



TECHNICAL SUPPORT DOCUMENT

**Air Discharge Permit 21-3483
Air Discharge Permit Application CL-3174**

Issued: October 14, 2021

Evergreen School District – Ellsworth Elementary School

SWCAA ID – 418

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ABBREVIATIONS

List of Acronyms

ADP	Air Discharge Permit	NESHAP	National Emission Standards for Hazardous Air Pollutants
AP-42	Compilation of Emission Factors, AP-42, 5th Edition, Volume 1, Stationary Point and Area Sources – published by EPA	NSPS	New Source Performance Standard
ASIL.....	Acceptable Source Impact Level	PSD	Prevention of Significant Deterioration
BACT.....	Best available control technology	RACT	Reasonably Available Control Technology
BART	Best Available Retrofit Technology	RCW	Revised Code of Washington
CAM	Compliance Assurance Monitoring	SQER	Small Quantity Emission Rate listed in WAC 173-460
CAS No.....	Chemical Abstracts Service registry number	Standard	Standard conditions at a temperature of 68°F (20°C) and a pressure of 29.92 in Hg (760 mm Hg)
CFR.....	Code of Federal Regulations	SWCAA.....	Southwest Clean Air Agency
EPA.....	U.S. Environmental Protection Agency	T-BACT	Best Available Control Technology for toxic air pollutants
EU	Emission Unit	WAC	Washington Administrative Code
LAER.....	Lowest achievable emission rate		
MACT.....	Maximum Achievable Control Technologies		

List of Units and Measures

µm.....	Micrometer (10 ⁻⁶ meter)	MMBtu	Million British thermal unit
acfm	Actual cubic foot per minute	MMcf.....	Million cubic feet
bhp	Brake horsepower	ppm	Parts per million
dscfm.....	Dry Standard cubic foot per minute	ppmv	Parts per million by volume
hp-hr.....	Horsepower-hour	ppmvd.....	Parts per million by volume, dry
kW.....	Kilowatt	scfm	Standard cubic foot per minute
lb/hr.....	Pounds per hour	tpy	Tons per year

List of Chemical Symbols, Formulas, and Pollutants

CO.....	Carbon monoxide	PM ₁₀	PM with an aerodynamic diameter 10 µm or less
CO ₂	Carbon dioxide	PM _{2.5}	PM with an aerodynamic diameter 2.5 µm or less
CO _{2e}	Carbon dioxide equivalent	SO ₂	Sulfur dioxide
HAP.....	Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act	SO _x	Sulfur oxides
NO _x	Nitrogen oxides	TAP.....	Toxic air pollutant pursuant to Chapter 173-460 WAC
O ₂	Oxygen	VOC.....	Volatile organic compound
PM.....	Particulate Matter with an aerodynamic diameter 100 µm or less		

Terms not otherwise defined have the meaning assigned to them in the referenced regulations or the dictionary definition, as appropriate.

1. FACILITY IDENTIFICATION

Applicant Name: Evergreen School District No. 114
Applicant Address: 13501 NW 28th Street
Vancouver, WA 98682
Facility Name: Ellsworth Elementary School
Facility Address: 512 SE Ellsworth Road
Vancouver, WA 98664
SWCAA Identification: 418
Contact Person: Martin Madarieta
Primary Process: Elementary School
SIC/NAICS Code: 8211: Educational Services
611110: Elementary and Secondary Schools
Facility Classification: Natural Minor

2. FACILITY DESCRIPTION

Evergreen School District No. 114 is a public primary education provider for Vancouver, Washington. The District operates multiple facilities which are registered with SWCAA under a single identification number. The facility addressed by this permitting action is the 61,000 square foot Ellsworth Elementary School constructed in 2020-2021.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit (ADP) application number CL-3174 received August 20, 2021. Air Discharge Permit Application CL-3174 requests approval for installation of the following at a new school:

- Two 1.999 MMBtu/hr natural-gas fired Lochinvar model FBN2001 boilers for hydronic heating
- Two 0.150 MMBtu/hr natural-gas fired State Industries model SUF-100-150-NEA 300 water heaters for domestic hot water
- One 180 kW MTU generator set, model 6R0120 DS180 driven by a Mercedes-Benz model OM926LA diesel engine

This is the initial permitting action for this facility.

