Providence

January 15, 2025

EPA Region 10
Office of Air Quality
1200 Sixth Avenue, Suite 155, 15-H13
Seattle, WA 98101

Providence Alaska Medical Center
3200 Providence Drive
Anchorage, Alaska 99508

T: (907)-562-2211
www.providence.org/alaska

SUBJECT: **Providence Health System – Washington Inc.**
Providence Alaska Medical Center
Title V Operating Permit Renewal Application
Air Quality Operating Permit No. AQ0486TVP03

Dear Permit Intake Clerk,

Providence Health System – Washington Inc. is submitting the enclosed revisions to the Title V operating permit application under 18 Alaska Administrative Code (AAC) 50.326(c) to renew the existing Air Quality Operating Permit No. AQ0486TVP03 for the Providence Alaska Medical Center. These revisions address the replacement of EU ID 3 with EU ID 3a. This submittal also meets the requirements of Condition 77 of the operating permit.

The attached revised renewal application contains applicable Series Forms as required for revisions, detailing the associated changes of EU ID 3 and EU ID 3a.

- Form A1-R. A brief description of the Application Revision.
- Form B. Details EU ID 3a as a unit to be added and EU ID 3 as a unit to be deleted.
- Form B-1. Provides information on EU ID 3a as the replacement boiler for EU ID 3.
- Form D1, D2, and D3. These forms detail the emissions estimates due to incorporating EU ID 3a and removal of EU ID 3.
- Form E3. Includes the Title V Conditions that need to be changed to account for inclusion of EU ID 3a.

Please contact Kenneth Nauseda at (907) 212-5058 or Chris Lindsey with SLR at (907) 222-1112 if you have questions or require additional information.

"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."

Sincerely,

Kenneth Nauseda

Kenneth Nauseda
Supervising Engineer Physical Plant
Providence Alaska Medical Center

cc: Compliance Technician, ADEC Fairbanks
Chris Lindsey, SLR International

Revision to Application for Renewal of an Air Quality Operating Permit

Providence Alaska Medical Center

Providence Health System – Washington Inc.

3200 Providence Drive
Anchorage, AK 99519

Prepared by:

SLR International Corporation

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

SLR Project No.: 105.021374.00001

Client Reference No: US.005410

January 13, 2025

Revision: 0

Appendices

Appendix A Stationary Source

Revision to Application for Renewal of an Air Quality Operating Permit

Providence Alaska Medical Center

Providence Health System – Washington Inc.

SLR Project No.: 105.021374.00001

January 13, 2025

A.1 Form A1-R: Stationary Source Supplemental Information or Application Revision

FORM A1-R
Stationary Source Supplemental Information or Application Revision

Permit Number: AQ0486TVP03

Permit Contact:	Name	Dale Rahn
	Title	Director Real Estate Operations
	Mailing Address Line 1	3200 Providence Drive, Anchorage, AK 99519
	Mailing Address Line 2	P.O. Box 196604
	Phone Number	(907) 212-5084
	Email	Dale.Rahn@Providence.org

Brief Description of Supplemental Information or Application Revision:

Providence Area Medical Center has replaced EU ID 3 with a new unit, EU ID 3a. This application includes a revised Form B1 for EU ID 3a, Form D1, D2, D3, and E3.

Statement of 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.

Kenneth Nauseda
Name of Responsible Official

Supervising Engineer
Title

Kenneth Nauseda
Signature (blue ink)

1-15-2025
Date

Appendix B Emission Units

Revision to Application for Renewal of an Air Quality Operating Permit

Providence Alaska Medical Center

Providence Health System – Washington Inc.

SLR Project No.: 105.021374.00001

January 13, 2025

B.1 Form B: Emission Unit Listing For This Application

B.2 Form B1: Emission Unit Detail Form – External Combustion Equipment

FORM B
Emission Unit Listing For This Application

Permit Number: AQ0486TVP03

EMISSION UNIT LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted					
Emission Unit ID Number	Emission Unit Name	Brief Emission Unit Description	Rating/Size	Construction Date	Notes
Emission Units To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)					
N/A	Hot Water Heater 1	Bldg. PRB water heater	1.0MMBtu/hr	2023	18 AAC 50.326(g)(5)
N/A	Hot Water Heater 2	Bldg. PRB backup water heater	1.0MMBtu/hr	2023	18 AAC 50.326(g)(5)
3a	Steam Boiler	Bldg. J Steam Boiler	47.0 MMBtu/hr	2023	Replacement
Emission Units To Be MODIFIED By This Application					
27	Unknown	Distillate Storage Tank	19,800 gallons	1992	Reclassified as IEU
69	EPSS Storage Tank 1	Distillate Storage Tank	45,000 gal	Unknown	Reclassified as IEU
70	EPSS Storage Tank 2	Distillate Storage Tank	45,000 gal	Unknown	Reclassified as IEU
Emission Units To Be DELETED By This Application					
N/A	Dom Hot Water Heater	Water Heater	1.0 MMBtu/hr	Unknown	
3	Steam Boiler	Bldg. SB Steam Boiler	49.0 MMBtu/hr	1999	Removed

FORM B
Emission Unit Listing For This Application

SIGNIFICANT EMISSION UNIT LISTING: Title V permitted emission units that have not been modified				
Emission Unit ID Number	Emission Unit Name	Brief Emission Unit Description	Rating/Size	Construction Date
1	SB-03	E. Keller Steam Boiler	38.5 MMBtu/hr	1974
2	SB-04	E. Keller Steam Boiler	38.5 MMBtu/hr	1974
4	SB-06	Cleaver Brooks Steam Boiler	42.2 MMBtu/hr	2000
17	G-201	Cummins Emergency Generator Engine	300 kW	1990
22	G-301	Komatsu Emergency Generator Engine	450 kW	1992
28	B-1	Bryan MOB Hub Boiler 1	12.6 MMBtu/hr	2006
29	B-2	Bryan MOB Hub Boiler 2	12.6 MMBtu/hr	2006
30	G-1	Cummins Emergency Generator Engine	680 hp	2005
35	API-3	Cummins PRB Emergency Generator Engine	1,046 hp	2005
39	G-2	Cummins QSB7-G3 Tower S Emergency Generator Engine	680 hp	2009
42	EPSS-1	CAT D3516C EPSS Generator 1	2,937 hp	2011
43	EPSS-2	CAT D3516C EPSS Generator 2	2,937 hp	2011
44	EPSS-3	CAT D3516C EPSS Generator 3	2,937 hp	2011
45	EPSS-4	CAT D3516C EPSS Generator 4	2,937 hp	2011
46	EPSS-5	CAT D3516C EPSS Generator 5	2,937 hp	2011
52	N/A	Weil McLain Boiler	0.872 MMBtu/hr	2011

FORM B

Emission Unit Listing For This Application

INSIGNIFICANT EMISSION UNIT LISTING: Insignificant Title V permitted emission units that have not been modified				
Emission Unit Name	Brief Emission Unit Description	Rating/Size	Construction Date	Basis for Insignificant Status
Space Heater	Heater	0.175 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Space Heater	Heater	0.175 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Supply Fan/Space Heater	Heater	0.25 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building A Boiler 1	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building A Boiler 2	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building A Boiler 3	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
T Building Boiler 5	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
T Building Boiler 6	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
PRB Boiler 1	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
PRB Boiler 2	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
PRB Boiler 3	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Hydronic Boiler 1	Boiler	0.175 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Hydronic Boiler 2	Boiler	0.175 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building K Boiler	Boiler	0.970 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building X Rooftop Heating Unit 1	Heater	0.125 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building X Rooftop Heating Unit 2	Heater	0.125 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building X Rooftop Heating Unit 3	Heater	0.125 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building X Rooftop Heating Unit 4	Heater	0.125 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building X Rooftop Heating Unit 5	Heater	0.125 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building X Rooftop Heating Unit 6	Heater	0.125 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building U Humidifier	Humidifier	0.3 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building S Boiler 1	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building S Boiler 2	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)

Building S Humidifier	Humidifier	0.055 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building HH Boiler	Boiler	2.0 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building B Boiler 1	Boiler	0.29 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Building B Boiler 2	Boiler	0.29 MMBtu/hr	Unknown	18 AAC 50.326(g)(5)
Diesel Storage Tank	Tank	1,000 gallons	Unknown	18 AAC 50.326(e)
201 Underground Storage Tank	Tank	2,000 gallons	Unknown	18 AAC 50.326(e)
Distillate Storage Tank	Distillate Storage Tank	19,800 gallons	Unknown	18 AAC 50.326(e)
EPSS Storage Tank 1	Tank	45,000 gal	Unknown	18 AAC 50.326(e)
EPSS Storage Tank 2	Tank	45,000 gal	Unknown	18 AAC 50.326(e)

FORM B1

Emission Unit Detail Form – External Combustion Equipment (Boilers and Heaters)

Permit Number: AQ0486TVP03

1.	Emission Unit ID Number // Operating Scenario	EU ID 3a
2.	Date installation/construction commenced	August 1, 2023
3.	Date installed	January 10, 2025
4.	Emission Unit serial number	CW-4803
5.	Special control requirements? [if yes, describe]	No
6.	Manufacturer	Cleaver Brooks
7.	Description of emission unit, including type of boiler/heater and firing method: Dual fuel steam boiler	
8.	Rated design capacity (heat input, MMBtu/hr)	47.0 MMBtu/hr
9.	Maximum steam production rate (lbs/hr)	39,250 lb/hr
10.	Maximum steam pressure (psi)	250
11.	Maximum steam temperature (°F)	227

12. Fuel usage: [for EACH fuel, enter]:

Fuel	Maximum hourly firing rate (specify units)
Natural Gas	47 Mscf/hr
Diesel	343.1 gal/hr

13.	Is waste heat utilized for any purpose? If yes, describe: No.

Applicable Requirements Specific to Emission Unit (*attach additional sheets as needed. Form B Supplement - Emission Unit-Specific Applicable Requirements*):

Permit and Condition Number	Applicable Requirement Citation[1]	Parameter/ Pollutant	Limit/Standard/ Requirement	Currently in Compliance?	Monitoring, Recordkeeping and Reporting Methods Used to Demonstrate Compliance
AQ0486TVP03 – Condition 1	18 AAC 50.055(a)(1)	Industrial Process and Fuel-Burning Equipment Visible Emissions	The Permittee shall not cause or allow visible emissions, excluding condensed water vapor to reduce visibility through the exhaust effluent by more than 20 percent averaged over any six consecutive minutes.	Yes	Incorporate revised Standard Permit Condition IX. Monitor, record, and report in accordance with Condition 1.5, and 9 through 12.
AQ0486TVP03 – Condition 5	18 AAC 50.055(b)(1)	Industrial Process and Fuel-Burning Equipment Particulate Matter	The Permittee shall not cause or allow particulate matter emitted to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.	Yes	Incorporate revised Standard Permit Condition IX. Monitor, record, and report in accordance with Condition 5.5 and 12.
AQ0486TVP03 – Condition 13	18 AAC 50.055(c)	Sulfur Compound Emissions	The Permittee shall not cause or allow sulfur compound emissions, expressed as SO_2, to exceed 500 ppm averaged over three hours.	Yes	Incorporate revised Standard Permit Condition XI. Monitor, record, and report in accordance with Conditions 13.1, and 13.3 through 13.5.
AQ0486TVP03 – Condition 15	Minor Permit No. AQ0486MSS01 Condition 7	Boiler Distillate Oil Limits	Limit the combined distillate fuel oil burned in EU IDs 1 through 4 to no more than 500,000 gallons in any 12 consecutive month period.	Yes	Monitor, record, and report in accordance with Conditions 15.1 through 15.4.
AQ0486TVP03 – Condition 16	Minor Permit No. AQ0486MSS01 Condition 8	Boiler Natural Gas Limits	Limit the combined natural gas burned in EU IDs 1 through 4, 28 and 29 to no more than 1,000 million standard cubic feet in any 12 consecutive month period.	Yes	Monitor, record, and report in accordance with Conditions 16.1 through 16.4.
AQ0486TVP03 – Condition 17.1	Minor Permit No. AQ0486MSS01 – Condition 9.1	Boiler Sulfur Limits	Limit the sulfur content of distillate fuel consumed to no greater than 0.5 percent by weight.	Yes	Monitor, record, and report in accordance with Conditions 17.3, 17.5 and 17.6.

Permit and Condition Number	Applicable Requirement Citation[1]	Parameter/ Pollutant	Limit/Standard/ Requirement	Currently in Compliance?	Monitoring, Recordkeeping and Reporting Methods Used to Demonstrate Compliance
AQ0486TVP03 – Condition 17.2	Minor Permit No. AQ0486MSS01 – Condition 9.2	Boiler Sulfur Limits	Burn pipeline quality natural gas with a sulfur content not to exceed 12 grains per 100 standard cubic feet.	Yes	Monitor, record, and report in accordance with Conditions 17.4 through and 17.6.
AQ0486TVP03 – Condition 23	40 CFR 60.7(b), Subpart A	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 ID 3a, any malfunctions of associated air pollution control equipment, or any periods during which a continuous monitoring system or monitoring device for EU ID 3a is inoperative.	Yes	Annual Compliance Certification.
AQ0486TVP03 – Condition 25	40 CFR 60.11(d), Subpart A	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 ID 3a 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 ID 3a.	Yes	Annual Compliance Certification.

Permit and Condition Number	Applicable Requirement Citation[1]	Parameter/ Pollutant	Limit/Standard/ Requirement	Currently in Compliance?	Monitoring, Recordkeeping and Reporting Methods Used to Demonstrate Compliance
AQ0486TVP03 – Condition 26	40 CFR 60.11(g), Subpart A	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 28 nothing in 40 CFR Part 60 shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether EU ID 3a would have been in compliance with applicable requirements of 40 CFR Part 60 if the appropriate performance or compliance test or procedure had been performed.	Yes	Annual Compliance Certification
AQ0486TVP03 – Condition 27	40 CFR 60.12, Subpart A	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 28. 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.	Yes	Annual Compliance Certification

Permit and Condition Number	Applicable Requirement Citation[1]	Parameter/ Pollutant	Limit/Standard/ Requirement	Currently in Compliance?	Monitoring, Recordkeeping and Reporting Methods Used to Demonstrate Compliance
AQ0486TVP03 – Condition 28	40 CFR 60.48c(g) & (i), Subpart Dc	NSPS Subpart Dc Fuel Consumption	For EU ID 3a, the Permittee shall record the amounts of each fuel combusted during each day and maintain the records for a period of two years following the date of such record; or monitor according to an EPA approved custom fuel-monitoring schedule. - As an alternative to meeting the requirements of Condition 28, the owner or operator of an affected facility that combusts only natural gas to demonstrate compliance with the SO_2 standard may elect to record and maintain records of the amount of each fuel combusted during each calendar month.	Yes	Annual Compliance Certification.
AQ0486TVP03 – Condition 28.1	40 CFR 60.42c(d) & (i), Subpart Dc	NSPS Subpart Dc Sulfur Standards	At all times, including periods of startup, shutdown, and malfunction, for EU ID 3a, the Permittee shall combust fuel oil that contains no more than 0.5 percent sulfur by weight.	Yes	Monitor, record, and report in accordance with Conditions 28.2, 28.3, and 28.10 through 28.16.
AQ0486TVP03 – Condition 28.4	40 CFR 60.43c(c) & (d), Subpart Dc	NSPS Subpart Dc PM Standards	At all times while operating on diesel fuel, except during periods of startup, shutdown, and malfunction, the Permittee shall not cause to be discharged into the atmosphere from EU ID 3a any gases that exhibit greater than 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity.	Yes	Monitor, record, and report in accordance with Conditions 28.6 through 28.9.

Permit and Condition Number	Applicable Requirement Citation[1]	Parameter/ Pollutant	Limit/Standard/ Requirement	Currently in Compliance?	Monitoring, Recordkeeping and Reporting Methods Used to Demonstrate Compliance
AQ0486TVP03 – Conditions 33 and 33.2	40 CFR 63.11193 & 63.11195(e), Subpart JJJJJJ	NESHAP Subpart JJJJJJ Applicability	If either boiler switches fuel or makes a physical change that results in the applicability of a different subcategory within Subpart JJJJJJ, or becomes subject to Subpart JJJJJJ, demonstrate compliance within 180 days of the effective date of the fuel switch or physical change.	Yes	Maintain records in accordance with Condition 33.3f.
AQ0486TVP03 – Condition 53	18 AAC 50.235(a), 50.326(j)(4), & 50.040(j)(4) 40 CFR 71.6(c)(6)	Technology-Based Emissions Standard	If an unavoidable emergency, malfunction, or non-routine repair, as defined in 18 AAC 50.235(d), causes emissions in excess of a technology-based emission standard listed in Condition 29, 30, or 33, the Permittee shall take all reasonable steps to minimize levels of emissions that exceed the standard.	Yes	Annual Compliance Certification.

