CITY OF UNALASKA
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Via Electronic Mail – Delivery Receipt Requested

December 23, 2019

Title I Program Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permits Program
555 Cordova St.
Anchorage, AK 99501

Subject: Minor Permit Application for Dutch Harbor Power Plant Emission Unit 16

Dear Sir or Madam:

The City of Unalaska (the City) hereby submits an air quality permit application consistent with the requirements of AAC 50.544(i)(1) and Section 508(6) to amend selected terms and conditions of permit AQ0215MSS03.

With this application, the City seeks a new minor permit to authorize the operation of Emission Unit 16, which is a model year 2013, 4,400 kW Caterpillar C280-16 diesel-fired generator at the Dutch Harbor Power Plant (DHPP). To avoid triggering a Title 1 major new source review and the associated permitting requirements under AS 46.14.130, the City has built the application around a limitation on the operation of EUs 7 and 16 via an Owner Requested Limit (ORL) under 18 AAC 50.508(5).

The required certification statement has been incorporated into page two of the permit application and signed by the City's designated responsible official.

We understand that the City will be billed permit administration fees for the time and other direct cost of Department staff working on this permit review as set out in 18 AAC 50.400(h).

Please contact me at 907-581-1260 if you have additional questions.

Sincerely,

Dan Winters
Director of Public Utilities

Attachments: Application to Revise Minor Source Specific Permit AQ0215MSS03
for City of Unalaska Dutch Harbor Power Plant
Appendices submitted via separate email

cc: Richard Owen, Powerhouse Supervisor
J. R. Pearson, Assistant City Manager
Jim Plosay, Air Permits Program Manager, ADEC, Juneau w/o enclosures via email
Patrick Dunn, ADEC, Anchorage w/ enclosures via email
Aaron Simpson, ADEC, w/ enclosures via email
Erik Haas, HMH Consulting, LLC

Application to Revise Minor Source Specific Permit AQ0215MSS03

for

City of Unalaska
Dutch Harbor Power Plant

Submitted To:

Alaska Department of Environmental Conservation
Division of Air Quality, Air Permits Program

Prepared By:

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200 West 34th Avenue, PMB 253, Anchorage, AK 99503
www.hmhconsulting.org

December 2019

Application to Revise Minor Source Specific Permit AQ0215MSS03

for

City of Unalaska Dutch Harbor Power Plant

December 2019

I. 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

12/24/19
Date

Dan Winters
Printed Name

DPU Director
Title

This certifies that on December 24, 2019, the person named above appeared before me, a notary public in and for the State of Alaska, and signed the above statements in my presence.

Lori Gregory
Notary Public, State of Alaska

My commission expires: 10/6/2022

OFFICIAL SEAL
Lori Gregory
Notary Public - State of Alaska
My Commission Expires 10/6/22

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List of Appendices

1.0 Introduction

Consistent with 18 AAC 50.544(i)(1) and Section 508(6), the City of Unalaska (the City) submits this application for an air quality permit to amend selected terms and conditions of permit AQ0215MSS03. The City requests new authorization to operate the model year 2013, 4,400 kW Caterpillar C280-16 diesel-fired generator at the Dutch Harbor Power Plant (DHPP) known as Emission Unit (EU) 16. In order to operate EU 16 without triggering a Title 1 major new source review and the associated permitting requirements under AS 46.14.130, the City wishes to establish limitations on the operation of EUs 7 and 16 via an Owner Requested Limit (ORL) under 18 AAC 50.508(5).

The limitations requested within this application on the operation of EUs 7 and 16 are used in determining the source's potential to emit in the emissions calculations presented in Appendix A. According to the U.S. EPA Prevention of Significant Deterioration (PSD) rules, DHPP is a major source. Therefore, the authorization of EU 16 to operate as part of the source inventory must adhere to PSD rules to determine whether the project constitutes a major modification and, if so, thereby requiring a New Source Review (NSR). A permitting applicability analysis has been conducted to determine the changes in emissions related to the project and is presented in the following sections of this application, including a review of emissions history and projections.

1.1 Facility Operations and Permitting History

The Dutch Harbor Power Plant (DHPP) is classified as a major stationary source under Titles I and V of the Clean Air Act (Act). DHPP's diesel electric generator sets are governed by the terms of four air quality permits issued by the Alaska Department of Environmental Conservation (Department, ADEC) implementing the requirements of the Act and the state's permitting rules. The Operating Permit AQ0215TVP04P is the guiding permit as it incorporates all of the applicable air related performance requirements of the other permits. The Operating Permit was renewed on September 14, 2018.

A 2007 Construction Permit (AQ0215CPT02) authorized the construction and installation of the two Wärtsilä engines (EUs 13 & 14), and a Caterpillar C-280 engine (EU 15). Following withdrawal of a PSD permit application in early 2014, the Minor Source Specific Permit AQ0215MSS04 was issued in late 2014 authorizing the installation of EU 16, the second Caterpillar C-280 engine. The 2014 PSD application was withdrawn due to the lack of baseline air quality monitoring data necessary to support the PSD application. The City was pressed to install incremental power redundancy to satisfy the N-1 contingency condition of the North American Electric Reliability Corporation's (NERC) Reliability Concepts. EU 16 was needed to meet the N-1 requirement for the prime generator EU 15. As a PSD permit could not be acquired, the City reluctantly accepted a permit whereby EU 16 is operationally restricted and the new air emissions from EU 16 were largely offset by shutting down two smaller generators, EU 7 (a 1989 Caterpillar 3516 engine) and EU 8 (a 1994 Caterpillar 3512B engine).

Below is a summary of past DHPP permitting Actions:

- (2000) Operating Permit AQ0215TVP01: Issuance of initial Title V operating permit, **expired**;
- (2002) Operating Permit AQ0215TVP01 Rev. 1: Revision to AQ0215TVP01 emissions fees, **expired**;
- (2003) Construction Permit AQ0215CPT01: Installation of an electric generator, **withdrawn**;
- (2005) Minor Permit AQ0215MSS01: Revision of AQ0215TVP01, **withdrawn**;
- (2007) Operating Permit AQ0215TVP02: Renewal of Operating Permit, **expired**;
- (2007) Construction Permit AQ0215CPT02: Construction of phases one and two, **rescinded**;
- (2009) Minor Permit AQ0215MSS02: Revision of AQ0215CPT02, **withdrawn**;
- (2010) Operating Permit AQ0215TVP02 Rev. 1: Incorporation of AQ0215CPT02, **expired**;
- (2010) Construction Permit AQ0215CPT02 Rev. 1: Correction of error in AQ0215CPT02, **active**;
- (2011) Construction Permit AQ0215CPT03: PSD revision to phase two construction, **rescinded**;
- (2011) Construction Permit AQ0215CPT03 Rev. 1: Correction of error in AQ0215CPT03, **rescinded**;
- (2011) Operating Permit AQ0215TVP02 Rev. 2: Incorporation of AQ0215CPT03, **expired**;
- (2012) Minor Permit AQ0215MSS03: Revision of AQ0215CPT03 Rev. 1, **active**;
- (2013) Operating Permit AQ0215TVP03: Renewal of Operating Permit, **expired**;
- (2014) Minor Permit AQ0215MSS04: Authorized installation of EU 16 with ORLs: **active**;
- (2015) Operating Permit AQ0215TVP03: Rev.1: administrative incorporation of MSS04, **expired**;
- (2018) Operating Permit AQ0215TVP04: permit renewal, **active**.

Preceding the 2014 issuance of Minor Permit AQ0215MSS04 (Permit MSS04), EUs 7 and 8 were the smallest rated engines in DHPP's inventory at 1,180 kWe and 1,230 kWe, respectively. Prior to their de-commissioning, these two smaller units were intended for use in combination with newer, larger units when demand ranged from approximately 4,600 to 5,300 kW. Removing the availability of EUs 7 and 8 has since made it unavoidable for the City to operate one or two primary engines (each of which are at least 4,400 kW capacity) at approximately 50 – 60% load. Reduced load operations of the primary engines results in diminished energy and cost efficiency.

Beginning September 2016, the City began a 13-month monitoring and data collection project through September 30, 2017 as a basis to support any future PSD modification at DHPP. Following the conclusion of the pre-construction ambient monitoring, the City submitted a PSD application in March of 2019 to re-start EUs 7 and 8 that incorporated the ambient data from the pre-construction monitoring project.

The Department found that the City's application for Air Quality Control Construction Permit AQ0215CPT05, dated March 27, 2019, was incomplete due to the requirements of 18 AAC 50.544(i)(1) and 40 CFR 52.21(r)(4).

Rather than revising the March 2019 PSD Permit Application, the City is hereby requesting to withdraw the PSD application and seek a permit for a minor modification at DHPP that would allow the re-start of EUs 7 & 8 as described in this permit application.

Consistent with 18 AAC 50.544(i)(1) and Section 508(6), the City is submitting this new minor source permit application requesting amendments to selected terms and conditions of permit AQ0215MSS03. Upon issuance, the new minor source permit will replace or supersede permit AQ0215MSS04.

1.2 Project Purpose and Overview

The City desires to continue improving the overall thermal and cost efficiency of operating the DHPP. The next step of improvement is to enhance its ability to better manage loads for the individual engines which will reduce the wear on the engines as well as significantly reduce overall emissions. In order to operate its engines in efficient speed ranges that match actual load demands, the Power Plant needs the availability of at least one of the smaller engines (EUs 7 and 8) to operate in combination with the larger existing[1] engine/generator sets (EUs 13, 14, and 15). This will lead to plant-wide energy efficiency improvement, reduce fuel consumption per kilowatt produced and lower the production cost per kilowatt. The City's goal is to keep the cost of diesel fuel derived electricity as low as reasonably achievable.

Furthermore, the City must be able to operate the EU 16 generator to satisfy the N-1 contingency condition as described in the permitting history in Section 1.1.

To achieve the efficiency goals and the operational availability of EU 16, the key objectives of the City's project are to:

1) re-authorize the operation of Emission Unit 16, a Caterpillar C-280, 4400 kWh rated engine generator set, by considering it a new source under 18 AAC 50.544(i)(1);

2) re-start Emission Units 7 and 8 which are considered existing authorized units under permit AQ0215MSS03, and

3) to operationally modify EU 7 to limit its emissions of nitrogen oxides to a quantity representative of baseline actual emissions and to share the allowed emissions in aggregate with EU 16 via an Owner Requested Limit.

These three objectives will be achieved using the process set in 18 AAC 50.544(i)(1)(B) of adopting new limits using the provision of 18 AAC 50.508(5), to continue to avoid Title 1 major new source review for the operation of EU 16.

[1] The term "existing" here refers to the existing inventory as of Minor Permit AQ0215MSS03, prior to late 2014.

1.3 Application Contents

The application includes:

1. Consistent with 18 AAC 50.544(i)(1) and Section 508(6), the City is requesting amendments to selected terms and conditions of permit AQ0215MSS03, including monitoring, record keeping and reporting provisions of Conditions 22 and 23 of the existing MSS03 permit;
2. Using the provision of 18 AAC 50.508(5), the City is requesting an aggregate NOx cap for combined emissions of EU 7 and EU 16;
3. An applicability analysis in accord with 40 CFR 52.21(a)(2)(iv)(a)-(f) to assess if the proposed emission increases from the new sources will result in a significant emission increase for any NSR regulated pollutants;
4. A minor source applicability analysis consistent with the provisions of 18 AAC 50.502(c) to assess if the proposed project will require a minor source permit review for any listed pollutant;
5. An analysis of federal and state regulatory requirements that may apply to EU 16, such as New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAPS) for the new engine, and Greenhouse Gas applicability;
6. Appendices containing supporting documentation; and
7. Under separate cover, a permit application to revise Operating Permit AQ0215TVP04 at a later date.

1.4 Location and Description of Project Area

DHPP is located on the island of Unalaska on the Aleutian Island Chain in Southwest Alaska. DHPP is located at 53.88° N, 166.52° W, or UTM Zone 3, 5972.60 km Northing, 399.06 km Easting.

The proposed project site at the south-east shore of Amaknak Island (see Figures B-1 through B-7 in Appendix B) is located within the Unalaska special protection areas for sulfur dioxide as defined in 18 AAC 50.025(c)(1). The project site is close to the origin of the special protection areas, specified as the land and water areas within a 3.4-mile radius of the intersection of 53^{o} 53' 4" N latitude and 166^{o} 32’ 11" W longitude.

The project area is part of the South Central Alaska Intrastate Air Quality Control Region. Federal PSD and Alaska Air Quality regulations designate the Unalaska area as Class II. The nearest Class I areas are the Bering Sea Wilderness Area and the Simeonof National Wildlife Area. These areas are located approximately 500 miles and 300 miles away from the project area, respectively.

The area surrounding the facility has a distinctly maritime climate. Temperature variations in winter are typically larger than in summer due to the difference between frigid weather associated with dry northerly airflow from the Arctic to mild temperatures associated with southerly airflow from the Pacific Ocean. In the summer, the sun is above the horizon from 15 to

18 hours during June and July with daily average maximum temperatures occasionally exceeding 65°F. In contrast, from November to early March, when the period of daylight ranges from 10 to less than 6 hours a day, the lowest temperature readings fall below 20 degrees, with daily average minimum temperatures occasionally dropping as low as 10°F.

2.0 Stationary Source Identification

The stationary source identification and contact information are provided in Sections 1 through 6 of the attached Stationary Source Identification Form in Appendix C.

3.0 Emission Unit Inventory and Description

Table 3-1 below provides a listing of the emission units permitted to operate at the Dutch Harbor Power Plant per the terms and conditions of Permit AQ0215MSS03. Emission units 13-17 are located in the new power house (see Figure B-6 in Appendix B), while EUs 7 and 8 are still located on their original foundations in the old powerhouse.

Table 3-1 Emission Unit Inventory (Existing and Proposed)

Emission Unit Identification		Description	Serial #	Rating (kWe)	Operating Limits	Install Date
No.	Name					
7	GenSet #8	Caterpillar 3516	73Z00272	1,180	105,803 MWh/ 12 month rolling total to restrict SO2, VOC; aggregate PM-10 limit of 22.3 tpy for EUs7,8,13,14, 15, 17	1989
8	GenSet #9	Caterpillar 3512B	2FN01033	1,230		1994
13	GenSet #10	Wärtsilä 12V32C	PAAE012105	5,211		2010
14	GenSet #11	Wärtsilä 12V32C	PAAE012106	5,211		2010
15	GenSet #13	Caterpillar C-280	NKB00148	4,400		2011
16 (proposed)	GenSet #12	Caterpillar C-280	NKB00331	4,400		2015
17	GenSet #15	Caterpillar C-9	S9L0Z576	250	100 hr/yr 12 hrs per 24-hr period	2010

The ADEC Emission Unit Information Form included in Appendix D contains further details regarding the use of EUs 7 and 16, which are the two emission units affected by the project.

4.0 Stationary Source Emissions and Permitting Applicability

This section provides the information required by the ADEC Emissions Summary Form attached in Appendix E.

4.1 Applicability of PSD Permitting under 40 CFR 52.21

According to the definition of major modification set out under 40 CFR 52.21(b)(2)(i), projects must satisfy both of the following components to be classified as PSD major modification:

- Significant emission increase of a criteria pollutant; and
- Significant net emission increase of a criteria pollutant.

Affirmative responses with both components mean that the project is a PSD major modification; a negative response for one or both component means the project is not a major modification.

Sections 4.1.1 and 4.1.2 include assessments of the emissions increases associated with the two components of the definition of major modification to determine whether the proposed project will result in a PSD major modification. The City's proposed project will operationally restrict EUs 7 and 16 under an Owner Requested Limit (ORL) where the combined NOx emissions from EU 7 and EU 16 are limited to 161.7 tons per year to avoid triggering affirmative responses to the components bullet-listed above. This aggregate ORL will provide flexibility for the City to selectively use EU 7 and EU 16 to meet the North American Electrical Reliability Corporation's N-1 redundancy requirements and to strategically pair DHPP's various engine sizes to most efficiently produce electricity responsive to actual and anticipated power demands.

The new ORL is designed to combine an EU 7 NOx allowance derived from the actual emissions for EU 7 for the two-year period of January 2009 through December of 2010 (the two year average was 121.8 tons of NOx) with a new NOx allowance of 39.9 tons acquired through the minor source permit approval process. To comply with the ORL emission cap, the City will calculate and monitor NOx emissions on a monthly basis.

The Project does not affect any changes to existing emission units at DHPP other than EU 7. Thus, the PSD applicability analysis presented below is limited to the proposed operation of EU 16, the new emission unit, and the modified operation of existing EU 7.