4. PROCESS DESCRIPTION

The facility will operate two natural gas fired boilers for space heating. Two tank-type water heaters will provide domestic hot water. An emergency generator will be installed for emergency backup power.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

- 5.a. Boiler 1 (new). This unit is one of two natural gas fired hydronic heating boilers. The following details were available.

Location: Mechanical Room (SE corner of the NE wing)
 Boiler Make/Model: Lochinvar / Crest Series FBN2001
 Boiler Description: Down-fired, firetube, forced draft, condensing boiler with pre-mix surface combustion burner. This boiler meets SCAQMD Rule 1146.2 standards (< 20 ppmvd @ 3% O₂)
 Serial Number: 2108 123246292
 Manufacture Date: Not provided
 Heat Input Rating: 1.999 MMBtu/hr
 Fuel: Natural gas
 Stack Description: ~8 inch diameter, exhausting ~18 feet above grade and ~4 feet above the roof.
 ~45°37'0.13"N, 122°33'44.24"W
 Applicable Federal Regulations: None

- 5.b. Boiler 2 (new). This unit is one of two natural gas fired hydronic heating boilers. The following details were available.

Location: Mechanical Room (SE corner of the NE wing)
 Boiler Make/Model: Lochinvar / Crest Series FBN2001
 Boiler Description: Down-fired, firetube, forced draft, condensing boiler with pre-mix surface combustion burner. This boiler meets SCAQMD Rule 1146.2 standards (< 20 ppmvd @ 3% O₂)
 Serial Number: 2108 123213526
 Manufacture Date: Not provided
 Heat Input Rating: 1.999 MMBtu/hr
 Fuel: Natural gas
 Stack Description: ~8 inch diameter, exhausting ~18 feet above grade and ~4 feet above the roof.
 ~45°37'0.13"N, 122°33'44.24"W
 Applicable Federal Regulations: None

- 5.c. Water Heater 1 (new). This unit is one of two tank-type natural-gas fired domestic water heaters. The following details were available.

Location: Mechanical Room (SE corner of the NE wing)
 Boiler Make/Model: State Industries / SUF-100-150-NEA 300
 Boiler Description: Forced draft, down-fired burner firing radially through a mesh. Advertised to meet SCAQMD Rule 1146.2 (20 ppmvd NO_x @ 3% O₂).
 Serial Number: 2121124480966
 Manufacture Date: May 24, 2021
 Heat Input Rating: 0.150 MMBtu/hr

Fuel: Natural gas
 Stack Description: Not provided. Located ~ 45°37'0.16"N, 122°33'44.09"W
 Applicable Federal Regulations: None

- 5.d. Water Heater 2 (new). This unit is one of two tank-type natural-gas fired domestic water heaters. The following details were available.

Location: Mechanical Room (SE corner of the NE wing)
 Boiler Make/Model: State Industries / SUF-100-150-NEA 300
 Boiler Description: Forced draft, down-fired burner firing radially through a mesh. Advertised to meet SCAQMD Rule 1146.2 (20 ppmvd NO_x @ 3% O₂).
 Serial Number: 2117124131258
 Manufacture Date: April 28, 2021
 Heat Input Rating: 0.150 MMBtu/hr
 Fuel: Natural gas
 Stack Description: Not provided. Located ~ 45°37'0.16"N, 122°33'44.09"W
 Applicable Federal Regulations: None

- 5.e. Emergency Generator Diesel Engine (new). The following details were available.

Location: In a cinder-block walled area southeast of the north wing
 Generator Set: MTU Onsite Energy / 6R0120 DS180
 Generator Set Output: 180 kW
 Engine Make / Model: Mercedes-Benz / OM926LA
 EPA Engine Family: LMBXL07.2RJC
 Engine Serial Number: 926.986-C-1165399
 Fuel: Diesel, 13.2 gph fuel consumption at 100% power rating
 Engine Power: 247 kW (331 bhp)
 Engine Manufacture Date: Not provided
 Engine Certification: EPA Tier 3
 Stack Description: ~5 inch diameter, 1,519 acfm at 916°F, ~8 feet above grade, ~ 45°37'0.16"N, 122°33'43.20"W
 Applicable Federal Regulations: 40 CFR 60 Subpart IIII, 40 CFR 63 Subpart ZZZZ

5.f. Equipment/Activity Summary.

