Alaska Department of Environmental Conservation
Air Permits Program

TECHNICAL ANALYSIS REPORT

For the terms and conditions of
Minor Permit AQ0090MSS01

Issued to Kenai LNG LLC
For the Kenai LNG Plant

Preliminary – February 20, 2026

Prepared by Brian Hirsch
ADEC AQ/APP (Juneau)

Reviewed by Joshua Klina
ADEC AQ/APP (Juneau)

1. INTRODUCTION

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Permit AQ0090MSS01 to Kenai LNG LLC (Kenai LNG) for the Kenai Liquefied Natural Gas (LNG) Plant.

The permit application for Minor Permit AQ0090MSS01 is classified under 18 AAC 50.508(5) for establishing an owner requested limit (ORL) to avoid one or more permit classifications under AS 46.14.130 at a stationary source that will remain subject to at least one permit classification. The Permittee is requesting an ORL to avoid minor permitting requirements under 18 AAC 50.502(c)(3)(A) for oxides of nitrogen (NO_X).

2. STATIONARY SOURCE DESCRIPTION

The Kenai LNG Plant is an existing stationary source. The stationary source is owned by Kenai LNG LLC. and operated by Harvest Alaska, LLC (Harvest). The SIC code for this stationary source is 4924 Natural Gas Distribution.

The stationary source was originally designed to liquefy natural gas to produce liquefied natural gas (LNG) and includes LNG storage and loading facilities for export. Feed gas originates from Cook Inlet area gas production facilities and is sent to shore to the Kenai LNG Plant. Two inlet scrubbers remove liquids from the feed gas streams. Carbon dioxide is removed in the amine treating system, and water vapor is removed by molecular sieve dehydrators. Carbon filters remove any heavy hydrocarbons or mercury, and dry gas filters remove any carbon fines. The feed gas entering the liquefaction section is predominantly methane, along with some nitrogen and traces of ethane, propane, and butane. A two-stage propane refrigeration cycle, a three-stage ethylene refrigeration cycle, and a three-stage methane refrigeration cycle cool the respective propane, ethylene and methane refrigerants. Nitrogen is freed in a final flash tank. The LNG is pumped to storage, and the boil off gas is compressed along with vapors recovered from the storage/loading section to serve as fuel for the refrigerant compressor gas turbines.

The LNG storage/loading section consists of three storage tanks, each with a capacity of 35,772 cubic meters (225,000 bbl) which contain the LNG at -258 °F.

3. PERMIT HISTORY RELEVANT TO PROJECT

The Department received correspondence along with the required affidavits on December 18, 2025, which reflects the transfer of ownership for the Kenai LNG Plant from Tesoro Logistics GP LLC (Tesoro) to Kenai LNG LLC, effective November 1, 2025. This correspondence also noted that the new operator for the stationary source would be Harvest.

4. APPLICATION DESCRIPTION

Kenai LNG submitted their application to the Department on December 29, 2025. As discussed above, in Section 2 of this TAR, the Kenai LNG Plant was originally designed to liquify natural gas to produce LNG. However, under its permit application for Minor Permit AQ0090MSS01, Kenai LNG's application materials stated that it plans to modify the stationary source to allow the stationary source to import LNG. One of the modifications,[6] as identified by Kenai LNG in

[6] In its application, Kenai LNG lists other new equipment it plans to install in its efforts to modify the Kenai LNG Plant. This equipment includes electrically driven pumps and compressors. Additionally, the application notes that this equipment will receive offsite power from the local utility grid. A more comprehensive discussion on Kenai LNG's proposed changes can be found in Section 12 of the Stationary Source Identification Form included in its application for Minor Permit AQ0090MSS01.

its application materials, required for this project includes the addition of two submerged combustion vaporizers (SCVs) with a design capacity of 100 million standard cubic feet per day (MMscfd). Each of the SCV systems will include a natural gas-fired auxiliary combustion air blower (EU IDs 24 and 25).

