

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
AIR PERMITS PROGRAM**

**TECHNICAL ANALYSIS REPORT**  
for  
Air Quality Control Minor Permit AQ0082MSS02

Alyeska Pipeline Service Company  
Valdez Marine Terminal

**POWER GENERATION UPGRADES PROJECT**

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## Table of Contents

1.0 Introduction.....	4
1.1 Stationary Source Description .....	4
1.2 Application Description .....	4
1.3 Emissions Summary.....	5
1.4 Department Findings.....	5
2.0 Permit Requirements.....	6
2.1 General Requirements for all Minor Permits.....	7
2.2 Certification and Information Requests .....	9
2.3 Standard Conditions.....	9
3.0 Permit Administration.....	9

## ABBREVIATIONS/ACRONYMS

AAC	Alaska Administrative Code
ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
AS	Alaska Statutes
ASTM	American Society of Testing and Materials
BAE	Baseline Actual Emissions
CEMS	Continuous Emission Monitoring System
C.F.R.	Code of Federal Regulations
EPA	Environmental Protection Agency
MACT	Maximum Achievable Control Technology
NA	Not Applicable
NAICS	North American Industry Classification System
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NSPS	New Source Performance Standards
ORL	Owner Requested Limit
PAE	Projected Actual Emissions
PS	Performance Specification
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
RM	Reference Method
SIC	Standard Industrial Classification
SN	Serial Number
TBD	To Be Determined

### Units and Measures

bhp	brake horsepower or boiler horsepower
gr./dscf	grains per dry standard cubic feet (1 pound = 7,000 grains)
dscf	dry standard cubic foot
gph	gallons per hour
kW	kiloWatts
kW-e	kiloWatts electric <sup>1</sup>
lbs	pounds
mmBtu	million British thermal units
ppm	parts per million
ppmv	parts per million by volume
tph	tons per hour
tpy	tons per year
wt%	weight percent

### Pollutants

CO	Carbon Monoxide
HAPS	Hazardous Air Pollutants
H <sub>2</sub> S	Hydrogen Sulfide
NO <sub>x</sub>	Oxides of Nitrogen
NO <sub>2</sub>	Nitrogen Dioxide
NO	Nitric Oxide
PM-10	Particulate Matter with an aerodynamic diameter less than 10 microns
SO <sub>2</sub>	Sulfur Dioxide
VOC	Volatile Organic Compound

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<sup>1</sup> kW-e refers to rated generator electrical output rather than engine output

## **1.0 Introduction**

This Technical Analysis Report (TAR) provides Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Source Air Quality Control Permit AQ0082MSS02 to Alyeska Pipeline Service Company (APSC) for the Valdez Marine Terminal (VMT) Power Generation Upgrades under 18 AAC 50.508(5). The minor permit application is dated August 20, 2009. In the minor permit, the Department authorizes the replacement of emergency diesel power generators (Emission Units 8 and 9) at the VMT and establishes an Owner Requested Limit (ORL) to prevent the project from being classified under 18 AAC 50.502(c)(3)(A) by restricting the annual hours of operation for the replacement generators.

### **1.1 Stationary Source Description**

The VMT is an existing Prevention of Significant (PSD) major stationary source and is also classified as a Hazardous Pollutant (HAP) major stationary source.

The VMT is an existing oil-and-gas storage and transfer facility at the terminus of the Trans Alaska Pipeline System located in Valdez. APSC loads oil onto tankers at the VMT either directly from the pipeline or from one of the many storage facilities.

The emission units currently permitted at the VMT include boilers, incinerators, emergency generators, firewater pumps, crude oil storage tanks, loading berths, air strippers, and biological treatment tanks.

### **1.2 Application Description**

APSC plans to replace two existing emergency diesel power generators (Units 8 and 9) with larger generators. APSC found that the existing generators are undersized to meet the power restart requirements for the boilers (Units 1, 2, and 3). The proposed electric generators (Units 8A and 9A) are two Caterpillar engine-generators driven by diesel-fired Caterpillar C175-16 engines with standby ratings of 3,000 kiloWatts-electric (kW-e) and 4,423 bhp respectively.

The application indicates that the proposed units are subject to 40 CFR 60 Subpart III – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, and 40 CFR 63 Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. APSC did not request that the Department process this minor permit application in accordance with 18 AAC 50.326(c)(1) or (2), as such they understand there is no need to include Subpart III or Subpart ZZZZ in the minor permit.

APSC requested an ORL to avoid classification under 18 AAC 50.502(c)(3)(A) by restricting the hours of operation for maintenance and readiness testing to 100 hours per year per unit as described in Subpart III (40 CFR 60.4211(e)). APSC plans to demonstrate compliance by equipping each engine with a non-resettable hour meter required by 40 CFR 60.4209(a) and monitoring the generators on a monthly basis.

Units 8A and 9A will replace Units 8 and 9. The application indicates that Units 8 and 9 will be removed as part of the project, but APSC did not specifically request removal of these units from the inventory. APSC did not take into account the emissions decreases in actual emissions from Units 8 and 9 in determining permit applicability.