ID No.	Equipment/Activity	Control Equipment/Measure
1	Boiler 1 (Lochinvar model FBN2001)	Low emission burner
2	Boiler 2 (Lochinvar model FBN2001)	Low emission burner
3	Water Heater 1 (State Industries model SUF-100-150-NEA 300)	Low emission burner
4	Water Heater 2 (State Industries model SUF-100-150-NEA 300)	Low emission burner
5	Emergency Generator Diesel Engine (Mercedes-Benz model OM926LA)	Ultra-low sulfur diesel, EPA Tier 3 engine

6. EMISSIONS DETERMINATION

Unless otherwise specified by SWCAA, actual emissions must be determined using the specified input parameter listed for each emission unit and the following hierarchy of methodologies:

- (a) Continuous emissions monitoring system (CEMS) data;
- (b) Source emissions test data (EPA reference method). When source emissions test data conflicts with CEMS data for the time period of a source test, source test data must be used;
- (c) Source emissions test data (other test method); and
- (d) Emission factors or methodology provided in this TSD.

6.a. Boiler 1. Potential annual emissions (PTE) from the combustion of natural gas by this boiler were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Boiler 1						
Heat Rate =	1,999 MMBtu/hr					
Natural Gas Heat Value =	1,020 Btu/scf for AP-42 emission factors					
Natural Gas Heat Value =	1,026 Btu/scf for 40 CFR 98 GHG emission factors					
Fuel Consumption =	17.168 MMscf/yr					
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
NO _x	30	0.0364	37.1	0.073	0.32	BACT
CO	50	0.0370	37.7	0.074	0.32	BACT
VOC		0.0054	5.5	0.011	0.047	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.0012	0.0052	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	4.1E-06	1.8E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.5E-04	6.4E-04	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	1,024.2	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.5	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.6	40 CFR 98
Total GHG - CO ₂ e			117.098	120,143	1,025.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.b. Boiler 2. Potential annual emissions (PTE) from the combustion of natural gas by this boiler were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Boiler 2						
Heat Rate =	1,999 MMBtu/hr					
Natural Gas Heat Value =	1,020 Btu/scf for AP-42 emission factors					
Natural Gas Heat Value =	1,026 Btu/scf for 40 CFR 98 GHG emission factors					
Fuel Consumption =	17.168 MMscf/yr					
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
		lb/MMBtu	lb/MMscf			
NO _x	30	0.0364	37.1	0.073	0.32	BACT
CO	50	0.0370	37.7	0.074	0.32	BACT
VOC		0.0054	5.5	0.011	0.047	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.0012	0.0052	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	4.1E-06	1.8E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.5E-04	6.4E-04	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases			CO ₂ e	CO ₂ e		
	kg/MMBtu	GWP	lb/MMBtu	lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	1,024.2	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.5	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.6	40 CFR 98
Total GHG - CO ₂ e			117.098	120,143	1,025.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.c. Water Heater 1. Potential annual emissions (PTE) from the combustion of natural gas by this boiler were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Water Heater 1						
Heat Rate =	0.150 MMBtu/hr					
Natural Gas Heat Value =	1,020 Btu/scf for AP-42 emission factors					
Natural Gas Heat Value =	1,026 Btu/scf for 40 CFR 98 GHG emission factors					
Fuel Consumption =	1.288 MMscf/yr					
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
		lb/MMBtu	lb/MMscf			
NO _x	20	0.0243	24.8	0.0036	0.016	SWCAA 400-070
CO	111.4	0.0824	84.0	0.012	0.054	AP-42 Sec. 1.4 (7/98)
VOC		0.0054	5.5	0.00081	0.0035	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.000088	0.00039	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0011	0.0049	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.0011	0.0049	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.0011	0.0049	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	3.1E-07	1.4E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.1E-05	4.8E-05	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases			CO ₂ e	CO ₂ e		
	kg/MMBtu	GWP	lb/MMBtu	lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	76.9	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.036	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.043	40 CFR 98
Total GHG - CO ₂ e			117.098	120,143	76.9	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.d. Water Heater 2. Potential annual emissions (PTE) from the combustion of natural gas by this boiler were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Water Heater 2						
Heat Rate =	0.150 MMBtu/hr					
Natural Gas Heat Value =	1,020 Btu/scf for AP-42 emission factors					
Natural Gas Heat Value =	1,026 Btu/scf for 40 CFR 98 GHG emission factors					
Fuel Consumption =	1.288 MMscf/yr					
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
		lb/MMBtu	lb/MMscf			
NO _x	20	0.0243	24.8	0.0036	0.016	SWCAA 400-070
CO	111.4	0.0824	84.0	0.012	0.054	AP-42 Sec. 1.4 (7/98)
VOC		0.0054	5.5	0.00081	0.0035	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.000088	0.00039	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0011	0.0049	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.0011	0.0049	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.0011	0.0049	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	3.1E-07	1.4E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.1E-05	4.8E-05	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases			CO ₂ e	CO ₂ e		
	kg/MMBtu	GWP	lb/MMBtu	lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	76.9	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.0362	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.0432	40 CFR 98
Total GHG - CO₂e			117.098	120,143	76.9	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