To determine if the project is subject to PSD review, the City is following the procedure set out in 40 CFR 52.21(a)(2)(iv)(a) – (f).

The first step, as described in subsection (b), is to determine if the project will result in a significant emission increase for any New Source Review (NSR) pollutant. If so, then the analysis for that pollutant must proceed to a Step 2 analysis to determine if the project will result in a significant net emissions increase at the facility. If the project will result in both a significant emissions increase and a significant net emissions increase, then the project is subject to a PSD review for those pollutants.

4.1.1 Major Modification Component 1: Significant Emissions Increase

Because the project involves modifying the operation of an existing emission unit and installing a new emission unit, the hybrid test of sub-section (f) applies. The hybrid test in (f) uses the Actual to Potential emissions features of sub-section (d) for the new emission unit, EU 16, and uses the Actual to Projected Actual emission test feature of sub-section (c) for the existing emission unit, EU 7.

For purposes of the applicability analysis, The City has chosen to present the emission calculations based upon full use of the ORL emissions cap assigned to EU 16 and the future

emissions of EU 7 set at zero. Based upon the characteristics of the ORL as an aggregate limit that applies to the summed emissions of both units, we believe that the choice of assigning emissions to just one, or split among the two units makes no substantive difference in the outcome of the analysis presented below. From an operational perspective, the City will most likely give preference to operation of EU 16, while EU 7 will largely serve as a supporting generator for handling incremental or short-term load demand changes.

A: The Actual to Potential Emission Test of Sub-section (d) for EU 16

The Potential to Emit for the proposed new source, EU 16, as restricted by the requested ORL is shown in Table 4-1 below in accord with the definition of PTE as set out in §52.21(b)(4) of the rule (see Appendix A, Table A-3 for emission calculations). The NOx emission factor used in the calculations of PTE rely on a 2015 source test of EU 16 when it was operating at 3,760 kWe - an 85% load condition. For purposes of optimizing fuel efficiency and minimizing engine maintenance cost, the City intends to target an 80% load condition as optimum yet may occasionally operate up to 85 % load.

Table 4-1 EU 16 Restricted Potential to Emit (PTE); tons per year

Nitrogen Oxides	PM-2.5	PM-10	Carbon Monoxide	Sulfur Dioxide
161.7	5.2	5.2	8.4	0.70

As per 18 AAC 50.544(i)(1)(B), EU 16 will be treated as a new emission unit and thus the current actual emissions are zero. Therefore, the values for each pollutant presented in the table above represent the Emissions Increase of each pollutant due to proposed installation of the new emission unit for the project.

B: The Actual to Projected Actual Emission Test of Sub-section (c) for EU 7

As mentioned above, EU 7 will be restricted in the aggregate ORL and for purposes of this analysis its future emissions are assumed to be zero.

As discussed in the EPA Memorandum of March 13, 2018 from EPA Administrator E. Scott Pruitt to Regional Administrators emission reductions as well as emission increases are to be considered in Step 1 of the PSD applicability analysis provided that the emission unit is part of the proposed project. The March 31, 2018 Memorandum is an active EPA policy applicable nationwide. To our knowledge, the State of Alaska has always relied upon EPA's PSD policy documents when making permit decisions, in part to avoid confusion with the regulated entities. Thus, the City has relied upon it.

Emission Unit 7 has a considerable operational record at the DHPP in which it has been authorized to operate at full capacity throughout its permit history. The City now desires to restrict its future operating capacity to an amount based upon its prior actual emissions and to

apply those creditable actual emissions toward the joint operations of EU 16 and 7 as explained previously.

The City has reviewed prior operating records to select a 24-month period that represents normal operations for EU 7 consistent with the definition of actual emission in §52.21(b)(21). The baseline period of January 2009 to December 2010, has been selected to represent normal operations of the source as configured under DHPP Renovation Phase I, which is described and authorized in permit AQ0215CPT02. The Actual Emissions of EU 7 during the selected 24 months are presented below in Table 4-2 (see supporting emissions documentation in Appendix F and Table A-1 of the Technical Analysis Report supporting the 2014 MSS04 permit). The table also reflects that the Projected Actual Emissions will be zero as explained above in section A.

Table 4-2: Actual to Projected Actual Emissions for EU 7; tons per year

	Nitrogen Oxides	PM-2.5	PM-10	Carbon Monoxide	Sulfur Dioxide
Actual Emissions	121.8	2.2	2.2	32.8	0.4
Projected Actual Emissions	0	0	0	0	0
Change in Actual Emissions	-121.8	-2.2	-2.2	-32.8	-0.4

C: The Hybrid Test for Projects with Multiple Types of Emissions Units of Sub-section (f)

As described in sub-section (f), the hybrid test is to determine if the sum of the emission increases from the project's new and existing emission units will result in a significant emissions increase for any NSR pollutant. The language further clarifies that the test is limited to only those NSR pollutants where emissions from each type of emission unit equals or exceeds the significant amount in §52.21(b)(23). As mentioned above, the March 13, 2018 EPA memorandum describes that emission decreases due to the project are also considered in the hybrid test. Considering the emission values presented above in Tables 4-1 and 4-2, the only pollutant with values above the significant amount is oxides of nitrogen.

Table 4-3 below consolidates the information presented in the tables above and provides the summation called for by sub-section (f) of the rule.

Table 4-3: Sum of Project Induced Emission Changes

	Nitrogen Oxides (tons)
EU 16 Potential Emission Increase	161.7
EU 7 Projected Actual Emission Change	-121.8
Project Induced Emission Increase	39.9
Significant Emission Increase Amount per §52.21(b)(23)	40
Does the Project result in a Significant Emission Increase for NOx ?	No

Answer to Question 1:

As indicated in Table 4-3, the project induced emissions increase for nitrogen oxides will be less than the significant amount set out in §52.21(b)(23). Therefore, the project will not result in a major modification of an existing major stationary source with respect to NOx emission. For all other NSR pollutants, the information provided in Tables 4-1 and 4-2 demonstrate that those emission increases will also be less than the significant increase amount listed in the rule.

4.1.2 Major Modification Component 2: Significant Net Emissions Increase

For a project to be considered a major modification, and thus subject to PSD new source review, the project must result in both a significant emissions increase and a significant net emissions increase. As this project does not result in a significant emission increase, it is not necessary to proceed with Step 2 of the analysis to determine if a significant net emission increase will occur.

4.2 Potential Emissions

DHPP operations and emissions are currently restricted under terms of the existing MSS03 permit due to various PSD avoidance provisions. The existing permit restriction for maximum allowable particulate emissions (Permit Condition 23) of 22.3 tons per year is a governing condition which limits the operations of emission units at DHPP and its overall power generation. This is illustrated in Scenarios #1 - #3 in Tables A-3 - A-5 of the DHPP Emissions Calculation spreadsheet (Appendix A) whereby the City has examined various operating scenarios that incorporate the existing permit conditions and also incorporate the new proposed aggregate NOx limit on EU 7 and EU 16 emissions. The City has chosen to present the values from Sheet A3 in

Table 4-4 below as representative of DHPP Potential Emissions as this operating scenario results in the highest overall NOx emissions while still ensuring compliance with the facility-wide governing PM-10 limit of 22.3 tons per year without EU 16. Tables A-4 and A-5 in Appendix A are also included with the application simply to illustrate the range of DHPP's operational

flexibility under the proposed aggregate NOx limit on EU 7 and EU 16 emissions. The City accepts that the operational flexibility carries an ongoing duty to tracking NOx and PM emissions to routinely monitor compliance with the requested NOx ORL and the existing PM-10 ORL.

Table 4-4 Potential Emissions for DHPP

Emission Unit	Make/Model	Hours	Power Produced (MWh)	NOx (TPY)	CO (TPY)	SO_2 (TPY)	PM (TPY)	VOC (TPY)
7	Caterpillar 3516	0	0	0.0	0.0	0.0	0.0	0.0
8	Caterpillar 3512B	7,600	9,348	89.6	38.9	0.5	2.6	3.8
13	Wartsilla 12V32C	5,300	27,618	413.7	29.9	1.2	5.7	9.5
14	Wartsilla 12V32C	5,000	26,055	390.3	28.3	1.1	5.4	8.9
15	Caterpillar C280-16	4,500	19,800	213.7	10.0	0.9	8.6	13.3
16	Caterpillar C280-16	4,445	16,624	161.7	8.4	0.7	5.2	13.1
17	Caterpillar C-9	100	25	0.2	0.1	0.0	0.0	0.0
Total Power Produced, all EUs (MWh)			99,471					
Total Power Produced, EUs 7, 8, and 13-15 (MWh)			82,821					
AQ0215MSS03 Limit for EUs 7, 8, and 13-15 (MWh)			105,803					
AQ0215MSS03 MWh Limit Exceeded?			No					
Restricted PTE before modification per AQ0215MSS03 permit				1,175.0	131.1	3.6	22.3	35.1
Restricted PTE after project, all EUs (TPY)				1,269.0	115.6	4.4	27.5	48.6
Restricted PTE after project, EUs 7 & 16 (TPY)				161.7				
New ORL, EUs 7 & 16 (TPY)				161.7				
New ORL for EUs 7 & 16 Exceeded?				No				
Restricted PTE, EUs 7, 8, 13-15 &17 (TPY)						3.6	22.3	35.5
AQ0215MSS03 Limit for EUs 7, 8, 13-15 & 17 (TPY)						46.8	22.3	51.2
AQ0215MSS03 Limit Exceeded?						No	No	No

Note: Shaded cells indicate that the ORL, PTE, or other value referenced in the corresponding row does not apply to the pollutant specified in the column header.

4.3 Applicability of Minor Source Permitting under 18 AAC 50.502

To determine if Title I minor source permitting is required for any project related pollutants the City reviewed the applicability rules in 18 AAC 50.502. The associated analysis is presented below.

The Caterpillar model C-280 engine, the proposed EU 16, has a rated capacity of more than 10 million BTU heat input per hour and is located in a sulfur dioxide special control area. Therefore, the requirements of 18 AAC 50.502(c)(2)(B) apply to this project - requiring a minor source permit for purposes of managing sulfur dioxide exposures in the Unalaska/Dutch Harbor locale.

Emission based minor source permitting trigger levels set out in 18 AAC 50.502(c)(3) are germane to DHPP as it is an existing major stationary source. The City is using the features of sub-section (A) of 502(c)(3) to determine whether a minor source permit review is required for any of the listed pollutants. Table 4-5 presents the increase in potential to emit (PTE) for each of

the respective pollutants by comparing the PTE of EU 7 before the project and the PTE of EUs 7 and 16 with the requested ORL after the project. The calculations for the restricted PTE of EU 7 per the terms and conditions of permit AQ0215MSS03 are provided in Table A-2 of Appendix A.

Table 4-5: DHPP Project Induced Net Emissions Increases

	Nitrogen Oxides (tons)	PM-10	PM-2.5	Sulfur Dioxide
EU 7 PTE Before Project	201.5	2.7	2.7	0.5
EU 7 & 16 PTE After Project	161.7	5.2	5.2	0.7
Project Induced Change in PTE	-39.8	2.5	2.5	0.2
Minor Source Permit Trigger Amount per 18 AAC 50.502(c)(3)(A)	10	10	10	10
Is a Minor Source Permit Required for this Pollutant ?	No	No	No	No

The information in Table 4-5 demonstrates that minor source permitting is not required for any pollutant on the basis of potential emission increases. While sulfur dioxide emission increases will be less than the triggering quantity of 10 tons per year, a minor source permit review is none-the-less required under 18 AAC 50.502(c)(2)(B). Section 5.0 provides the information required to support the minor source permit application.

5.0 Permit Application Requirements for Requested Title I Actions

5.1 Requested Title I Permit Actions

DHPP requests revisions to Permit No. AQ0215MSS03 to apply the process described in 18 AAC 50.544(i)(1) to:

1. Rescind permit AQ0215MSS04;
2. Authorize limited operation of EU 16 as a new source with an authorization for new emissions of 39.9 tons per year(tpy) of NOx, 5.2 tpy of PM-10 and PM-2.5, 8.4 tpy of CO and 0.7 tpy of SO_2;
3. Using the authority of 18 AAC 50.508(6) establish a new ORL for the collective operations of EUs 7 and 16 whereby baseline actual NOx emissions of 121.8 tpy from

EU 7, as shown in Table 4-2, are aggregated with the new allocation of 39.9 tpy for EU16 to establish an ORL NOx limit of 161.7 tpy as an aggregate limit applicable to the combined operations of EUs 7 and 16. Compliance with the ORL will be attained through the monitoring record keeping and reporting provisions described below;

4. Using the authority of 18 AAC 50.508(6) establish a new ORL for EU16 whereby the power production of the unit will not exceed 3,740 kW/hr, which is 85% of the manufacture's rated maximum capacity. Compliance with the ORL will be attained through the monitoring record keeping and reporting provisions described below;
5. Revise the monitoring, record keeping and reporting provisions of MSS03 Permit Conditions 22 to remove the 105,803 MWh 12 month rolling limit set out in Condition 22.3 while preserving the underlying PSD avoidance limits for SO_2 and VOCs. The proposed revised language of Condition 22.3 is provided below.
6. Revise the monitoring, record keeping and reporting provisions of MSS03 Permit Conditions 23 to base the calculation on emission factors reported or converted to grams/ kWh of power produced where those values have been previously relied upon, gathered or from source testing or may be obtained in any future source. The proposed revised language for Permit Condition 23.1 is provided below.

5.2 Requirements for Revising or Rescinding Terms or Conditions of a Title I Permit

An application for a minor permit revising or rescinding terms or conditions of a Title I permit under 18 AAC 50.508(6) must include the following information as required by 18 AAC 50.540(k).

1) A copy of the Title I permit that established the permit term or condition [18 AAC 50.540(k)(1)];

A copy of the Title I permit AQ0215MSS03 is attached in Appendix G.

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

The introduction section of this application provides the justification for the installation of EU 16.

3) The effect of revising or revoking the permit term or condition on emissions [18 AAC 50.540(k)(3)(A)];

Emission calculations are provided in Appendix A for multiple operating scenarios under the proposed engine configuration. The effect of the City's requested changes to permit terms and conditions on facility emissions is discussed in detail in Section 4.0.

4) The effect of revising or revoking the permit term or condition on other permit terms [18 AAC 50.540(k)(3)(B)];

The revision to the Permit AQ0215MSS03 terms or conditions will have the following effects:

- The Ambient Air Quality Protection Requirements of DHPP's current construction permit include Conditions 15 and17.
  - Condition 15 will be adjusted to preserve the established above ground stack height minimum of 25.4 meters for EU 16.
  - Condition 17 limits the sulfur content of the fuel to 0.01 wt%S. This condition is also proposed to be applied to EU 16.
- The City proposes to modify the method of compliance with the Owner Requested Limits to Avoid PSD Review for VOCs and SO_2 in Condition 22. The proposed change to the condition will limit emissions of VOCs to no more than 51.2 tons per year and emissions of SO_2 to no more than 46.8 tons per year. The PM-10 limit of 22.3 tons per year in Condition 23, which applies to EUs 7, 8, 13-15, and 17, constrains the facility such that the emission limits for VOCs and SO_2 cannot be approached. Thus, the proposed change will utilize direct calculation methods to determine compliance with the limits on emissions of VOCs and SO_2 rather than relying on the surrogate 105,803 MWh per 12-month rolling total limit currently in place for EUs 7, 8, and 13-15.
- The City proposes to modify the calculation method used to demonstrate compliance with the Owner Requested Limits to Avoid PSD Review for PM-10 in Condition 23. The proposed calculation method will rely on emission factors in units of grams of pollutant per kilowatt hour (for EUs 13-15 and 17) and pounds per MM BTU as based on monthly fuel use for EUs 7 and 8. All engines are equipped with dedicated kilowatt hour meters. Using these updated emission factors, which are listed in Table 5-3, will enhance DHPP's operational flexibility while ensuring compliance with the limit on emissions of PM-10 to no more than 22.3 tons per year.
- The NSPS Subpart A and Subpart IIII requirements in Conditions 24 through 34 apply to EU 16, which is the same make and model as EU 15 (Conditions 24 through 36 were based on the addition of EU 15 to DHPP's inventory.) A NSPS applicability analysis for Emission Unit 16 is provided in Section 5.4.3. Because of the construction date and engine displacement and power rating of EU 16, this engine is subject to the same Tier 2 emission standards as EU 15 in Condition 32.
- The NESHAP Subpart A and Subpart ZZZZ requirements in Conditions 35 and 36 apply to EU 16. Because EU 16 is a new stationary reciprocating internal combustion engine located at an area source of hazardous air pollutants, it must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII in Conditions 30 through 34 for compression ignition engines. The NESHAP applicability analysis for Emission Unit 16 is provided in Section 5.4.5.

