



December 22, 2025

Delivery by e-Mail

Alaska Department of Environmental Conservation
Air Permit Program
Attention: Permit Intake Clerk
555 Cordova Street
Anchorage, Alaska 99501

**Subject: Application for an Owner Requested Limit
Kenai LNG LLC
Kenai LNG Plant – Import Terminal Project**

Dear Sir or Madam,

Kenai LNG LLC, a wholly owned subsidiary of Harvest Alaska, LLC, (Harvest) submits the enclosed application to request an Owner Requested Limit (ORL) under 18 Alaska Administrative Code (AAC) 50.508(5) for the Import Terminal Project that is located at the Kenai LNG Plant (KLNG) near Nikiski, Alaska. Please note, on December 18, 2025, a request to change the Responsible Official to Ms. Cindy Monnin with Harvest for KLNG has been recently provided.

As required under 18 AAC 50.400(h), Kenai LNG LLC is required to pay an hourly administration fee for a designated regulatory service to process this application.

If you have any questions regarding this request, please call me at (907) 335-7475 or Chris Lindsey with SLR International Corporation at (907) 264-6919.

Sincerely,

A handwritten signature in black ink, appearing to read "Kijun-Hong".

Kijun-Hong
Environmental Specialist, Harvest Alaska, LLC

Encl.: Application for an Owner Requested Limit (Hardcopy and Electronic Copy)

cc: Chris Lindsey, SLR



Application for an Owner Requested Limit

Kenai LNG Plant

Kenai LNG LLC

3800 Centerpoint Drive, Suite 1300
Anchorage, AK 99503

Prepared by:

SLR International Corporation

2700 Gambell Street, Suite 200, Anchorage, Alaska, 99503

SLR Project No.: 105.021468.00001

December 22, 2025

Table of Contents

1.0 Stationary Source ID Form 1

Attachments

- Attachment A** Summary of Required Application Elements
- Attachment B** Detailed Emission Calculations
- Attachment C** Owner Requested Limit Application Requirements under 18 AAC 50.540(j)
- Attachment D** Vendor Data
- Attachment E** Letter from Mr. Lee M. Zeldin with EPA Regarding New Source Review Program “Reactivation Policy”



1.0 Stationary Source ID Form



**Alaska Department of Environmental Conservation
Air Quality Minor Permit Application**



STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

| | | | |
|--|--|---------------------|-------------------------|
| Name: Kenai LNG Plant | | | SIC: 4924 |
| Project Name (if different): Import Terminal Project | | Contact: Kijun Hong | |
| Physical Address: 48237 Kenai Spur Highway | City: Kenai | State: AK | Zip: 99611 |
| | Telephone: 907.335.7545 | | |
| | E-Mail Address: khong@harvestmidstream.com | | |
| UTM Coordinates (m) or Latitude/Longitude: | Northing: | Easting: | Zone: |
| | Latitude: 60° 40' 42" North | | Longitude: 151° 22' 59" |

Section 2 Legal Owner

| | | |
|---|-----------|------------|
| Name: Kenai LNG LLC | | |
| Mailing Address: 3800 Centerpoint Dr., Suite 1400 | | |
| City: Anchorage | State: AK | Zip: 99503 |
| Telephone #: | | |
| E-Mail Address: | | |

Section 3 Operator (if different from owner)

| | | |
|---|-----------|------------|
| Name: Harvest Alaska, LLC | | |
| Mailing Address: 3800 Centerpoint Drive, Suite 1400 | | |
| City: Anchorage | State: AK | Zip: 99503 |
| Telephone #: | | |
| E-Mail Address: | | |

Section 4 Designated Agent (for service of process)

| | | |
|------------------|--------|------|
| Name: | | |
| Mailing Address: | | |
| City | State: | Zip: |
| Telephone #: | | |
| E-Mail Address: | | |

Section 5 Billing Contact Person (if different from owner)

| | | |
|--|-----------|------------|
| Name: Kijun Hong | | |
| Mailing Address: 48237 Kenai Spur Highway | | |
| City: Kenai | State: AK | Zip: 99611 |
| Telephone #: 907.335.7545 | | |
| E-Mail Address: khong@harvestmidstream.com | | |

Section 6 Application Contact

| | | | |
|---|--|-----------|------------|
| Name: Chris Lindsey | | | |
| Mailing Address: 2700 Gambell Street, Suite 200 | City: Anchorage | State: AK | Zip: 99503 |
| | Telephone: 907.264.6916 | | |
| | E-Mail Address: clindsey@slrconsulting.com | | |

Section 7 Desired Process Method (Check only one – see 18 AAC 50.542(a) for process descriptions and restrictions)

- Fast track for a permit classification under 18 AAC 50.502 [18 AAC 50.542(b)]
 Public comment [18 AAC 50.542(d)]

STATIONARY SOURCE IDENTIFICATION FORM

Section 8 Source Classification(s) (Check all that apply)

[18 AAC 50.502(b)]

- Asphalt Plant [≥ 5 ton per hour]
- Thermal Soil Remediation Unit [≥ 5 ton per hour]
- Rock Crusher [≥ 5 ton per hour]
- Incinerator(s) [total rated capacity ≥ 1000 lb/hour]
- Coal Preparation Plant
- Port of Anchorage Facility

If you checked any of the above, is (are) the emission unit(s) new, relocated*, or existing?

[18 AAC 50.502(c)(1)]

New or relocated* stationary source with potential emissions greater than:

- 40 tons per year (tpy) NOx
- 40 tpy SO₂
- 15 tpy PM-10
- 10 tpy PM-2.5
- 0.6 tpy lead
- 100 tpy CO in a nonattainment area

[18 AAC 50.502(c)(2)]

Construction or relocation* of a:

- Portable oil and gas operation
- ≥ 10 MMBtu/hr fuel burning equipment in a SO₂ special protection area

* Relocation does NOT include moving equipment from one place to another within your current stationary source boundary.

Section 9 Modification Classification(s) (Check all that apply)

[18 AAC 50.502(c)(3)]

- NOx Increase > 10 tpy [and existing PTE > 40 tpy]
- SO₂ Increase > 10 tpy [and existing PTE > 40 tpy]
- PM-10 Increase > 10 tpy [and existing PTE > 15 tpy]
- PM-2.5 Increase > 10 tpy [and existing PTE > 10 tpy]
- CO Increase > 100 tpy [and existing PTE > 100 tpy in a nonattainment area]

[18 AAC 50.502(c)(4)]

- NOx Increase > 40 tpy [and existing PTE ≤ 40 tpy]
- SO₂ Increase > 40 tpy [and existing PTE ≤ 40 tpy]
- PM-10 Increase > 15 tpy [and existing PTE ≤ 15 tpy]
- PM-2.5 Increase > 10 tpy [and existing PTE ≤ 10 tpy]
- CO Increase > 100 tpy [and Existing PTE ≤ 100 tpy in a nonattainment area]

Basis for calculating modification:

- Projected actual emissions minus baseline actual emissions
- New potential emissions minus existing potential emissions

Section 10 Permit Action Request (Check all that apply)

[18 AAC 50.508]

- Establish Plant-wide Applicability Limitation (PAL)
 - Establish emission reductions to offset nonattainment pollutant
 - Owner Requested Limit* (ORL)
 - Revise or Rescind Title I Permit Conditions *
- Permit Number: _____ Condition No. _____
Date: _____

*Which to use? See <http://www.dec.state.ak.us/air/ap/docs/orlrtc.pdf>

Section 11 Existing Permits and Limits

For an existing stationary source, do you have an existing: (Check all that apply)

- Air quality permit Number(s)*: AQ0090TVP03
9323-AA007

- Owner Requested Limit(s) Permit Number(s):
- Pre-Approved Emission Limit (PAEL) Number(s)**:

* All active construction, Title V, and minor permit numbers.

**Optional. Please provide this number if possible.

<http://dec.alaska.gov/Applications/Air/airtoolsweb/>

STATIONARY SOURCE IDENTIFICATION FORM

Section 12 Project Description

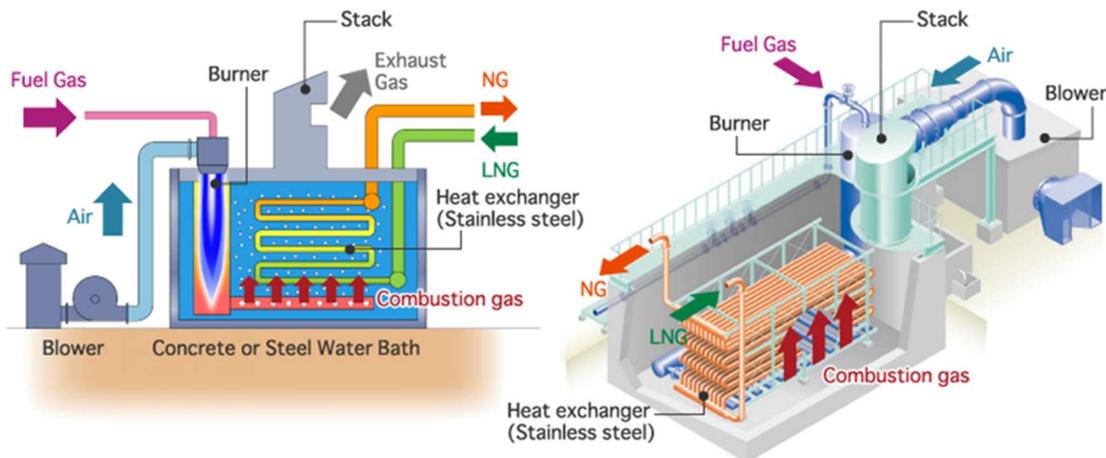
Provide a short narrative describing the project. Discuss the purpose for conducting this project, what emission units/activities will be added/modified under this project (i.e., project scope), and the project timeline. If the project is a modification to an existing stationary source, describe how this project will affect the existing process. Include any other discussion that may assist the Department in understanding your project or processing your application. Include a schedule of construction.

Please use additional copies of this sheet if necessary.

Kenai LNG LLC owns and is authorized to operate the Kenai LNG Plant under Air Quality Operating Permit No. AQ0090TVP03. The Kenai LNG Plant is originally designed to liquify natural gas to produce liquified natural gas (LNG) and includes LNG storage and loading facilities for export. Currently, the Kenai LNG Plant is in a standby mode where the equipment is minimally operated, inspected on intervals, and kept in a steady state to maintain operability and integrity.

Under this permit application, Kenai LNG LLC proposes to utilize some of the existing infrastructure associated with the Kenai LNG Plant and install additional equipment to allow the plant to act as an LNG Import Terminal. The proposed changes include the addition of vaporizer technology with a vaporization capacity of 17.5 billion cubic feet per year (BCF/yr) and additional supporting equipment to accommodate a regasification rate and associated operational requirements of the Project. The vaporizer(s) will be used to provide makeup to the boil-off gas (BOG) production in order to meet the total gas export targets to customers specified for the Project. While the Kenai LNG Import Terminal is designed to achieve a net gas send-out rate of 17.5 BCF/yr, each Submerged Combustion Vaporizer (SCV) must be capable of operating at a maximum daily rate to meet seasonal peak demand. Refer to Figure 1 for a schematic of an SCV.

Figure 1. Main Components for Submerged Combustion Vaporizer



Each of the two SCVs for this project will utilize a natural gas-fired combustion air blower with a required total gross heat input of 63.4 million British thermal units per hour (MMBtu/hr). These combustion air blowers are the only combustion equipment being added to the source by the Project. To accommodate varying send-out rates, the SCV system will be equipped with three (3) electrically powered high-pressure (HP) LNG Vaporizer Feed Pumps per SCV, which will be used to modulate LNG flow to the vaporizers based on real-time demand and allow for efficient turndown during periods of low consumption. To manage the anticipated increase in BOG generated during LNG carrier offloading operations, the design of this project also includes additional electrically driven BOG compression equipment to capture BOG. Under the existing facility design, BOG gas is vented. BOG compression will ensure collection of gas which is a valuable product of the Plant. This enhancement is also intended to maintain safe operating conditions and eliminate the need for routine BOG

STATIONARY SOURCE IDENTIFICATION FORM

venting during normal operations, consistent with modern LNG facility design practices and emissions reduction goals. As a result, emissions associated with the BOG Vent for the LNG Storage Tanks (Emissions Unit ID 22 under Title V Operating Permit AQ0090TVP03) are not anticipated to occur under normal operations.

To mitigate the risk of failure from aging or obsolete legacy equipment, the Import Terminal Project will replace or upgrade select systems with new, modernized equipment that meets current standards. These upgrades which do not result in emissions or installing emissions units will include the Process and Safety Control System, new power distribution equipment to support the additional load, and an upgraded water treatment system. These changes are intended to enhance operational safety, reliability, and overall facility efficiency.

Under this permit application, the Import Terminal Project will utilize the following new equipment:

- Two (2) new SCVs with a design capacity of 100 million standard cubic feet per day (MMscfd). Each of the SCV systems will include natural gas-fired auxiliary combustion air blowers and a dedicated water recycle system to support sustained and efficient vaporization operations.
- Six (6) new 840 gallons per minute (gpm) electrically driven HP LNG Vaporizer Feed Pumps
- Two (2) new 700 horsepower (hp) electrically driven BOG/FG Compressors
- Two (2) new 750 hp electrically driven BOG Pipeline Compressors
- Two (2) new 1.3 MMBtu/hr electrically driven BOG Pipeline Compressor Discharge Air Coolers
- One (1) new 6,000 hp electrically driven BOG Offloading Compressor for the BOG Vent
- One (1) new 5.2 MMBtu/hr electrically driven BOG Offloading Compressor Discharge Cooler
- Two (2) new 500 gpm electrically driven LNG Tank Circulation Pumps.

All electrically driven equipment will receive offsite power from the local utility grid.

In addition, the Project will utilize the following existing permitted equipment at the Kenai LNG Plant:

- One (1) existing 350 kilowatt (kW) diesel-fired emergency generator engine (Emissions Unit ID 11)
- One (1) existing 375 hp diesel-fired emergency fire water pump engine (Emissions Unit ID 12)
- One (1) existing 375 hp diesel-fired emergency fire water pump engine (Emissions Unit ID 13)
- One (1) existing 231 hp diesel-fired emergency fire water pump engine (Emissions Unit ID 14)
- One (1) existing 78 hp diesel-fired air compressor engine (Emissions Unit ID 17)
- One (1) existing boil-off gas vent (Emissions Unit ID 22)
- One (1) existing 1,015 gallons gasoline storage and dispensing tank (Emissions Unit ID 23)

Under this Project, potential emissions for the stationary source are anticipated to increase as a result of the two (2) new combustion air blowers associated with the SCVs. An Owner Requested Limit (ORL) is proposed for this Project under 18 AAC 50.508(5) to limit potential nitrogen oxides (NO_x) emissions associated with the SCVs to avoid a classification under 18 AAC 50.502(c)(3)(A) for a physical change to the Kenai LNG Plant stationary source. All existing permitted emissions units will continue to operate under any limits and requirements as authorized by existing underlying permits.

As demonstrated under Attachment B3 of this application, no major modification, as defined under 40 Code of Federal Regulation (CFR) 52.21, to the existing major stationary source will occur as a result of the Project. In addition to the increase in emissions associated with the new SCV combustion air blowers, changes in emissions for other existing permitted equipment at the Kenai LNG Plant will occur. The BOG vent (Emissions Unit ID 22) is anticipated to undergo a change under the Project for the addition of compression and associated equipment as LNG is received as an import rather than an export. However, as previously stated, the BOG vent is not expected to have any projected actual emissions increase because the need for routine BOG venting in the future during normal operations will be eliminated. All other sources of pollutant emissions for other existing permitted equipment associated with this Project will not contribute to an exceedance of the major modification thresholds for the stationary source.

No modification or reconstruction, as defined under the New Source Performance Standards (NSPS) or the National Emission Standards for Hazardous Air Pollutants (NESHAP), will occur for any equipment associated with the Project.

On November 27, 2017, ConocoPhillips Alaska (CPAI), a previous owner of the Kenai LNG Plant, submitted a letter to Ms. Denise Koch with the Alaska Department of Environmental Conservation (ADEC) indicating that the source was transitioned into “standby mode” rather than shutting down the plant to allow for resumption of future export operations. At the time, the ADEC adopted and applied the United States Environmental Protection Agency’s (EPA) New Source

STATIONARY SOURCE IDENTIFICATION FORM

Review (NSR) Reactivation Policy. As stated in that letter, the decision to maintain the Kenai LNG Plant in “standby mode” was supported by the Policy such that new permits are not required when a facility suspends normal operations for a temporary period during which the facility is maintained, as opposed to a facility that shuts down completely but is later reactivated. On December 7, 2017, Mr. Jim Plosay with ADEC replied to the CPAI letter acknowledging the standby operational plan of the Kenai LNG Plant. Additionally, under the ADEC reply, Mr. Plosay indicated that the Department would need to consider all such factors listed under the Policy in evaluating the intent of the standby operating period at some point in the future. It is important to note that the stationary source has remained in “standby mode” since the 2017 correspondence.

Even though the Kenai LNG Plant has remained in a standby operating mode status since the 2017 correspondence previously referenced, a recent letter from EPA dated September 18, 2025, indicates that “EPA will no longer apply the Reactivation Policy to classify resuming operation of a stationary source as construction of a new source in EPA permitting and enforcement actions on a national basis.” A copy of the EPA letter is provided under Attachment E. The letter states, “Thus, a restart of an idled facility involving a physical change (or a change in the method of operation at the source other than simply restarting) will still require a PSD permit [if] it qualifies as a “major modification” by virtue of the nature of the change and the degree to which it results in an increase in regulated NSR pollutant emissions.” This application to request an owner requested limit documents review of PSD major modification permit applicability. For these reasons, Harvest believes that ADEC should no longer adopt and apply the EPA (EPA) New Source Review (NSR) Reactivation Policy for this project.

STATIONARY SOURCE IDENTIFICATION FORM

Section 12 Project Description Continued

For **PALs under Section 10** of this application, include the information listed in 40 C.F.R. 52.21(aa)(3), adopted by reference in 18 AAC 50.040 [18 AAC 50.540(h)].

N/A

For a **limit to establish offsetting emissions under Section 10** of this application, specify the physical or operational limitations necessary to provide actual emission reductions of the nonattainment air pollutant; including [18 AAC 50.540(i)]:

- A calculation of the expected reduction in actual emissions; and

N/A

- The emission limitation representing that quantity of emission reduction.

N/A

STATIONARY SOURCE IDENTIFICATION FORM

Section 12 Project Description Continued

For **ORLs under Section 10** of this application [18 AAC 50.540(j)], include:

A description of each proposed limit, including for each air pollutant a calculation of the effect the limit will have on the stationary source's potential to emit and the allowable emissions [18 AAC 50.225(b)(4)];

See Attachment B3 and Attachment C.

A description of a verifiable method to attain and maintain each limit, including monitoring and recordkeeping requirements [18 AAC 50.225(b)(5)];

See Attachment C.

Citation to each requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement [18 AAC 50.225(b)(6)];

See Attachment C.

A statement that the owner or operator of the stationary source will be able to comply with each limit [18 AAC 50.225(b)(8)];

See Attachment C.

STATIONARY SOURCE IDENTIFICATION FORM

Section 12 Project Description Continued

For revising or rescinding Title I permit conditions under Section 10 of this application [18 AAC 50.540(k)], include:

An explanation of why the permit term or condition should be revised or rescinded [18 AAC 50.540(k)(2)];

N/A

The effect of revising or revoking the permit term or condition on [18 AAC 50. 540 (k)(3)]:

- Emissions;

N/A

- Other permit terms;

N/A

- The underlying ambient demonstration, if any;

N/A

- Compliance monitoring; and

N/A

For revising a condition that allows avoidance of a permit classification, the information required for that type of permit, unless the revised condition would also allow the owner or operator to avoid the classification. [18 AAC 50.540(k)(4)]

N/A

STATIONARY SOURCE IDENTIFICATION FORM

Section 13 Other Application Material

The information listed below must be included in your air quality control minor permit application. *Note: These must be attached in order for your application to be complete.*

If required to submit an analysis of ambient air quality under 18 AAC 50.540(c)(2), or if otherwise requested by the Department:

- Attached are maps, plans, and/or aerial photographs as necessary to show the locations and distances of
 - emissions units, buildings, emitting activities and boundaries of the associated with the stationary source, and
 - nearby or adjacent residences, roads, other occupied structures and general topography within 15 kilometers.

(Indicate compass direction and scale on each.)

- Attached is a document (e.g., spreadsheet) showing coordinates and elevations of each modeled unit, along with parameters necessary to characterize each unit for dispersion modeling.

- Attached is an electronic copy of all modeling files.

Section 14 Certification

This certification applies to the Air Quality Control Minor Permit Application for the Kenai LNG Plant submitted to the Department on: Dec-2025 (Stationary Source Name)

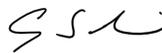
Type of Application

- Initial Application
- Change to Initial Application

The application is **NOT** complete unless the certification of truth, accuracy, and completeness on this form bears the signature of a **Responsible Official**. Responsible Official is defined in 18 AAC 50.990. (18 AAC 50.205)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

“Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.”

| | |
|--|--------------------|
| Signature:  | Date: 12/22/25 |
| Printed Name: Cindy Monnin | Title: Regional VP |

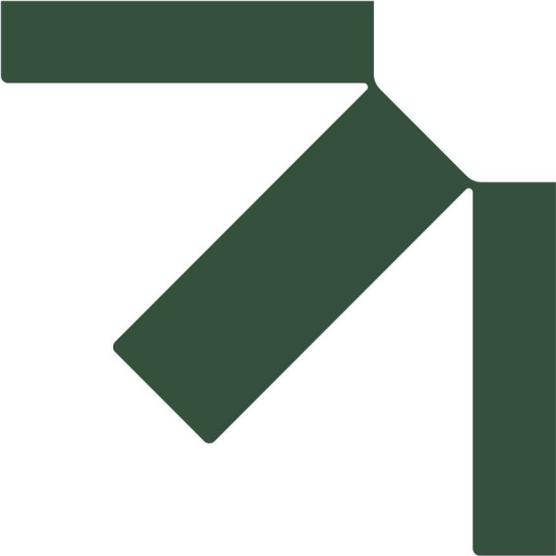
Section 15 Attachments

- Attachments Included. List attachments:
 - A – Summary of Required Application Elements
 - B – Detailed Emissions Calculations
 - C – Owner Requested Limit Application Requirements under 18 AAC 50.540(j)
 - D – Vendor Data
 - E – Letter from Mr. Lee M. Zeldin with EPA Regarding New Source Review Program “Reactivation Policy”

Section 16 Mailing Address

Submit the minor permit application to the Permit Intake Clerk in the Department's Anchorage office. Submitting to a different office will delay processing. The mailing address and phone number for the Anchorage office is:

Alaska Department of Environmental Conservation
Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-4718



Attachment A

Summary of Required Application Elements

Application for an Owner Requested Limit

Kenai LNG Plant

Kenai LNG LLC

SLR Project No.: 105.021468.00001

December 22, 2025



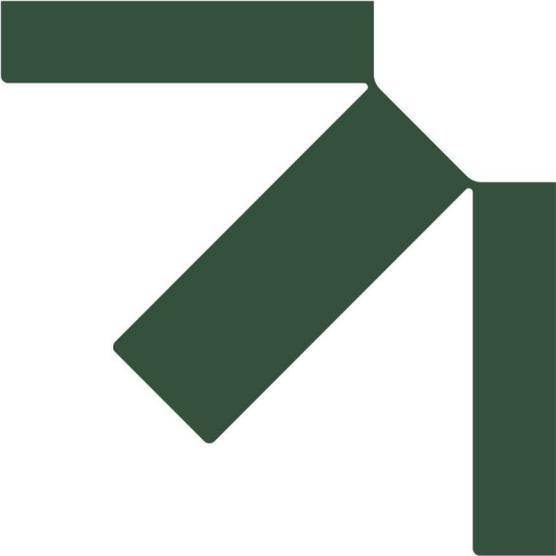
**Kenai LNG Plant
 Import Terminal Project
 Application for an Owner Requested Limit
 Attachment A: Required Elements for an Owner Requested Limit
 under 18 AAC 50.540(j)**

Per 18 Alaska Administrative Code (AAC) 50.540(j), the required elements of an application for establishing an owner requested limit (ORL) under 18 AAC 50.508(5) to avoid one or more permit classification under Alaska Statute (AS) 46.14.130 at a stationary source that will remain subject to at least one permit classification are located in this application as identified under the following table.