- 6.e. Emergency Generator Diesel Engine. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

Emergency Generator Diesel Engine						
Hours of Operation =	200 hours					
Power Output =	331 horsepower					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	13.2 gal/hr					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
	Emission					
	Factor	Emissions	Emissions			
Pollutant	g/hp-hr	lb/hr	tpy	Emission Factor Source		
NO _x	3.93	2.87	0.29	MTU Onsite Energy		
CO	1.2	0.88	0.088	MTU Onsite Energy		
VOC	0.052	0.038	0.0038	EPA Certification Database		
SO _x as SO ₂		0.0029	0.00029	Mass Balance		
PM	0.06	0.044	0.0044	MTU Onsite Energy		
PM ₁₀	0.06	0.044	0.0044	MTU Onsite Energy		
PM _{2.5}	0.06	0.044	0.0044	MTU Onsite Energy		
			CO ₂ e	CO ₂ e	Emission	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	Factor Source
CO ₂	73.96	1	163.05	23	30	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.03	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.07	40 CFR 98
Total GHG - CO ₂ e			163.613	23	30	

Emissions must be calculated by multiplying the number of hours the engine operated by the hourly emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.f. Emissions Summary

Air Pollutant	Potential to Emit (tpy)	Project Impact (tpy)
NO _x	0.96	0.96
CO	0.84	0.84
VOC	0.11	0.11
SO ₂	0.011	0.011
PM	0.14	0.14
PM ₁₀	0.14	0.14
PM _{2.5}	0.14	0.14
CO ₂ /CO _{2e}	2,234	2,234

Toxic/Hazardous Air Pollutant	Potential to Emit (lbs)	Project Impact (lbs)
benzene [71-43-2]	0.078	0.078
Formaldehyde [50-00-0]	2.77	2.77

7. REGULATIONS AND EMISSION STANDARDS

Regulations have been established for the control of emissions of air pollutants to the ambient air. Regulations applicable to the proposed facility that have been used to evaluate the acceptability of the proposed facility and establish emission limits and control requirements include, but are not limited to, the following regulations, codes, or requirements. These items establish maximum emissions limits that could be allowed and are not to be exceeded for new or existing facilities. More stringent limits are established in this Permit consistent with implementation of Best Available Control Technology (BACT):

- 7.a. Title 40 Code of Federal Regulations (40 CFR) Part 60 Subpart IIII [§60.4200 et seq.] "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" applies to each compression ignition (CI) internal combustion engine (ICE) that commences construction after July 11, 2005, and is manufactured after April 1, 2006, or that is modified or reconstructed after July 11, 2005.

