconsin Public Service Corporation - Weston Plant	Marathon	WI	03/10/2022	RICE (P101-P107)	Seven (7) identical natural-gas fired RICE EGUs. 18,817-kW nominal site rating, engine rating of 25,850 HP.	152.3	MMBTU/H	Use of good combustion practices and use of pipeline quality natural gas | Limit 1: 2.37 lb/hr | Limit 2: 0 | BACT-PSD

TABLE C-4
SUMMARY OF RECENT PM/PM10/PM2.5 PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
MI-0440	Michigan State University	Ingham	MI	05/22/2019	FG-Engines	This flexible group consists of the four (4) natural gas-fired RICEs. The throughput capacity is 16,500 HP per engine.	16,500	HP	Natural gas and good combustion practices. | Limit 1: 2 lb/hr (hourly) | Limit 2: 0 | BACT-PSD
MI-0440	Michigan State University	Ingham	MI	05/22/2019	FG-Engines	This flexible group consists of the four (4) natural gas-fired RICEs. The throughput capacity is 16,500 HP per engine.	16,500	HP	Natural gas and good combustion practices | Limit 1: 3 lb/hr (each engine hourly/except startup/shutdown [SU/SD]) | Limit 2: 0 | BACT-PSD
MI-0440	Michigan State University	Ingham	MI	05/22/2019	FG-Engines	This flexible group consists of the four (4) natural gas-fired RICEs. The throughput capacity is 16,500 HP per engine.	16,500	HP	Natural gas and good combustion practices | Limit 1: 3 lb/hr (each engine hourly/except SU/SD) | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82-megawatt (MW) SI Internal Combustion Engine Unit 1A	Based on the higher heating value (HHV) of natural gas at 100% load	161.4	MMBtu/hour	Good combustion practices (i.e., advanced lean-burn engine design, ignition timing, and air-to-fuel ration controllers with regular and preventative maintenance as recommended by the manufacturer), along with combustion of pipeline-quality natural gas shall be utilized to minimize emissions of PM/PM_{10}/$PM_{2.5}$ emissions. In addition, as measured by reference method stack test, ammonia slip from each engine shall not exceed 10 ppmv to minimize $PM_{2.5}$ emissions | Limit 1: 0 | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1B	Based on the HHV of natural gas at 100% load	161.4	MMBtu/hour	Good combustion practices (i.e., advanced lean-burn engine design, ignition timing, and air-to-fuel ration controllers with regular and preventative maintenance as recommended by the manufacturer), along with combustion of pipeline-quality natural gas shall be utilized to minimize emissions of PM/PM_{10}/$PM_{2.5}$ emissions. In addition, as measured by reference method stack test, ammonia slip from each engine shall not exceed 10 ppmv to minimize $PM_{2.5}$ emissions | Limit 1: 0 | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1C	Based on the HHV of natural gas at 100% load	161.4	MMBtu/hour	Good combustion practices (i.e., advanced lean-burn engine design, ignition timing, and air-to-fuel ration controllers with regular and preventative maintenance as recommended by the manufacturer), along with combustion of pipeline-quality natural gas shall be utilized to minimize emissions of PM/PM_{10}/$PM_{2.5}$ emissions. In addition, as measured by reference method stack test, ammonia slip from each engine shall not exceed 10 ppmv to minimize $PM_{2.5}$ emissions | Limit 1: 0 | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1D	Based on the HHV of natural gas at 100% load	161.4	MMBtu/hour	Good combustion practices (i.e., advanced lean-burn engine design, ignition timing, and air-to-fuel ration controllers with regular and preventative maintenance as recommended by the manufacturer), along with combustion of pipeline-quality natural gas shall be utilized to minimize emissions of PM/PM_{10}/$PM_{2.5}$ emissions. In addition, as measured by reference method stack test, ammonia slip from each engine shall not exceed 10 ppmv to minimize $PM_{2.5}$ emissions | Limit 1: 0 | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82 MW SI Internal Combustion Engine Unit 1E	Based on the HHV of natural gas at 100% load	161.4	MMBtu/hour	Good combustion practices (i.e., advanced lean-burn engine design, ignition timing, and air-to-fuel ration controllers with regular and preventative maintenance as recommended by the manufacturer), along with combustion of pipeline-quality natural gas shall be utilized to minimize emissions of PM/PM_{10}/$PM_{2.5}$ emissions. In addition, as measured by reference method stack test, ammonia slip from each engine shall not exceed 10 ppmv to minimize $PM_{2.5}$ emissions | Limit 1: 0 | Limit 2: 0 | BACT-PSD

TABLE C-4
SUMMARY OF RECENT PM/PM10/PM2.5 PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE electricity generating units (EGUs)	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 MW (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 1.31 lb/hr (24-hr ave. Period, except during startup) | Limit 2: 1.68 lb/hr (24-hr ave. Period, during startup) | BACT-PSD
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE EGUs	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 MW (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 1.31 lb/hr (24-hr ave. Period, except during startup) | Limit 2: 1.68 lb/hr (24-hr ave. Period, during startup) | BACT-PSD
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE EGUs	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 MW (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 1.31 lb/hr (24-hr ave. Period, except during startup) | Limit 2: 1.68 lb/hr (24-hr ave. Period, during startup) | BACT-PSD
LA-0292	Holbrook Compressor Station	Calcasieu	LA	01/22/2016	Waukesha 16V-275GL Compressor Engines Nos. 1-12		5,000	HP	Use of natural gas as fuel, good equipment design, and proper combustion techniques | Limit 1: 0.003 lb/hr (hourly maximum) | Limit 2: 0.01 tons per year annual maximum) | BACT-PSD

TABLE C-5
SUMMARY OF RECENT SO2 AND H2SO4 PSD BACT AND LAER DETERMINATIONS FOR RICE ENGINES (EMERGENCY USE ONLY)
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Methods & Emission Limits
TN-0183	Sinova Silicon LLC	Lake	TN	04/25/2022	Emergency natural gas-fired engine	Reciprocating engine 2,682-horsepower (HP)	2682	HP	Limit 1: 0.0029 lb/hr (one hour) | Limit 2: 0.0005 G/HP-hr (one hour) | BACT-PSD
KY-0110	Nucor Steel Brandenburg	Meade	KY	07/23/2020	EP 10-05 - Austenitizing Furnace Rolls Emergency Generator	A natural gas emergency generator used to provide emergency power supply for critical operations should the facility power supply be interrupted. This generator is a 4-stroke, lean-burn engines that has a displacement of less than 30 liters per cylinder.	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan. | Limit 1: 0 | Limit 2: 0 | BACT-PSD
KY-0110	Nucor Steel Brandenburg	Meade	KY	07/23/2020	EP 10-06 - Tempering Furnace Rolls Emergency Generator	A natural gas emergency generator used to provide emergency power supply for critical operations should the facility power supply be interrupted. This generator is a 4-stroke, lean-burn engines that has a displacement of less than 30 liters per cylinder.	636	HP	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan. | Limit 1: 0 | Limit 2: 0 | BACT-PSD
FL-0368	Nucor Steel Florida Facility	Polk	FL	02/14/2019	Emergency Engines	Two 2,000-kilowatt emergency natural gas-fired generators and one emergency natural gas-fired 500-HP fire pump	0		Limited sulfur content in natural gas. | Limit 1: 2 GR./100 standard cubic feet (SCF) | Limit 2: 0 | BACT-PSD

TABLE C-6
SUMMARY OF RECENT AMMONIA PSD BACT AND LAER DETERMINATIONS FOR NON-EMERGENCY RICE ENGINES
PERMIT APPLICATION FOR TCEQ NEW SOURCE REVIEW
TOM GREEN COUNTY, TEXAS

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
CA-1240	Gold Coast Packing	Santa Barbara	CA	03/17/2017	Internal Combustion Engine		881	BHP	Oxidation catalyst | Limit 1: 5 parts per million by volume dry basis corrected to 15% oxygen (PPMVD) (@15%O_2) | Limit 2: 0 |Other case-by-case

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
*TX-1013	Pecos Power	Reeves	TX	03/27/2026	Engines	Wartsila 18V50SG-D Engines - 4SLB @ 19-MW, 25000-horsepower (HP) 24 Engines	25,000	HP	Natural gas combustion -Startup emissions for the engines have been based on a total of 700 startups per 12-month rolling average with different startup numbers for cold, warm, or hot starts over a 12-month rolling period. The worst case emission rate, generally a cold start, has been assumed for the short-term and annual emission rate. Engine startup is expected to take as few as 10 minutes and up to 30 minutes depending on whether the start is hold, warm, or cold. Emissions of NOx, CO, and VOC during startups are represented to be uncontrolled for the first 30 minutes of each hour and controlled (routine) for the last 30 minutes of each hour. Because these are considered peaking units, the number of startups per year will be based on the requirements of the power grid. Startup emissions for the engines have been based on a total of 700 startups per 12-month rolling average with different startup numbers for cold, warm, or hot starts over a 12-month rolling period. The worst case emission rate, generally a cold start, has been assumed for the short-term and annual emission rate. Engine startup is expected to take as few as 10 minutes and up to 30 minutes depending on whether the start is hold, warm, or cold. Emissions of NOx, CO, and VOC during startups are represented to be uncontrolled for the first 30 minutes of each hour and controlled (routine) for the last 30 minutes of each hour. Because these are considered peaking units, the number of startups per year will be based on the requirements of the power grid. | Limit 1: 0 | Limit 2: 0 | BACT-PSD
MI-0459	Lansing Board of Water and Light-Delta Energy Park	Eaton	MI	06/27/2024	FG Engines	This flexible group (FG Engines) consists of 6 natural gas-fired RICEs. Each engine has a maximum throughput capacity of 29,147 brake horsepower (BHP).	29,147	BHP	Good combustion practices, use of current energy efficiency measures. | Limit 1: 90268 tons per year (12-month rolling time period) | Limit 2: 0 | BACT-PSD
WI-0314	Wisconsin Public Service Corporation - Weston Plant	Marathon	WI	03/10/2022	Reciprocating Internal Combustion Engine (RICE) (P101-P107)	Seven (7) identical natural-gas fired RICE EGUs. 18,817-kilowatt nominal site rating, engine rating of 25,850 HP.	152.3	MMBTU/HR	Use of good combustion practices and use of pipeline-quality natural gas | Limit 1: 1100 lb/MW-hr electric output (ANY 12 consecutive operrating months) | Limit 2: 0 | BACT-PSD
MI-0440	Michigan State University	Ingham	MI	05/22/2019	FG Engines	This flexible group consists of the four (4) natural gas-fired RICEs. The throughput capacity is 16,500 HP per engine.	16,500	HP	Utilize low-carbon fuels and implement energy efficiency measures and preventive maintenance pursuant to manufacturer recommendations. | Limit 1: 48724 tons per year(12-month rolling time period) | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82-Megawatt (MW) SI Internal Combustion Engine Unit 1A	Based on the higher heating value (HHV) of natural gas at 100% load	161.4	MMBTU/HR	Use of new natural gas-fired, thermally efficient SI RICE combined with good combustion and maintenance practices to maintain optimum efficiency | Limit 1: 1110 lb/MW-hr basec on HHV (three 1-hour test runs @ 100%, 70% & 40%) | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82-MW SI Internal Combustion Engine Unit 1B	Based on the HHV of natural gas at 100% load	161.4	MMBTU/HR	Use of new natural gas-fired, thermally efficient SI RICE combined with good combustion and maintenance practices to maintain optimum efficiency | Limit 1: 1110 lb/MW-hr basec on HHV (three 1-hour test runs @ 100%, 70% & 40%) | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82-MW SI Internal Combustion Engine Unit 1B	Based on the HHV of natural gas at 100% load	161.4	MMBTU/HR	Use of new natural gas-fired, thermally efficient SI RICE combined with good combustion and maintenance practices to maintain optimum efficiency | Limit 1: 1110 lb/MW-hr basec on HHV (three 1-hour test runs @ 100%, 70% & 40%) | Limit 2: 0 | BACT-PSD

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name	Process Notes	Throughput	Throughput Unit	Control Method & Emission Limits
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82-MW SI Internal Combustion Engine Unit 1B	Based on the HHV of natural gas at 100% load	161.4	MMBTU/HR	Use of new natural gas-fired, thermally efficient SI RICE combined with good combustion and maintenance practices to maintain optimum efficiency | Limit 1: 1110 lb/MW-hr basec on HHV (three 1-hour test runs @ 100%, 70% & 40%) | Limit 2: 0 | BACT-PSD
FL-0370	Arvah B. Hopkins Generating Station	Leon	FL	04/03/2019	18.82-MW SI Internal Combustion Engine Unit 1B	Based on the HHV of natural gas at 100% load	161.4	MMBTU/HR	Use of new natural gas-fired, thermally efficient SI RICE combined with good combustion and maintenance practices to maintain optimum efficiency | Limit 1: 1110 lb/MW-hr basec on HHV (three 1-hour test runs @ 100%, 70% & 40%) | Limit 2: 0 | BACT-PSD
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE electricity generating units (EGUs)	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 MW (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 10692 lb/hr (annual ave. period, except during startup) | Limit 2: 10476 lb/hr (annual ave. period during startup) | BACT-PSD
KS-0030	Mid-Kansas Electric Company, LLC - Rubart Station	Grant	KS	03/31/2016	Spark ignition RICE EGUs	Twenty-four (24) new spark ignition 4SLB RICE EGUs (Caterpillar model G20CM34), used to generate electricity. The generating capacity of each EGU will be 10 MW (approximately 13,410 BHP). Each EGU shall be equipped with a selective catalytic reduction (SCR) system and an oxidation catalyst, and shall burn only natural gas for fuel.	10	MW	Limit 1: 1.25 lb/KW-hr (12-month rolling average) | Limit 2: 0 | BACT-PSD
LA-0292	Holbrook Compressor Station	Calcasieu	LA	01/22/2016	Waukesha 16V-275GL Compressor Engines Nos. 1-12		5,000	HP	Limit 1: 21170 tons per year (annual maximum) | Limit 2: 0 | BACT-PSD

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
*IN-0407	Maple Creek Energy LLC	Sullivan	IN	05/13/2026	Auxiliary Boiler	The auxiliary boiler (AUX) shall not exceed 2,000 hours of operation per 12-month consecutive period.	96	MMBtu	0.011 LB/MMBTU [BACT-PSD] NOx emissions from the natural gas-fired auxiliary boiler (AUX) shall be controlled by an Ultra-Low NOx Burner.		0.037 LB/MMBTU [BACT-PSD] Good combustion practices	0.0019 LB/MMBTU [BACT-PSD] | 0.0075 LB/MMBTU [BACT-PSD] Use of pipeline-quality natural gas and good combustion practices. Emissions shall be controlled through the use of pipeline-quality natural gas and good combustion practices.		CO2e: 11244.0 TONS/YEAR [BACT-PSD] Good combustion practices
*IN-0401	Nucor Steel	Montgomery	IN	11/10/2025	CC-Boil Boiler		37	MMBtu/hr	0.011 LB/MMBTU [BACT-PSD] Ultra-LNB good combustion practices	0.004 LB/MMBTU [BACT-PSD] Use of natural gas GCP	0.037 G/KW-HR [BACT-PSD] Good combustion practices	0.0019 LB/MMBTU [BACT-PSD] | 0.0005 LB/MMBTU [BACT-PSD] | 0.0004 LB/MMBTU [BACT-PSD] Good combustion practices and use of pipeline quality natural gas	0.0006 LB/MMBTU [BACT-PSD] Use of pipeline quality natural gas fuel	CO2e: 117.1 LB/MMBTU [BACT-PSD] use of low carbon fuels and energy efficiency measures
*TX-0994	SL Energy Power Plant I	Lee	TX	10/29/2025	AUXILLARY BOILER		84	MMBtu/hr	0.01 LB/MMBTU [BACT-PSD] Dry low NOx burners and good combustion practices are used	0.0 [BACT-PSD] Good combustion practices are used.	50.0 PPMVD (3% O2) [BACT-PSD] Good combustion practices are used.	0.0 [BACT-PSD] fired exclusively with pipeline quality natural gas	0.0 [BACT-PSD] fired exclusively with pipeline quality natural gas based on 0.5 gr S/100 dscf of natural gas supplied by the natural gas supplier.	CO2e: 0.0 [BACT-PSD] fired exclusively with pipeline quality natural gas
*MI-0461	Belle River Power Plant	St. Clair	MI	07/09/2025	FG-AUXBOILERS-BR (Auxiliary boilers)	Two identical natural gas-fired auxiliary boilers each rated at 99.9 MMBTU/H (HHV).	99.9	MMBtu/hr			0.037 LB/MMBTU (HOURLY/MAX LOAD; PER BOILER) [BACT-PSD]			
*TX-0999	Semiconductor Manufacturing Facility	Williamson	TX	07/07/2025	BOILERS	< 40 MMBTU/HR	0		0.03 LB/MMBTU (HHV 1-HR AVG) [BACT-PSD] ultra-low NOx burners		50.0 PPMV (3% O2) [BACT-PSD] BEST COMBUSTION PRACTICES, CLEAN FUEL,	0.0 [BACT-PSD] GOOD COMBUSTION PRACTICES, CLEAN GASEOUS FUEL		
*WI-0329	CHS Oilseed Processing LLC	Rock	WI	04/01/2025	Boilers	4 boilers: 99 1 high pressure steam generator: 14 1 wash water heater: 3 MMBtu/hr Boilers B01, B02, B03, B04, B05 and B06	99	MMBtu/hr		0.0054 LBS/MMBTU [BACT-PSD] Good combustion practices, pipeline quality natural gas	0.082 LBS/MMBTU [BACT-PSD] Good combustion practices, pipeline quality natural gas	0.0075 LBS/MMBTU [BACT-PSD] Good combustion practices, pipeline quality natural gas		CO2e: 118.0 LBS/MMBTU [BACT-PSD] Good combustion practices, pipeline quality natural gas
*WI-0331	WPL Sheboygan Falls Energy Facility	Sheboygan	WI	01/22/2025	P07 5 Natural Gas Boiler Heaters	5 natural gas boilers operating at 3.0mmbtu/hr each	3	MMBtu/hr	0.05 LB/MMBTU [BACT-PSD] Good combustion practices, use of low NOx burners		0.08 LB/MMBTU [BACT-PSD] Good combustion practices	0.007 LB/MMBTU [BACT-PSD] Good Combustion Practices		CO2e: 117.65 LB/MMBTU [BACT-PSD] Good combustion practices
IN-0371	Wabash Valley Resources, LLC	Vigo	IN	01/11/2024	Auxiliary Boiler (AB-3)		20	MMBtu/hr	35.0 LB/MMSCF [BACT-PSD] Low NOx burners and Good Combustion Practices					CO2e: 117.0 LB/MMBTU [BACT-PSD] Good Combustion Practices

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
*WI-0326	Nemadji Trail Energy Center	Douglas County	WI	09/19/2023	Boiler; S02/B02	Natural Gas-Fired Auxiliary Boiler with ultra-low NOx burners, FGR and oxidation catalyst.	100	MMBtu/hr	0.011 LB/MMBTU [BACT-PSD] (a) B02 shall be equipped with ultra-low NOx burners and flue gas recirculation. (b) The permittee shall operate and maintain B02 according to the manufacturer's recommendations.	0.0027 LB/MMBTU [BACT-PSD] (a) An oxidation catalyst shall be used to control emissions from B02 while B02 is in operation. (b) The permittee shall operate and maintain B02 according to the manufacturer's recommendations.	0.0037 LB/MMBTU [BACT-PSD] (a) An oxidation catalyst shall be used to control emissions from B02 while B02 is in operation. (b) The permittee shall operate and maintain B02 according to the manufacturer's recommendations.	0.01 LB/MMBTU [BACT-PSD] (a) Only pipeline quality natural gas may be combusted in B02. (b) The permittee shall operate and maintain B02 according to the manufacturer's recommendations.		CO2e: 160.0 LBS OF CO2E (PER MMBTU USEFUL HEAT (STEAM) OUTPUT,) [BACT-PSD] B02 shall be equipped with ultra-low NOx burners and flue gas recirculation. The permittee shall operate and maintain B02 according to the manufacturer's recommendations. Only pipeline quality natural gas may be combusted in B02.
*IN-0365	Maple Creek Energy LLC	Sullivan	IN	06/19/2023	Auxiliary Boiler		96	MMBtu/hr	0.037 LB PER MMBTU (BASED ON A 3-HR AVERAGE) [BACT-PSD]	0.0 [BACT-PSD]	0.037 LB PER MMBTU (BASED ON A 3-HR AVERAGE) [BACT-PSD]	0.0075 LB PER MMBTU (BASED ON A 3-HOUR AVERAGE) [BACT-PSD] | 0.0075 LB PER MMBTU (BASED ON A 3-HR AVERAGE) [BACT-PSD]		CO2e: 11244.0 TONS PER YEAR [BACT-PSD]
IN-0361	C-Plant (Specialty Soybean Extraction)	Shelby	IN	05/12/2023	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	Two (2) natural gas-fired boilers, identified as SPC Boiler #1 PS37 and SPC Boiler #2 PS38, each approved in 2023 for construction, each with a maximum heat input capacity of 73.6 MMBtu/hr, each using no control, and exhausting to stacks PS37 and PS38, respectively. Under 40 CFR 60, Subpart Dc, these units are each considered an affected facility. Under 40 CFR 63, Subpart DDDDD, these units are each considered a new, affected source. These units are part of the C-Plant, a specialty soybean extraction process.	73.6	MMBtu/hr (each)		5.5 LB/MMCF (EACH) [BACT-PSD] Good Combustion Practices		1.9 LB/MMCF (EACH) [BACT-PSD] | 7.6 LB/MMCF (EACH) [BACT-PSD] Good Combustion Practices		