ORL Air Quality Application Elements

| Regulatory Citation | | Requirement | Location |
|---------------------|---------------------|---|--|
| 18 AAC 50.540(b) | | Completed <i>Stationary Source Identification Form</i> | Stationary Source Identification (SSID) Form |
| 18 AAC 50.540(j) | 18 AAC 50.225(b)(2) | List of all emissions units at the stationary source | Attachment B1 |
| | 18 AAC 50.225(b)(3) | Calculation of the stationary source's actual emissions and potential to emit air pollutants | Attachment B1 Attachment B2 |
| | 18 AAC 50.225(b)(4) | Description of each proposed limit, and Effects the limit will have on: - Stationary source potential to emit - Stationary source allowable emissions | Attachment B3 Attachment C |
| | 18 AAC 50.225(b)(5) | Description of a verifiable method to attain and maintain each limit, including monitoring and recordkeeping requirements | Attachment C |
| | 18 AAC 50.225(b)(6) | Citation to each requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement | Attachment C |

| Regulatory Citation | | Requirement | Location |
|---------------------|---------------------|--|--------------|
| | 18 AAC 50.225(b)(8) | Statement that the owner or operator of the stationary source will be able to comply with each limit | Attachment C |



Attachment B Detailed Emission Calculations

Application for an Owner Requested Limit

Kenai LNG Plant

Kenai LNG LLC

SLR Project No.: 105.021468.00001

December 22, 2025



**Table B1-1. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions - Emissions Unit Inventory**

| EU ID | Make / Model | Description | Fuel Type | Maximum Rating | Actual Annual Use ¹ |
|-------|------------------------------|---|-------------|----------------|--------------------------------|
| 1 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr |
| 2 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr |
| 3 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr |
| 4 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr |
| 5 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr |
| 6 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr |
| 7a | Solar Taurus 60 | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr |
| 8 | ERIE City 9M | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr |
| 9 | ERIE City 9M | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr |
| 10 | ERIE City 9M | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr |
| 11 | Caterpillar D-379 | Emergency Generator | Diesel | 350 kW | 26.5 hr |
| 12 | Caterpillar 3406 BDIT | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr |
| 13 | Caterpillar 3406 BDIT | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr |
| 14 | Caterpillar 3306 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr |
| 15 | Unknown | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf |
| 16 | NA | Amine Reperation Process Vent | N/A | 15,300 scf/hr | 0 hr |
| 17 | John Deere 4039 | Compressor #5 | Diesel | 78 hp | 26.0 hr |
| 18 | NA | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr |
| 19 | NA | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr |
| 20 | NA | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr |
| 21 | NA | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr |
| 22 | NA | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf |
| 23 | NA | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal |

Notes:

¹ Actual annual use is based on CY2024 actual operation applied under the FY2026 Assessable Emission Estimate.

**Table B1-2. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Oxides of Nitrogen (NO_x)**

| EU ID | Description | Fuel Type | Maximum Rating | Actual Annual Use | Factor Reference | Emission Factor | Actual Annual NO _x Emissions ¹ |
|---|---|-------------|----------------|-------------------|--------------------------|-----------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr | Source Test | 0.316 lb/MMBtu | 0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr | Source Test | 0.316 lb/MMBtu | 0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr | Source Test | 0.417 lb/MMBtu | 0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr | Source Test | 0.417 lb/MMBtu | 0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr | Source Test | 0.292 lb/MMBtu | 0 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr | Source Test | 0.292 lb/MMBtu | 0 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr | Source Test/Subpart KKKK | 0.167 lb/MMBtu | 0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42 Table 1.4-1 | 100 lb/MMscf | 0 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42 Table 1.4-1 | 100 lb/MMscf | 0 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42 Table 1.4-1 | 100 lb/MMscf | 0 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 26.5 hr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.2 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf | AP-42 Table 13.5-1 | 0.068 lb/MMBtu | 0 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 0 hr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 26 hr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.03 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal | N/A | N/A | 0 tpy |
| Total Actual Annual Emissions NO_x Emissions | | | | | | | 0.2 tpy |

**Table B1-3. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Carbon Monoxide (CO)**

| EU ID | Description | Fuel Type | Maximum Rating | Actual Annual Use | Factor Reference | Emission Factor | Actual Annual CO Emissions ¹ |
|---|---|-------------|----------------|-------------------|---------------------------|------------------|---|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu | 0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu | 0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu | 0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu | 0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu | 0 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu | 0 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr | Source Test (non SoLoNOx) | 0.006 lb/MMBtu | 0 tpy |
| | | | | | Source Test (SoLoNOx) | 5.121 lb/MMBtu | 0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-1 | 84 lb/MMscf | 0 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-1 | 84 lb/MMscf | 0 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-1 | 84 lb/MMscf | 0 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 26.5 hr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.04 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf | AP-42, Table 13.5-1 | 0.31 lb/MMBtu | 0 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 0 hr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 26 hr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.007 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal | N/A | N/A | 0 tpy |
| Total Actual Annual CO Emissions | | | | | | | 0.05 tpy |

**Table B1-4. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Particulate Matter Less than 10 Microns (PM₁₀)**

| EU ID | Description | Fuel Type | Maximum Rating | Actual Annual Use | Factor Reference | Emission Factor | Actual Annual PM ₁₀ Emissions ¹ |
|--|---|-------------|----------------|-------------------|-----------------------------------|-----------------|---|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf | 0 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf | 0 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf | 0 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf | 0 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf | 0 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf | 0 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 26.5 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.01 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf | AP-42, Table 13.5-1 | 40 µg/L | 0 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 0 hr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 26 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.002 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal | N/A | N/A | 0 tpy |
| Total Actual Annual PM₁₀ Emissions | | | | | | | 0.02 tpy |

**Table B1-5. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Particulate Matter Less than 2.5 Microns (PM_{2.5})**

| EU ID | Description | Fuel Type | Maximum Rating | Actual Annual Use | Factor Reference | Emission Factor | Actual Annual PM _{2.5} Emissions ¹ |
|---|---|-------------|----------------|-------------------|-----------------------------------|-----------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu | 0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu | 0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf | 0 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf | 0 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf | 0 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf | 0 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf | 0 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf | 0 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 26.5 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.01 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf | AP-42, Table 13.5-1 | 40 µg/L | 0 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 0 hr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 26 hr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.002 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal | N/A | N/A | 0 tpy |
| Total Actual Annual PM_{2.5} Emissions | | | | | | | 0.02 tpy |

**Table B1-6. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Volatile Organic Compounds (VOC)**

| EU ID | Description | Fuel Type | Maximum Rating | Actual Annual Use | Factor Reference | Emission Factor | Actual Annual VOC Emissions ¹ |
|--|---|-------------|----------------|-------------------|---------------------|------------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu | 0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu | 0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu | 0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu | 0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu | 0 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu | 0 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu | 0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-1 | 5.5 lb/MMscf | 0 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-1 | 5.5 lb/MMscf | 0 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr | AP-42, Table 1.4-1 | 5.5 lb/MMscf | 0 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 26.5 hr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.02 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf | AP-42, Table 13.5-1 | 0.66 lb/MMBtu | 0 tpy |
| 16 | Amine Reperation Process Vent | N/A | 15,300 scf/hr | 0 hr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 26 hr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.003 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr | Mass Balance | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr | Mass Balance | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr | Mass Balance | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr | Mass Balance | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf | Mass Balance | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal | N/A | N/A | 0 tpy |
| Total Actual Annual VOC Emissions | | | | | | | 0.02 tpy |

**Table B1-7. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Sulfur Dioxide (SO₂)**

| EU ID | Description | Fuel Type | Maximum Rating | Actual Annual Use | Factor Reference | Measured Sulfur Content ² | Emission Factor | Actual Annual SO ₂ Emissions ¹ |
|---|---|-------------|----------------|-------------------|------------------|--------------------------------------|------------------|--|
| 1 | Compressor Drive Turbine - Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 26.5 hr | Mass Balance | 4.55E-05 wt. % S | 6.093E-06 lb/gal | 1.91E-06 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr | Mass Balance | 4.55E-05 wt. % S | 6.093E-06 lb/gal | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr | Mass Balance | 4.55E-05 wt. % S | 6.093E-06 lb/gal | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr | Mass Balance | 4.55E-05 wt. % S | 6.093E-06 lb/gal | 0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf | Mass Balance | 0.5 ppmv H ₂ S | 0.08 lb/MMscf | 0 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 0 hr | N/A | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 26 hr | Mass Balance | 4.55E-05 wt. % S | 6.093E-06 lb/gal | 4.17E-07 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf | N/A | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal | N/A | N/A | N/A | 0 tpy |
| Total Actual Annual SO₂ Emissions | | | | | | | | 2.33E-06 tpy |

Notes:

¹ Parameters and conversions:

| | |
|--|-------------------------------|
| Natural Gas H ₂ S Content | 0.5 ppmv |
| Density of diesel fuel | 6.7 lb/gal |
| Diesel average heat value: Table 3.1-2a, AP-42 | 139 MMBtu/10 ³ gal |
| Diesel Sulfur Content | 4.55E-05 wt. pct. |
| Average BSFC, Table 3.4-1, AP-42 | 7,000 Btu/hp-hr |

**Table B1-8. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Hazardous Air Pollutants (HAP) Emissions Summary**

| Hazardous Air Pollutant | | | | | Total HAP Emissions |
|--|---------------------|----------------------|----------|------------------------|---------------------|
| | Natural Gas Boilers | Natural Gas Turbines | Flare | Diesel Engines <600 hp | |
| Acetaldehyde | ---- | ---- | ---- | 3.58E-05 | 3.58E-05 |
| Acrolein | ---- | ---- | ---- | 4.31E-06 | 4.31E-06 |
| Benzene | ---- | ---- | ---- | 4.35E-05 | 4.35E-05 |
| 1,3-Butadiene | ---- | ---- | ---- | 1.82E-06 | 1.82E-06 |
| Formaldehyde | ---- | ---- | ---- | 5.50E-05 | 5.50E-05 |
| Polycyclic aromatic compounds (PAH) | ---- | ---- | ---- | 7.84E-06 | 7.84E-06 |
| Polycyclic Organic Matter (POM) | ---- | ---- | ---- | 7.84E-06 | 7.84E-06 |
| Acenaphthene | ---- | ---- | ---- | 6.62E-08 | 6.62E-08 |
| Acenaphthylene | ---- | ---- | ---- | 2.36E-07 | 2.36E-07 |
| Anthracene | ---- | ---- | ---- | 8.72E-08 | 8.72E-08 |
| Benzo(a)pyrene | ---- | ---- | ---- | 8.77E-09 | 8.77E-09 |
| Benzo(b)fluoranthene | ---- | ---- | ---- | 4.62E-09 | 4.62E-09 |
| Benzo(g,h,i)perylene | ---- | ---- | ---- | 2.28E-08 | 2.28E-08 |
| Benzo(k)fluoranthene | ---- | ---- | ---- | 7.23E-09 | 7.23E-09 |
| Chrysene | ---- | ---- | ---- | 1.65E-08 | 1.65E-08 |
| Dibenz(a,h)anthracene | ---- | ---- | ---- | 2.72E-08 | 2.72E-08 |
| Fluoranthene | ---- | ---- | ---- | 3.55E-07 | 3.55E-07 |
| Fluorene | ---- | ---- | ---- | 1.36E-06 | 1.36E-06 |
| Indeno(1,2,3-cd)pyrene | ---- | ---- | ---- | 1.75E-08 | 1.75E-08 |
| Naphthalene | ---- | ---- | ---- | 3.96E-06 | 3.96E-06 |
| Phenanthrene | ---- | ---- | ---- | 1.37E-06 | 1.37E-06 |
| Pyrene | ---- | ---- | ---- | 2.23E-07 | 2.23E-07 |
| Toluene | ---- | ---- | ---- | 1.91E-05 | 1.91E-05 |
| Xylenes (isomers and mixture) | ---- | ---- | ---- | 1.33E-05 | 1.33E-05 |
| | | | | | |
| | | | | | |
| Total HAPs - Maximum Individual HAP | 0 | 0 | 0 | 5.50E-05 | 5.50E-05 |
| Total VOC HAP Emissions | 0 | 0 | 0 | 1.81E-04 | 1.89E-04 |
| Total HAPs Emissions | 0 | 0 | 0 | 1.81E-04 | 1.89E-04 |

Notes:

¹ HAP emissions from the fuel storage tanks are considered negligible.

² The HAP emissions from insignificant natural gas heaters are included under Table D1-13 IEU NG Heaters and D1-14 IEU Diesel Heaters.

**Table B1-9. Kenai LNG, LLC - Kenail LNG Plant
Actual Annual Emissions: Hazardous Air Pollutants (HAP)
Diesel Engines Less Than 600 Horsepower**

Maximum Total Heat Input: 93.3 MMBtu/yr¹

| <u>No.</u> | <u>Section 112 Hazardous Air Pollutants</u> | | <u>Source Category Emission Calculations</u> | |
|---------------------------------------|---|-------------------------------------|--|----------------------------|
| | <u>CAS No.</u> | <u>Chemical Name</u> | <u>Emission Factor²</u> | <u>Estimated Emissions</u> |
| 1 | 75070 | Acetaldehyde | 7.67E-04 lb/MMBtu | 3.58E-05 tpy |
| 6 | 107028 | Acrolein | 9.25E-05 lb/MMBtu | 4.31E-06 tpy |
| 15 | 71432 | Benzene | 9.33E-04 lb/MMBtu | 4.35E-05 tpy |
| 23 | 106990 | 1,3-Butadiene | 3.91E-05 lb/MMBtu | 1.82E-06 tpy |
| 87 | 5000 | Formaldehyde | 1.18E-03 lb/MMBtu | 5.50E-05 tpy |
| 152 | 108883 | Toluene | 4.09E-04 lb/MMBtu | 1.91E-05 tpy |
| 169 | 1330207 | Xylenes (isomers and mixture) | 2.85E-04 lb/MMBtu | 1.33E-05 tpy |
| 187 | N/A | Polycyclic Organic Matter (POM) | 1.68E-04 lb/MMBtu | 7.84E-06 tpy |
| | | Polycyclic aromatic compounds (PAH) | | |
| 119 | 91203 | Naphthalene | 8.48E-05 lb/MMBtu | 3.96E-06 tpy |
| | | Acenaphthylene | 5.06E-06 lb/MMBtu | 2.36E-07 tpy |
| | | Acenaphthene | 1.42E-06 lb/MMBtu | 6.62E-08 tpy |
| | | Fluorene | 2.92E-05 lb/MMBtu | 1.36E-06 tpy |
| | | Phenanthrene | 2.94E-05 lb/MMBtu | 1.37E-06 tpy |
| | | Anthracene | 1.87E-06 lb/MMBtu | 8.72E-08 tpy |
| | | Fluoranthene | 7.61E-06 lb/MMBtu | 3.55E-07 tpy |
| | | Pyrene | 4.78E-06 lb/MMBtu | 2.23E-07 tpy |
| | | Benzo(a)anthracene | 1.68E-06 lb/MMBtu | 7.84E-08 tpy |
| | | Chrysene | 3.53E-07 lb/MMBtu | 1.65E-08 tpy |
| | | Benzo(b)fluoranthene | 9.91E-08 lb/MMBtu | 4.62E-09 tpy |
| | | Benzo(k)fluoranthene | 1.55E-07 lb/MMBtu | 7.23E-09 tpy |
| | | Benzo(a)pyrene | 1.88E-07 lb/MMBtu | 8.77E-09 tpy |
| | | Indeno(1,2,3-cd)pyrene | 3.75E-07 lb/MMBtu | 1.75E-08 tpy |
| | | Dibenz(a,h)anthracene | 5.83E-07 lb/MMBtu | 2.72E-08 tpy |
| | | Benzo(g,h,i)perylene | 4.89E-07 lb/MMBtu | 2.28E-08 tpy |
| Total Potential HAP Emissions: | | | 1.81E-04 tpy | |

Notes:

¹ Total fuel use based on maximum full-time operation as noted below.

| | |
|--------------------------------------|--------------------|
| EU ID 11 Emergency Generator | 375 hp |
| Potential Heat Input: | 3.5 MMBtu/hr |
| Potential Annual Use: | 27 hrs |
| Potential Annual Heat Input: | 93 MMBtu/yr |
| EU ID 12 Emergency Firewater Pump #2 | 375 hp |
| Potential Annual Use: | 2.6 MMBtu/hr |
| Potential Heat Input: | 0 hrs |
| Potential Annual Heat Input: | 0 MMBtu/yr |
| EU ID 13 Emergency Firewater Pump #3 | 231 hp |
| Potential Annual Use: | 2.6 MMBtu/hr |
| Potential Heat Input: | 0 hrs |
| Potential Annual Heat Input: | 0 MMBtu/yr |
| EU ID 14 Emergency Firewater Pump #4 | 148 MMscf/day |
| Potential Annual Use: | 1.0 MMBtu/hr |
| Potential Heat Input: | 0 hrs |
| Potential Annual Heat Input: | 0 MMBtu/yr |
| EU ID 17 Compressor #5 | 78 hp |
| Potential Annual Use: | 0.5 MMBtu/hr |
| Potential Heat Input: | 0 hrs |
| Potential Annual Heat Input: | 0 MMBtu/yr |
| Total Potential Heat Input: | 93 MMBtu/yr |
| Engines heat rate: | 7,000 Btu/hp-hr |

² Reference: AP-42, Table 3.3-2.

**Table B1-10. Kenai LNG, LLC - Kenai LNG Plant
Actual Annual Emissions: Greenhouse Gas (GHG) Summary**

| EU ID | Description | Fuel Type | Maximum Rating | Actual Annual Use | Factor Reference | CH ₄ Emission Factor | Actual Annual CH ₄ Emissions ¹ |
|---|---|-------------|----------------|-------------------|----------------------|---------------------------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 26.5 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 8.35E-06 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 0 MMscf | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 0 hr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 26 hr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 1.02E-06 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 0 hr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 0 MMscf | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gal | 0 gal | N/A | N/A | 0 tpy |
| Total Actual Annual CH₄ Emissions | | | | | | | 9.37E-06 tpy |

Notes:

¹ Parameters and conversions

Average BSFC, Table 3.4-1, AP-42 7000 Btu/hp-hr

² Based on global warming potential to CO₂ (1), CH₄ (28) and N₂O (265) from Table A-1, 40 CFR 98.

**Table B2-1. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit - Emissions Unit Inventory**

| EU ID | Make / Model | Description | Fuel Type | Maximum Rating | Potential Annual Use ¹ |
|--------------|------------------------------|---|------------------|-----------------------|--|
| 1 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr |
| 2 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr |
| 3 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr |
| 4 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr |
| 5 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr |
| 6 | GE Frame 5 / Model MS5001 LA | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr |
| 7a | Solar Taurus 60 | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr |
| 8 | ERIE City 9M | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr |
| 9 | ERIE City 9M | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr |
| 10 | ERIE City 9M | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr |
| 11 | Caterpillar D-379 | Emergency Generator | Diesel | 350 kW | 500 hr/yr |
| 12 | Caterpillar 3406 BDIT | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr |
| 13 | Caterpillar 3406 BDIT | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr |
| 14 | Caterpillar 3306 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr |
| 15 | Unknown | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr |
| 16 | NA | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 8,760 hr/yr |
| 17 | John Deere 4039 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr |
| 18 | NA | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr |
| 19 | NA | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr |
| 20 | NA | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr |
| 21 | NA | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr |
| 22 | NA | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr |
| 23 | NA | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr |

Notes:

¹ Potential annual use is based on physical and operational design and incorporates any federally enforceable limitations (e.g., underlying Title I construction permit).

Additional assumptions from Title V Operating Permit AQ090TVP03 Renewal Application submitted on April 23, 2024.