Additionally, Kenai LNG's application materials indicate that potential emissions for the stationary source are expected to increase because of the addition of the two new combustion air blowers, EU IDs 24 and 25, associated with the SCVs. The anticipated increase in potential NO_X emissions would trigger minor permitting requirements under 18 AAC 50.502(c)(3)(A).[7] However, in its application materials, Kenai LNG proposed an ORL to avoid minor permitting requirements under 18 AAC 50.502(c)(3)(A) for NO_X. The proposed ORL would limit emissions from EU IDs 24 and 25 to no more than 9.9 TPY, which is below 10 TPY of NO_X, the threshold under 18 AAC 50.502(c)(3)(A).

5. CLASSIFICATION FINDINGS

Based on the review of the application, the Department finds that:

1. Minor Permit AQ0090MSS01 is classified under 18 AAC 50.508(5) for Owner Requested Limits to avoid minor permitting requirements under 18 AAC 50.502(c)(3)(A).

6. APPLICATION REVIEW FINDINGS

Based on the review of the application, the Department finds that:

1. Kenai LNG's application for Minor Permit AQ0090MSS01 contains the required elements for a complete minor permit application listed under 18 AAC 50.540. Therefore, the Department finds Kenai LNG's application to be complete.
2. The Department did not include conditions for the State associated with the *State Emissions Standards*, since those provisions are part of the Title V Operating Permit AQ0090TVP03 Rev. 1 and will be carried forward into pending Operating Permit AQ0090TVP04. Though State Emission Standards were not included in this permit, though they still apply and will be carried forward in the pending Title V Permit (AQ0090TVP04).
3. Kenai LNG, in its application for Minor Permit AQ0090MSS01, proposes installing two new emission units (i.e. EU IDs 24 and 25). Both are natural gas-fired blowers associated with the SCVs which are being added as part of Kenai LNG's efforts to modify this stationary source so that it can import LNG. EU IDs 24 and 25 are expected to increase the stationary source's PTEs. Without any of the ORLs requested by Kenai LNG, the addition of EU IDs 24 and 25 are expected to increase the stationary source's NO_X PTEs by 17.52 TPY; which would trigger minor permitting requirements under 18 AAC 50.502(c)(3)(A). However, Kenai LNG did request an ORL and the Department

[7] 18 AAC 50.502(c)(3)(A) states "the owner or operator must obtain a minor permit under this section before… beginning a physical change to or a change in the method of operation of an existing stationary source with a potential to emit an air pollutant greater than an amount listed in (1) of this subsection that will cause for that pollutant an emissions increase calculated at the discretion of the owner or operator as either an increase in… potential to emit that is greater than… 10 TPY of nitrogen oxides…"

did establish an ORL in Condition 5 of this permit limiting the combined NO_X emissions of EU IDs 24 and 25 to no more than 9.9 TPY.

4. Kenai LNG requested an ORL to limit NO_X emissions from EU IDs 24 and 25 to no more than 9.9 TPY. The proposed ORL would limit emissions from EU IDs 24 and 25 through an operational limit of 9,900 combined hours of operation on a 12-month rolling basis. This proposed limit is based on emission factors from vendor information which were provided in Kenai LNG's application materials. The Department finds with sufficient monitoring, recordkeeping, and reporting, this ORL would limit this stationary source's PTE and, therefore, this stationary source would avoid the minor permitting requirements under 18 AAC 50.502(c)(3)(A).

7. EMISSIONS SUMMARY AND PERMIT APPLICABLITY

Table A shows the emissions summary and permit applicability with assessable emissions from the stationary source. Emission factors and detailed calculations are provided in Appendix A.

A summary of the potential to emit (PTE) and assessable PTE, as determined by the Department, is shown in Table A below.