APSC plans to have a mobile emergency power generator on-site during installation for no more than eight months, which APSC defined as “temporary construction activity” (18 AAC 50.660(107)).

### 1.3 Emissions Summary

**Table 1** shows the emission summary and reflects the requested ORL for the new diesel power generators (Units 8A and 9A). As shown in the table, this project is not classified under 18 AAC 50.502(c) (3) (A). Calculation assumptions in **Table 1** include:

- 1) 100 hr/yr operation, for each Unit 8A and 9A; and 80 hour per year for Unit 8T
- 2) Use of Ultra-Low Sulfur Diesel (ULSD) at 15 parts per million by weight
- 3) Performance and emission data provided by Caterpillar:
  - a) Worst-case NO<sub>x</sub>, CO, VOC, and PM emission rates
  - b) Maximum fuel consumption rate of 213 gal/hr/unit

**Table 2** shows the stationary source’s potential to emit (PTE) with this project, used to calculate assessable emissions. The assessable emissions include emission from existing Units 8 and 9.

**Table 1 – Emissions Summary and Permit Applicability, tpy**

Parameter	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM-10	VOC
New Emergency Generator Emission (ORL, combined operation)	6.1	1.3	0.004	0.1	0.3
Minor Permit Thresholds 18 ACC 50.502(c)(3)(A)	10	N/A	10	10	N/A
Minor Permit Required?	No	No	No	No	No

**Table 2 – VMT Stationary Source Change in PTE, tpy**

Parameter	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	VOC	Total Assessable
PTE in AQ0082MSS01 (supersedes AQ0082TV01, Rev 3)	1,582	138	1,767	278	3,464	7,229
PTE in AQ0082MSS02	6	1	0	0	0	7
Revised PTE	1,588	139	1,767	278	3,464	7,236

### 1.4 Department Findings

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

1. VMT is an existing PSD major stationary source because it has a potential to emit more than 250 tpy of a regulated pollutant in an area classified as attainment or unclassifiable (see Table 2).
2. APSC is currently operating VMT under Operating Permit AQ0082TVP01 and has a Minor Permit AQ0082MSS01. APSC is in the process of applying for a renewal Operating Permit.
3. This project to add new generators is classified under 18 AAC 50.508(5) because APSC is requesting an ORL to restrict hours of operation per year in order to avoid classification under 18 AAC 50.502(c) (3) (A).
4. As restricted by the hours of operation per year ORL, the net emissions increase due to this project are below the 18 AAC 50.502(c) (3) (A) thresholds (see Table 1).
5. New Emission Units 8A and 9A are subject to New Source Performance Standards (NSPS) Subpart IIII and National Emission Standards for Hazardous air Pollutants (NESHAPS) Subpart ZZZZ. The Department is not required to include NSPS or NESHAPA in minor permits. However, APSC requested that the Department use specific NSPS and NESHAPS requirements as a basis for their ORL. APSC is required to comply with NSPS regardless of this permit action. The Department does not object to using NSPS and NESHAPS requirements as a basis for this ORL. The Department added additional conditions in order to adequately ensure permit classification avoidance...
6. Two generators are needed to fully restart VMT's power system in case of a complete power failure of the three boilers (Units 1, 2, and 3). APSC plans to have a mobile emergency power generator on-site during installation for no more than 8 months. The Department finds that this does not qualify as "temporary construction activity" or as a non-road engine as described in Section 2.1.2 below. The Department included hourly and other operational restrictions on the engine for permit avoidance.
7. APSC plans to install Units 8A and 9A over two summers and will remove the mobile emergency generator after installation.
8. The VMT is located in the South-central Coastal District. The project is consistent with the Alaska Coastal Management Program (ACMP) through AS 46.40.040(b) (1). The application for a minor permit classified under 18 AAC 50.508(5) is not on the ACMP "C list", therefore the ACMP project modification and Department Single Agency Review procedures do not apply
9. APSC's application for a minor permit for VMT Power Generation Upgrades contains the elements listed in 18 AAC 50.540.

## **2.0 Permit Requirements**

State regulations in 18 AAC 50.544 describe the elements that the Department must include in minor permits. This section of the TAR provides the technical and regulatory basis for the permit requirements in Minor Permit AQ0082MSS02, which is classified under 18 AAC 50.508(5).

## **2.1 General Requirements for all Minor Permits**

This permit includes the following requirements necessary for all minor permits as described in 18 AAC 50.544(a) (1) through (4):

- (1) The cover page identifies the stationary source, the project, the permittee, and contact information.
- (2) The application includes the requirements of an ORL under 18 AAC 50.225 that applies to the stationary source.

Emission fee requirements are required for each minor permit issued under 18 AAC 50.542, as described in 18 AAC 50.544(a). The Department is rescinding the fee requirements established in Minor Permit AQ0082MSS01 (supersedes Operating Permit AQ0082TV01, Revision 3) and replacing it with the new fee requirements established by this minor permit. Table 2 shows the assessable emissions are 7,236 tpy. This reflects all changes to the stationary source through this minor permit.