**Table B2-2. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Oxides of Nitrogen (NO_x)**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | Emission Factor | Potential to Emit NO _x Emissions ¹ |
|---|---|-------------|----------------------|----------------------|--------------------|----------------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Source Test | 0.316 lb/MMBtu (LHV) | 126.0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Source Test | 0.316 lb/MMBtu (LHV) | 126.0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Source Test | 0.417 lb/MMBtu (LHV) | 226.5 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Source Test | 0.417 lb/MMBtu (LHV) | 226.5 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Source Test | 0.292 lb/MMBtu (LHV) | 111.6 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Source Test | 0.292 lb/MMBtu (LHV) | 111.6 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | NSPS Subpart KKKK | 0.167 lb/MMBtu (LHV) | 26.9 tpy |
| | | | | | Source Test | | |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42 Table 1.4-1 | 100 lb/MMscf (LHV) | 22.4 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42 Table 1.4-1 | 100 lb/MMscf (LHV) | 22.4 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42 Table 1.4-1 | 100 lb/MMscf (LHV) | 22.4 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 3.6 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.7 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.7 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.4 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | AP-42 Table 13.5-1 | 0.068 lb/MMBtu (HHV) | 12.8 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15300 scf/hr | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 10.6 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Potential to Emit NO_x Emissions | | | | | | | 1,050.9 tpy |

Notes:

¹ Parameters and conversions:

| | |
|-----------------|---------------|
| Natural Gas HHV | 1,011 Btu/scf |
| Natural Gas LHV | 910 Btu/scf |

**Table B2-3. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Carbon Monoixde (CO)**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | Emission Factor | Potential to Emit CO Emissions ¹ |
|---|---|-------------|----------------------|----------------------|---------------------------|----------------------|---|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu (HHV) | 36.0 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu (HHV) | 36.0 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu (HHV) | 49.0 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu (HHV) | 49.0 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu (HHV) | 34.5 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-1 | 0.082 lb/MMBtu (HHV) | 34.5 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | Source Test (non SoLoNOx) | 0.006 lb/MMBtu | 1.5 tpy |
| | | | | | Source Test (SoLoNOx) | 5.121 lb/MMBtu | 38.0 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-1 | 84 lb/MMscf (HHV) | 18.6 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-1 | 84 lb/MMscf (HHV) | 18.6 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-1 | 84 lb/MMscf (HHV) | 18.6 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.8 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.2 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.2 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.1 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | AP-42, Table 13.5-1 | 0.31 lb/MMBtu (LHV) | 52.7 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15300 scf/hr | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 2.3 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Potential to Emit CO Emissions | | | | | | | 390.3 tpy |

Notes:

¹ Parameters and conversions:

| | |
|------------------------|---------------|
| Natural Gas HHV | 1,011 Btu/scf |
| Natural Gas LHV | 910 Btu/scf |
| Natural Gas Conversion | 1.1 HHV/LHV |

**Table B2-4. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Particulate Matter Less than 10 Microns (PM₁₀)**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | Emission Factor | Potential to Emit PM ₁₀ Emissions ¹ |
|--|---|-------------|----------------------|----------------------|-----------------------------------|-----------------------|---|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.1 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.1 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.8 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 1.1 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.8 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 1.1 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 1.4 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.6 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf (HHV) | 1.3 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf (HHV) | 0.4 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf (HHV) | 1.3 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf (HHV) | 0.4 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf (HHV) | 1.3 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf (HHV) | 0.4 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.3 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.05 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.05 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.03 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | AP-42, Table 13.5-1 | 40 µg/L (HHV) | 4.1 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.8 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Potential to Emit PM₁₀ Emissions | | | | | | | 31.4 tpy |

Notes:

¹ Parameters and conversions:

| | |
|---|-------------------|
| Natural Gas HHV | 1,011 Btu/scf |
| Natural Gas LHV | 910 Btu/scf |
| Natural Gas Conversion | 1.1 HHV/LHV |
| Diesel High Heat Value: AP-42 Table 1.3-1 | 139,000 MMBtu/gal |
| 40 CFR 60, Method 19 F Factor (HHV) | 8,710 dscf/MMBtu |

**Table B2-5. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Particulate Matter Less than 2.5 Microns (PM_{2.5})**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | Emission Factor | Potential to Emit PM _{2.5} Emissions ¹ |
|---|---|-------------|----------------------|----------------------|-----------------------------------|-----------------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.1 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.1 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.8 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 1.1 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.8 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 1.1 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 2.0 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.8 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 3.1-2a (condensable) | 0.0047 lb/MMBtu (HHV) | 1.4 tpy |
| | | | | | AP-42, Table 3.1-2a (filterable) | 0.0019 lb/MMBtu (HHV) | 0.6 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf (HHV) | 1.3 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf (HHV) | 0.4 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf (HHV) | 1.3 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf (HHV) | 0.4 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 (condensable) | 5.7 lb/MMscf (HHV) | 1.3 tpy |
| | | | | | AP-42, Table 1.4-2 (filterable) | 1.9 lb/MMscf (HHV) | 0.4 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.3 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | AP-42, Table 13.5-1 | 40 µg/L (HHV) | 4.1 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.8 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Potential to Emit PM_{2.5} Emissions | | | | | | | 31.4 tpy |

Notes:

¹ Parameters and conversions:

| | |
|---|-------------------|
| Natural Gas HHV | 1,011 Btu/scf |
| Natural Gas LHV | 910 Btu/scf |
| Natural Gas Conversion | 1.1 HHV/LHV |
| Diesel High Heat Value: AP-42 Table 1.3-1 | 139,000 MMBtu/gal |
| 40 CFR 60, Method 19 F Factor (HHV) | 8,710 dscf/MMBtu |

**Table B2-6. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Volatile Organic Compounds (VOC)**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | Emission Factor | Potential to Emit VOC Emissions ¹ |
|--|---|-------------|----------------------|----------------------|---------------------------------|--------------------------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu (HHV) | 0.9 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu (HHV) | 0.9 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu (HHV) | 1.3 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu (HHV) | 1.3 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu (HHV) | 0.9 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu (HHV) | 0.9 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 3.1-2a | 0.0021 lb/MMBtu (HHV) | 0.6 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 | 5.5 lb/MMscf | 1.1 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 | 5.5 lb/MMscf | 1.1 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | AP-42, Table 1.4-2 | 5.5 lb/MMscf | 1.1 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.3 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.1 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.1 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.0 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | AP-42, Table 13.5-1 | 0.66 lb/MMBtu (HHV) | 124.5 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15300 scf/hr | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.8 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | Mass Balance | N/A | 211.5 tpy ² |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | Mass Balance | N/A | 211.5 tpy ² |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | Mass Balance | N/A | 108.0 tpy ² |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | Mass Balance | N/A | 108.0 tpy ² |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | Mass Balance | N/A | 19.1 tpy ³ |
| 23 | Vehicle Refueling (spillage) | N/A | 1,015 gallons | 17,000 gal/yr | AP-42, Table 5.2-7 | 0.7 lb/10 ³ gallons | 0.006 tpy |
| | AP-42, Table 5.2-7 | | | | 11.0 lb/10 ³ gallons | 0.09 tpy | |
| | AP-42, Chapter 7 | | | | N/A | 0.07 tpy ⁴ | |
| Total Potential to Emit VOC Emissions | | | | | | | 794.1 tpy |

Notes:

¹ Parameters and conversions:

| | |
|------------------------|---------------|
| Natural Gas HHV | 1,011 Btu/scf |
| Natural Gas LHV | 910 Btu/scf |
| Natural Gas Conversion | 1.1 HHV/LHV |

² VOC emission from each seal oil degassing vent (one for each propane compressor and ethylene compressor) were based on refrigerant volume losses. Refrigerant losses were estimated using a material balance based on annual refrigerant purchased and initial (January 1) and final (December 31) refrigerant storage volumes. Annual estimated propane losses, 423 tons per year, and ethylene losses, 216 tons per year, were allocated equally between the two propane compressor seal oil degassing vents (EU IDs 18 and 19) and two ethylene compressor seal oil degassing vents (EU IDs 19 and 20), respectively.

³ The VOC estimate is based on potential annual throughput of 556 MMscf per year and fuel gas composition.

⁴ The VOC estimate is based on Title V Operating Permit AQ0090TP03 Renewal Application submitted on April 23, 2024.

**Table B2-7. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Sulfur Dioxide (SO₂)**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | Maximum Fuel Sulfur Content ¹ | Emission Factor | Potential to Emit SO ₂ Emissions ² |
|---|---|-------------|----------------------|----------------------|------------------|--|-----------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.2 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.2 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.3 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.3 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.2 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.2 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.1 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.1 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.1 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.1 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | Mass Balance | 0.5 wt. % S | 0.071 lb/gal | 0.4 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | Mass Balance | 0.5 wt. % S | 0.071 lb/gal | 0.1 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | Mass Balance | 0.5 wt. % S | 0.071 lb/gal | 0.1 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | Mass Balance | 0.5 wt. % S | 0.071 lb/gal | 0.1 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | Mass Balance | 3 ppmv H ₂ S | 0.51 lb/MMscf | 0.09 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 8,760 hr/yr | N/A | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | Mass Balance | 0.5 wt. % S | 0.071 lb/gal | 1.6 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr | N/A | N/A | N/A | 0 tpy |
| Total Potential to Emit SO₂ Emissions | | | | | | | | 4.4 tpy |

Notes:

¹ Title V Operating Permit Conditions 12 and Condition 74.4 limit liquid fuel sulfur content to 0.5% by weight sulfur and fuel gas H₂S concentration to 3 ppmv.

² Parameters and conversions:

| | |
|--|-------------------------------|
| Natural Gas HHV | 1,011 Btu/scf |
| Natural Gas LHV | 910 Btu/scf |
| Density of diesel fuel | 7.1 lb/gal |
| Diesel average heat value: Table 3.1-2a, AP-42 | 139 MMBtu/10 ³ gal |
| Average BSFC, Table 3.4-1, AP-42 | 7,000 Btu/hp-hr |

**Table B2-9. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Hazardous Air Pollutants (HAP)
Natural Gas Fired Boilers**

823,440 MMBtu/yr ¹

| CAS No. | Chemical Name | Source Category Emission Calculations | |
|------------|--------------------------------|---------------------------------------|----------------------------------|
| | | AP-42 Emission Factor ² | Estimated Emissions ³ |
| 91-57-6 | 2-Methylnaphthalene | 2.40E-05 lb/MMscf | 1.09E-05 tpy |
| 56-49-5 | 3-Methylcholanthrene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| | 7,12-Dimethylbenz(a)anthracene | 1.60E-05 lb/MMscf | 7.24E-06 tpy |
| 83-32-9 | Acenaphthene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| 203-96-8 | Acenaphthylene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| 120-12-7 | Anthracene | 2.40E-06 lb/MMscf | 1.09E-06 tpy |
| 56-55-3 | Benz(a)anthracene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| 71-43-2 | Benzene | 2.10E-03 lb/MMscf | 9.50E-04 tpy |
| 50-32-8 | Benzo(a)pyrene | 1.20E-06 lb/MMscf | 5.43E-07 tpy |
| 205-99-2 | Benzo(b)fluoranthene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| 191-24-2 | Benzo(g,h,i)perylene | 1.20E-06 lb/MMscf | 5.43E-07 tpy |
| 207-08-9 | Benzo(k)fluoranthene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| 218-01-9 | Chrysene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| 53-70-3 | Dibenz(a,h)anthracene | 1.20E-06 lb/MMscf | 5.43E-07 tpy |
| 25321-22-6 | Dichlorobenzene | 1.20E-03 lb/MMscf | 5.43E-04 tpy |
| 206-44-0 | Fluoranthene | 3.00E-06 lb/MMscf | 1.36E-06 tpy |
| 86-73-7 | Fluorene | 2.80E-06 lb/MMscf | 1.27E-06 tpy |
| 50-00-0 | Formaldehyde | 7.50E-02 lb/MMscf | 3.39E-02 tpy |
| 110-54-3 | Hexane | 1.80E+00 lb/MMscf | 8.14E-01 tpy |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.80E-06 lb/MMscf | 8.14E-07 tpy |
| 91-20-3 | Naphthalene | 6.10E-04 lb/MMscf | 2.76E-04 tpy |
| 85-01-8 | Phenanthrene | 1.70E-05 lb/MMscf | 7.69E-06 tpy |
| 129-00-0 | Pyrene | 5.00E-06 lb/MMscf | 2.26E-06 tpy |
| 108-88-3 | Toluene | 3.40E-03 lb/MMscf | 1.54E-03 tpy |
| 7440-38-2 | Arsenic | 2.00E-04 lb/MMscf | 9.05E-05 tpy |
| 7440-41-7 | Beryllium | 1.20E-05 lb/MMscf | 5.43E-06 tpy |
| 7440-43-9 | Cadmium | 1.10E-03 lb/MMscf | 4.98E-04 tpy |
| 7440-47-3 | Chromium | 1.40E-03 lb/MMscf | 6.33E-04 tpy |
| 7440-48-4 | Cobalt | 8.40E-05 lb/MMscf | 3.80E-05 tpy |
| 7439-96-5 | Manganese | 3.80E-04 lb/MMscf | 1.72E-04 tpy |
| 7439-97-6 | Mercury | 2.60E-04 lb/MMscf | 1.18E-04 tpy |
| 7440-02-0 | Nickel | 2.10E-03 lb/MMscf | 9.50E-04 tpy |
| 7782-49-2 | Selenium | 2.40E-05 lb/MMscf | 1.09E-05 tpy |

Total Potential HAP Emissions: 8.54E-01 tpy

Notes:

¹ Total fuel use based on maximum full-time operation or permit-limited operation as noted below.

| | | |
|----------|------------------------------------|-------------------------|
| EU ID 8 | Boiler #501 | 46.5 MMBtu/hr |
| | Potential Annual Use: | 8,760 hr/yr |
| | Potential Heat Input: | 407,340 MMBtu/yr |
| EU ID 9 | Boiler #502 | 46.5 MMBtu/hr |
| | Potential Annual Use: | 8,760 hr/yr |
| | Potential Heat Input: | 407,340 MMBtu/yr |
| EU ID 10 | Boiler #511 | 46.5 MMBtu/hr |
| | Potential Annual Use: | 8,760 hr/yr |
| | Potential Heat Input: | 8,760 MMBtu/yr |
| | Total Potential Heat Input: | 823,440 MMBtu/yr |

² Reference: AP-42, Tables 1.4-3 and 1.4-4.

³ Parameters and conversions:

| | |
|-----------------|---------------|
| Natural Gas HHV | 1,011 Btu/scf |
| Natural Gas LHV | 910 Btu/scf |

**Table B2-10. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Hazardous Air Pollutants (HAP)
Natural Gas Fired Turbines**

5,823,648 MMBtu/yr ¹

| <u>CAS No.</u> | <u>Chemical Name</u> | <u>Source Category Emission Calculations</u> | |
|----------------|-------------------------------------|--|----------------------------|
| | | <u>AP-42 Emission Factor ²</u> | <u>Estimated Emissions</u> |
| | 1,3-Butadiene | 4.30E-07 lb/MMBtu | 1.25E-03 tpy |
| | Acetaldehyde | 4.00E-05 lb/MMBtu | 1.16E-01 tpy |
| | Acrolein | 6.40E-06 lb/MMBtu | 1.86E-02 tpy |
| 71-43-2 | Benzene | 1.20E-05 lb/MMBtu | 3.49E-02 tpy |
| 100-41-4 | Ethylbenzene | 3.20E-05 lb/MMBtu | 9.32E-02 tpy |
| 50-00-0 | Formaldehyde | 7.10E-04 lb/MMBtu | 2.07E+00 tpy |
| | Napthalene | 1.30E-06 lb/MMBtu | 3.79E-03 tpy |
| | Polycyclic aromatic compounds (PAH) | 2.20E-06 lb/MMBtu | 6.41E-03 tpy |
| | Propylene Oxide | 2.90E-05 lb/MMBtu | 8.44E-02 tpy |
| 108-88-3 | Toluene | 1.30E-04 lb/MMBtu | 3.79E-01 tpy |
| 1330-20-7 | Xylenes (isomers and mixture) | 6.40E-05 lb/MMBtu | 1.86E-01 tpy |
| | | | 2.99E+00 tpy |

Notes:

¹ Total fuel use based on maximum full-time operation as noted below.

| | | |
|------------------------------------|--|--|
| EU ID 1 | Compressor Drive Turbine - Propane Cycle #151 | 168.0 MMBtu/hr |
| | | Potential Annual Use: 4,745 hr/yr |
| | | Potential Heat Input: 797,160 MMBtu/yr |
| EU ID 2 | Compressor Drive Turbine - Propane Cycle #152 | 168.0 MMBtu/hr |
| | | Potential Annual Use: 4,745 hr/yr |
| | | Potential Heat Input: 797,160 MMBtu/yr |
| EU ID 3 | Compressor Drive Turbine - Ethylene Cycle #251 | 228.9 MMBtu/hr |
| | | Potential Annual Use: 4,745 hr/yr |
| | | Potential Heat Input: 1,086,131 MMBtu/yr |
| EU ID 4 | Compressor Drive Turbine - Ethylene Cycle #252 | 228.9 MMBtu/hr |
| | | Potential Annual Use: 4,745 hr/yr |
| | | Potential Heat Input: 1,086,131 MMBtu/yr |
| EU ID 5 | Compressor Drive Turbine - Methane Cycle #351 | 161.1 MMBtu/hr |
| | | Potential Annual Use: 4,745 hr/yr |
| | | Potential Heat Input: 764,420 MMBtu/yr |
| EU ID 6 | Compressor Drive Turbine - Methane Cycle #352 | 161.1 MMBtu/hr |
| | | Potential Annual Use: 4,745 hr/yr |
| | | Potential Heat Input: 764,420 MMBtu/yr |
| EU ID 7a | Compressor Drive Turbine - Fuel System #701 | 60.3 MMBtu/hr |
| | | 8,760 hr/yr |
| | | Potential Heat Input: 528,228 MMBtu/yr |
| Total Potential Heat Input: | | 5,823,648 MMBtu/yr |

² Reference: AP-42, Tables 3.1-3

**Table B2-11. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Hazardous Air Pollutants (HAP)
Flare (Products of Combustion)**

Estimated Fuel Gas Maximum Flow Rate: 373 MMscf/yr¹

| Section 112 Hazardous Air Pollutants | | Source Category Emission Calculations | |
|---|---------------------------------|--|----------------------------|
| CAS No. | Chemical Name | Emission Factor² | Estimated Emissions |
| 75070 | Acetaldehyde | 4.30E-02 lb/MMscf | 8.03E-03 tpy |
| 107028 | Acrolein | 1.00E-02 lb/MMscf | 1.87E-03 tpy |
| 71432 | Benzene | 1.59E-01 lb/MMscf | 2.97E-02 tpy |
| 100414 | Ethylbenzene | 1.44E+00 lb/MMscf | 2.69E-01 tpy |
| 51796 | Ethyl carbamate (Urethane) | | |
| 5000 | Formaldehyde | 1.17E+00 lb/MMscf | 2.18E-01 tpy |
| 110543 | Hexane | 2.90E-02 lb/MMscf | 5.41E-03 tpy |
| | | | |
| 91203 | Naphthalene | 1.10E-02 lb/MMscf | 2.05E-03 tpy |
| 108883 | Toluene | 5.80E-02 lb/MMscf | 1.08E-02 tpy |
| 1330207 | Xylenes (isomers and mixture) | 2.90E-02 lb/MMscf | 5.41E-03 tpy |
| N/A | Polycyclic Organic Matter (POM) | 1.40E-02 lb/MMscf | 2.61E-03 tpy |
| | | Total Potential HAP Emissions: | 5.51E-01 tpy |

Notes:

¹ Total fuel use based on maximum full-time operation as noted below.

| | | |
|----------|------------------------------|-----------------------|
| EU ID 15 | Ground Safety Flare | 148.0 MMscf/day |
| | Potential Annual Use: | 373.3 MMscf/yr |

² Reference VCAPCD EFs (Flares - Natural Gas)

**Table B2-12. Kenai LNG, LLC - Kenail LNG Plant
Potential to Emit Emissions: Hazardous Air Pollutants (HAP)
Diesel Engines Less Than 600 Horsepower**

Maximum Total Heat Input: 7,249.7 MMBtu/yr¹

| Section 112 Hazardous Air Pollutants | | | Source Category Emission Calculations | |
|---|----------------|-------------------------------------|--|----------------------------|
| No. | CAS No. | Chemical Name | Emission Factor² | Estimated Emissions |
| 1 | 75070 | Acetaldehyde | 7.67E-04 lb/MMBtu | 2.78E-03 tpy |
| 6 | 107028 | Acrolein | 9.25E-05 lb/MMBtu | 3.35E-04 tpy |
| 15 | 71432 | Benzene | 9.33E-04 lb/MMBtu | 3.38E-03 tpy |
| 23 | 106990 | 1,3-Butadiene | 3.91E-05 lb/MMBtu | 1.42E-04 tpy |
| 87 | 5000 | Formaldehyde | 1.18E-03 lb/MMBtu | 4.28E-03 tpy |
| 152 | 108883 | Toluene | 4.09E-04 lb/MMBtu | 1.48E-03 tpy |
| 169 | 1330207 | Xylenes (isomers and mixture) | 2.85E-04 lb/MMBtu | 1.03E-03 tpy |
| 187 | N/A | Polycyclic Organic Matter (POM) | 1.68E-04 lb/MMBtu | 6.09E-04 tpy |
| | | Polycyclic aromatic compounds (PAH) | | |
| 119 | 91203 | Naphthalene | 8.48E-05 lb/MMBtu | 3.07E-04 tpy |
| | | Acenaphthylene | 5.06E-06 lb/MMBtu | 1.83E-05 tpy |
| | | Acenaphthene | 1.42E-06 lb/MMBtu | 5.15E-06 tpy |
| | | Fluorene | 2.92E-05 lb/MMBtu | 1.06E-04 tpy |
| | | Phenanthrene | 2.94E-05 lb/MMBtu | 1.07E-04 tpy |
| | | Anthracene | 1.87E-06 lb/MMBtu | 6.78E-06 tpy |
| | | Fluoranthene | 7.61E-06 lb/MMBtu | 2.76E-05 tpy |
| | | Pyrene | 4.78E-06 lb/MMBtu | 1.73E-05 tpy |
| | | Benzo(a)anthracene | 1.68E-06 lb/MMBtu | 6.09E-06 tpy |
| | | Chrysene | 3.53E-07 lb/MMBtu | 1.28E-06 tpy |
| | | Benzo(b)fluoranthene | 9.91E-08 lb/MMBtu | 3.59E-07 tpy |
| | | Benzo(k)fluoranthene | 1.55E-07 lb/MMBtu | 5.62E-07 tpy |
| | | Benzo(a)pyrene | 1.88E-07 lb/MMBtu | 6.81E-07 tpy |
| | | Indeno(1,2,3-cd)pyrene | 3.75E-07 lb/MMBtu | 1.36E-06 tpy |
| | | Dibenz(a,h)anthracene | 5.83E-07 lb/MMBtu | 2.11E-06 tpy |
| | | Benzo(g,h,i)perylene | 4.89E-07 lb/MMBtu | 1.77E-06 tpy |
| | | | Total Potential HAP Emissions: | 1.40E-02 tpy |

Notes:

¹ Total fuel use based on maximum full-time operation as noted below.

| | | |
|----------|------------------------------------|-----------------------|
| EU ID 11 | Emergency Generator | 350 kW |
| | Potential Heat Input: | 3.3 MMBtu/hr |
| | Potential Annual Use: | 500 hrs |
| | Potential Annual Heat Input: | 1,643 MMBtu/yr |
| EU ID 12 | Emergency Firewater Pump #2 | 375 hp |
| | Potential Annual Use: | 2.6 MMBtu/hr |
| | Potential Heat Input: | 120 hrs |
| | Potential Annual Heat Input: | 315 MMBtu/yr |
| EU ID 13 | Emergency Firewater Pump #3 | 375 hp |
| | Potential Annual Use: | 2.6 MMBtu/hr |
| | Potential Heat Input: | 120 hrs |
| | Potential Annual Heat Input: | 315 MMBtu/yr |
| EU ID 14 | Emergency Firewater Pump #4 | 231 hp |
| | Potential Annual Use: | 1.6 MMBtu/hr |
| | Potential Heat Input: | 120 hrs |
| | Potential Annual Heat Input: | 194 MMBtu/yr |
| EU ID 17 | Compressor #5 | 78 hp |
| | Potential Annual Use: | 0.5 MMBtu/hr |
| | Potential Heat Input: | 8,760 hrs |
| | Potential Annual Heat Input: | 4,783 MMBtu/yr |
| | Total Potential Heat Input: | 7,250 MMBtu/yr |
| | Engines heat rate: | 7,000 Btu/hp-hr |

² Reference: AP-42, Table 3.3-2.