The Emergency Diesel Generator Engine is a CI ICE that was manufactured after the applicability date; therefore, this regulation is applicable to this unit. Subpart IIII requires that new diesel engines meet specific emission standards at the point of manufacture and during operation. In addition, maximum fuel sulfur contents are specified, and minimum maintenance standards are required.

- 7.b. 40 CFR 63 Subpart ZZZZ [§63.6580 et seq.] "National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines" establishes national emission limitations and operating limitations for HAP

emitted from stationary reciprocating internal combustion engines located at major and area sources of HAP emissions. The Emergency Generator Diesel Engine is located at an area source of HAP and used in emergency situations; therefore, this regulation applies to this unit.

The Emergency Generator Diesel Engine is a new source subject to this regulation because it will be installed after June 12, 2006. A "new" stationary RICE at an area source must comply with Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII for compression ignition engines or 40 CFR 60 Subpart JJJJ for spark ignition engines.

There may be other requirements under the Subpart that apply to the facility that are not specified above. SWCAA has not yet taken delegation of this regulation; therefore, at this time, EPA is the Administrator of this regulation and the facility must communicate directly with EPA regarding compliance demonstrations and/or reporting required by this rule.

For purposes of this Subpart, "diesel fuel" also includes any non-distillate fuel with comparable physical and chemical properties (e.g., biodiesel) that is suitable for use in compression ignition engines per §63.6675.

- 7.c. Revised Code of Washington (RCW) 70A.15.2040 empowers any activated air pollution control authority to prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution within its jurisdiction. An air pollution control authority may issue such orders as may be necessary to effectuate the purposes of the Washington Clean Air Act (RCW 70A.15) and enforce the same by all appropriate administrative and judicial proceedings subject to the rights of appeal as provided in Chapter 62, Laws of 1970 ex. sess. This law applies to the facility.
- 7.d. RCW 70A.15.2210 provides for the inclusion of conditions of operation as are reasonably necessary to assure the maintenance of compliance with the applicable ordinances, resolutions, rules and regulations when issuing an ADP for installation and establishment of an air contaminant source. This law applies to the facility.
- 7.e. WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" (as in effect August 21, 1998) requires Best Available Control Technology (BACT) for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety. The facility emits Toxic Air Pollutants (TAPs); therefore, this regulation applies to the facility.
- 7.f. WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM₁₀, PM_{2.5}, lead, SO₂, NO_x, ozone, and CO in the ambient air, which must not be exceeded. The facility emits PM₁₀, PM_{2.5}, SO_x, NO_x, and CO; therefore, certain sections of this regulation apply. The facility does not emit lead; therefore, the lead regulation section does not apply.

- 7.g. SWCAA 400-040 "General Standards for Maximum Emissions" requires all new and existing sources and emission units to meet certain performance standards with respect to Reasonably Available Control Technology (RACT), visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, SO₂, concealment and masking, and fugitive dust. This regulation applies to the facility.
- 7.h. SWCAA 400-040(1) "Visible Emissions" requires that emissions of an air contaminant from any emissions unit must not exceed twenty percent opacity for more than three minutes in any one hour at the emission point, or within a reasonable distance of the emission point. This regulation applies to the facility.
- 7.i. SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person is allowed to cause or permit the emission of PM from any combustion or incineration unit in excess of 0.23 grams per dry cubic meter (0.1 grains per dry standard cubic foot) of exhaust gas at standard conditions. The facility has combustion units; therefore, this regulation applies to the facility.
- 7.j. SWCAA 400-109 "Air Discharge Permit Applications" requires that an ADP application be submitted for all new installations, modifications, changes, or alterations to process and emission control equipment consistent with the definition of "new source." Sources wishing to modify existing permit terms may submit an ADP application to request such changes. An ADP must be issued, or written confirmation of exempt status must be received, before beginning any actual construction, or implementing any other modification, change, or alteration of existing equipment, processes, or permits. This regulation applies to the facility.
- 7.k. SWCAA 400-110 "New Source Review" requires that SWCAA issue an ADP in response to an ADP application prior to establishment of the new source, emission unit, or modification. The new units meet the definition of a new source; therefore, this regulation applies to the facility.
- 7.l. SWCAA 400-111 "Requirements for Sources in a Maintenance Plan Area" requires that no approval to construct or alter an air contaminant source will be granted unless it is evidenced that:
- (1) The equipment or technology is designed and will be installed to operate without causing a violation of the applicable emission standards;
 - (2) Emissions will be minimized to the extent that the new source will not exceed emission levels or other requirements provided in the maintenance plan;
 - (3) BACT will be employed for all air contaminants to be emitted by the proposed equipment;
 - (4) The proposed equipment will not cause any ambient air quality standard to be exceeded; and
 - (5) If the proposed equipment or facility will emit any toxic air pollutant regulated under WAC 173-460, the proposed equipment and control measures will meet all the requirements of that Chapter.