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
IN-0359	Nucor Steel	Montgomery	IN	03/30/2023	Boiler (CC-BOIL)		50	MMBtu/hr	0.035 LB/MMBTU [BACT-PSD] low NOx burners	0.0054 LB/MMBTU [BACT-PSD] good combustion practices and natural gas fuel (clean fuel)	61.0 LB/MMSCF [BACT-PSD] good combustion practices	0.0007 LB/MMBTU [BACT-PSD] good combustion practices and only pipeline quality natural gas fuel shall be combusted	0.0006 LB/MMBTU [BACT-PSD] good combustion practices and only pipeline quality natural gas fuel shall be combusted	CO2e: 117.1 LB/MMBTU [BACT-PSD] energy efficiency measures and only pipeline quality natural gas fuel shall be combusted
MI-0454	LBWL-Erickson Station	Eaton	MI	12/20/2022	EUAUXBOILER--natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H	A natural gas-fired auxiliary boiler, rated at less than or equal to 50 MMBtu/hr will facilitate startup of the CTG/HRSG trains and provide steam to the steam turbine generator (STG) seals. The boiler will also provide warming steam to the HRSG, and other related services. The boiler will not produce high pressure steam for use in electric generation.	50	MMBtu/hr	30.0 PPM (HOURLY) [BACT-PSD] Low NOx Burners (LNB) or Flue Gas Recirculation (FGR) along with good combustion practices.	0.3 LB/H (HOURLY) [BACT-PSD] Good combustion practices.	50.0 PPM (PPMVD AT 3%O2; HOURLY) [BACT-PSD] Good combustion practices.	0.4 LB/H (HOURLY) [BACT-PSD] Good combustion practices.		CO2e: 25644.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Low carbon fuel (pipeline quality natural gas), good combustion practices, and energy efficiency measures.
NE-0064	Norfolk Crush, LLC	Madison	NE	11/21/2022	Boiler A	Natural gas-fired boiler (EP-130) required to provide steam for processes.	84	MMBtu/hr		0.52 LB/HR (THREE 1-HOUR TESTS / TEST METHOD AVERAGE) [BACT-PSD]		0.26 LB/HR (THREE 1-HOUR TESTS / TEST METHOD AVERAGE) [BACT-PSD]		
NE-0064	Norfolk Crush, LLC	Madison	NE	11/21/2022	Boiler B	Natural gas-fired boiler (EP-131) required to provide steam for processes.	84	MMBtu/hr		0.52 LB/HR (THREE 1-HOUR TESTS / TEST METHOD AVERAGE) [BACT-PSD]		0.26 LB/HR (THREE 1-HOUR TESTS / TEST METHOD AVERAGE) [BACT-PSD]		
OH-0387	Intel Ohio Site	Licking	OH	09/20/2022	29.4 MMBtu/hr Natural Gas-Fired Boilers: B001 through B028	Twenty-eight 29.4 MMBtu/hr Natural Gas-Fired Boilers: B001 through B028	29.4	MMBtu/hr	9.74 T/YR (PER ROLLING 12 MONTH PERIOD B001 TO B014) [BACT-PSD] Ultra-low NOX burners, good combustion practices, and the use of natural gas	4.86 T/YR (PER ROLLING 12 MONTH PERIOD B001 TO B014) [BACT-PSD] Good combustion practices and the use of natural gas	33.0 T/YR (PER ROLLING 12 MONTH PERIOD B001 TO B014) [BACT-PSD] Good combustion practices and the use of natural gas	1.68 T/YR (PER ROLLING 12 MONTH PERIOD B001 TO B014) [BACT-PSD] | 0.46 T/YR (PER ROLLING 12 MONTH PERIOD B001 TO B014) [BACT-PSD] | 0.38 T/YR (PER ROLLING 12 MONTH PERIOD B001 TO B014) [BACT-PSD] Good combustion practices and the use of natural gas		CO2: 106048.0 T/YR (PER ROLLING 12 MONTH PERIOD B001 TO B014) [BACT-PSD] Good combustion practices and the use of natural gas
IL-0133	Lincoln Land Energy Center	Sangamon	IL	07/29/2022	Auxiliary Boiler	The Auxiliary Boiler is used on an intermittent basis to produce intermediate pressure steam for heating the heat recovery steam generator (HRSG) and combined-cycle combustion turbines	80	MMBtu/hr	0.01 POUNDS/MMBTU (ROLLING 3-OPERATING HOUR) [BACT-PSD] Ultra low-NOx burners and flue gas recirculation, air preheater, automated combustion management system, with an oxygen trim system and an automated water blowdown system.	0.0015 POUNDS/MMBTU (ROLLING 3-OPERATING HOUR) [BACT-PSD] Good burner design and good combustion practices	0.037 POUNDS/MMBTU (ROLLING 3-OPERATING HOUR) [BACT-PSD] Good burner design and good combustion practices.	0.0019 POUNDS/MMBTU (ROLLING 3-OPERATING HOUR) [BACT-PSD] | 0.0075 POUNDS/MMBTU (ROLLING 3-OPERATING HOUR) [BACT-PSD] Good combustion practices.	0.0014 POUNDS/MMBTU (ROLLING 3-OPERATING HOUR) [BACT-PSD] Use of only natural gas with a sulfur content of no greater than 0.5 grains (gr)/100 standard cubic feet (scf).	CO2e: 5059.0 TONS/YEAR (12 MONTH ROLLING) [BACT-PSD] Good combustion practices.

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
MI-0451	MEC North, LLC	Calhoun	MI	06/23/2022	EUAUXBOILER (North Plant): Auxiliary Boiler	A natural gas-fired auxiliary boiler, rated at 61.5 MMBTU/hr (HHV) to facilitate startup of the CTGHRSG train and to provide the required steam to support the startup of the facility, including but not limited to steam for sparging, STG seals, etc. The auxiliary boiler is equipped with low NOx burners (LNB) and flue gas recirculation (FGR).	61.5	MMBtu/hr	0.04 LB/MMBTU (30-DAY ROLLING AVERAGE) [BACT-PSD] Low NOx burners/Flue gas recirculation and good combustion practices.	0.004 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices	0.08 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices	0.005 LB/MMBTU (HOURLY) [BACT-PSD] | 0.46 LB/H (HOURLY) [BACT-PSD] Good combustion practices | Good combustion practices.	1.8 LB/MMSCF (MONTHLY) [BACT-PSD] Good combustion practices and the use of pipeline quality natural gas.	CO2e: 31540.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).
MI-0452	MEC South, LLC	Calhoun+C22	MI	06/23/2022	EUAUXBOILER (South Plant): Auxiliary Boiler	A natural gas-fired auxiliary boiler, rated at 61.5 MMBTU/hr (HHV) to facilitate startup of the CTGHRSG train and to provide the required steam to support the startup of the facility, including but not limited to steam for sparging, STG seals, etc. The auxiliary boiler is equipped with low NOx burners (LNB) and flue gas recirculation (FGR).	61.5	MMBtu/hr	0.04 LB/MMBTU (30-DAY ROLLING AVERAGE) [BACT-PSD] Low NOx Burners/Flue Gas Recirculation and Good Combustion Practices	0.004 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices	0.08 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices.	0.005 LB/MMBTU (HOURLY) [BACT-PSD] | 0.46 LB/H (HOURLY) [BACT-PSD] Good combustion practices. | Good combustion practices	1.8 LB/MMSCF (MONTHLY) [BACT-PSD] Good combustion practices, and the use of pipeline quality natural gas.	CO2e: 31540.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Energy Efficiency Measures and the use of a low carbon fuel (pipeline quality natural gas)
LA-0391	Magnolia Power Generating Station Unit 1	Iberville	LA	06/03/2022	Auxiliary Boiler		80	MMBtu/hr	0.01 LB/MM BTU [BACT-PSD] Ultra-low NOx burners and good combustion practices.	0.0054 LB/MM BTU [BACT-PSD] Good combustion practices; compliance with 40 CFR 63 Subpart DDDDD.	0.05 LB/MM BTU [BACT-PSD] Good combustion practices; compliance with 40 CFR 63 Subpart DDDDD.	0.0074 LB/MM BTU [BACT-PSD] Exclusive combustion of natural gas and good combustion practices. | Combusts exclusively natural gas and good combustion practices.		CO2e: 117.0 LB/MM BTU [BACT-PSD] Good combustion practices; compliance with 40 CFR 63 Subpart DDDDD.
AR-0173	Big River Steel LLC	Mississippi	AR	01/31/2022	Pickle Line Boiler	SN-24	53.7	MMBtu/hr	0.035 LB/MMBTU [BACT-PSD] Low NOx burners Combustion of clean fuel Good Combustion Practices	0.0054 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0824 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0019 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0006 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	CO2e: 117.0 LB/MMBTU [BACT-PSD] Good operating practices Minimum Boiler Efficiency
AR-0173	Big River Steel LLC	Mississippi	AR	01/31/2022	Galvanizing Line Boilers #1 and #2	SN-27 and SN-28	53.7	MMBtu/hr	0.035 LB/MMBTU [BACT-PSD] Low NOx burners Combustion of clean fuel Good Combustion Practices	0.0054 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0824 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0007 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0006 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	CO2e: 117.0 LB/MMBTU [BACT-PSD] Good operating practices Minimum Boiler Efficiency

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
AR-0173	Big River Steel LLC	Mississippi	AR	01/31/2022	Pickle Galvanizing Line Boiler	SN-37	53.7	MMBtu/hr	0.035 LB/MMBTU [BACT-PSD] Low NOx burners Combustion of clean fuel Good Combustion Practices	0.0054 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0824 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0012 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0006 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	CO2e: 117.0 LB/MMBTU [BACT-PSD] Good operating practices
AR-0172	Nucor Steel Arksansas	Mississippi	AR	09/01/2021	SN-202, 203, 204 Pickle Line Boilers	Three 12.5 MMBTY/hr boilers	0		0.035 LB/MMBTU [BACT-PSD] Low NOx burners	0.0055 LB/MMBTU [BACT-PSD] Good Combustion Practice	0.084 LB/MMBTU [BACT-PSD] Good Combustion Practice	0.0019 LB/MMBTU [BACT-PSD] | 0.0076 GR/DSCF [BACT-PSD] Good Combustion Practice	0.0006 LB/MMBTU [BACT-PSD] Low Sulfur fuels	CO2e: 121.0 LB/MMBTU [BACT-PSD] Good Combustion Practice
FL-0371	Shady Hills Combined Cycle Facilty	Pasco	FL	06/07/2021	60 MMBtu/hour Auxiliary Boiler	Only fires natural gas	60	MMBtu/hr	0.05 LB/MMBTU [BACT-PSD] Low-NOx burners		0.08 LB/MMBTU [BACT-PSD] Good combustion practices and low-NOx burners	1.4 GR. S/100 SCF NG (FUEL RECORDKEEPING) [BACT-PSD] Clean Fuels	1.4 GR. S/100 SCF NG (FUEL RECORDKEEPING) [BACT-PSD] Limited sulfur content in fuel	
KY-0115	Nucor Steel Gallatin, LLC	Gallatin	KY	04/19/2021	Vacuum Degasser Boiler (EP 20-13)		50.4	MMBtu/hr	35.0 LB/MMSCF [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan. Also equipped with low-NOx burners.	5.5 LB/MMSCF [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	61.0 LB/MMSCF [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	1.9 LB/MMSCF [BACT-PSD] | 7.6 LB/MMSCF [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.6 LB/MMSCF [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	CO2e: 26125.0 TONS/YR (12-MONTH ROLLING) [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.
KY-0115	Nucor Steel Gallatin, LLC	Gallatin	KY	04/19/2021	Pickle Line #2 â€“ Boiler #1 & #2 (EP 21-04 & EP 21-05)	Emission limitations are on an individual basis.	18	MMBtu/hr, each	50.0 LB/MMSCF (EACH) [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan. Equipped with low-NOx burners.	5.5 LB/MMSCF (EACH) [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	84.0 LB/MMSCF (EACH) [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	7.6 LB/MMSCF (EACH) [BACT-PSD] | 1.9 LB/MMSCF (EACH) [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	0.6 LB/MMSCF (EACH) [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan	CO2e: 12675.0 TONS/YR (EACH) [BACT-PSD] The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan and implement various design and operational efficiency requirements.
*IA-0117	Shell Rock Soy Processing	Grundy	IA	03/17/2021	Natural Gas Boiler A		82	MMBtu/hr				0.026 LB/HR (PM, PM10 AND PM2.5) [BACT-PSD] Low NOx Burner and Flue Gas Recirculation		
*IA-0117	Shell Rock Soy Processing	Grundy	IA	03/17/2021	Natural Gas Boiler B		82	MMBtu/hr				0.26 LB/HR (PM, PM10 AND PM2.5) [BACT-PSD] Low NOx Burner and Flue Gas Recirculation		
WI-0305	WPL- Riverside Energy Center	Rock	WI	01/22/2021	Natural Gas Auxiliary Boiler (B22)		83.5	MMBtu/hr						CO2e: 157.0 LB CO2/MMBTU (ANY MONTH, AVG ANY CONSECUTIVE 12-MONTHS) [BACT-PSD] Combust only pipeline quality natural gas.

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
MI-0447	LBWL-Erickson Station	Eaton	MI	01/07/2021	EUAUXBOILER--nat gas fired auxiliary boiler	A natural gas-fired auxiliary boiler, rated at less than or equal to 50 MMBTU/hour will facilitate startup of the CTG/HRSG trains and provide steam to the steam turbine generator (STG) seals. The boiler will also provide warming steam to the HRSG, and other related services. The boiler will not produce high pressure steam for use in electric generation.	50	MMBtu/hr	30.0 PPM (AT 3% O2; HOURLY) [BACT-PSD] Low NOx burners (LNB) or flue gas recirculation (FGR) along with good combustion practices.	0.3 LB/H (HOURLY) [BACT-PSD] Good combustion practices	50.0 PPM (AT 3% O2; HOURLY) [BACT-PSD] Good combustion practices.	0.74 LB/H (HOURLY) [BACT-PSD] | 0.4 LB/H (HOURLY) [BACT-PSD] Good combustion practices.		CO2e: 25644.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Low carbon fuel (pipeline quality natural gas), good combustion practices, and energy efficiency measures.
VA-0333	Norfolk Naval Shipyard	Norfolk	VA	12/09/2020	Three (3) boilers	The steam from the boilers will be used for facility needs such as heating buildings and not for power generation	76.6	MMBtu/hr				0.0078 LB (MMBTU) [BACT-PSD]		CO2e: 117.1 LB (MMBTU) [BACT-PSD]
AR-0167	Lion Oil Company	Union County	AR	12/01/2020	SN-803 - #4 Pre-Flash Column Reboiler	SN-803 is a 40 MMBtu/hr reboiler (nominal design) used to maintain the temperature in the pre-flash column in order to separate crude oil into gasoline and naphtha. The reboiler is fueled by NSPS Subpart J quality gas. It was installed in 1979 and will be retrofitted with next generation, ultra-low NOx burners. As a result of the refinery expansion permit revision, this source has undergone PSD review for PM10. BACT for this source is good combustion practice.	40	MMBtu/hr	1.9 LB/HR (3-HOUR AVERAGE) [BACT-PSD] Ultra-low NOx burners and good combustion practice					

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
AR-0167	Lion Oil Company	Union County	AR	12/01/2020	SN-805 - #4 Pre-Flash Reboiler	SN-805 is a 75 MM Btu/hr reboiler (nominal design). It was installed in 1996 and will be retrofitted with next generation, ultra-low NOx burners. On May 17, 2000, this source was tested for NOx emissions using EPA Reference Method 7E pursuant to Â§19.702 of Regulation 19, and 40 C.F.R., Part 52, Subpart E. The test results submitted to the Department demonstrated compliance. As a result of the refinery expansion permit revision, this source has undergone PSD review for PM10. BACT for this source is good combustion practice.	75	MMBtu/hr	3.5 LB/HR (3-HOUR AVERAGE) [BACT-PSD] Ultra-low NOx burners and good combustion practice					
AR-0167	Lion Oil Company	Union County	AR	12/01/2020	SN-810 - #9 Hydrotreater Furnace/Reboiler	SN-810 is a 70 MMBtu/hr furnace (nominal design) used to heat naphtha. It is fueled NSPS Subpart J quality gas. It was installed in 1958. This source was declared subject to NSPS Subpart J as a result of the Consent Decree (CIV. No. 03-1028) between Lion Oil, ADEQ, and the US EPA.	70	MMBtu/hr	12.7 LB/HR (3-HOUR AVERAGE) [BACT-PSD]					
AL-0328	Plant Barry	Mobile	AL	11/09/2020	90.5 MMBtu/hr Aux Boiler		90.5	MMBtu/hr	0.011 LB/MMBTU (3 HOUR AVG) [BACT-PSD]	0.004 LB/MMBTU [BACT-PSD]	0.037 LB/MMBTU [BACT-PSD]	0.0075 LB/MMBTU (3 HOUR AVG) [BACT-PSD]	0.002 LB/MMBTU (3 HOUR AVG) [BACT-PSD]	CO2e: 46416.0 TPY [BACT-PSD]

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
WI-0300	NEMADJI TRAIL ENERGY CENTER	Douglas	WI	09/01/2020	Natural Gas-Fired Auxiliary Boiler (B02)	Boiler B02 â€“ One 100 MMBtu/hr Natural Gas-Fired Auxiliary Boiler with ultra-low NOx burners, Flue Gas Recirculation (FGR), and Oxidation Catalyst (C02)	100	MMBtu/hr	0.011 LB/MMBTU [BACT-PSD] Ultra-low NOx burners, flue gas recirculation, and operate and maintain B02 according to the manufacturer's recommendations.	0.0027 LB/MMBTU [BACT-PSD] Oxidation catalyst and operate and maintain boiler according to manufacturer's recommendations.	0.0037 LB/MMBTU [BACT-PSD] Oxidation Catalyst and operate and maintain boiler according to the manufacturer's recommendations.	0.01 LB/MMBTU [BACT-PSD] Only use pipeline quality natural gas and operate and maintain B02 according to manufacturer's recommendations. | Only combust pipeline quality natural gas and operate and maintain boiler according to the manufacturer's recommendations. | Only combust pipeline quality natural gas and operate and maintain B02 according to the manufacturer's recommendations.		CO2e: 160.0 LB/MMBTU (12-MONTH ROLLING AVG.) [BACT-PSD] Ultra-low NOx burners and flue gas recirculation. Operate and maintain boiler according to manufacturer's recommendations. Only use pipeline quality natural gas.
OH-0383	Petmin USA Incorporated	Ashtabula	OH	07/17/2020	Startup boiler (B001)	Startup boiler, natural gas fired with maximum heat input of 15.17 MMBtu/hr.	15.17	MMBtu/hr			1.25 LB/H [BACT-PSD] good combustion practices and the use of natural gas			
WI-0303	Green Bay Packing, Inc.- GB Mill Div.	Brown	WI	07/14/2020	Natural Gas-Fired Boiler (B01)		32.7	MMBtu/hr						CO2e: 16771.0 T/Y (ANY CONSECUTIVE 12-MONTH PERIOD) [BACT-PSD] Only burn natural gas, good combustion practices, low NOx burner, and flue gas recirculation.
WI-0306	WPL- Riverside Energy Center	Rock	WI	02/28/2020	Temporary Boiler (B98A)		14.67	MMBtu/hr	0.04 LB/MMBTU (AVG. OVER ANY CONSECUTIVE 3-HR PERIOD) [BACT-PSD] Low NOx burners, flue gas recirculation, shall be operated for no more than 500 hours, and shall combust only pipeline quality natural gas.	0.0 SEE NOTES [BACT-PSD] Shall be operated for no more than 500 hours and combust only pipeline quality natural gas.	0.04 LB/MMBTU (HEAT INPUT) [BACT-PSD] Shall be operated for no more than 500 hours and combust only pipeline quality natural gas.	0.008 LB/MMBTU (HEAT INPUT) [BACT-PSD] Combust only pipeline quality natural gas, can be operated for no more than 500 hours.		CO2e: 118.0 LB CO2/MMBTU (HEAT INPUT) [BACT-PSD] Combust only pipeline quality natural gas.
TX-0877	Sweeny Refinery	BRAZORIA	TX	01/08/2020	Isostripper Reboiler (heater)		0			0.0054 LB/MMBTU [LAER] Good combustion practices, use of natural gas fuel for the project heater				
LA-0364	FG LA Complex	ST. JAMES	LA	01/06/2020	PR Waste Heat Boiler	Maximum operating rate. 86 MMBTU/h normal operating rate.	94	MMBtu/hr	14.41 LB/H (12-MONTH ROLLING AVERAGE) [BACT-PSD] SCR and LNB	13.37 LB/H [BACT-PSD] Good combustion practices and oxidation catalyst	26.21 LB/H [BACT-PSD] Good combustion practices and oxidation catalyst.	0.61 LB/H [BACT-PSD] Use of pipeline quality natural gas or fuel gas and good combustion practices.	8.03 LB/H [BACT-PSD] Use of pipeline quality natural gas or fuel gas.	CO2e: 455475.0 T/YR [BACT-PSD] Use of natural gas or fuel gas as fuel, energy-efficient design options, and operational/maintenance practices.