**Table B2-13. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Greenhouse Gas (GHG) Summary**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | CO ₂ Emission Factor | Potential to Emit CO ₂ Emissions ¹ |
|---|---|-------------|----------------------|----------------------|----------------------|---------------------------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 46,527 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 46,527 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 63,393 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 63,393 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 44,616 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 44,616 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 30,831 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 23,775 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 23,775 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 23,775 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 96 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 18 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 18 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 11 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 21,788 tpy |
| 16 | Amine Regeneration Process Vent | N/A | 15,300 scf/hr | 8,760 hr/yr | N/A | 0.1 lb/scf | 6,701 tpy ³ |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 279 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | N/A | 0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Potential to Emit CO₂ Emissions | | | | | | | 440,140 tpy |

Notes:

¹ Parameters and conversions

| | |
|----------------------------------|-----------------|
| Natural gas HHV | 1,000 Btu/scf |
| Average BSFC, Table 3.4-1, AP-42 | 7,000 Btu/hp-hr |

² Based on global warming potential to CO₂ (1), CH₄ (28) and N₂O (265) from Table A-1, 40 CFR 98.

³ The typical composition of amine treater vent gas (VG) (volume basis) is 89-90% CO₂, 10% water vapor, and trace amounts of H₂S and CH₄. CO₂ emissions from the amine treater vent are based on VG composition and a flow rate of 15,300 scf per hour.

**Table B2-13. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Greenhouse Gas (GHG) Summary**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | CH ₄ Emission Factor | Potential to Emit CH ₄ Emissions ¹ |
|---|---|-------------|----------------------|----------------------|----------------------|---------------------------------|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 2.6 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 2.6 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 3.6 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 3.6 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 2.5 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 2.5 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 1.7 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 1.3 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 1.3 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 1.3 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0.005 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0.001 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0.001 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0.001 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0.001 tpy |
| 16 | Amine Reeneration Process Vent | N/A | 15,300 scf/hr | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0.02 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | 0.042 lb/scf | 11,676 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Potential to Emit CH₄ Emissions | | | | | | | 11,699.3 tpy |

Notes:

¹ Parameters and conversions

| | |
|----------------------------------|-----------------|
| Natural gas HHV | 1,000 Btu/scf |
| Average BSFC, Table 3.4-1, AP-42 | 7,000 Btu/hp-hr |

² Based on global warming potential to CO₂ (1), CH₄ (28) and N₂O (265) from Table A-1, 40 CFR 98.

³ The typical composition of amine treater vent gas (VG) (volume basis) is 89-90% CO₂, 10% water vapor, and trace amounts of H₂S and CH₄. CO₂ emissions from the amine treater vent are based on VG composition and a flow rate of 15,300 scf per hour.

**Table B2-13. Kenai LNG, LLC - Kenai LNG Plant
Potential to Emit Emissions: Greenhouse Gas (GHG) Summary**

| EU ID | Description | Fuel Type | Maximum Rating | Potential Annual Use | Factor Reference | N ₂ O Emission Factor | Potential to Emit N ₂ O Emissions ¹ | Potential to Emit CO ₂ e Emissions ² |
|---|---|-------------|----------------------|----------------------|----------------------|----------------------------------|---|--|
| 1 | Compressor Drive Turbine- Propane Cycle #151 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.5 tpy | 46,740 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | Natural Gas | 168.0 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.5 tpy | 46,740 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.7 tpy | 63,683 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | Natural Gas | 228.9 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.7 tpy | 63,683 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.5 tpy | 44,820 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | Natural Gas | 161.1 MMBtu/hr (LHV) | 4,745 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.5 tpy | 44,820 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | Natural Gas | 60.3 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.3 tpy | 30,972 tpy |
| 8 | Boiler #501 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.3 tpy | 23,884 tpy |
| 9 | Boiler #502 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.3 tpy | 23,884 tpy |
| 10 | Boiler #511 | Natural Gas | 46.5 MMBtu/hr (LHV) | 8,760 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.3 tpy | 23,884 tpy |
| 11 | Emergency Generator | Diesel | 350 kW | 500 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.001 tpy | 96 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 120 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 2.1E-04 tpy | 18 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 120 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 2.1E-04 tpy | 18 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 120 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 1.3E-04 tpy | 11 tpy |
| 15 | Ground Safety Flare | Flue Gas | 148 MMscf/day | 373.3 MMscf/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 2.6E-04 tpy | 21,788 tpy |
| 16 | Amine Reeneration Process Vent | N/A | 15,300 scf/hr | 8,760 hr/yr | N/A | N/A | 0 tpy | 6,701 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 8,760 hr/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.003 tpy | 280 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | N/A | N/A | 8,760 hr/yr | N/A | N/A | 0 tpy | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | N/A | N/A | 556 MMscf/yr | N/A | N/A | 0 tpy | 326,928 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy | 0 tpy |
| Total Potential to Emit N₂O Emissions | | | | | | | 4.7 tpy | |
| | | | | | | | | 768,953 tpy |

Notes:

¹ Parameters and conversions

| | |
|----------------------------------|-----------------|
| Natural gas HHV | 1,000 Btu/scf |
| Average BSFC, Table 3.4-1, AP-42 | 7,000 Btu/hp-hr |

² Based on global warming potential to CO₂ (1), CH₄ (28) and N₂O (265) from Table A-1, 40 CFR 98.

³ The typical composition of amine treater vent gas (VG) (volume basis) is 89-90% CO₂, 10% water vapor, and trace amounts of H₂S and CH₄. CO₂ emissions from the amine treater vent are based on VG composition and a flow rate of 15,300 scf per hour.

**Table B3-1a. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Emissions Unit Inventory - New Units**

| EU ID | Make / Model | Description | Fuel Type | Maximum Rating | Allowable Annual Use |
|-------|---|---------------|-------------|----------------|---------------------------|
| 24 | Cryonorm Submerged Combustion Vaporizer | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs/yr ¹ |
| 25 | Cryonorm Submerged Combustion Vaporizer | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | |

Notes:

¹ Proposed Owner Requested Limit (ORL).

**Table B3-1b. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Emissions Unit Inventory - Existing Units**

| EU ID | Make / Model | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use ¹ | Projected Annual Use |
|-------|-----------------------|--------------------------------------|-----------|---------------------------|---|-------------------------|
| 11 | Caterpillar D-379 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | 100 hrs/yr ² |
| 12 | Caterpillar 3406 BDIT | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | 100 hrs/yr ² |
| 13 | Caterpillar 3406 BDIT | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | 100 hrs/yr ² |
| 14 | Caterpillar 3306 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | 100 hrs/yr ² |
| 17 | John Deere 4039 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | 5,000 hrs/yr |
| 23 | NA | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 0 gal/yr | 17,000 gal/yr |

Notes:

¹ Actual annual use is based on an annual average of CY2023 & CY2024 actual operation applied under the FY2025 & FY2026 Assessable Emission Estimate.

² Projected annual use is based on 100 hours per year of maintenance and readiness testing, per Condition 23.8 of AQ0090TVP03 and 40 CFR 63.6640(f).

**Table B3-2. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Minor Source Air Permit Applicability Summary**

| Air Pollutant | Changes to Existing Stationary Source PTE Emissions | Modification to Existing Minor Stationary Source Permit Applicability 18 AAC 50.502(c) | Minor Source Permit Required? |
|-------------------------------|--|---|--------------------------------------|
| NO _x | 9.9 tpy | 10 tpy ¹ | No |
| CO | 0.2 tpy | 100 tpy ¹ | NA ² |
| PM ₁₀ ³ | 2.2 tpy | 10 tpy ¹ | No |
| PM _{2.5} | 2.2 tpy | 10 tpy ¹ | No |
| SO ₂ | 0.1 tpy | 40 tpy ⁴ | No |

Notes:

¹ Consistent with 18 AAC 50.502(c)(3)(A), a minor permit is required for a modification to an existing stationary source with a potential to emit an air pollutant greater than an amount listed in 18 AAC 50.502(c)(1) that will cause for that pollutant an increase greater than an amount listed.

² Per 18 AAC 50.502(c)(3)(A)(iv), the stationary source is not located within 10 kilometers of a carbon monoxide (CO) nonattainment area.

³ PM₁₀ emissions are assumed to be equivalent to PM_{2.5} emissions.

⁴ Consistent with 18 AAC 50.502(c)(4)(A), a minor permit is required for a modification to an existing stationary source with a potential to emit an air pollutant less or equal to an amount listed in 18 AAC 50.502(c)(1) that will cause for that pollutant an increase greater than an amount listed.

**Table B3-3. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project**

Prevention of Significant Deterioration (PSD) Air Permit Applicability Summary - Project Emissions Accounting: Step 1¹

| Regulated NSR Pollutant ² | Existing Emissions Units ³ | | New Emissions Units ⁴ | | Sum of the Difference ⁶ | PSD Significant Applicability 40 CFR 52.21(b)(23) ^{7,8,9} | PSD Major Modification Permit Required? ^{10,11} |
|---|---------------------------------------|----------------------------|--|-----------------------------|------------------------------------|---|--|
| | Baseline Actual Emissions | Projected Actual Emissions | Baseline Actual Emissions ⁵ | Potential to Emit Emissions | | | |
| NO _x | 0.2 tpy | 8.3 tpy | 0 tpy | 9.9 tpy | 18.0 tpy | 40 tpy | No |
| CO | 0.05 tpy | 1.8 tpy | 0 tpy | 0.2 tpy | 2.0 tpy | 100 tpy | No |
| PM ¹² | 0.02 tpy | 0.6 tpy | 0 tpy | 2.2 tpy | 2.7 tpy | 25 tpy | No |
| PM ₁₀ ¹² | 0.02 tpy | 0.6 tpy | 0 tpy | 2.2 tpy | 2.7 tpy | 15 tpy | No |
| PM _{2.5} | 0.02 tpy | 0.6 tpy | 0 tpy | 2.2 tpy | 2.7 tpy | 10 tpy | No |
| SO ₂ | 0.03 tpy | 0.9 tpy | 0 tpy | 0.1 tpy | 1.0 tpy | 40 tpy | No |
| Pb ¹³ | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 0.6 tpy | No |
| NO _x as a precursor to PM _{2.5} | 0.2 tpy | 8.3 tpy | 0 tpy | 9.9 tpy | 18.0 tpy | 40 tpy | No |
| SO ₂ as a precursor to PM _{2.5} | 0.03 tpy | 0.9 tpy | 0 tpy | 0.1 tpy | 1.0 tpy | 40 tpy | No |
| NO _x as a precursor to O ₃ | 0.2 tpy | 8.3 tpy | 0 tpy | 9.9 tpy | 18.0 tpy | 40 tpy | No |
| VOC as a precursor to O ₃ | 0.02 tpy | 0.8 tpy | 0 tpy | 1.6 tpy | 2.4 tpy | 40 tpy | No |
| GHG - CO ₂ e | 9 tpy | 303 tpy | 0 tpy | 36,802 tpy | 37,096 tpy | 75,000 tpy ¹⁴ | No |

Notes:

- ¹ Per from Mr. E. Scott Pruitt dated March 13, 2018 titled "Project Emissions Accounting Under the New Source Review Preconstruction Permitting Program", emissions decreases as well as increases are to be considered at Step I of the NSR applicability process, provided they are part of a single project.
- ² A *regulated NSR pollutant*, as defined under 40 Code of Federal Regulations (CFR) 52.21(b)(50), includes, but is not limited to, any pollutant subject to a national ambient air quality standard (NAAQS), as defined under 18 Alaska Administrative Code (AAC) 50.306(b)(1)(B), a constituent or precursor for a pollutant for which a NAAQS has been promulgated, and any pollutant that otherwise is subject to regulation, as defined in 40 CFR 52.21(b)(49), under the Act.
- ³ Consistent with 40 CFR 52.21(a)(2)(iv)(C), an actual-to-projected actual applicability test is applied for projects that involve existing emissions units.
- ⁴ Consistent with 40 CFR 52.21(a)(2)(iv)(D), an actual-to-potential applicability test is applied for projects that involve new emissions units.
- ⁵ For a new emissions unit, the *baseline actual emissions* for purposes of determining the emissions increase that will result from the initial construction and operation of such unit shall equal zero, per 40 CFR 52.21(b)(48)(iii).
- ⁶ Per 40 CFR 52.21(a)(2)(iv)(G), the "sum of the difference" as used in 40 CFR 52.21(a)(2)(iv)(C), (D) and (F) of this section shall include both increases and decreases in emissions calculated in accordance with those paragraphs.
- ⁷ Per 40 CFR 52.21(a)(2)(iv)(F), a *significant* emissions increase of a *regulated NSR pollutant* is projected to occur if the "sum of the difference" for all emissions units, using the method specified in 40 CFR 52.21(a)(2)(iv)(c) and (d) with respect to each emissions unit, equals or exceeds the significant amount for that pollutant.
- ⁸ Per 40 CFR 52.21(b)(23)(i), *significant* means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates.
- ⁹ Per 40 CFR 52.21(r)(6)(vi), a *reasonable possibility* occurs when a *projected actual emissions* increase of at least 50 percent of the amount that is a *significant emissions increase* for the *regulated NSR pollutant*.
- ¹⁰ Consistent with 40 CFR 52.21(b)(2)(i), any physical change or change in the method of operation of an existing *major stationary source* that would result in a *significant* emissions increase of a *regulated NSR pollutant* is a *major modification*.
- ¹¹ Consistent with 40 CFR 52.21(i)(3), a *major modification* to an existing *stationary source* shall apply best available control technology for each *regulated NSR pollutant* for which it would result in a *significant net emissions increase*.
- ¹² PM and PM₁₀ emissions are assumed to be equivalent to PM_{2.5} emissions.
- ¹³ Lead emissions are considered negligible.
- ¹⁴ Greenhouse gases (GHGs) are *subject to regulation* if the *major stationary source* is an existing *major stationary source* for a *regulated NSR pollutant* that is not GHGs, and also will also have an increase of a *regulated NSR pollutant*, and an emissions increase of 75,000 tpy CO₂e or more, per 40 CFR 52.21(b)(49)(iv)(B).

**Table B3-4. Kenai LNG LLC - Kenai LNG Plant
 Import Terminal Project
 Hazardous Air Pollutant (HAP) Air Permit Applicability Summary**

| Hazardous Air Pollutants | Stationary Source Potential to Emit Emissions ¹ | HAP Major Source Permit Applicability 18 AAC 50.316(a)(1) | HAP Major Source Permit Required? ² |
|-----------------------------------|---|--|---|
| Maximum Individual (formaldehyde) | 2.4 tpy | 10 tpy | No |
| Aggregate Total | 5.4 tpy | 25 tpy | No |

Notes:

¹ New Stationary Source Potential to Emit, as demonstrated in Table B3-11.

² A major stationary source of hazardous air pollutants subject to a standard under 40 CFR 63 must obtain a construction permit, per 18 AAC 50.316(a)(1).

**Table B3-5. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Stationary Source Potential to Emit Emissions Summary ¹**

| EU ID | Description | Potential to Emit NO _x Emissions | Potential to Emit CO Emissions | Potential to Emit PM ₁₀ Emissions ² | Potential to Emit PM _{2.5} Emissions | Potential to Emit VOC Emissions | Potential to Emit SO ₂ Emissions | Potential to Emit GHG Emissions |
|--|---|---|--------------------------------|---|---|---------------------------------|---|---------------------------------|
| 1 | Compressor Drive Turbine - Propane Cycle #151 | 126.0 tpy | 36.0 tpy | 2.9 tpy | 2.9 tpy | 0.9 tpy | 0.2 tpy | 46,740 tpy |
| 2 | Compressor Drive Turbine - Propane Cycle #152 | 126.0 tpy | 36.0 tpy | 2.9 tpy | 2.9 tpy | 0.9 tpy | 0.2 tpy | 46,740 tpy |
| 3 | Compressor Drive Turbine - Ethylene Cycle #251 | 226.5 tpy | 49.0 tpy | 3.9 tpy | 3.9 tpy | 1.3 tpy | 0.3 tpy | 63,683 tpy |
| 4 | Compressor Drive Turbine - Ethylene Cycle #252 | 226.5 tpy | 49.0 tpy | 3.9 tpy | 3.9 tpy | 1.3 tpy | 0.3 tpy | 63,683 tpy |
| 5 | Compressor Drive Turbine - Methane Cycle #351 | 111.6 tpy | 34.5 tpy | 2.8 tpy | 2.8 tpy | 0.9 tpy | 0.2 tpy | 44,820 tpy |
| 6 | Compressor Drive Turbine - Methane Cycle #352 | 111.6 tpy | 34.5 tpy | 2.8 tpy | 2.8 tpy | 0.9 tpy | 0.2 tpy | 44,820 tpy |
| 7a | Compressor Drive Turbine - Fuel System #701 | 26.9 tpy | 39.6 tpy | 1.9 tpy | 1.9 tpy | 0.6 tpy | 0.1 tpy | 30,972 tpy |
| 8 | Boiler #501 | 22.4 tpy | 18.6 tpy | 1.7 tpy | 1.7 tpy | 1.1 tpy | 0.1 tpy | 23,884 tpy |
| 9 | Boiler #502 | 22.4 tpy | 18.6 tpy | 1.7 tpy | 1.7 tpy | 1.1 tpy | 0.1 tpy | 23,884 tpy |
| 10 | Boiler #511 | 22.4 tpy | 18.6 tpy | 1.7 tpy | 1.7 tpy | 1.1 tpy | 0.1 tpy | 23,884 tpy |
| 11 | Emergency Generator | 3.6 tpy | 0.8 tpy | 0.3 tpy | 0.3 tpy | 0.3 tpy | 0.4 tpy | 96 tpy |
| 12 | Emergency Firewater Pump #2 | 0.7 tpy | 0.2 tpy | 0.05 tpy | 0.05 tpy | 0.1 tpy | 0.1 tpy | 18 tpy |
| 13 | Emergency Firewater Pump #3 | 0.7 tpy | 0.2 tpy | 0.05 tpy | 0.05 tpy | 0.1 tpy | 0.1 tpy | 18 tpy |
| 14 | Emergency Firewater Pump #4 | 0.4 tpy | 0.1 tpy | 0.03 tpy | 0.03 tpy | 0.0 tpy | 0.1 tpy | 11 tpy |
| 15 | Ground Safety Flare | 12.8 tpy | 52.7 tpy | 4.1 tpy | 4.1 tpy | 124.5 tpy | 0.09 tpy | 21,788 tpy |
| 16 | Amine Regeneration Process Vent | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 6,701 tpy |
| 17 | Compressor #5 | 10.6 tpy | 2.3 tpy | 0.8 tpy | 0.8 tpy | 0.8 tpy | 1.6 tpy | 280 tpy |
| 18 | Propane Compressor #151 Seal Oil Degassing Vent | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 211.5 tpy | 0 tpy | 0 tpy |
| 19 | Propane Compressor #152 Seal Oil Degassing Vent | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 211.5 tpy | 0 tpy | 0 tpy |
| 20 | Propane Compressor #251 Seal Oil Degassing Vent | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 108.0 tpy | 0 tpy | 0 tpy |
| 21 | Propane Compressor #252 Seal Oil Degassing Vent | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 108.0 tpy | 0 tpy | 0 tpy |
| 22 | Boil-Off Gas Vent for LNG Storage Tanks | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 0 tpy ³ | 0 tpy | 0 tpy ³ |
| 23 | Gasoline Storage and Dispensing Tank | 0 tpy | 0 tpy | 0 tpy | 0 tpy | 0.2 tpy | 0 tpy | 0 tpy |
| 24 | SCV #1 Blower | 9.9 tpy | 0.2 tpy | 2.2 tpy | 2.2 tpy | 1.6 tpy | 0.1 tpy | 36,802 tpy |
| 25 | SCV #2 Blower | | | | | | | |
| Total Potential to Emit Emissions | | 1,060.9 tpy | 390.6 tpy | 33.6 tpy | 33.6 tpy | 776.6 tpy | 4.5 tpy | 478,827 tpy |

Notes:

¹ Potential to Emit emissions for existing emissions units are based on Attachment B2 of this application or as otherwise noted below.

² PM₁₀ emissions are assumed to equal PM_{2.5}.

³ Emissions from the Boil-Off Gas Vent (EU ID 22) will be collected and routed to BOG compressors and will be combined with the vaporized LNG before being sent to the outbound pipeline. As a result, the VOC and GHG emissions are projected to be negligible.