[1] Citations must be specific. Include sub-paragraph level detail [e.g. 18 AAC 50.055(a)(1), or 40 C.F.R. 60.332(a)(2).]

Non-applicable Requirements Specific to Emission Unit (*attach additional sheets as needed. Form B Supplement - Emission Unit-Specific Permit Shield Request*):

Non-Applicable Requirements[1]	Reason for non-applicability and citation/basis
40 CFR 63 Subpart JJJJJJ	This unit is exempt from Subpart JJJJJJ because they only fire natural gas, or fire diesel no more than 48 hours per year.
40 CFR 60 Subpart Dc §§60.42c(a) through (c), §§60.43c(a) and (b), §§60.46c(a) through (d) and (f), and §§60.47c(a), (b) and (d) through (f)	This unit does not burn coal or wood.

[1] Citations must be specific. Include sub-paragraph level detail [e.g. 18 AAC 50.055(a)(1), or 40 C.F.R. 60.332(a)(2).]

Appendix C Pollution Control Devices – *Not Applicable*

Revision to Application for Renewal of an Air Quality Operating Permit

Providence Alaska Medical Center

Providence Health System – Washington Inc.

SLR Project No.: 105.021374.00001

January 13, 2025

Appendix D Emissions Summary

Revision to Application for Renewal of an Air Quality Operating Permit

Providence Alaska Medical Center

Providence Health System – Washington Inc.

SLR Project No.: 105.021374.00001

January 13, 2025

D.1 Form D1: Potential Annual Emissions (*after* controls/limitations) Summary

D.2 Form D3: Potential Annual Emissions (*before* controls/ limitations) Summary

D.3 Form D3: Expected Actual Annual Emissions (*after* controls/ limitations) Summary

Table D-1.1. Potential Annual Emissions (after controls/limitations) Summary
Providence Health System - Providence Alaska Medical Center

Emission Unit Type	Regulated Air Pollutant Emissions (tons per year) [1,2]							
	NO_X	CO	PM_{10}	$PM_{2.5}$ [3]	VOC	SO_2	HAP	GHG (CO_2e) [4]
Significant	122.1	51.2	5.5	5.5	3.8	36.2	1.0	69,549
Insignificant	12.0	9.3	0.9	0.9	0.7	4.1	0.2	14,671
Stationary Source Total	**134.1**	**60.5**	**6.4**	**6.4**	**4.4**	**40.3**	**1.3**	**84,220.1**
Fees Apply to Pollutant?	**Yes**	**Yes**	**Yes**	**No** [3]	**Yes**	**Yes**	**No** [5]	**No** [6]
Total Assessable Emissions	**246**							

Notes:

[1] Emissions are potential to emit, except where noted, based on maximum allowable operation and permit operating limits, where applicable.

[2] Regulated air pollutant calculations based on AP-42 emission factors, manufacturer data, and mass balances as shown in accompanying spreadsheets.

[3] PM_{10} emissions are assumed to equal $PM_{2.5}$ emissions. $PM_{2.5}$ emissions excluded from assessable emissions total to avoid double payment.

[4] GHG emissions are defined as CO_2e emissions. CO_2e is the summations of CO_2, CH_4, and N_2O, applying the global warming potential for each pollutant.

[5] HAP emissions are a subset of either VOC emissions or PM_{10} emissions and are excluded from the assessable emissions total to avoid a double payment.

[6] Assessable emission fees for GHGs have not been established under 18 AAC 50.

Table D-1.2. Potential Annual Emissions (after controls/limitations) Inventory - Significant Emission Units
Providence Health System - Providence Alaska Medical Center

Emission Unit					Installation	Fuel	
ID	Equip. No.	Description	Make/Model	Bldg. No.	Date	Type	Rating
1	SB-03	Steam Boiler	E. Keller	Bldg. SB	1974	Dual Fuel	38.5 MMBtu/hr
2	SB-04	Steam Boiler	E. Keller	Bldg. SB	1974	Dual Fuel	38.5 MMBtu/hr
3a	SB-07	Steam Boiler	Cleaver Brooks / NB-200D-40	Bldg. J	2025	Dual Fuel	47.0 MMBtu/hr
4	SB-06	Steam Boiler	Cleaver Brooks	Bldg. SB	2000	Dual Fuel	42.2 MMBtu/hr
17	G-201	Emergency Generator Engine	Cummins	Bldg. B	1990	Diesel	300 kW
22	G-301	Emergency Generator Engine	Komatsu	Bldg. A	1992	Diesel	450 kW
28	B-1	MOB Hub Boiler 1	Bryan	Bldg. T	2006	Natural Gas	12.6 MMBtu/hr
29	B-2	MOB Hub Boiler 2	Bryan	Bldg. T	2006	Natural Gas	12.6 MMBtu/hr
30	G-1	Emergency Generator Engine	Cummins	Bldg. T	2005	Diesel	680 hp
35	API-3	PRB Emergency Generator Engine	Cummins	Bldg. PRB	2006	Diesel	1,046 hp
39	G-2	Tower S Emergency Generator Engine	Cummins QSB7-G3	Bldg. S	2009	Diesel	680 hp
42	EPSS-1	EPSS Generator 1	CAT D3516C	Bldg. K	2011	Diesel	2,937 hp
43	EPSS-2	EPSS Generator 2	CAT D3516C	Bldg. K	2011	Diesel	2,937 hp
44	EPSS-3	EPSS Generator 3	CAT D3516C	Bldg. K	2011	Diesel	2,937 hp
45	EPSS-4	EPSS Generator 4	CAT D3516C	Bldg. K	2011	Diesel	2,937 hp
52	NA	Boiler	Weil McLain	Bldg. K	Unknown	Diesel	0.872 MMBtu/hr

Table D-1.3. Potential Annual Emissions (after controls/limitations) Inventory - Insignificant Emission Units
Providence Health System - Providence Alaska Medical Center

Emission Unit(s)					Fuel Type	Rating	Basis for Insignificance
ID	Equip. No.	Description	Make/Model	Bldg. No.			
9	UH-701	Space Heater	Modine	Greenhouse	Natural Gas	0.175 MMBtu/hr	18 AAC 50.326(g)(5)
10	UH-702	Space Heater	Modine	Greenhouse	Natural Gas	0.175 MMBtu/hr	18 AAC 50.326(g)(5)
12	SF-701	Supply Fan/Space Heater	Reznor	Carpentry Shop	Natural Gas	0.250 MMBtu/hr	18 AAC 50.326(g)(5)
20	HB-301	Boiler	Aerco Benchmark 2.0	Bldg. A	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
21	HB-302	Boiler	Aerco Benchmark 2.0	Bldg. A	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
22	HB-303	Boiler	Aerco Benchmark 2.0	Bldg. A	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
31	B-5	MOB Hub Boiler 5	Aerco	Bldg. T	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
32	B-6	MOB Hub Boiler 6	Aerco	Bldg. T	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
33	BLR-1001	API Boiler 1	Aerco	Bldg. PRB	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
34	BLR-1002	API Boiler 2	Aerco	Bldg. PRB	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
36	BLR-1003	API Boiler 3	Aerco	Bldg. PRB	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
N/A	NA	Boiler 1	Unknown	Bldg. B	Natural Gas	0.29 MMBtu/hr	18 AAC 50.326(g)(5)
N/A	NA	Boiler 2	Unknown	Bldg. B	Natural Gas	0.29 MMBtu/hr	18 AAC 50.326(g)(5)
N/A	NA	Hot Water Heater 1	Unknown	Bldg. PRB	Natural Gas	1.0 MMBtu/hr	18 AAC 50.326(g)(5)
N/A	NA	Hot Water Heater 2 (backup)	Unknown	Bldg. PRB	Natural Gas	1.0 MMBtu/hr	18 AAC 50.326(g)(5)
51	NA	Hydronic Boiler 1	Weil McLain	PS3	Natural Gas	0.175 MMBtu/hr	18 AAC 50.326(g)(5)
53	NA	Hydronic Boiler 2	Weil McLain	PS3	Natural Gas	0.175 MMBtu/hr	18 AAC 50.326(g)(5)
54	NA	Boiler	Aerco	Bldg. K	Natural Gas	0.970 MMBtu/hr	18 AAC 50.326(g)(5)
55	RUT-1	Rooftop Heating Unit 1	York	Bldg. X	Natural Gas	0.125 MMBtu/hr	18 AAC 50.326(g)(5)
56	RUT-2	Rooftop Heating Unit 2	York	Bldg. X	Natural Gas	0.125 MMBtu/hr	18 AAC 50.326(g)(5)
57	RUT-3	Rooftop Heating Unit 3	York	Bldg. X	Natural Gas	0.125 MMBtu/hr	18 AAC 50.326(g)(5)
58	RUT-4	Rooftop Heating Unit 4	York	Bldg. X	Natural Gas	0.125 MMBtu/hr	18 AAC 50.326(g)(5)
59	RUT-5	Rooftop Heating Unit 5	York	Bldg. X	Natural Gas	0.125 MMBtu/hr	18 AAC 50.326(g)(5)
60	RUT-6	Rooftop Heating Unit 6	York	Bldg. X	Natural Gas	0.125 MMBtu/hr	18 AAC 50.326(g)(5)
61	Hum-900	Humidifier	Dristeem	Bldg. U	Natural Gas	0.3 MMBtu/hr	18 AAC 50.326(g)(5)
62	BLR-900	Boiler	Aerco	Bldg. S	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
63	BLR-901	Boiler	Aerco	Bldg. S	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
64	HU-900	Humidifier	Carel	Bldg. S	Natural Gas	0.055 MMBtu/hr	18 AAC 50.326(g)(5)
65	B-2000	Boiler	Aerco	Bldg. HH	Natural Gas	2.0 MMBtu/hr	18 AAC 50.326(g)(5)
66	N/A	Ace Tank Distillate Storage	N/A	Above Ground	Diesel	1,000 gallons	18 AAC 50.326(e)
67	N/A	201 Underground Storage Tank	N/A	Underground	Diesel	2,000 gallons	18 AAC 50.326(e)
69	NA	EPSS Storage Tank 1	Unknown	Bldg. K	Diesel	45,000 gallons	18 AAC 50.326(e)
70	NA	EPSS Storage Tank 2	Unknown	Bldg. K	Diesel	45,000 gallons	18 AAC 50.326(e)

Table D-1.4. Potential Annual Emissions (after controls/limitations) Calculations - Oxides of Nitrogen (NO_X) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	NO_X Emission Factor	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	Potential NO_X Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	38.5 MMBtu/hr	1,000 MMscf/yr	50.0 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	38.5 MMBtu/hr		
3a	Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	42.2 MMBtu/hr		
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	12.6 MMBtu/hr		
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	12.6 MMBtu/hr		
1	SB-03 Steam Boiler	Diesel	Table 1.3-1, AP-42	20 lb/kgal	38.5 MMBtu/hr	500,000 gal/yr	5.0 tpy
2	SB-04 Steam Boiler	Diesel	Table 1.3-1, AP-42	20 lb/kgal	38.5 MMBtu/hr		
3a	Steam Boiler	Diesel	Table 1.3-1, AP-42	20 lb/kgal	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Diesel	Table 1.3-1, AP-42	20 lb/kgal	42.2 MMBtu/hr		
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.031 lb/hp-hr	300 kW	250 hr/yr	1.6 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.031 lb/hp-hr	450 kW	250 hr/yr	2.3 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	680 hp	250 hr/yr	2.0 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	1,046 hp	500 hr/yr [3]	6.3 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	680 hp	500 hr/yr [3]	4.1 tpy
42	EPSS Generator 1	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	2,400 hr/yr	50.2 tpy
43	EPSS Generator 2	Diesel	Vendor Data	41.9 lb/hr	2,937 hp		
44	EPSS Generator 3	Diesel	Vendor Data	41.9 lb/hr	2,937 hp		
45	EPSS Generator 4	Diesel	Vendor Data	41.9 lb/hr	2,937 hp		
52	Boiler	Diesel	Table 1.3-1, AP-42	20.0 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.6 tpy
						Significant Emission Units Total Potential to Emit - NO_X	**122.1 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	94 lb/MMscf	4.3 MMBtu/hr	8,760 hr/yr	1.8 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	23.3 MMBtu/hr	8,760 hr/yr	10.2 tpy
66	Ace Tank Distillate Storage	Diesel	NA	NA	1,000 gallons	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	NA	2,000 gallons	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	NA	45,000 gallons	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	NA	45,000 gallons	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - NO_X	**12.0 tpy**
						Total Potential to Emit - NO_X	**134.1 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Engine Heat Rate:	7,000 Btu/hp-hr

[3] According to a memorandum from John S. Seitz of the EPA, 500 hours of operation is an appropriate default assumption for estimating the number of hours an emergency generator could be expected to operate per year.

Table D-1.5. Potential Annual Emissions (after controls/limitations) Calculations - Carbon Monoxide (CO) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	CO Emission Factor	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	Potential CO Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	38.5 MMBtu/hr	1,000 MMscf/yr	42.0 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	38.5 MMBtu/hr		
3a	Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	42.2 MMBtu/hr		
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	12.6 MMBtu/hr		
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	12.6 MMBtu/hr		
1	SB-03 Steam Boiler	Diesel	Table 1.3-1, AP-42	5 lb/kgal	38.5 MMBtu/hr	500,000 gal/yr	1.3 tpy
2	SB-04 Steam Boiler	Diesel	Table 1.3-1, AP-42	5 lb/kgal	38.5 MMBtu/hr		
3a	Steam Boiler	Diesel	Table 1.3-1, AP-42	5 lb/kgal	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Diesel	Table 1.3-1, AP-42	5 lb/kgal	42.2 MMBtu/hr		
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00668 lb/hp-hr	300 kW	250 hr/yr	0.3 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00668 lb/hp-hr	450 kW	250 hr/yr	0.5 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	680 hp	250 hr/yr	0.5 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	1,046 hp	500 hr/yr [3]	1.4 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	680 hp	500 hr/yr [3]	0.9 tpy
42	EPSS Generator 1	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	2,400 hr/yr	4.1 tpy
43	EPSS Generator 2	Diesel	Vendor Data	3.43 lb/hr	2,937 hp		
44	EPSS Generator 3	Diesel	Vendor Data	3.43 lb/hr	2,937 hp		
45	EPSS Generator 4	Diesel	Vendor Data	3.43 lb/hr	2,937 hp		
52	Boiler	Diesel	Table 1.3-1, AP-42	5 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.1 tpy
						Significant Emission Units Total Potential to Emit - CO	**51.2 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	40 lb/MMscf	4.3 MMBtu/hr	8,760 hr/yr	0.76 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	23.3 MMBtu/hr	8,760 hr/yr	8.56 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gallons	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gallons	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - CO	**9.3 tpy**
						Total Potential to Emit - CO	**60.5 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Engine Heat Rate:	7,000 Btu/hp-hr

[3] According to a memorandum from John S. Seitz of the EPA, 500 hours of operation is an appropriate default assumption for estimating the number of hours an emergency generator could be expected to operate per year.

Table D-1.6. Potential Annual Emissions (after controls/limitations) Calculations - Particulate Matter Less Than 10 Microns (PM_{10}) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	PM_{10} Emission Factor	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	Potential PM_{10} Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	38.5 MMBtu/hr	1,000 MMscf/yr	3.8 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	38.5 MMBtu/hr		
3a	Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	42.2 MMBtu/hr		
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	12.6 MMBtu/hr		
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	12.6 MMBtu/hr		
1	SB-03 Steam Boiler	Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	38.5 MMBtu/hr	500,000 gal/yr	0.8 tpy
2	SB-04 Steam Boiler	Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	38.5 MMBtu/hr		
3a	Steam Boiler	Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	42.2 MMBtu/hr		
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.0022 lb/hp-hr	300 kW	250 hr/yr	0.1 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.0022 lb/hp-hr	450 kW	250 hr/yr	0.2 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	680 hp	250 hr/yr	0.03 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	1,046 hp	500 hr/yr [3]	0.1 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	680 hp	500 hr/yr [3]	0.07 tpy
42	EPSS Generator 1	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	2,400 hrs/yr	0.3 tpy
43	EPSS Generator 2	Diesel	Vendor Data	0.23 lb/hr	2,937 hp		
44	EPSS Generator 3	Diesel	Vendor Data	0.23 lb/hr	2,937 hp		
45	EPSS Generator 4	Diesel	Vendor Data	0.23 lb/hr	2,937 hp		
52	Boiler	Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.09 tpy
					Significant Emission Units Total Potential to Emit - PM_{10}		**5.5 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	4.3 MMBtu/hr	8,760 hr/yr	0.14 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	23.3 MMBtu/hr	8,760 hr/yr	0.8 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gallons	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gallons	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
					Insignificant Emission Units Total Potential to Emit - PM_{10}		**0.9 tpy**
					Total Potential to Emit - PM_{10}		**6.4 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Engine Heat Rate:	7,000 Btu/hp-hr

[3] According to a memorandum from John S. Seitz of the EPA, 500 hours of operation is an appropriate default assumption for estimating the number of hours an emergency generator could be expected to operate per year.