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MI-0442	Thomas Township Energy, LLC	SAGINAW	MI	08/21/2019	FGAUXBOILER	Two (2) natural gas-fired auxiliary boilers, each with a maximum rating of 80 MMBTU/H (HHV) to facilitate startup of the CTGHRSG and to provide the required steam to support the startup of the facility, including but not limited to: steam for sparging, STG seals, etc.	80	MMBtu/hr	0.036 LB/MMBTU (HOURLY; EACH BOILER) [BACT-PSD] Good combustion practices and low NOx burners.	0.0054 LB/MMBTU (HOURLY; EACH BOILER) [BACT-PSD] Good combustion practices.	0.037 LB/MMBTU (HOURLY; EACH BOILER) [BACT-PSD] Good combustion practices	1.9 LB/MMSCF (HOURLY; EACH BOILER) [BACT-PSD] | 7.6 LB/MMSCF (HOURLY; EACH BOILER) [BACT-PSD] Low sulfur fuel (natural gas) and good combustion practices (efficient combustion).		CO2e: 41031.0 T/YR (12-MO ROLLING TIME PERIOD; EACH BOILER) [BACT-PSD] Energy efficiency
SC-0192	Canfor Southern Pine - Conway Mill	HORRY	SC	05/21/2019	Boiler No. 2	29.113 MMBtu/hr rated heat input capacity	0			0.0054 LB/MMBTU [BACT-PSD] Work Practice Standards	0.0375 LB/MMBTU [BACT-PSD] Work Practice Standards			
AR-0159	Big River Steel LLC	MISSISSIPPI	AR	04/05/2019	BOILER, PICKLE LINE		0		0.035 LB/MMBTU [BACT-PSD] LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.0054 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0824 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0019 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0006 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	CO2: 117.0 LB/MMBTU [BACT-PSD] GOOD OPERATING PRACTICES MINIMUM BOILER EFFICIENCY 75%
AR-0159	Big River Steel LLC	MISSISSIPPI	AR	04/05/2019	BOILER, ANNEALING PICKLE LINE		0		0.035 LB/MMBTU [BACT-PSD] Low NOx burners, Combustion of clean fuel, and Good Combustion Practices	0.0054 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0824 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0019 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	0.0006 LB/MMBTU [BACT-PSD] Combustion of Natural gas and Good Combustion Practice	CO2: 117.0 LB/MMBTU [BACT-PSD] GOOD OPERATING PRACTICES MINIMUM BOILER EFFICIENCY 75%
AR-0159	Big River Steel LLC	MISSISSIPPI	AR	04/05/2019	BOILERS SN-26 AND SN-27, GALVANIZING LINE		0		0.035 LB/MMBTU [BACT-PSD] LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.0054 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0824 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0007 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0006 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	CO2: 117.0 LB/MMBTU [BACT-PSD] GOOD OPERATING PRACTICES MINIMUM BOILER EFFICIENCY 75%
WI-0289	GEORGIA-PACIFIC CONSUMER PRODUCTS LLC	Brown	WI	04/01/2019	B98 & B99 Natural Gas Fired Temporary Boilers		95	MMBtu/hr		0.0055 LB/MMBTU [BACT-PSD] Good Combustion Practices				
AR-0171	Nucor Steel Arkansas	Mississippi	AR	02/14/2019	SN-142 Vacuum Degasser Boiler		50.4	MMBtu/hr	0.035 LB/MMBTU [BACT-PSD] Low Nox Burners	0.0026 LB/HR [BACT-PSD] Good combustion practices	0.075 LB/MMBTU [BACT-PSD] Good combustion practices	0.0019 LB/MMBTU (3-HR) [BACT-PSD] | 0.0076 LB/MMBTU (3-HR) [BACT-PSD] Good combustion practices	0.0006 LB/MMBTU [BACT-PSD] Good combustion practices	CO2e: 121.0 LB/MMBTU [BACT-PSD] Good combustion practices
AR-0171	Nucor Steel Arkansas	Mississippi	AR	02/14/2019	SN-233 Galvanizing Line Boilers		15	MMBtu/hr each	0.1 LB/MMBTU (3-HR) [BACT-PSD] Low Nox Burners	0.0055 LB/MMBTU [BACT-PSD] Good combustion practices	0.084 LB/MMBTU [BACT-PSD] Good combustion practices	0.0019 LB/MMBTU [BACT-PSD] | 0.0076 LB/MMBTU [BACT-PSD] Good combustion practices	0.0006 LB/MMBTU [BACT-PSD] Good combustion practices	CO2e: 121.0 LB/MMBTU [BACT-PSD] Good combustion practices
OH-0379	Petmin USA Incorporated	Ashtabula	OH	02/06/2019	Startup boiler (B001)	Startup boiler, natural gas fired with maximum heat input of 15.17 MMBtu/hr.	15.17	MMBtu/hr	0.634 LB/H [BACT-PSD] Low-NOX burners, good combustion practices and the use of natural gas			0.113 LB/H (SEE NOTES.) [BACT-PSD] Good combustion practices and the use of natural gas		CO2e: 1784.0 LB/H [BACT-PSD] Good combustion practices and the use of natural gas

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IL-0130	Jackson Energy Center	Will	IL	12/31/2018	Auxiliary Boiler	The auxiliary boiler is used on an intermittent basis (up to 2,000 hours/year) to produce intermediate pressure steam for heating the heat recovery steam generators (HRSGs) and steam turbines	96	MMBtu/hr	0.01 LB/MMBTU (3-HOUR AVERAGE) [LAER] Ultra low-NOx burners and flue gas recirculation air preheater, automated combustion management systems, automated water blowdown, good combustion practices		0.037 LB/MMBTU (3-HOUR) [BACT-PSD] Good combustion practice	0.0075 LB/MMBTU (3-HOUR AVERAGE) [BACT-PSD] Good combustion practice		CO2e: 11250.0 TONS/YEAR (12-MONTH ROLLING AVERAGE) [BACT-PSD] Good combustion practice
MI-0441	LBWL-Erickson Station	Eaton	MI	12/21/2018	EUAUXBOILER--natural gas fired auxiliary boiler rated at <= 99MMBTU/H	A natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H will facilitate startup of the CTG/HRSG trains and provide steam to the steam turbine generator (STG) seals. The boiler will also provide warming steam to the HRSG, and other related services. The boiler will not produce high pressure steam for use in electric generation.	99	MMBtu/hr	30.0 PPM (@3%O2; HOURLY) [BACT-PSD] Low NOx burners (LNB) or flue gas recirculation along with good combustion practices.	0.5 LB/H (HOURLY) [BACT-PSD] Good combustion practices.	50.0 PPM (@3%O2; HOURLY) [BACT-PSD] Good combustion practices	0.74 LB/H (HOURLY) [BACT-PSD] Good combustion practices | Good combustion practices		CO2e: 50776.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Low carbon fuel (pipeline quality natural gas), good combustion practices and energy efficiency measures.
AR-0155	Big River Steel LLC	Mississippi	AR	11/07/2018	BOILER, PICKLE LINE		53.7	MMBtu/hr	0.035 LB/MMBTU [BACT-PSD] LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.0054 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0824 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0019 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE		CO2: 117.0 LB/MMBTU [BACT-PSD] GOOD OPERATING PRACTICES MINIMUM BOILER EFFICIENCY 75%
AR-0155	Big River Steel LLC	Mississippi	AR	11/07/2018	BOILER SN-26, GALVANIZING LINE		53.7	MMBtu/hr	0.035 LB/MMBTU [BACT-PSD] LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.054 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0824 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	6.8 X10^-4 LB/MMBTU [BACT-PSD] COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE		CO2: 117.0 LB/MMBTU [BACT-PSD] GOOD OPERATING PRACTICES MINIMUM BOILER EFFICIENCY 75%
WI-0266	Green Bay Packaging, Inc. - Shipping Container Division	Brown	WI	09/06/2018	Natural gas-fired boiler (Boiler B01)		35	MMBtu/hr		0.0055 LB/MMBTU [BACT-PSD] Good combustion practices, use only natural gas, equip boiler with Low NOx burners and flue gas recirculation				CO2e: 160.0 LBCO2E/1000 LB STEAM [BACT-PSD] Good combustion practices, use only natural gas, equip with Low NOx burners and flue gas recirculation

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IL-0129	CPV Three Rivers Energy Center	Grundy	IL	07/30/2018	Auxiliary Boiler	The auxiliary boiler is used on an intermittent basis (up to 4,000 hr/yr) to produce intermediate pressure steam for heating the heat recovery steam generators (HRSG) and combustion turbines.	96	MMBtu/hr	0.011 LB/MMBTU (3-HOUR AVERAGE) [LAER] Ultra-low NOx burners and flue gas recirculation, air preheater, automated combustion management system with O2 trim system and automated water blowdown, and good combustion practices.		0.037 LB/MMBTU (3-HOUR AVERAGE) [BACT-PSD] Good combustion practices	0.0075 [BACT-PSD] Good combustion practices		CO2e: 22500.0 TON/YR (12-MONTH ROLLING AVERAGE) [BACT-PSD] Good combustion practice
FL-0367	Shady Hills Combined Cycle Facilty	Pasco	FL	07/27/2018	60 MMBtu/hour Auxiliary Boiler	Only fire natural gas	60	MMBtu/hr	0.05 LB/MMBTU [BACT-PSD] low-NOx burners		0.08 LB/MMBTU [BACT-PSD] Good combustion practices and low-NOx burners	0.0 [BACT-PSD] Clean fuels	0.0 [BACT-PSD] Limited sulfur content in natural gas	
*PA-0319	Renaissance Energy Center	Greene	PA	07/19/2018	NATURAL GAS FIRED AUXILIARY BOILER		88	MMBtu/hr	0.02 LB/MMBTU (HR) [LAER] Lo-NOx burners, Flue Gas Recirculation, good combustion practices, proper operation and maintenance.		0.055 LB/MMBTU (HR) [BACT-PSD] Lo-NOx burners, Flue Gas Recirculation, good combustion practices, proper operation and maintenance.			
MI-0435	Belle River Combined Cycle Plant	St. Clair	MI	07/16/2018	EUAUXBOILER: Auxiliary Boiler	A natural gas-fired auxiliary boiler, rated at 99.9 MMBTU/H to facilitate startup of the CTG/HRSG trains and to provide steam to the steam turbine generator seals. The auxiliary boiler is equipped with low NOx burners (LNB) and flue gas recirculation (FGR).	99.9	MMBtu/hr	0.036 LB/MMBTU (HOURLY) [BACT-PSD] Low NOx burners/Flue gas recirculation.	0.008 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices	0.075 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices	0.007 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices, low sulfur fuel		CO2e: 25623.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Energy efficiency measures, use of natural gas.
MI-0433	MEC North, LLC AND MEC South LLC	Calhoun	MI	06/29/2018	EUAUXBOILER (North Plant): Auxiliary Boiler	A natural gas-fired auxiliary boiler, rated at 61.5 MMBTU/H (HHV) to facilitate startup of the CTGHRSG train and to provide the required steam to support the startup of the facility, including but not limited to steam for sparging, STG seals, etc. The auxiliary boiler is equipped with low NOx burners (LNB) and flue gas recirculation (FGR).	61.5	MMBtu/hr	0.04 LB/MMBTU (30-DAY ROLLING AVG TIME PERIOD) [BACT-PSD] Low NOx burners/flue gas recirculation and good combustion practices.	0.004 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices.	0.08 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices.	0.005 LB/MMBTU (HOURLY) [BACT-PSD] | 0.46 LB/H (HOURLY) [BACT-PSD] Good combustion practices. | Good combustion practices	1.8 LB/MMSCF (MONTHLY) [BACT-PSD] Good combustion practices and the use of pipeline quality natural gas.	CO2e: 31540.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).

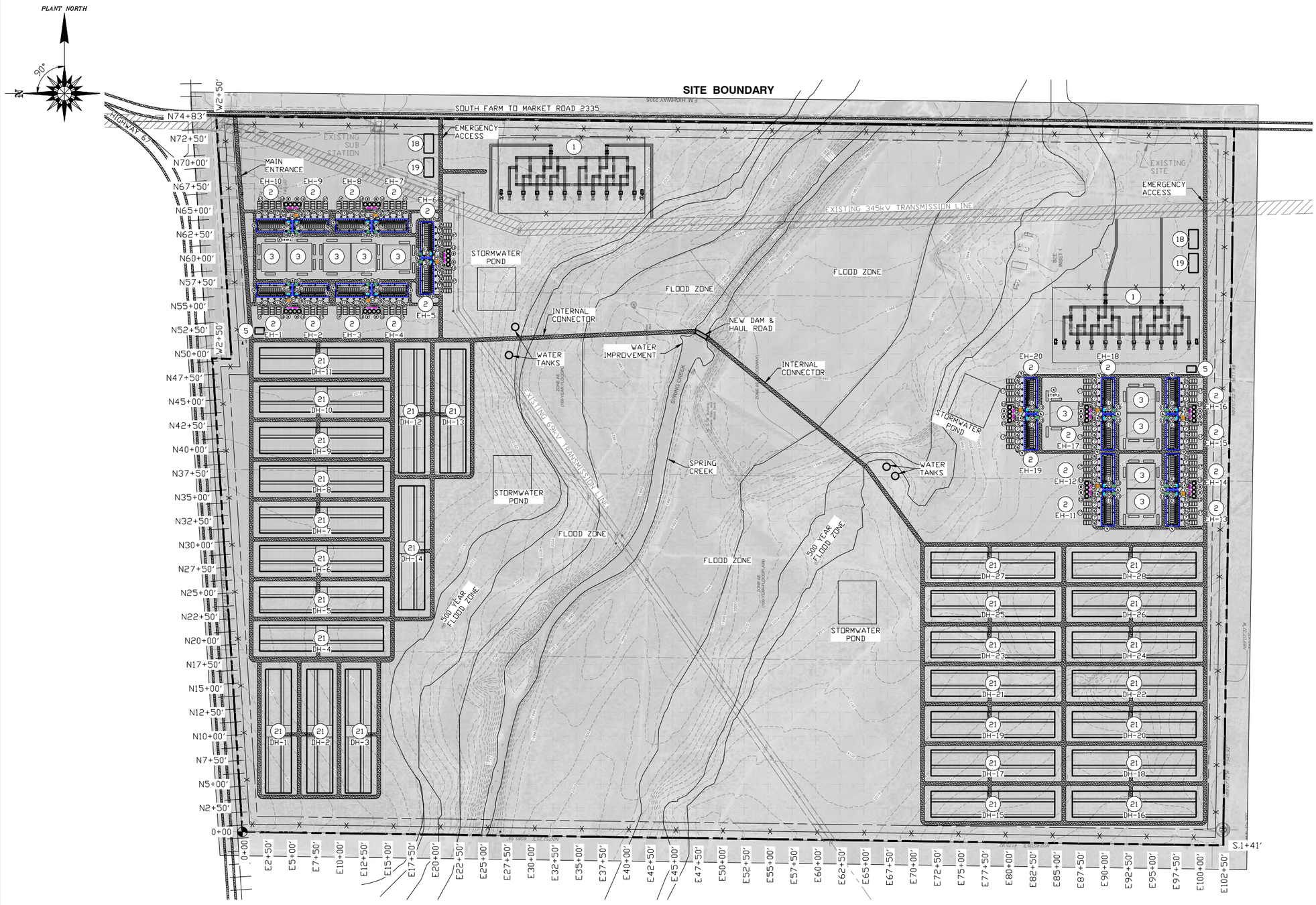
RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
MI-0433	MEC North, LLC AND MEC South LLC	Calhoun	MI	06/29/2018	EUAUXBOILER (South Plant): Auxiliary Boiler	A natural gas-fired auxiliary boiler, rated at 61.5 MMBTU/H (HHV) to facilitate startup of the CTGHRSG train and to provide the required steam to support the startup of the facility, including but not limited to steam for sparging, STG seals, etc. The auxiliary boiler is equipped with low NOx burners (LNB) and flue gas recirculation (FGR).	61.5	MMBtu/hr	0.04 LB/MMBTU (30 DAY ROLLING AVG TIME PERIOD) [BACT-PSD] Low NOx burners/flue gas recirculation and good combustion practices.	0.004 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices.	0.08 LB/MMBTU (HOURLY) [BACT-PSD] Good combustion practices.	0.005 LB/MMBTU (HOURLY) [BACT-PSD] | 0.46 LB/H (HOURLY) [BACT-PSD] Good combustion practices.	1.8 LB/MMSCF (MONTHLY) [BACT-PSD] Good combustion practices and the use of pipeline quality natural gas.	CO2e: 31540.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).
*WV-0031	Mockingbird Hill Compressor Station	Wetzel	WV	06/14/2018	WH-1 - Boiler	Used to generated heat for the new building associated with the project during the heating season.	8.72	MMBtu/hr				0.0 [BACT-PSD] Limited to natural gas | Limited to natural gas.		CO2e: 0.0 [BACT-PSD] Limited to natural gas; and tune-up the boiler once every five years.
WI-0283	AFE, Inc. LCM Plant	Racine	WI	04/24/2018	B01-B12, Boilers	Each of the twelve boilers, 28 MMBtu/hr maximum rating	28	MMBtu/hr	0.0105 LB/MMBTU [BACT-PSD] Ultra-low NOx Burners, Flue Gas Recirculation and Good Combustion Practices	0.0036 LB/MMBTU [BACT-PSD] Ultra-low NOx Burners, Flue Gas Recirculation and Good Combustion Practices	25.0 PPMVD [BACT-PSD] Ultra-low NOx Burners, Flue Gas Recirculation and Good Combustion Practices	0.0075 LB/MMBTU [BACT-PSD] Good Combustion Practices	0.0006 LB/MMBTU [BACT-PSD] Good Combustion Practices and the Use of Pipeline Quality Natural Gas	CO2e: 160.0 LB/1000 LB CO2E (12-MONTH AVERAGE) [BACT-PSD] Ultra-low NOx Burners, Flue Gas Recirculation, Good Combustion Practices and the Use of Pipeline Quality Natural Gas
WI-0284	SIO International Wisconsin, Inc. Energy Plant		WI	04/24/2018	B13-B24 & B25-B36 Natural Gas-Fired Boilers	Twenty-four natural gas-fired boilers. Only 20 operating at any given time.	28	MMBtu	0.0105 LB/MMBTU (1-HOUR AVERAGE) [BACT-PSD] Ultra-Low NOx Burners, Flue Gas Recirculation, and Good Combustion Practices.	0.0036 LB/MMBTU [BACT-PSD] Ultra-Low NOx Burners, Flue Gas Recirculation, and Good Combustion Practices.	25.0 PPMVD [BACT-PSD] Ultra-Low NOx Burners, Flue Gas Recirculation, and Good Combustion Practices.	0.0075 LB/MMBTU [BACT-PSD] Good Combustion Practices and The Use of Pipeline Quality Natural Gas	0.0006 LB/MMBTU [BACT-PSD] Good Combustion Practices and The Use of Pipeline Quality Natural Gas	CO2e: 160.0 LB CO2E/1000LB STEAM (12 MONTH AVERAGE) [BACT-PSD] Ultra-Low NOx Burners, Flue Gas Recirculation, and Good Combustion Practices and the Use of Pipeline Quality Natural Gas.
OH-0377	Harrison Power	Harrison	OH	04/19/2018	Auxiliary Boiler (B001)	44.55 MMBtu/hr natural gas-fired boiler equipped with low-NOx burners. The permit includes the option to install either General Electric turbines (with 80 MMBTU aux boiler B002) or Mitsubishi turbines (with 44.55 MMBTU aux boiler B001).	44.55	MMBtu/hr	1.56 LB/H [BACT-PSD] Good combustion practices and low NOx burner	0.16 LB/H [BACT-PSD] Good combustion practices	1.67 LB/H [BACT-PSD] Good combustion practices	0.33 LB/H [BACT-PSD] Pipeline quality natural gas	0.022 LB/H [BACT-PSD] Pipeline quality natural gas	CO2e: 2817.6 T/YR (PER ROLLING 12 MONTH PERIOD) [BACT-PSD] Good combustion practices and pipeline quality natural gas