5) The effect of revising or revoking the permit term or condition on the underlying ambient demonstration, if any [18 AAC 50.540(k)(3)(C)];

The requested modifications to Conditions 15 and 17 that are described above for 18 AAC 50.540(k)(3)(B) do not alter or otherwise disturb previously performed ambient air quality demonstrations showing that the applicable ambient standards are protected.

6) The effect of revising or revoking the permit term or condition on compliance monitoring [18 AAC 50.540(k)(3)(D)];

Requested changes to compliance monitoring, recordkeeping and reporting are detailed in Section 5.3 below.

7) For a condition that allows an owner or operator to avoid a permit classification, the information required of an applicant 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)].

There are no permit conditions to be revised that expose the City to a permit classification that was previously avoided. The AQ0215MSS04 permit contains permit conditions to avoid a major source review when installing EU 16 in 2014. The proposed conditions in this application also avoid that classification, albeit in another manner. This application also modifies other monitoring record keeping and reporting provisions, yet does so in a manner to preserve prior established PSD classification for other pollutants. Furthermore, SO_2 emissions have dropped below minor permitting thresholds and, therefore, the City proposes that the only permit condition required to protect SO_2 ambient air quality standards and increments is the current fuel sulfur limit of 0.1% by weight.

5.3 Proposed Monitoring Record Keeping and Reporting Requirements (MR&R)

5.3.1 MR&R for Requested NOx ORL

The City proposes the following MR&R language to demonstrate compliance with the requested NOx ORL applicable to the combined operations of EU 7 and 16:

> The Permittee shall limit the combined emissions of NOx from EU 7 and EU 16 to no more than 161.7 tons per year by complying with the following:
> 1) Install on each unit a dedicated kilowatt meter with an accuracy of plus or minus two percent.
> 2) Monitor and record the monthly kilowatts produced on each EU.
> 3) Before the end of each calendar month calculate and record the total NOx emissions for the previous month from the combined operations of EUs 7 and 16 using Equation A and the emission factors in Table 5-1 below, or more current source test based emission factors.

Equation A

$$NOx = \frac{kWh_7 * EF_7 + kWh_{16} * EF_{16}}{454 * 2000}$$

Where: NOx = monthly NOx emissions in tons
kWh= total kilowatt hours produced for a calendar month for each emission unit
EF = NOx emission factor for each emission unit in g/kWh

Table 5-1: Approved NOx Emission Factors

EU ID	Emission Factor (g/kWh)	Reference Source
7	17.7	Vendor provided for Permit to Operate 9625-AA003
16	8.83	2015 Source Test at 85% load

Note: The engine rating provided above for EU 16 is based on 85% load.

4) Calculate the rolling 12-month total NOx emissions by adding the previous 11 months;
5) Report in accordance with the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18AAC 50;
6) Report in accordance with the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 if the total NOx emissions exceed the limit in Condition __.

5.3.2 MR&R for Requested EU 16 Power Production ORL

The City proposes the following MR&R language to demonstrate compliance with the generating capacity limit for EU 16:

The Permittee shall limit the operation of EU 16 to not exceed 3,740 kWh produced for any given hour in a calendar day by complying with the following:
1) Maintain a dedicated kilowatt meter on EU 16 with an accuracy of plus or minus two percent;
2) Limit the hourly power production of EU 16 so as not to exceed 3,740 kW in a given hour;
3) Monitor and record the highest hourly power production for each calendar day;
4) Report the value and the associated day each month that exhibited the highest hourly power production in accordance with the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50;
5) Report in accordance with the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS

46.14.130(b) and 18 AAC 50 for all calendar days that exhibited hourly power production in excess of 3,740 kWh.

5.3.3 MR&R for Requested Revision to MSS03 Permit Condition 22

The City proposes the following revised language for MSS03 Permit Condition 22 to demonstrate compliance with the underlying PSD avoidance limits for SO_2 and VOCs:

The Permittee shall limit emissions of VOCs to no more than 51.2 tons per year and emissions of SO_2 to no more than 46.8 tons per year by complying with the following:

1) Comply with Condition 17;
2) Maintain a dedicated fuel meter on each of EUs 7, 8 and 13-15;
3) Maintain a dedicated kilowatt meter with an accuracy of plus or minus two percent on EU 15;
4) Before the end of each calendar month calculate and record the total VOC emissions for the previous month from the combined operations of EUs 7, 8 and 13-15 using Equation B and the emission factors in Table 5-2 below, or more current source test based emission factors.

Table 5-2: Requested Emission Factors, Permit AQ0215MSS03, Condition 22

EU ID	VOC Requested Emission Factor		Source
7	0.082	lb/MMBtu	AP-42 Table 3.4.1, 91% of TOC
8	0.082	lb/MMBtu	AP-42 Table 3.4.1, 91% of TOC
13	0.082	lbs/MMBtu	AP-42 Table 3.4.1, 91% of TOC
14	0.082	lb/MMBtu	AP-42 Table 3.4.1, 91% of TOC
15	0.61	g/kW-hr	Mfg.- NOT TO EXCEED DATA 100%

Equation B

$$VOC = VOC_7 + VOC_8 + VOC_{13} + VOC_{14} + VOC_{15}$$

Where the VOC emissions for each emissions unit are as follows:

$$VOC_7 = \frac{f_7 * EF_7 * 0.139}{2000}$$

$$VOC_8 = \frac{f_8 * EF_8 * 0.139}{2000}$$

$$VOC_{13} = \frac{f_{13} * EF_{13} * 0.139}{2000}$$

$$VOC_{14} = \frac{f_{14} * EF_{14} * 0.139}{2000}$$

$$VOC_{15} = \frac{kWh_{15} * EF_{15}}{454 * 2000}$$

Where: *VOC = monthly VOC emissions in tons*
f = gallons of fuel usage for a calendar month for each emission unit
kWh= total kilowatt hours produced for a calendar month for each emission unit
EF = emission factor of each emission unit in lb/MMBtu or g/kWh

5) Calculate the rolling 12-month total VOC emissions by adding the previous 11 months;
6) Before the end of each calendar month calculate and record the total SO2 emissions for the previous month from the combined operations of EUs 7, 8 and 13-15 using the mass balance calculation in Equation C;

Equation C

$$SO_2 = \frac{0.0001 * 6.9 * f * 2}{2000}$$

Where: *SO_2 = monthly SO_2 emissions in tons*
f = combined gallons of monthly fuel usage for a calendar month for EUs 7, 8, and 13-15

7) Report in accordance with the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50.
8) Report in accordance with the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS

46.14.130(b) and 18 AAC 50 if the total VOC or SO2 emissions exceed the limit in Condition __.

5.3.4 MR&R for Requested Revision to MSS03 Permit Condition 23

The City proposes the following revised language for MSS03 Permit Condition 23 to demonstrate compliance with the underlying PSD avoidance limit for PM-10.

The Permittee shall limit emissions of PM-10 to no more than 22.3 tons per year by complying with the following:

1) Limit the total emissions from EUs 7, 8, 13 – 15, and 17 to no more than 22.3 tons per year.
    a. For EUs 7, 8, 13-15, and 17, maintain a dedicated kilowatt meter with an accuracy of plus or minus two percent; and
    b. Monitor and record the monthly kilowatt hours of power production from each engine.
2) Before the end of each calendar month calculate and record the total PM-10 emissions for the previous month by adding the results of Equations D and E using the emission factors in Table 5-3. Then determine the rolling 12-month PM-10 emissions by adding the previous 11 months.

Table 5-3 Requested Emission Factors, Permit AQ0215MSS03, Condition 23(c)

EU ID	PM-2.5/PM-10 Requested Emission Factor		Source
7	0.0573	lb/MMBtu	AP-42 Table 3.4.2, Total PM
8	0.0573	lb/MMBtu	AP-42 Table 3.4.2, Total PM
13	0.187	g/kW-hr	Mfg.data AQO215CPT02
14	0.187	g/kW-hr	Mfg.data AQO215CPT02
15	0.394	g/kW-hr	2012 Source Test of EU 15
17	0.2	g/kW-hr	TV Cond #30.1 re Table E of 60/IIII

Equation D

$$PM_{10} = \frac{(f_7 * EF_7 + f_8 * EF_8) * 0.139}{2000}$$

Equation E

$$PM_{10} = \frac{(kWh_{13} * EF_{13} + kWh_{14} * EF_{14} + kWh_{15} * EF_{15} + kWh_{17} * EF_{17})}{454 * 2000}$$

Where: *PM_{10} = monthly PM_{10} emissions in tons*
f = gallons of fuel usage for a calendar month for each emission unit
kWh= total kilowatt hours produced for a calendar month for each emission unit
EF = emission factor of each emission unit in lb/MMBtu or g/kWh

3) Report in accordance with the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18AAC 50, the information listed in Condition __.
4) Report in accordance with the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 if the total PM-10 emissions exceed the limit in Condition __.

5.4 New Source Review (NSR)

5.4.1 NSR Applicability Based on Net Emission Increases

DHPP is classified as a PSD major stationary source with the potential to emit 250 tons or more of a regulated air pollutant. The definition of a major stationary source is found in 40 CFR 51.166(b)(1)(i).

As previously demonstrated in Table 4-3, the project induced emission increase for nitrogen oxides will be less than the significant amount set out in §52.21(b)(23). Since no significant emission increase occurs, it is not necessary to proceed with Step 2 of the PSD analysis to determine if a significant net emission increase will occur. Therefore, the project will not result in a major modification of an existing major stationary source with respect to NOx emission. For all other NSR pollutants, the information provided in Tables 4-1 and 4-2 demonstrated that those emission increases will also be less than the significant increase amount listed in the rule. The installation of EU 16 will not be significant under 40 CFR 51.166(b)(23)(i) for NOx, PM, CO, SO_2, or VOCs. Any increases in potential emissions for these pollutants are also below minor permit requirement thresholds.

5.4.2 New Source Review for Greenhouse Gas Applicability

As greenhouse gas emissions associated with the proposed project are less than 75,000 metric tons, greenhouse gas emission increases are not subject to review as part of the overall PSD new source review. The operating scenario numbers in Tables 5-3 and 5-4 below correspond to the Restricted Potential Emissions discussion in Section 4.2 and the emission calculations in Tables A-3 through A-5 of Appendix A. As shown in Table 5-4, the maximum possible project

greenhouse gas emissions given the range of practicable operating scenarios under the proposed engine configuration is 63,586 metric tons per year.

Table 5-4 Greenhouse Gas Emissions (metric TPY) for all EUs

	DHPP RESTRICTED POTENTIAL TO EMIT (all EUs)					
	Greenhouse Gases					
Operating Scenario No. (Appendix A Table No.)	Fuel (gallons)	MMBtu/ year	CO2 (Metric Tons)	CO2e CH4 (Metric Tons)	CO2e N2O (Metric Tons)	Total Metric Tons
Scenario #1 (Table A-4)	6,044,639	840,205	62,142	53	156	62,351
Scenario #2 (Table A-3)	6,164,390	856,850	63,373	54	159	63,586
Scenario #3 (Table A-5)	5,166,215	718,104	53,111	45	134	53,290
Maximum Project Greenhouse Gas Emissions, All EUs, Metric Tons						63,586

Table 5-5 Greenhouse Gas Emissions (metric TPY) for EU 16 only

	DHPP RESTRICTED POTENTIAL TO EMIT (EU 16 only)					
	Greenhouse Gases					
Operating Scenario No. (Appendix A Table No.)	Fuel (gallons)	MMBtu/ year	CO2 (Metric Tons)	CO2e CH4 (Metric Tons)	CO2e N2O (Metric Tons)	Total Metric Tons
Scenario #1 (Table A-4)	947,520	131,705	9,741	8	24	9,774
Scenario #2 (Table A-3)	1,002,792	139,388	10,309	9	26	10,344
Scenario #3 (Table A-5)	0	0	0	0	0	0
Maximum Project Greenhouse Gas Emissions, EU 16 only, Metric Tons						10,344

5.4.3 New Source Performance Standards Applicability

EU 16 is a model year 2013 Caterpillar C280-16, non-emergency stationary compression ignition (CI) engine with a displacement of greater than 10, but less than 30 liters per cylinder. 40 CFR 60.4201(d)(3) allows all 2013 model year non-emergency stationary CI engines with cylinder displacement ranging from 15 to 30 liters to comply with Tier 2 emission standards of 40 CFR 94.8, as applicable. The C280-16 is a 16-cylinder engine with a total displacement of 296 liters, so the displacement of each cylinder is 18.5 liters. Therefore, EU 16 must comply with Tier 2 standards. A letter certifying EU 16's compliance with the Tier 2 standards is included in Appendix H. In accordance with 40 CFR 60.4203, this engine will continue to meet the standards, as specified, for the full useful life of the engine.

The City utilizes ULSD fuel meeting the requirement specified in §80.510(b), as referenced in 40 CFR 60.4207(b).

Under 40 CFR 60.4211(a) and (c), the engine must be operated, installed, and configured in accordance with the manufacturer's written instructions. The engine must also be certified to the applicable emission standards.

Per 40 CFR 60.4214(a)(1), the facility is required to submit an initial notification as required in 40 CFR 60.7(a)(1). This notification must include:

- Name and address of the owner or operator;
- The address of the affected source;
- Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
- Emission control equipment; and
- Fuel used.

The facility must also keep records of the following information pursuant to §60.4214(a)(2):

- All notifications submitted in compliance with Subpart IIII and all documentation supporting any notification;
- Maintenance conducted on the engine;
- If the stationary CI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.

The EU 16 is also subject to the General Provisions of 40 CFR 60.1 through 40 CFR 60.19, as presented in Table 8 to Subpart IIII.

5.4.4 National Emission Standards for Hazardous Air Pollutants Applicability

An important consideration in a facility's classification under NSR regulations is the potential emissions of hazardous air pollutants (HAPs). AS 46.14.990(14) defines "hazardous air pollutant" as "a pollutant listed in or under 42 U.S.C. 7412(b) (Clean Air Act, sec. 112(b))." This section of the Clean Air Act lists 164 pollutants subject to regulation under the Act. Depending on a facility's potential emissions of HAPs, a facility may be classified as a major source of HAPs. A major source of HAPs is classified as a stationary source that has the potential to emit 10 tons of any HAP or 25 tons per year of all HAPs in aggregate. A stationary source that is not a major source of HAPS is termed an area source of HAPS.

Under the terms and conditions of Permit AQ0215MSS03, DHPP has the restricted potential to emit 1.27 TPY of HAPS, with no single HAP greater than 10 tons. Under the provisions of the prospective permit modifications, DHPP has the restricted potential to emit a total of 1.55 TPY of HAPs, with no single HAP greater than 10 tons. Therefore, DHPP is not, nor will be classified as a major source of HAPs. The City of Unalaska is requesting the permit shield of 40 CFR 71.6(f)(1)(ii) for any requirements related to HAP major sources. A demonstration of the facility's HAPs emissions is included in Appendix I.

5.4.5 NESHAPS for Reciprocating Internal Combustion Engines

DHPP is classified as an area source of Hazardous Air Pollutants (HAPs) and has diesel-fired Compression Ignition Reciprocating Internal Combustion Engines (CI RICE). Under NESHAP Subpart ZZZZ, EU 16 is categorized as a new stationary RICE at an area source. Therefore, this engine satisfies the criteria of 40 CFR 63.6590(c)(1) to meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for EU 16 under NESHAP Subpart ZZZZ.

6.0 Modeling

The information provided in Section 4.3 and in Table 4-5 demonstrates that potential emission increases from the project will not lead to minor permitting requirements for any pollutant.
While sulfur dioxide emission increases will be less than the triggering quantity of 10 tons per year, a minor source permit review is none-the-less required under 18 AAC 50.502(c)(2)(B). This includes a modeling analysis for SO_2 under 18 AAC 50.540(c)(2)(C).

For purposes of this demonstration, the City is relying on SO_2 Stage 1 modeling performed to support the March 2019 PSD permit application whereby emissions from EUs 7 and 8 were modeled as they were considered to be the new sources under that application. The City desired to avoid a complete re-modeling as the prior modeling was based on higher short term emission rates of SO_2 and therefore already presents a conservative assessment of potential impacts. In order to represent maximum short term emissions from EU 16, the City has doubled the SO_2 impacts from the prior modeling as presented in Table 6-1. Though this approach is overly conservative, it accounts for factors such as higher plume rise from the exhaust of EU 16 versus that of the exhaust from the smaller EUs 7 and 8. Even with the scaling factor applied in Table 6-1 the ambient SO_2 impacts are still well below the Significant Impact Limits (SILs).