Table A – Emissions Summary and Permit Applicability, tons per year (TPY)

Parameter	NO_x	CO	VOC	$PM_{2.5}$[4]	PM_{10}[4]	SO_2
PTE before Modification[1]	1,050.91	390.34	794.12	31.44	31.44	4.39
PTE after Modification	1,060.81	390.59	776.61	33.60	33.60	4.53
Change in PTE	9.90	0.25	-17.51[5]	2.17	2.17	0.14
18 AAC 50.502(c)(3) Permit Thresholds[2]	10	N/A	N/A	10	10	10
502(c)(3) Applicable?	No	N/A	N/A	No	No	No
Title V Permit Thresholds	100	100	100	100	100	100
Title V Permit Required?	Yes	Yes	Yes	No	No	No
Assessable Emissions[3]	1,060.81	390.59	794.12	33.60	33.60	4.53
Total Assessable Emissions[4]	2,266.20					

Notes:

1. PTE before modification is from the AQ0090MSS01 permit application and includes enforceable limits from AQ0090TVP03 Rev. 1.
2. The thresholds in 18 AAC 50.502(c)(4) apply if the stationary source's current PTE for any criteria pollutant is less than 18 AAC 50.502(c)(1) threshold for that pollutant.
3. Assessable emissions include fugitive emissions but do not include nonroad engines emissions.
4. PM_{10} emissions include $PM_{2.5}$ emissions. Therefore, $PM_{2.5}$ is not counted in total assessable emissions.
5. 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 emissions are projected to be negligible from EU ID 22. This change largely contributes to the decrease in VOC emissions shown in Table A.

8. PERMIT ADMINISTRATION

Minor Permit AQ0090MSS01 does not contradict any conditions in the Title V operating permit issued to the Kenai LNG Plant. Kenai LNG may therefore operate in accordance with Minor Permit AQ0090MSS01 upon issuance.

It should be noted that the previous owner of the stationary source, Tesoro, submitted an application dated April 23, 2024 for Operating Permit AQ0090TVP04 as required in Condition

67 of Operating Permit AQ0090TVP03. Consequently, after issuance of this permit, Kenai LNG will have to submit an amendment to the application submitted for Operating Permit AQ0090TVP03 to reflect the requirements established in this permit and changes to the stationary source that have occurred after its submission of its application for Operating Permit AQ0090TVP04. Additionally, the requirements of this permit will be incorporated into the next operating permit and streamlined as applicable.

9. PERMIT CONDITIONS

The bases for the standard and general conditions imposed in Minor Permit AQ0090MSS01 are described below.

Cover Page

18 AAC 50.544(a)(1) requires the Department to identify the stationary source, Permittee, and contact information. The Department provided this information on the cover page of the permit.

Section 1: Emissions Unit Inventory

The EUs authorized and/or restricted by this permit are listed in Table 1 of the permit. Unless otherwise noted in the permit, the information in Table 1 is for identification purposes only. Condition 1 is a general requirement to comply with AS 46.14 and 18 AAC 50 when installing a replacement EU.

Section 2: Fee Requirements

18 AAC 50.544(a)(2) requires the Department to include a requirement to pay fees in accordance with 18 AAC 50.400 – 18 AAC 50.499 in each minor permit issued under 18 AAC 50.542. The Department used the Standard Permit Condition (SPC) I language for Minor Permit AQ0090MSS01. However, the Department modified the condition by removing the requirement to only pay for emissions of each air pollutant in quantities of 10 tons per year or greater, to be consistent with the updates to the emission fees in 18 AAC 50.410(a) that went into effect September 7, 2022. The Department is in the process of incorporating these updates into SPC I.

Section 3: Owner Requested Limits (ORLs) to Avoid Permit Minor Classification

Condition 5, NO_X Limits

18 AAC 50.544(h) and (i) describe the requirements for a permit classified under 18 AAC 50.508(5) and (6), respectively. This permit describes the ORL, including specific testing, monitoring, recordkeeping, and reporting requirements; it lists all equipment covered by the ORL; and describes the classification that the limit allows the applicant to avoid.

This permit contains an ORL restricting the combined NO_X emissions from EU IDs 24 and 25 to no more than 9.9 TPY to avoid minor permitting requirements under 18 AAC 50.502(c)(3)(A) as described in Condition 5. This ORL restricts emissions from EU IDs 24 and 25 through an operational limit of no more than 9,900 combined hours of operation on a 12-month rolling basis, as described in Condition 5.1. The Department included sufficient monitoring, recordkeeping, and reporting requirements in Conditions 5.1a through 5.1e.