**Table B3-6a. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit Emissions: Oxides of Nitrogen (NO_x) - New Units**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | Emission Factor | Potential to Emit NO _x Emissions |
|---|---------------|-------------|----------------|----------------------|------------------|----------------------------------|---|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Vendor Data | 2.00 lbm/hr @ 15% O ₂ | 9.9 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | |
| Total Potential to Emit NO_x Emissions | | | | | | | 9.9 tpy |

**Table B3-6b. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Baseline Actual Emissions: Oxides of Nitrogen (NO_x) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | Emission Factor | Baseline Actual NO _x Emissions |
|---|--------------------------------------|-----------|---------------------------|----------------------------|-------------------|-----------------|---|
| 11 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.2 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.03 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 0 gal/yr | N/A | N/A | 0 tpy |
| Total Baseline Actual NO_x Emissions | | | | | | | 0.2 tpy |

**Table B3-6c. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Projected Actual Emissions: Oxides of Nitrogen (NO_x) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | Emission Factor | Projected Actual NO _x Emissions |
|--|--------------------------------------|-----------|---------------------------|-----------------------------|-------------------|-----------------|--|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.7 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.6 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.6 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 0.4 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | AP-42 Table 3.3-1 | 0.031 lb/hp-hr | 6.0 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Projected Actual NO_x Emissions | | | | | | | 8.3 tpy |

**Table B3-7a. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit Emissions: Carbon Monoxide (CO) - New Units**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | Emission Factor | Potential to Emit CO Emissions |
|---|---------------|-------------|----------------|----------------------|------------------|----------------------------------|--------------------------------|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Vendor Data | 0.05 lbm/hr @ 15% O ₂ | 0.2 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | |
| Total Potential to Emit CO Emissions | | | | | | | 0.2 tpy |

**Table B3-7b. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Baseline Actual Emissions: Carbon Monoxide (CO) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | Emission Factor | Baseline Actual CO Emissions |
|---|--------------------------------------|-----------|---------------------------|----------------------------|--------------------|------------------|------------------------------|
| 11 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.04 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.007 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 0 gal/yr | N/A | N/A | 0 tpy |
| Total Baseline Actual CO Emissions | | | | | | | 0.05 tpy |

**Table B3-7c. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Projected Annual Emissions: Carbon Monoxide (CO) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | Emission Factor | Projected Actual CO Emissions |
|--|--------------------------------------|-----------|---------------------------|-----------------------------|--------------------|------------------|-------------------------------|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.2 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.1 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.1 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 0.08 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | AP-42, Table 3.3-1 | 0.00668 lb/hp-hr | 1.3 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Projected Actual CO Emissions | | | | | | | 1.8 tpy |

**Table B3-8a. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit Emissions: Particulate Matter Less than 2.5 Microns (PM_{2.5}) - New Units**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | Emission Factor | Potential to Emit PM _{2.5} Emissions ¹ |
|---|---------------|-------------|----------------|----------------------|--------------------|-----------------|--|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Table 1.4-2, AP-42 | 7.6 lb/MMscf | 2.2 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | |
| Total Potential to Emit PM_{2.5} Emissions | | | | | | | 2.2 tpy |

Notes:

¹ Parameters and conversions:

Natural Gas HHV 1,100 Btu/scf

**Table B3-8b. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Baseline Actual Emissions: Particulate Matter Less than 2.5 Microns (PM_{2.5}) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | Emission Factor | Baseline Actual PM _{2.5} Emissions |
|---|-----------------------|-----------|---------------------------|----------------------------|--------------------|-----------------|---|
| 11 | Caterpillar D-379 | Diesel | 350 kW | 27.5 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.01 tpy |
| 12 | Caterpillar 3406 BDIT | Diesel | 375 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 13 | Caterpillar 3406 BDIT | Diesel | 375 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 14 | Caterpillar 3306 | Diesel | 231 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0 tpy |
| 17 | John Deere 4039 | Diesel | 78 hp | 27.6 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.002 tpy |
| 23 | NA | N/A | 1,015 gallons | 0 gal/yr | N/A | N/A | 0 tpy |
| Total Baseline Actual PM_{2.5} Emissions | | | | | | | 0.02 tpy |

**Table B3-8c. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Actual Annual Emissions: Particulate Matter Less than 2.5 Microns (PM_{2.5}) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | Emission Factor | Projected Actual PM _{2.5} Emissions |
|--|--------------------------------------|-----------|---------------------------|-----------------------------|--------------------|-----------------|--|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.1 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.04 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.04 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.03 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | AP-42, Table 3.3-1 | 0.0022 lb/hp-hr | 0.4 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Projected Actual PM_{2.5} Emissions | | | | | | | 0.6 tpy |

**Table B3-9a. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit Emissions: Volatile Organic Compounds (VOC) - New Units**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | Emission Factor | Potential to Emit VOC Emissions ¹ |
|--|---------------|-------------|----------------|----------------------|--------------------|-----------------|--|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Table 1.4-2, AP-42 | 5.5 lb/MMscf | 1.6 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | |
| Total Potential to Emit VOC Emissions | | | | | | | 1.6 tpy |

Notes:

¹ Parameters and conversions:

Natural Gas HHV 1,100 Btu/scf

**Table B3-9b. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Baseline Actual Emissions: Volatile Organic Compounds (VOC) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | Emission Factor | Baseline Actual VOC Emissions |
|--|--------------------------------------|-----------|---------------------------|----------------------------|--------------------|------------------|-------------------------------|
| 11 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.02 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.003 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 0 gal/yr | N/A | N/A | 0 tpy |
| Total Baseline Actual VOC Emissions | | | | | | | 0.02 tpy |

**Table B3-9c. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Projected Actual Emissions: Volatile Organic Compounds (VOC) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | Emission Factor | Projected Actual VOC Emissions |
|---|--|-----------|---------------------------|-----------------------------|--------------------|---------------------------------|--------------------------------|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.06 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.05 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.05 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.03 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | AP-42, Table 3.3-1 | 0.00247 lb/hp-hr | 0.5 tpy |
| 23 | Vehicle Refueling (spillage) | N/A | 1,015 gallons | 17,000 gal/yr | AP-42, Table 5.2-7 | 0.7 lb/10 ³ gallons | 0.006 tpy |
| | Vehicle Refueling (uncontrolled displacement losses) | | | | AP-42, Table 5.2-7 | 11.0 lb/10 ³ gallons | 0.09 tpy |
| | Gasoline Storage and Dispensing Tank | | | | AP-42, Chapter 7 | N/A | 0.07 tpy ¹ |
| Total Projected Actual VOC Emissions | | | | | | | 0.8 tpy |

Notes:

¹ The VOC estimate is based on Title V Operating Permit AQ0090TVP03 Renewal Application submitted on April 23, 2024.

**Table B3-10a. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit Emissions: Sulfur Dioxide (SO₂) - New Units**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | Emission Factor ¹ | Potential to Emit SO ₂ Emissions ¹ |
|---|---------------|-------------|----------------|----------------------|------------------|------------------------------|--|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Mass Balance | 0.5 lb/MMscf | 0.1 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | |
| Total Potential to Emit SO₂ Emissions | | | | | | | 0.1 tpy |

**Table B3-10b. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Baseline Actual Emissions: Sulfur Dioxide (SO₂) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | Emission Factor ¹ | Baseline Actual SO ₂ Emissions ¹ |
|---|--------------------------------------|-----------|---------------------------|----------------------------|------------------|------------------------------|--|
| 11 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 2.21E-02 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 3.69E-03 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 0 gal/yr | N/A | N/A | 0 tpy |
| Total Baseline Actual SO₂ Emissions | | | | | | | 2.58E-02 tpy |

**Table B3-10c. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Projected Actual Emissions: Sulfur Dioxide (SO₂) - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | Emission Factor ¹ | Projected Actual SO ₂ Emissions ¹ |
|--|--------------------------------------|-----------|---------------------------|-----------------------------|------------------|------------------------------|---|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0.08 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0.06 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0.06 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0.04 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | Mass Balance | 6.70E-02 lb/gal | 0.7 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1,015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Projected Actual SO₂ Emissions | | | | | | | 9.16E-01 tpy |

Notes:

¹ Parameters and conversions:

| | | |
|--|-------------------------------|--|
| Natural gas sulfur content | 3 ppmv H ₂ S | (Condition 10.1, Title V Operating Permit AQ0900TVP03) |
| Natural Gas HHV | 1,100 Btu/scf | |
| Density of diesel fuel | 6.7 lb/gal | |
| Diesel average heat value: Table 3.1-2a, AP-42 | 137 MMBtu/10 ³ gal | |
| ULSD Sulfur Content | 0.5 wt. pct. | (Condition 12, Title V Operating Permit AQ0900TVP03) |
| Average BSFC, Table 3.4-1, AP-42 | 7,000 Btu/hp-hr | |

**Table B3-11. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit - Hazardous Air Pollutants (HAP) Emissions Summary**

| Hazardous Air Pollutant | Existing Stationary Source Potential to Emit ¹ | New EU ID 24 and 25 Potential to Emit | New Stationary Source Potential to Emit |
|--|--|--|--|
| Acetaldehyde | 1.25E-01 | ---- | 1.25E-01 |
| Acrolein | 2.06E-02 | ---- | 2.06E-02 |
| Benzene | 6.67E-02 | 1.20E-03 | 6.79E-02 |
| 1,3 Butadiene | 1.25E-03 | ---- | 1.25E-03 |
| Dichlorobenzene | 5.43E-04 | 6.85E-04 | 1.23E-03 |
| Ethylbenzene | 2.69E-01 | ---- | 2.69E-01 |
| Formaldehyde | 2.32E+00 | 4.28E-02 | 2.36E+00 |
| Hexane | 8.20E-01 | 1.03E+00 | 1.85E+00 |
| Polycyclic aromatic compounds (PAH) | 9.53E-03 | 3.89E-04 | 9.92E-03 |
| Polycyclic Organic Matter (POM) | 3.13E-03 | 3.89E-04 | 3.52E-03 |
| Acenaphthene | 2.57E-06 | 1.03E-06 | 3.59E-06 |
| Acenaphthylene | 7.06E-06 | 1.03E-06 | 8.08E-06 |
| Anthracene | 3.39E-06 | 1.37E-06 | 4.76E-06 |
| Benz(a)anthracene | 8.14E-07 | 1.03E-06 | 1.84E-06 |
| Benzo(a)pyrene | 7.75E-07 | 6.85E-07 | 1.46E-06 |
| Benzo(b)fluoranthene | 9.37E-07 | 1.03E-06 | 1.96E-06 |
| Benzo(g,h,i)perylene | 5.43E-07 | 6.85E-07 | 1.23E-06 |
| Benzo(g,h,l)perylene | 6.03E-07 | ---- | 6.03E-07 |
| Benzo(k)fluoranthene | 1.01E-06 | 1.03E-06 | 2.03E-06 |
| Chrysene | 1.25E-06 | 1.03E-06 | 2.28E-06 |
| Dibenz(a,h)anthracene | 1.26E-06 | 6.85E-07 | 1.95E-06 |
| 7,12-Dimethylbenz(a)anthracene | 7.24E-06 | 9.13E-06 | 1.64E-05 |
| Fluoranthene | 1.07E-05 | 1.71E-06 | 1.25E-05 |
| Fluorene | 3.73E-05 | 1.60E-06 | 3.89E-05 |
| Indeno(1,2,3-cd)pyrene | 1.28E-06 | 1.03E-06 | 2.30E-06 |
| 2-Methylnaphthalene | 1.09E-05 | 1.37E-05 | 2.46E-05 |
| 3-Methylcholanthrene | 8.14E-07 | 1.03E-06 | 1.84E-06 |
| Naphthalene | 2.43E-03 | 3.48E-04 | 2.78E-03 |
| Phenanthrene | 3.63E-05 | ---- | 3.63E-05 |
| Pyrene | 8.16E-06 | 2.85E-06 | 1.10E-05 |
| Propylene Oxide | 8.44E-02 | ---- | 8.44E-02 |
| Toluene | 3.91E-01 | 1.94E-03 | 3.93E-01 |
| Xylenes (isomers and mixture) | 1.92E-01 | ---- | 1.92E-01 |
| Arsenic | 9.05E-05 | 1.14E-04 | 2.05E-04 |
| Beryllium | 5.43E-06 | 6.85E-06 | 1.23E-05 |
| Cadmium | 4.98E-04 | 6.28E-04 | 1.13E-03 |
| Chromium | 6.33E-04 | 7.99E-04 | 1.43E-03 |
| Cobalt | 3.80E-05 | 4.79E-05 | 8.59E-05 |
| Manganese | 1.72E-04 | 2.17E-04 | 3.89E-04 |
| Mercury | 1.18E-04 | 1.48E-04 | 2.66E-04 |
| Nickel | 9.50E-04 | 1.20E-03 | 2.15E-03 |
| Selenium | 1.09E-05 | 1.37E-05 | 2.46E-05 |
| Total HAPs - Maximum Individual HAP | 2.32E+00 | 1.03E+00 | 2.36E+00 |
| Total VOC HAP Emissions | 4.30E+00 | 1.07E+00 | 5.38E+00 |
| Total HAPs Emissions | 4.30E+00 | 1.08E+00 | 5.38E+00 |

Notes:

¹ Potential to Emit emissions for existing emissions units are based on Attachment B2 of this application or as otherwise noted.

**Table B3-12. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit - Hazardous Air Pollutant (HAP) Emissions
Natural Gas Fired Heaters**

1,255,320 MMBtu/yr ¹

| Source Category Emission Calculations | | | |
|--|--------------------------------|---|---|
| <u>CAS No.</u> | <u>Chemical Name</u> | <u>AP-42 Emission Factor ²</u> | <u>Estimated Emissions ³</u> |
| 91-57-6 | 2-Methylnaphthalene | 2.40E-05 lb/MMscf | 1.37E-05 tpy |
| 56-49-5 | 3-Methylcholanthrene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| | 7,12-Dimethylbenz(a)anthracene | 1.60E-05 lb/MMscf | 9.13E-06 tpy |
| 83-32-9 | Acenaphthene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| 203-96-8 | Acenaphthylene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| 120-12-7 | Anthracene | 2.40E-06 lb/MMscf | 1.37E-06 tpy |
| 56-55-3 | Benz(a)anthracene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| 71-43-2 | Benzene | 2.10E-03 lb/MMscf | 1.20E-03 tpy |
| 50-32-8 | Benzo(a)pyrene | 1.20E-06 lb/MMscf | 6.85E-07 tpy |
| 205-99-2 | Benzo(b)fluoranthene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| 191-24-2 | Benzo(g,h,i)perylene | 1.20E-06 lb/MMscf | 6.85E-07 tpy |
| 207-08-9 | Benzo(k)fluoranthene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| 218-01-9 | Chrysene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| 53-70-3 | Dibenz(a,h)anthracene | 1.20E-06 lb/MMscf | 6.85E-07 tpy |
| 25321-22-6 | Dichlorobenzene | 1.20E-03 lb/MMscf | 6.85E-04 tpy |
| 206-44-0 | Fluoranthene | 3.00E-06 lb/MMscf | 1.71E-06 tpy |
| 86-73-7 | Fluorene | 2.80E-06 lb/MMscf | 1.60E-06 tpy |
| 50-00-0 | Formaldehyde | 7.50E-02 lb/MMscf | 4.28E-02 tpy |
| 110-54-3 | Hexane | 1.80E+00 lb/MMscf | 1.03E+00 tpy |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.80E-06 lb/MMscf | 1.03E-06 tpy |
| 91-20-3 | Naphthalene | 6.10E-04 lb/MMscf | 3.48E-04 tpy |
| 85-01-8 | Phenanathrene | 1.70E-05 lb/MMscf | 9.70E-06 tpy |
| 129-00-0 | Pyrene | 5.00E-06 lb/MMscf | 2.85E-06 tpy |
| 108-88-3 | Toluene | 3.40E-03 lb/MMscf | 1.94E-03 tpy |
| 7440-38-2 | Arsenic | 2.00E-04 lb/MMscf | 1.14E-04 tpy |
| 7440-41-7 | Beryllium | 1.20E-05 lb/MMscf | 6.85E-06 tpy |
| 7440-43-9 | Cadmium | 1.10E-03 lb/MMscf | 6.28E-04 tpy |
| 7440-47-3 | Chromium | 1.40E-03 lb/MMscf | 7.99E-04 tpy |
| 7440-48-4 | Cobalt | 8.40E-05 lb/MMscf | 4.79E-05 tpy |
| 7439-96-5 | Manganese | 3.80E-04 lb/MMscf | 2.17E-04 tpy |
| 7439-97-6 | Mercury | 2.60E-04 lb/MMscf | 1.48E-04 tpy |
| 7440-02-0 | Nickel | 2.10E-03 lb/MMscf | 1.20E-03 tpy |
| 7782-49-2 | Selenium | 2.40E-05 lb/MMscf | 1.37E-05 tpy |
| Total | | | 1.08E+00 tpy |

Notes:

¹ Total fuel use based on maximum full-time operation or permit-limited operation as noted below.

| | | |
|---------------|------------------------------------|---------------------------|
| EU ID 24 & 25 | Heat Consumption Rate: | 126.8 MMBtu/hr |
| | | 9,900 hr/yr |
| | | 1,255,320 MMBtu/yr |
| | Total Potential Heat Input: | 1,255,320 MMBtu/yr |

² Reference: AP-42, Tables 1.4-3 and 1.4-4.

³ Parameters and conversions:

| | |
|-----------------|---------------|
| Natural Gas HHV | 1,100 Btu/scf |
|-----------------|---------------|

**Table B3-13a. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Potential to Emit Emissions: Greenhouse Gas (GHG) Summary - New Units**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | CO ₂ Emission Factor | Potential to Emit CO ₂ Emissions ¹ |
|---|---------------|-------------|----------------|----------------------|----------------------|---------------------------------|--|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Table C-1, 40 CFR 98 | 53.06 kg/MMBtu | 36,634 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | |
| Total Potential to Emit CO₂ Emissions | | | | | | | 36,634 tpy |

**Table B3-13b. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Baseline Actual Emissions: Greenhouse Gas (GHG) Summary - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | CO ₂ Emission Factor | Baseline Actual CO ₂ Emissions ¹ |
|---|--------------------------------------|-----------|---------------------------|----------------------------|----------------------|---------------------------------|--|
| 11 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 7 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 1 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 0 gal/yr | N/A | N/A | 0 tpy |
| Total Baseline Actual CO₂ Emissions | | | | | | | 8 tpy |

**Table B3-13c. Kenai LNG LLC - Kenai LNG Plant
Import Terminal Project
Projected Actual Emissions: Greenhouse Gas (GHG) Summary - Existing Units**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | CO ₂ Emission Factor | Projected Actual CO ₂ Emissions ¹ |
|--|--------------------------------------|-----------|---------------------------|-----------------------------|----------------------|---------------------------------|---|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 26 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 21 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 21 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 13 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | Table C-1, 40 CFR 98 | 73.25 kg/MMBtu | 220 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Projected Actual CO₂ Emissions | | | | | | | 302 tpy |

Notes:

¹ Parameters and conversions

Average BSFC, Table 3.4-1, AP-42 7000 Btu/hp-hr

² Based on global warming potential to CO₂ (1), CH₄ (28) and N₂O (265) from Table A-1, 40 CFR 98.

**Table B3-13a. Kenai LNG LLC - Kenai LNG
Import Terminal Project
Potential to Emit Emissions: Greenhouse Gas (GHG) Su**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | CH ₄ Emission Factor | Potential to Emit CH ₄ Emissions ¹ |
|---|---------------|-------------|----------------|----------------------|----------------------|---------------------------------|--|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 2.1 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | |
| Total Potential to Emit CH₄ Emissions | | | | | | | 2.1 tpy |

**Table B3-13b. Kenai LNG LLC - Kenai LNG
Import Terminal Project
Baseline Actual Emissions: Greenhouse Gas (GHG) Sum**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | CH ₄ Emission Factor | Baseline Actual CH ₄ Emissions ¹ |
|---|--------------------------------------|-----------|---------------------------|----------------------------|----------------------|---------------------------------|--|
| 11 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 2.98E-04 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 4.97E-05 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 0 gal/yr | N/A | N/A | 0 tpy |
| Total Baseline Actual CH₄ Emissions | | | | | | | 3.48E-04 tpy |

**Table B3-13c. Kenai LNG LLC - Kenai LNG
Import Terminal Project
Projected Actual Emissions: Greenhouse Gas (GHG) Sum**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | CH ₄ Emission Factor | Projected Actual CH ₄ Emissions ¹ |
|--|--------------------------------------|-----------|---------------------------|-----------------------------|----------------------|---------------------------------|---|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 0.001 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 8.66E-04 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 8.66E-04 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 5.34E-04 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | Table C-2, 40 CFR 98 | 3.00E-03 kg/MMBtu | 9.01E-03 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy |
| Total Projected Actual CH₄ Emissions | | | | | | | 0.01 tpy |

Notes:

¹ Parameters and conversions

Average BSFC, Table 3.4-1, AP-42 7000 Btu/hp-hr

² Based on global warming potential to CO₂ (1), CH₄ (28) and N₂O (265) from Table A-1, 40 CFR 98.

**Table B3-13a. Kenai LNG LLC - Kenai LNG
Import Terminal Project
Potential to Emit Emissions: Greenhouse Gas (GHG) Su**

| EU ID | Description | Fuel Type | Maximum Rating | Allowable Annual Use | Factor Reference | N ₂ O Emission Factor | Potential to Emit N ₂ O Emissions ¹ | Potential to Emit CO ₂ e Emissions ² |
|---|---------------|-------------|----------------|----------------------|----------------------|----------------------------------|---|--|
| 24 | SCV #1 Blower | Natural Gas | 63.4 MMBtu/hr | 9,900 hrs | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0.4 tpy | 36,802 tpy |
| 25 | SCV #2 Blower | Natural Gas | 63.4 MMBtu/hr | | | | | |
| Total Potential to Emit N₂O Emissions | | | | | | | 0.4 tpy | |
| | | | | | | | | 36,802 tpy |

**Table B3-13b. Kenai LNG LLC - Kenai LNG
Import Terminal Project
Baseline Actual Emissions: Greenhouse Gas (GHG) Sum:**

| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Baseline Actual Annual Use | Factor Reference | N ₂ O Emission Factor | Baseline Actual N ₂ O Emissions ¹ | Baseline Actual CO ₂ e Emissions ² |
|---|--------------------------------------|-----------|---------------------------|----------------------------|----------------------|----------------------------------|---|--|
| 11 | Emergency Generator | Diesel | 350 kW | 27.5 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 6.0E-05 tpy | 7 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 0 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0 tpy | 0 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 0 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0 tpy | 0 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 0 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 0 tpy | 0 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 27.6 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 9.95E-06 tpy | 1 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 0 gal/yr | N/A | N/A | 0 tpy | 0 tpy |
| Total Baseline Actual N₂O Emissions | | | | | | | 6.96E-05 tpy | |
| | | | | | | | | 8.5 tpy |

**Table B3-13c. Kenai LNG LLC - Kenai LNG
Import Terminal Project
Projected Actual Emissions: Greenhouse Gas (GHG) Sum**

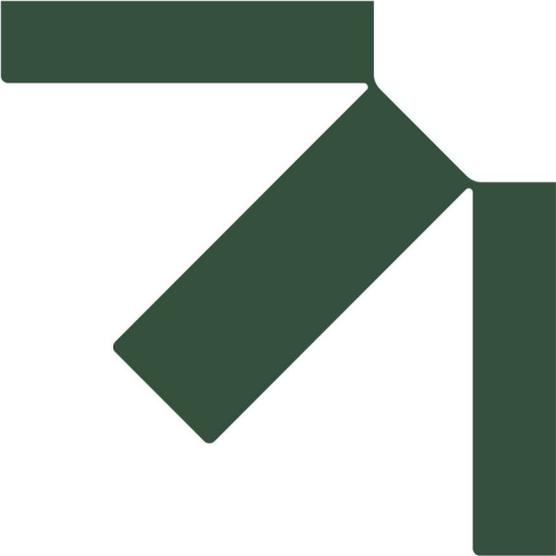
| EU ID | Description | Fuel Type | Maximum Rating / Capacity | Projected Actual Annual Use | Factor Reference | N ₂ O Emission Factor | Projected Actual N ₂ O Emissions ¹ | Projected Actual CO ₂ e Emissions ² |
|--|--------------------------------------|-----------|---------------------------|-----------------------------|----------------------|----------------------------------|--|---|
| 11 | Emergency Generator | Diesel | 350 kW | 100 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 2.17E-04 tpy | 27 tpy |
| 12 | Emergency Firewater Pump #2 | Diesel | 375 hp | 100 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 1.73E-04 tpy | 21 tpy |
| 13 | Emergency Firewater Pump #3 | Diesel | 375 hp | 100 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 1.73E-04 tpy | 21 tpy |
| 14 | Emergency Firewater Pump #4 | Diesel | 231 hp | 100 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 1.07E-04 tpy | 13 tpy |
| 17 | Compressor #5 | Diesel | 78 hp | 5,000 hrs/yr | Table C-2, 40 CFR 98 | 6.00E-04 kg/MMBtu | 1.80E-03 tpy | 221 tpy |
| 23 | Gasoline Storage and Dispensing Tank | N/A | 1015 gallons | 17,000 gal/yr | N/A | N/A | 0 tpy | 0 tpy |
| Total Projected Actual N₂O Emissions | | | | | | | 2.47E-03 tpy | |
| | | | | | | | | 302.8 tpy |

Notes:

¹ Parameters and conversions

Average BSFC, Table 3.4-1, AP-42 7000 Btu/hp-hr

² Based on global warming potential to CO₂ (1), CH₄ (28) and N₂O (265) from Table A-1, 40 CFR 98.



Attachment C Owner Requested Limit Application Requirements under 18 AAC 50.540(j)

Application for an Owner Requested Limit

Kenai LNG Plant

Kenai LNG LLC

SLR Project No.: 105.021468.00001

December 22, 2025



**Kenai LNG Plant
Import Terminal Project
Application for an Owner Requested Limit
Attachment C: Owner Requested Limit Application Requirements
under 18 AAC 50.540(j)**

An application for an owner requested limit (ORL) under 18 Alaska Administrative Code (AAC) 50.540(j) must include the information and materials required under 18 AAC 50.225(b)(2) through (6) and (8). Information pertaining to 18 AAC 50.225(b)(4) through (6) and (8) is provided below.