The facility is located in a maintenance plan area; therefore, this regulation applies to the facility.

8. RACT/BACT/BART/LAER/PSD/CAM DETERMINATIONS

The proposed equipment and control systems incorporate BACT for the types and amounts of air contaminants emitted by the processes as described below:

- 8.a. BACT Determination – Boilers 1 and 2. These units have received South Coast (California) Air Quality Management District certification for their ability to maintain NO_x emissions at no more than 20 ppmvd @ 3% O₂. SWCAA believes that achieving NO_x and CO emissions of 30 and 50 ppmvd @ 3% O₂ respectively meets the requirements of BACT for hydronic heating units at this facility. A NO_x limit of 30 ppmvd @ 3% O₂, which is slightly higher than the advertised capability of the units, will provide for greater flexibility to tune the unit for lower CO emissions. While test results for the Lochinvar model FBN2001 provided by Lochinvar indicate CO emissions of 0.077 lb/MMBtu (~104 ppmvd @ 3% O₂) with NO_x at 0.0239 lb/MMBtu (20 ppmvd @ 3% O₂), test results from Clark College for this same model indicates an ability to maintain CO well below 50 ppmvd @ 3% O₂ when NO_x is between 20 and 30 ppmvd @ 3% O₂.
- 8.b. BACT Determination – Emergency Generator Engine. Available control measures for new diesel engines include engine design, the use of ultra-low sulfur fuel and add-on control equipment such as selective catalytic reduction (SCR) units and oxidation catalysts. SWCAA believes that SCR is not feasible for this unit based on a combination of cost and practicality (most operation will be short-term and intermittent). SWCAA has found that an oxidation catalyst is not a cost-effective control for CO, VOC, and PM for relatively small emergency engines.
- The use of modern diesel-fired engine design meeting the relevant EPA emission standard for the new engine as applicable, the use of ultra-low sulfur diesel fuel (\leq 0.0015% sulfur by weight), limitation of visible emissions to 5% opacity or less, and limitation of engine operation has been determined to meet the requirements of BACT for the types and quantities of air contaminants emitted. The use of ultra-low sulfur fuel is also required by 40 CFR 60 Subpart IIII for "new" engines.
- 8.c. Prevention of Significant Deterioration (PSD) Applicability Determination. This permitting action will not result in a potential increase in emissions equal to or greater than the PSD thresholds. Therefore, PSD review is not applicable to this action.
- 8.d. Compliance Assurance Monitoring (CAM) Applicability Determination. CAM is not applicable to any emission unit at this facility because it is not a major source and is not required to obtain a Part 70 (Title V) permit.

9. AMBIENT IMPACT ANALYSIS

- 9.a. Criteria Air Pollutant Review. Potential emissions of criteria air pollutants (nitrogen oxides, carbon monoxide, sulfur dioxide, PM₁₀) and volatile organic compounds are all at or below 0.96 tons per year each from the facility. At these emission rates, no adverse ambient air quality impact is anticipated.
- 9.b. Toxic Air Pollutant Review. Potential emissions of toxic air pollutants will not exceed the applicable Small Quantity Emission Rates (SQER) listed in WAC 173-460 (in effect August 21, 1998); therefore, toxic impacts are presumed to be below regulatory significance.