This ORL is based on emissions calculations submitted by Kenai LNG to verify that the ORL would limit NO_X emissions from EU IDs 24 and 25 to no more than 9.9 TPY. These calculations assumed the following: a maximum combined total of 9,900 hours of operation for EU IDs 24 and 25; and an emission factor of 2.00 lbm/hr @ 15% O_2 based on vendor data provided in Attachment D of the application materials for Minor Permit AQ0090MSS01.

This condition includes both a ton per year limit and an operational limit.

Section 4: General Recordkeeping, Reporting, and Certification Requirements

Condition 6, Recordkeeping Requirements

The condition restates the regulatory requirements for recordkeeping, and supplements the recordkeeping defined for specific conditions in the permit. The records being kept provide evidence of compliance with this requirement.

Condition 7, Certification

18 AAC 50.205 requires the Permittee to certify any permit application, report, affirmation, or compliance certification submitted to the Department. The Department used the language in SPC XVII. This requirement is reiterated as a standard permit condition in 18 AAC 50.345(j).

Condition 8 Submittals

Condition 8 clarifies where the Permittee should send their reports, certifications, and other submittals required by the permit. The Department used the language in SPC XVII. The Department included this condition from a practical perspective rather than a regulatory obligation.

Condition 9, Information Requests

AS 46.14.020(b) allows the Department to obtain a wide variety of emissions, design and operational information from the owner and operator of a stationary source. This statutory provision is reiterated as a standard permit condition in 18 AAC 50.345(i). The Department used the standard language in Minor Permit AQ0090MSS01.

Condition 10 and Section 9, Excess Emission and Permit Deviation Reports and Notification Form

This condition reiterates the notification requirements in 18 AAC 50.235(a)(2) and 18 AAC 50.240 regarding unavoidable emergencies, malfunctions, and excess emissions. Also, the Permittee is required to notify the Department when emissions or operations deviate from the requirements of the permit. The Department used the language in SPCs III and IV,

The Department has modified Condition 10.3 and the Notification Form in Section 9 to reflect the electronic submittal requirements in 18 AAC 50.270 using the Department's online form to submit notification of excess emissions and permit deviations beginning September 7, 2023. The electronic notification form is found at the Division of Air Quality's Air Online Services (AOS) system webpage http://dec.alaska.gov/applications/air/airtoolsweb using the Permittee Portal option. Submittal through other methods may be allowed only upon written Department approval.

Beyond as noted, the Department has determined that the standard conditions adequately meet the requirements of 40 C.F.R. 71.6(a)(3).

Condition 11, Operating Reports

The Department mostly used the SPC VII language for the operating report condition. However, the Department modified or eliminated the Title V only aspects in order to make the language applicable for a minor permit.

Section 5: Standard Permit Conditions

Conditions 12 – 17, Standard Permit Conditions

18 AAC 50.544(a)(5) requires each minor permit issued under 18 AAC 50.542 to contain the standard permit conditions in 18 AAC 50.345, as applicable. 18 AAC 50.345(a) clarifies that subparts (c)(1) and (2), and (d) through (o), may be applicable for a minor permit.

The Department included all of the minor permit-related standard conditions of 18 AAC 50.345 in Minor Permit AQ0090MSS01. The Department incorporated these standard conditions as follows:

- 18 AAC 50.345(c)(1) and (2) is incorporated as Condition 12 of Section 5 (Standard Permit Conditions);
- 18 AAC 50.345(d) through (h) is incorporated as Conditions 13 through 17, respectively, of Section 5 (Standard Permit Conditions); and
- As previously discussed, 18 AAC 50.345(i) is incorporated as Condition 9 and 18 AAC 50.345(j) is incorporated as Condition 7 of Section 4 (Recordkeeping, Reporting, and Certification Requirements);

Appendix A: Emissions Calculations

Table A-1 presents details of the EUs, their characteristics, and emissions. Potential emissions are estimated using maximum annual operation for all fuel burning equipment as defined in 18 AAC 50.990(39) subject to any operating limits.