Table D-1.7. Potential Annual Emissions (after controls/limitations) Calculations - Volatile Organic Compounds (VOC) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	VOC Emission Factor	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	Potential VOC Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	38.5 MMBtu/hr	1,000 MMscf/yr	2.8 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	38.5 MMBtu/hr		
3a	Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	42.2 MMBtu/hr		
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	12.6 MMBtu/hr		
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	12.6 MMBtu/hr		
1	SB-03 Steam Boiler	Diesel	Table 1.3-1, AP-42	0.2 lb/kgal	38.5 MMBtu/hr	500,000 gal/yr	0.1 tpy
2	SB-04 Steam Boiler	Diesel	Table 1.3-1, AP-42	0.2 lb/kgal	38.5 MMBtu/hr		
3a	Steam Boiler	Diesel	Table 1.3-1, AP-42	0.2 lb/kgal	49.0 MMBtu/hr		
4	SB-06 Steam Boiler	Diesel	Table 1.3-1, AP-42	0.2 lb/kgal	42.2 MMBtu/hr		
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00247 lb/hp-hr	300 kW	250 hr/yr	0.1 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00247 lb/hp-hr	450 kW	250 hr/yr	0.2 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	680 hp	250 hr/yr	0.06 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	1,046 hp	500 hr/yr [3]	0.2 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	680 hp	500 hr/yr [3]	0.1 tpy
42	EPSS Generator 1	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	2,400 hr/yr	0.3 tpy
43	EPSS Generator 2	Diesel	Vendor Data	0.23 lb/hr	2,937 hp		
44	EPSS Generator 3	Diesel	Vendor Data	0.23 lb/hr	2,937 hp		
45	EPSS Generator 4	Diesel	Vendor Data	0.23 lb/hr	2,937 hp		
52	Boiler	Diesel	Table 1.3-1, AP-42	0.2 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.006 tpy
					Significant Emission Units Total Potential to Emit - VOC		**3.8 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	4.3 MMBtu/hr	8,760 hr/yr	0.10 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	23.3 MMBtu/hr	8,760 hr/yr	0.6 tpy
66	Ace Tank Distillate Storage	Diesel	See Table D-1.12	NA	1,000 gallons	8,760 hr/yr	8.21E-05 tpy
67	201 Underground Storage Tank	Diesel	See Table D-1.12	NA	2,000 gallons	8,760 hr/yr	6.39E-05 tpy
69	EPSS Storage Tank 1	Diesel	See Table D-1.12	NA	45,000 gallons	8,760 hr/yr	0.003 tpy
70	EPSS Storage Tank 2	Diesel	See Table D-1.12	NA	45,000 gallons	8,760 hr/yr	0.003 tpy
					Insignificant Emission Units Total Potential to Emit - VOC		**0.7 tpy**
					Total Potential to Emit - VOC		**4.4 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.

[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Engine Heat Rate:	7,000	Btu/hp-hr

[3] According to a memorandum from John S. Seitz of the EPA, 500 hours of operation is an appropriate default assumption for estimating the number of hours an emergency generator could be expected to operate per year.

Table D-1.8. Potential Annual Emissions (after controls/limitations) Calculations - Sulfur Dioxide (SO_2) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	SO_2 Emission Factor	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	Potential SO_2 Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	38.5 MMBtu/hr	1,000 MMscf/yr	17.1 tpy
2	SB-04 Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	38.5 MMBtu/hr		
3a	Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	47 MMBtu/hr		
4	SB-06 Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	42.2 MMBtu/hr		
28	MOB Hub Boiler 1	Natural Gas	Permit Limit	12 gr S/100 scf	12.6 MMBtu/hr		
29	MOB Hub Boiler 2	Natural Gas	Permit Limit	12 gr S/100 scf	12.6 MMBtu/hr		
1	SB-03 Steam Boiler	Diesel	Permit Limit	0.5 pct. wt. S	38.5 MMBtu/hr	500,000 gal/yr	17.3 tpy
2	SB-04 Steam Boiler	Diesel	Permit Limit	0.5 pct. wt. S	38.5 MMBtu/hr		
3a	Steam Boiler	Diesel	Permit Limit	0.5 pct. wt. S	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Diesel	Permit Limit	0.5 pct. wt. S	42.2 MMBtu/hr		
17	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	300 kW	250 hr/yr	0.2 tpy
22	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	450 kW	250 hr/yr	0.3 tpy
30	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	680 hp	250 hr/yr	0.3 tpy
35	PRB Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	1,046 hp	500 hr/yr [3]	0.9 tpy
39	Tower S Emergency Generator Engine	Diesel	Permit Limit	0.05 pct. wt. S	680 hp	500 hr/yr [3]	0.06 tpy
42	EPSS Generator 1	Diesel	Permit Limit	15 ppmw	2,937 hp	2,400 hr/yr	0.04 tpy
43	EPSS Generator 2	Diesel	Permit Limit	15 ppmw	2,937 hp		
44	EPSS Generator 3	Diesel	Permit Limit	15 ppmw	2,937 hp		
45	EPSS Generator 4	Diesel	Permit Limit	15 ppmw	2,937 hp		
						Significant Emission Units Total Potential to Emit - SO_2	**36.2 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	12 gr/100 scf	4.3 MMBtu/hr	8,760 hr/yr	0.7 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	12 gr/100 scf	23.3 MMBtu/hr	8,760 hr/yr	3.5 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gallons	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gallons	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - SO_2	**4.1 tpy**
						Total Potential to Emit - SO_2	**40.3 tpy**

Notes:
[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.
[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Turbine Heat Rate:	8000	Btu/hp-hr
Diesel Density	6.90	lb/gal
Standard Molar Volume	385.3	scf/lb-mol
Engine Heat Rate:	7,000	Btu/hp-hr

[3] According to a memorandum from John S. Seitz of the EPA, 500 hours of operation is an appropriate default assumption for estimating the number of hours an emergency generator could be expected to operate per year.

Table D-1.9. Potential Annual Emissions (after controls/limitations) Hazardous Air Pollutants (HAP) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	HAP Emission Factor	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	Potential HAP Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	See Table D-1.10	1.89 lb/MMscf	38.5 MMBtu/hr	1,000 MMscf/yr	0.9 tpy
2	SB-04 Steam Boiler	Natural Gas	See Table D-1.10	1.89 lb/MMscf	38.5 MMBtu/hr		
3a	Steam Boiler	Natural Gas	See Table D-1.10	1.89 lb/MMscf	47 MMBtu/hr		
4	SB-06 Steam Boiler	Natural Gas	See Table D-1.10	1.89 lb/MMscf	42.2 MMBtu/hr		
28	MOB Hub Boiler 1	Natural Gas	See Table D-1.10	1.89 lb/MMscf	12.6 MMBtu/hr		
29	MOB Hub Boiler 2	Natural Gas	See Table D-1.10	1.89 lb/MMscf	12.6 MMBtu/hr		
1	SB-03 Steam Boiler	Diesel	See Table D-1.10	1.58E-01 lb/10^3Gal	38.5 MMBtu/hr	500,000 gal/yr	0.04 tpy
2	SB-04 Steam Boiler	Diesel	See Table D-1.10	1.58E-01 lb/10^3Gal	38.5 MMBtu/hr		
3a	Steam Boiler	Diesel	See Table D-1.10	1.58E-01 lb/10^3Gal	47.0 MMBtu/hr		
4	SB-06 Steam Boiler	Diesel	See Table D-1.10	1.58E-01 lb/10^3Gal	42.2 MMBtu/hr		
17	Emergency Generator Engine	Diesel	See Table D-1.10	3.87E-03 lb/MMBtu	300 kW	250 hr/yr	1.36E-03 tpy
22	Emergency Generator Engine	Diesel	See Table D-1.10	3.87E-03 lb/MMBtu	450 kW	250 hr/yr	2.05E-03 tpy
30	Emergency Generator Engine	Diesel	See Table D-1.10	1.56E-03 lb/MMBtu	680 hp	250 hr/yr	9.29E-04 tpy
35	PRB Emergency Generator Engine	Diesel	See Table D-1.10	1.56E-03 lb/MMBtu	1,046 hp	500 hr/yr [3]	2.86E-03 tpy
39	Tower S Emergency Generator Engine	Diesel	See Table D-1.10	1.56E-03 lb/MMBtu	680 hp	500 hr/yr [3]	1.86E-03 tpy
42	EPSS Generator 1	Diesel	See Table D-1.10	1.56E-03 lb/MMBtu	2,937 hp	2,400 hr/yr	0.04 tpy
43	EPSS Generator 2	Diesel	See Table D-1.10	1.56E-03 lb/MMBtu	2,937 hp		
44	EPSS Generator 3	Diesel	See Table D-1.10	1.56E-03 lb/MMBtu	2,937 hp		
45	EPSS Generator 4	Diesel	See Table D-1.10	1.56E-03 lb/MMBtu	2,937 hp		
52	Boiler	Diesel	See Table D-1.10	1.58E-01 lb/10^3Gal	0.872 MMBtu/hr	8,760 hr/yr	4.40E-03 tpy
						Significant Emission Units Total Potential to Emit - HAP	**1.0 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	See Table D-1.10	1.89 lb/MMscf	4.3 MMBtu/hr	8,760 hr/yr	0.04 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	See Table D-1.10	1.89 lb/MMscf	23.3 MMBtu/hr	8,760 hr/yr	0.2 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gallons	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gallons	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gallons	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - HAP	**0.2 tpy**
						Total Potential to Emit - HAP	**1.3 tpy [4]**

Notes:
[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.
[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Turbine Heat Rate:	8000 Btu/hp-hr
Diesel Density	6.90 lb/gal
Engine Heat Rate:	7,000 Btu/hp-hr

[3] According to a memorandum from John S. Seitz of the EPA, 500 hours of operation is an appropriate default assumption for estimating the number of hours an emergency generator could be expected to operate per year.
[4] Individual HAP estimates are not shown as the total HAP emissions are below 10 TPY

Table D-1.10. Potential Annual Emissions (after controls/limitations) - Emission Factors
Providence Health System - Providence Alaska Medical Center

Pollutant	Diesel Boilers AP-42 Tables 1.3-8, 9, & 11	Small Diesel Engines AP-42 Table 3.3-2	Large Diesel Engines AP-42 Tables 3.4-3, 4	Natural Gas Boilers/Heaters AP-42 Tables 1.4-2, 3, & 4
Acenaphthene	2.11E-05 lb/10^3 Gal	1.42E-06 lb/MMBtu	4.68E-06 lb/MMBtu	1.80E-06 lb/MMscf
Acenaphthylene	2.53E-07 lb/10^3 Gal	5.06E-06 lb/MMBtu	9.23E-06 lb/MMBtu	1.80E-06 lb/MMscf
Acetaldehyde	N A	7.67E-04 lb/MMBtu	2.52E-05 lb/MMBtu	N A
Acrolein	N A	9.25E-05 lb/MMBtu	7.88E-06 lb/MMBtu	N A
Anthracene	1.22E-06 lb/10^3 Gal	1.87E-06 lb/MMBtu	1.23E-06 lb/MMBtu	2.40E-06 lb/MMscf
Antimony	5.25E-03 lb/10^3 Gal	N A	N A	N A
Arsenic	1.32E-03 lb/10^3 Gal	N A	N A	2.00E-04 lb/MMscf
Benz(a)anthracene	4.01E-06 lb/10^3 Gal	1.68E-06 lb/MMBtu	6.22E-07 lb/MMBtu	1.80E-06 lb/MMscf
Benzene	2.14E-04 lb/10^3 Gal	9.33E-04 lb/MMBtu	7.76E-04 lb/MMBtu	2.10E-03 lb/MMscf
Benzo(a)pyrene	N A	1.88E-07 lb/MMBtu	2.57E-07 lb/MMBtu	1.20E-06 lb/MMscf
Benzo(b)fluoranthene	1.48E-06 lb/10^3 Gal	9.91E-08 lb/MMBtu	1.11E-06 lb/MMBtu	1.80E-06 lb/MMscf
Benzo(g,h,i)peylene	2.26E-06 lb/10^3 Gal	4.89E-07 lb/MMBtu	5.56E-07 lb/MMBtu	1.20E-06 lb/MMscf
Benzo(k)fluoranthene	N A	1.55E-07 lb/MMBtu	2.18E-07 lb/MMBtu	1.80E-06 lb/MMscf
Beryllium	2.78E-05 lb/10^3 Gal	N A	N A	1.20E-05 lb/MMscf
1,3-Butadiene	N A	3.91E-05 lb/MMBtu	N A	N A
Cadmium	3.98E-04 lb/10^3 Gal	N A	N A	1.10E-03 lb/MMscf
Chromium	8.45E-04 lb/10^3 Gal	N A	N A	1.40E-03 lb/MMscf
Chromium VI	2.48E-04 lb/10^3 Gal	N A	N A	N A
Chrysene	2.38E-06 lb/10^3 Gal	3.53E-07 lb/MMBtu	1.53E-06 lb/MMBtu	1.80E-06 lb/MMscf
Cobalt	6.02E-03 lb/10^3 Gal	N A	N A	8.40E-05 lb/MMscf
Dibenzo(a,h)anthracene	1.37E-06 lb/10^3 Gal	5.83E-07 lb/MMBtu	3.46E-07 lb/MMBtu	1.20E-06 lb/MMscf
1,1,1-Trichloroethane	2.36E-04 lb/10^3 Gal	N A	N A	N A
Ethylbenzene	6.36E-05 lb/10^3 Gal	N A	N A	N A
Fluoranthene	4.84E-06 lb/10^3 Gal	7.61E-06 lb/MMBtu	4.03E-06 lb/MMBtu	3.00E-06 lb/MMscf
Fluorene	4.47E-06 lb/10^3 Gal	2.92E-05 lb/MMBtu	1.28E-06 lb/MMBtu	2.80E-06 lb/MMscf
Formaldehyde	3.30E-02 lb/10^3 Gal	1.18E-03 lb/MMBtu	7.89E-05 lb/MMBtu	7.50E-02 lb/MMscf
Hexane	N A	N A	N A	1.80E+00 lb/MMscf
Indeno(1,2,3-cd)pyrene	2.14E-06 lb/10^3 Gal	3.75E-07 lb/MMBtu	4.14E-07 lb/MMBtu	1.80E-06 lb/MMscf
Lead	1.51E-03 lb/103 Gal	N A	N A	5.00E-04 lb/MMscf
Manganese	3.00E-03 lb/103 Gal	N A	N A	3.80E-04 lb/MMscf
Mercury	1.13E-04 lb/103 Gal	N A	N A	N A
Naphthalene	1.13E-03 lb/10^3 Gal	8.48E-05 lb/MMBtu	1.30E-04 lb/MMBtu	6.10E-04 lb/MMscf
Nickel	8.45E-02 lb/10^3 Gal	N A	N A	2.10E-03 lb/MMscf
Phenanathrene	1.05E-05 lb/10^3 Gal	2.94E-05 lb/MMBtu	4.08E-05 lb/MMBtu	1.70E-05 lb/MMscf
Phosphorous	9.46E-03 lb/10^3 Gal	N A	N A	N A
PAH	N A	N A	N A	N A
Polycylic Organic Matter	3.30E-03 lb/10^3 Gal	N A	N A	N A
Propylene Oxide	N A	N A	N A	N A
Pyrene	4.25E-06 lb/10^3 Gal	4.78E-06 lb/MMBtu	3.71E-06 lb/MMBtu	5.00E-06 lb/MMscf
Selenium	6.83E-04 lb/10^3 Gal	N A	N A	2.40E-05 lb/MMscf
Toluene	6.20E-03 lb/10^3 Gal	4.09E-04 lb/MMBtu	2.81E-04 lb/MMBtu	3.40E-03 lb/MMscf
Xylenes	1.09E-04 lb/10^3 Gal	2.85E-04 lb/MMBtu	1.93E-04 lb/MMBtu	N A
Total HAPs	**1.58E-01 lb/10^3 Gal**	**3.87E-03 lb/MMBtu**	**1.56E-03 lb/MMBtu**	**1.89 lb/MMscf**