### **2.1.1 Emission Units**

The minor permit authorizes replacement of Units 8 and 9 (emergency diesel power generators) with new Units 8A and 9A. Though APSC states they will remove the old units, the permit does not require removal of existing Units 8 and 9 because APSC did not use take into account the removal of the existing units when determining permit applicability. The minor permit also allows the operation of mobile generator Unit 8T that will be used in place of Unit 8, 9, 8A, or 9A if necessary.

### **2.1.2 NSPS/NEHAPS and ORL to Avoid Project Classification Under 18 AAC 502(c)(3)(A)**

As required in 18 AAC 50.544(h), the minor permit includes the following:

- The terms and conditions, including specific testing, monitoring, recordkeeping, and reporting requirements
- A list of the equipment covered by the ORL
- Description of the classification that the limit allows the applicant to avoid

The minor permit contains the ORL for the hours of operation per year to avoid classification under 18 AAC 502(c) (3) (A). APSC requested an ORL summarizing 40 CFR 60.4211(e) and 40 CFR 60.4209(a) such that:

- Maintenance and testing is limited to 100 hours per year
- Any operation other than emergency situations and the aforementioned conditions are prohibited.
- Equip each engine with a non-resettable hour meter.

The Department based the ORL in the permit on 40 CFR 60.11(e) and 40 CFR 60.4209(a). In order to avoid potential conflict when the minor permit is incorporated into the Title V operating permit, the minor permit includes the verbatim text of each selected NSPS and NESHAPS requirement that applies to Units 8A and 9A. The Department added in additional recordkeeping and reporting requirements to ensure permit applicability avoidance.

The Department notes that some of the language requested in the application was from 40 CFR 60 Subpart JJJJ. Subpart JJJJ applies to spark ignition engines. The Department did not include this language in the permit.

APSC stated that a mobile generator will be onsite during installation to provide necessary emergency power should it be needed during this time. APSC predicts that the generator will be removed within 8 months. In their application, APSC defines this mobile generator as “temporary construction activity” stated in 18 AAC 50.990(107). The Department does not find this to be appropriate as follows:

- The “temporary construction activity” reference 18 AAC 50.990(107) refers only to modeling criteria found under 18 AAC 50.215(b) (2) (A).
- The emissions from this unit do not qualify as secondary emissions which would occur as a result of the construction or operation of a major stationary source or modification as defined in 40 CFR 51.166(b)(4) and (18), because the unit will operate as a substitute for one of the emission units at the stationary source. For the same reason, this unit does not qualify as a nonroad engine (an engine is not a nonroad engine if it replaces an engine at a location and is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period – see 40 CFR 89.2(2)(iii)).

In order to maintain avoidance of permit classification under 18 AAC 50.502(c), the Department has included in the permit a condition limiting total hours of operation of the 2,000 kWe (2,718 bhp) generator to 80 hours per 12-month rolling period. This is well above 12-month rolling total of VMT’s current generators (Units 8 and 9) recorded from January 2007 to January 2008 provided by APSC. **Table 3** shows the 2000 kWe generator’s potential to emit using AP-42 Table 2.4-1. The emissions from the mobile generator do not trigger 18 AAC 50.502(c) (3) permit applicability when added to the emissions from the new generators.

**Table 3 – PTE of Temporary Generator**

<b>Emission</b>	<b>TPY</b>
NO <sub>x</sub>	2.61
CO	0.60
VOC	0.88
PM	0.08
SO <sub>x</sub>	0.08

- The Department has also included limits in the minor permit as to when and where the mobile generator may operate such that the mobile generator may only be onsite during the installation phases of Units 8A and 9A.
- The mobile generator can operate up to 80 hpy for testing and for emergency start-up of the plant. If additional emergency operation is necessary, it will be a permit deviation and is limited to complete power failure of all boilers (Units 1, 2, and 3) with the currently operating generator while the other generator is offline during installation.

APSC assumed Ultra Low Sulfur Diesel fuel use in calculating permit applicability. A permit limitation is not necessary because (1) APSC is subject to NSPS requirements for fuel use for Units 8A and 9A; and (2) use of fuel with 0.75 wt percent sulfur would not trigger applicability under 18 aAC 50.502(c)(3)(A).

## **2.2 Certification and Information Requests**

All air quality control permits must contain procedures for information requests and certification, including certification requirements described in 18 AAC 50.544(h) (4). Information request requirements are specifically required under 18 AAC 50.200. Certification requirements are specifically required under 18 AAC 50.205.

## **2.3 Standard Conditions**

The minor permit contains these requirements to ensure that the permittee will construct and operate the stationary source or modification in accordance with 18 AAC 50, as described in 18 AAC 50.544(i).

## **3.0 Permit Administration**

The Department intends to incorporate the terms and conditions of Minor Permit AQ0082MSS02 into the renewal of Operating Permit AQ0082TVP01, Revision 3.

None of the proposed permit terms and conditions are prohibited by the operating permit. The Permittee may operate under Minor Permit AQ0082MSS02 upon issuance.