Table A-1 – Emissions Summary, in Tons Per Year (TPY)

EU ID	Unit ID/Description	Maximum Rating or Capacity	Operating Limits	NO_X		CO		VOC		$PM_{2.5}$ / PM_{10}		SO_2
				EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	PTE (TPY)
1	Compressor Drive Turbine – Propane Cycle #151	168 MMBtu/hr (LHV)	4,745 hr/yr	0.316 lb/MMBtu (LHV)	125.95	0.082 lb/MMBtu (HHV)	35.95	0.0021 lb/MMBtu (HHV)	0.92	0.0047 lb/MMBtu (HHV) 0.0019 lb/MMBtu (HHV)	2.89	0.22
2	Compressor Drive Turbine – Propane Cycle #152	168 MMBtu/hr (LHV)	4,745 hr/yr	0.316 lb/MMBtu (LHV)	125.95	0.082 lb/MMBtu (HHV)	35.95	0.0021 lb/MMBtu (HHV)	0.92	0.0047 lb/MMBtu (HHV) 0.0019 lb/MMBtu (HHV)	2.89	0.22
3	Compressor Drive Turbine – Ethylene Cycle #251	228.9 MMBtu/hr (LHV)	4,745 hr/yr	0.417 lb/MMBtu (LHV)	226.46	0.082 lb/MMBtu (HHV)	48.98	0.0021 lb/MMBtu (HHV)	1.25	0.0047 lb/MMBtu (HHV) 0.0019 lb/MMBtu (HHV)	3.94	0.3
4	Compressor Drive Turbine – Ethylene Cycle #252	228.9 MMBtu/hr (LHV)	4,745 hr/yr	0.417 lb/MMBtu (LHV)	226.46	0.082 lb/MMBtu (HHV)	48.98	0.0021 lb/MMBtu (HHV)	1.25	0.0047 lb/MMBtu (HHV) 0.0019 lb/MMBtu (HHV)	3.94	0.3

EU ID	Unit ID/Description	Maximum Rating or Capacity	Operating Limits	NO_X		CO		VOC		$PM_{2.5}$ / PM_{10}		SO_2
				EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	PTE (TPY)
5	Compressor Drive Turbine – Methane Cycle #351	161.1 MMBtu/hr (LHV)	4,745 hr/yr	0.292 lb/MMBtu (LHV)	111.61	0.082 lb/MMBtu (HHV)	34.48	0.0021 lb/MMBtu (HHV)	0.88	0.0047 lb/MMBtu (HHV) 0.0019 lb/MMBtu (HHV)	2.77	0.21
6	Compressor Drive Turbine – Methane Cycle #352	161.1 MMBtu/hr (LHV)	4,745 hr/yr	0.292 lb/MMBtu (LHV)	111.61	0.082 lb/MMBtu (HHV)	34.48	0.0021 lb/MMBtu (HHV)	0.88	0.0047 lb/MMBtu (HHV) 0.0019 lb/MMBtu (HHV)	2.77	0.21
7a	Compressor Drive Turbine – Fuel System #701	60.3 MMBtu/hr (LHV)	8,760 hr/yr	0.167 lb/MMBtu (LHV)	26.9	0.006 lb/MMBtu 5.121 lb/MMBtu	39.56	0.0021 lb/MMBtu (HHV)	0.61	0.0047 lb/MMBtu (HHV) 0.0019 lb/MMBtu (HHV)	1.92	0.15
8	Boiler # 501	46.5 MMBtu/hr (LHV)	8,760 hr/yr	100 lb/MMscf (LHV)	22.38	84 lb/MMscf (HHV)	18.61	5.5 lb/MMscf	1.11	5.7 lb/MMscf (HHV) 1.9 lb/MMscf (HHV)	1.68	0.11
9	Boiler #502	46.5 MMBtu/hr (LHV)	8,760 hr/yr	100 lb/MMscf (LHV)	22.38	84 lb/MMscf (HHV)	18.61	5.5 lb/MMscf	1.11	5.7 lb/MMscf (HHV) 1.9 lb/MMscf (HHV)	1.68	0.11
10	Boiler #511	46.5 MMBtu/hr (LHV)	8,760 hr/yr	100 lb/MMscf (LHV)	22.38	84 lb/MMscf (HHV)	18.61	5.5 lb/MMscf	1.11	5.7 lb/MMscf (HHV) 1.9 lb/MMscf (HHV)	1.68	0.11