Table 6-1 Stage 1 Modeling Results

Pollutant	Averaging Period	Modeling Demonstration Result, 2013-2017, Scaling Factor of 2X Applied (µg/m3)	SIL (µg/m3)
SO_2	1-hr	2.86 (H1H, 2015 & 2016)	8
	3-hr	2.50 (H1H, 2013 & 2015)	25
	24-hr	1.72 (H1H, 2013)	5
	Annual	0.26 (2013)	1

Based on the results of the modeling demonstration, there will be no exceedance of ambient standards. The Stage 1 modeling output files are provided as Appendix J.

Appendix B – Topographical Map and Aerial Photos

Figure B-1 Southern Alaska Including Unalaska Island

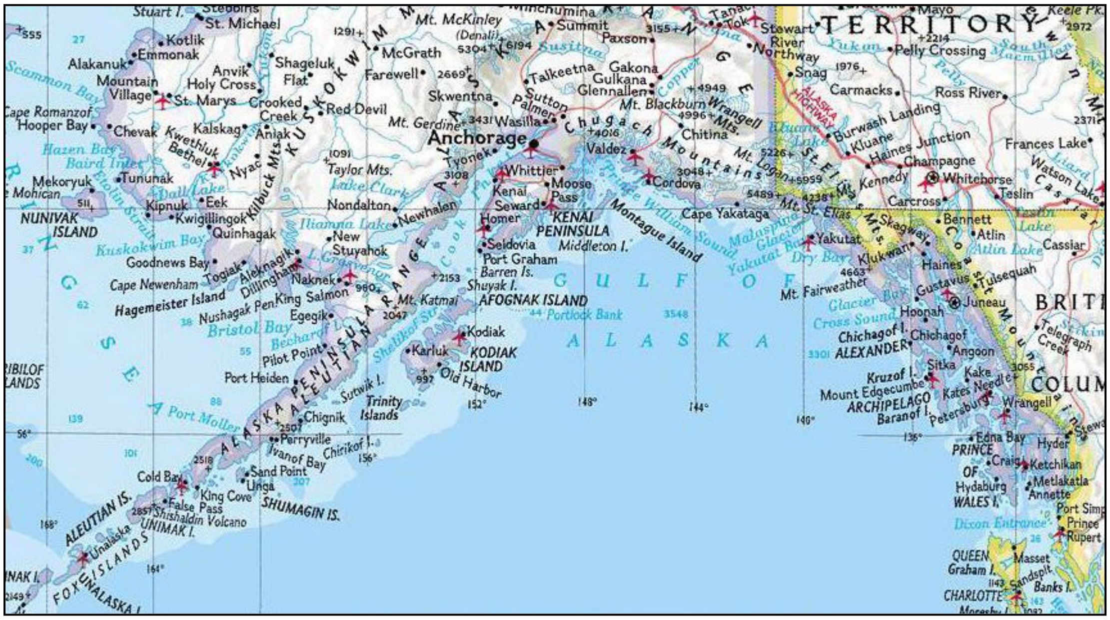


Figure B-2 Unalaska Island Including Dutch Harbor

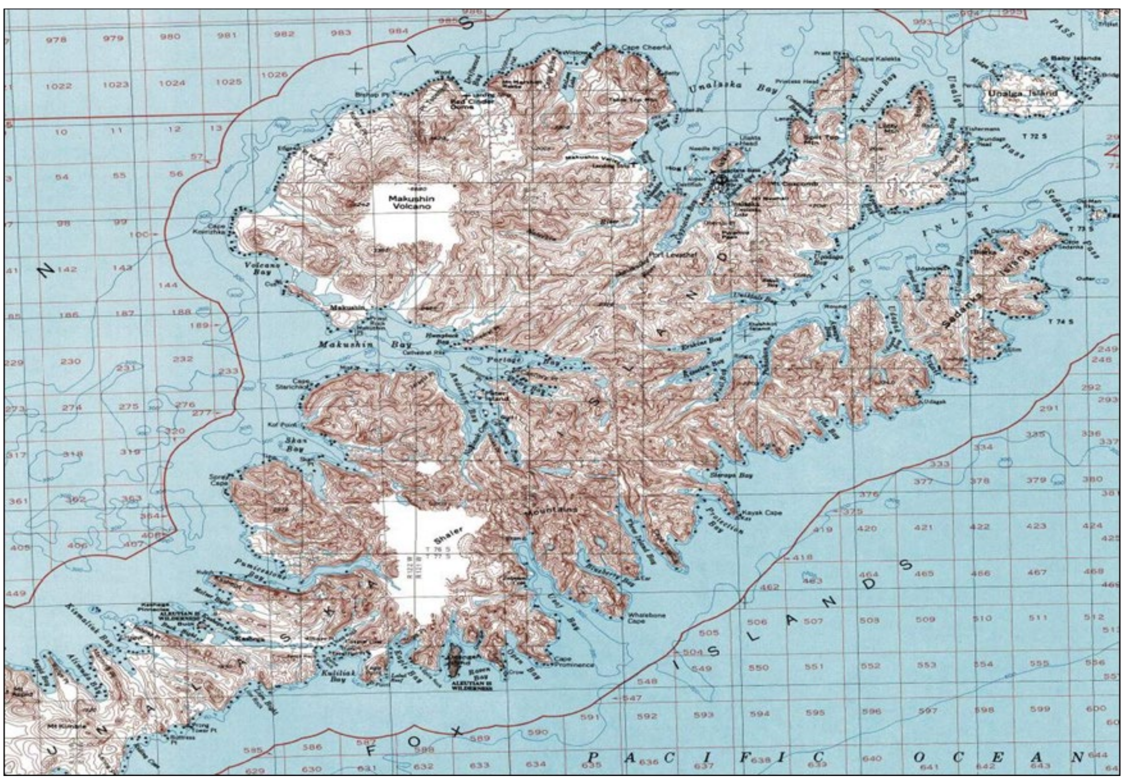
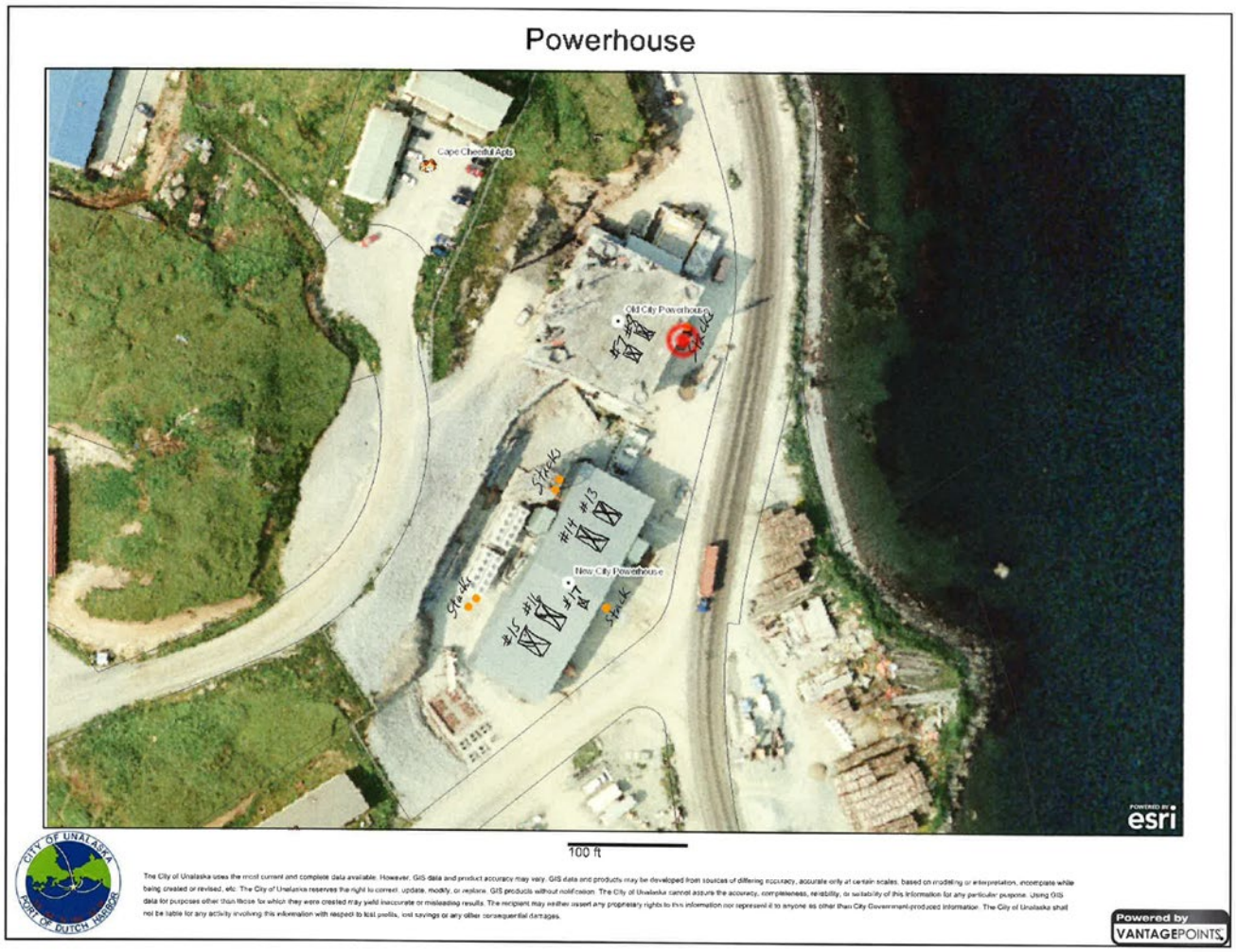


Figure B-3 Dutch Harbor in Unalaska Bay

Figure B-4 Dutch Harbor

Figure B-5 Aerial Photo of Dutch Harbor and Unalaska

Figure B-6 Site Photo of Dutch Harbor Power Plant



Appendix C – Stationary Source Identification Form

Alaska Department of Environmental Conservation
Air Quality Minor Permit Application

STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

Name: Dutch Harbor Power Plant			SIC: 4911 Electrical Services
Project Name (if different):	Building Contact: Richard Owen, Powerhouse Supervisor		
Physical Address: 1732 East Point Road Dutch Harbor, Alaska 99685	City: Unalaska	State: AK	Zip: 99685
	Telephone: (907) 581-1831		
	E-Mail Address:dwinters@ci.unalaska.ak.us		
UTM Coordinates (m) or Latitude/Longitude:	Northing: 5972.60 km	Easting: 399.06 km	Zone: 3
	Latitude: 53° 53’ 18.6” North	Longitude: 166° 32’ 14.28” West	

Section 2 Legal Owner

Name: City of Unalaska, Department of Public Utilities		
Mailing Address: P.O. Box 610		
City: Unalaska	State: AK	Zip: 99685
Telephone #: (907) 581-1831		
E-Mail Address:		

Section 3 Operator *(if different from owner)*

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

Section 4 Designated Agent *(for service of process)*

Name: Erin Reinders, City Manager		
Mailing Address: P.O. Box 610		
City Unalaska	State: AK	Zip: 99685
Telephone #: (907) 581-1831		
E-Mail Address: ereinders@ci.unalaska.ak.us		

Section 5 Billing Contact Person *(if different from owner)*

Name: Dan Winters, Director of Public Utilities		
Mailing Address: P.O. Box 610		
City: Unalaska	State: AK	Zip: 99685
Telephone #: (907) 581-1831		
E-Mail Address: dwinters@ci.unalaska.ak.us		

Section 6 Application Contact

Name: Dan Winters, Director of Public Utilities			
Mailing Address: P.O. Box 610	City: Unalaska	State: AK	Zip: 99685
	Telephone: (907) 581-1831		
	E-Mail Address: dwinters@ci.unalaska.ak.us		

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)]

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 SO_2
- ☐ 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 SO_2 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]
- ☐ SO_2 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]
- ☐ SO_2 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: AQ0215MSS03 Condition No.: 22 and 23
  Date: 11/28/2012
  Permit Number: AQ0215MSS04 Condition No.: Entire permit
  Date: 11/24/2014

**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)*: AQ0215CPT02, Rev. 1
  AQ0215MSS03
  AQ0215MSS04
  AQ0215TVP04
- ☒ Owner Requested Limit(s) Permit Number(s):
  AQ0215MSS03
  AQ0215MSS04
- ☐ 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/

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.

Please refer to Section 1.0 of the Application to Revise Minor Source Specific Permit AQ0215MSS03 for the project description.

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

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)];

Please refer to Section 5.1 of the Application to Revise AQ0215MSS03 for a description of the requested ORLs.

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

Please refer to Section 5.3 of the Application to Revise AQ0215MSS03 for proposed monitoring, recordkeeping and reporting requirements for the requested ORLs.

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)];

The requested ORLs allow the project to avoid PSD review under 40 CFR 52.21 for VOCs, SO2, PM-2.5/PM-10, and NOx. Please refer to Section 4.0 of the Application to Revise AQ0215MSS03 for details.

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)];

The required certification is provided directly following the cover page of the Application to Revise AQ0215MSS03.

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)];

Please refer to the introduction and Section 5.2 of the Application to Revise AQ0215MSS03 for the information required by 18 AAC 50.540(k).

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

- Emissions;

  See Section 5.2 of the Application to Revise AQ0215MSS03.

- Other permit terms;

  See Section 5.2 of the Application to Revise AQ0215MSS03.

- The underlying ambient demonstration, if any;

  See Section 5.2 of the Application to Revise AQ0215MSS03.

- Compliance monitoring; and

  See Section 5.2 of the Application to Revise AQ0215MSS03.

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)]

See Section 5.2 of the Application to Revise AQ0215MSS03.

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. **See Section 6.0 of the Application to Revise AQ0215MSS03 for a qualitative discussion of the modeling and the demonstration of compliance with ambient air quality standards.**

☐ Attached is an electronic copy of all modeling files. **See Section 6.0 of the Application to Revise AQ0215MSS03.**

Section 14 Certification

This certification applies to the Air Quality Control Minor Permit Application for the Dutch Harbor Power Plant (Stationary Source Name) submitted to the Department on: 12/23/2019

Type of Application

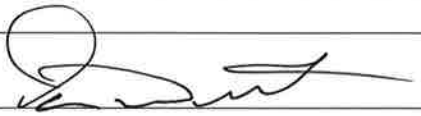
☒ Initial Application

☐ 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: 12/23/19
Printed Name: Dan Winters	Title: Director of Public Utilities, City of Unalaska

Section 15 Attachments

☒ Attachments Included. List attachments: Attachments are listed in the Application to Revise AQ0215MSS03. See the List of Appendices following the Table of Contents.

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:

Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-6881

Appendix D – Emission Unit Information Form

Alaska Department of Environmental Conservation
Air Quality Control Minor Permit Application

MINOR PERMIT APPLICATION – EMISSION UNIT INFORMATION

FOR A NEW STATIONARY SOURCE: Complete this form for all emissions units.

FOR A MODIFICATION TO AN EXISTING STATIONARY SOURCE:
IF YOU HAVE A TITLE V PERMIT: Complete this form for each emissions unit that is new or that is affected by a physical change or change in the method of operation.
IF YOU DO NOT HAVE A TITLE V PERMIT or APPLICATION CLASSIFIED UNDER 18 AAC 50.508(5): Complete this form for all emissions units.

Section 1 Stationary Source Information

Stationary Source Name: Dutch Harbor Power Plant

Section 2 Emissions Unit (EU) Identification (ID) and Description

Note: Do not use this section for emission units associated with asphalt plants, soil remediation, and rock crushers. Use the Supplementary Forms for these units.

EU ID No.	Description	Construction Date	Make / Model		Serial No.	Requested Limit* (specify units)	Max. Rated Capacity (kW, MMBtu), Horsepower (hp) or. Design Throughput
7	GenSet #8	1989	Caterpillar	3516	73Z00272	ORL – see Application	1,180 kWe
16	GenSet #16	2013	Caterpillar	C280-16	NKB00331	ORL – see Application	4,400 kWe

**If no annual limit is applicable (e.g., hours, fuel), then specify not applicable (N/A).*
Please use additional copies of this sheet if necessary.