Table D-1.11. Potential Annual Emissions (after controls/limitations) Greenhouse Gas Calculations - CO_{2e} Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	CO_2 Emissions [2]	CH_4 Emissions [2]	N_2O Emissions [2]	CO_2e Emissions
Significant Emission Units								
1	SB-03 Steam Boiler	Natural Gas	38.5 MMBtu/hr	1,000 MMscf/yr	58,488 tpy	1.10E+00 tpy	1.10E-01 tpy	58,548 tpy
2	SB-04 Steam Boiler	Natural Gas	38.5 MMBtu/hr					
3a	Steam Boiler	Natural Gas	47.0 MMBtu/hr					
4	SB-06 Steam Boiler	Natural Gas	42.2 MMBtu/hr					
28	MOB Hub Boiler 1	Natural Gas	12.6 MMBtu/hr					
29	MOB Hub Boiler 2	Natural Gas	12.6 MMBtu/hr					
1	SB-03 Steam Boiler	Diesel	38.5 MMBtu/hr	500,000 gal/yr	5,585 tpy	2.27E-01 tpy	4.53E-02 tpy	5,604 tpy
2	SB-04 Steam Boiler	Diesel	38.5 MMBtu/hr					
3a	Steam Boiler	Diesel	47.0 MMBtu/hr					
4	SB-06 Steam Boiler	Diesel	42.2 MMBtu/hr					
17	Emergency Generator Engine	Diesel	300 kW	250 hr/yr	57 tpy	2.33E-03 tpy	4.66E-04 tpy	58 tpy
22	Emergency Generator Engine	Diesel	450 kW	250 hr/yr	86 tpy	3.49E-03 tpy	6.98E-04 tpy	86 tpy
30	Emergency Generator Engine	Diesel	680 hp	250 hr/yr	97 tpy	3.94E-03 tpy	7.87E-04 tpy	97 tpy
35	PRB Emergency Generator Engine	Diesel	1,046 hp	500 hr/yr [3]	298 tpy	1.21E-02 tpy	2.42E-03 tpy	299 tpy
39	Tower S Emergency Generator Engine	Diesel	680 hp	500 hr/yr [3]	194 tpy	7.87E-03 tpy	1.57E-03 tpy	195 tpy
42	EPSS Generator 1	Diesel	2,937 hp	2,400 hr/yr	4,023 tpy	1.63E-01 tpy	3.26E-02 tpy	4,036 tpy
43	EPSS Generator 2	Diesel	2,937 hp					
44	EPSS Generator 3	Diesel	2,937 hp					
45	EPSS Generator 4	Diesel	2,937 hp					
52	Boiler	Diesel	0.872 MMBtu/hr	8,760 hr/yr	623 tpy	2.53E-02 tpy	5.05E-03 tpy	625 tpy
							Significant Emission Units Total Assessable Potential to Emit - CO_2e	**69,549 tpy**
Insignificant Emission Units								
	Various Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	4.3 MMBtu/hr, total	8,760 hr/yr	2,221 tpy	4.19E-02 tpy	4.19E-03 tpy	2,223 tpy
	Various Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	24.3 MMBtu/hr, total	8,760 hr/yr	12,435 tpy	2.34E-01 tpy	2.34E-02 tpy	12,448 tpy
66	Ace Tank Distillate Storage	Diesel	1,000 gallons	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
67	201 Underground Storage Tank	Diesel	2,000 gallons	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
69	EPSS Storage Tank 1	Diesel	45,000 gallons	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
70	EPSS Storage Tank 2	Diesel	45,000 gallons	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
							Insignificant Emission Units Total Assessable Potential to Emit - CO_2e	**1.47E+04 tpy**
							Total Assessable Potential to Emit - CO_2e	**8.42E+04 tpy**

Notes:
[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.
[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Turbine Heat Rate:	8,000	Btu/hp-hr
Diesel Density	6.90	lb/gal
Engine Heat Rate:	7,000	Btu/hp-hr

[3] According to a memorandum from John S. Seitz of the EPA, 500 hours of operation is an appropriate default assumption for estimating the number of hours an emergency generator could be expected to operate per year.

GHG Emission Factors (kg/MMBtu):	Fuel Gas	Diesel	GWP
CO_2	53.06	73.96	1
CH_4	1.00E-03	3.00E-03	25
N_2O	1.00E-04	6.00E-04	298

Table D-1.12 Potential Annual Emissions (after controls/limitations) Tank Emissions - VOC Emissions
Providence Health System - Providence Alaska Medical Center

Parameter	Factor Reference	Emissions Unit ID			
		66	67	69	70
Orientation	NA	Horizontal	Horizontal UST	Vertical	Vertical
Contents	NA	Diesel	Diesel	Diesel	Diesel
Diameter (ft)	NA	6	12	15	15
Tank Height (ft), H_S	NA	5	5	40	40
Color	NA	White	White	White	White
Maximum Liquid Height (ft), H_L	NA	4	4	35	35
Capacity (gal)	NA	1,000	2,000	45,000	45,000
Throughput (gal/yr) [1]	NA	1,000	2,000	45,000	45,000
Turnovers [4]	NA	1	1	1	1
Paint Condition	NA	Average	Average	Average	Average
Standing Loss (L_S) Calculations [3]					
K_E	AP-42, Section 7.1, Equation 1-12	0.019	0.019	0.019	0.019
H_{VO} (ft)	AP-42, Section 7.1, Equation 1-16	1.06	1.13	5.16	5.16
H_{RO} (ft)	AP-42, Section 7.1, Equation 1-17	0.06	0.13	0.16	0.16
K_S	AP-42, Section 7.1, Equation 1-21	1.000	1.000	0.998	0.998
T_{AA} (^oR)	AP-42, Section 7.1, Equation 1-30	497.60	497.60	497.60	497.60
T_B (^oR)	AP-42, Section 7.1, Equation 1-31	498.23	498.23	498.23	498.23
T_V (^oR) - uninsulated	AP-42, Section 7.1, Equation 1-33	152.05	152.05	152.05	152.05
W_V (lb/ft^3)	AP-42, Section 7.1, Equation 1-22	4.78E-04	4.78E-04	4.78E-04	4.78E-04
L_S (lb/yr)	AP-42, Section 7.1, Equation 1-4	0.10	0	3.04	3.04
Working Loss (L_W) Calculations [3]					
Q (bbl/yr)	NA	24	48	1,071	1,071
V_Q (ft^3)	AP-42, Section 7.1, Equation 1-39	134	267	6,015	6,015
K_N [4]	AP-42, Section 7.1, Equation 1-35	1.00	1.00	1.00	1.00
L_W (lb/yr)	AP-42, Section 7.1, Equation 1-35	0.1	0.1	2.9	2.9
TOTAL VOCs L_T (tpy)	**AP-42, Section 7.1, Equation 1-1**	**8.21E-05**	**6.39E-05**	**0.003**	**0.003**

Note:
[1] Tanks are filled with submerged loading.
[2] EU ID 67 is conservatively estimated as an above ground storage tank.
[3] Meteorological Inputs (Anchorage, AK):

	T_{AX} =	42.5	^oF	502.2 ^oK
AP-42, Section 7.1, Table 7.1-6	T_{AN} =	33.3	^oF	493.0 ^oK
AP-42, Section 7.1, Table 7.1-7	α =	0.25	White, Average	
From the 1995 version of AP-42	I =	838	Btu/ft^2-d	
Constants:				
AP-42, Section 7.1, Table 7.1-2 (diesel/distillate)				
AP-42, Section 7.1, Table 7.1-2	M_V (diesel)=	130	lb/lb-mol	
AP-42, Section 7.1, Note below equation 1-37	P_{VA} (diesel)=	0.006	psi	
AP-42, Section 7.1, Note below equation 1-37	K_P (diesel)=	1		
	K_B =	1		

[4] K_N is equal to 1 for 36 or less turnovers per year

Table D-2.1. Potential Annual Emissions (before controls/limitations) Emissions Summary
Providence Health System - Providence Alaska Medical Center

Emission Unit Type	Regulated Air Pollutant Emissions (tons per year) [1,2]							
	NO_X	CO	PM_{10}	$PM_{2.5}$ [3]	VOC	SO_2	HAP [4]	GHG (CO_2e) [5]
Significant	1,240.9	218.0	36.4	36.4	27.0	416.1	8.3	208,698
Insignificant	11.6	9.3	0.9	0.9	0.6	4.0	0.2	13,646
Total Potential to Emit Emissions	**1,252.5**	**227.4**	**37.3**	**37.3**	**27.6**	**420.1**	**8.5**	**222,343.7**

Notes:

[1] Emissions are unlimited potential to emit.

[2] Regulated air pollutant calculations based on AP-42 emission factors, manufacturer data, and mass balances as shown in accompanying spreadsheets.

[3] PM_{10} emissions are assumed to equal $PM_{2.5}$ emissions.

[4] HAP emissions are a subset of either VOC emissions or PM_{10} emissions and are excluded from the total.

[5] GHG means greenhouse gases and is the summation of CO_2, CH_4, and N_2O and applying the global warming potential for each pollutant.

Table D-2.2. Potential Annual Emissions (before controls/limitations) Calculations - Oxides of Nitrogen (NO_X) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	NO_X Emission Factor	Emission Unit Rating/Capacity	Potential Annual Operation [1]	Potential NO_X Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Diesel [3]	Table 1.3-1, AP-42	20 lb/kgal	38.5 MMBtu/hr	8,760 hr/yr	24.6 tpy
2	SB-04 Steam Boiler	Diesel [3]	Table 1.3-1, AP-42	20 lb/kgal	38.5 MMBtu/hr	8,760 hr/yr	24.6 tpy
3a	Steam Boiler	Diesel [3]	Table 1.3-1, AP-42	20 lb/kgal	47.0 MMBtu/hr	8,760 hr/yr	30.1 tpy
4	SB-06 Steam Boiler	Diesel [3]	Table 1.3-1, AP-42	20 lb/kgal	42.2 MMBtu/hr	8,760 hr/yr	27.0 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.031 lb/hp-hr	300 kW	8,760 hr/yr	54.6 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.031 lb/hp-hr	450 kW	8,760 hr/yr	81.9 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	5.5 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	5.5 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	680 hp	8,760 hr/yr	71.5 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	1,046 hp	8,760 hr/yr	110.0 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	680 hp	8,760 hr/yr	71.5 tpy
42	EPSS Generator 1	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	8,760 hr/yr	183.4 tpy
43	EPSS Generator 2	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	8,760 hr/yr	183.4 tpy
44	EPSS Generator 3	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	8,760 hr/yr	183.4 tpy
45	EPSS Generator 4	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	8,760 hr/yr	183.4 tpy
52	Boiler	Diesel	Table 1.3-1, AP-42	20.0 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.6 tpy
						Significant Emission Units Total Potential to Emit - NO_X	**1,240.9 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	94 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr	1.0 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr	10.6 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - NO_X	**11.6 tpy**
						Total Potential to Emit - NO_X	**1,252.5 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation to calculate unlimited potential emissions.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Engine Heat Rate:	7,000 Btu/hp-hr

[3] Potential emissions for EU IDs 1-4 are highest when operating on diesel, therefore full time operation on diesel is assumed for the purpose of calculating unlimited potential emissions.

Table D-2.3. Potential Annual Emissions (before controls/limitations) Calculations - Carbon Monoxide (CO) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	CO Emission Factor	Emission Unit Rating/Capacity	Potential Annual Operation [1]	Potential CO Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Diesel [3]	Table 1.4-1, AP-42	84 lb/MMscf	38.5 MMBtu/hr	8,760 hr/yr	14.2 tpy
2	SB-04 Steam Boiler	Diesel [3]	Table 1.4-1, AP-42	84 lb/MMscf	38.5 MMBtu/hr	8,760 hr/yr	14.2 tpy
3a	Steam Boiler	Diesel [3]	Table 1.4-1, AP-42	84 lb/MMscf	47.0 MMBtu/hr	8,760 hr/yr	17.3 tpy
4	SB-06 Steam Boiler	Diesel [3]	Table 1.4-1, AP-42	84 lb/MMscf	42.2 MMBtu/hr	8,760 hr/yr	15.5 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00668 lb/hp-hr	300 kW	8,760 hr/yr	11.8 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00668 lb/hp-hr	450 kW	8,760 hr/yr	17.7 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	4.6 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	4.6 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	680 hp	8,760 hr/yr	16.4 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	1,046 hp	8,760 hr/yr	25.2 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	680 hp	8,760 hr/yr	16.4 tpy
42	EPSS Generator 1	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	8,760 hr/yr	15.0 tpy
43	EPSS Generator 2	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	8,760 hr/yr	15.0 tpy
44	EPSS Generator 3	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	8,760 hr/yr	15.0 tpy
45	EPSS Generator 4	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	8,760 hr/yr	15.0 tpy
52	Boiler	Diesel	Table 1.3-1, AP-42	5 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.1 tpy
						Significant Emission Units Total Potential to Emit - CO	**218.0 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	40 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr	0.4 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr	8.9 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - CO	**9.3 tpy**
						Total Potential to Emit - CO	**227.4 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation to calculate unlimited potential emissions.

[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Engine Heat Rate:	7,000	Btu/hp-hr

[3] Potential emissions for EU IDs 1-4 are highest when operating on natural gas, therefore full time operation on natural gas is assumed for the purpose of calculating unlimited potential emissions.

Table D-2.4. Potential Annual Emissions (before controls/limitations) Calculations - Particulate Matter Less Than 10 Microns (PM_{10}) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	PM_{10} Emission Factor	Emission Unit Rating/Capacity	Potential Annual Operation [1]	Potential PM_{10} Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Diesel [3]	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	38.5 MMBtu/hr	8,760 hr/yr	4.1 tpy
2	SB-04 Steam Boiler	Diesel [3]	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	38.5 MMBtu/hr	8,760 hr/yr	4.1 tpy
3a	Steam Boiler	Diesel [3]	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	47.0 MMBtu/hr	8,760 hr/yr	5.0 tpy
4	SB-06 Steam Boiler	Diesel [3]	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	42.2 MMBtu/hr	8,760 hr/yr	4.5 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.0022 lb/hp-hr	300 kW	8,760 hr/yr	3.9 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.0022 lb/hp-hr	450 kW	8,760 hr/yr	5.8 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	0.4 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	0.4 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	680 hp	8,760 hr/yr	1.2 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	1,046 hp	8,760 hr/yr	1.8 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	680 hp	8,760 hr/yr	1.2 tpy
42	EPSS Generator 1	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
43	EPSS Generator 2	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
44	EPSS Generator 3	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
45	EPSS Generator 4	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
52	Boiler	Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.1 tpy
						Significant Emission Units Total Potential to Emit - PM_{10}	**36.4 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr	0.1 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr	0.8 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - PM_{10}	**0.9 tpy**
						Total Potential to Emit - PM_{10}	**37.3 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation to calculate unlimited potential emissions.

[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Engine Heat Rate:	7,000	Btu/hp-hr

[3] Potential emissions for EU IDs 1-4 are highest when operating on diesel, therefore full time operation on diesel is assumed for the purpose of calculating unlimited potential emissions.

Table D-2.5. Potential Annual Emissions (before controls/limitations) Calculations - Volatile Organic Compounds (VOC) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	VOC Emission Factor	Emission Unit Rating/Capacity	Potential Annual Operation [1]	Potential VOC Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Diesel [3]	Table 1.4-2, AP-42	5.5 lb/MMscf	38.5 MMBtu/hr	8,760 hr/yr	0.9 tpy
2	SB-04 Steam Boiler	Diesel [3]	Table 1.4-2, AP-42	5.5 lb/MMscf	38.5 MMBtu/hr	8,760 hr/yr	0.9 tpy
3a	Steam Boiler	Diesel [3]	Table 1.4-2, AP-42	5.5 lb/MMscf	47.0 MMBtu/hr	8,760 hr/yr	1.1 tpy
4	SB-06 Steam Boiler	Diesel [3]	Table 1.4-2, AP-42	5.5 lb/MMscf	42.2 MMBtu/hr	8,760 hr/yr	1.0 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00247 lb/hp-hr	300 kW	8,760 hr/yr	4.4 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00247 lb/hp-hr	450 kW	8,760 hr/yr	6.5 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	0.3 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	12.6 MMBtu/hr	8,760 hr/yr	0.3 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	680 hp	8,760 hr/yr	2.1 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	1,046 hp	8,760 hr/yr	3.2 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	680 hp	8,760 hr/yr	2.1 tpy
42	EPSS Generator 1	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
43	EPSS Generator 2	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
44	EPSS Generator 3	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
45	EPSS Generator 4	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	8,760 hr/yr	1.0 tpy
52	Boiler	Diesel	Table 1.3-1, AP-42	0.2 lb/kgal	0.872 MMBtu/hr	8,760 hr/yr	0.006 tpy
						Significant Emission Units Total Potential to Emit - VOC	**27.0 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr	0.06 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr	0.6 tpy
66	Ace Tank Distillate Storage	Diesel	See Table D-2.10	NA	1,000 gal	8,760 hr/yr	8.21E-05 tpy
67	201 Underground Storage Tank	Diesel	See Table D-2.10	NA	2,000 gal	8,760 hr/yr	6.39E-05 tpy
69	EPSS Storage Tank 1	Diesel	See Table D-2.10	NA	45,000 gal	8,760 hr/yr	0.003 tpy
70	EPSS Storage Tank 2	Diesel	See Table D-2.10	NA	45,000 gal	8,760 hr/yr	0.003 tpy
						Insignificant Emission Units Total Potential to Emit - VOC	**0.6 tpy**
						Total Potential to Emit - VOC	**27.6 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation to calculate unlimited potential emissions.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Engine Heat Rate:	7,000 Btu/hp-hr

[3] Potential emissions for EU IDs 1-4 are highest when operating on natural gas, therefore full time operation on natural gas is assumed for the purpose of calculating unlimited potential emissions.