EU ID	Unit ID/Description	Maximum Rating or Capacity	Operating Limits	NO_X		CO		VOC		$PM_{2.5}$ / PM_{10}		SO_2
				EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	PTE (TPY)
11	Emergency Generator	350 kW	500 hr/yr	0.031 lb/hp-hr	3.64	0.00668 lb/hp-hr	0.78	0.00247 lb/hp-hr	0.29	0.0022 lb/hp-hr	0.26	0.42
12	Emergency Firewater Pump #2	375 hp	120 hr/yr	0.031 lb/hp-hr	0.7	0.00668 lb/hp-hr	0.15	0.00247 lb/hp-hr	0.06	0.0022 lb/hp-hr	0.05	0.11
13	Emergency Firewater Pump #3	375 hp	120 hr/yr	0.031 lb/hp-hr	0.7	0.00668 lb/hp-hr	0.15	0.00247 lb/hp-hr	0.06	0.0022 lb/hp-hr	0.05	0.11
14	Emergency Firewater Pump #4	231 hp	120 hr/yr	0.031 lb/hp-hr	0.43	0.0068 lb/hp-hr	0.09	0.00247 lb/hp-hr	0.03	0.0022 lb/hp-hr	0.03	0.07
15	Ground Safety Flare	148 MMscf/day	373.3 MMscf/yr	0.068 lb/MMBtu (HHV)	12.83	0.31 lb/MMBtu (LHV)	52.65	0.66 lb/MMBtu (HHV)	124.54	40 µg/L (HHV)	4.1	0.09
16	Amine Regeneration Process Vent	15,300 Scf/hr	8,760 hr/yr	N/A	0	N/A	0	N/A	0	N/A	0	0
17	Compressor #5	78 hp	8,760 hr/yr	0.031 lb/hp-hr	10.59	0.00668 lb/hp-hr	2.28	0.00247 lb/hp-hr	0.84	0.0022 lb/hp-hr	0.75	1.64
18	Propane Compressor #151 Seal Oil Degassing Vent	N/A	8,760 hr/yr	N/A	0	N/A	0	N/A	211.5	N/A	0	0
19	Propane Compressor #152 Seal Oil Degassing Vent	N/A	8,760 hr/yr	N/A	0	N/A	0	N/A	211.5	N/A	0	0
20	Propane Compressor #251 Seal Oil Degassing Vent	N/A	8,760 hr/yr	N/A	0	N/A	0	N/A	108	N/A	0	0
21	Propane Compressor #252 Seal Oil Degassing Vent	N/A	8,760 hr/yr	N/A	0	N/A	0	N/A	108	N/A	0	0

EU ID	Unit ID/Description	Maximum Rating or Capacity	Operating Limits	NO_X		CO		VOC		$PM_{2.5}$ / PM_{10}		SO_2
				EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	EF	PTE (TPY)	PTE (TPY)
22	Boil-Off Gas Vent for LNG Storage Tanks	N/A	556 MMscf/yr	N/A	0	N/A	0	N/A	0	N/A	0	0
23	Vehicle Refueling (spillage)	1,015 gallons	17,000 gal/yr	N/A	0	N/A	0	0.7 lb/10^3 gallons	0.006	N/A	0	0
	Vehicle Refueling (uncontrolled displacement losses)							11 lb/10^3 gallons	0.09			
	Gasoline Storage and Dispensing Tank							N/A	0.07			
24	SCV #1 Blower	63.4 MMBtu/hr	9,900 hr	2 lbm/hr @ 15% O_2	9.9	0.05 lbm/hr @ 15% O_2	0.25	5.5 lb/MMscf	1.57	7.6 lb/MMscf	2.17	0.14
25	SCV #2 Blower	63.4 MMBtu/hr										
Total Potential to Emit					1,060.87		390.56		776.60		33.57	4.52