Have you identified each emission unit (if you do not have a Title V permit), or each new or affected emission unit (if you have an existing Title V permit) in Section 2 above? ☒ Yes ☐ No

If not, please explain:

Section 3 Emissions Unit Use

EU ID No.	Is unit portable?		Is the unit:						Is this unit a:		If limited operation, is the unit:		
[List same EUs as in Section 2.]	Yes	No	a nonroad engine? Yes	a nonroad engine? No	an intermittently used oil field support equipment per Policy 04.02.105? Yes	No	an oil field construction unit per Policy 04.02.104? Yes	No	primary (base load) unit?	or limited operation unit?	emergency or black start unit?	subject to a permit limit?	or other (specify)?
7	☐	☒	☐	☒	☐	☒	☐	☒	☒	☒	☐	☒	☐
16	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☒	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Please use additional copies of this sheet if necessary.

Have you specified the use of each emission unit in Section 3 above? ☒ Yes ☐ No
If not, please explain:

Section 4 Fuel Information

Complete Section 4a or 4b for each emissions unit, as appropriate.

Section 4a Fuel Burning Equipment not Including Flares

EU ID No.	Fuel type(s)	Maximum fuel sulfur content	Fuel density (lb/gal) (if liquid fuel)	Higher heating value*	Maximum fuel consumption rate (gallons/hour or MMscf/hour)
7	Diesel	0.01 ☒ wt. % S ☐ ppmv H_2S	7 lb/gal	137,000 ☒ Btu/gal ☐ Btu/dscf Other	77.04 gallons/hour
16	Diesel	0.01 ☒ wt. % S ☐ ppmv H_2S	7 lb/gal	137,000 ☒ Btu/gal ☐ Btu/dscf Other	281.99 gallons/hour
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	
		☐ wt. % S ☐ ppmv H_2S		☐ Btu/gal ☐ Btu/dscf Other	

**Use British thermal unit (Btu) per gallon (gal) for liquid fuels. Use Btu per dry standard cubic foot (dscf) for gaseous fuels.*
Please use additional copies of this sheet if necessary.

Have you provided the fuel details for each fuel-burning emission unit (excluding flares) in Section 4a above? ☒ Yes ☐ No
If not, please explain:

Section 4b Flares

Complete this section if the project/stationary source contains a flare.

Do you own or operate a flare? ☐ Yes ☒ No *(If not skip this section)*

EU ID No:	Heat release rate for pilot / purge operation (MMBtu/hr)	Maximum heat release rate (MMBtu/hr)	Flare gas heat content (Btu/scf)	Flare gas H_2S content (ppmv)

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you provided the fuel use details for all flares in Section 4b above? ☐ Yes ☐ No

If not, please explain:

N/A

Section 5 Materials Processed and Methods of Operation

Complete this section if the project/stationary source contains a materials-handling process.

Do you own or operate a flare? ☐ Yes ☒ No *(If not, skip this section)*

EU ID No.	Materials processed	Maximum material processing rate	Describe method of operation

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the material processing details in Section 5 above? ☐ Yes ☐ No

If not, please explain:

N/A

Section 6 Emission Control Information (if applicable)

Complete this section if the project/stationary source contains emission control equipment.

Do you own or operate emission control equipment? ☐ Yes ☒ No *(If not, note below and skip this section.)*

EU ID No.	Control equipment	Pollutant(s) controlled:	Description of the control equipment	Description of significant operating parameters and set points for the control equipment	The control equipment is necessary:		
					To comply with an emission standard	To avoid a project classification	Other – give purpose of control equipment
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

DHPP does not own or operate emission control equipment.

Have you specified the details of any emission controls in Section 6 above? ☐ Yes ☐ No

If not, please explain:

N/A – DHPP does not own or operate emission control equipment.

Section 7 Emission Factors

Give exact citations of emission factor sources.

EU ID No.	Emission Factors								
	NOx	CO	PM-2.5	PM-10	PM	SO_2	VOC	HAPs	Lead
7 16	*Please refer to Appendix A emissions calculations spreadsheet for emission factors.*								

EU ID No.	Sources and References for Emission Factors								
	NOx	CO	PM-2.5	PM-10	PM	SO_2	VOC	HAPs	Lead
7 16	*Please refer to Appendix A emissions calculations spreadsheet for emission factor sources and references.*								

Please use additional copies of this sheet if necessary.

Include additional notes as warranted.

Have you specified all emission factors and reference sources in Section 7 above? ☐ Yes ☒ No

If not, please explain:

Emission factors and reference sources are provided in Appendix A to Application to Revise AQ0215MSS03.

Section 8 Applicable State Emission Limits (listed in 18 AAC 50.050 through 18 AAC 50.090)

Complete this section for emissions units that are new or are affected by the physical change or change in operation.

EU ID No.	Emission Limit or Standard	Regulation Citation	Compliance Method
7	Industrial Process and Fuel-Burning Equipment Visible Emissions	18 AAC 50.055(a)	Visible Emissions MR&R
	Industrial Process and Fuel-Burning Equipment Particulate Matter	18 AAC 50.055(b)	Particulate Matter MR&R
	Sulfur Compound Emissions Standard	18 AAC 50.055(c)	Fuel sulfur limit and MR&R
16	Industrial Process and Fuel-Burning Equipment Visible Emissions	18 AAC 50.055(a)	Visible Emissions MR&R
	Industrial Process and Fuel-Burning Equipment Particulate Matter	18 AAC 50.055(b)	Particulate Matter MR&R
	Sulfur Compound Emissions Standard	18 AAC 50.055(c)	Fuel sulfur limit and MR&R

Please use additional copies of this sheet if necessary.

Have you specified all applicable state emission limits in Section 8 above? ☒ Yes ☐ No

Have you specified a demonstration of compliance for each emission limit or standard? ☒ Yes ☐ No

If you answered "no" to either question, please explain:

Section 9 Incinerators

Complete this section if the project/stationary source contains an incinerator.
Do you own or operate an incinerator? ☐ Yes ☒ No *(If not, skip this section.)*

EU ID No.	Fuels Burned (type and consumption rate)	Rated capacity in pounds per hour	Type of waste burned

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the details of all incinerators in Section 9 above? ☐ Yes ☐ No
If not, please explain:

N/A

Appendix E – Emissions Summary Form

Alaska Department of Environmental Conservation
Air Quality Control Minor Permit Application

EMISSIONS SUMMARY FORM
Modification of an Existing Stationary Source

Section 1 Stationary Source Information

Stationary Source Name: Dutch Harbor Power Plant

Section 2 Existing Potential to Emit (PTE) for the Entire Stationary Source BEFORE the Modification

EU ID No.	*Does project affect the emissions unit?*	PTE (tpy)								
		CO	NOx[4]	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC[2]	Fugitive VOC[3]	Fugitive PM[3]
7	☒ Yes ☐ No	39.9	201.5	2.7			0.5	3.85		
8	☐ Yes ☒ No	44.8	103.2	3.0			0.5	4.32		
13	☐ Yes ☒ No	49.5	683.7	9.4			1.9	15.67		
14	☐ Yes ☒ No	49.5	683.7	9.4			1.9	15.67		
15	☐ Yes ☒ No	19.5	416.0	16.7			1.7	25.89		
17	☐ Yes ☒ No	8.4	13.9	0.5			0.1	7.89		
	☐ Yes ☐ No									
Total tons per year (tpy)		**211.7**	**2,102.0**	**41.7**			**6.7**	**73.3**		

☒ Detailed Excel spreadsheet emissions calculations are attached. *These must be attached in order for your application to be complete.*
Include multiple copies of this page if more space is required.

☐ *Check this box if fugitive emissions are included in permit applicability under 18 AAC 50.502(i).*

Brief description of why fugitive emissions are included in permit applicability:

Notes:
1. Include condensable particulate matter for PM-10 and PM-2.5.
2. If total PTE for volatile organic compounds (VOCs) is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.
3. Fugitive VOC and PM emissions are included as assessable emissions regardless of permit applicability.
4. Fugitive NOx emissions from blasting should be included in the PTE column for NOx.

Have you completed Section 2 above? ☒ Yes ☐ No

If not, please explain:

Section 3 Change in Emissions

Show ONLY existing emissions units that are affected by the project. Show EITHER the change in actual emissions (Sections 3a and 3b) OR the change in potential emissions (Sections 2 and 3c). ***The change in potential emissions is demonstrated in Sections 2 and 3c.***

Section 3a Actual Emissions – NOx, CO, PM-2.5, PM-10, PM, SO_2 (18 AAC 50.502(c)(3)(B) or 18 AAC 50.508(5))

If an existing emissions unit is being removed, enter zero for "projected actual emissions" for that unit.

See 18 AAC 50.502 for directions on calculating "baseline actual emissions" and "projected actual emissions."

EU ID No.	Type of Modification		Baseline Actual Emissions (tpy)					Projected Actual Emissions (tpy)				
	Modified EU	Removed EU	CO	NO_X	PM-2.5[1]	PM-10[1]	SO_2	CO	NO_X	PM-2.5[1]	PM-10[1]	SO_2
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
Total												

Use this table only if the project does not include new emission units. See 18 AAC 50.502(e) and (h)(4)

☐ Detailed Excel spreadsheets emissions calculations are attached. *These must be attached in order for your application to be complete. You may give an example calculation where the method of calculation is identical for multiple emissions units.*

Notes:

[1] Include condensable particulate matter for PM-10 and PM-2.5.

Section 3b Change in Actual Emissions (18 AAC 50.502(c)(3)(B) or 18 AAC 50.502(c)(4)(B))

If you choose actual emissions as your basis, complete Sections 3a and 3b for each emissions unit for which you answered "YES" in Section 2. Change in actual emissions = "projected actual emissions" minus "baseline actual emissions" from Section 3a.

EU ID No.	Change in Actual Emissions (tpy)				
	CO	NOx	PM-2.5[1]	PM-10[1]	SO_2
Total					

Use this table only if the project does not include new emission units. See 18 AAC 50.502(e) and (h)(4)

[1] Include condensable particulate matter for PM-10 and PM-2.5.

Have you completed Section 3a and 3b above? ☐ Yes ☒ No

If not, please explain:

Sections 3a and 3b are not applicable; change in potential emissions used instead. See Sections 2 and 3c.

Section 3c Change in Potential to Emit (PTE) (18 AAC 50.502(c)(3)(A) or 18 AAC 50.502(c)(4)(A))

If you choose PTE as your basis for calculation, complete this section for each emissions unit that is new and for each emissions unit for which you answered "YES" in Section 2.

Under "PTE AFTER the Modification", enter zero if you are removing the emissions unit.

Under "Change in PTE":
For each EXISTING emissions unit, subtract the amount of PTE BEFORE Modification in Section 2 from the "PTE AFTER the Modification"
For each NEW emissions unit, enter the amount from "PTE AFTER the Modification."

EU ID No.	PTE - AFTER the Modification (tpy) [only from modified and new emissions units. Do not list emission units for which you answered "NO" in Section 2.]								Change in PTE (tpy)							
	CO	NO_X	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC	HAPs[2]	CO	NO_X	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC	HAPs
7 16	*Please see Section 4.3 of the Application to Revise AQ0215MSS03. Table 4-5 in Section 4.3 shows the change in PTE before and after the project for EUs 7 and 16 and the resulting minor permitting outcomes per 18 AAC 50.502(c)(3)(A).*															
Total																
Source-Wide																

Include multiple copies of this page if more space is required.
☒ Detailed Excel spreadsheet emissions calculations are attached. *These must be attached for your application to be complete.*

Notes:
1 Include condensable particulate matter for PM-10 and PM-2.5
2 If the total PTE for hazardous air pollutants (HAPs) for the entire stationary source is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.

Have you completed all portions of Section 3c above? ☒ Yes ☐ No
If not, please explain:

Appendix G – Minor Permit AQ0215MSS03, Issued November 2012

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY CONTROL MINOR PERMIT

Permit No: AQ0215MSS03 **Final** – November 28, 2012
Rescinds Permit No. AQ0215CPT03 Revision 1

The Alaska Department of Environmental Conservation (Department), under the authority of AS 46.14 and 18 AAC 50, issues Air Quality Control Minor Permit No. AQ0215MSS03 to the Permittee listed below.

Permittee:	City of Unalaska, Department of Public Utilities P.O. Box 610 Unalaska, AK 99685
Owner/Operator:	Same as Permittee
Stationary Source:	City of Unalaska, Dutch Harbor Power Plant (DHPP)
Location:	UTM Coordinates Zone 3, Northing 5972.60 km; Easting 399.06 km
Physical Address:	1732 East Point Road, Dutch Harbor, AK 99685
Permit Contact:	Chris Hladick; (907) 581-1260
Project:	Stack Height Revision

This project is classified 18 AAC 50.508(6) to revise the terms and conditions for a Title I permit. The permit satisfies the obligation of the Permittee to obtain a minor permit under 18 AAC 50.

This permit authorizes the Permittee to operate under the terms and conditions of this permit, and as described in the original permit application and subsequent application supplements listed in Section 9 except as specified in this permit.

John F. Kuterbach
Manager, Air Permits Program

Table of Contents

Section 1. Emission Unit Inventory

1. Table 1 in Construction Permit AQ0215CPT02, Rev. 1, dated July 20, 2010 is revised as follows:

Table 1: Phase II Emission Unit Updates[a]

EU ID	Phase of Installation	Description	Rating/Size	Install Date
15	Phase II	Caterpillar C-280 ~~Post 2007 Model Year Generator~~[b]	4,400 kW-e ~~5,000 kW-e~~	Est. 2011 ~~TBD~~
~~16~~	~~Phase II~~	~~Post 2007 Model Year Generator~~[b]	~~5,000 kW-e~~	~~TBD~~

[a] The listed emission units had specific monitoring, recordkeeping, or reporting conditions in Construction Permit AQ0215CPT03, Rev. 1 and are carried forward into this minor permit. The descriptions and rating are for identification purposes only.

[b] These two units were replaced by one Caterpillar C-280 unit in Permit AQ0215CPT03, Rev. 1 and carried forward into this permit. The replaced units are shown in strikeout format to add clarity.

Section 2. Emission Fees

2. Conditions 6 and 7 in Construction Permit AQ0215CPT02, Rev. 1, dated July 20, 2010, are rescinded and replaced with Condition 3 and 4.

3. Assessable Emissions. The Permittee shall pay to the Department an annual emission fee based on the stationary source's assessable emissions as determined by the Department under 18 AAC 50.410. The assessable emission fee rate is set out in 18 AAC 50.410(b). The Department will assess fees per ton of each air pollutant that the stationary source emits or has the potential to emit in quantities greater than 10 tons per year. The quantity for which fees will be assessed is the lesser of

3.1 The stationary source's assessable potential to emit of

a. 1,742 TPY during Phase I; and

b. 1,685 TPY during Phase II[1]; or

3.2 The stationary source's projected annual rate of emissions that will occur from July 1 to the following June 30, based upon actual annual emissions emitted during the most recent calendar year or another 12-month period approved in writing by the Department, when demonstrated by

a. an enforceable test method described in 18 AAC 50.220;

b. material balance calculations;

c. emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035; or

d. other methods and calculations approved by the Department**.**

4. Assessable Emission Estimates. Emission fees will be assessed as follows:

4.1 No later than March 31 of each year, the Permittee may submit an estimate of the stationary source's assessable emissions to ADEC, Air Permits Program, ATTN: Assessable Emissions Estimate, 410 Willoughby Ave., Juneau, AK 99801-1795**;** the submittal must include all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so the Department can verify the estimates; or

4.2 If no estimate is submitted on or before March 31 of each year, emission fees for the next fiscal year will be based on the potential to emit set forth in Condition 3.1.

[1] Phase II starts upon initial startup of EU 15.

Section 3. State Requirements

5. Industrial Process and Fuel-Burning Equipment Visible Emissions. The Permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from EU 15 listed in Table 1 to reduce visibility through the exhaust effluent by more than 20 percent averaged over any six consecutive minutes.

5.1 For EU 15 monitor, record and report in accordance with Conditions 6 - 8.

6. Visible Emissions Monitoring. The Permittee shall observe the exhaust of EU 15 for visible emissions using the Method 9 Plan under Condition 6.1.