Table D-2.6. Potential Annual Emissions (before controls/limitations) Calculations - Sulfur Dioxide (SO_2) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	SO_2 Emission Factor	Emission Unit Rating/Capacity	Potential Annual Operation [1]	Potential SO_2 Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Diesel [3]	Permit Limit	0.5 pct. wt. S	38.5 MMBtu/hr	8,760 hr/yr	84.9 tpy
2	SB-04 Steam Boiler	Diesel [3]	Permit Limit	0.5 pct. wt. S	38.5 MMBtu/hr	8,760 hr/yr	84.9 tpy
3a	Steam Boiler	Diesel [3]	Permit Limit	0.5 pct. wt. S	47.0 MMBtu/hr	8,760 hr/yr	103.7 tpy
4	SB-06 Steam Boiler	Diesel [3]	Permit Limit	0.5 pct. wt. S	42.2 MMBtu/hr	8,760 hr/yr	93.1 tpy
17	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	300 kW	8,760 hr/yr	6.21 tpy
22	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	450 kW	8,760 hr/yr	9.32 tpy
28	MOB Hub Boiler 1	Natural Gas	Permit Limit	12 gr S/100 scf	12.6 MMBtu/hr	8,760 hr/yr	1.9 tpy
29	MOB Hub Boiler 2	Natural Gas	Permit Limit	12 gr S/100 scf	12.6 MMBtu/hr	8,760 hr/yr	1.9 tpy
30	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	680 hp	8,760 hr/yr	10.50 tpy
35	PRB Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	1,046 hp	8,760 hr/yr	16.15 tpy
39	Tower S Emergency Generator Engine	Diesel	Permit Limit	0.05 pct. wt. S	680 hp	8,760 hr/yr	1.05 tpy
42	EPSS Generator 1	Diesel	Permit Limit	15 ppmw	2,937 hp	8,760 hr/yr	0.14 tpy
43	EPSS Generator 2	Diesel	Permit Limit	15 ppmw	2,937 hp	8,760 hr/yr	0.14 tpy
44	EPSS Generator 3	Diesel	Permit Limit	15 ppmw	2,937 hp	8,760 hr/yr	0.14 tpy
45	EPSS Generator 4	Diesel	Permit Limit	15 ppmw	2,937 hp	8,760 hr/yr	0.14 tpy
52	Boiler	Diesel	Permit Limit	0.5 pct. wt. S	0.872 MMBtu/hr	8,760 hr/yr	1.92 tpy
						Significant Emission Units Total Potential to Emit - SO_2	**416.1 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	12 gr/100 scf	2.3 MMBtu/hr	8,760 hr/yr	0.35 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	12 gr/100 scf	24.3 MMBtu/hr	8,760 hr/yr	3.64 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - SO_2	**4.0 tpy**
						Total Potential to Emit - SO_2	**420.1 tpy**

Notes:

[1] Maximum annual operation for all units based on full-time operation to calculate unlimited potential emissions.

[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Turbine Heat Rate:	8,000	Btu/hp-hr
Diesel Density	6.90	lb/gal
Standard Molar Volume	385.3	scf/lb-mol
Engine Heat Rate:	7,000	Btu/hp-hr

[3] Potential emissions for EU IDs 1-4 are highest when operating on diesel, therefore full time operation on diesel is assumed for the purpose of calculating unlimited potential emissions.

Table D-2.7. Potential Annual Emissions (before controls/limitations) Hazardous Air Pollutants (HAP) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	HAP Emission Factor	Emission Unit Rating/Capacity	Allowable Annual Operation [1]	Potential HAP Emissions [2,4]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas [3]	See Table D-1.11	1.89 lb/MMscf	38.5 MMBtu/hr	8,760 hr/yr	0.3 tpy
2	SB-04 Steam Boiler	Natural Gas [3]	See Table D-1.11	1.89 lb/MMscf	38.5 MMBtu/hr	8,760 hr/yr	0.3 tpy
3a	Steam Boiler	Natural Gas [3]	See Table D-1.11	1.89 lb/MMscf	47.0 MMBtu/hr	8,760 hr/yr	0.4 tpy
4	SB-06 Steam Boiler	Natural Gas [3]	See Table D-1.11	1.89 lb/MMscf	42.2 MMBtu/hr	8,760 hr/yr	0.3 tpy
17	Emergency Generator Engine	Natural Gas	See Table D-1.11	1.89 lb/MMscf	300 kW	8,760 hr/yr	2.5 tpy
22	Emergency Generator Engine	Natural Gas	See Table D-1.11	1.89 lb/MMscf	450 kW	8,760 hr/yr	3.7 tpy
28	MOB Hub Boiler 1	Natural Gas	See Table D-1.11	3.87E-03 lb/MMBtu	12.6 MMBtu/hr	8,760 hr/yr	0.00 tpy
29	MOB Hub Boiler 2	Natural Gas	See Table D-1.11	3.87E-03 lb/MMBtu	12.6 MMBtu/hr	8,760 hr/yr	0.00 tpy
30	Emergency Generator Engine	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	680 hp	8,760 hr/yr	0.03 tpy
35	PRB Emergency Generator Engine	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	1,046 hp	8,760 hr/yr	0.05 tpy
39	Tower S Emergency Generator Engine	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	680 hp	8,760 hr/yr	0.03 tpy
42	EPSS Generator 1	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	8,760 hr/yr	0.14 tpy
43	EPSS Generator 2	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	8,760 hr/yr	0.14 tpy
44	EPSS Generator 3	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	8,760 hr/yr	0.14 tpy
45	EPSS Generator 4	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	8,760 hr/yr	0.14 tpy
52	Boiler	Diesel	See Table D-1.11	1.58E-01 lb/10^3Gal	0.872 MMBtu/hr	8,760 hr/yr	0.004 tpy
						Significant Emission Units Total Potential to Emit - HAP	**8.3 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	See Table D-1.11	1.89 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr	0.02 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	See Table D-1.11	1.89 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr	0.2 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr	0 tpy
						Insignificant Emission Units Total Potential to Emit - HAP	**0.2 tpy**
						Total Potential to Emit - HAP	**8.5 tpy**

Notes:
[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.
[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Turbine Heat Rate:	8000	Btu/hp-hr
Diesel Density	6.90	lb/gal
Engine Heat Rate:	7,000	Btu/hp-hr

[3] Potential emissions for EU IDs 1-4 are highest when operating on natural gas, therefore full time operation on fuel gas is assumed for the purpose of calculating unlimited potential emissions.
[4] Individual HAP estimates are not shown as the total HAP emissions are below 10 TPY.

Table D-2.8. Potential Annual Emissions (before controls/limitations) - Hazardous Air Pollutants (HAP) Emission Factors
Providence Health System - Providence Alaska Medical Center

Pollutant	Diesel Boilers AP-42 Tables 1.3-8, 9, & 11	Small Diesel Engines AP-42 Table 3.3-2	Large Diesel Engines AP-42 Tables 3.4-3, 4	Natural Gas Boilers/Heaters AP-42 Tables 1.4-2, 3, & 4
Acenaphthene	2.11E-05 lb/10^3 Gal	1.42E-06 lb/MMBtu	4.68E-06 lb/MMBtu	1.80E-06 lb/MMscf
Acenaphthylene	2.53E-07 lb/10^3 Gal	5.06E-06 lb/MMBtu	9.23E-06 lb/MMBtu	1.80E-06 lb/MMscf
Acetaldehyde	N A	7.67E-04 lb/MMBtu	2.52E-05 lb/MMBtu	N A
Acrolein	N A	9.25E-05 lb/MMBtu	7.88E-06 lb/MMBtu	N A
Anthracene	1.22E-06 lb/10^3 Gal	1.87E-06 lb/MMBtu	1.23E-06 lb/MMBtu	2.40E-06 lb/MMscf
Antimony	5.25E-03 lb/10^3 Gal	N A	N A	N A
Arsenic	1.32E-03 lb/10^3 Gal	N A	N A	2.00E-04 lb/MMscf
Benz(a)anthracene	4.01E-06 lb/10^3 Gal	1.68E-06 lb/MMBtu	6.22E-07 lb/MMBtu	1.80E-06 lb/MMscf
Benzene	2.14E-04 lb/10^3 Gal	9.33E-04 lb/MMBtu	7.76E-04 lb/MMBtu	2.10E-03 lb/MMscf
Benzo(a)pyrene	N A	1.88E-07 lb/MMBtu	2.57E-07 lb/MMBtu	1.20E-06 lb/MMscf
Benzo(b)fluoranthene	1.48E-06 lb/10^3 Gal	9.91E-08 lb/MMBtu	1.11E-06 lb/MMBtu	1.80E-06 lb/MMscf
Benzo(g,h,i)peylene	2.26E-06 lb/10^3 Gal	4.89E-07 lb/MMBtu	5.56E-07 lb/MMBtu	1.20E-06 lb/MMscf
Benzo(k)fluoranthene	N A	1.55E-07 lb/MMBtu	2.18E-07 lb/MMBtu	1.80E-06 lb/MMscf
Beryllium	2.78E-05 lb/10^3 Gal	N A	N A	1.20E-05 lb/MMscf
1,3-Butadiene	N A	3.91E-05 lb/MMBtu	N A	N A
Cadmium	3.98E-04 lb/10^3 Gal	N A	N A	1.10E-03 lb/MMscf
Chromium	8.45E-04 lb/10^3 Gal	N A	N A	1.40E-03 lb/MMscf
Chromium VI	2.48E-04 lb/10^3 Gal	N A	N A	N A
Chrysene	2.38E-06 lb/10^3 Gal	3.53E-07 lb/MMBtu	1.53E-06 lb/MMBtu	1.80E-06 lb/MMscf
Cobalt	6.02E-03 lb/10^3 Gal	N A	N A	8.40E-05 lb/MMscf
Dibenzo(a,h)anthracene	1.37E-06 lb/10^3 Gal	5.83E-07 lb/MMBtu	3.46E-07 lb/MMBtu	1.20E-06 lb/MMscf
1,1,1-Trichloroethane	2.36E-04 lb/10^3 Gal	N A	N A	N A
Ethylbenzene	6.36E-05 lb/10^3 Gal	N A	N A	N A
Fluoranthene	4.84E-06 lb/10^3 Gal	7.61E-06 lb/MMBtu	4.03E-06 lb/MMBtu	3.00E-06 lb/MMscf
Fluorene	4.47E-06 lb/10^3 Gal	2.92E-05 lb/MMBtu	1.28E-06 lb/MMBtu	2.80E-06 lb/MMscf
Formaldehyde	3.30E-02 lb/10^3 Gal	1.18E-03 lb/MMBtu	7.89E-05 lb/MMBtu	7.50E-02 lb/MMscf
Hexane	N A	N A	N A	1.80E+00 lb/MMscf
Indeno(1,2,3-cd)pyrene	2.14E-06 lb/10^3 Gal	3.75E-07 lb/MMBtu	4.14E-07 lb/MMBtu	1.80E-06 lb/MMscf
Lead	1.51E-03 lb/103 Gal	N A	N A	5.00E-04 lb/MMscf
Manganese	3.00E-03 lb/103 Gal	N A	N A	3.80E-04 lb/MMscf
Mercury	1.13E-04 lb/103 Gal	N A	N A	N A
Naphthalene	1.13E-03 lb/10^3 Gal	8.48E-05 lb/MMBtu	1.30E-04 lb/MMBtu	6.10E-04 lb/MMscf
Nickel	8.45E-02 lb/10^3 Gal	N A	N A	2.10E-03 lb/MMscf
Phenanathrene	1.05E-05 lb/10^3 Gal	2.94E-05 lb/MMBtu	4.08E-05 lb/MMBtu	1.70E-05 lb/MMscf
Phosphorous	9.46E-03 lb/10^3 Gal	N A	N A	N A
PAH	N A	N A	N A	N A
Polycylic Organic Matter	3.30E-03 lb/10^3 Gal	N A	N A	N A
Propylene Oxide	N A	N A	N A	N A
Pyrene	4.25E-06 lb/10^3 Gal	4.78E-06 lb/MMBtu	3.71E-06 lb/MMBtu	5.00E-06 lb/MMscf
Selenium	6.83E-04 lb/10^3 Gal	N A	N A	2.40E-05 lb/MMscf
Toluene	6.20E-03 lb/10^3 Gal	4.09E-04 lb/MMBtu	2.81E-04 lb/MMBtu	3.40E-03 lb/MMscf
Xylenes	1.09E-04 lb/10^3 Gal	2.85E-04 lb/MMBtu	1.93E-04 lb/MMBtu	N A
Total HAPs	**1.58E-01 lb/10^3 Gal**	**3.87E-03 lb/MMBtu**	**1.56E-03 lb/MMBtu**	**1.89 lb/MMscf**

Table D-2.9. Potential Annual Emissions (before controls/limitations) Greenhouse Gas Calculations - CO_{2e} Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Emission Unit Rating/Capacity	Potential Annual Operation [1]	CO_2 Emissions [2]	CH_4 Emissions [2]	N_2O Emissions [2]	CO_2e Emissions
Significant Emission Units								
1	SB-03 Steam Boiler	Diesel [3]	38.5 MMBtu/hr	8,760 hr/yr	27,495 tpy	1.12E+00 tpy	2.23E-01 tpy	27,590 tpy
2	SB-04 Steam Boiler	Diesel [3]	38.5 MMBtu/hr	8,760 hr/yr	27,495 tpy	1.12E+00 tpy	2.23E-01 tpy	27,590 tpy
3a	Steam Boiler	Diesel [3]	47.0 MMBtu/hr	8,760 hr/yr	33,566 tpy	1.36E+00 tpy	2.72E-01 tpy	33,681 tpy
4	SB-06 Steam Boiler	Diesel [3]	42.2 MMBtu/hr	8,760 hr/yr	30,138 tpy	1.22E+00 tpy	2.44E-01 tpy	30,241 tpy
17	Emergency Generator Engine	Diesel	300 kW	8,760 hr/yr	2,011 tpy	8.16E-02 tpy	1.63E-02 tpy	2,018 tpy
22	Emergency Generator Engine	Diesel	450 kW	8,760 hr/yr	3,017 tpy	1.22E-01 tpy	2.45E-02 tpy	3,027 tpy
28	MOB Hub Boiler 1	Natural Gas	12.6 MMBtu/hr	8,760 hr/yr	6,456 tpy	1.22E-01 tpy	1.22E-02 tpy	6,462 tpy
29	MOB Hub Boiler 2	Natural Gas	12.6 MMBtu/hr	8,760 hr/yr	6,456 tpy	1.22E-01 tpy	1.22E-02 tpy	6,462 tpy
30	Emergency Generator Engine	Diesel	680 hp	8,760 hr/yr	3,399 tpy	1.38E-01 tpy	2.76E-02 tpy	3,411 tpy
35	PRB Emergency Generator Engine	Diesel	1,046 hp	8,760 hr/yr	5,229 tpy	2.12E-01 tpy	4.24E-02 tpy	5,247 tpy
39	Tower S Emergency Generator Engine	Diesel	680 hp	8,760 hr/yr	3,399 tpy	1.38E-01 tpy	2.76E-02 tpy	3,411 tpy
42	EPSS Generator 1	Diesel	2,937 hp	8,760 hr/yr	14,683 tpy	5.96E-01 tpy	1.19E-01 tpy	14,733 tpy
43	EPSS Generator 2	Diesel	2,937 hp	8,760 hr/yr	14,683 tpy	5.96E-01 tpy	1.19E-01 tpy	14,733 tpy
44	EPSS Generator 3	Diesel	2,937 hp	8,760 hr/yr	14,683 tpy	5.96E-01 tpy	1.19E-01 tpy	14,733 tpy
45	EPSS Generator 4	Diesel	2,937 hp	8,760 hr/yr	14,683 tpy	5.96E-01 tpy	1.19E-01 tpy	14,733 tpy
52	Boiler	Diesel	0.872 MMBtu/hr	8,760 hr/yr	623 tpy	2.53E-02 tpy	5.05E-03 tpy	625 tpy
							Significant Emission Units Total Potential to Emit - CO_2e	**2.09E+05 tpy**
Insignificant Emission Units								
	Various Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	2.3 MMBtu/hr, total	8,760 hr/yr	1,197 tpy	2.26E-02 tpy	2.26E-03 tpy	1,198 tpy
	Various Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	24.3 MMBtu/hr, total	8,760 hr/yr	12,435 tpy	2.34E-01 tpy	2.34E-02 tpy	12,448 tpy
66	Ace Tank Distillate Storage	Diesel	1,000 gal	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
67	201 Underground Storage Tank	Diesel	2,000 gal	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
69	EPSS Storage Tank 1	Diesel	45,000 gal	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
70	EPSS Storage Tank 2	Diesel	45,000 gal	8,760 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
							Insignificant Emission Units Total Potential to Emit - CO_2e	**1.36E+04 tpy**
							Total Potential to Emit - CO_2e	**2.22E+05 tpy**

Notes:
[1] Maximum annual operation for all units based on full-time operation to calculate unlimited potential emissions.
[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Turbine heat rate:	8,000	Btu/hp-hr
Diesel Density	6.90	lb/gal
Engine Heat Rate:	7,000	Btu/hp-hr

GHG Emission Factors (kg/MMBtu):	Fuel Gas	Diesel	GWP
CO_2	53.06	73.96	1
CH_4	1.00E-03	3.00E-03	25
N_2O	1.00E-04	6.00E-04	298

[3] Potential emissions for EU IDs 1-4 are highest when operating on diesel, therefore full time operation on diesel is assumed for the purpose of calculating unlimited potential emissions.