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
OH-0377	Harrison Power	HARRISON	OH	04/19/2018	Auxiliary Boiler (B002)	80 MMBtu/hr natural gas-fired boiler equipped with low-NOx burners. The permit includes the option to install either General Electric turbines (with 80 MMBTU aux boiler B002) or Mitsubishi turbines (with 44.55 MMBTU aux boiler B001).	80	MMBtu/hr	2.19 LB/H [BACT-PSD] Good combustion practices and low NOx burner	0.248 LB/H [BACT-PSD] Good combustion practices	2.48 LB/H [BACT-PSD] Good combustion practices	0.48 LB/H [BACT-PSD] Pipeline quality natural gas	0.12 LB/H [BACT-PSD] Pipeline quality natural gas	CO2e: 5009.1 T/YR (PER ROLLING 12 MONTH PERIOD) [BACT-PSD] Good combustion practices and pipeline quality natural gas
*WV-0029	Harrison County Power Plant	Harrison	WV	03/27/2018	Auxiliary Boiler	Annual emission based on 4600 hours/year.	77.8	MMBtu/hr	0.86 LB/HR [BACT-PSD] LNB, FGR, Good Combustion Practices	0.62 LB/HR [BACT-PSD] Use of Natural Gas, Good Combustion Practices	2.88 LB/HR [BACT-PSD] Good Combustion Practices	0.6 LB/HR [BACT-PSD] Use of Natural Gas, Good Combustion Practices		CO2e: 9107.0 LB/HR [BACT-PSD] Use of Natural Gas
*PA-0316	Renovo Energy Center, LLC	Clinton	PA	01/26/2018	Auxiliary Boiler		118800	MMBtu/12 month period	0.011 LB/MMBTU [LAER] &liquor;‘ultra-low NOx burners and flue gas re-circulation & liquor; operated in accordance with the manufacturer's specifications and good operating practices	0.005 LB (MMBTU)	0.036 LB/MMBTU [BACT-PSD]	0.0019 LB/MMBTU [BACT-PSD]		
FL-0363	Dania Beach Energy Center	Broward	FL	12/04/2017	99.8 MMBtu/hr auxiliary boiler	Fueled only with natural gas.	99.8	MMBtu/hr			0.08 LB/MMBTU [BACT-PSD] Clean fuel	0.0 [BACT-PSD] Clean fuels	0.0 [BACT-PSD] Clean fuels	
OH-0375	Long Ridge Energy Generation LLC - Hannibal Power	Monroe	OH	11/07/2017	Auxiliary Boiler (B001)	26.8 MMBtu/hr natural gas-fired boiler with a low-NOx burner and flue gas recirculation	26.8	MMBtu/hr	0.29 LB/H [BACT-PSD] Flue gas recirculation and low NOX burner	0.13 LB/H [BACT-PSD] Good combustion controls	0.99 LB/H [BACT-PSD] Good combustion controls	0.27 LB/H [BACT-PSD] Low sulfur fuel		CO2e: 7845.0 T/YR (PER ROLLING 12 MONTH PERIOD) [BACT-PSD] Natural gas as the sole fuel
OH-0372	Oregon Energy Center	Lucas	OH	09/27/2017	Auxiliary Boiler (B001)	37.8 mmBtu/hr natural gas fired auxiliary boiler with low- NOX burners and flue gas recirculation	37.8	MMBtu/hr	0.76 LB/H [BACT-PSD] low NOX burners and flue gas recirculation	0.23 LB/H [BACT-PSD] good combustion controls	2.08 LB/H [BACT-PSD] good combustion controls	0.3 LB/H [BACT-PSD] low sulfur fuel	0.06 LB/H [BACT-PSD] low sulfur fuel	CO2e: 4502.0 T/YR (PER ROLLING 12 MONTH PERIOD) [BACT-PSD] use of natural gas, good combustion controls
OH-0370	Trumbull Energy Center	Trumbull	OH	09/07/2017	Auxiliary Boiler (B001)	Auxiliary Boiler 37.8 MMBtu/hr	37.8	MMBtu/hr	0.76 LB/H [BACT-PSD] Flue gas recirculation (FGR), low NOx burner	0.23 LB/H [BACT-PSD] Good combustion controls	2.08 LB/H [BACT-PSD] Good combustion controls	0.3 LB/H [BACT-PSD] Low sulfur fuel	0.06 LB/H [BACT-PSD] Low sulfur fuel	CO2e: 4456.0 T/YR (PER ROLLING 12 MONTH PERIOD) [BACT-PSD] Good combustion controls/natural gas combustion
VA-0327	Perdue Grain and Oilseed, LLC	Chesapeake	VA	07/12/2017	(4) 27 MMBtu/hr boilers, Natural gas and No. 2 fuel oi		0	MMBtu/hr		0.1 LB/HR [BACT-PSD]				

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
MI-0426	DTE Gas Company--Milford Compressor Station	Oakland	MI	03/24/2017	FGAUXBOILERS (6 auxiliary boilers EUAUXBOIL2A, EUAUXBOIL3A, EUAUXBOIL2B, EUAUXBOIL3B, EUAUXBOIL2C, EUAUXBOIL3C)	Four natural gas-fired auxiliary boilers, each rated at 3 MMBTU/H fuel heat input (EUAUXBOIL2A, EUAUXBOIL3A, EUAUXBOIL2B and EUAUXBOIL3B in FGAUXBOILERS) and two natural gas-fired auxiliary boilers, each rated at 1 MMBTU/H fuel heat input (EUAUXBOIL2C and EUAUXBOIL3C in FGAUXBOILERS). The boilers are subject to 40 CFR Part 63 Subpart DDDDD which requires tune ups.	3	MMBtu/hr	20.0 PPM AT 3% O2 (EACH 3 MMBTU/H BOILER) [BACT-PSD] Ultra-low NOx burners and good combustion practices.		84.0 LB/MMSCF (EACH BOILER) [BACT-PSD] Good combustion practices and clean burn fuel (pipeline quality natural gas).	0.52 LB/MMSCF (EACH BOILER) [BACT-PSD] Good combustion practices and low sulfur fuel (pipeline quality natural gas).		CO2e: 7324.0 T/YR (COMBINED FOR ALL BOILERS) [BACT-PSD] Use of pipeline quality natural gas and energy efficiency measures.
MI-0424	Holland Board of Public Works - East 5TH Street	Ottawa	MI	12/05/2016	EUAUXBOILER (Auxiliary boiler)	One natural gas fired auxiliary boiler rated at 83.5 MMBTU/hr fuel heat input (EUAUXBOILER).	83.5	MMBtu/hr	0.05 LB/MMBTU (TEST PROTOCOL WILL SPECIFY AVG TIME) [BACT-PSD] Low NOx burners/Internal flue gas recirculation and good combustion practices.	0.008 LB/MMBTU (TEST PROTOCOL WILL SPECIFY AVG TIME) [BACT-PSD] Good combustion practices.	0.077 LB/MMBTU (TEST PROTOCOL WILL SPECIFY AVG TIME) [BACT-PSD] Good combustion practices.	0.0018 LB/MMBTU (TEST PROTOCOL WILL SPECIFY AVG TIME) [BACT-PSD] | 0.007 LB/MMBTU (TEST PROTOCOL WIL SPECIFY AVG TIME) [BACT-PSD] | 0.007 LB/MMBTU (TEST PROTOCOL WILL SPECIFY AVG TIME.) [BACT-PSD] Good combustion practices.		CO2e: 43283.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Good combustion practices.
TX-0813	Odessa Petrochemical Plant	Ector	TX	11/22/2016	small Boiler		39.9	MMBtu/hr		0.0005 MMBTU/HR [BACT-PSD] best combustion practices				
OH-0367	South Field Energy LLC	Columbiana	OH	09/23/2016	Auxiliary Boiler (B001)	99 MMBtu/hr dual fuel [natural gas and ultra-low sulfur diesel (ULSD)-fired] boiler with low-NOx burners and flue gas recirculation	99	MMBtu/hr	9.9 LB/H [BACT-PSD] Flue gas recirculation (FGR), low NOx burner, and natural gas/ultra low sulfur diesel	0.59 LB/H [BACT-PSD] Good combustion controls and natural gas/ultra low sulfur diesel	7.92 LB/H [BACT-PSD] Good combustion controls and natural gas/ultra low sulfur diesel	5.94 LB/H [BACT-PSD] natural gas/ultra low sulfur diesel	0.15 LB/H [BACT-PSD] natural gas/ultra low sulfur diesel	CO2e: 32171.0 T/YR (PER ROLLING 12 MONTH PERIOD) [BACT-PSD] Good combustion controls, natural gas combustion, and ultra low sulfur diesel
PA-0310	CPV Fairfield Energy Center	Cambria	PA	09/02/2016	Auxiliary boiler	Operation of the auxiliary boiler shall not exceed 4000 hrs. in any continuous 12-month period.	92.4	MMBtu/hr	0.011 LB/MMBTU (AVG OF 3 1-HR TEST RUNS) [LAER] Ultra low NOx burners, FGR, good combustion practices	0.004 LB/MMBTU (AVG OF 3 1-HR TEST RUNS) [LAER] ULSD and good combustion practices	0.037 LB/MMBTU (AVG OF 3 1-HR TEST RUNS) [BACT-PSD] ULSD and good combustion practices	0.007 LB/MMBTU [BACT-PSD] ULSD and good combustion practices		

RBLC ID	Facility Name	County	State	Permit Issuance Date	Process Name (AD)	Process Notes (AI)	Throughput (AG)	Throughput Unit (AH)	NOx	VOC	CO	PM	SO2	GHG
NJ-0085	Middlesex Energy Center, LLC	Middlesex	NJ	07/19/2016	AUXILIARY BOILER		4000	H/YR	0.975 LB/H (AV OF THREE ONE H INITIAL STACK TEST) [LAER] Low NOx burners and Flue Gas Recirculation (FGR) and use of natural gas a clean burning fuel	0.488 LB/H (AV OF THREE ONE H STACK TESTS INITIALLY) [LAER] USE OF NATURAL GAS A CLEAN BURNING FUEL AND GOOD COMBUSTION PRACTICES	3.61 LB/H (AV OF THREE ONE H STACK TESTS INITIALLY) [BACT-PSD] USE OF NATURAL GAS A CLEAN BURNING FUEL AND GOOD COMBUSTION PRACTICES	0.181 LB/H (AV OF THREE ONE H STACK TESTS INITIALLY) [BACT-PSD] | 0.488 LB/H (AV OF THREE ONE H STACK TESTS INITIALLY) [BACT-PSD] USE OF NATURAL GAS A CLEAN BURNING FUEL	0.128 LB/H [OTHER CASE-BY-CASE] USE OF NATURAL GAS A CLEAN BURNING LOW SULFUR FUEL	
MI-0420	DTE Gas Company--Milford Compressor Station	Oakland	MI	06/03/2016	FGAUXBOILERS	Two natural gas-fired auxiliary boilers, each rated at 6 MMBTU/H fuel heat input. The boilers are identified as EUAUXBOIL2 and EUAUXBOIL3 within the flexible group FGAUXBOILERS. The boilers are subject to 40 CFR Part 63 Subpart DDDDD, which requires tune ups.	6	MMBtu/hr	14.0 PPMVOL (AT 15%O2; TEST PROTOCOL) [BACT-PSD] Ultra low NOx burners and good combustion practices.		0.08 LB/MMBTU (TEST PROTOCOL) [BACT-PSD] Good combustion practices and clean burn fuel (pipeline quality natural gas)	0.0075 LB/MMBTU (TEST PROTOCOL) [BACT-PSD] Good combustion practices and low sulfur fuel (pipeline quality natural gas).		CO2e: 6155.0 T/YR (12-MO ROLLING TIME PERIOD) [BACT-PSD] Use of pipeline quality natural gas and energy efficiency measures.
AL-0312	Belk Chip-N-Saw Facility	Fayette	AL	05/26/2016	60 MMBTU/HR NATURAL GAS-FIRED BOILER (ES-008)		60	MMBtu/hr		0.0054 LB/MMBTU INPUT [BACT-PSD] GOOD COMBUSTION PRACTICES				
SC-0193	Mercedes Benz Vans, LLC	Charleston	SC	04/15/2016	Energy Center Boilers	Two Boilers, each rated at 14.27 MMBTU/hr	14.27	MMBtu/hr		5.5 LB/MMSCF (3 HOUR BLOCK AVERAGE) [BACT-PSD] Annual tune ups per 40 CFR 63.7540(a)(10) are required.		7.6 LB/MMSCF (3 HR BLOCK AVERAGE) [BACT-PSD] | 7.6 LB/MMSCF (3 HOUR BLOCK AVERAGE) [BACT-PSD] Annual tune ups per 40 CFR 63.7540(a)(10) are required.		
NJ-0084	PSEG Fossil LLC Sewaren Generating Station	Middlesex	NJ	03/10/2016	Auxiliary Boiler firing natural gas	Maximum heat input rate for natural gas fired auxiliary boiler is 80 MMBtu/hr (HHV) permitted to operate for 8760 hrs./yr.	687	MMCFT/YR	0.8 LB/H (AV OF THREE ONE H STACK TESTS) [LAER] low NOx burners and flue gas recirculation (FGR)	0.32 LB/H (AV OF THREE ONE H STACK TESTS) [LAER] Use of good combustion practices and use of natural gas a clean burning fuel	2.88 LB/H (AV OF THREE ONE H STACK TESTS) [BACT-PSD] Use of good combustion practices and use of natural gas a clean burning fuel	0.26 LB/H (AV OF THREE ONE HOUR STACK TESTS) [BACT-PSD] | 0.4 LB/H (AV OF THREE ONE HOUR STACK TESTS) [BACT-PSD] Use of natural gas a clean burning | use of natural gas a clean burning fuel	0.12 LB/H [OTHER CASE-BY-CASE] Use of natural gas a low sulfur fuel	
FL-0356	Okeechobee Clean Energy Center	Okeechobee	FL	03/09/2016	Auxiliary Boiler, 99.8 MMBtu/hr	Fires only natural gas. Limited to 2000 hr/yr.	99.8	MMBtu/hr.	0.05 LB/MMBTU [BACT-PSD] Low-NOx burners		0.08 LB/MMBTU [BACT-PSD] Proper combustion prevents CO	10.0 % OPACITY [BACT-PSD] Use of clean fuels	2.0 GR. S/100 SCF GAS [BACT-PSD] Use of low-sulfur gas	CO2e: 0.0 [BACT-PSD] Use of natural gas only
NY-0103	Cricket Valley Energy Center	USA	NY	02/03/2016	Auxiliary boiler	Limited to 4,500 H/YR	60	MMBtu/hr.	0.0085 LB/MMBTU (1 H) [LAER] flue gas recirculation with low NOx burners	0.0015 LB/MMBTU (1 H) [LAER] good combustion practice	0.0375 LB/MMBTU (1 H) [BACT-PSD] good combustion practice	0.005 LB/MMBTU (1 H) [BACT-PSD] good combustion practiced and pipeline quality natural gas		CO2e: 119.0 LB/MMBTU (12 MO) [BACT-PSD] good combustion practiced and pipeline quality natural gas

EXHIBIT 1
Facility General Arrangement (Site Plan)



EQUIPMENT LIST		
ITEM	EQUIPMENT TAG	DESCRIPTION
1	TBD	345 kV SUBSTATION
2	TBD	100 MW RICE POWER PLANT (EH)
3	TBD	60 MW BESS
4	TBD	SWITCHGEAR BUILDING
5	TBD	FUEL GAS RISER
6	TBD	EMERGENCY GENSET & BLACK START
7	TBD	EXHAUST STACK (GROUP OF 3)
8	TBD	FIRE WATER TANKS & PUMP HOUSE
9	TBD	POWER BLOCK
10	TBD	FUEL GAS LINE HEATER
11	TBD	PUMPS & COMPRESSORS
12	TBD	BOILERS
13	TBD	DIESEL TANKS
14	TBD	WATER & LUBE OIL TANKS
15	TBD	SCR & UREA TANK
16	TBD	CEMS
17	TBD	RADIATORS
18	TBD	OFFICE/ADMIN. BUILDING
19	TBD	WAREHOUSE/SHOP BUILDING
20	TBD	ELECTRICAL SUBSTATION BUILDING
21	TBD	DATA HALL (DH)

LEGEND FOR EMISSION SOURCES
EMERGENCY GENSET & BLACK START
EXHAUST STACK
FIRE PUMP STATION
FUEL GAS LINE HEATER
BOILERS

Notes:

1. LOCATIONS OF PONDS AND WATER TANKS ARE ESTIMATES AND NOT TO SCALE. EQUIPMENT SIZING AND LOCATIONS ARE PRELIMINARY.
2. ENGINE HALLS HAVE BEEN SIMPLIFIED FOR CLARITY. PLEASE REFER TO DETAILED PLOT PLANS (26020-001-PRO-PLN-012-01 & 26020-001-PRO-PLN-013-01) FOR MORE DETAIL.

NOT FOR CONSTRUCTION

Rev	Date	Issue	Description	Project No	By
D	2026-06-08	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
C	2026-05-05	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
B	2026-05-01	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
A	2026-04-22	IFR	ISSUED FOR REVIEW	26020-001	VJ

Drafting Checked by:
Engineering Checked by:
Approved for Issue by:
Applies to Current Revision Only

JOULEGRID
PROACTIVE POWER-AUTOMATION

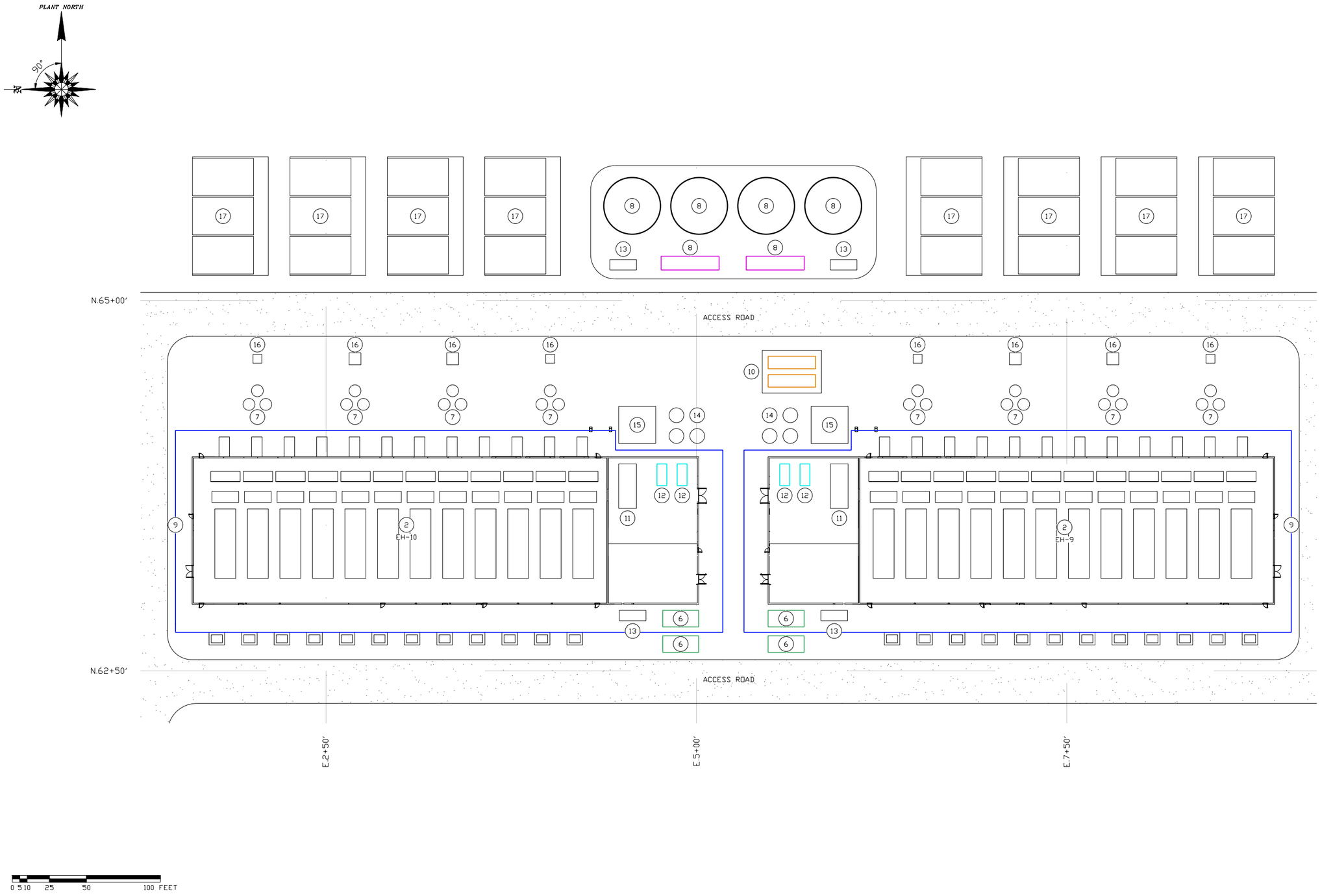
WESTLINE 2335

31.34838101950303, −100.6424063783624

WESTLINE 2335
OVERALL SITE PLAN – AIR EMISSIONS
PLOT PLAN

Scale	Size	Drawing Number	Rev
1/512"=1'-0"	D	26020-001-PRO-PLN-011-01	D

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EQUIPMENT LIST		
ITEM	EQUIPMENT TAG	DESCRIPTION
2	TBD	100 MW RICE POWER PLANT
6	TBD	EMERGENCY GENSET & BLACK START
7	TBD	EXHAUST STACK (GROUP OF 3)
8	TBD	FIRE WATER TANKS & PUMP HOUSE
9	TBD	POWER BLOCK
10	TBD	FUEL GAS LINE HEATER
11	TBD	PUMPS & COMPRESSORS
12	TBD	BOILERS
13	TBD	DIESEL TANKS
14	TBD	WATER & LUBE OIL TANKS
15	TBD	SCR & UREA TANK
16	TBD	CEMS
17	TBD	RADIATORS

LEGEND FOR EMISSION SOURCES	
	EMERGENCY GENSET & BLACK START
	EXHAUST STACK
	FIRE PUMP STATION
	FUEL GAS LINE HEATER
	BOILERS

Notes:
1. EQUIPMENT SIZING AND LOCATIONS ARE PRELIMINARY.