6.1 **Method 9 Plan.** For all 18-minute observations in this plan, observe exhaust, following 40 C.F.R. 60, Appendix A-4, Method 9, adopted by reference in 18 AAC 50.040(a), for 18 minutes to obtain 72 consecutive 15-second opacity observations.

a. First Method 9 Observation. For EU 15, observe exhaust for 18 minutes within 60 days after initial startup. For any unit, observe exhaust for 18 minutes within 30 days after startup.

b. Monthly Method 9 Observations. After the first Method 9 observation, perform 18-minute observations at least once in each calendar month that an emission unit operates.

c. Semiannual Method 9 Observations. After observing emissions for three consecutive operating months under Condition 6.1b, unless a six-minute average is greater than 15 percent and one or more observations are greater than 20 percent, perform 18-minute observations:

(i) within six months after the preceding observation, or

(ii) for an emission unit with intermittent operations, during the next scheduled operation immediately following six months after the preceding observation.

d. Annual Method 9 Observations. After at least two semiannual 18-minute observations, unless a six-minute average is greater than 15 percent and one or more individual observations are greater than 20 percent, perform 18-minute observations:

(i) within twelve months after the preceding observation; or

(ii) for an emission unit with intermittent operations, during the next scheduled operation immediately following twelve months after the preceding observation.

e. Increased Method 9 Frequency. If a six-minute average opacity is observed during the most recent set of observations to be greater than 15 percent and one or more observations are greater than 20 percent, then increase or maintain the 18-minute observation frequency for that emission unit to at least monthly intervals as described in Condition 6.1b, until the criteria in Condition 6.1c for semiannual monitoring are met.

7. Visible Emissions Recordkeeping. The Permittee shall keep records as follows:

7.1 When using the Method 9 Plan of Condition 6.1,

a. the observer shall record

(i) the name of the stationary source, emission unit and location, emission unit type, observer's name and affiliation, and the date on the Visible Emissions Field Data Sheet in Section 10;

(ii) the time, estimated distance to the emissions location, sun location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), plume background, and operating mode (load or fuel consumption rate or best estimate if unknown) on the sheet at the time opacity observations are initiated and completed;

(iii) the presence or absence of an attached or detached plume and the approximate distance from the emissions outlet to the point in the plume at which the observations are made;

(iv) opacity observations to the nearest five percent at 15-second intervals on the Visible Emissions Observation record in Section 10; and

(v) the minimum number of observations required by the permit; each momentary observation recorded shall be deemed to represent the average opacity of emissions for a 15-second period.

b. To determine the six-minute average opacity, divide the observations recorded on the record sheet into sets of 24 consecutive observations; sets need not be consecutive in time and in no case shall two sets overlap; for each set of 24 observations, calculate the average by summing the opacity of the 24 observations and dividing this sum by 24; record the average opacity on the sheet.

c. Calculate and record the highest six-minute and 18-consecutive-minute averages observed.

8. Visible Emissions Reporting: The Permittee shall report visible emissions as follows:

8.1 In each stationary source operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 include for the period covered by the report:

a. copies of the observation results (i.e. opacity observations) for each emission unit that used the Method 9 Plan, except for the observations the Permittee has already supplied to the Department;

b. a summary to include:

(i) number of days observations were made;

(ii) highest six-minute average observed; and

(iii) dates when one or more observed six-minute averages were greater than 20 percent; and

c. a summary of any monitoring or recordkeeping required under Conditions 6 and 7 that was not done.

8.2 Report under the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50:

a. the results of Method 9 observations that exceed an average of 20 percent opacity for any six-minute period; and

b. if any monitoring under Condition 6 was not performed when required, report within three days of the date the monitoring was required.

9. Industrial Process and Fuel-Burning Equipment Particulate Matter. The Permittee shall not cause or allow particulate matter emitted from EU 15 listed in Table 1 to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

9.1 For EU 15, monitor, record and report in accordance with Conditions 10 - 11.

10. Particulate Matter Monitoring for Diesel Engines. The Permittee shall conduct source tests on diesel engines and liquid fuel-fired turbines, EU 15 to determine the concentration of particulate matter (PM) in the exhaust of an emission unit in accordance with this Condition 10.

10.1 Except as provided in Condition 10.4 within six months of exceeding the criteria of Conditions 10.2a or 10.2b, either

a. conduct a PM source test according to requirements set out in the general source testing and monitoring requirements described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50; or

b. make repairs so that emissions no longer exceed the criteria of Condition 10.2; to show that emissions are below those criteria, observe emissions as described in Condition 6.1 under load conditions comparable to those when the criteria were exceeded.

10.2 Conduct the test according to Condition 10.1 if

a. 18 consecutive minutes of Method 9 observations result in an 18-minute average opacity greater than 20 percent; or

b. for an emission unit with an exhaust stack diameter that is less than 18 inches, 18 consecutive minutes of Method 9 observations result in an 18-minute average opacity that is greater than 15 percent and not more than 20 percent, unless the Department has waived this requirement in writing.

10.3 During each one-hour PM source test run, observe the exhaust for 60 minutes in accordance with Method 9 and calculate the average opacity measured during each one-hour test run. Submit a copy of these observations with the source test report.

10.4 The automatic PM source test requirement in Conditions 10.1 and 10.2 is waived for an emissions unit if a PM source test on that unit has shown compliance with the PM standard during this permit term.

11. Particulate Matter Recordkeeping for Diesel Engines. Within 180 calendar days after the effective date of this permit, the Permittee shall record the exhaust stack diameter(s) of EU 15. Report the stack diameter(s) in the next operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50.

12. Particulate Matter Reporting for Diesel Engines. The Permittee shall report as follows:

12.1 Report under the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50

a. the results of any PM source test that exceeds the PM emissions limit; or

b. if one of the criteria of Condition 10.2 was exceeded and the Permittee did not comply with either Condition 10.1a or 10.1b, this must be reported by the day following the day compliance with Condition 10.1 was required;

12.2 Report observations in excess of the threshold of Condition 10.2b within 30 days of the end of the month in which the observations occur;

12.3 In each operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50, include for the period covered by the report:

a. the dates, EU ID(s), and results when an observed 18-minute average was greater than an applicable threshold in Condition 10.2;

b. a summary of the results of any PM testing under Condition 10; and

c. copies of any visible emissions observation results (opacity observations) greater than the thresholds of Condition 10.2, if they were not already submitted.

13. Sulfur Compound Emissions. The Permittee shall not cause or allow sulfur compound emissions, expressed as SO_2, from EU 15 to exceed 500 ppm averaged over three hours.

13.1 The Permittee shall do one of the following for each shipment of fuel:

a. if the fuel grade requires a sulfur content less than 0.5 percent by weight, keep receipts that specify fuel grade and amount; or

b. if the fuel grade does not require a sulfur content less than 0.5 percent by weight, keep receipts that specify fuel grade and amount; and

(i) test the fuel for sulfur content; or

(ii) obtain test results showing the sulfur content of the fuel from the supplier or refinery; the test results must include a statement signed by the supplier or refinery of what fuel they represent.

13.2 Fuel testing under Condition 13.1 must follow an appropriate method listed in 18 AAC 50.035(b)-(c) and 40 C.F.R. 60.17 incorporated by reference in 18 AAC 50.040(a)(1).

13.3 If a load of fuel contains greater than 0.75 percent sulfur by weight, the Permittee shall calculate SO_2 emissions in ppm using either Section 11 or Method 19 of 40 C.F.R. 60, Appendix A-7, adopted by reference in 18 AAC 50.040(a).

13.4 The Permittee shall report as follows:

a. If SO_2 emissions calculated under Condition 13.3 exceed 500 ppm, the Permittee shall report under the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50. When reporting under this condition, include the calculation under Section 11.

b. The Permittee shall include in the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50:

(i) a list of the fuel grades received at the stationary source during the reporting period;

(ii) for any grade with a maximum fuel sulfur greater than 0.5 percent sulfur, the fuel sulfur of each shipment; and

(iii) for fuel with a sulfur content greater than 0.75 percent, the calculated SO_2 emissions in ppm.

Section 4. Ambient Air Quality Protection Requirements

14. Conditions 20 and 22 of Construction Permit AQ0215CPT02, Rev. 1, dated July 20, 2010 are rescinded and replaced with Conditions 15 through 18.

15. To protect the annual NO_2 AAAQS and increment; the 24-hour and annual PM-2.5 AAAQS; the 24-hour and annual PM-10 increment; the 1-hour, 3-hour, 24-hour, and annual SO_2 AAAQS and the 3-hour, 24-hour, and annual SO_2 increment, the Permittee shall:

15.1 For each exhaust stack that is installed and operated on EUs 7, 8, 13 – 15, and 17, construct the exhaust stack to have a released point that equals or exceeds an above grade height of the values listed in Table 2.

Table 2: Emission Unit Stack Heights

EU ID	Description	Stack Height (m)
7	Caterpillar 3516	25.6
8	Caterpillar 3512B	25.6
13	Wartsila 12V32C	26.2
14	Wartsila 12V32C	26.2
15	Caterpillar C-280	25.6
17	Caterpillar C-9	3.66

15.2 Provide as-built drawings of the exhaust stacks or measurements of the release point above grade of the exhaust stacks in the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 submitted for the period in which EUs 7, 8, 13 – 15, and 17 begin initial operation, unless this requirement has already been fulfilled by a previous permit.

16. To protect the annual NO_2 increment, the Permittee shall:

16.1 Operate EU 17 no more than 100 hours per rolling 12-month period.

a. Install on EU 17 a non-resettable hour meter.

b. Monitor and record the hours of operation on EU 17.

c. Before the end of each calendar month calculate and record the total hours of operation for EU 17 for the previous month, then calculate the rolling 12-month total hours of operation by adding the previous 11 months.

d. Report in the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 should the monthly and rolling 12-month hours of operation.

e. Notify the Department in the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50should the consecutive 12-month operating hours exceed the limit in this condition.

17. To protect the 1-hour, 3-hour, 24-hour, and annual SO_2 AAAQS and the 3-hour, 24-hour, and annual SO_2 increment, the Permittee shall:

17.1 In EUs 7, 8, 13 – 15, and 17, burn diesel fuel with a sulfur content of no greater than 0.01 wt%S (100 ppm).

a. Monitor, record, and report as follows:

(i) Obtain a statement or receipt from the fuel supplier certifying the maximum sulfur content of the fuel for each shipment of fuel delivered to DHPP. If a certified statement or receipt is not available from the supplier, analyze a representative sample of any fuel added to any tank in accordance with Condition 17.1a(ii).

(ii) If required under this permit to determine the sulfur content of fuel oil, analyze fuel sulfur content in accordance with Condition 13.2.

(iii) Prior to start of Phase II, measure and record the initial fuel sulfur content of each fuel storage tank, in accordance with Condition 17.1a(ii).

(iv) Except as indicated in Condition 17.1a(v), calculate and record the sulfur content, by weight, of the fuel in each tank, after each time fuel is added to a tank, using Equation 1.

Equation 1 $$S_T = \frac{(Q_D \times S_D) + (Q_{BD} \times S_{BD})}{Q_T}$$

Where: Q_D = *Quantity of Delivered Fuel, pounds*
S_D = *Sulfur content of Delivered Fuel, percent sulfur by weight*
Q_{BD} = *Quantity of Fuel in Tank before Delivery, pounds*
S_{BD} = *Sulfur content of Fuel in Tank before Delivery, percent sulfur by weight*
S_T = *Sulfur content of blended fuel in the tank, percent sulfur by weight (will be S_{BD} for next calculation)*
Q_T = *Total Quantity of Fuel in Tank (Q_D + Q_{BD}), pounds*

(v) If the fuel sulfur content in a given tank (S_{BD}) is less than 0.01 wt%S and the sulfur content of a given fuel oil delivery is less than 0.01 wt%S, then the Permittee may forego fuel sulfur content calculations in Condition 17.1a(iv) for that delivery. If the Permittee foregoes fuel sulfur content calculations for a delivery, then for the next fuel delivery for which the fuel sulfur content is greater than 0.01 wt%S, the Permittee shall either

(A) assume the fuel sulfur content of the fuel in the tank is 0.01 wt%S; or

(B) test the fuel sulfur content of the fuel in the tank in accordance with Condition 17.1a(ii).

(vi) Keep records of statements or receipts from the fuel supplier showing sulfur content and quantity of each shipment of fuel under Condition 17.1a(i), results of each sulfur measurement required under Condition 17.1a(ii), and each fuel sulfur calculation conducted under Condition 17.1a(iv).

(vii) During Phase II, if the fuel sulfur content combusted in any fuel burning emission unit exceeds 0.01 wt%S, report as excess emissions in the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50.

(viii) Monitor, record, and report sulfur content in accordance with the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50.

18. To protect the 24-hour PM-10 increment and 24-hour PM-2.5 AAAQS, the Permittee shall:

18.1 For EU 17, operate only 12 hours of any rolling 24-hour period.

a. Report the start and stop times and dates for EU 17.

b. Report in accordance with the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50, the information listed in condition 18.1a.

c. Report in accordance with the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 if EU 17 is operated for more than 12 of any rolling 24 hour period.

Section 5. Best Available Control Technology (BACT) Requirements

19. Conditions 18.1 through 18.5 of Construction Permit AQ0215CPT02, Rev. 1, dated July 20, 2010 are rescinded and replaced with Condition 20. No change to Condition 18.6.

20. BACT Limits for EU 15.

20.1 The Permittee shall limit the emissions from EU 15 to the values shown below in Table 3. The Permittee shall implement the BACT controls on EU 15 listed in Table 3.

Table 3: BACT Limits and Controls For EU 15

Pollutant	BACT Control	BACT Emission Limit
NO_X	Turbocharger/Aftercooler	9.8 g/kW-hr
PM-2.5	Positive Crankcase Ventilation	0.50 g/kW-hr

20.2 To show compliance with the NO_X BACT limit, the Permittee shall:

a. comply with the initial NO_X compliance demonstration requirements in NSPS Subpart IIII, set forth in Condition 32; and

b. comply with the NO_X monitoring requirements in NSPS Subpart IIII, set forth in Conditions 33 and 34.

20.3 To show compliance with the PM-2.5 BACT limit, the Permittee shall:

a. comply with the initial PM compliance demonstration requirements in NSPS Subpart IIII, set forth in Condition 32; and

b. comply with the PM monitoring requirements in NSPS Subpart IIII, set forth in Conditions 33 and 34.

Section 6. Owner Requested Limits to Avoid PSD review for VOCs, SO_2 and PM-10

21. Conditions 13, 14, 15, and 16 of Construction Permit AQ0215CPT02, Rev. 1, dated July 20, 2010 are rescinded and replaced with Conditions 22 and 23 below.

22. Phase II ORL to Avoid PSD Review for SO_2 and VOCs. The Permittee shall limit emissions of VOCs to no more than 51.2 tons per year and emissions of SO_2 to no more than 46.8 tons per year by complying with the following[2]:

22.1 Decommission (remove) EUs 1 through 6;

22.2 Comply with Condition 17; and

22.3 Limit the total power production of EUs 7, 8, and 13 – 15 to no more than 105,803 MWh per rolling 12-month period.

a. Install on each EU 7, 8, and 13 – 15, a dedicated kilowatt meter with an accuracy of plus or minus two percent.

b. Monitor and record the monthly kilowatts produced on each EU 7, 8, and 13 – 15.

c. Before the end of each month, calculate and record the total MWh of power produced using Equation 2, then calculate the 12-month rolling MWh of power produced by adding the previous 11 months.

Equation 2

$$\boldsymbol{MWh = \frac{(kW_7 + kW_8 + kW_{13} + kW_{14} + kW_{15})}{1000}}$$

Where: *MWh = monthly power production in megawatts for the emission units*

kW = monthly power production in kilowatts for each emission unit

d. Report in accordance with the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18AAC 50, the information listed in Condition 22.3c.

e. Report in accordance with the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 if the total power production exceeds the limit in Condition 22.3.

23. Phase II ORL to Avoid PSD Review for PM-10. The Permittee shall limit emissions of PM-10 to no more than 22.3 tons per year by complying with the following:

23.1 Limit the total emissions from EUs 7, 8, 13 – 15, and 17 to no more than 22.3 tons per year.

[2] The 51.2 tpy limit of VOC and the 46.8 tpy limit of SO_2 avoid PSD review by limiting the facility-wide increase of VOC and SO_2 emissions to 39.9 tpy, each.

a. For EUs 7, 8, and 13 – 15:

(i) install on each engine a non-resettable hour meter; and

(ii) monitor and record the monthly hours of operation.

b. For EU 17, comply with Conditions 16.1a and 16.1b.

c. Before the end of each calendar month calculate and record the total PM-10 emissions for the previous month, then calculate the rolling 12-month total hours of operation by adding the previous 11 months. Use Equation 3 with the emission factors in Table 4 to determine the rolling 12-month PM-10 emissions.