18 AAC 50.225(b)(4): A description of each proposed limit, including for each air pollutant a calculation of the effect the limit will have on the stationary source's potential to emit and the allowable emissions.

1. Kenai LNG LLC is requesting an ORL of 9,900 hours of operation for EU ID 24 and 25, combined, to limit nitrogen oxides (NO_x) emissions to avoid classification as a minor modification to a stationary source under 18 AAC 50.502(c)(3).

See Attachment B of this application for a description of the effect the limits will have on the stationary source's potential to emit.

18 AAC 50.225(b)(5): A description of a verifiable method to attain and maintain each limit, including monitoring and recordkeeping requirements.

Owner Requested Limits to Avoid Minor Permitting under 18 AAC 50.502(c)(3) for NO_x

1. The Permittee shall limit NO_x emissions from EU ID 24 and 25 to 9.9 TPY by limiting the operation of EU ID 24 and 25 to 9,900 hours, combined, per 12 consecutive month period. Monitor, record, and report as follows:
 - 1.1. The Permittee shall install and maintain hour meters on each of EU ID 24 and 25.
 - 1.2. Monitor and record the monthly operational hours of EU ID 24 and 25.
 - 1.3. By the 15th day of each month, calculate and record:
 - a. the total operational hours combined for EU IDs 24 and 25 for the previous month; and
 - b. the total operational hours during the previous 12 months.
 - 1.4. Include in each operating report required by the applicable operating permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50, the records required by Conditions 1.2 and 1.3.

- 1.5. Report in accordance with the operating permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50, if the Permittee fails to comply with any requirements in Condition 1.

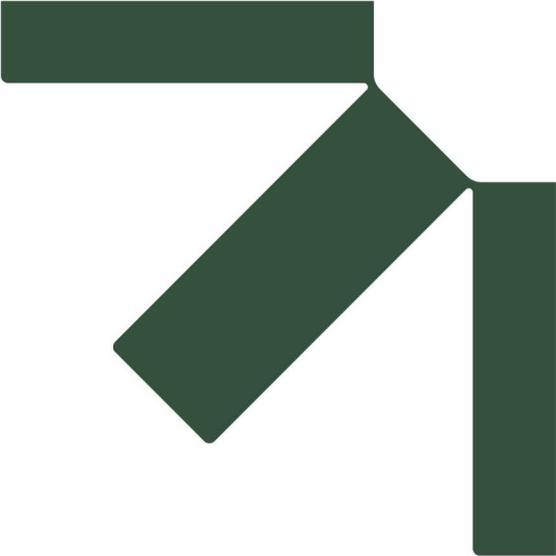
18 AAC 50.225(b)(6): Citation to each requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement.

18 AAC 50.502(c)(3)(A) – Avoid Minor Permitting for a Modification to a Stationary Source

Without the ORL to restrict the operational hours for EU IDs 24 and 25, the Kenai LNG Plant Import Terminal Project would be classified as a minor modification to a stationary source for NO_x. The proposed ORL reduces the PTE emissions for the project to levels below the minor modification thresholds under 18 AAC 50.502(c)(3)(A).

18 AAC 50.225(b)(8): A statement that the owner or operator of the stationary source will be able to comply with each limit.

Kenai LNG LLC will be able to comply with the proposed limits.



Attachment D Vendor Data

Application for an Owner Requested Limit

Kenai LNG Plant

Kenai LNG LLC

SLR Project No.: 105.021468.00001

December 22, 2025





Cryonorm, LLC

41661 Enterprise Circle N, Suite #211, Temecula, CA 92590, United States

**BUDGET PROPOSAL TO SUPPLY
SUBMERGED COMBUSTION VAPORIZERS
100 MMSCFD @ 900 psi
TAG # Z-3701 / Z-3702**

Kenai Peninsula LNG terminal

FOR:



audubon

F.a.o. mr. Dane Price

Cryonorm Proposal No. 302250151 rev. 02

15 May 2025



Table of Contents

| | | |
|----|--------------------------------------|----|
| 1 | SYSTEM DUTY SPECIFICATION..... | 3 |
| 2 | DESIGN CONCEPT | 4 |
| 3 | PROCESS DESCRIPTION | 4 |
| 4 | SCOPE OF SUPPLY | 5 |
| 5 | DETAILED EQUIPMENT DESCRIPTION | 6 |
| 6 | UTILITY REQUIREMENTS..... | 11 |
| 7 | SCHEDULE..... | 12 |
| 8 | Site services | 12 |
| 9 | DOCUMENTATION | 12 |
| 10 | BUDGET PRICES..... | 13 |
| 11 | Warranty..... | 13 |
| 12 | VALIDITY PERIOD | 14 |
| 13 | PAYMENT TERMS | 14 |
| 14 | GENERAL TERMS AND CONDITIONS | 14 |
| 15 | PERFORMANCE GUARANTEE | 14 |

Attention: mr. Dane Price

RE: **LNG SUBMERGED COMBUSTION VAPORIZERS**

Cryonorm is pleased to submit this proposal for the design, fabrication and supply of two Submerged Combustion Vaporizer (SCV) Units for a 17.5 BCF/yr LNG regas plant on the Kenai Peninsula in Alaska.

This proposal is based on Cryonorm standards and ASME div. VIII latest edition for pressure parts.

Further refer to our General Arrangement drawing 302250151-00-000 and P&ID 302250151-1100-102.

1 SYSTEM DUTY SPECIFICATION

1.1 PROCESS DESIGN BASIS

| | | |
|---|----------------------------|---------------------|
| Process Fluid | LNG | LNG |
| Vaporization Rate per unit | 85 ton/hr | 100 MMSCFD |
| LNG Inlet Temperature | -162°C | -260°F |
| NG Outlet Design Temperature | 10°C | 50°F |
| Number of Burners per Unit | 1 | 1 |
| Site Elevation | sea level | sea level |
| Bath temperature | 40°C | 104°F |
| Required Total Gross Heat Input, Kwh | 18.585 Kwh | 63.4 MMBTUhr |
| Thermal Efficiency, % HHV basis | approx. 95% | approx. 95% |
| Unit Turndown | 10:1 | 10:1 |
| Fuel | Natural Gas | Natural Gas |
| Fuel flow at full duty rate, approx.* | 2.250 Nm ³ /hr | 1,446 scfm |
| Design burner excess air | 30% | 30% |
| Combustion Air Flow at Design Rate | 28.100 Nm ³ /hr | 14,250 scfm |
| Combustion Air Pressure at Design Rate | 0,3 barg (max) | 4.79 psig |
| LNG Inlet Pressure | 62 barg | 900 psig |
| Pressure Drop Across Coil, approx. | 2,8 bar | 40 psi |
| Minimum Design Temperature | -35°C | -30°F |
| Maximum Design Temperature | 30°C | 86°F |

* based on fuel composition (13.23% Nitrogen)

1.2 PROCESS DUTY

As we have not received a LNG composition, we have assumed the LNG will have a composition as per below table:

| INLET LNG COMPOSITION | | |
|-----------------------|----------------------|---------------------|
| <u>COMPONENT</u> | <u>MOLE FRACTION</u> | <u>LIQUID PHASE</u> |
| METHANE | 0.9196 | 0.9196 |
| ETHANE | 0.0700 | 0.0700 |
| PROPANE | 0.0053 | 0.0053 |
| I-BUTANE | 0.0001 | 0.0001 |
| N-BUTANE | 0.0001 | 0.0001 |
| I-PENTANE | 0.0000 | 0.0000 |
| N-PENTANE | 0.0000 | 0.0000 |
| NITROGEN | 0.0049 | 0.0049 |
| CARBON DIOXIDE | 0.0001 | 0.0001 |

Process calculations using Promax simulation software and LNG composition as per table, a heat input of 63.4 MMBTUhr (18,6 MW) is needed to meet the thermal duty for the vaporization of 100 MMSCFD (85 ton/hr) and heating the natural gas to 50°F (10°C).

2 DESIGN CONCEPT

Cryonorm is proposing single burner submerged combustion vaporizer units based on full shop assembly including stainless steel tank as per preliminary GA drawing 302250151-00-000. SCV units to be installed inside an airconditioned building.

Each of the SCVs are standalone systems, control panels of both units will be supplied loose and to be placed in overall plant – safe zone – control room.

Each SCV will have a process control PLC and have full communication capabilities with the plant DCS, via modbus. The firing rate of the burners will be controlled by a temperature PID loop to control the outlet gas temperature at a design value of 20-70°F (-6 - 21°C). Flow measurement of fuel and air will be used to ratio the fuel and air for safe and clean combustion with a cross-limited control strategy. The hot combustion gases will be distributed across the footprint of the vaporization coil through a header emanating from the combustion chamber, with fingers that extend below the coil to sparge the gas evenly at all firing rates.

We have various options for tank design, and have opted for a metal tank design (304 Stainless Steel). This offers the advantages of complete construction at our workshop in Tulsa and complete loop testing of the unit. The anticipation is the units can be shipped direct from factory to your LNG plant by road and/or marine transport.

3 PROCESS DESCRIPTION

Each SCV unit will comprise a low emissions burner, vaporization tube bundle, stainless steel containment tank, combustion air blower, exhaust stack, fuel train, PLC-based control system and Burner Management Safety system. The vaporization coil is submerged in the water bath. The water bath is heated by hot product of combustion gases from the burner combustion chamber, uniformly distributed underneath the tube bundle by a header and laterals piping arrangement on the tank floor.

The hot gases rise and pass around the tubes while heating the water bath, transferring their thermal energy to the tube side process liquid and gas. Water is carried along with the gas

bubbles up through the tube bundle. The cooler water above the tube bundle overflows the side walls of the weir box and is circulated to the lower regions of the tank to be reheated by the combustion gas, and once again pass through the vaporization coil.

Fuel gas is piped to each burner through fuel trains installed on side of SCV unit. Each fuel train comprising a manual shutoff valve, strainer, pressure regulator, double block safety shutoff valves, valve proving system, mass flow meter, flow control valve and check valve. Combustion air is provided by a centrifugal blower. The air duct to the burner contains a mass flow meter and flow conditioning element. The air flow is controlled by throttling a Variable Frequency Drive (by others) and trimmed with a control valve at the burner air inlet nozzle. The air to fuel ratio is controlled by the process Burner Management System (BMS) which monitors the flows of the air and fuel, and adjusts the air flow with the combustion air flow. An air flow rate 30% - 40% in excess of stoichiometric requirements for fuel combustion is the design criterion. The air and fuel flow rates are determined by the required heat load as dictated by the heated water temperature setpoint. The burner firing rate is controlled by this temperature PID loop. To allow for lower heat demand periods, the burner can be turned down by at least 10:1.

The burner is mounted on the top of the vertically orientated submerged combustion chamber. The fuel and air are mixed in the burner and ignited in the burner throat. The pressure imparted by the blower forces the combustion gases down into the chamber and through a horizontal header. A series of laterals emanate from the header towards the longitudinal axis of the tank underneath the vaporization tube bundle.

The combustion gases emerge as bubbles that contact the water and transfer their heat, and some of the water vapor in the combustion gases condense to contribute their latent heat to the process water.

The non-condensable gas bubbles rise to the surface, traversing between the tubes of the tube bundle. Heated water is carried along by the rising gas bubbles, transferring heat to the tubes. The gases are released into the vapor space above the liquid bath and are exhausted through the vent stack.

A Burner Management System (BMS) monitors all of the required conditions for safe operation of the burner, and will shut the burner down when the conditions deviate from the set parameters. The BMS is certified to the latest standards which would be applicable at the time of order.

4 SCOPE OF SUPPLY

4.1 BATTERY LIMITS

The battery limits of each SCV are:

- Bottom of equipment skid
- Make-up water inlet on tank
- Excess water bleed nozzle
- Fuel train gas inlet flange
- Exhaust stack outlet
- Tank drain nozzle faces
- Power junction boxes on blower motor
- Tank emergency overflow nozzle
- LNG inlet flange
- Natural Gas outlet flange

Control panel for both units to be placed in central -safe zone- control room.

Scope OF SUPPLY

The following components and services are included in the scope of supply.

- Two (2) Submerged Combustion Vaporizers for LNG service
- Full manufacturing data book
- Control panels (to be installed in safe zone plant control room)

4.2 EXCLUSIONS FROM SCOPE OF SUPPLY

The following items, and others not necessarily listed, are not included in the scope of supply.

- Soft starters for blowers
- Equipment unloading
- Equipment installation
- Grouting
- Anchors for skid to concrete
- LNG and Natural Gas piping outside battery limit
- Insulation (vessel, water piping, LNG piping, etc)
- Site pre-commissioning and commissioning (can be offered as field service)
- Wiring to control container and of devices outside of battery limit
- Preservation of equipment on site
- Applicable taxes
- Insurances
- Vaporizers can be manufactured under surveillance of customer appointed inspection authority. Cost arising from such third party inspection will be charged against cost plus 10%.
- participation in the HAZOP and SIL meetings, can be offered against daily rates & conditions

5 DETAILED EQUIPMENT DESCRIPTION

5.1 GENERAL

Each SCV unit will comprise an independent standalone system.

Installation of each system requires

- Placement & anchoring of the tank and combustion air blower on an engineered concrete pad
- Connection of inlet and outlet process piping for LNG/Natural Gas
- Connection of electrical power to motor and panel
- Connection of fuel supply to inlet of fuel train
- Installation of combustion air ducting
- Installation of the stack onto the tank
- Installation of fuel gas train skid on tank top
- Installation of handrails, access ladder and platform

5.2 TANK

| | |
|--------------------------|--|
| Material of Construction | 304L Stainless Steel |
| Dimensions LxWxH | 354.33x157.48x118.11 inch (9.000x4.000x3.000 mm) |
| LNG Inlet nozzle | 4" ANSI class 1500 RF |

| | |
|----------------------------|--|
| NG Outlet nozzle | 8" ANSI class 1500 RF |
| Drain nozzles | 2" ANSI class 150 RF |
| Instrument couplings | 2" and 3" ANSI class 150 RF |
| Level Sensor Stilling Well | 2" diameter, internal in tank |
| Access ladder | 1 - carbon steel painted, Safety Yellow w/ safety gate |
| Safety railing | Carbon Steel, painted Safety Yellow |
| Stack | Ø4ft x 15ft (Preliminary) |
| Insulation | Not included, to be done on site if required |
| Anti frost protection | Two off Frost Heaters (removable in service) |

5.3 VAPORIZER COIL

Each SCV vaporizer coil consists of a number of parallel working tubes connected to in- and outlet header for single customer tie-in. Coil welds will be pickled and passivated, coil cleaned and degreased for cryogenic service and pressurized with Nitrogen to keep positive pressure.

| | |
|--|--------------------------------------|
| Material of Construction | 316L SS |
| Design Code | ASME Section VIII, Div 1, CSA B51-19 |
| Marking | CE |
| Tube Type | Seamless |
| Maximum design pressure | 1,200 psig (83 barg) |
| Hydrostatic test pressure | 1,560 psig (108 barg) |
| Working pressure | 900 psig (62 barg) |
| Natural gas outlet temperature | ≥50°F (≥10°C) |
| NDI Testing | 100% RT on welds |
| Finish | Pickled and passivated |
| LNG Inlet Nozzle Size and Rating | 4" ANSI CL 1500 |
| NG Outlet Nozzle Size and Rating | 8" ANSI CL 1500 |
| Pressure Drop, approx. | 40 psi (2,8 bar) |
| Fouling Resistance, m ² -°K/W | 0.002 |

BURNER

Burner management system will be set on below fuel composition, please note that this composition can not change too much in time and composition.

| 17 | FUEL COMPOSITION (MOLE %) | | | |
|----|---------------------------|-------|--------------------|-----|
| 18 | NITROGEN | 13.23 | I-PENTANE | 0 |
| 19 | CARBON DIOXIDE | 0 | N-PENTANE | 0 |
| 20 | METHANE | 86.76 | HEXANE | 0 |
| 21 | ETHANE | 0.01 | TOTAL | 100 |
| 22 | PROPANE | 0 | SUPPLY CONDITIONS: | - |
| 23 | I-BUTANE | 0 | PRESSURE (PSIG): | 100 |
| 24 | N-BUTANE | 0 | TEMPERATURE (°F): | -8 |

| | |
|------------------------------|--|
| Design gross heat input | 63,4 MMBTU (18.584 kW) |
| Type of burners | Maxon Kinedizer LE 16" |
| Qty. of burner per SCV | 1 |
| Materials of construction | Carbon Steel / stainless steel 304L |
| Surface Finish | Painted |
| Spark ignitor | Maxon |
| Peep sight | 4 x 1.5" |
| Combustion gas sampling port | TBC |
| Gas Distribution Spargers | Single Header with multiple distribution tubes |
| Stack | Free Standing 15ft High |
| Stack Accessories | De-mister pad |

| Emission [≤] | @3% Oxygen | | @15% Oxygen | |
|--------------|------------|-------|-------------|-------|
| | [lbm/hr] | [ppm] | [lbm/hr] | [ppm] |
| CO | 0.05 | 0.66 | 0.05 | 0.2 |
| NOx | 2.00 | 30 | 2.00 | 10 |

5.1 COMBUSTION AIR BLOWERS AND DUCTING



| | |
|-------------------------------------|--|
| Enclosure | Blower and e-motor installed on base frame covered by noise reducing enclosure with access panels |
| Quantity per SCV | 1 |
| Air delivery rating per blower unit | 14,250 scfm @ 3.77 PSI diff pressure (21.485 Nm ³ /h @ 33 kPa diff pressure) |
| Manufacturer | Halifax Fans or equal |
| Casing Material of Construction | Mild Steel S275 |
| Impeller material | Mild Steel S275 |
| External paint | Manufacturer's standard |
| Blower Motor Model | WEG or equal |
| Motor Power Rating | 402 HP (300 kW) |
| Motor Spec | 2.983 rpm, 4160 V /3 ph/60 Hz TEFC Zone 2 Group IIA installation, Class I Division 2 per UL1203 |
| Inlet air silencer/filter | Inlet silencer to reduce noise to 85 dbA @ 3 feet (free field conditions per SCV unit) |
| Vibration isolation pads | Vibration absorbing pads |

| | |
|---|--|
| Vibration Sensors | One vibration sensor per blower bearing and one per motor bearing |
| Temperature Sensors | 3-wire PT 100 RTD on each blower bearing and each motor bearing, two per phase winding on motors |
| Inlet Expansion Joint | EPDM single sphere – TBC |
| Outlet Expansion Joint | EPDM single sphere – TBC |
| Blower & motor common base skid | Factory standard |
| Blower dimensions (on skid, LxHxW), TBC | 236.22x118.11x94.69 inch (6.000x 3.000x2.405 mm) |
| Blower skid construction | Carbon steel, factory paint |
| Blower External Finish | Epoxy coated, supplier standard |
| Coupling | Falk 40R10 Direct coupling TBA |
| Blower Testing | TBA |
| Air ducting | Carbon Steel |
| Noise Level | 85 dBA @ 3 feet free field per SCV |

A note on the stack

We have listed the stack as the basic minimum for both safe operation and human factors. The stack is designed in such a way that can easily handle most environmental requirements and legislation. As we have not received any project/site specifications, considerations can be made for height, velocity, emissions monitoring, and safe access – please inform once required.

5.2 FUEL AND GAS TRAIN

| | |
|---------------------------|---|
| Enclosure | Fuel and gas trains installed on base frame covered by enclosure with access panels |
| Piping Fuel Gas and Pilot | CS A105/A106 Welded/Flanged |
| Cooling Water | 304 St.St Welded |
| Instrument Air | 304 St.St Threaded NPT |
| Instrument tube Air | ¼” mm Swagelok or equal |
| Instrument tube Process | ½” mm Swagelok or equal |

Overpressure protection upstream of battery limit must be provided. For mor details see attached Instrument list. Please note when manufacturers are listed please consider “or equal”. This would apply if there is a standard vendor list

5.3 CONTROL PANEL

| | |
|--------------------|---------------------------------------|
| Process CPC | Siemens S7 or equal (Non-Safety) |
| NMS | Lamtec VMS or Equal |
| HMI unit | Non PC based Screen |
| Enclosure | Steel Rittal enclosure Safe area |
| Emergency Shutdown | Pilz or equal |
| Supply power | 415 VAC - 24 VDC internal transformer |

6 UTILITY REQUIREMENTS

All values below are indicative and TBC based on detailed design or specific site requirements

6.1 FUEL GAS

| Fuel Gas | |
|---|--|
| Composition | Vaporized LNG or Boil Off Gas |
| Process Flowrate @ full load | approx. 1,446 scfm (2.250 Nm ³ /h), based on fuel gas composition (13,23% Nitrogen) |
| Design Pressure at Vaporizer Inlet Flange (min / max) | 43.5 / 175 psig (3 / 12 barg) |
| Temp. at Vaporizer Inlet Flange | ≥ 32 °F (0°C) |

6.2 ELECTRIC POWER

| Electrical Supply | | |
|--|-----------------------|--------------------------------|
| Service | Supply | Maximum Load per SCV |
| Combustion Air Blower | 4160V / 3 ph / 60Hz | 604 HP (450 kW) |
| Immersion Heaters | 480V / 3 ph / 60Hz | 2 x 13.4 HP (2 x 10 kW) |
| Cooling Water Pump | 480V / 3 ph / 60Hz | 7.4 HP (5.5 kW) |
| Lighting Load (CA Blower acoustic housing) | 120V, 1ph+N+PE, 60 Hz | 0.27 HP (0.2 kW - 4x49W lamps) |
| Vaporizer Controls – to include panel lights, ventilation fans | 120V / 1 ph / 60Hz | 2 HP (1.5 kW) |
| Motor Anti-Condensation Heater | 240V / 1 ph / 60 Hz | 0.13 HP (100 W) |
| Igniter | 240V / 3 ph / 60 Hz | 0.57 HP (440 W) |

6.3 INSTRUMENT AND PLANT AIR

| Instrument Air | |
|---|---|
| Composition | -40°F Dewpoint |
| Flowrate (norm / max) | 17.5 / 25 scfm (28 / 40 Nm ³ /h) |
| Pressure at Vaporizer Inlet Flange (min / norm / max) | 43.5 / 101.5 / 175 psig (3 / 7 / 10 barg) |
| Temp. at Vaporizer Inlet Flange (min / max) | Ambient |

6.4 WATER

| Water | | | |
|-------------|----------------------|-----------------|---|
| Quality | First Fill / Make-Up | | Demineralized, with chloride content < 10 ppm |
| | For NOx Control | | Bath Water |
| Consumption | Initial Fill | ft ³ | Approx 3,565 |

| | | | |
|--|---------------|------|--|
| | Make-Up Water | scfm | None (except during shutdown due to evaporation losses & for initial fill) |
|--|---------------|------|--|

6.5 CAUSTIC SOLUTION

| Caustic Solution * | |
|--------------------|---------------------------------------|
| Composition | Sodium Hydroxide – 20% Water – 80% |
| Flowrate | 14 lb/hr (6.2 kg/hr) |

* Caustic solution supplied via pump from centralized storage tank for both SCVs mounted at grade. Flowrate is for design duty for 1 SCV

6.1 WASTE WATER

The bath will generate water due to the products of combustion. The water is fully absorbed as the bubble collapses in the weir and any residual humidity is condensed in the stack. As such there will be a free flow of slightly acidic and de-oxygenated water. This can not be discharged directly but is usually captured by the site waste water treatment plant.

| Overflow / Drain | |
|------------------|--|
| Composition | Water (max 6 pH) |
| Flowrate (max) | 40 gal/day (3.600 kg/hr) |
| Composition | Sodium salts produced by acid neutralization. Average compositions: 75 mg/l NaNO ₃ /NaNO ₂ & 350 mg/l Na ₂ CO ₃ . Maximum compositions: 150 mg/l NaNO ₃ / NaNO ₂ & 380 mg/l Na ₂ CO ₃ . |

7 SCHEDULE

At this time, it appears possible to meet a delivery of approx. 12-14 months; however conditions for delivery of all materials, components and specially fabricated items are changing daily, mostly increasing in quoted delivery times.