NOT FOR CONSTRUCTION

Rev	Date	Issue	Description	Project No	By
B	2026-06-08	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
A	2026-05-05	IFR	ISSUED FOR REVIEW	26020-001	KC

Drafting Checked by:
Engineering Checked by:
Approved for Issue by:
Applies to Current Revision Only

JOULEGRID
PROACTIVE POWER AUTOMATION

WESTLINE 2335
31.34838101950303, -100.6424063783624

WESTLINE 2335
MAJOR EQUIPMENT LOCATION – ENGINE HALLS 9 & 10
DETAIL PLAN

Scale	Size	Drawing Number	Rev
1/32"=1'-0"	D	26020-001-PRO-PLN-014-01	B

PLOTTED: Jun 10, 2026 11:07 AM USER: VJANZEN
FILE:\\PROJECTS\DRAFT\26020-001\PIPING\PLN\26020-001-PRO-PLN-011-01.DWG

EXHIBIT 2
Places of Interest Map



Structures			
Map ID	Building Type	Distance from Property	Direction
1	Agricultural	2,365	S
2	Agricultural	2,489	S
3	Agricultural	2,489	S
4	Agricultural	2,477	S
5	Agricultural	2,477	S
6	Agricultural	2,574	S
7	Residential	3,385	S
8	Residential	2,302	S
9	Residential	2,369	S
10	Agricultural	2,540	S
11	Residential	2,931	S
12	Residential	2,843	S
13	Residential	2,936	S
14	Residential	3,039	S
15	Agricultural	2,606	S
16	Residential	1,734	S
17	Residential	1,969	S
18	Residential	2,063	S
19	Residential	1,792	S
20	Residential	1,323	S
21	Agricultural	Subject Property	
22	Agricultural	Subject Property	
23	Agricultural	Subject Property	
24	Residential	1,013	S
25	Residential	801	S
26	Residential	1,328	S
27	Agricultural	1,440	S
28	Residential	1,011	S
29	Residential	1,819	S
30	Residential	2,110	S
31	Residential	2,040	S
32	Residential	1,667	S
33	Residential	1,019	S
34	Residential	816	S
35	Residential	869	S
36	Agricultural	815	S
37	Agricultural	735	S
38	Residential	534	SE
39	Residential	1,720	SSE
40	Residential	2,246	SSE
41	Residential	2,332	SSE
42	Residential	1,305	SE
43	Residential	1,377	SE
44	Residential	3,485	ESE
45	Commercial	3,014	E
46	Agricultural	2,813	ESE
47	Agricultural	2,853	ESE
48	Commercial	2,343	ESE
49	Commercial	2,218	E
50	Residential	1,990	E
51	Commercial	2,271	E
52	Residential	2,499	E
53	Public	1,128	ESE
54	Residential	1,781	SE
55	Residential	1,856	SE
56	Residential	2,059	ESE
57	Commercial	2,455	SE
58	Commercial	2,649	SE
59	Commercial	2,504	SE
60	Public	1,257	ESE
61	Residential	3,113	SSE
62	Residential	2,948	SE
63	Residential	3,261	SE
64	Agricultural	3,469	N
65	Residential	3,321	N
66	Agricultural	2,676	N
67	Agricultural	2,544	N
68	Residential	3,464	N
69	Agricultural	2,923	N
70	Vacant or Unknown	3,433	N
71	Vacant or Unknown	3,428	N
72	Vacant or Unknown	3,509	N
73	Vacant or Unknown	3,373	N
74	Vacant or Unknown	3,500	N
75	Agricultural	525	S
76	Commercial	625	W
77	Commercial	529	W
78	Residential	1,065	W
79	Residential	1,285	W
80	Residential	1,004	W
81	Residential	3,451	WSW
82	Agricultural	2,210	N
83	Agricultural	2,287	N
84	Agricultural	1,627	N
85	Agricultural	2,115	N
86	Residential	1,468	N
87	Residential	1,418	N
88	Agricultural	532	N
89	Agricultural	562	N
90	Agricultural	166	N
91	Residential	1,359	N
92	Residential	1,392	N
93	Residential	3,183	SSE
94	Public	3,507	SSE
95	Public	3,467	S
96	Residential	3,257	S
97	Residential	3,372	S
98	Agricultural	2,706	S
99	Residential	2,530	S

Transportation			
Road Name	Type	Distance from Property	Direction
FM 2335	Highway	Adjoining	E
US Highway 67	Highway	Adjoining	N
FM 2166	Highway	100	E
Spring Creek Lane	Residential	100	E
Westcross Lane	Residential	100	E
East Bryant Lane	Residential	2,700	W
South Orient	Railroad	Adjoining	N

Other Points of Interest			
Name	Type	Distance from Property	Direction
Tankersley Cemetery	Cemetery	1,100	N
Foster Park	Public Park	100	E
Four56 Church	Church	800	SE

TN

0 0.13 0.25 0.38 0.5 Miles
0 890 1780 2670 Feet

1 inch equals 750 feet

Scale: 1:9,000

Legend

Buidling Footprints

- Agricultural
- Commercial
- Public
- Residential
- Vacant or Unknown

3,000' Buffer

Property

Places of Interest Map

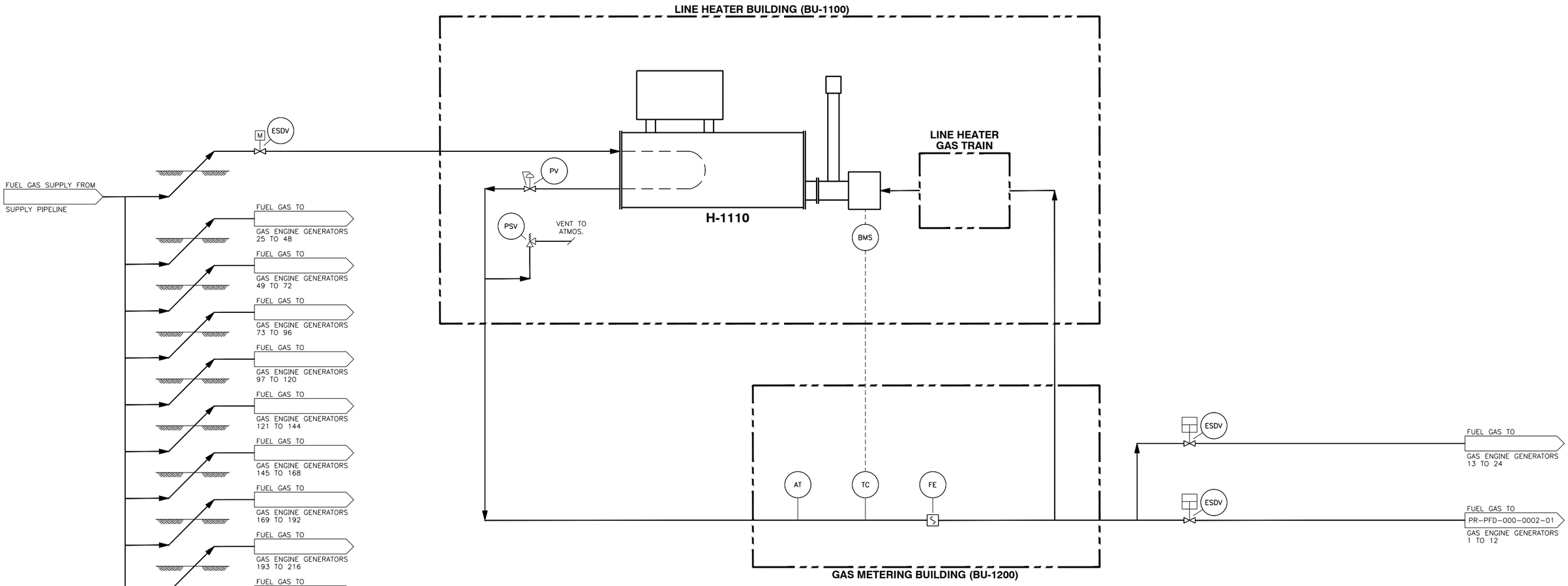
Westline 2335

26-E-0127

SKG ENGINEERING, LLC
FIRM NUMBER P-7950 & 50306
SURVEYING • ENVIRONMENTAL • LAB/CMT
706 SOUTH ABE STREET
SAN ANGELO, TEXAS 76903
PHONE: 325.655.1288
FAX: 325.657.8189

EXHIBIT 3
Process Flow Diagrams

H-1110
FUEL GAS LINE HEATER



Notes:
1. LINE HEATER AND METER SKID ARE TYPICAL FOR EACH FUEL GAS RISER TO PROVIDE GAS FOR 24 ENGINES. TOTAL OF 10 REQUIRED.

NOT FOR CONSTRUCTION

Rev	Date	Issue	Description	Project No	By
C	2026/06/08	RE-IFR	RE-ISSUED FOR REVIEW	26020-001	KC
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A	2026/02/20	IFR	ISSUED FOR REVIEW	26020-001	ERV

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Engineering Checked by:
Approved for Issue by:
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JOULEGRID

PROACTIVE POWER AUTOMATION
CALGARY'S GRID LOGIC ENGINEERING LTD.

WESTLINE 2335
31.34838101950303, -100.6424063783624

WESTLINE 2335
NATURAL GAS METERING AND LINE HEATER
PROCESS FLOW DIAGRAM

Scale	Size	Drawing Number	Rev
NTS	D	26020-001-PR-PFD-000-0001-01	C

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PK-2100	AC-2110	V-2120	PK-2200	AC-2210	V-2220	PK-2300	AC-2310	V-2320	AC-2410	PK-2400	V-2420	AC-2510	PK-2500	V-2520	AC-2610	PK-2600	V-2620
ENGINE GENERATOR PACKAGE	POWER GEN AREA HT/LT RADIATORS	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	ENGINE GENERATOR PACKAGE	POWER GEN AREA HT/LT RADIATORS	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	ENGINE GENERATOR PACKAGE	POWER GEN AREA HT/LT RADIATORS	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	POWER GEN AREA HT/LT RADIATORS	ENGINE GENERATOR PACKAGE	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	POWER GEN AREA HT/LT RADIATORS	ENGINE GENERATOR PACKAGE	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	POWER GEN AREA HT/LT RADIATORS	ENGINE GENERATOR PACKAGE	SCR AMMONIA INJECTION GRID AND CATALYST MODULE

UREA FROM PR-PFD-000-0008-01 — UREA PUMP STATION

NOX CO CO2 O2 — AE — FE — VENT TO ATMOS.

AC-2110 AC-2210 AC-2310 AC-2410 AC-2510 AC-2610

V-2120 V-2220 V-2320 V-2420 V-2520 V-2620

SCR DOSING STATION ENGINE GENERATOR PACKAGE (PK-2100)

SCR DOSING STATION ENGINE GENERATOR PACKAGE (PK-2200)

SCR DOSING STATION ENGINE GENERATOR PACKAGE (PK-2300)

SCR DOSING STATION ENGINE GENERATOR PACKAGE (PK-2400)

SCR DOSING STATION ENGINE GENERATOR PACKAGE (PK-2500)

SCR DOSING STATION ENGINE GENERATOR PACKAGE (PK-2600)

ENGINE AUXILIARY MODULE

ENGINE GAS TRAIN

NEW LUBE OIL FROM PR-PFD-000-0005-01 — NEW LUBE OIL TANK

USED LUBE OIL TO PR-PFD-000-0005-01 — USED LUBE OIL TANK

START AIR FROM PR-PFD-000-0004-01 — START AIR RECEIVER

FUEL GAS TO PR-PFD-000-0003-01 — GAS ENGINE GENERATORS 7 TO 11

POWER GENERATION BUILDING (BU-2000)

FUEL GAS SUPPLY FROM PR-PFD-000-0001-01 — METER SKID

ESDV ESDV PV

FUEL GAS TO PR-PFD-000-0007-01 — HEAT MEDIUM HEATER

Notes:

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JOULEGRID

PROACTIVE POWER AUTOMATION
A SUBSIDIARY OF JOULEGRID ENGINEERING LTD.

WESTLINE 2335

31.34838101950303, -100.6424063783621

WESTLINE 2335
POWER GENERATORS – TYPICAL FOR EACH 12 ENGINE BUILDING
PROCESS FLOW DIAGRAM

Scale	Size	Drawing Number	Rev
NTS	D	26020-001-PR-PFD-000-0002-01	C

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PK-2700	AC-2710	V-2720	PK-2800	AC-2810	V-2820	PK-2900	AC-2910	V-2920	AC-3010	PK-3000	V-3020	AC-3110	PK-3100	V-3120	AC-3210	PK-3200	V-3220
ENGINE GENERATOR PACKAGE	POWER GEN AREA HT/LT RADIATORS	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	ENGINE GENERATOR PACKAGE	POWER GEN AREA HT/LT RADIATORS	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	ENGINE GENERATOR PACKAGE	POWER GEN AREA HT/LT RADIATORS	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	POWER GEN AREA HT/LT RADIATORS	ENGINE GENERATOR PACKAGE	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	POWER GEN AREA HT/LT RADIATORS	ENGINE GENERATOR PACKAGE	SCR AMMONIA INJECTION GRID AND CATALYST MODULE	POWER GEN AREA HT/LT RADIATORS	ENGINE GENERATOR PACKAGE	SCR AMMONIA INJECTION GRID AND CATALYST MODULE

UREA FROM PR-PFD-000-0008-01 — UREA PUMP STATION

NOX CO CO2 O2 — AE — FE — VENT TO ATMOS.

AC-2710 | AC-2810 | AC-2910 | AC-3010 | AC-3110 | AC-3210

V-2720 | V-2820 | V-2920 | V-3020 | V-3120 | V-3220

SCR DOSING STATION

ENGINE GENERATOR PACKAGE (PK-2700) | (PK-2800) | (PK-2900) | (PK-3000) | (PK-3100) | (PK-3200)

ENGINE AUXILIARY MODULE

ENGINE GAS TRAIN

NEW LUBE OIL FROM PR-PFD-000-0005-01 — NEW LUBE OIL TANK

USED LUBE OIL TO PR-PFD-000-0005-01 — USED LUBE OIL TANK

START AIR FROM PR-PFD-000-0004-01 — START AIR RECEIVER

FUEL GAS FROM PR-PFD-000-0002-01 — GAS METERING BUILDING

POWER GENERATION BUILDING (BU-2000)

Notes:

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JOULEGRID

PROACTIVE POWER AUTOMATION
A SUBSIDIARY OF GRIDLOGIX ENGINEERING LTD.

WESTLINE 2335

31.34838101950303, -100.6424063783621

WESTLINE 2335
POWER GENERATORS – TYPICAL FOR EACH 12 ENGINE BUILDING PROCESS FLOW DIAGRAM

Scale	Size	Drawing Number	Rev
NTS	D	26020-001-PR-PFD-000-0003-01	C

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K-4100 THRU 4400
STARTING AIR COMPRESSORS

V-4500
INSTRUMENT AIR RECEIVER

V-4600 THRU 4710
STARTING AIR RECEIVERS

GENERATOR BUILDING MECHANICAL ROOM

STARTING AIR COMPRESSOR PACKAGE (BU-4000)

K-4100

K-4200

K-4300

K-4400

PV

IA DRYER

PSV — VENT TO ATMOS.

TO USERS

V-4500

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 12
START AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 12

V-4710

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 11
START AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 11

V-4700

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 10
START AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 10

V-4690

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 9
START AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 9

V-4680

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 8
START AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 8

V-4670

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 7
START AIR TO PR-PFD-000-0003-01 ENGINE GENERATOR 7

V-4660

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 6
START AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 6

V-4650

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 1
START AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 1

V-4600

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 2
START AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 2

V-4610

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 3
START AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 3

V-4620

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 4
START AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 4

V-4630

PSV — VENT TO ATMOS.

CONTROL AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 5
START AIR TO PR-PFD-000-0002-01 ENGINE GENERATOR 5

V-4640

POWER GENERATION BUILDING (BU-2000)

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JOULEGRID

PROACTIVE POWER AUTOMATION
A DIVISION OF JOULEGRID ENGINEERING LTD.

WESTLINE 2335
31.34838101950303, -100.6424063783621

WESTLINE 2335
POWER GENERATORS – TYPICAL FOR EACH 12 ENGINE BUILDING
PROCESS FLOW DIAGRAM

Scale	Size	Drawing Number	Rev
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P-6000 USED LUBE OIL PUMP

TK-6010 USED LUBE OIL TANK

TK-6020 CLEAN LUBE OIL TANK

P-6030 CLEAN LUBE OIL PUMP

POWER GENERATION BUILDING (BU-2000)

USED LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 12
USED LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 11
USED LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 10
USED LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 9
USED LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 8
USED LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 7
USED LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 6
USED LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 5
USED LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 4
USED LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 3
USED LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 2
USED LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 1

PSV
FE
P-6000
TRUCK OUT c/w ENVIRO BOX
CLIP GATE
GROUND ROD & CABLE CLAMP
LC
TK-6010

PSV
FE
P-6030
CLIP GATE
TRUCK IN c/w ENVIRO BOX
GROUND ROD & CABLE CLAMP
TC
HWR
HWS
TK-6020

POWER GENERATION BUILDING (BU-2000)

CLEAN LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 12
CLEAN LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 11
CLEAN LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 10
CLEAN LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 9
CLEAN LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 8
CLEAN LUBE OIL FROM PR-PFD-000-0003-01 ENGINE GENERATOR 7
CLEAN LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 6
CLEAN LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 5
CLEAN LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 4
CLEAN LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 3
CLEAN LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 2
CLEAN LUBE OIL FROM PR-PFD-000-0002-01 ENGINE GENERATOR 1

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PROACTIVE POWER AUTOMATION
A DIVISION OF GRIDLOGIX ENGINEERING LTD.

WESTLINE 2335
31.34838101950303, -100.6424063783621

WESTLINE 2335
POWER GENERATORS – TYPICAL FOR EACH 12 ENGINE BUILDING PROCESS FLOW DIAGRAM

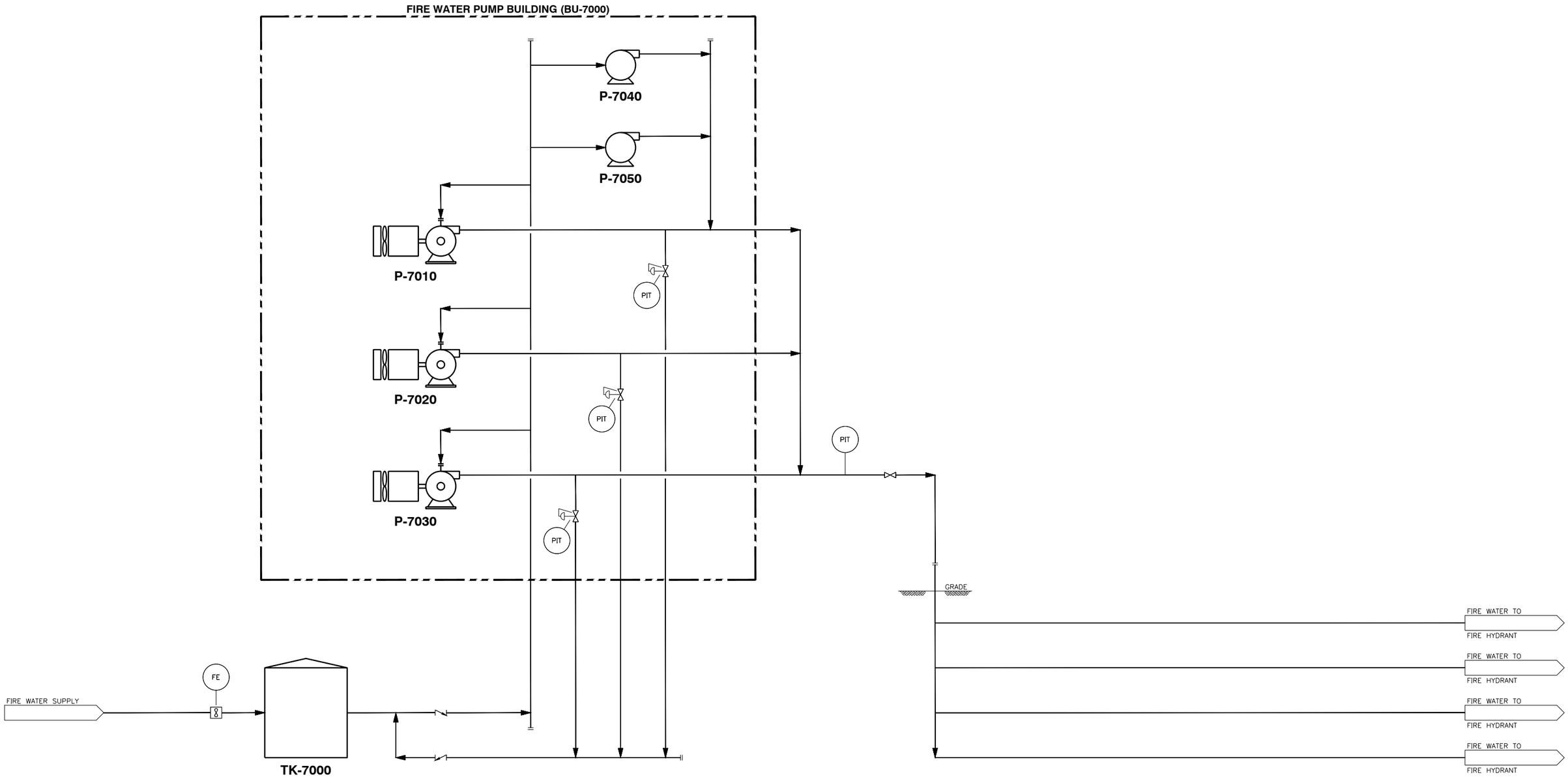
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TK-7000
FIRE WATER SUPPLY TANK

P-7010/7020/7030
FIRE WATER PUMPS

P-7040/7050
FIRE WATER JOCKEY PUMPS



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THE EXPERTS OF FLUIDS ENGINEERING LTD.