Table 4: Department-Approved Emission Factors

EU ID	EF (lb/hr)
7	0.61
8	0.69
13	2.22
14	2.22
15	2.99
17	0.83

Equation 3

$$PM_{10} = \frac{(EF_7 * h_7 + EF_8 * h_8 + EF_{13} * h_{13} + EF_{14} * h_{14} + EF_{15} * h_{15} + EF_{17} * h_{17})}{2000}$$

Where: *PM_{10} = Monthly PM-10 emissions*
EF = Department Approved PM-10 Emission Factor for each emission unit
h = hours of operation for each emission unit each month

d. Report in accordance with the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18AAC 50, the information listed in Condition 23.1c.

e. Report in accordance with the excess emission and permit deviation report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 if the total PM-10 emissions exceed the limit in Condition 23.1.

Section 7. Federal Requirements

Emission Units Subject to Federal NSPS, Subpart A

24. NSPS Subpart A Notification. For any affected facility[3] or existing facility[4] regulated under NSPS requirements in 40 C.F.R. 60, the Permittee shall furnish the Department and EPA written or electronic notification of:

24.1 The date that construction or reconstruction of an affected facility commences postmarked no later than 30 days after such date;

24.2 The actual date of initial startup of an affected facility postmarked within 15 days after such date;

24.3 Any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies unless that change is specifically exempted under an applicable subpart or in 40 C.F.R. 60.14(e), postmarked 60 days or as soon as practicable before the change is commenced and shall include:

a. information describing the precise nature of the change,

b. present and proposed emission control systems,

c. productive capacity of the facility before and after the change, and

d. the expected completion date of the change;

24.4 The date of a continuous monitoring system performance demonstration, postmarked not less than 30 days prior to such date;

24.5 The anticipated date for conducting the opacity observations required by 40 C.F.R. 60.11(e)(1), including, if appropriate, a request for the Department to provide a visible emissions reader during a performance test, postmarked not less than 30 days prior to such date;

24.6 That continuous opacity monitoring system data results will be used to determine compliance with the applicable opacity standard during a performance test required in lieu of Method 9 observation data as allowed by 40 C.F.R. 60.11(e)(5), postmarked not less than 30 days prior to the date of the performance test; and

24.7 Any proposed replacement of an existing facility, for which the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, postmarked as soon as practicable, but no less than 60 days before commencement of replacement, and including the following information:

[3] *Affected facility* means, with reference to a stationary source, any apparatus to which a standard applies, as defined in 40 C.F.R. 60.2, effective 7/1/07

[4] *Existing facility* means, with reference to a stationary source, any apparatus of the type for which a standard is promulgated in this part, and the construction or modification of which was commenced before the date of proposal of that standard; or any apparatus which could be altered in such a way as to be of that type, as defined in 40 C.F.R. 60.2, effective 7/1/07.

a. the name and address of owner or operator,

b. the location of the existing facility,

c. a brief description of the existing facility and the components that are to be replaced,

d. a description of the existing and proposed air pollution control equipment,

e. an estimate of the fixed capital cost of the replacements, and of constructing a comparable entirely new facility,

f. the estimated life of the existing facility after the replacements, and

g. a discussion of any economic or technical limitations the facility may have in complying with the applicable standards of performance after the proposed replacements.

25. NSPS Subpart A Startup, Shutdown, & Malfunction Requirements. The Permittee shall maintain records of the occurrence and duration of any start-up, shutdown, or malfunction in the operation of EU 15, any malfunctions of associated air-pollution control equipment, or any periods during which a continuous monitoring system or monitoring device for EU 15 is inoperative.

26. NSPS Subpart A Performance (Source) Tests. The Permittee shall conduct initial source tests according to the general source testing and monitoring requirements described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 and as indicated in this condition on any affected facility within 60 days after achieving the maximum production rate at which the unit will be operated, but not later than 180 days after initial startup, and at such other times as may be required by EPA, and shall provide the Department and EPA with a written report of the results of the source test. The Permittee shall:

26.1 Conduct source tests and reduce data as set out in 40 C.F.R. 60.8(b), and provide the Department copies of any EPA waivers or approvals of alternative methods;

26.2 Conduct source tests under conditions specified by EPA to be based on representative performance of EU 15;

26.3 Notify the Department and EPA at least 30 days in advance of the source test; and

26.4 Provide adequate sampling ports, safe sampling platform(s), safe access to sampling platform(s), and utilities for sampling and testing equipment.

27. NSPS Subpart A Good Air Pollution Control Practice. At all times, including periods of startup, shutdown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate EU 15 including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. The Administrator will determine whether acceptable operating and maintenance procedures are being used based on information available, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance records, and inspections of EU 15.

28. NSPS Subpart A Credible Evidence. For the purpose of submitting compliance certifications or establishing whether or not the Permittee has violated or is in violation of the standards set forth in Condition 32, nothing in 40 C.F.R. Part 60 shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether EU 15 would have been in compliance with applicable requirements of 40 C.F.R. Part 60 if the appropriate performance or compliance test or procedure had been performed.

29. NSPS Subpart A Concealment of Emissions. The Permittee shall not build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission, which would otherwise constitute a violation of a standard set forth in Condition 32. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard that is based on the concentration of a pollutant in the gases discharged to the atmosphere.

Compression Ignition CI ICE Subject to NSPS Subpart IIII

30. NSPS Subpart IIII Requirements. For EU 15, the Permittee shall comply with any applicable requirement for stationary compression ignition (CI) internal combustion engine (ICE) whose construction[5], modification[6], or reconstruction[7] commences after July 11, 2005.

30.1 Operate and maintain the stationary CI ICE and control device according to the manufacturer's written instructions or procedures developed by the Permittee that are approved by the engine manufacturer over the entire life of the engine. In addition, the Permittee may only change those settings that are permitted by the manufacturer.

30.2 Comply with the applicable provisions of Subpart A as specified in Table 8 to Subpart IIII.

30.3 Notification. The Permittee shall comply with the following requirements:

a. For EU 15, submit an initial notification as required in Condition 24.1. The notification shall include the information in Conditions 30.3a(i) through 30.3a(v):

(i) name and address of the owner or operator;

(ii) the address of the affected source;

(iii) engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

(iv) emission control equipment; and

(v) fuel used.

[5] For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.
[6] As defined in 18 AAC 50.990(59).
[7] As defined in 18 AAC 50.990(88).

30.4 Performance Tests. The Permittee shall conduct performance tests in accordance with 40 C.F.R. 60.4212 for stationary CI ICE with a displacement of less than 30 liters per cylinder.

31. NSPS Subpart IIII Fuel Requirements. Beginning December 1, 2010, for EU 15, comply with the applicable fuel requirements in 40 C.F.R. 60.4207, as provided under 40 C.F.R. 60.4216 for engines operated in Alaska.

32. NSPS Subpart IIII Emission Standards. The Permittee shall comply with the applicable emission standards for EU 15, as listed below.

32.1 For EU 15, the Permittee shall comply with the emission standards in Table 1 to NSPS Subpart IIII. The emission limits are as follows:

a. 9.8 g/kW-hr for THC+NO_X;

b. 5.0 g/kW-hr for CO; and

c. 0.50 g/kW-hr for PM.

32.2 For EU 15, the Permittee shall certify to the certification emission standards for new marine CI engines in 40 C.F.R. 94.8, as applicable, for all pollutants, for the same displacement and maximum engine power.

32.3 The Permittee may petition the Administrator for approval of alternative emission standards, if the Permittee can demonstrate that the fuel used in EU 15 is not the fuel on which the manufacturer of the engine certified the engine and that the engine cannot meet the applicable standards required in 40 C.F.R. 60.4202 or 40 C.F.R. 60.4203 using such fuels.

33. NSPS Subpart IIII Monitoring and Recordkeeping. The Permittee shall meet the monitoring requirements, as follows:

33.1 For EU 15, demonstrate compliance according to one of the methods specified in Conditions 33.1a through 33.1e:

a. Purchasing an engine certified according to 40 C.F.R. Part 89 or 40 C.F.R. Part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications;

b. Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in the general source testing and monitoring requirements described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 and these methods must have been followed correctly;

c. Keeping records of engine manufacturer data indicating compliance with the standards;

d. Keeping records of control device vendor data indicating compliance with the standards; and

e. Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in 40 C.F.R. 60.4212, as applicable.

33.2 Keep records of the information in Conditions 33.2a through 33.2d:

a. All notifications required in Condition 30.3 and all documentation supporting any notification;

b. Maintenance conducted on the engine;

c. If the stationary CI ICE is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards; and

d. If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

34. NSPS Subpart IIII Reporting. The Permittee shall report in the operating report described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50 the following:

34.1 Upon initial startup, provide a copy of the records required in Conditions 33.2c or 33.2d in the next operating report;

34.2 The method of compliance used to demonstrate compliance with Condition 33.1; and

34.3 The records required in Condition 33.1.

Compression Ignition CI ICE Subject to NESHAP Subpart ZZZZ

35. NESHAP Subpart A. The Permittee shall comply with the applicable requirements of 40 C.F.R. 63 Subpart A in accordance with the provisions for applicability of Subpart ZZZZ Table 8 of 40 C.F.R. 63 Subpart ZZZZ.

36. NESHAPS Subpart ZZZZ Requirements. The provisions of 40 C.F.R. 63 Subpart ZZZZ is applicable to EU 15 as follows:

36.1 An affected source that is new or reconstructed stationary reciprocating internal combustion engines (RICE) located at an area source must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 C.F.R. 60 Subpart IIII in Conditions 30 through 34 for compression ignition engines. No further requirements apply for such engines under this part.

Section 8. General Conditions

Standard Terms and Conditions

37. The Permittee must comply with each permit term and condition. Noncompliance with a permit term or condition constitutes a violation of AS 46.14, 18 AAC 50, and, except for those terms or conditions designated in the permit as not federally enforceable, the Clean Air Act, and is grounds for:

37.1 An enforcement action; or

37.2 Permit termination, revocation and reissuance, or modification in accordance with AS 46.14.280.

38. It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.

39. Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of the permit.

40. The permit may be modified, reopened, revoked and reissued, or terminated for cause. A request by the Permittee for modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

41. The permit does not convey any property rights of any sort, nor any exclusive privilege.

Section 9. Permit Documentation

October 1, 2012	Addendum to the permit application.
July 27, 2012	Permit application to revise the stack height.
June 1, 2011	email: Application and addendum forward to Laurie Kral (EPA Region 10).
June 1, 2011	email: SCR cost information received from Miratech Corporation to Krystin Bablinskas (Department).
May 31, 2011	email: DPF cost information received from Johnson Matthey to Krystin Bablinskas (Department).
May 27, 2011	Emails sent to various vendors for cost information for SCR and DPF systems.
May 11, 2011	email: Used oil information provided by Donna Celia (HMH) to Krystin Bablinskas (Department).
May 10, 2011	Meeting between Dan Winters (the City), Donna Celia (HMH) and the Department to discussion construction options for DHPP.
May 5, 2011	Application addendum received by the Department. Application determined complete.
March 29, 2011	email: From Krystin Bablinskas (Department) to Phil Austin (HMH) regarding modeling incompleteness findings.
March 28, 2011	letter: From Donna Celia (HMH Consulting) to Sean Lowther (Department) with requested revised calculations.
March 24, 2011	email: From Sean Lowther (Department) to Donna Celia (HMH Consulting) regarding request for revision of emissions calculations to convert the pollutant calculations from a kWe basis to a bkW basis.
March 4, 2011	The Department received the City's initial application.

Section 10. Visible Emissions Forms

Visible Emissions Field Data Sheet

Certified Observer: _____

Company & Stationary Source: _____

Location: _____

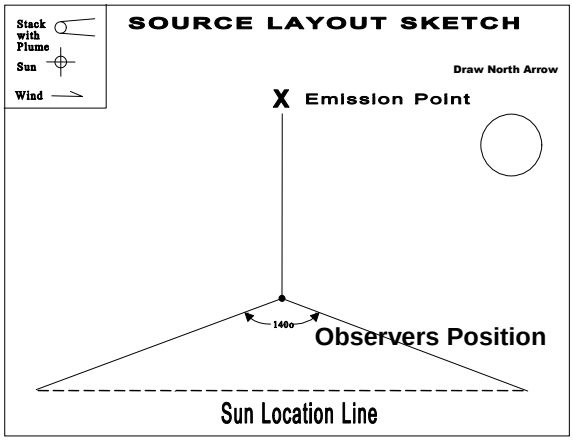
Test No.: _____ Date: _____

Emission Unit: _____

Production Rate/Operating Rate: _____

Unit Operating Hours: _____

Hrs. of observation: _____



Clock Time	Initial				Final
Observer location Distance to discharge					
Direction from discharge					
Height of observer point					
Background description					
Weather conditions Wind Direction					
Wind speed					
Ambient Temperature					
Relative humidity					
Sky conditions: (clear, overcast, % clouds, etc.)					
Plume description: Color					
Distance visible					
Water droplet plume? (Attached or detached?)					
Other information					

Visible Emissions Observation Record

Page _____ of _____

Company & Stationary Source _____ Certified Observer _____

Test Number Clock Time

Date:		Visibility reduction every 15 Seconds (Opacity)				Steam Plume (check if applicable)		Comments
Hr	Min	0	15	30	45	Attached	Detached	

Additional information:

_____ _____

Observer Signature and Date Certified By and Date

Data Reduction:

Duration of Observation Period (minutes): _____ Duration Required by Permit (minutes) _____

Number of Observations _____ Highest Six –Minute Average Opacity (%) _____

Number of Observations exceeding 20% _____

In compliance with six-minute opacity limit? (Yes or No) _____

Average Opacity Summary

Set Number	Time Start—End	Opacity	
		Sum	Average

Section 11. Material Balance Calculation

If the sulfur content of a fuel shipment is greater than 0.75 percent by weight, calculate the three-hour exhaust concentration of SO_2 using the following equations:

A. = 31,200 x [**wt%S_{fuel}**] = 31,200 x _____ = _____

B. = 0.148 x [**wt%S_{fuel}**] = 0.148 x _____ = _____

C. = 0.396 x [**wt%C_{fuel}**] = 0.396 x _____ = _____

D. = 0.933 x [**wt%H_{fuel}**] = 0.933 x _____ = _____

E. = B + C + D = _____ + _____ + _____ = _____

F. = 21 – [**vol%$_{dry}$O2, $_{exhaust}$**] = 21 - _____ = _____

G. = [**vol%$_{dry}$O2, $_{exhaust}$**] ÷ F = _____ ÷ _____ = _____

H. = 1 + G = 1 + _____ = _____

I. = E x H = _____ x _____ = _____

SO_2 concentration = A ÷ I = _____ ÷ _____ = _____ ppm

The wt%S_{fuel}, wt%C_{fuel}, and wt%H_{fuel} are equal to the weight percents of sulfur, carbon, and hydrogen in the fuel. These percentages should total 100%.

The fuel weight percent (wt%) of sulfur is obtained pursuant to Condition 13.1. The fuel weight percents of carbon and hydrogen are obtained from the fuel refiner.

The volume percent of oxygen in the exhaust (vol%$_{dry}O_2$, exhaust) is obtained from oxygen meters, manufacturer's data, or from the most recent ORSAT analysis at the same engine load used in the calculation.

Enter all of the data in percentages without dividing the percentages by 100. For example, if wt%S_{fuel}l = 1.0%, then enter 1.0 into the equations not 0.01 and if vol%$_{dry}O_2$, exhaust = 3.00%, then enter 3.00, not 0.03.

Section 12. ADEC Notification Form[8]

Stationary Source (Facility) Name _____ **Air Quality Permit Number** _____

Company Name _____

When did you discover the Excess Emissions/Permit Deviation?
Date: _____ / _____ / _____ Time: _____ : _____

When did the event/deviation occur?
Begin Date: _____ / _____ / _____ Time: _____ : _____ (please use 24hr clock)
End Date: _____ / _____ / _____ Time: _____ : _____ (please use 24hr clock)

What was the duration of the event/deviation?: _____ : _____ (hrs:min) or _____ days
(total # of hrs, min, or days, if intermittent then include only the duration of the actual emissions/deviation)

Reason for Notification: (please check only 1 box and go to the corresponding section)

☐ Excess Emissions - Complete Section 1 and Certify.