We use MS Project for planning the schedule and this will be issued shortly after order and updated frequently during the project.

8 SITE SERVICES

The price excludes site visits for either project execution and product delivery although we would expect there to be some involvement.

We would expect to attend a kick-off meeting as well as Hazop and possibly LOPA. We include for remote attendance using Teams but should there be a need for attending in person we would be happy to do so, using our standard rates as a re-imbusement.

Similarly it would not be possible to put the unit in service without our commissioning team and would be pleased to work with your team to ensure this is completed in the correct manor.

Training is mandatory in some form but we are happy to customize our training to best suit either operators, technicians, or engineers.

All the above would be at standard rates & conditions.

9 DOCUMENTATION

This quote is based on supply of full manufacturing data book documentation per Cryonorm standard as per below overview including pressure test records, welder qualifications, weld log, x-

ray paperwork, and MTRs. All documents in English language and only interface drawings will be issued for Comment. All others will be for information.

Documents will be issued in adobe format and will be fully searchable in the case of Cryonorm generated documents.

| | |
|--------------------------------------|--|
| 1 PROCESS | 4 INSTRUMENTATION |
| P&ID | Automatic Valves List |
| PFD | Safety Valves list |
| Operating Manual | Instrument List |
| 2 MECHANICAL | Instrument datasheet |
| General Arrangement Vaporizer | 5 AUTOMATED CONTROL SYSTEM |
| Drawing coil product assembly | Cause & Effect Charts Vaporizer |
| Drawing gas valve train assembly | 6 SAFETY, HEALTH, ENVIRONMENT & QUALITY |
| Drawing stack | Inspection and Test Plans/ Quality control plan |
| Lifting plan | |
| Equipment List | |
| Manual Valves List | |
| Strength calculations - product coil | |
| Allowable Nozzle Loads | |
| Strength analysis - vessel | |
| Strength analysis - Seismic loads | |
| 3 ELECTRICAL | |
| Field Wiring Burner Control | |
| Power panel electrical drawing | |
| Control panel electrical drawing | |
| Electrical consumable list | |
| Electrical parts List | |

10 BUDGET PRICES

Budget price for the supply of two (2) Cryonorm 100 MMSCFD Submerged Combustion Vaporizers as described in the foregoing sections:

| | |
|--|------------------------|
| Total Price | USD 6.885.000,- |
| 2-years operational spare parts | USD 200.000,- |
| CRN registration | at cost +10% |

Total Price is quoted in USD, EXW Cryonorm shop Tulsa OK, Incoterms 2020

Price is based on closed order for two (2) identical SCV units and exclusive of applicable taxes and duties and items listed in Section 4.3 of this proposal.

11 WARRANTY

We include for our standard 12/24 warranty period. That is 12 Months from Start-up or 24 Months from delivery, whichever is sooner. This is for parts only and excludes consumable items and normal wear and tear.

12 VALIDITY PERIOD

NA, budgetary offer.

13 PAYMENT TERMS

TBA based on multiple stage payments.

14 GENERAL TERMS AND CONDITIONS

Attached Cryonorm standard terms and conditions apply.

15 PERFORMANCE GUARANTEE

Cryonorm will guarantee the performance of the specified equipment as offered by making necessary modifications to the system to meet the performance duty in Section 1.1 of this bid proposal.

We hope to have made a clear technical and commercially interesting offer and we will be available at any suiting moment for further information.

We look forward to your reaction with great interest,

Best regards,

CRYONORM B.V.

A handwritten signature in blue ink, appearing to read "Piet TEL", is written over the company name.

Piet TEL
ptel@cryonorm.com

Fan selection

Conveyed medium and ambient conditions

| | |
|--|--|
| Conveyed medium | ambient air |
| Properties of the conveyed medium | non-abrasive, non-adhesive |
| Dust content | <2 mg/Nm ³ |
| Highest possible dew point temperature | no operation under dew point temperature |
| Ambient pressure | 1.013 bar a |
| Ambient temperature | -10 ... 40 °C |
| Site conditions | coastal saline atmosphere |
| Area classification inside / outside fan | none hazardous |
| Area classification electrical equipment | Zone 2 IIA T1 |

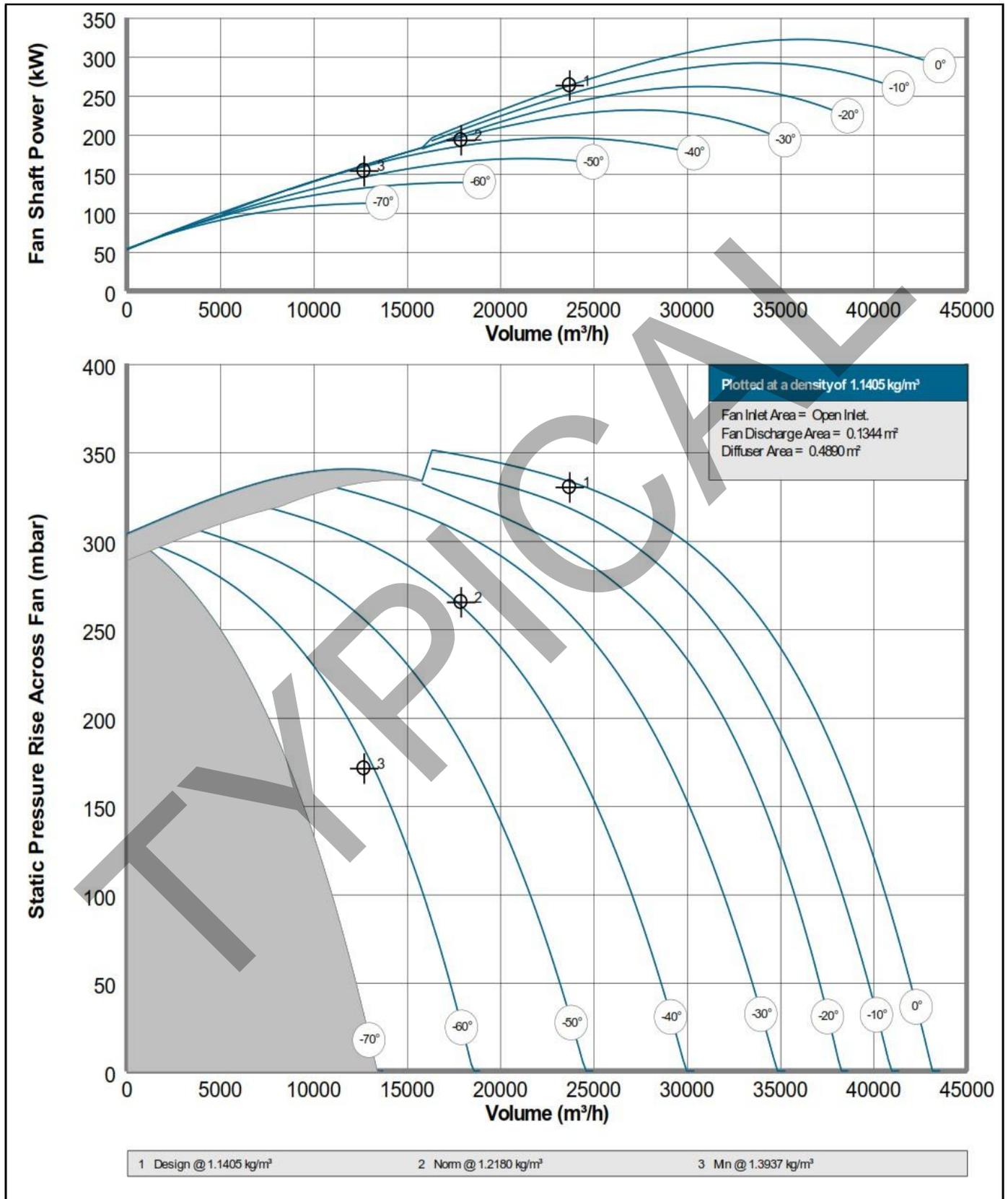
Fan specification

| | |
|--|---------------------------------------|
| Fan design | TBC @ 2980 rpm |
| Quantity | 1 |
| Arrangement | single inlet |
| Shaft arrangement | overhung |
| Drive arrangement | drive over coupling |
| Operation mode | continuous operation |
| Installation | outdoors, on even concrete foundation |
| Casing position | GL 315 |
| Inlet box position | n/a |
| Speed control | none |
| Flow control | radial inlet vane control |
| Mechanical design temperature | 100 °C |
| Total weight (excl motor and insulation) | approx. 3000 kg |

Aerodynamic data

| | | Design | Norm | Min |
|--------------------------|-------------------|--------|-------|-------|
| Inlet mass flow | kg/h | 26504 | 21554 | 17616 |
| Inlet volume flow in (1) | m ³ /h | 23240 | 17697 | 12639 |
| Static pressure in (1) | mbar | 0.0 | 0.0 | 0.0 |
| Dynamic pressure in (1) | mbar | 0.0 | 0.0 | 0.0 |
| Static pressure in (2) | mbar | 330.0 | 265.0 | 171.0 |
| Dynamic pressure in (2) | mbar | 0.83 | 0.54 | 0.35 |
| Inlet temperature | °C | 40 | 15 | -20 |
| Inlet density | kg/m ³ | 1.14 | 1.22 | 1.39 |
| Fan speed | rpm | 2980 | 2980 | 2980 |
| Inlet vane angle | ° | 0 | -43 | -65 |
| Fan shaft power | kW | 263 | 193 | 153 |

Performance curve



Drive requirements

| | |
|--|----------------------|
| Minimum recommended power (10% margin on max. fan shaft power) | 290 kW |
| Speed | 2980 rpm |
| Fan rotor inertia (mr ²) | 46 kg m ² |

Technical specification
Impeller

| | |
|---------------------------|--------------------------------|
| Actual impeller diameter | 1336 mm |
| Maximum permissible speed | 2980 rpm |
| Blade design | backward inclined curved blade |

| | Material | Thickness of plate | Thickness of wear protection |
|-----------|----------|--------------------|------------------------------|
| Blade | P355 | 4 mm | - mm |
| Backplate | S690 | 8 mm | - mm |
| Sideplate | S690 | 8 mm | - mm |

Shaft

| | |
|----------------------|---|
| Material | S355J2+N |
| First critical speed | at least 130% of the maximum continuous running speed |

Bearings

| | |
|--------------------------|---------------------------------------|
| Bearing housing type | tubular bearing housing (common unit) |
| Bearing housing material | cast iron |
| Bearing type | roller bearings |
| Lubrication | oil sump |
| Cooling | natural cooling |

Drive

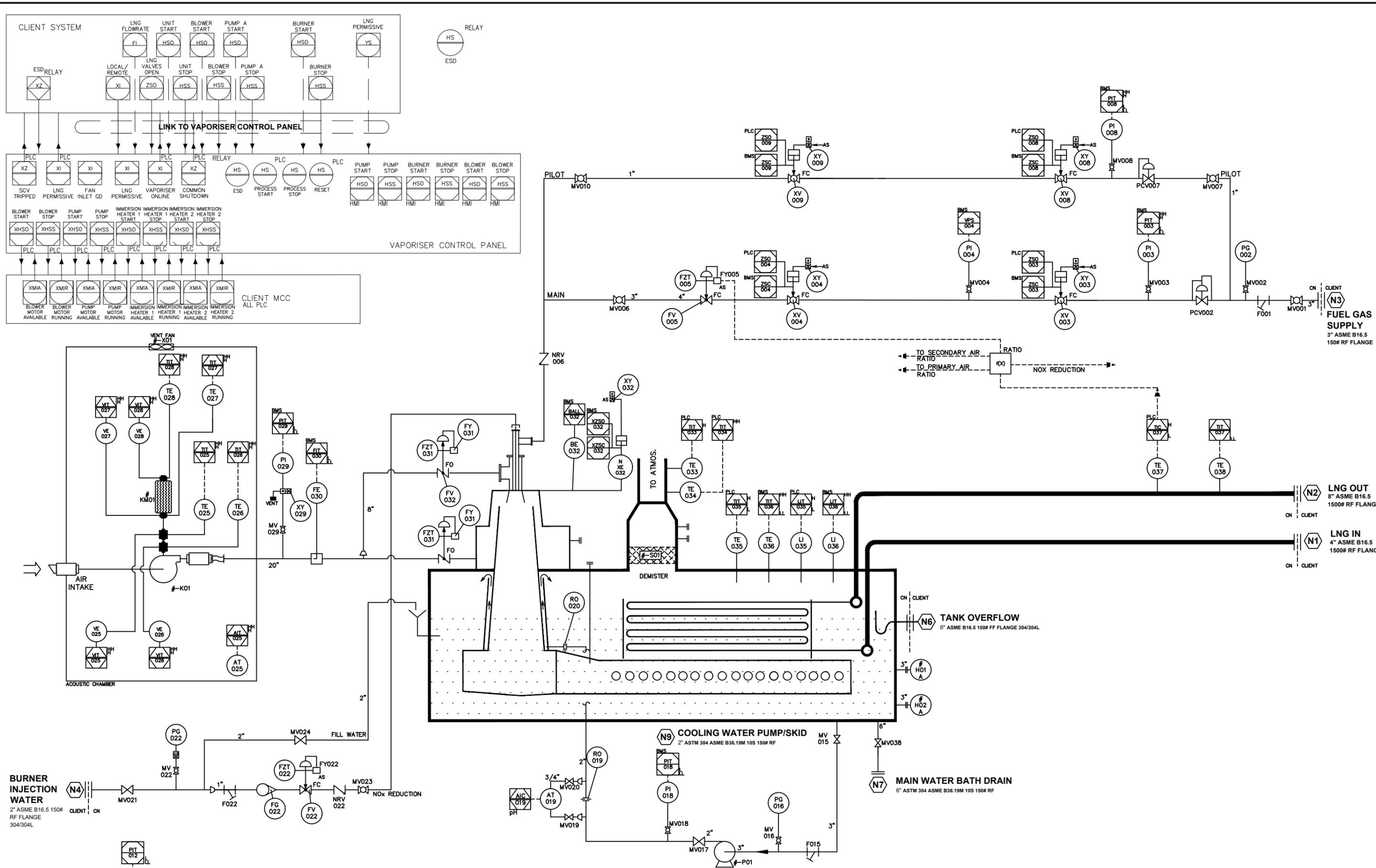
Scope of supply

| | |
|-------------------------------------|---|
| Manufacturer | WEG |
| Standard / specifications | IEC / EN / ISO |
| Rated motor voltage | 6.6 kV |
| Frequency | 50 Hz |
| Motor start up | direct online start |
| Motor power | 290 kW |
| No. of poles | 2 |
| Bearing design | grease lubricated anti-friction bearing, NDE bearing insulation |
| Frame size | 400 |
| Type of construction | IM B3 |
| Paint system | painting plan: 212P (in acc. with ISO 12944 - C5I or C5M & CX) |
| Frame material | cast iron |
| Degree of protection | IP55 |
| Method of cooling, TEFC | IC411 |
| Vibration class | B |
| Insulation class / temp. rise | F / B |
| Duty type | S1 (continuous operation) |
| Temperature monitoring for windings | 6 Pt100 Three Wires |
| Bearing temperature monitoring | 2 Duplex PT 100 Three Wires |
| Explosion protection | II 2G Ex db eb IIB T4 Gb |
| Anti-condensation heater | yes (220-240 V) |

Acoustics

Sound spectrum

| Octave band [Hz] | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | Overall [dB] |
|------------------|-----|-----|-----|-----|------|------|------|------|--------------|
| PWL in duct | 124 | 125 | 134 | 128 | 125 | 119 | 121 | 112 | 136 |



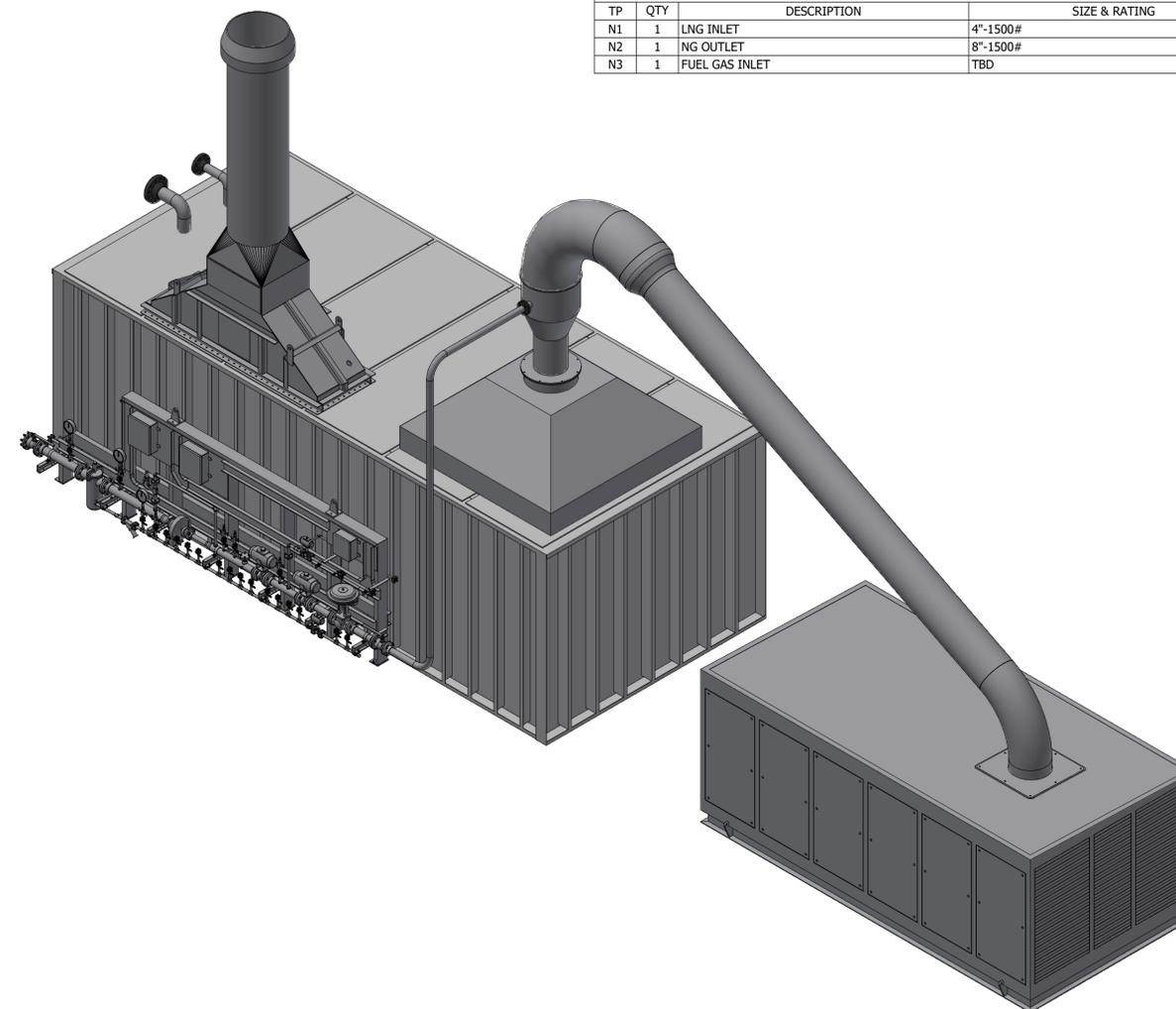
| REV. | DESCRIPTION | AM | DATE |
|------|---------------------------------|--------------|------------------|
| 0 | FIRST ISSUE FOR DISCUSSION ONLY | | |
| | | DRAWN BY: AM | SCALE: NTS |
| | | APPROVED: | DATE: 13-05-2023 |
| | | PAGE: GA01 | |

| | | | |
|--|--|-----------------------------|--|
| P&ID 100mmscfd SCV Standard | | 302250151-1100-02 | |
| CRYONORM BY KOPERWEG 3 2401 LH ALPHEN A/D RLM THE NETHERLANDS | | COPYRIGHTS CRYONORM B.V. | |