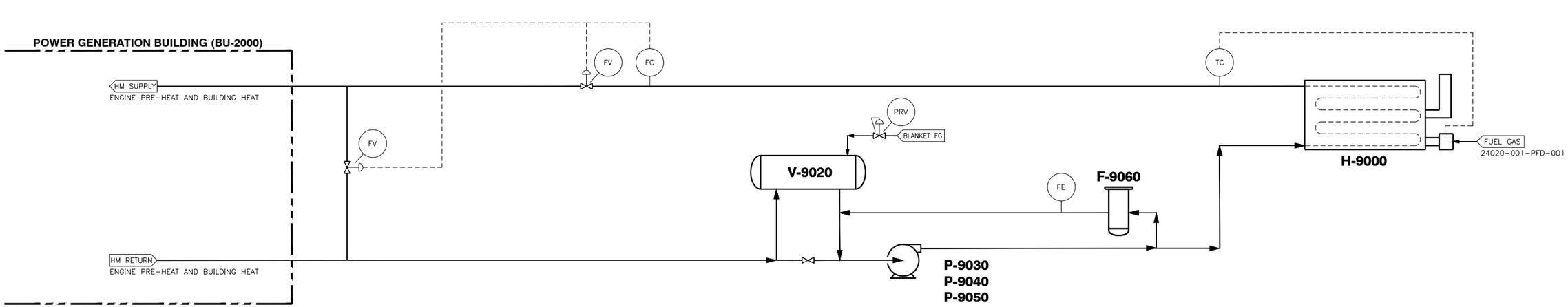
WESTLINE 2335
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WESTLINE 2335
POWER GENERATORS – TYPICAL FOR EACH 12 ENGINE BUILDING
PROCESS FLOW DIAGRAM

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V-9020	P-9030	P-9040	P-9050	F-9060	H-9000
HEAT MEDIUM EXPANSION TANK	HEAT MEDIUM PUMP	HEAT MEDIUM PUMP	HEAT MEDIUM PUMP	HEAT MEDIUM FILTER	HEAT MEDIUM HEATER



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A DIVISION OF JOULEGRID ENGINEERING LTD.

WESTLINE 2335

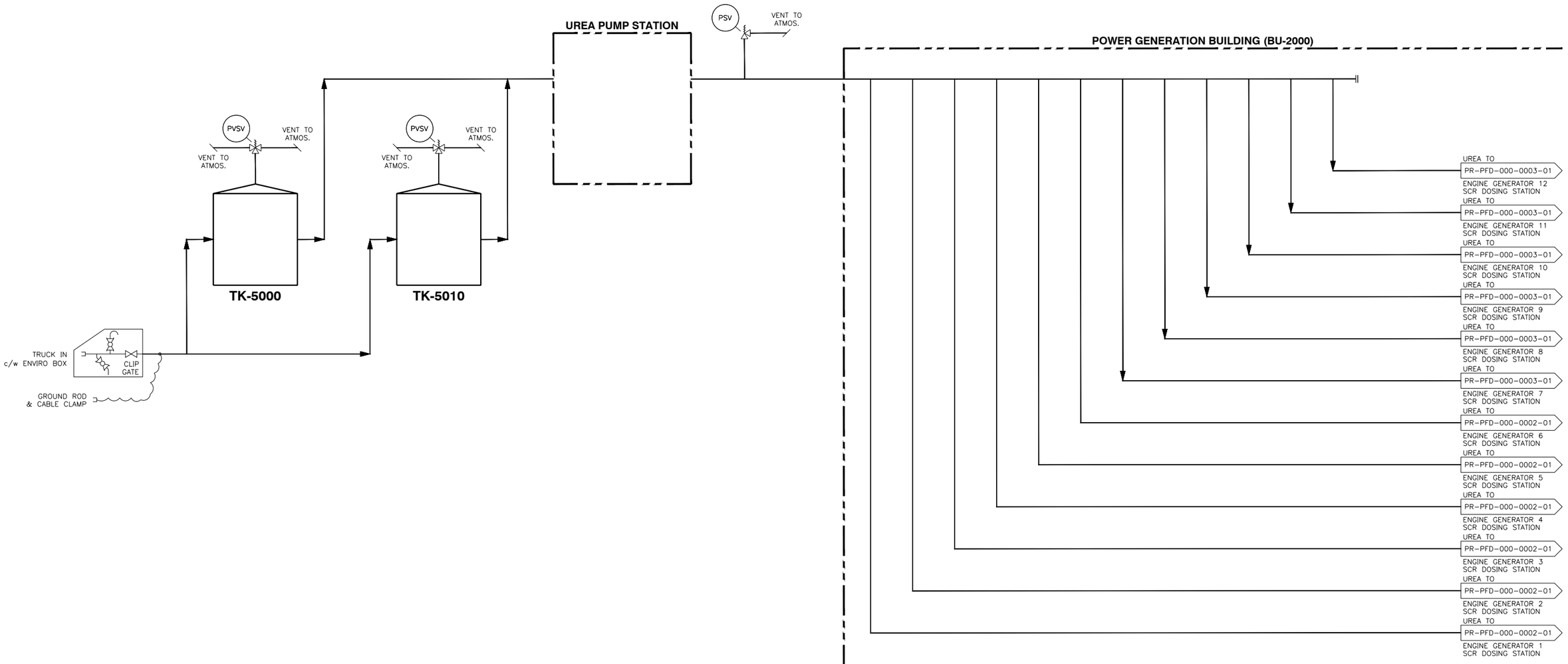
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WESTLINE 2335
POWER GENERATORS – TYPICAL FOR EACH 12 ENGINE BUILDING
PROCESS FLOW DIAGRAM

Scale	Size	Drawing Number	Rev
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TK-5000
UREA TANK 1

TK-5010
UREA TANK 2



Notes:

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PROACTIVE POWER AUTOMATION
A SUBSIDIARY OF ARB LIQUID ENGINEERING LTD.

WESTLINE 2335

31.34838101950303, -100.6424063783621

WESTLINE 2335
TYPICAL FOR EACH 12 ENGINE BUILDING
PROCESS FLOW DIAGRAM

Scale	Size	Drawing Number	Rev
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Texas Commission on Environmental Quality

Public Involvement Plan Form for Permit and Registration Applications

The Public Involvement Plan is intended to provide applicants and the agency with information about how public outreach will be accomplished for certain types of applications in certain geographical areas of the state. It is intended to apply to new activities; major changes at existing plants, facilities, and processes; and to activities which are likely to have significant interest from the public. This preliminary screening is designed to identify applications that will benefit from an initial assessment of the need for enhanced public outreach.

All applicable sections of this form should be completed and submitted with the permit or registration application. For instructions on how to complete this form, see TCEQ-20960-inst.

Section 1. Preliminary Screening

☒ New Permit or Registration Application

☐ New Activity – modification, registration, amendment, facility, etc. (see instructions)

If neither of the above boxes are checked, completion of the form is not required and does not need to be submitted.

Section 2. Secondary Screening

☒ Requires public notice,

☒ Considered to have significant public interest, **and**

☒ Located within any of the following geographical locations:

- Austin
- Dallas
- Fort Worth
- Houston
- San Antonio
- West Texas
- Texas Panhandle
- Along the Texas/Mexico Border
- Other geographical locations should be decided on a case-by-case basis

If all the above boxes are not checked, a Public Involvement Plan is not necessary. Stop after Section 2 and submit the form.

☐ Public Involvement Plan not applicable to this application. Provide **brief** explanation.

Section 3. Application Information

Type of Application (check all that apply):

Air ☒ Initial ☒ Federal ☐ Amendment ☐ Standard Permit ☒ Title V

Waste ☐ Municipal Solid Waste ☐ Industrial and Hazardous Waste ☐ Scrap Tire
☐ Radioactive Material Licensing ☐ Underground Injection Control

Water Quality

☐ Texas Pollutant Discharge Elimination System (TPDES)

- ☐ Texas Land Application Permit (TLAP)
- ☐ State Only Concentrated Animal Feeding Operation (CAFO)
- ☐ Water Treatment Plant Residuals Disposal Permit

☐ Class B Biosolids Land Application Permit

☐ Domestic Septage Land Application Registration

Water Rights New Permit

☐ New Appropriation of Water

☐ New or existing reservoir

Amendment to an Existing Water Right

☐ Add a New Appropriation of Water

☐ Add a New or Existing Reservoir

☐ Major Amendment that could affect other water rights or the environment

Section 4. Plain Language Summary

Provide a brief description of planned activities.

Please see attached Plain Language Summary (English and Spanish)

Section 5. Community and Demographic Information

Community information can be found using EPA's EJ Screen, U.S. Census Bureau information, or generally available demographic tools.

Information gathered in this section can assist with the determination of whether alternative language notice is necessary. Please provide the following information.

San Angelo

(City)

Tom Green County

(County)

N/A

(Census Tract)

Please indicate which of these three is the level used for gathering the following information.

☐ City ☒ County ☐ Census Tract

(a) Percent of people over 25 years of age who at least graduated from high school

Approximately 87% of individuals age 25 years and older have a high school diploma or higher within Tom Green County.

(b) Per capita income for population near the specified location

Per capita income for Tom Green County is approximately $35,866.

(c) Percent of minority population and percent of population by race within the specified location

Minority population is approximately ~49%
White (non-Hispanic): ~51%
Hispanic or Latino: ~40%

(d) Percent of Linguistically Isolated Households by language within the specified location

Approximately 23–24% of residents speak a language other than English at home, and a subset of these households may be linguistically isolated (primarily Spanish-speaking households). Specific linguistically isolated household

(e) Languages commonly spoken in area by percentage

English is the predominant language spoken in Tom Green County, Texas. U.S. Census Bureau ACS data show that most residents speak only English at home, while a smaller portion of households speak Spanish as the primary non-English

(f) Community and/or Stakeholder Groups

Key stakeholders in Tom Green County include local residents, City of San Angelo and Tom Green County officials, school districts, and local business and civic organizations. Environmental and public health stakeholders may also participate

(g) Historic public interest or involvement

Public involvement in environmental permitting actions in Tom Green County is generally conducted through the standard TCEQ public notice and comment process. The level of public interest is project-specific and may vary depending on

Section 6. Planned Public Outreach Activities

(a) Is this application subject to the public participation requirements of Title 30 Texas Administrative Code (30 TAC) Chapter 39?

☐ Yes ☐ No

(b) If yes, do you intend at this time to provide public outreach other than what is required by rule?

☐ Yes ☐ No

If Yes, please describe.

If you answered "yes" that this application is subject to 30 TAC Chapter 39, answering the remaining questions in Section 6 is not required.

(c) Will you provide notice of this application in alternative languages?

☐ Yes ☐ No

Please refer to Section 5. If more than 5% of the population potentially affected by your application is Limited English Proficient, then you are required to provide notice in the alternative language.

If yes, how will you provide notice in alternative languages?

☐ Publish in alternative language newspaper

☐ Posted on Commissioner's Integrated Database Website

☐ Mailed by TCEQ's Office of the Chief Clerk

☐ Other (specify)

(d) Is there an opportunity for some type of public meeting, including after notice?

☐ Yes ☐ No

(e) If a public meeting is held, will a translator be provided if requested?

☐ Yes ☐ No

(f) Hard copies of the application will be available at the following (check all that apply):

☐ TCEQ Regional Office ☐ TCEQ Central Office

☐ Public Place (specify)

Section 7. Voluntary Submittal

For applicants voluntarily providing this Public Involvement Plan, who are not subject to formal public participation requirements.

Will you provide notice of this application, including notice in alternative languages?

☐ Yes ☐ No

What types of notice will be provided?

☐ Publish in alternative language newspaper

☐ Posted on Commissioner's Integrated Database Website

☐ Mailed by TCEQ's Office of the Chief Clerk

☐ Other (specify)

Plain Language Summary (see next page for Spanish version)

Westline TX Holdings LLC (Westline) (CN # pending) has submitted an application for initial permit number (# pending). The Westline 2335 facility (RN # pending) will be a data center and energy facility located on South Farm to Market Road 2335 (FM 2335) approximately 0.25 miles south of the FM 2335 intersection with Highway 67, near San Angelo, in Tom Green County, Texas.

The permit will authorize construction of the data center and energy facility. The data center will not rely upon power from the grid, but rather, will operate using electricity that is generated onsite by the energy facility using natural-gas reciprocating internal combustion engines (RICE). Other support equipment (engine heaters and line heaters) will also use natural gas and various diesel emergency generators will provide power for any unexpected outages. Westline has listed in the application the pollutants and amounts that will be emitted by the facility. Below is the total amount for each pollutant that is proposed to be emitted each year for the facility.

Pollutant	**Proposed Emissions (tons per year)**
Volatile organic compounds (VOC)	446.8
Total particulate matter (PM)	642.9
Particulate matter, less than 10 microns (PM_{10})	642.9
Particulate matter, less than 2.5 microns ($PM_{2.5}$)	642.9
Nitrogen oxides (NO_X)	419.3
Carbon monoxide (CO)	1,177.2
Sulfur dioxide (SO_2)	117.2
Lead (Pb)	0.0002

The RICE engines will use selective catalytic reduction (SCR) and oxidation catalyst systems to convert most of the NO_X, CO, and VOC emissions to nitrogen gas, water vapor, and carbon dioxide. Support equipment will use efficient burners to minimize emissions of NO_X and CO. All equipment will use pipeline quality natural gas or ultra-low sulfur distillate (ULSD) to minimize emissions of SO_2 and other pollutants.

This application is being processed in an expedited manner, as allowed by the commission's rules in 30 Texas Administrative Code, Chapter 101, Subchapter J.

Westline TX Holdings LLC (Westline) (N.º de CN pendiente) ha presentado una solicitud de número de permiso inicial (N.º pendiente). La instalación Westline 2335 (N.º de RN pendiente) será un centro de datos y planta de generación de energía ubicada en South Farm to Market Road 2335 (FM 2335), aproximadamente 0,25 millas al sur de la intersección de FM 2335 con la Carretera 67, cerca de San Angelo, en el Condado de Tom Green, Texas.

El permiso autorizará la construcción del centro de datos y la planta de generación de energía. El centro de datos no dependerá de la red eléctrica pública, sino que operará con electricidad generada en el sitio por la planta de energía, mediante motores de combustión interna recíprocos de gas natural (RICE, por sus siglas en inglés). Otros equipos de soporte (calentadores de motores y calentadores de línea) también utilizarán gas natural, y se instalarán generadores de emergencia diésel para suministrar energía durante cualquier corte imprevisto. Westline ha indicado en la solicitud los contaminantes y las cantidades que serán emitidos por la instalación. A continuación se presentan las emisiones anuales totales propuestas para cada contaminante en la instalación.

Contaminante	**Emisiones propuestas (toneladas por año)**
Compuestos orgánicos volátiles (COV)	446,8
Material particulado total (MP)	642,9
Material particulado menor a 10 micrones (MP10)	642,9
Material particulado menor a 2,5 micrones (MP2,5)	642,9
Óxidos de nitrógeno (NOX)	419,3
Monóxido de carbono (CO)	1.177,2
Dióxido de azufre (SO2)	117,2
Plomo (Pb)	0,0002

Los motores RICE utilizarán sistemas de reducción catalítica selectiva (SCR) y catalizadores de oxidación para convertir la mayor parte de las emisiones de NOX, CO y COV en nitrógeno gaseoso, vapor de agua y dióxido de carbono. Los equipos de soporte emplearán quemadores de alta eficiencia para minimizar las emisiones de NOX y CO. Todos los equipos utilizarán gas natural de calidad de red o destilado ultrabajo en azufre (ULSD, por sus siglas en inglés) para minimizar las emisiones de SO_2 y otros contaminantes.

Esta solicitud está siendo procesada de manera expedita, conforme a lo permitido por las normas de la Comisión establecidas en el Capítulo 101, Subcapítulo J del Código Administrativo de Texas, Título 30.

HALEY & ALDRICH, INC.
3 Bedford Farms Drive
Bedford, NH 03110
603.625.5353

TECHNICAL MEMORANDUM

June 11, 2026
File No. 0214923

TO: Texas Commission on Environmental Quality

cc: Westline TX Holdings LLC

FROM: Haley & Aldrich, Inc.
Alexis Rainery, Project Engineer
Steve Rakowski, Senior Associate

SUBJECT: Modeling and Effects Review Applicability and State Property Line Analyses
Proposed Westline 2335 Facility
Tom Green County, Texas

On behalf of Westline TX Holdings LLC (Westline), Haley & Aldrich, Inc. (Haley & Aldrich) developed supplemental information for the proposed Westline 2335 facility (Facility). This supplemental information includes the health effects analysis and a State Property Line Analysis for the Facility, which are documented in this memorandum and the enclosed Texas Commission on Environmental Quality (TCEQ) Electronic Modeling Evaluation Workbook (EMEW).

Emission sources associated with the Project are described in the Modeling Protocol submitted concurrently with this memorandum. Note that additional sources, including diesel tanks, lube oil vents, and maintenance, startup and shutdown (MSS) activities associated with the proposed Bergen reciprocating internal combustion engine (RICE) engines and fugitive releases from piping valves and flanges are not presented in the Protocol because they are not sources of Prevention of Significant Deterioration (PSD) pollutants but are potential sources of air toxics. For this reason, they are included in the health effects analysis described in this memorandum.

Note the following in regard to model inputs and the EMEW (Attachment 1):

- Completed modeling was performed using line heaters with a capacity of 3 million British thermal units per hour (MMBTU/hr). The design capacity of the line heaters has since been increased to 5.02 MMBtu/hr. Westline proposes to provide updated modeling results and the corresponding EMEW with the Air Quality Analysis.
- Due to the use of merged stacks for the RICE engines (as discussed in the Modeling Protocol), a single Model ID may correspond to multiple emission point numbers (EPNs). Because of the 10-character limit of EPN columns in the EMEW, shorthand designations were used to represent

the applicable EPNs. For example, Model ID GEN1 represents EPNS BERG1, BERG2, and BERG3 and is listed as "BRG1-3" in the EMEW. A separate attachment is included that cross-references Model IDs to the full EPNs (Attachment 2).

- The EMEW allows the entry of 5,000 speciated emissions. However for the Facility, representing each model source's individual health effects requires more than 5,000 rows. Therefore, a second EMEW is provided for the balance of emissions not included in the first EMEW. Therefore, the Summary of Emissions tab for each EMEW is not representative of the entire Facility. The health effects emissions are also included in the MERA Evaluation (Attachment 3).

Health Effects Analysis

TCEQ has implemented a state-specific procedure to evaluate off-property, ground-level concentrations of pollutants that do not have a federal or state-level standard. The procedure is outlined in TCEQ Air Permit Division Guidance 5874, Modeling and Effects Review Applicability (MERA). MERA evaluation is required if a chemical species is listed in the Texas Air Monitoring Information System and its emission rate will increase from any source associated with a given project. Several chemical species are considered exempt due to a relevant state air quality standard, National Ambient Air Quality Standard (NAAQS), or otherwise listed exemptions in the MERA guidance. MERA calculations are provided in Attachment 3. As a new facility, evaluated emissions represent the entire Facility. Relevant inputs and results are presented in TCEQ's EMEW, which is provided in Excel format as Attachment 1. Associated figures are included in the Modeling Protocol.

SCREENING EVALUATION

In the first step of the MERA analysis, maximum short-term emissions for the Project are compared against the relevant *de minimis* level determined by the respective chemical's Effect Screening Limit (ESL). As described in the Protocol, the modeling evaluation for the Facility consists of a single operating scenario that includes concurrent operation of 200 RICE engines (i.e., 10 engines per engine hall), with each engine running at worst-case conditions of 100 percent load. This is considered to be a worst-case scenario because the typical operating scenario for the Facility includes concurrent operation of a maximum of 200 RICE engines, with each engine typically running at or near 80 percent load.

Toxics emissions from the RICE engines and ancillary sources are established by the amount of fuel combusted, similar to sulfur dioxide (SO_2), whose emissions are based on the sulfur content of the fuel and the amount of fuel consumed. Therefore, for the Bergen RICE engines, it was assumed that the controlling operating scenario for SO_2 (100 percent load) would also be the controlling scenario for air toxics. The identified controlling scenario is Case 1.

In the next step of the MERA process, the ground-level concentrations (GLCs), were evaluated for the Project using AERMOD version 24142. The GLCs were conservatively estimated by determining normalized concentrations for each air toxics source for short-term and annual averaging times. The highest normalized concentration was selected for each piece of equipment regardless of receptor location, providing a more conservative GLC compared to refined modeling. The GLCs from Step 3 were

compared to 10 percent of their corresponding ESL values to determine which air toxics would require further investigation (provided in Attachments 1 and 3).

PROJECT-WIDE MODELING

Ten chemical species were determined to exceed 10 percent of their short-term ESLs and 10 chemical species were determined to exceed 10 percent of their long-term ESLs. Therefore, the Project-wide modeling is required for these pollutants. Because this is a new facility, project-wide modeling is also considered site-wide modeling. Site-wide modeling was conducted using AERMOD.