Table D-2.10. Potential Annual Emissions (before controls/limitations) Tank Emissions - VOC Emissions
Providence Health System - Providence Alaska Medical Center

Parameter	Factor Reference	Emissions Unit ID			
		66	67	69	70
Orientation	NA	Horizontal	Horizontal UST	Vertical	Vertical
Contents	NA	Diesel	Diesel	Diesel	Diesel
Diameter (ft)	NA	6	12	15	15
Tank Height (ft), H_S	NA	5	5	40	40
Color	NA	White	White	White	White
Maximum Liquid Height (ft), H_L	NA	4	4	35	35
Capacity (gal)	NA	1,000	2,000	45,000	45,000
Throughput (gal/yr) [1,2]	NA	1,000	2,000	45,000	45,000
Turnovers [4]	NA	1	1	1	1
Paint Condition	NA	Average	Average	Average	Average
Standing Loss (L_S) Calculations [3]					
K_E	AP-42, Section 7.1, Equation 1-12	0.019	0.019	0.019	0.019
H_{VO} (ft)	AP-42, Section 7.1, Equation 1-16	1.06	1.13	5.16	5.16
H_{RO} (ft)	AP-42, Section 7.1, Equation 1-17	0.06	0.13	0.16	0.16
K_S	AP-42, Section 7.1, Equation 1-21	1.000	1.000	0.998	0.998
T_{AA} (^oR)	AP-42, Section 7.1, Equation 1-30	497.60	497.60	497.60	497.60
T_B (^oR)	AP-42, Section 7.1, Equation 1-31	498.23	498.23	498.23	498.23
T_V (^oR) - uninsulated	AP-42, Section 7.1, Equation 1-33	152.05	152.05	152.05	152.05
W_V (lb/ft^3)	AP-42, Section 7.1, Equation 1-22	4.78E-04	4.78E-04	4.78E-04	4.78E-04
L_S (lb/yr)	AP-42, Section 7.1, Equation 1-4	0.10	0	3.04	3.04
Working Loss (L_W) Calculations [3]					
Q (bbl/yr)	NA	24	48	1,071	1,071
V_Q (ft^3)	AP-42, Section 7.1, Equation 1-39	134	267	6,015	6,015
K_N [4]	AP-42, Section 7.1, Equation 1-35	1.00	1.00	1.00	1.00
L_W (lb/yr)	AP-42, Section 7.1, Equation 1-35	0.1	0.1	2.9	2.9
TOTAL VOCs L_T (tpy)	**AP-42, Section 7.1, Equation 1-1**	**8.21E-05**	**6.39E-05**	**0.003**	**0.003**

Note:

[1] Tanks are filled with submerged loading.

[2] EU ID 67 is conservatively estimated as an above ground storage tank.

[3] Meteorological Inputs (Anchorage, AK):

	T_{AX} =	42.5	^oF	502.2 ^oK
AP-42, Section 7.1, Table 7.1-6	T_{AN} =	33.3	^oF	493.0 ^oK
AP-42, Section 7.1, Table 7.1-7	α =	0.25	White, Average	
From the 1995 version of AP-42	I =	838	Btu/ft^2-d	

Constants:

AP-42, Section 7.1, Table 7.1-2 (diesel/distilate)

AP-42, Section 7.1, Table 7.1-2 M_V (diesel)=	130	lb/lb-mol	
AP-42, Section 7.1, Note below equation 1-37 $_{VA}$ (diesel)=	0.006	psi	
AP-42, Section 7.1, Note below equation 1-37 K_P (diesel)=	1		
K_B =	1		

[4] K_N is equal to 1 for 36 or less turnovers per year

Table D-3.1. Expected Actual Annual Emissions (after controls/limitations) Summary
Providence Health System - Providence Alaska Medical Center

Emission Unit Type	Regulated Air Pollutant Emissions (tons per year) [1,2]							
	NO_X	CO	PM_{10}	$PM_{2.5}$ [3]	VOC	SO_2	HAP [4]	GHG (CO_2e) [5]
Significant	24.8	19.2	1.7	1.7	1.3	7.9	0.4	36,666
Insignificant	11.6	9.3	0.9	0.9	0.1	0.8	0.2	13,645
Total Expected Actual Emissions	**36.4**	**28.5**	**2.6**	**2.6**	**1.4**	**8.7**	**0.65**	**50,311**

Notes:

[1] Emissions are based on 2021 actual operations and emission factors recorded in source tests, where applicable.

[2] Regulated air pollutant calculations based on AP-42 emission factors, manufacturer data, and mass balances as shown in accompanying spreadsheets.

[3] PM_{10} emissions are assumed to equal $PM_{2.5}$ emissions.

[4] HAP emissions are a subset of either VOC emissions or PM_{10} emissions and are excluded from the total.

[5] GHG means greenhouse gases and is the summation of CO_2, CH_4, and N_2O and applying the global warming potential for each pollutant.

Table D-3.2. Expected Actual Annual Emissions (after controls/limitations) Calculations - Oxides of Nitrogen (NO_X) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	NO_X Emission Factor	Emission Unit Rating/Capacity	Expected Actual Operation [1]	Expected Actual NO_X Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	38.5 MMBtu/hr	65,847 Mscf/yr	3.3 tpy
		Diesel	Table 1.3-1, AP-42	20 lb/10^3 Gal		0 gal/yr	0 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	38.5 MMBtu/hr	173,252 Mscf/yr	8.7 tpy
		Diesel	Table 1.3-1, AP-42	20 lb/10^3 Gal		1,311 gal/yr	0.01 tpy
3a	Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	47.0 MMBtu/hr	56,869 Mscf/yr	2.8 tpy
		Diesel	Table 1.3-1, AP-42	20 lb/10^3 Gal		565 gal/yr	0.01 tpy
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	42.2 MMBtu/hr	110,509 Mscf/yr	5.5 tpy
		Diesel	Table 1.3-1, AP-42	20 lb/10^3 Gal		736 gal/yr	0.01 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.031 lb/hp-hr	300 kW	13 hr/yr	0.1 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.031 lb/hp-hr	450 kW	14 hr/yr	0.1 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	12.6 MMBtu/hr	17,491 Mscf/yr	0.9 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	12.6 MMBtu/hr	25,892 Mscf/yr	1.3 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	680 hp	14 hr/yr	0.1 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	1,046 hp	15 hr/yr	0.2 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.024 lb/hp-hr	680 hp	14 hr/yr	0.1 tpy
42	EPSS Generator 1	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	20 hr/yr	0.4 tpy
43	EPSS Generator 2	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	20 hr/yr	0.4 tpy
44	EPSS Generator 3	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	20 hr/yr	0.4 tpy
45	EPSS Generator 4	Diesel	Vendor Data	41.9 lb/hr	2,937 hp	20 hr/yr	0.4 tpy
46	EPSS Generator 5	Diesel	Vendor Data	41.9 lb/hr	2,937.0 hp	0 hr/yr	0 tpy
52	Boiler	Diesel	Table 1.3-1, AP-42	20.0 lb/kgal	0.872 MMBtu/hr	24 hr/yr	0.002 tpy
						Significant Emission Units Expected Actual Emissions - NO_X	**24.8 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	94 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr [3]	1.0 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	100 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr [3]	10.6 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr [3]	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr [3]	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
						Insignificant Emission Units Expected Actual Emissions - NO_X	**11.6 tpy**
						Total Expected Actual Emissions - NO_X	**36.4 tpy**

Notes:

[1] Actual emissions based on operation in calendar year 2021.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Engine Heat Rate:	7,000 Btu/hp-hr

[3] These units are not required to be monitored for hours of operation or throughput. Expected actual hours of operation are listed as the highest possible operation.

Table D-3.3. Expected Actual Annual Emissions (after controls/limitations) Calculations - Carbon Monoxide (CO) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	CO Emission Factor	Emission Unit Rating/Capacity	Expected Actual Operation [1]	Expected Actual CO Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	38.5 MMBtu/hr	65,847 Mscf/yr	2.8 tpy
		Diesel	Table 1.3-1, AP-42	5 lb/10^3 Gal		0 gal/yr	0 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	38.5 MMBtu/hr	173,252 Mscf/yr	7.3 tpy
		Diesel	Table 1.3-1, AP-42	5 lb/10^3 Gal		1,311 gal/yr	0.003 tpy
3a	Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	47.0 MMBtu/hr	56,869 Mscf/yr	2.4 tpy
		Diesel	Table 1.3-1, AP-42	5 lb/10^3 Gal		565 gal/yr	0.001 tpy
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	42.2 MMBtu/hr	110,509 Mscf/yr	4.6 tpy
		Diesel	Table 1.3-1, AP-42	5 lb/10^3 Gal		736 gal/yr	0.002 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00668 lb/hp-hr	300 kW	13 hr/yr	0.02 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00668 lb/hp-hr	450 kW	14 hr/yr	0.03 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	12.6 MMBtu/hr	17,491 Mscf/yr	0.7 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	12.6 MMBtu/hr	25,892 Mscf/yr	1.1 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	680 hp	14 hr/yr	0.03 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	1,046 hp	15 hr/yr	0.04 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	0.0055 lb/hp-hr	680 hp	14 hr/yr	0.03 tpy
42	EPSS Generator 1	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	20 hr/yr	0.03 tpy
43	EPSS Generator 2	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	20 hr/yr	0.03 tpy
44	EPSS Generator 3	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	20 hr/yr	0.03 tpy
45	EPSS Generator 4	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	20 hr/yr	0.03 tpy
46	EPSS Generator 5	Diesel	Vendor Data	3.43 lb/hr	2,937 hp	0 hr/yr	0 tpy
52	Boiler	Diesel	Table 1.3-1, AP-42	5 lb/kgal	0.872 MMBtu/hr	24 hr/yr	3.82E-04 tpy
Significant Emission Units Expected Actual Emissions - CO							**19.2 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	40 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr [3]	0.4 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-1, AP-42	84 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr [3]	8.9 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr [3]	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr [3]	0 tpy
69	EPSS Storage Tank 1	Diesel	N/A	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
70	EPSS Storage Tank 2	Diesel	N/A	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
Insignificant Emission Units Expected Actual Emissions - CO							**9.3 tpy**
Total Expected Actual Emissions - CO							**28.5 tpy**

Notes:

[1] Actual emissions based on operation in calendar year 2021.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Engine Heat Rate:	7,000 Btu/hp-hr

[3] These units are not required to be monitored for hours of operation or throughput. Expected actual hours of operation are listed as the highest possible operation.

Table D-3.4. Expected Actual Annual Emissions (after controls/limitations) Calculations - Particulate Matter Less Than 10 Microns (PM10) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	PM_{10} Emission Factor	Emission Unit Rating/Capacity	Expected Actual Operation [1]	Expected Actual PM_{10} Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	38.5 MMBtu/hr	65,847 Mscf/yr	0.3 tpy
		Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/10^3 Gal		0 gal/yr	0 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	38.5 MMBtu/hr	173,252 Mscf/yr	0.7 tpy
		Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/10^3 Gal		1,311 gal/yr	2.2E-03 tpy
3a	Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	47.0 MMBtu/hr	56,869 Mscf/yr	0.2 tpy
		Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/10^3 Gal		565 gal/yr	9.32E-04 tpy
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	42.2 MMBtu/hr	110,509 Mscf/yr	0.4 tpy
		Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/10^3 Gal		736 gal/yr	1.2E-03 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.0022 lb/hp-hr	300 kW	13 hr/yr	5.8E-03 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.0022 lb/hp-hr	450 kW	14 hr/yr	9.2E-03 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	12.6 MMBtu/hr	17,491 Mscf/yr	0.1 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	12.6 MMBtu/hr	25,892 Mscf/yr	0.1 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	680 hp	14 hr/yr	1.8E-03 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	1,046 hp	15 hr/yr	3.1E-03 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-2, AP-42	0.0573 lb/MMBtu	680 hp	14 hr/yr	1.9E-03 tpy
42	EPSS Generator 1	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
43	EPSS Generator 2	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
44	EPSS Generator 3	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
45	EPSS Generator 4	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
46	EPSS Generator 5	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	0 hr/yr	0 tpy
52	Boiler	Diesel	Table 1.3-1 and 1.3-2, AP-42	3.30 lb/kgal	0.872 MMBtu/hr	24 hr/yr	2.52E-04 tpy
						Significant Emission Units Expected Actual Emissions - PM_{10}	**1.7 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr [3]	0.08 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	7.6 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr [3]	0.8 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr [3]	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr [3]	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
						Insignificant Emission Units Expected Actual Emissions - PM_{10}	**0.9 tpy**
						Total Expected Actual Emissions - PM_{10}	**2.6 tpy**

Notes:

[1] Actual emissions based on operation in calendar year 2021.

[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Engine Heat Rate:	7,000	Btu/hp-hr

[3] These units are not required to be monitored for hours of operation or throughput. Expected actual hours of operation are listed as the highest possible operation.

Table D-3.5. Expected Actual Annual Emissions (after controls/limitations) Calculations - Volatile Organic Compounds (VOC) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	VOC Emission Factor	Emission Unit Rating/Capacity	Expected Actual Operation [1]	Expected Actual VOC Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	38.5 MMBtu/hr	65,847 Mscf/yr	0.2 tpy
		Diesel	Table 1.3-1, AP-42	0.2 lb/10^3 Gal		0 gal/yr	0 tpy
2	SB-04 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	38.5 MMBtu/hr	173,252 Mscf/yr	0.5 tpy
		Diesel	Table 1.3-1, AP-42	0.2 lb/10^3 Gal		1,311 gal/yr	1.3E-04 tpy
3a	Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	47.0 MMBtu/hr	56,869 Mscf/yr	0.2 tpy
		Diesel	Table 1.3-1, AP-42	0.2 lb/10^3 Gal		565 gal/yr	5.65E-05 tpy
4	SB-06 Steam Boiler	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	42.2 MMBtu/hr	110,509 Mscf/yr	0.3 tpy
		Diesel	Table 1.3-1, AP-42	0.2 lb/10^3 Gal		736 gal/yr	7.4E-05 tpy
17	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00247 lb/hp-hr	300 kW	13 hr/yr	6.5E-03 tpy
22	Emergency Generator Engine	Diesel	Table 3.3-1, AP-42	0.00247 lb/hp-hr	450 kW	14 hr/yr	1.0E-02 tpy
28	MOB Hub Boiler 1	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	12.6 MMBtu/hr	17,491 Mscf/yr	0.05 tpy
29	MOB Hub Boiler 2	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	12.6 MMBtu/hr	25,892 Mscf/yr	0.07 tpy
30	Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	680 hp	14 hr/yr	3.2E-03 tpy
35	PRB Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	1,046 hp	15 hr/yr	5.5E-03 tpy
39	Tower S Emergency Generator Engine	Diesel	Table 3.4-1, AP-42	7.05E-04 lb/hp-hr	680 hp	14 hr/yr	3.3E-03 tpy
42	EPSS Generator 1	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
43	EPSS Generator 2	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
44	EPSS Generator 3	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
45	EPSS Generator 4	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	20 hr/yr	2.3E-03 tpy
46	EPSS Generator 5	Diesel	Vendor Data	0.23 lb/hr	2,937 hp	0 hr/yr	0 tpy
52	Boiler	Diesel	Table 1.3-1, AP-42	0.2 lb/kgal	0.872 MMBtu/hr	24 hr/yr	1.5E-05 tpy
						Significant Emission Units Expected Actual Emissions - VOC	**1.3 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr [3]	0.06 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	5.5 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr [3]	0.08 tpy
66	Ace Tank Distillate Storage	Diesel	See Table D-3.10	NA	1,000 gal	8,760 hr/yr [3]	8.2E-05 tpy
67	201 Underground Storage Tank	Diesel	See Table D-3.10	NA	2,000 gal	8,760 hr/yr [3]	6.4E-05 tpy
69	EPSS Storage Tank 1	Diesel	See Table D-3.10	NA	45,000 gal	8,760 hr/yr [3]	3.0E-03 tpy
70	EPSS Storage Tank 2	Diesel	See Table D-3.10	NA	45,000 gal	8,760 hr/yr [3]	3.0E-03 tpy
						Insignificant Emission Units Expected Actual Emissions - VOC	**0.1 tpy**
						Total Expected Actual Emissions - VOC	**1.4 tpy**

Notes:

[1] Actual emissions based on operation in calendar year 2021.