☐ Deviation from Permit Condition - Complete Section 2 and Certify

☐ Deviations from COBC, CO, or Settlement Agreement - Complete Section 2 and Certify

Section 1. Excess Emissions

(a) Was the exceedance:
o☐ Intermittent ☐ Continuous

(b) Cause of Event (Check one that applies):

☐ Start Up /Shut Down ☐ Natural Cause (weather/earthquake/flood)

☐ Control Equipment Failure ☐ Scheduled Maintenance/Equipment Adjustment

☐ Bad fuel/coal/gas ☐ Upset Condition ☐ Other _____

(c) **Description**
Describe briefly, what happened and the cause. Include the parameters/operating conditions exceeded, limits, monitoring data and exceedance.

(d) Emissions Units Involved:
Identify the emission unit involved in the event, using the same identification number and name as in the permit. Identify each emission standard potentially exceeded during the event and the exceedance.

Unit ID	Emission Unit Name	Permit Condition Exceeded/Limit/Potential Exceedance

[8] Revised as of August 20, 2008.

(e) Type of Incident (Please Check only one).

☐ Opacity _____ % ☐ Venting _____ (gas/scf) ☐ Control Equipment Down

☐ Fugitive Emissions ☐ Emission Limit Exceeded ☐ Other: _____

☐ Marine Vessel Opacity ☐ Flaring

(f) Unavoidable Emissions:

Do you intend to assert that these excess emissions were unavoidable? ☐ Yes ☐ No

Do you intend to assert the affirmative defense of 18 AAC 50.235? ☐ Yes ☐ No

Certify Report (go to end of form)

Section 2 Permit Deviations

(a) Permit Deviation Type (check one only box, corresponding with the section in the permit).

☐ Source Specific

☐ Failure to monitor/report

☐ General Source Test/Monitoring Requirements

☐ Recordkeeping/Reporting/Compliance Certification

☐ Standard Conditions Not Included in Permit

☐ Generally Applicable Requirements

☐ Reporting/Monitoring for Diesel Engines

☐ Record Keeping Failure

☐ Insignificant Source

☐ Facility Wide

☐ Other Section _____ (title of section and section number of your permit).

(b) Emission Unit Involved.

Identify the emission unit involved in the event, using the same identification number and name as in the permit. List the corresponding permit conditions and the deviation.

(c) Description of Potential Deviation:

Describe briefly what happened and the cause. Include the parameters/operating conditions and the potential deviation.

Unit ID	Emission Unit Name	Permit Condition / Potential Deviation

(d) Corrective Actions:

Describe actions taken to correct the deviation or potential deviation and to prevent future recurrence.

Certification:

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.

Printed Name: _____ Title: _____ Date: _____

Signature: _____ Phone Number: _____

NOTE: *This document must be certified in accordance with 18 AAC 50.345(j)*

To Submit this Report:

1. Fax to: 907-451-2187;

Or

2. Email to: DEC.AQ.Airreports@alaska.gov - *if faxed or emailed, the report must be certified within the Operating Report required for the same reporting period* described in the applicable operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50.

Or

3. Mail to: ADEC
   Air Permits Program
   610 University Avenue
   Fairbanks, AK 99709-3643

Or

4. Phone Notification: 907-451-5173
   Phone notifications require a written follow-up report.

Or

5. Submission of information contained in this report can be made electronically at the following website:
   https://myalaska.state.ak.us/dec/air/airtoolsWeb/PublicPermitListings.aspx
   if submitted online, report must be submitted by an authorized E-Signer for the Stationary Source.

Appendix H – Caterpillar C280-16 Emission Documentation

CATERPILLAR®

Caterpillar Inc.
3701 State Rd. 26 East
Lafayette, IN 47905

March 4, 2009

Via Electronic Transmission

Mr. Gary Hirschberg
NC Power Systems
GHirschberg@NCPowerSystems.com

Dear Mr. Hirschberg:

Pursuant to United States Environmental Protection Agency regulations, Caterpillar Model Year 2009 C280 non-emergency, stationary diesel internal combustion engines are certified under the emission standards for new marine compression ignition ("CI") engines. *See* 40 C.F.R. Part 60, Subpart IIII, § 60.4201(d) (emission standards for non-emergency stationary engines greater than 10 and less than 30 liters per cylinder), which requires certification to the exhaust emission standards for new marine CI engines found at 40 C.F.R. § 94.8.

Based on this regulatory framework, MY2009 C280 diesel engines, including serial number NKB00148, are both marine and stationary Tier 2 certified, as indicated on the Emissions Control Information label that will be applied to the engine. Specifically, the label will state that the engine: "Conforms to U.S. EPA Regulations for Category 2 Compression-Ignition Marine & Stationary Engines."

We understand that a question has arisen concerning whether the C280 engine in question (serial number NKB00148) will meet the emission standard for THC + NOx, which is 9.8 g/kW-hr. *See* 40 C.F.R. § 94.8, Table A-1. We have confirmed that the engine in question is a member of a U.S. EPA certified engine family that meets the 9.8 g/kW-hr requirement for THC + NOx. For purposes of Tier 2 Certification as applied in this case, U.S. EPA regulations require this emission standard to be achieved based on a weighted average of exhaust emitted over the five specified operating modes of the D2 duty cycle. *See* 40 C.F.R. § 94.105(d)(1), Table B-4:

Table B-4 Duty Cycle for Constant-Speed Auxiliary Engines

Test Mode	Engine Speed	% Max. test torque	Weighting factors
1	Maximum test speed	100	0.05
2	Maximum test speed	75	0.25
3	Maximum test speed	50	0.30
4	Maximum test speed	25	0.30
5	Maximum test speed	10	0.10

Caterpillar Inc.
3701 State Rd. 26 East
Lafayette, IN 47905

We further understand that a specific question has arisen regarding emissions at 100% torque operating conditions (Test Mode 1). As set forth in the above table, the 100% torque operating condition represents only 5% of the mandatory emissions test cycle. Therefore, it is possible for emissions calculated over the entire test cycle (including all specified operating points) to fall well below the regulatory standard of 9.8 g/kW-hr, even if brake-specific emissions at this single point slightly exceed the standard, given the cycle-weighted nature of EPA's prescribed test procedure.

To reiterate, the C280 engine is certified as meeting U.S. EPA Tier 2 emission standards, including the emission standard of 9.8 g/kW-hr for THC + NOx. If you have any questions, please do not hesitate to contact me.

Sincerely,

Melissa J Baysinger

Melissa Baysinger
Emissions Certification Engineer
Caterpillar Inc, Diversified Power Products
Lafayette Engine Center
Phone: 764-448-5870
Baysinger_Melissa_J@Cat.com

C280-16 DIESEL ENGINE TECHNICAL DATA CATERPILLAR®

Genset	60 Hz	RATING:	Marine Aux - Continuous
		CERTIFICATION:	IMO/EPA MARINE TIER II
ENGINE SPEED (rpm):	900	TURBOCHARGER PART #:	284-8281
COMPRESSION RATIO:	13:1	FUEL TYPE:	Distillate
AFTERCOOLER WATER (°C):	32	RATED ALTITUDE @ 25°C (m):	150
JACKET WATER INLET (°C):	90	ASSUMED GENERATOR EFFICIENCY (%):	96
IGNITION SYSTEM:	EUI	ASSUMED GENERATOR POWER FACTOR:	0.8
EXHAUST MANIFOLD:	DRY	MEAN PISTON SPEED (m/s):	9
FIRING PRESSURE, MAXIMUM (kPa)	17300		

RATING		NOTES	LOAD	110%	100%	75%	50%
ENGINE POWER		(2)	bkW	5060	4600	3450	2300
GENERATOR POWER		(2)	ekW	4858	4416	3312	2208
BMEP			kPa	2283	2076	1557	1038
ENGINE EFFICIENCY	**(ISO 3046/1)**	**(1)**	**%**	**44.1%**	**44.2%**	**42.4%**	**40.0%**
ENGINE EFFICIENCY	(NOMINAL)	(1)	%	42.8%	42.9%	41.1%	38.8%

ENGINE DATA							
FUEL CONSUMPTION	**(ISO 3046/1)**	**(1)**	**g/bkw-hr**	**192.0**	**191.5**	**199.7**	**211.2**
FUEL CONSUMPTION	(NOMINAL)	(1)	g/bkw-hr	195.8	195.3	203.6	215.3
FUEL CONSUMPTION	(90% CONFIDENCE)	(1)	g/bkw-hr	198.0	197.6	206.2	218.2
AIR FLOW (@ 25°C, 101.3 kPaa)			Nm3/min	477.8	441.2	332.9	218.5
AIR MASS FLOW			kg/hr	31982	29528	22284	14621
INLET MANIFOLD PRESSURE			kPa (abs)	358.6	330.7	251.4	169.1
INLET MANIFOLD TEMPERATURE			°C	44.9	39.7	37.5	35.6
EXHAUST STACK TEMPERATURE			°C	362.1	363.7	409.6	448.6
EXHAUST GAS FLOW (@ stack temp, 101.3 kPa)			m3/min	1022.9	939.0	700.0	455.0
EXHAUST GAS MASS FLOW			kg/hr	32957	30426	22985	15111

EMISSIONS "NOT TO EXCEED DATA"						
NOx (as NO) + THC (molecular weight of 15.84)		g/bkW-hr	9.54	9.92	10.48	10.33
NOx (as NO)		g/bkW-hr	8.95	9.31	9.79	9.42
CO		g/bkW-hr	0.46	0.46	0.74	1.58
THC (molecular weight of 15.84)		g/bkW-hr	0.59	0.61	0.69	0.90
Particulates		g/bkW-hr	0.24	0.26	0.32	0.59

EMISSIONS "NOMINAL DATA"						
NOx (as NO) + THC (molecular weight of 15.84)		g/bkW-hr	8.24	8.57	9.04	8.89
NOx (as NO)		g/bkW-hr	7.78	8.10	8.51	8.20
CO		g/bkW-hr	0.35	0.35	0.57	1.22
THC (molecular weight of 15.84)		g/bkW-hr	0.46	0.47	0.53	0.69
Particulates		g/bkW-hr	0.17	0.19	0.23	0.42

ENERGY BALANCE DATA							
FUEL INPUT ENERGY (LHV)	(NOMINAL)	(1)	KW	11830	10726	8390	5922
HEAT REJ. TO JACKET WATER	(NOMINAL)	(3)	KW	1029	971	820	648
HEAT REJ. TO ATMOSPHERE	(NOMINAL)	(4)	KW	237	215	168	118
HEAT REJ. TO OIL COOLER	(NOMINAL)	(5)	KW	511	485	424	360
HEAT REJ. TO EXH. (LHV to 25°C)	(NOMINAL)	(3)	KW	3511	3192	2764	2086
HEAT REJ. TO EXH. (LHV to 177°C)	(NOMINAL)	(3)	KW	2883	2599	1807	1168
HEAT REJ. TO AFTERCOOLER	(NOMINAL)	(6) (7)	KW	1457	1241	748	395

CONDITIONS AND DEFINITIONS
ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 AND SAE J1995 JAN90 STANDARD REFERENCE CONDITIONS OF 25°C, 100 KPA, 30% RELATIVE HUMIDITY AND 150M ALTITUDE AT THE STATED AFTERCOOLER WATER TEMPERATURE.
CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.
PERFORMANCE AND FUEL CONSUMPTION ARE BASED ON 35 API, 16°C FUEL HAVING A LOWER HEATING VALUE OF 42.780 KJ/KG USED AT 29°C WITH A DENSITY OF 838.9 G/LITER.

NOTES
1) FUEL CONSUMPTION TOLERANCE. ISO 3046/1 IS 0, + 5% OF FULL LOAD DATA. NOMINAL IS ± 3 % OF FULL LOAD DATA.
2) ENGINE POWER TOLERANCE IS ± 3 % OF FULL LOAD DATA.
3) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ± 10% OF FULL LOAD DATA. (heat rate based on treated water)
4) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ±50% OF FULL LOAD DATA. (heat rate based on treated water)
5) HEAT REJECTION TO LUBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA. (heat rate based on treated water)
6) HEAT REJECTION TO AFTERCOOLER TOLERANCE IS ± 5% OF FULL LOAD DATA. (heat rate based on treated water)
7) TOTAL AFTERCOOLER HEAT = AFTERCOOLER HEAT x ACHRF (heat rate based on treated water)

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C280-16 DIESEL ENGINE TECHNICAL DATA CATERPILLAR®

ALTITUDE DERATION FACTORS

AIR TO TURBO (°C)	0	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
50	0.94	0.91	0.88	0.86	0.83	0.81	0.78	0.76	0.74	0.71	0.69	0.67	0.65
45	0.95	0.93	0.90	0.87	0.85	0.82	0.80	0.77	0.75	0.73	0.70	0.68	0.66
40	0.97	0.94	0.91	0.89	0.86	0.83	0.81	0.78	0.76	0.74	0.71	0.69	0.67
35	0.98	0.96	0.93	0.90	0.87	0.85	0.82	0.80	0.77	0.75	0.73	0.70	0.68
30	1.00	0.97	0.94	0.92	0.89	0.86	0.84	0.81	0.79	0.76	0.74	0.71	0.69
25	1.00	0.99	0.96	0.93	0.90	0.88	0.85	0.82	0.80	0.77	0.75	0.73	0.70
20	1.00	1.00	0.98	0.95	0.92	0.89	0.86	0.84	0.81	0.79	0.76	0.74	0.72
15	1.00	1.00	0.99	0.96	0.93	0.91	0.88	0.85	0.83	0.80	0.78	0.75	0.73
10	1.00	1.00	1.00	0.98	0.95	0.92	0.89	0.87	0.84	0.82	0.79	0.77	0.74

ALTITUDE (METERS ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS

AIR TO TURBO (°C)	0	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
50	1.23	1.27	1.30	1.34	1.38	1.42	1.45	1.49	1.53	1.56	1.60	1.64	1.67
45	1.18	1.22	1.25	1.29	1.32	1.36	1.39	1.43	1.46	1.50	1.53	1.57	1.61
40	1.13	1.17	1.20	1.23	1.27	1.30	1.34	1.37	1.40	1.44	1.47	1.50	1.54
35	1.08	1.12	1.15	1.18	1.21	1.24	1.28	1.31	1.34	1.37	1.41	1.44	1.47
30	1.03	1.06	1.10	1.13	1.16	1.19	1.22	1.25	1.28	1.31	1.34	1.37	1.40
25	1.00	1.01	1.04	1.07	1.10	1.13	1.16	1.19	1.22	1.25	1.28	1.31	1.34
20	1.00	1.00	1.00	1.02	1.05	1.07	1.10	1.13	1.16	1.19	1.21	1.24	1.27
15	1.00	1.00	1.00	1.00	1.00	1.02	1.04	1.07	1.10	1.12	1.15	1.18	1.20
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.04	1.06	1.09	1.11	1.14

ALTITUDE (METERS ABOVE SEA LEVEL)

FREE_FIELD MECHANICAL NOISE

SOUND PRESSURE LEVEL dB(A)

DISTANCE FROM THE ENGINE (M)		Overall	63	125	250	500	1000	2000	4000	8000
	15M	94	82.2	88.2	87.7	88.3	87.3	85.3	84	81.6
	7M	98	87.7	93.7	93.2	93.8	92.8	90.8	89.5	87.1
	1M	109	98.7	104.7	104.2	104.8	103.8	101.8	100.5	98.1

Octave Band (Hz)

FREE_FIELD EXHAUST NOISE

SOUND PRESSURE dB(A)

DISTANCE FROM THE ENGINE (M)		Overall	63	125	250	500	1000	2000	4000	8000
	15M	98	111.0	108.0	99.0	94.0	90.0	90.0	89.0	83.0
	7M	105	117.0	115.0	106.0	101.0	96.0	97.0	95.0	90.0
	1.5M	118	131.0	128.0	119.0	114.0	110.0	110.0	109.0	103.0

Octave Band (Hz)

TOTAL DERATION FACTORS:
This table shows the deration required for various air inlet temperatures and altitudes. Use this information to help determine actual engine power for your site. The total deration factor includes deration due to altitude and ambient temperature, and air inlet manifold temperature deration.

AFTERCOOLER HEAT REJECTION FACTORS:
Aftercooler heat rejection is given for standard conditions of 25°C and 150 m altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection.

GENERATOR EFFICIENCY:
Generator power determined with an assumed generator effeciency of 96% [generator power = engine power x 0.96]. If the actual generator efficiency is less than 96% [and greater than 94.5%], the generator power [ekW] listed in the technical data can still be achieved. The BSFC values must be increased by a factor. The factor is a percentage = 96% - actual generator efficiency.

SOUND DATA:
Data determined by methods similar to ISO Standard DIS-8528-10. Accuracy Grade 3.

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