All modeled site-wide impacts for the health effects analysis are less than their respective ESLs; therefore, they satisfy the ratio test for the MERA process. The final GLCs are included in Attachments 1 and 3.

TCEQ State Property Line Standard Analysis

TCEQ has implemented a state-specific procedure for evaluation of ground-level concentrations of SO_2, hydrogen sulfide (H_2S), and sulfuric acid (H_2SO_4). The analysis is intended to include all new and modified Project sources. Since the Project is a new facility, all sources were included in the State Property Line Standard Analysis. The Project is not expected to produce H_2S; therefore, H_2S is not included in this analysis. The Facility fenceline is immediately adjacent to the property line and was used for this analysis.

State standards for SO_2 vary by county within Texas. For Tom Green County, this analysis defaults to the state's minimum standard, which is based on a 30-minute averaging time. However, since preferred models used for regulatory demonstrations typically have a minimum of 1-hour averaging time, the modeled impacts for a 1-hour averaging time may be used. H_2SO_4 is based on 24-hour and annual averaging times.

Inputs and results, as applicable, are presented in the EMEW. While five-year meteorological data were used in the State Property Line Standard Analysis, the highest first high value was used in the evaluation. SO_2 emissions assume full conversion of sulfur oxide (SO_X), while H_2SO_4 emissions assume 10 percent conversion of SO_2.

As with the health effects analysis, Bergen RICE engines were modeled at 100 percent load. Note that sulfur compounds are self-correcting during MSS events because they are based on fuel used; therefore, the MSS cases were not evaluated. Comparison of modeled results to applicable standards are provided in Tables 1 and 2, with supporting information provided in the EMEW.

For H_2SO_4, modeled impacts (shown in Table 1) were below 2 percent of the state regulatory limit.

Table 1. Sulfuric Acid Modeled Impact

Averaging Time	Maximum Modeled Impact ($\mu g/m^3$)[a]	State Limit ($\mu g/m^3$)	Two Percent of State Limit ($\mu g/m^3$)
1-hour	0.52626	50	1
24-hour	0.19770	15	0.3

Note: *[a] micrograms per cubic meter*

For SO_2, the modeled impact (shown in Table 2) is below 2 percent of the state regulatory limit. No further evaluation is necessary.

Table 2. Sulfur Dioxide 1-Hour Modeled Impact

Maximum Modeled Impact ($\mu g/m^3$)	State Limit ($\mu g/m^3$)	Two Percent of State Limit ($\mu g/m^3$)
3.49935	1,021	20.42

Modeling files associated with the state property line standards analysis are listed in the EMEW and have been provided electronically to TCEQ.

Attachments:

Attachment 1 – Electronic Modeling Evaluation Workbook (provided in Excel format)
Attachment 2 – Model ID/EPN Cross-Reference
Attachment 3 – Modeling Parameters and MERA Evaluation

ATTACHMENT 1

Electronic Modeling Evaluation Workbook

(provided electronically)

ATTACHMENT 2
Model ID/EPN Cross-Reference

Model ID	EPN
1_GEN1	BERG1, BERG2, BERG3
1_GEN2	BERG4, BERG5, BERG6
1_GEN3	BERG7, BERG8, BERG9
1_GEN4	BERG10
1_GEN5	BERG13, BERG14, BERG15
1_GEN6	BERG16, BERG17, BERG18
1_GEN7	BERG19, BERG20, BERG21
1_GEN8	BERG22
1_GEN9	BERG25, BERG26, BERG27
1_GEN10	BERG28, BERG29, BERG30
1_GEN11	BERG31, BERG32, BERG33
1_GEN12	BERG34
1_GEN13	BERG37, BERG38, BERG39
1_GEN14	BERG40, BERG41, BERG42
1_GEN15	BERG43, BERG44, BERG45
1_GEN16	BERG46
1_GEN17	BERG49, BERG50, BERG51
1_GEN18	BERG52, BERG53, BERG54
1_GEN19	BERG55, BERG56, BERG57
1_GEN20	BERG58
1_GEN21	BERG61, BERG62, BERG63
1_GEN22	BERG64, BERG65, BERG66
1_GEN23	BERG67, BERG68, BERG69
1_GEN24	BERG70
1_GEN25	BERG73, BERG74, BERG75
1_GEN26	BERG76, BERG77, BERG78
1_GEN27	BERG79, BERG80, BERG81
1_GEN28	BERG82
1_GEN29	BERG85, BERG86, BERG87
1_GEN30	BERG88, BERG89, BERG90
1_GEN31	BERG91, BERG92, BERG93
1_GEN32	BERG94
1_GEN33	BERG97, BERG98, BERG99
1_GEN34	BERG100, BERG101, BERG102
1_GEN35	BERG103, BERG104, BERG105
1_GEN36	BERG106
1_GEN37	BERG109, BERG110, BERG111
1_GEN38	BERG112, BERG113, BERG114
1_GEN39	BERG115, BERG116, BERG117
1_GEN40	BERG118
1_GEN41	BERG121, BERG122, BERG123
1_GEN42	BERG124, BERG125, BERG126
1_GEN43	BERG127, BERG128, BERG129
1_GEN44	BERG130

Model ID	EPN
1_GEN45	BERG133, BERG134, BERG135
1_GEN46	BERG136, BERG137, BERG138
1_GEN47	BERG139, BERG140, BERG141
1_GEN48	BERG142
1_GEN49	BERG145, BERG146, BERG147
1_GEN50	BERG148, BERG149, BERG150
1_GEN51	BERG151, BERG152, BERG153
1_GEN52	BERG154
1_GEN53	BERG157, BERG158, BERG159
1_GEN54	BERG160, BERG161, BERG162
1_GEN55	BERG163, BERG164, BERG165
1_GEN56	BERG166
1_GEN57	BERG169, BERG170, BERG171
1_GEN58	BERG172, BERG173, BERG174
1_GEN59	BERG175, BERG176, BERG177
1_GEN60	BERG178
1_GEN61	BERG181, BERG182, BERG183
1_GEN62	BERG184, BERG185, BERG186
1_GEN63	BERG187, BERG188, BERG189
1_GEN64	BERG190
1_GEN65	BERG193, BERG194, BERG195
1_GEN66	BERG196, BERG197, BERG198
1_GEN67	BERG199, BERG200, BERG201
1_GEN68	BERG202
1_GEN69	BERG205, BERG206, BERG207
1_GEN70	BERG208, BERG209, BERG210
1_GEN71	BERG211, BERG212, BERG213
1_GEN72	BERG214
1_GEN73	BERG217, BERG218, BERG219
1_GEN74	BERG220, BERG221, BERG222
1_GEN75	BERG223, BERG224, BERG225
1_GEN76	BERG226
1_GEN77	BERG229, BERG230, BERG231
1_GEN78	BERG232, BERG233, BERG234
1_GEN79	BERG235, BERG236, BERG237
1_GEN80	BERG238
2_GEN1	BERG1, BERG2, BERG3
2_GEN2	BERG4, BERG5, BERG6
2_GEN3	BERG7, BERG8, BERG9
2_GEN4	BERG10
2_GEN5	BERG13, BERG14, BERG15
2_GEN6	BERG16, BERG17, BERG18
2_GEN7	BERG19, BERG20, BERG21
2_GEN8	BERG22

Model ID	EPN
2_GEN9	BERG25, BERG26, BERG27
2_GEN10	BERG28, BERG29, BERG30
2_GEN11	BERG31, BERG32, BERG33
2_GEN12	BERG34
2_GEN13	BERG37, BERG38, BERG39
2_GEN14	BERG40, BERG41, BERG42
2_GEN15	BERG43, BERG44, BERG45
2_GEN16	BERG46
2_GEN17	BERG49, BERG50, BERG51
2_GEN18	BERG52, BERG53, BERG54
2_GEN19	BERG55, BERG56, BERG57
2_GEN20	BERG58
2_GEN21	BERG61, BERG62, BERG63
2_GEN22	BERG64, BERG65, BERG66
2_GEN23	BERG67, BERG68, BERG69
2_GEN24	BERG70
2_GEN25	BERG73, BERG74, BERG75
2_GEN26	BERG76, BERG77, BERG78
2_GEN27	BERG79, BERG80, BERG81
2_GEN28	BERG82
2_GEN29	BERG85, BERG86, BERG87
2_GEN30	BERG88, BERG89, BERG90
2_GEN31	BERG91, BERG92, BERG93
2_GEN32	BERG94
2_GEN33	BERG97, BERG98, BERG99
2_GEN34	BERG100, BERG101, BERG102
2_GEN35	BERG103, BERG104, BERG105
2_GEN36	BERG106
2_GEN37	BERG109, BERG110, BERG111
2_GEN38	BERG112, BERG113, BERG114
2_GEN39	BERG115, BERG116, BERG117
2_GEN40	BERG118
2_GEN41	BERG121, BERG122, BERG123
2_GEN42	BERG124, BERG125, BERG126
2_GEN43	BERG127, BERG128, BERG129
2_GEN44	BERG130
2_GEN45	BERG133, BERG134, BERG135
2_GEN46	BERG136, BERG137, BERG138
2_GEN47	BERG139, BERG140, BERG141
2_GEN48	BERG142
2_GEN49	BERG145, BERG146, BERG147
2_GEN50	BERG148, BERG149, BERG150
2_GEN51	BERG151, BERG152, BERG153
2_GEN52	BERG154

Model ID	EPN
2_GEN53	BERG157, BERG158, BERG159
2_GEN54	BERG160, BERG161, BERG162
2_GEN55	BERG163, BERG164, BERG165
2_GEN56	BERG166
2_GEN57	BERG169, BERG170, BERG171
2_GEN58	BERG172, BERG173, BERG174
2_GEN59	BERG175, BERG176, BERG177
2_GEN60	BERG178
2_GEN61	BERG181, BERG182, BERG183
2_GEN62	BERG184, BERG185, BERG186
2_GEN63	BERG187, BERG188, BERG189
2_GEN64	BERG190
2_GEN65	BERG193, BERG194, BERG195
2_GEN66	BERG196, BERG197, BERG198
2_GEN67	BERG199, BERG200, BERG201
2_GEN68	BERG202
2_GEN69	BERG205, BERG206, BERG207
2_GEN70	BERG208, BERG209, BERG210
2_GEN71	BERG211, BERG212, BERG213
2_GEN72	BERG214
2_GEN73	BERG217, BERG218, BERG219
2_GEN74	BERG220, BERG221, BERG222
2_GEN75	BERG223, BERG224, BERG225
2_GEN76	BERG226
2_GEN77	BERG229, BERG230, BERG231
2_GEN78	BERG232, BERG233, BERG234
2_GEN79	BERG235, BERG236, BERG237
2_GEN80	BERG238

ATTACHMENT 3
Modeling Parameters and MERA Evaluation

ATTACHMENT 3
MERA Evaluation

Equipment			Bergen Engines 100% Load	Line Heater	Emergency Generators	Fire Water Pump	Lube Oil Vents	MSS Anal Equip	All Diesel Tanks
		Hours per year per unit of operation	7300.0	8760.0	100.0	100.0	8760.0	8760.0	8760.0
		Number of units in operation	200.0	20.0	40.0	60.0	20.0	1.0	1.0
		Per Unit Emission Rates							
Scenario Type			Production	Production	Production	Production	Production	MSS	Production
Max Hourly Emission Rates (lb/hr)	CAS Number	Averaging Time (Units)	Short Term ESL (ug/m3)	Bergen Engines	Line Heaters	Emergency Generators	Fire Water Pump	Lube Oil Vent	MSS Anal Equip.	All Diesel Tanks
Ammonia	7664-41-7	Short term (lb/hr)	180	0.780821918	0	0	0	0		
paraffins (surrogate for analytical equip)	64771-72-8	Short term (lb/hr)	3500	0	0	0	0	0.0001724	0.0034	0.0050
1,1,2,2-Tetrachloroethane	79-34-5	Short term (lb/hr)	70	0.00228	0	0	0	0		
1,1,2-Trichloroethane	79-00-5	Short term (lb/hr)	550	0.0018126	0	0	0	0		
1,1-Dichloroethane	75-34-3	Short term (lb/hr)	4000	0.0013452	0	0	0	0		
1,2,3-Trimethylbenzene	526-73-8	Short term (lb/hr)	4400	0.001311	0	0	0	0		
1,2,4-Trimethylbenzene	95-63-6	Short term (lb/hr)	4400	0.0008151	0	0	0	0		
1,2-Dichloroethane	107-06-2	Short term (lb/hr)	650	0.0013452	0	0	0	0		
1,2-Dichloropropane	78-87-5	Short term (lb/hr)	460	0.0015333	0	0	0	0		
1,3,5-Trimethylbenzene	108-67-8	Short term (lb/hr)	4400	0.0019266	0	0	0	0		
1,3-Butadiene	106-99-0	Short term (lb/hr)	510	0.015219	0	0	0	0		
1,3-Dichloropropene	542-75-6	Short term (lb/hr)	45	0.0015048	0	0	0	0		
2,2,4-Trimethylpentane	540-84-1	Short term (lb/hr)	5600	0.01425	0	0	0	0		
2-Methylnaphthalene	91-57-6	Short term (lb/hr)	200	0	1.22353E-07	0	0	0		
Acenaphthene	83-32-9	Short term (lb/hr)	100	0	9.17647E-09	4.39312E-05	8.3496E-07	0		
Acenaphthylene	208-96-8	Short term (lb/hr)	100	0	9.17647E-09	8.6642E-05	2.97528E-06	0		
Acetaldehyde	75-07-0	Short term (lb/hr)	120	0.47652	0	0.000236552	0.000450996	0		
Acroleink	107-02-8	Short term (lb/hr)	3.2	0.073245	0	0.000073970	0.00005439	0		
Benzene	71-43-2	Short term (lb/hr)	170	0.02508	1.07059E-05	0.007284312	0.000548604	0		
Benzo[b]fluoranthene	205-99-2	Short term (lb/hr)	0.5	0	6.11765E-09	1.04196E-05	5.82708E-08	0		
Benzo[e]pyrene	192-97-2	Short term (lb/hr)	0.5	0	0	2.41246E-06	1.10544E-07	0		
Benzo[g,h,i]perylene	191-24-2	Short term (lb/hr)	0.5	0	6.11765E-09	5.21917E-06	2.87532E-07	0		
Biphenyl	92-52-4	Short term (lb/hr)	13	0	0	0	0	0		
Butane	106-97-8	Short term (lb/hr)	66000	0.030837	0	0	0	0		
Butyr/Isobutyraldehyde	123-72-8	Short term (lb/hr)	27	0.005757	0	0	0	0		
Carbon Tetrachloride k	56-23-5	Short term (lb/hr)	2400	0.0020919	0	0	0	0		
Chlorobenzene k	108-90-7	Short term (lb/hr)	460	0.0017328	0	0	0	0		
Chloroethane	75-00-3	Short term (lb/hr)	2700	0.00010659	0	0	0	0		
Chloroform k	67-66-3	Short term (lb/hr)	100	0.0016245	0	0	0	0		
Chrysene k	218-01-9 (PM)	Short term (lb/hr)	0.5	0.000039501	9.17647E-09	1.43621E-05	2.07564E-07	0		
Cyclopentane	287-92-3	Short term (lb/hr)	17000	0.012939	0	0	0	0		
Ethylbenzene k	100-41-4	Short term (lb/hr)	26000	0.0022629	0	0	0	0		
Ethylene Dibromide k	106-93-4	Short term (lb/hr)	150	0.0025251	0	0	0	0		
Fluoranthene k	206-44-0	Short term (lb/hr)	0.5	0	1.52941E-08	3.78296E-05	4.47468E-06	0		
Fluorene k	86-73-7	Short term (lb/hr)	10	0	1.42745E-08	0.000120154	1.71696E-05	0		
Formaldehyde k, l	50-00-0	Short term (lb/hr)	15	0.082191781	0.000382353	0.000740634	0.00069384	0		
Methanol k	67-56-1	Short term (lb/hr)	3900	0.1425	0	0	0	0		
Methylcyclohexane	108-87-2	Short term (lb/hr)	16100	0.07011	0	0	0	0		
Methylene Chloride k	75-09-2	Short term (lb/hr)	3600	0.00114	0	0	0	0		
Naphthalenek	91-20-3	Short term (lb/hr)	440	0	3.1098E-06	0.00122031	4.98624E-05	0		
Hexane	110-54-3	Short term (lb/hr)	5600	0.06327	0.009176471	0	0	0		
n-Nonane	111-84-2	Short term (lb/hr)	4800	0.00627	0	0	0	0		
n-Octane	111-65-9	Short term (lb/hr)	5600	0.020007	0	0	0	0		
n-Pentane	109-66-0	Short term (lb/hr)	59000	0.1482	0	0	0	0		
PAH k	130498-29-2 (PM	Short term (lb/hr)	0.5	0.0030666	0	0.000098784	0.000098784	0		
Perchloroethylene k, m	127-18-4	Short term (lb/hr)	2000	0.00014136	0	0	0	0		
Phenanthrene k	85-01-8	Short term (lb/hr)	8	0	8.66667E-08	0.00038299	1.72872E-05	0		
Phenol k	108-95-2	Short term (lb/hr)	150	0.001368	0	0	0	0		
Pyrene k	129-00-0	Short term (lb/hr)	0.5	0	2.54902E-08	3.48258E-05	2.81064E-06	0		
Styrene k	100-42-5	Short term (lb/hr)	110	0.0013452	0	0	0	0		
Toluene k	108-88-3	Short term (lb/hr)	4500	0.023256	1.73333E-05	0.002637747	0.000240492	0		
Vinyl Chloride k	75-01-4	Short term (lb/hr)	20000	0.0008493	0	0	0	0		
Xylene k	1330-20-7	Short term (lb/hr)	2200	0.010488	0	0.001811691	0.00016758	0		
3-methylcholanthrene	56-49-5	Short term (lb/hr)	0.02	0	9.17647E-09	0	0	0		
7,12-Dimethylbenz[a]anthracene	57-97-6	Short term (lb/hr)	0.5	0	8.15686E-08	0	0	0		
Anthracene	120-12-7	Short term (lb/hr)	1	0	1.22353E-08	0	0	0		
Benzo[a]anthracene	56-55-3	Short term (lb/hr)	0.5	0	9.17647E-09	5.83871E-06	9.8784E-07	0		
Dichlorobenzene	25321-22-6	Short term (lb/hr)	900	0	6.11765E-06	0	0	0		
Indeno[1,2,3-cd]pyrene	193-39-5	Short term (lb/hr)	0.5	0	9.17647E-09	3.88622E-06	2.205E-07	0		
Arsenic	7440-38-2	Short term (lb/hr)	3	0	1.01961E-06	0	0	0		
Beryllium	7440-41-7	Short term (lb/hr)	0.02	0	6.11765E-08	0	0	0		
Cadmium	7440-43-9	Short term (lb/hr)	5.4	0	5.60784E-06	0	0	0		
Chromium	7440-47-3	Short term (lb/hr)	3.6	0	7.13725E-06	0	0	0		
Cobalt	7440-48-4	Short term (lb/hr)	0.21	0	4.28235E-07	0	0	0		
Manganese	7439-96-5	Short term (lb/hr)	2.7	0	1.93725E-06	0	0	0		
Mercury	7439-97-6	Short term (lb/hr)	0.25	0	1.32549E-06	0	0	0		
Nickel	7440-02-0	Short term (lb/hr)	0.33	0	1.07059E-05	0	0	0		
Selenium	7782-49-2	Short term (lb/hr)	2	0	1.22353E-07	0	0	0		
Vanadium	7440-62-2	Short term (lb/hr)	0.66	0	1.17255E-05	0	0	0		