[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Engine Heat Rate:	7,000	Btu/hp-hr

[3] These units are not required to be monitored for hours of operation or throughput. Expected actual hours of operation are listed as the highest possible operation and significant tanks assume one turnover a year.

Table D-3.6. Expected Actual Annual Emissions (after controls/limitations) Calculations - Sulfur Dioxide (SO_2) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	SO_2 Emission Factor	Emission Unit Rating/Capacity	Expected Actual Operation [1]	Expected Actual SO_2 Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	38.5 MMBtu/hr	65,847 Mscf/yr	1.1 tpy
		Diesel	Permit Limit	0.5 pct. wt. S		0 gal/yr	0 tpy
2	SB-04 Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	38.5 MMBtu/hr	173,252 Mscf/yr	3.0 tpy
		Diesel	Permit Limit	0.5 pct. wt. S		1,311 gal/yr	0.05 tpy
3a	Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	47.0 MMBtu/hr	56,869 Mscf/yr	1.0 tpy
		Diesel	Permit Limit	0.5 pct. wt. S		565 gal/yr	0.02 tpy
4	SB-06 Steam Boiler	Natural Gas	Permit Limit	12 gr S/100 scf	42.2 MMBtu/hr	110,509 Mscf/yr	1.9 tpy
		Diesel	Permit Limit	0.5 pct. wt. S		736 gal/yr	0.03 tpy
17	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	300 kW	13 hr/yr	0.009 tpy
22	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	450 kW	14 hr/yr	0.01 tpy
28	MOB Hub Boiler 1	Natural Gas	Permit Limit	12 gr S/100 scf	12.6 MMBtu/hr	17,491 Mscf/yr	0.3 tpy
29	MOB Hub Boiler 2	Natural Gas	Permit Limit	12 gr S/100 scf	12.6 MMBtu/hr	25,892 Mscf/yr	0.4 tpy
30	Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	680 hp	14 hr/yr	0.02 tpy
35	PRB Emergency Generator Engine	Diesel	Permit Limit	0.5 pct. wt. S	1,046 hp	15 hr/yr	0.03 tpy
39	Tower S Emergency Generator Engine	Diesel	Permit Limit	0.05 pct. wt. S	680 hp	14 hr/yr	0.00 tpy
42	EPSS Generator 1	Diesel	Permit Limit	15 ppmw	2,937 hp	20 hr/yr	3.1E-04 tpy
43	EPSS Generator 2	Diesel	Permit Limit	15 ppmw	2,937 hp	20 hr/yr	3.1E-04 tpy
44	EPSS Generator 3	Diesel	Permit Limit	15 ppmw	2,937 hp	20 hr/yr	3.1E-04 tpy
45	EPSS Generator 4	Diesel	Permit Limit	15 ppmw	2,937 hp	20 hr/yr	3.1E-04 tpy
46	EPSS Generator 5	Diesel	Permit Limit	15 ppmw	2,937 hp	0 hr/yr	0 tpy
52	Boiler	Diesel	Permit Limit	0.5 pct. wt. S	0.872 MMBtu/hr	24 hr/yr	0.01 tpy
						Significant Emission Units Expected Actual Emissions - SO_2	**7.88 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	12 gr/100 scf	2.3 MMBtu/hr	8,760 hr/yr [3]	0.4 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	Table 1.4-2, AP-42	12 gr/100 scf	24.3 MMBtu/hr	8,760 hr/yr [3]	0.5 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr [3]	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr [3]	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
						Insignificant Emission Units Expected Actual Emissions - SO_2	**0.8 tpy**
						Total Expected Actual Emissions - SO_2	**8.7 tpy**

Notes:

[1] Actual emissions based on operation in calendar year 2021.

[2] Conversion factors:

Diesel Heating Value	137,000 Btu/gal
Natural Gas Heat Content:	1,000 Btu/scf
Turbine Heat Rate:	8,000 Btu/hp-hr
Diesel Density	6.90 lb/gal
Standard Molar Volume	385.3 scf/lb-mol
Engine Heat Rate:	7,000 Btu/hp-hr

[3] These units are not required to be monitored for hours of operation or throughput. Expected actual hours of operation are listed as the highest possible operation.

Table D-3.7. Expected Actual Annual Emissions (after controls/limitations) Calculations - Hazardous Air Pollutants (HAP) Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Factor Reference	HAP Emission Factor	Emission Unit Rating/Capacity	Expected Actual Operation [1]	Expected Actual HAP Emissions [2]
Significant Emission Units							
1	SB-03 Steam Boiler	Natural Gas	See Table D-1.11	1.89 lb/MMscf	38.5 MMBtu/hr	65,847 Mscf/yr	0.06 tpy
		Diesel	See Table D-1.11	1.58E-01 lb/10^3 Gal		0 gal/yr	0 tpy
2	SB-04 Steam Boiler	Natural Gas	See Table D-1.11	1.89 lb/MMscf	38.5 MMBtu/hr	173,252 Mscf/yr	0.2 tpy
		Diesel	See Table D-1.11	1.58E-01 lb/10^3 Gal		1,311 gal/yr	1.03E-04 tpy
3a	Steam Boiler	Natural Gas	See Table D-1.11	1.89 lb/MMscf	47.0 MMBtu/hr	56,869 Mscf/yr	0.05 tpy
		Diesel	See Table D-1.11	1.58E-01 lb/10^3 Gal		565 gal/yr	4.45E-05 tpy
4	SB-06 Steam Boiler	Natural Gas	See Table D-1.11	1.89 lb/MMscf	42.2 MMBtu/hr	110,509 Mscf/yr	0.1 tpy
		Diesel	See Table D-1.11	1.58E-01 lb/10^3 Gal		736 gal/yr	5.80E-05 tpy
17	Emergency Generator Engine	Diesel	See Table D-1.11	3.87E-03 lb/MMBtu	300 kW	13 hr/yr	7.15E-05 tpy
22	Emergency Generator Engine	Diesel	See Table D-1.11	3.87E-03 lb/MMBtu	450 kW	14 hr/yr	1.14E-04 tpy
28	MOB Hub Boiler 1	Natural Gas	See Table D-1.11	1.89 lb/MMscf	12.6 MMBtu/hr	17,491 Mscf/yr	0.02 tpy
29	MOB Hub Boiler 2	Natural Gas	See Table D-1.11	1.89 lb/MMscf	12.6 MMBtu/hr	25,892 Mscf/yr	0.02 tpy
30	Emergency Generator Engine	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	680 hp	14 hr/yr	5.02E-05 tpy
35	PRB Emergency Generator Engine	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	1,046 hp	15 hr/yr	8.52E-05 tpy
39	Tower S Emergency Generator Engine	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	680 hp	14 hr/yr	5.09E-05 tpy
42	EPSS Generator 1	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	20 hr/yr	3.18E-04 tpy
43	EPSS Generator 2	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	20 hr/yr	3.18E-04 tpy
44	EPSS Generator 3	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	20 hr/yr	3.18E-04 tpy
45	EPSS Generator 4	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	20 hr/yr	3.18E-04 tpy
46	EPSS Generator 5	Diesel	See Table D-1.11	1.56E-03 lb/MMBtu	2,937 hp	0 hr/yr	0 tpy
52	Boiler	Diesel	See Table D-1.11	1.58E-01 lb/10^3Gal	0.872 MMBtu/hr	24 hr/yr	1.20E-05 tpy
Significant Emission Units Total Potential to Emit with Limits - HAP							**0.4 tpy**
Insignificant Emission Units							
N/A	Various Combined Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	See Table D-1.11	1.89 lb/MMscf	2.3 MMBtu/hr	8,760 hr/yr [3]	0.02 tpy
N/A	Various Combined Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	See Table D-1.11	1.89 lb/MMscf	24.3 MMBtu/hr	8,760 hr/yr [3]	0.20 tpy
66	Ace Tank Distillate Storage	Diesel	NA	N A	1,000 gal	8,760 hr/yr [3]	0 tpy
67	201 Underground Storage Tank	Diesel	NA	N A	2,000 gal	8,760 hr/yr [3]	0 tpy
69	EPSS Storage Tank 1	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
70	EPSS Storage Tank 2	Diesel	NA	N A	45,000 gal	8,760 hr/yr [3]	0 tpy
Insignificant Emission Units Total Potential to Emit with Limits - HAP							**0.2 tpy**
Total Potential to Emit with Limits - HAP							**0.6 tpy**

Notes:
[1] Maximum annual operation for all units based on full-time operation, or permit operating limits, where applicable.
[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Turbine Heat Rate:	8000	Btu/hp-hr
Diesel Density	6.90	lb/gal
Engine Heat Rate:	7,000	Btu/hp-hr

[3] These units are not required to be monitored for hours of operation or throughput. Expected actual hours of operation are listed as the highest possible operation.

Table D-3.8. Expected Actual Annual Emissions (after controls/limitations) - Hazardous Air Pollutants (HAP) Emission Factors
Providence Health System - Providence Alaska Medical Center

Pollutant	Diesel Boilers AP-42 Tables 1.3-8, 9, & 11	Small Diesel Engines AP-42 Table 3.3-2	Large Diesel Engines AP-42 Tables 3.4-3, 4	Natural Gas Boilers/Heaters AP-42 Tables 1.4-2, 3, & 4
Acenaphthene	2.11E-05 lb/10^3 Gal	1.42E-06 lb/MMBtu	4.68E-06 lb/MMBtu	1.80E-06 lb/MMscf
Acenaphthylene	2.53E-07 lb/10^3 Gal	5.06E-06 lb/MMBtu	9.23E-06 lb/MMBtu	1.80E-06 lb/MMscf
Acetaldehyde	N A	7.67E-04 lb/MMBtu	2.52E-05 lb/MMBtu	N A
Acrolein	N A	9.25E-05 lb/MMBtu	7.88E-06 lb/MMBtu	N A
Anthracene	1.22E-06 lb/10^3 Gal	1.87E-06 lb/MMBtu	1.23E-06 lb/MMBtu	2.40E-06 lb/MMscf
Antimony	5.25E-03 lb/10^3 Gal	N A	N A	N A
Arsenic	1.32E-03 lb/10^3 Gal	N A	N A	2.00E-04 lb/MMscf
Benz(a)anthracene	4.01E-06 lb/10^3 Gal	1.68E-06 lb/MMBtu	6.22E-07 lb/MMBtu	1.80E-06 lb/MMscf
Benzene	2.14E-04 lb/10^3 Gal	9.33E-04 lb/MMBtu	7.76E-04 lb/MMBtu	2.10E-03 lb/MMscf
Benzo(a)pyrene	N A	1.88E-07 lb/MMBtu	2.57E-07 lb/MMBtu	1.20E-06 lb/MMscf
Benzo(b)fluoranthene	1.48E-06 lb/10^3 Gal	9.91E-08 lb/MMBtu	1.11E-06 lb/MMBtu	1.80E-06 lb/MMscf
Benzo(g,h,i)peylene	2.26E-06 lb/10^3 Gal	4.89E-07 lb/MMBtu	5.56E-07 lb/MMBtu	1.20E-06 lb/MMscf
Benzo(k)fluoranthene	N A	1.55E-07 lb/MMBtu	2.18E-07 lb/MMBtu	1.80E-06 lb/MMscf
Beryllium	2.78E-05 lb/10^3 Gal	N A	N A	1.20E-05 lb/MMscf
1,3-Butadiene	N A	3.91E-05 lb/MMBtu	N A	N A
Cadmium	3.98E-04 lb/10^3 Gal	N A	N A	1.10E-03 lb/MMscf
Chromium	8.45E-04 lb/10^3 Gal	N A	N A	1.40E-03 lb/MMscf
Chromium VI	2.48E-04 lb/10^3 Gal	N A	N A	N A
Chrysene	2.38E-06 lb/10^3 Gal	3.53E-07 lb/MMBtu	1.53E-06 lb/MMBtu	1.80E-06 lb/MMscf
Cobalt	6.02E-03 lb/10^3 Gal	N A	N A	8.40E-05 lb/MMscf
Dibenzo(a,h)anthracene	1.37E-06 lb/10^3 Gal	5.83E-07 lb/MMBtu	3.46E-07 lb/MMBtu	1.20E-06 lb/MMscf
1,1,1-Trichloroethane	2.36E-04 lb/10^3 Gal	N A	N A	N A
Ethylbenzene	6.36E-05 lb/10^3 Gal	N A	N A	N A
Fluoranthene	4.84E-06 lb/10^3 Gal	7.61E-06 lb/MMBtu	4.03E-06 lb/MMBtu	3.00E-06 lb/MMscf
Fluorene	4.47E-06 lb/10^3 Gal	2.92E-05 lb/MMBtu	1.28E-06 lb/MMBtu	2.80E-06 lb/MMscf
Formaldehyde	3.30E-02 lb/10^3 Gal	1.18E-03 lb/MMBtu	7.89E-05 lb/MMBtu	7.50E-02 lb/MMscf
Hexane	N A	N A	N A	1.80E+00 lb/MMscf
Indeno(1,2,3-cd)pyrene	2.14E-06 lb/10^3 Gal	3.75E-07 lb/MMBtu	4.14E-07 lb/MMBtu	1.80E-06 lb/MMscf
Lead	1.51E-03 lb/103 Gal	N A	N A	5.00E-04 lb/MMscf
Manganese	3.00E-03 lb/103 Gal	N A	N A	3.80E-04 lb/MMscf
Mercury	1.13E-04 lb/103 Gal	N A	N A	N A
Naphthalene	1.13E-03 lb/10^3 Gal	8.48E-05 lb/MMBtu	1.30E-04 lb/MMBtu	6.10E-04 lb/MMscf
Nickel	8.45E-02 lb/10^3 Gal	N A	N A	2.10E-03 lb/MMscf
Phenanathrene	1.05E-05 lb/10^3 Gal	2.94E-05 lb/MMBtu	4.08E-05 lb/MMBtu	1.70E-05 lb/MMscf
Phosphorous	9.46E-03 lb/10^3 Gal	N A	N A	N A
PAH	N A	N A	N A	N A
Polycylic Organic Matter	3.30E-03 lb/10^3 Gal	N A	N A	N A
Propylene Oxide	N A	N A	N A	N A
Pyrene	4.25E-06 lb/10^3 Gal	4.78E-06 lb/MMBtu	3.71E-06 lb/MMBtu	5.00E-06 lb/MMscf
Selenium	6.83E-04 lb/10^3 Gal	N A	N A	2.40E-05 lb/MMscf
Toluene	6.20E-03 lb/10^3 Gal	4.09E-04 lb/MMBtu	2.81E-04 lb/MMBtu	3.40E-03 lb/MMscf
Xylenes	1.09E-04 lb/10^3 Gal	2.85E-04 lb/MMBtu	1.93E-04 lb/MMBtu	N A
Total HAPs	**1.58E-01 lb/10^3 Gal**	**3.87E-03 lb/MMBtu**	**1.56E-03 lb/MMBtu**	**1.89 lb/MMscf**

Table D-3.9. Expected Actual Annual Emissions (after controls/limitations) Greenhouse Gas Calculations - CO_2e Emissions
Providence Health System - Providence Alaska Medical Center