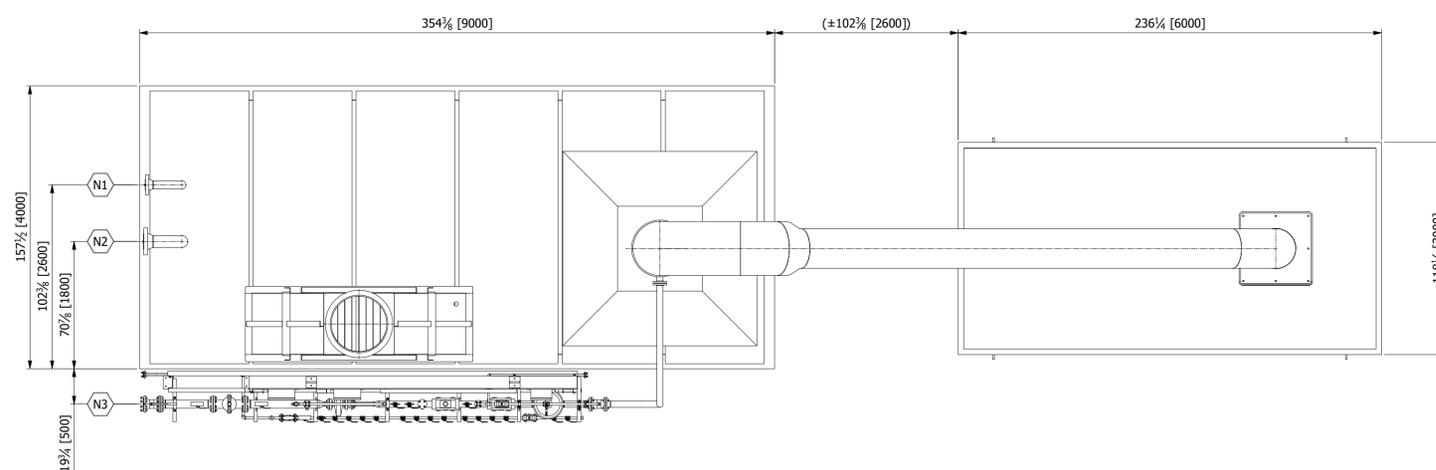
Plotdate: 14/05/2023 20:02:02

NOZZLE LIST

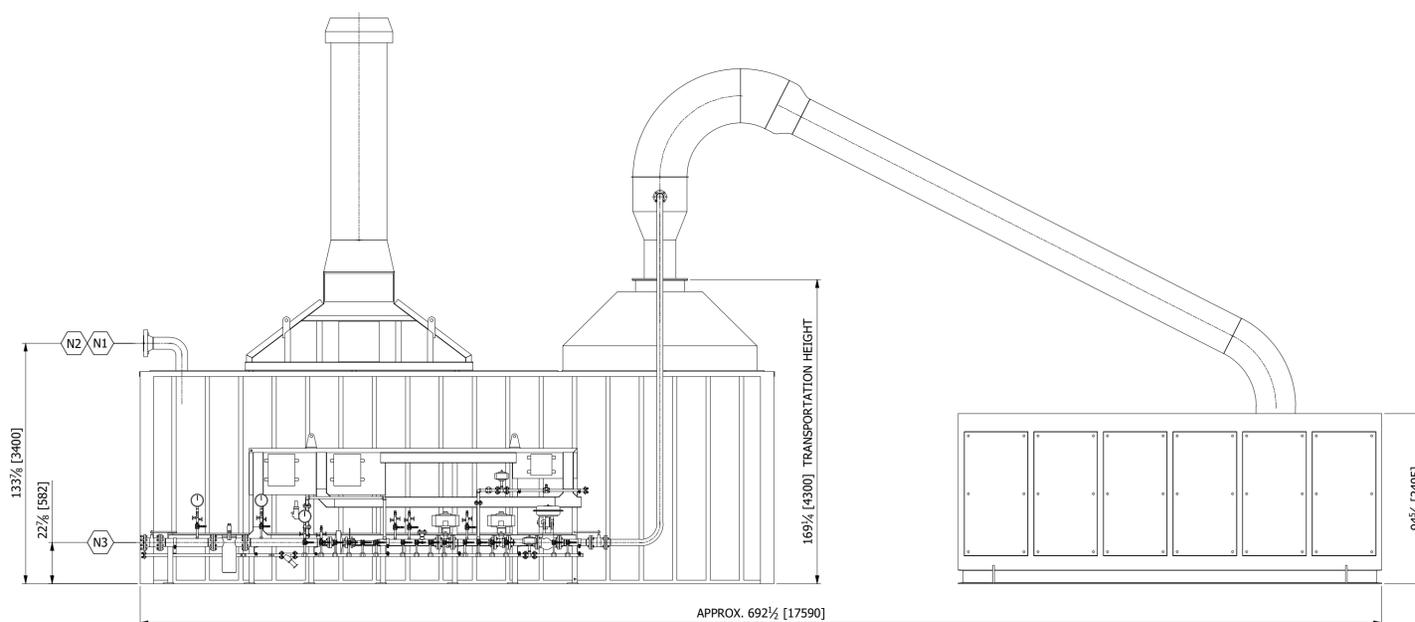
| TP | QTY | DESCRIPTION | SIZE & RATING |
|----|-----|----------------|---------------|
| N1 | 1 | LNG INLET | 4"-1500# |
| N2 | 1 | NG OUTLET | 8"-1500# |
| N3 | 1 | FUEL GAS INLET | TBD |



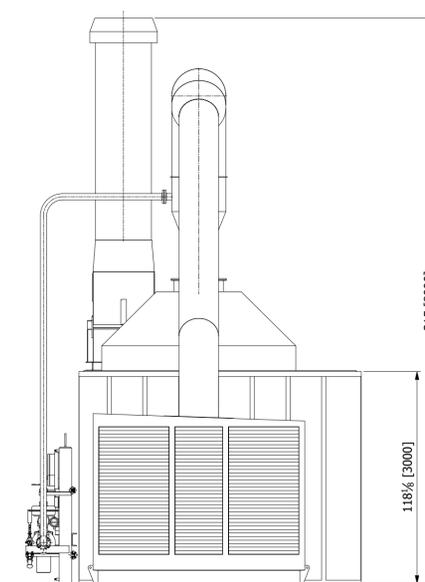
ISOMETRIC VIEW
N.T.S.



TOP VIEW
(1 : 50)



FRONT VIEW
(1 : 50)

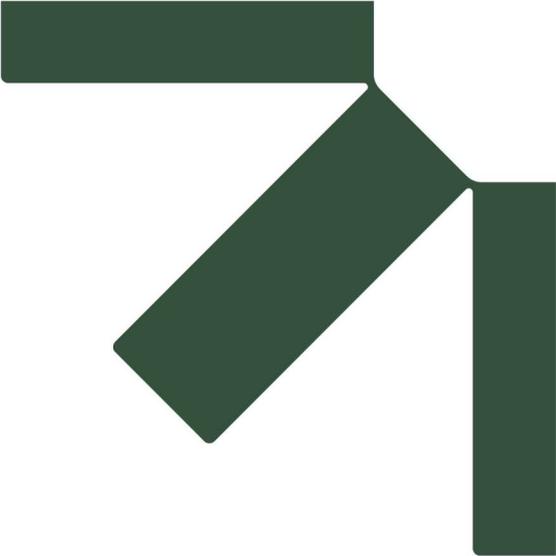


RIGHT SIDE VIEW
(1 : 50)

REVISIONS

| REV | DESCRIPTION | AB | PT | 06-02-2025 |
|-----|-------------------------|------|----|------------|
| BY | CHD | DATE | | |
| 0 | FIRST ISSUE, FOR REVIEW | | | |

| | | | |
|--|--|--|----------------------|
| | | CN SCV 100 MMSCFD LNG PRINCIPAL DESIGN | |
| <small>KOPERWEG 3 2401 LH ALPHEN AFD RIJN THE NETHERLANDS PHONE: +31 (0) 172-41 80 80 WEB: WWW.CRYONORM.COM E-MAIL: SALES@CRYONORM.COM</small> | | <small>THIS DRAWING IS THE EXCLUSIVE PROPERTY OF CRYONORM B.V. AND MAY NOT BE COPIED, MADE PUBLIC OR SHOWN TO THIRD PARTIES WITHOUT OUR WRITTEN CONSENT. GENERAL TOLERANCES ACC. TO ISO 2768-mS FOR WELDED CONSTRUCTION ACC. TO ISO 15609-01</small> | |
| <small>DRAWN</small> AB <small>DATE</small> 06/02/2025 | <small>DOCUMENT NUMBER</small> 302250151-00-000 | <small>REQUIRED</small> 1 <small>SHEET</small> 1 of 1 <small>SIZE</small> A1 | <small>REV</small> 0 |



Attachment E

**Letter from Mr. Lee
M. Zeldin with EPA
Regarding New
Source Review
Program
“Reactivation
Policy”**

Application for an Owner Requested Limit

Kenai LNG Plant

Kenai LNG LLC

SLR Project No.: 105.021468.00001

December 22, 2025





THE ADMINISTRATOR
WASHINGTON, D.C. 20460

September 18, 2025

MEMORANDUM

SUBJECT: New Source Review Program "Reactivation Policy"
FROM: Lee M. Zeldin 
TO: Regional Administrators
Deputy Regional Administrators

I. Introduction and Purpose

The U.S. Environmental Protection Agency has historically applied a policy under the Clean Air Act New Source Review program known as the "Reactivation Policy" for the purpose of determining whether an NSR permit was required to resume the operation of an idle stationary source. Under the Reactivation Policy, EPA presumed that a major stationary source that was idle for two or more years was permanently shut down and thus subject to NSR permitting requirements applicable to a newly constructed source prior to restarting operations. That presumption controlled unless the source could rebut the presumption by providing evidence that it intended to restart operations at the time the source went idle. On July 25, 2023, the U.S. Court of Appeals for the Third Circuit rejected an EPA determination that a specific stationary source would require an NSR permit to restart based on the principles in the Reactivation Policy. See *Port Hamilton Refining and Transportation, LLLP v. EPA*, 87 F.4th 188 (3d Cir. 2023) ("*Port Hamilton*").¹

In response to the reading of the Clean Air Act reflected in the Third Circuit's decision, the agency will no longer apply any form of the Reactivation Policy in its NSR permitting determinations and enforcement proceedings, or in its oversight of state, local and tribal air permitting programs. EPA will continue to apply the modification provisions of the NSR program to shut down sources in accordance with the CAA and applicable EPA regulations. Thus, where an existing major stationary source that has been idle makes a change in order to enable it to resume operation, EPA will not require the source to obtain an NSR permit unless this change qualifies as a "major modification" under applicable regulations based on the nature of the change and the magnitude of any resulting increase in emissions.

¹ See <https://www2.ca3.uscourts.gov/opinarch/231094ppan.pdf>.

II. Background

The NSR provisions of the CAA and of EPA's implementing regulations require a permit before constructing a new major stationary source or a major modification at existing major stationary sources.² This permitting process for major stationary sources is required whether the major source or major modification is planned for an area where the national ambient air quality standards are exceeded (nonattainment areas) or an area that is in attainment with the NAAQS or unclassifiable. In general, permits for sources in attainment and unclassifiable areas and for certain other pollutants regulated under the major source program are referred to as prevention of significant deterioration permits, while permits for major sources emitting nonattainment pollutants and located in nonattainment areas are referred to as nonattainment NSR permits. The entire preconstruction permitting program, which includes PSD and NNSR permits, is referred to as the NSR program.

Under the CAA and EPA regulations, the NSR program applies to any new major stationary source or major modification of an existing source. *See, e.g.*, 40 CFR § 52.21(a)(2)(iii). Whether NSR requirements apply to a newly constructed source turns on the source's potential to emit regulated NSR pollutants. Under the PSD program, a "major stationary source" is one that emits or has the potential to emit 100 or 250 tons per year of any regulated NSR pollutant, depending on whether the source is classified under a list of source categories identified in CAA section 169(1) (42 U.S.C. § 7479) and EPA regulations. Once a source is determined to be a major stationary source, PSD permitting requirements for individual regulated NSR pollutants are based on the source's potential to emit each pollutant and the corresponding significant emission rate defined in the PSD regulations. Under the NNSR program, a "major stationary source" is one that emits or has the potential to emit 100 tpy of the regulated NSR pollutant for which the area is designated nonattainment, although a lower threshold can apply depending on the pollutant and the severity of the nonattainment classification in the area. Whether NSR requirements apply to changes at an existing major stationary source is generally based on the increase in actual emissions that would result from the project (i.e., a physical change or change the method of operation) using calculation procedures defined in the NSR regulations and the applicable significant emission rate for each regulated NSR pollutant.³

Since the late 1970s, EPA has expressed a view that resuming operation of an idle facility that was determined to be permanently shut down qualifies as construction of a new stationary source and thus requires an NSR permit. This view, and the framework EPA used to determine if a source had permanently shut down, became known as the "Reactivation Policy." In 1999, in response to a petition for an objection to a state-issued operating permit under Title V of the CAA (42 U.S.C. § 7661 *et seq.*), the Administrator issued an Order that contains the most complete articulation of the Reactivation Policy. *In the Matter of Monroe Electric Generating Plant Entergy Louisiana Inc., Proposed Operating Permit, Petition No. 6-99-2 (June 11, 1999) ("Monroe").*⁴ In the *Monroe* Order, the Administrator stated the following:

[R]eactivation of facilities that have been in an extended condition of inoperation may trigger PSD requirements as "construction" of either a new major stationary source or a major modification of an existing stationary source. Where facilities are reactivated

² 42 U.S.C. §§ 7475(a), 7502(c)(5), 7503(a); 40 C.F.R. §§ 51.165, 51.166, 52.21.

³ See 40 C.F.R. §§ 51.165(a)(v), 51.166(b)(2), 52.21(b)(2).

⁴ See www.epa.gov/sites/default/files/2015-07/documents/ccaw_ord.pdf.

after having been permanently shut down, operation of the facility will be treated as operation of a new source. Alternatively, shutdown and subsequent reactivation of a long-dormant facility may trigger PSD review by qualifying as a major modification.

Monroe at 7 (emphasis in original). The *Monroe* Order explained that whether a shutdown should be treated as permanent depends on the intention of the owner or operator at the time of shutdown and that shutdowns of more than two years, or that have resulted in the removal of the source from the state's emissions inventory, are presumed to be permanent. *Id.* at 8-9. In such cases, it was up to the facility owner or operator to rebut the presumption. *Id.* To determine the intent of the owner or operator, EPA cited several factors to be examined, including the amount of time the facility has been out of operation, the reason for the shutdown, statements by the owner or operator regarding intent, cost and time required to reactivate the facility, status of permits and ongoing maintenance and inspections that have been conducted during shutdown. *Id.*

On November 16, 2022, the Assistant Administrator for the Office of Air and Radiation issued a letter to the owners of a petroleum refinery on St. Croix, U.S. Virgin Islands,⁵ communicating EPA's determination that a PSD permit would be required for restart of the refinery in accordance with the Reactivation Policy. On January 13, 2023, the owner of this refinery petitioned for review in the U.S. Court of Appeals for the Third Circuit. On July 25, 2023, the Third Circuit vacated EPA's determination that the owners of the refinery must obtain a PSD permit under the CAA prior to restarting the refinery. The Court held that:

The Clean Air Act unambiguously limits the PSD program's application to newly constructed or modified facilities. The Refinery is not new and has not undergone a "modification" as the Act defines that term. The EPA therefore exceeded its authority by requiring Port Hamilton to obtain a PSD permit for the Refinery.

Port Hamilton, 87 F.4th at 194. The Court rested its decision on the text of CAA sections 165 and 169. The former provides that "[n]o major emitting facility on which construction is commenced after August 7, 1977, may be constructed" in an attainment area without a PSD permit. 42 U.S.C. § 7475. The latter defines "construction" as including only "modification." *Id.* § 7479(2)(C). The Court rejected EPA's argument that these provisions were ambiguous and provided room for EPA to construe "construction" to also apply to facilities that are shut down and later restarted. In support of its decision, the Court also relied on its earlier opinion in *United States v. EME Homer City Generation, L.P.*, 727 F.3d 274 (3d Cir. 2013) ("*Homer City*"), which it described as already holding that "the CAA's PSD permitting provisions unambiguously extended the PSD program to construction and modification alone, and not 'operation.'" *Port Hamilton*, 87 F.4th at 194-95.

III. Analysis

EPA has reviewed the Third Circuit's decision in *Port Hamilton* and accepts the Court's reading that the CAA does not presumptively require an NSR permit to resume operation of an existing stationary source. In addition to vacating EPA's determination that the refinery in question required a permit prior to restarting, the Third Circuit also stated the following:

⁵ Port Hamilton Refining and Transportation and an associated company, West Indies Petroleum Ltd.

The CAA limits the PSD program's reach to only two circumstances: construction and modification. . . . The EPA's Reactivation Policy extends the PSD program beyond those limited circumstances.

Port Hamilton, 87 F.4th at 195. EPA agrees with this conclusion insofar as its prior Reactivation Policy calls for treating as "construction" the resumption of operations at an existing major stationary source that was considered to have been permanently shut down. While the Third Circuit did not vacate the Reactivation Policy itself, the court's reasoning leads to the inescapable conclusion that it is not permissible for EPA to apply that policy to require existing stationary sources to obtain a permit based solely on resuming operation of the source after a period of inactivity. Even prior to this decision, EPA leadership had expressed that the Reactivation Policy was not grounded in the NSR regulations and that the factors EPA employed to determine if a facility was permanently shut down were subjective and prone to inconsistent application. In 2018, the Assistant Administrator for the Office of Air and Radiation stated that the agency intended to reconsider the policy.⁶ Administrator Wheeler subsequently decided to cease following the policy in a 2020 permitting decision.⁷ However, that decision was reversed without explanation by Administrator Regan in 2021.⁸ This action restored the prior approach, which EPA then applied to the Port Hamilton refinery. This led to the Third Circuit decision that makes clear that some elements of the Reactivation Policy were not supported by applicable law.

Thus, consistent with *Port Hamilton* and the agency's analysis of its reasoning, EPA will no longer apply the Reactivation Policy to classify resuming operation of a stationary source as construction of a new source in EPA permitting and enforcement actions on a national basis. EPA is also clarifying that it will not consider the restarting of an emissions unit that was idled to by itself constitute a "change in the method of operation" that would potentially trigger NSR permitting requirements. EPA intends to follow this policy nationwide. The Third Circuit's reasoning is persuasive and illustrates that the Clean Air Act is best read not to require a permit to resume operation of an idle stationary source. Section 165(a) requires a permit for construction on a major stationary source, and section 169(2)(C) defines construction to include "modification" but not "operation" of such source. 42 U.S.C. § 7475(2)(C). No U.S. Court of Appeals has adopted a contrary reading of the statute, and the Third Circuit's earlier decision in *Homer City* aligns with the view of four other circuits that have expressly confirmed NSR requirements are triggered by construction or modification.⁹ An additional reason to apply the Third Circuit's holding nationwide is a strong interest in equal treatment among sources and nationwide uniformity. Thus, the revised policy described in this memorandum is not limited to only those states

⁶ Letter from William L. Wehrum, EPA Assistant Administrator for Office of Air and Radiation, to LeeAnn Johnson Koch, Perkins Coie, Re: Limetree Bay Terminals, St. Croix, U.S. Virgin Islands – Permitting Questions, p. 2 n.2 (April 5, 2018), available at: https://www.epa.gov/sites/default/files/2018-04/documents/limetree_2018.pdf.

⁷ EPA, Response to Comments on the Clean Air Act Plantwide Applicability Permit for the Limetree Bay Terminal and Limetree Bay Refining, St Croix, U.S. Virgin Islands, pp. 108-11 (November 2020), available at https://www.epa.gov/sites/default/files/2020-12/documents/response_to_comments-limetree_pal_permit.pdf.

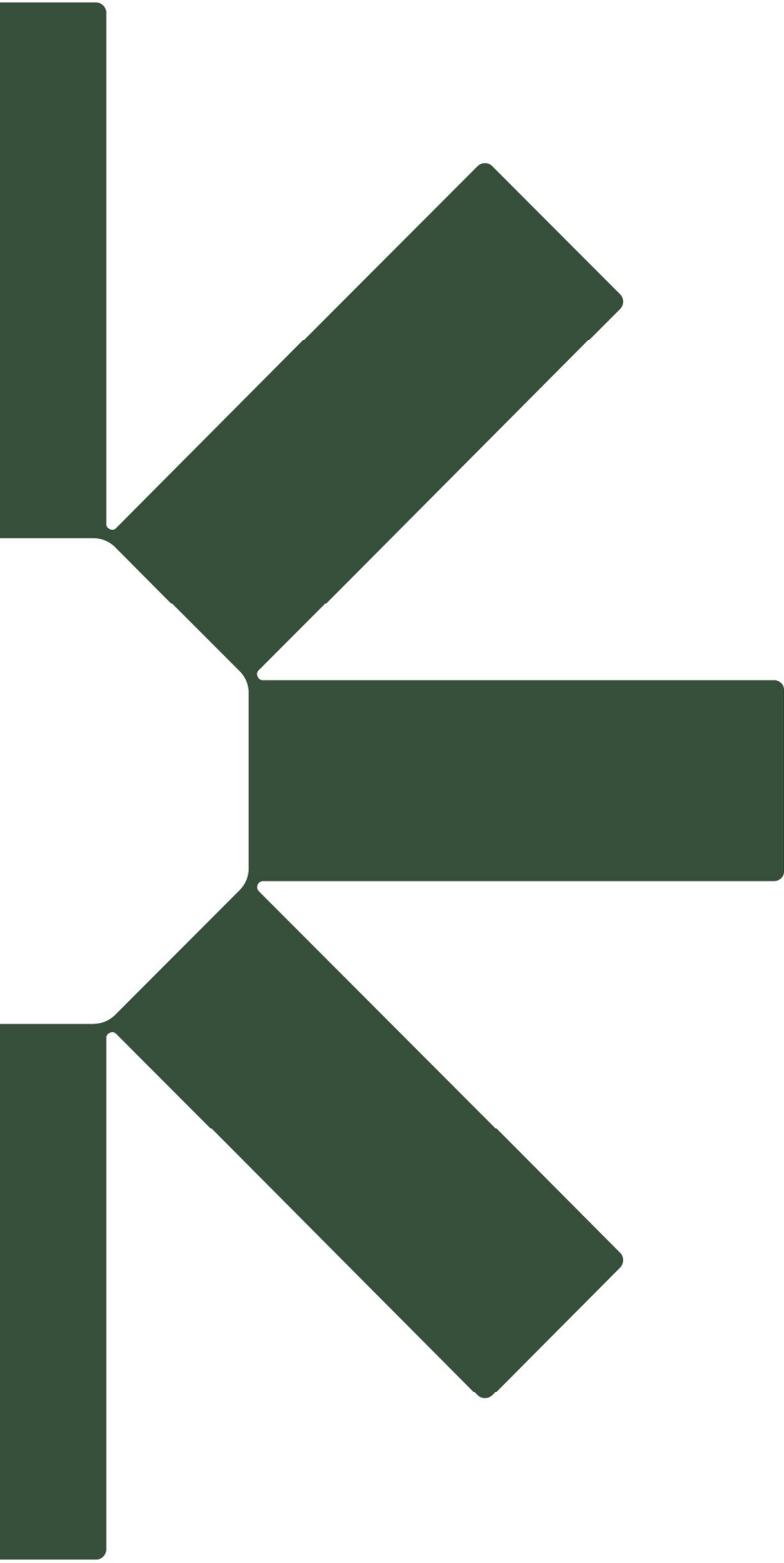
⁸ Michael S. Regan, EPA Administrator, Withdrawal of Plantwide Applicability Limit Permit No. EPA-PAL-VIOO1/2019 (March 25, 2021), available at: https://www.epa.gov/sites/default/files/2021-04/documents/withdrawal_decision_applicability.limit_permit.signed.pdf.

⁹ See *Sierra Club v. Okla. Gas & Elec. Co.*, 816 F.3d 666 (10th Cir. 2016); *United States v. Midwest Generation LLC*, 720 F.3d 644 (7th Cir. 2013); *Sierra Club v. Otter Tail Power Co.*, 615 F.3d 1008 (8th Cir. 2010); *Nat'l Parks & Conservation Ass'n, Inc. v. Tenn. Valley Auth.*, 502 F.3d 1316 (11th Cir. 2007).

within the jurisdiction of the Third Circuit and should be applied by EPA regional offices in all states across the United States.

EPA will continue to implement and enforce the NSR applicability provisions for modification of existing facilities in accordance with the CAA and applicable EPA and state regulations. Thus, a restart of an idled facility involving a physical change (or a change in the method of operation at the source other than simply restarting) will still require a PSD permit if it qualifies as a "major modification" by virtue of the nature of the change and the degree to which it results in an increase in regulated NSR pollutant emissions.

State, local and tribal air agencies are encouraged to follow this policy as well, where doing so is consistent with applicable law in their jurisdictions. This memorandum does not preclude permitting authorities from continuing to implement their own requirements with respect to preconstruction permitting for the reactivation of idle sources where those policies are supported by applicable laws in their jurisdictions that are more stringent than the CAA. EPA will evaluate on a case-by-case basis the extent to which it is necessary to enforce or revisit its approval of State Implementation Plans that contain requirements that were based on EPA's prior policy and are not independently supported by state or local laws.



Making Sustainability Happen