Step 2											Step 3					Step 6	
Production Only	MSS Only	Production Only	Production Only	MSS Only	MSS Only	All	All	All	All	All	Production Only	MSS Only	Production Only	MSS Only	All	All	All
Total Emissions Increase Production (lb/hr)	Total Emissions Increase MSS (lb/hr)	MERA de minimis Production	Below de minimis? Production	MERA de minimis MSS	Below de minimis? MSS	Combined de minimis Check	10% of short-term ESL (ug/m3)	Annual ESL	Long-term ESL >= 10% short-term ESL	Move on to step 3?	GLC total (ug/m3)	GLC total (ug/m3)	Less than or equal to 10% ESL?	Less Than or equal to 10% ESL?	Move on to step 6?	GLC total (ug/m3)	Less than ESL?
156.164	0	0.04	No	0.10	Yes	No	18.0	92	Yes	Yes	2547.6	-	No	-	Yes	20.51372	Yes
0.008	0.0034	0.40	Yes	0.40	Yes	Yes	350.0	350	Yes	No	-	-	-	-	No		
0.456	0	0.04	No	0.10	Yes	No	7.0	7	Yes	Yes	7.4	-	No	-	Yes	0.05985	Yes
0.363	0	0.10	No	0.10	Yes	No	55.0	55	Yes	Yes	5.9	-	Yes	-	No		
0.269	0	0.40	Yes	0.40	Yes	Yes	400.0	400	Yes	No	-	-	-	-	No		
0.262	0	0.40	Yes	0.40	Yes	Yes	440.0	54	No	Yes	4.3	-	Yes	-	No		
0.163	0	0.40	Yes	0.40	Yes	Yes	440.0	54	No	Yes	2.7	-	Yes	-	No		
0.269	0	0.00	No	0.10	Yes	No	650.0	2.9	No	Yes	4.4	-	Yes	-	No		
0.307	0	0.04	No	0.10	Yes	No	46.0	46	Yes	Yes	5.0	-	Yes	-	No		
0.385	0	0.40	Yes	0.40	Yes	Yes	440.0	54	No	Yes	6.3	-	Yes	-	No		
3.044	0	0.10	No	0.10	Yes	No	51.0	9.9	No	Yes	49.7	-	Yes	-	No		
0.301	0	0.04	No	0.10	Yes	No	4.5	4.5	Yes	Yes	4.9	-	No	-	Yes	0.03962	Yes
2.850	0	0.04	No	0.10	Yes	No	560.0	540	No	Yes	46.5	-	Yes	-	No		
7.10E-06	0	0.04	Yes	0.10	Yes	Yes	20.0	20	Yes	No	-	-	-	-	No		
0.002	0	0.00	No	0.10	Yes	No	10.0	10	Yes	Yes	0.4	-	Yes	-	No		Yes
0.004	0	0.00	No	0.10	Yes	No	10.0	10	Yes	Yes	0.8	-	Yes	-	No		
95.341	0	0.04	No	0.10	Yes	No	12.0	45	Yes	Yes	1593.1	-	No	-	Yes	12.50876	Yes
14.655	0	0.04	No	0.10	Yes	No	0.3	0.82	Yes	Yes	243.9	-	No	-	Yes	1.92493	Yes
5.341	0	0.04	No	0.10	Yes	No	17.0	4.5	No	Yes	176.5	-	No	-	Yes	0.6624	Yes
4.21E-04	0	0.04	Yes	0.10	Yes	Yes	0.1	0.05	Yes	No	-	-	-	-	No		
1.03E-04	0	0.00	No	0.10	Yes	No	0.1	0.05	Yes	Yes	0.026	-	Yes	-	No		
2.26E-04	0	0.04	Yes	0.10	Yes	Yes	0.1	0.05	Yes	No	-	-	-	-	No		
0.00E+00	0	0.00E+00	Yes	0.10	Yes	Yes	1.3	1.3	Yes	No	-	-	-	-	No		
6.167	0	0.04	No	0.10	Yes	No	6600.0	7100	Yes	Yes	100.6	-	Yes	-	No		
1.151	0	-	Yes	0.10	Yes	Yes	N/A	290	No	Yes	18.8	-	Yes	-	No		
0.418	0	0.00	No	0.10	Yes	No	240.0	2.8	No	Yes	6.8	-	Yes	-	No		
0.347	0	0.00	No	0.10	Yes	No	46.0	46	Yes	Yes	5.7	-	Yes	-	No		
0.021	0	0.00	No	0.10	Yes	No	270.0	270	Yes	Yes	0.3	-	Yes	-	No		
0.325	0	0.00	No	0.10	Yes	No	10.0	10	Yes	Yes	5.3	-	Yes	-	No		
0.008	0	0.00	No	0.10	Yes	No	0.1	0.05	Yes	Yes	0.2	-	No	-	Yes	0.00104	Yes
2.588	0	0.04	No	0.10	Yes	No	1700.0	1700	Yes	Yes	42.2	-	Yes	-	No		
0.453	0	0.00	No	0.10	Yes	No	2600.0	570	No	Yes	7.4	-	Yes	-	No		
0.505	0	0.04	No	0.10	Yes	No	15.0	0.22	No	Yes	8.2	-	Yes	-	No		
0.002	0	0.04	Yes	0.10	Yes	Yes	0.1	0.05	Yes	No	-	-	-	-	No		
0.006	0	0.10	Yes	0.10	Yes	Yes	1.0	1	Yes	No	-	-	-	-	No		
16.532	0	0.04	No	0.10	Yes	No	1.5	3.3	Yes	Yes	331.6	-	No	-	Yes	2.16378	Yes
28.500	0	0.10	No	0.10	Yes	No	390.0	2100	Yes	Yes	464.9	-	No	-	Yes	3.74737	Yes
14.022	0	0.04	No	0.10	Yes	No	1610.0	1610	Yes	Yes	228.8	-	Yes	-	No		
0.228	0	0.04	No	0.10	Yes	No	360.0	350	No	Yes	3.7	-	Yes	-	No		
0.052	0	0.00	No	0.10	Yes	No	44.0	50	Yes	Yes	12.4	-	Yes	-	No		
13.186	0	0.00	No	0.10	Yes	No	560.0	200	No	Yes	251.6	-	Yes	-	No		
1.254	0	0.40	No	0.40	Yes	No	480.0	450	No	Yes	20.5	-	Yes	-	No		
4.001	0	0.00	No	0.10	Yes	No	560.0	540	No	Yes	65.3	-	Yes	-	No		
29.640	0	0.10	No	0.10	Yes	No	5900.0	7100	Yes	Yes	483.5	-	Yes	-	No		
0.623	0	-	Yes	0.10	Yes	Yes	0.5	0.05	No	Yes	18.7	-	No	-	Yes	0.08359	Yes
0.028	0	0.40	Yes	0.40	Yes	Yes	200.0	26	No	Yes	0.5	-	Yes	-	No		
0.016	0	0.04	Yes	0.10	Yes	Yes	0.8	0.8	Yes	No	-	-	-	-	No		
0.274	0	0.00	No	0.10	Yes	No	15.0	3.3	No	Yes	4.5	-	Yes	-	No		
0.002	0	0.04	Yes	0.10	Yes	Yes	0.1	0.05	Yes	No	-	-	-	-	No		
0.269	0	0.04	No	0.10	Yes	No	11.0	140	Yes	Yes	4.4	-	Yes	-	No		
4.772	0	0.40	No	0.40	Yes	No	450.0	1200	Yes	Yes	113.6	-	Yes	-	No		
0.170	0	0.00	No	0.10	Yes	No	2000.0	1.2	No	Yes	2.8	-	Yes	-	No		
2.180	0	0.04	No	0.10	Yes	No	220.0	180	No	Yes	60.3	-	Yes	-	No		
5.32E-07	0	0.00	No	0.10	Yes	No	0.0	0.002	Yes	Yes	0.000045	-	Yes	-	No		
4.73E-06	0	0.40	Yes	0.40	Yes	Yes	0.1	0.05	Yes	No	-	-	-	-	No		
7.10E-07	0	0.40	Yes	0.40	Yes	Yes	0.1	0.1	Yes	No	-	-	-	-	No		
2.93E-04	0	0.40	Yes	0.40	Yes	Yes	0.1	0.05	Yes	No	-	-	-	-	No		
3.55E-04	0	0.04	Yes	0.10	Yes	Yes	90.0	160	Yes	No	-	-	-	-	No		
1.69E-04	0	0.40	Yes	0.40	Yes	Yes	0.1	0.05	Yes	No	-	-	-	-	No		Yes
5.98E-05	0	0.00	No	0.10	Yes	No	0.3	0.067	No	Yes	0.005	-	Yes	-	No		
3.59E-06	0	0.40	Yes	0.40	Yes	Yes	0.0	0.002	Yes	No	-	-	-	-	No		
3.29E-04	0	0.40	Yes	0.40	Yes	Yes	0.5	0.0033	No	Yes	0.028	-	Yes	-	No		
4.18E-04	0	0.40	Yes	0.40	Yes	Yes	0.4	0.041	No	Yes	0.035	-	Yes	-	No		
2.51E-05	0	0.40	Yes	0.40	Yes	Yes	0.0	0.0017	No	Yes	0.002	-	Yes	-	No		
1.14E-04	0	0.00	No	0.10	Yes	No	0.3	0.25	No	Yes	0.010	-	Yes	-	No		
7.77E-05	0	0.10	Yes	0.10	Yes	Yes	0.0	0.025	Yes	No	-	-	-	-	No		
0.001	0	0.04	Yes	0.10	Yes	Yes	0.0	0.059	Yes	No	-	-	-	-	No		
7.17E-06	0	0.04	Yes	0.10	Yes	Yes	0.2	0.2	Yes	No	-	-	-	-	No		
0.001	0	0.04	Yes	0.10	Yes	Yes	0.7	0.066	No	Yes	0.1	-	Yes	-	No		

ATTACHMENT 3
MERA Evaluation

Annual Average Emission Rates (lb/hr)		Averaging Time (Units)	Long Term ESL (ug/m^3)	Bergen Engines	Line Heaters	Emergency Generators	Fire Water Pump	Lube Oil Vent	MSS Anal Equip.	All Diesel Tanks		Total Emissions Increase Production (lb/hr)	Total Emissions Increase MSS (lb/hr)					10% of short-term ESL (ug/m^3)			GLC total (ug/m^3)	GLC total (ug/m^3)	Less than or equal to 10% ESL?	Less Than or equal to 10% ESL?	Move on to step 6?		Less than ESL?
Ammonia	7664-41-7	Long term (lb/hr)	92	0.650684932				0.0001724	0.0034			130.137	0					9.2			154.9	-	No	-	Yes	1.25645	Yes
paraffins (surrogate for analytical equip)	64771-72-8	Long term (lb/hr)	350									0.003	0					35.0			-	-	-	-	No		
1,1,2,2-Tetrachloroethane	79-34-5	Long term (lb/hr)	7	0.0019	0	0	0	0				0.380	0					0.7			0.5	-	Yes	-	No		Yes
1,1,2-Trichloroethane	79-00-5	Long term (lb/hr)	55	0.0015105	0	0	0	0				0.302	0					5.5			0.4	-	Yes	-	No		
1,1-Dichloroethane	75-34-3	Long term (lb/hr)	400	0.001121	0	0	0	0				0.224	0					40.0			-	-	-	-	No		
1,2,3-Trimethylbenzene	526-73-8	Long term (lb/hr)	54	0.0010925	0	0	0	0				0.219	0					5.4			0.3	-	Yes	-	No		
1,2,4-Trimethylbenzene	95-63-6	Long term (lb/hr)	54	0.00067925	0	0	0	0				0.136	0					5.4			0.2	-	Yes	-	No		
1,2-Dichloroethane	107-06-2	Long term (lb/hr)	2.9	0.001121	0	0	0	0				0.224	0					0.3			0.3	-	Yes	-	No		
1,2-Dichloropropane	78-87-5	Long term (lb/hr)	46	0.00127775	0	0	0	0				0.256	0					4.6			0.3	-	Yes	-	No		
1,3,5-Trimethylbenzene	108-67-8	Long term (lb/hr)	54	0.0016055	0	0	0	0				0.321	0					5.4			0.4	-	Yes	-	No		
1,3-Butadiene	106-99-0	Long term (lb/hr)	9.9	0.0126825	0	0	0	0				2.537	0					1.0			3.0	-	No	-	Yes	0.02448	Yes
1,3-Dichloropropene	542-75-6	Long term (lb/hr)	4.5	0.001254	0	0	0	0				0.251	0					0.5			0.3	-	Yes	-	No		
2,2,4-Trimethylpentane	540-84-1	Long term (lb/hr)	540	0.011875	0	0	0	0				2.375	0					54.0			2.8	-	Yes	-	No		
2-Methylnaphthalene	91-57-6	Long term (lb/hr)	20	0	1.22353E-07	0	0	0				2.49E-06	0					2.0			-	-		-	No		
Acenaphthene	83-32-9	Long term (lb/hr)	10	0	9.17647E-09	5.01497E-07	9.53151E-09	0				2.08E-05	0					1.0			3.15E-04	-	Yes	-	No		
Acenaphthylene	208-96-8	Long term (lb/hr)	10	0	9.17647E-09	9.89064E-07	3.39644E-08	0				4.18E-05	0					1.0			6.55E-04	-	Yes	-	No		
Acetaldehyde	75-07-0	Long term (lb/hr)	45	0.3971	0	2.70037E-06	5.14836E-06	0				79.420	0					4.5			94.6	-	No	-	Yes	0.76675	Yes
Acroleink	107-02-8	Long term (lb/hr)	0.82	0.0610375	0	8.44401E-07	6.2089E-07	0				12.208	0					0.1			14.5	-	No	-	Yes	0.11786	Yes
Benzene	71-43-2	Long term (lb/hr)	4.5	0.0209	1.07059E-05	8.31542E-05	6.2626E-06	0				4.184	0					0.5			5.0	-	No	-	Yes	0.04065	Yes
Benzo[b]fluoranthene	205-99-2	Long term (lb/hr)	0.05	0	6.11765E-09	1.18945E-07	6.65192E-10	0				4.92E-06	0					0.0			-	-	-	-	No		
Benzo[e]pyrene	192-97-2	Long term (lb/hr)	0.05	0	0	2.75395E-08	1.26192E-09	0				1.18E-06	0					0.0			0.000019	-	Yes	-	No		
Benzo[g,h,i]perylene	191-24-2	Long term (lb/hr)	0.05	0	6.11765E-09	5.95796E-08	3.28233E-09	0				2.70E-06	0					0.0			-	-	-	-	No		
Biphenyl	92-52-4	Long term (lb/hr)	1.3	0	0	0	0	0				0.00E+00	0					0.1			-	-	-	-	No		
Butane	106-97-8	Long term (lb/hr)	7100	0.0256975	0	0	0	0				5.140	0					710.00			6.1	-	Yes	-	No		
Butyr/Isobutyraldehyde	78-84-2	Long term (lb/hr)	290	0.0047975	0	0	0	0				0.960	0					29.0			1.1	-	Yes	-	No		
Carbon Tetrachloride k	56-23-5	Long term (lb/hr)	2.8	0.00174325	0	0	0	0				0.349	0					0.28			0.4	-	No	-	Yes	0.00337	Yes
Chlorobenzene k	108-90-7	Long term (lb/hr)	46	0.001444	0	0	0	0				0.289	0					4.6			0.3	-	Yes	-	No		
Chloroethane	75-00-3	Long term (lb/hr)	270	0.000888825	0	0	0	0				0.018	0					27.0			2.11E-02	-	Yes	-	No		
Chloroform k	67-66-3	Long term (lb/hr)	10	0.0013575	0	0	0	0				0.271	0					1.0			0.3	-	Yes	-	No		
Chrysene k	218-01-9 (PM)	Long term (lb/hr)	0.05	3.29175E-05	9.17647E-09	1.63951E-07	2.36945E-09	0				0.007	0					0.005			7.94E-03	-	No	-	Yes	6.00E-05	Yes
Cyclopentane	287-92-3	Long term (lb/hr)	1700	0.0107825	0	0	0	0				2.157	0					170.0			2.6	-	Yes	-	No		
Ethylbenzene k	100-41-4	Long term (lb/hr)	570	0.00188575	0	0	0	0				0.377	0					57.0			0.4	-	Yes	-	No		
Ethylene Dibromide k	106-93-4	Long term (lb/hr)	0.22	0.00210425	0	0	0	0				0.421	0					0.022			0.5	-	No	-	Yes	0.00406	Yes
Fluoranthene k	206-44-0	Long term (lb/hr)	0.05	0	1.52941E-08	4.31845E-07	5.10808E-08	0				2.06E-05	0					0.0			-	-	-	-	No		
Fluorene k	86-73-7	Long term (lb/hr)	1	0	1.42745E-08	1.37162E-06	0.000000196	0				6.69E-05	0					0.1			-	-	-	-	No		
Formaldehyde k, l	50-00-0	Long term (lb/hr)	3.3	0.068493151	0.000382353	8.45473E-06	7.92055E-06	0				13.707	0					0.3			16.4	-	No	-	Yes	0.13276	Yes
Methanol k	67-56-1	Long term (lb/hr)	2100	0.11875	0	0	0	0				23.750	0					210.0			28.3	-	Yes	-	No		
Methylcyclohexane	108-87-2	Long term (lb/hr)	1610	0.058425	0	0	0	0				11.685	0					161.0			13.9	-	Yes	-	No		
Methylene Chloride k	75-09-2	Long term (lb/hr)	350	0.00095	0	0	0	0				0.190	0					35.0			0.2	-	Yes	-	No		
Naphthalenek	91-20-3	Long term (lb/hr)	50	0	3.1098E-06	1.39305E-05	5.69205E-07	0				0.001	0					5.0			1.01E-02	-	Yes	-	No		
Hexane	110-54-3	Long term (lb/hr)	200	0.052725	0.009176471	0	0	0				10.731	0					20.0			14.6	-	Yes	-	No		
n-Nonane	111-84-2	Long term (lb/hr)	450	0.005225	0	0	0	0				1.045	0					45.0			1.2	-	Yes	-	No		
n-Octane	111-65-9	Long term (lb/hr)	540	0.0166725	0	0	0	0				3.335	0					54.0			4.0	-	Yes	-	No		
n-Pentane	109-66-0	Long term (lb/hr)	7100	0.1235	0	0	0	0				24.700	0					710.0			29.4	-	Yes	-	No		
PAH k	130498-29-2 (PM	Long term (lb/hr)	0.05	0.0025555	0	1.12767E-06	1.12767E-06	0				0.511	0					0.005			0.6	-	No	-	Yes	0.00496	Yes
Perchloroethylene k, m	127-18-4	Long term (lb/hr)	26	0.0001178	0	0	0	0				0.024	0					2.6			2.80E-02	-	Yes	-	No		
Phenanthrene k	85-01-8	Long term (lb/hr)	0.8	0	8.66667E-08	4.37203E-06	1.97342E-07	0				1.88E-04	0					0.1			-	-	-	-	No		
Phenol k	108-95-2	Long term (lb/hr)	3.3	0.00114	0	0	0	0				0.228	0					0.3			0.3	-	Yes	-	No		
Pyrene k	129-00-0	Long term (lb/hr)	0.05	0	2.54902E-08	3.97554E-07	3.20849E-08	0				1.83E-05	0					0.0			-	-	-	-	No		
Styrene k	100-42-5	Long term (lb/hr)	140	0.001121	0	0	0	0				0.224	0					14.0			0.3	-	Yes	-	No		
Toluene k	108-88-3	Long term (lb/hr)	1200	0.01938	1.73333E-05	3.01113E-05	2.74534E-06	0				3.878	0					120.0			4.6	-	Yes	-	No		
Vinyl Chloride k	75-01-4	Long term (lb/hr)	1.2	0.00070775	0	0	0	0				0.142	0					0.1			0.2	-	No	-	Yes	0.00137	Yes
Xylene k	1330-20-7	Long term (lb/hr)	180	0.00874	0	2.06814E-05	1.91301E-06	0				1.749	0					18.0			2.1	-	Yes	-	No		
3-methylcholanthrene	56-49-5	Long term (lb/hr)	0.002	0	9.17647E-09	0	0	0				1.86E-07	0					0.0			2.04E-06	-	Yes	-	No		
7,12-Dimethylbenz[a]anthracene	57-97-6	Long term (lb/hr)	0.05	0	8.15686E-08	0	0	0				1.66E-06	0					0.0			-	-	-	-	No		
Anthracene	120-12-7	Long term (lb/hr)	0.1	0	1.22353E-08	0	0	0				2.49E-07	0					0.0			-	-	-	-	No		
Benzo[a]anthracene	56-55-3	Long term (lb/hr)	0.05	0	9.17647E-09	6.6652E-08	1.12767E-08	0				3.53E-06	0					0.0			-	-	-	-	No		
Dichlorobenzene	25321-22-6	Long term (lb/hr)	160	0	6.11765E-06	0	0	0				1.24E-04	0					16.0			-	-	-	-	No		
Indeno[1,2,3-cd]pyrene	193-39-5	Long term (lb/hr)	0.05	0	9.17647E-09	4.43632E-08	2.51712E-09	0				2.11E-06	0					0.0			-	-	-	-	No		
Arsenic	7440-38-2	Long term (lb/hr)	0.067	0	1.01961E-06	0	0	0				2.07E-05	0					0.0			2.26E-04	-	Yes	-	No		
Beryllium	7440-41-7	Long term (lb/hr)	0.002	0	6.11765E-08	0	0	0				1.24E-06	0					0.0			-	-	-	-	No		
Cadmium	7440-43-9	Long term (lb/hr)	0.0033	0	5.60784E-06	0	0	0				1.14E-04	0					0.0003			0.00125	-	No	-	Yes	2.00E-05	Yes
Chromium	7440-47-3	Long term (lb/hr)	0.041	0	7.13725E-06	0	0	0				1.45E-04	0					0.0			1.58E-03	-	Yes	-	No		
Cobalt	7440-48-4	Long term (lb/hr)	0.0017	0	4.28235E-07	0	0	0				8.70E-06	0					0.0			9.51E-05	-	Yes	-	No		
Manganese	7439-96-5	Long term (lb/hr)	0.25	0	1.93725E-06	0	0	0				3.94E-05	0					0.0			4.30E-04	-	Yes	-	No		
Mercury	7439-97-6	Long term (lb/hr)	0.025	0	1.32549E-06	0	0	0				2.69E-05	0					0.0			-	-	-	-	No		
Nickel	7440-02-0	Long term (lb/hr)	0.059	0	1.07059E-05	0	0	0				2.18E-04	0					0.0			-	-	-	-	No		
Selenium	7782-49-2	Long term (lb/hr)	0.2	0	1.22353E-07	0	0	0				2.49E-06	0					0.0			-	-	-	-	No		
Vanadium	7440-62-2	Long term (lb/hr)	0.066	0	1.17255E-05	0	0	0				2.38E-04	0					0.0			2.60E-03	-	Yes	-	No		

Notes:
ug/m3 = micrograms per cubic meter
lb/hr = pound per hour