Emission Unit ID	Emission Unit Description	Fuel Type	Emission Unit Rating/Capacity	Expected Actual Operation [1]	CO_2 Emissions [2]	CH_4 Emissions [2]	N_2O Emissions [2]	CO_2e Emissions
Significant Emission Units								
1	SB-03 Steam Boiler	Natural Gas	38.5 MMBtu/hr	65,847 Mscf/yr	3,851 tpy	7.26E-02 tpy	7.26E-03 tpy	3,855 tpy
		Diesel		0 gal/yr	0 tpy	0 tpy	0 tpy	0 tpy
2	SB-04 Steam Boiler	Natural Gas	38.5 MMBtu/hr	173,252 Mscf/yr	10,133 tpy	1.91E-01 tpy	1.91E-02 tpy	10,144 tpy
		Diesel		1,311 gal/yr	15 tpy	5.94E-04 tpy	1.19E-04 tpy	15 tpy
3a	Steam Boiler	Natural Gas	47.0 MMBtu/hr	56,869 Mscf/yr	3,326 tpy	6.27E-02 tpy	6.27E-03 tpy	3,330 tpy
		Diesel		565 gal/yr	6 tpy	2.56E-04 tpy	5.12E-05 tpy	6 tpy
4	SB-06 Steam Boiler	Natural Gas	42.2 MMBtu/hr	110509 Mscf/yr	6,463 tpy	1.22E-01 tpy	1.22E-02 tpy	6,470 tpy
		Diesel		736 gal/yr	8 tpy	3.33E-04 tpy	6.67E-05 tpy	8 tpy
17	Emergency Generator Engine	Diesel	300.0 kW	17,491 Mscf/yr	1,023 tpy	1.93E-02 tpy	1.93E-03 tpy	1,024 tpy
22	Emergency Generator Engine	Diesel	450.0 kW	25,892 Mscf/yr	1,514 tpy	2.85E-02 tpy	2.85E-03 tpy	1,516 tpy
28	MOB Hub Boiler 1	Natural Gas	12.6 MMBtu/hr	65,847 Mscf/yr	3,851 tpy	7.26E-02 tpy	7.26E-03 tpy	3,855 tpy
29	MOB Hub Boiler 2	Natural Gas	12.6 MMBtu/hr	173,252 Mscf/yr	10,133 tpy	1.91E-01 tpy	1.91E-02 tpy	10,144 tpy
30	Emergency Generator Engine	Diesel	680 hp	14 hr/yr	5 tpy	2.13E-04 tpy	4.25E-05 tpy	5 tpy
35	PRB Emergency Generator Engine	Diesel	1,046 hp	15 hr/yr	9 tpy	3.61E-04 tpy	7.22E-05 tpy	9 tpy
39	Tower S Emergency Generator Engine	Diesel	680 hp	14 hr/yr	5 tpy	2.16E-04 tpy	4.31E-05 tpy	5 tpy
42	EPSS Generator 1	Diesel	2,937 hp	20 hr/yr	33 tpy	1.35E-03 tpy	2.69E-04 tpy	33 tpy
43	EPSS Generator 2	Diesel	2,937 hp	20 hr/yr	33 tpy	1.35E-03 tpy	2.69E-04 tpy	33 tpy
44	EPSS Generator 3	Diesel	2,937 hp	20 hr/yr	33 tpy	1.35E-03 tpy	2.69E-04 tpy	33 tpy
45	EPSS Generator 4	Diesel	2,937 hp	20 hr/yr	33 tpy	1.35E-03 tpy	2.69E-04 tpy	33 tpy
46	EPSS Generator 5	Diesel	2,937 hp	0 hr/yr	0 tpy	0 tpy	0 tpy	0 tpy
52	Boiler	Diesel	0.872 MMBtu/hr	24 hr/yr	2 tpy	6.92E-05 tpy	1.38E-05 tpy	2 tpy
					Significant Emission Units Total Expected Actual Emissions - CO_2e			**36,666 tpy**
Insignificant Emission Units								
	Various Natural Gas-Fired Boilers and Heaters <0.3 MMBtu/hr	Natural Gas	2.3 MMBtu/hr	8,760 hr/yr [3]	1.20E+03 tpy	2.25E-02 tpy	2.25E-03 tpy	1.20E+03 tpy
	Various Natural Gas-Fired Boilers and Heaters >0.3 MMBtu/hr, <100 MMBtu/hr	Natural Gas	24.3 MMBtu/hr	8,760 hr/yr [3]	1.24E+04 tpy	2.34E-01 tpy	2.34E-02 tpy	1.24E+04 tpy
66	Ace Tank Distillate Storage	Diesel	1,000 gal	8,760 hr/yr [3]	0 tpy	0 tpy	0 tpy	0 tpy
67	201 Underground Storage Tank	Diesel	2,000 gal	8,760 hr/yr [3]	0 tpy	0 tpy	0 tpy	0 tpy
69	EPSS Storage Tank 1	Diesel	45,000 gal	8,760 hr/yr [3]	0 tpy	0 tpy	0 tpy	0 tpy
70	EPSS Storage Tank 2	Diesel	45,000 gal	8,760 hr/yr [3]	0 tpy	0 tpy	0 tpy	0 tpy
					Insignificant Emission Units Total Expected Actual Emissions - CO_2e			**1.36E+04 tpy**
					Total Expected Actual Emissions - CO_2e			**5.03E+04 tpy**

Notes:
[1] Expected actual operation is based on actual 2021 data, except for EU IDs 27, 52, 69, 70, and the insignificant units which are not required to be tracked and are therefore estimated with the maximum hours of operation.
[2] Conversion factors:

Diesel Heating Value	137,000	Btu/gal
Natural Gas Heat Content:	1,000	Btu/scf
Turbine heat rate:	8,000	Btu/hp-hr
Diesel Density	6.90	lb/gal
Engine Heat Rate:	7,000	Btu/hp-hr

GHG Emission Factors (kg/MMBtu):	Fuel Gas	Diesel	GWP
CO_2	53.06	73.96	1
CH_4	1.00E-03	3.00E-03	25
N_2O	1.00E-04	6.00E-04	298

Table D-3.10. Expected Actual Annual Emissions (after controls/limitations) Tank Emissions - VOC Emissions
Providence Health System - Providence Alaska Medical Center

Parameter	Factor Reference	Emissions Unit ID			
		66	67	69	70
Orientation	NA	Horizontal	Horizontal UST	Vertical	Vertical
Contents	NA	Diesel	Diesel	Diesel	Diesel
Diameter (ft)	NA	6	12	15	15
Tank Height (ft), H_S	NA	5	5	40	40
Color	NA	White	White	White	White
Maximum Liquid Height (ft), H_L	NA	4	4	35	35
Capacity (gal)	NA	1,000	2,000	45,000	45,000
Throughput (gal/yr) [1,2]	NA	1,000	2,000	45,000	45,000
Turnovers [4]	NA	1	1	1	1
Paint Condition	NA	Average	Average	Average	Average
Standing Loss (L_S) Calculations [3]					
K_E	AP-42, Section 7.1, Equation 1-12	0.019	0.019	0.019	0.019
H_{VO} (ft)	AP-42, Section 7.1, Equation 1-16	1.06	1.13	5.16	5.16
H_{RO} (ft)	AP-42, Section 7.1, Equation 1-17	0.06	0.13	0.16	0.16
K_S	AP-42, Section 7.1, Equation 1-21	1.000	1.000	0.998	0.998
T_{AA} (^oR)	AP-42, Section 7.1, Equation 1-30	497.60	497.60	497.60	497.60
T_B (^oR)	AP-42, Section 7.1, Equation 1-31	498.23	498.23	498.23	498.23
T_V (^oR) - uninsulated	AP-42, Section 7.1, Equation 1-33	152.05	152.05	152.05	152.05
W_V (lb/ft^3)	AP-42, Section 7.1, Equation 1-22	4.78E-04	4.78E-04	4.78E-04	4.78E-04
L_S (lb/yr)	AP-42, Section 7.1, Equation 1-4	0.10	0	3.04	3.04
Working Loss (L_W) Calculations [3]					
Q (bbl/yr)	NA	24	48	1,071	1,071
V_Q (ft^3)	AP-42, Section 7.1, Equation 1-39	134	267	6,015	6,015
K_N [4]	AP-42, Section 7.1, Equation 1-35	1.00	1.00	1.00	1.00
L_W (lb/yr)	AP-42, Section 7.1, Equation 1-35	0.1	0.1	2.9	2.9
TOTAL VOCs L_T (tpy)	**AP-42, Section 7.1, Equation 1-1**	**8.21E-05**	**6.39E-05**	**0.003**	**0.003**

Note:

[1] Tanks are filled with submerged loading.

[2] EU ID 67 is conservatively estimated as an above ground storage tank.

[3] Meteorological Inputs (Anchorage, AK):

	T_{AX} =	42.5	^oF	502.2 ^oK
AP-42, Section 7.1, Table 7.1-6	T_{AN} =	33.3	^oF	493.0 ^oK
AP-42, Section 7.1, Table 7.1-7	α =	0.25	White, Average	
From the 1995 version of AP-42	I =	838	Btu/ft^2-d	

Constants:

AP-42, Section 7.1, Table 7.1-2 (diesel/distilate)

AP-42, Section 7.1, Table 7.1-2	M_V (diesel)=	130	lb/lb-mol
AP-42, Section 7.1, Note below equation 1-37	P_{VA} (diesel)=	0.006	psi
AP-42, Section 7.1, Note below equation 1-37	K_P (diesel)=	1	
	K_B =	1	

[4] K_N is equal to 1 for 36 or less turnovers per year

Appendix E Regulatory Requirements

Revision to Application for Renewal of an Air Quality Operating Permit

Providence Alaska Medical Center

Providence Health System – Washington Inc.

SLR Project No.: 105.021374.00001

January 13, 2025

Form E3: Title V Condition Change Request

FORM E3
Title V Condition Change Request

Permit Number: AQ0486TVP03

Title V Permit Information (*attach additional sheets as needed*):

Current Title V Operating Permit Condition Number	Type of change (revise or remove)	Reason for change	Requested Alaska Title V Operating Permit Condition
AQ0486TVP03 – Table A	Revise	EU ID 27 was removed from the source. EU ID 46 does not exist and will not be purchased and installed.	Remove EU IDs 27 and 46.
AQ0486TVP03 – Conditions 1, 1.1, 2, 3, 4, 5, 5.1, 6, 13, 13.2, 18.1b, 19, 20, 20.1, 20.5a, 29, 29.1, 29.7b, 32, 32.1	Revise	EU ID 46 does not exist and will not be purchased and installed.	Revise the conditions as follows: 42 through ~~46~~ 45
AQ0486TVP03 – Condition 2.2a(iii)	Remove	EU ID 46 does not exist and will not be purchased and installed.	Remove the condition. ~~(iii) Observe the exhaust of EU ID 46 within 90 days after startup.~~
AQ0486TVP03 – Condition 1.2	Revise	EU IDs 28 and 29 can only burn gas as fuel.	Revise the condition as follows: For EU IDs 28 and 29, burn only gas as fuel. Monitoring for these emissions units shall consist of a statement in each operating report under Condition 70 indicating whether each of these emissions units burned only gas during the period covered by the report. ~~Report under Condition 69 if any fuel other than gas is burned.~~

AQ0486TVP03 – Condition 5.2	Revise	EU IDs 28 and 29 can only burn gas as fuel.	Revise the conditions as follows: For EU IDs 28 and 29, burn only gas as fuel. Monitoring for these emissions units shall consist of a statement in each operating report under Condition 70 indicating whether each of these emissions units fired only gas during the period covered by the report. ~~Report under Condition 69 if any fuel other than gas is burned.~~
AQ0486TVP03 – Condition 7	Remove	EU ID 46 does not exist and will not be purchased and installed.	Remove the condition. ~~Particulate Matter Recordkeeping. Within 180 calendar days of installation of the emissions unit, the Permittee shall record the exhaust stack diameter of EU ID 46. Report the stack diameter in the next operating report under Condition 70.~~
AQ0486TVP03 – Condition 18.2	Remove	This condition is redundant.	~~Operational Limits:~~ ~~a. Comply with the existing owner requested limits currently described in Conditions 14 through 17; and~~ ~~b. Comply with Condition 19.~~
AQ0486TVP03 – Condition 32.2	Revise	Revise the permit condition for clarity. No EU IDs are listed in 32.2a	Revise the condition as follows: For EU IDs 17, 22, 30, and 35, the emergency stationary RICE ~~listed in Condition 32.2.a~~ are not subject to NESHAP Subpart ZZZZ…
AQ0486TVP03 – Condition 33	Revise	EU IDs 28 and 29 can only burn gas as fuel and are exempt from Subpart JJJJJJ per 40 CFR 63.11195(e).	NESHAP Subpart JJJJJJ Applicability. For EU IDs 1 through 4~~, 28, 29,~~ and 52, comply with the following applicable requirements of NESHAP Subpart JJJJJJ.
AQ0486TVP03 – Condition 33.2	Revise	EU IDs 28 and 29 can only burn gas as fuel and are exempt from Subpart JJJJJJ per 40 CFR 63.11195(e).	Revise the condition as follows: For EU IDs 1 through 4~~, 28, 29,~~ and 52, comply with the following:

AQ0486TVP03 – Condition 48	Revise	EU IDs 69 and 70 are diesel storage tanks listed as insignificant emissions units and are not applicable under Standard Permit Condition VI. EU ID 27 was removed from the source.	**Good Air Pollution Control Practice.** The Permittee shall do the following for EU IDs 1, 2, 17, 22, ~~27,~~ 30, and 35~~, 69, and 70:~~
AQ0486TVP03 – Various Conditions	Revise	Please replace all references of EU ID 3 with EU ID 3a. EU ID 3 was replaced with EU ID 3a. EU ID 3a started up on January 10, 2025.	(Various Conditions)

Appendix F Permits– *Not Applicable*

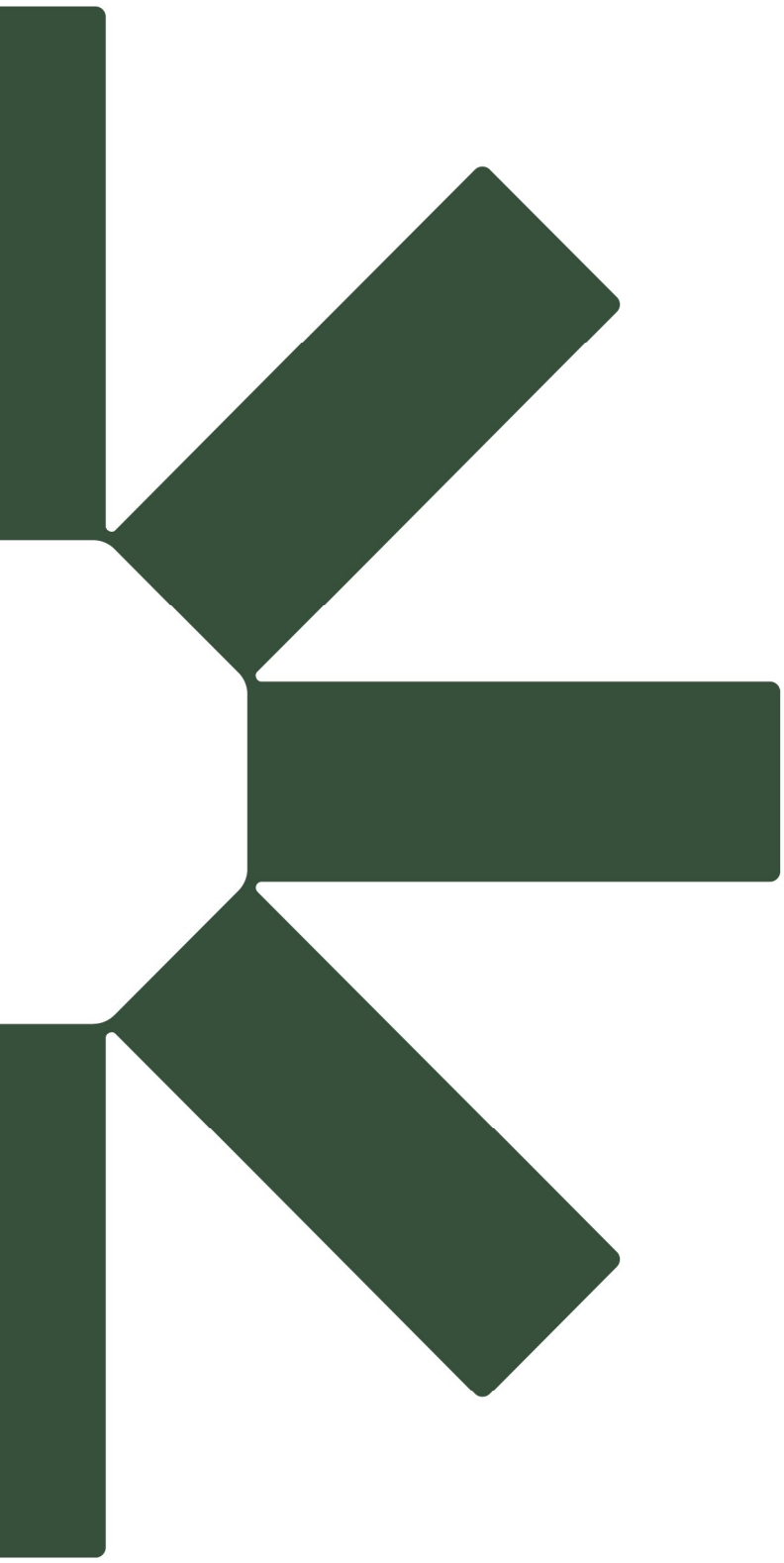
Revision to Application for Renewal of an Air Quality Operating Permit

Providence Alaska Medical Center

Providence Health System – Washington Inc.

SLR Project No.: 105.021374.00001

January 13, 2025



Making Sustainability Happen