Conclusions

- 9.c. Operation of the new boilers, water heaters, and emergency generator engine as proposed in ADP Application CL-3174 will not cause the ambient air quality standards established by Title 40 Code of Federal Regulations Part 50 (40 CFR 50), "National Primary and Secondary Ambient Air Quality Standards" to be violated.
- 9.d. Operation of the boilers, water heaters, and emergency generator engine as proposed in ADP Application CL-3174 in accordance with the Air Discharge Permit will not cause the requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants," (in effect August 21, 1998) or WAC 173-476 "Ambient Air Quality Standards" to be violated.
- 9.e. The new boilers, water heaters, and emergency generator engine proposed in ADP Application CL-3174, if properly installed and maintained, can be operated without causing a violation of the applicable emission standards, which include the limits established under SWCAA 400-040 "General Standards for Maximum Emissions."

10. DISCUSSION OF APPROVAL CONDITIONS

SWCAA has made a determination to issue ADP 21-3483 in response to ADP Application CL-3174. ADP 21-3483 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

- 10.a. Supersession of Previous Permits. This is the initial permitting action for the facility.
- 10.b. Emission Limits. The short-term NO_x and CO emission limits for Boilers 1 and 2 were established at levels identified in Section 8 as meeting the requirements of BACT. Annual emission limits were based on the boilers operating for 8,760 hours per year at full rated load using the emission factors supplied in Section 6.

All natural gas fired equipment other than Boilers 1 and 2 are under 0.4 MMBtu/hr each, therefore individual emission limits were not established for these units. This is consistent with the way small boilers are regulated in SWCAA 400 (see SWCAA 400-070 and Small Unit Notification requirements of SWCAA 400-072).

- 10.c. Operational Limits and Requirements. Corrective action is required whenever performance monitoring of any boiler indicates that emission concentrations may exceed the permitted emission limits.
- 10.d. Monitoring and Recordkeeping Requirements. Sufficient monitoring and recordkeeping was established to document compliance with the annual emission limits and provide for general requirements (e.g. upset reporting, annual emission inventory submission).

At a minimum, facility-wide natural gas consumption must be recorded to assure that an annual fuel consumption value will be available for emission inventory purposes. If boilers or heaters are not equipped with individual fuel meters, fuel use may be apportioned between individual units using operating records.

- 10.e. Reporting Requirements. Specific reporting deadlines were established for each reporting requirement. The submittal date refers to the earlier of the date the report is delivered to SWCAA or the postmarked date if sent through the US Post Office.

Upset conditions with the potential to cause excess emissions must be reported immediately in order to qualify for relief from penalty in accordance with SWCAA 400-107 for unavoidable exceedances. In addition, prompt reporting allows for prompt and accurate investigation into the cause of the event and the prevention of similar future incidents.

The permit requires reporting of the annual air emissions inventory, and reporting of the data necessary to develop the emission inventory. Because it is not expected that individual units will be equipped with fuel meters and emissions from individual units are relatively minor, fuel use may be apportioned between individual units using operating records. Some amount of individual judgment will necessarily be involved in how the operating records are used for this purpose.

11. **START-UP AND SHUTDOWN/ALTERNATIVE OPERATING SCENARIOS/POLLUTION PREVENTION**

- 11.a. Start-up and Shutdown Provisions. Pursuant to SWCAA 400-081 "Start-up and Shutdown," technology-based emission standards and control technology determinations shall take into consideration the physical and operational ability of a source to comply with the applicable standards during start-up or shutdown. Where it is determined that a source is not capable of achieving continuous compliance with an emission standard during start-up or shutdown, SWCAA shall include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

The emergency generator engine may exhibit higher than normal opacity upon startup even if the unit is in proper working order. Accordingly, the visual emissions limits listed in the permit for the emergency generator engine does not apply during the startup

period defined in the permit. The general opacity standard from SWCAA 400-040 continues to apply during startup.

- 11.b. Alternate Operating Scenarios. SWCAA conducted a review of alternate operating scenarios applicable to equipment affected by this permitting action. The permittee did not propose or identify any applicable alternate operating scenarios. Therefore, none were included in the approval conditions.
- 11.c. Pollution Prevention Measures. SWCAA conducted a review of possible pollution prevention measures for the facility. No pollution prevention measures were identified by either the permittee or SWCAA separate or in addition to those measures required under BACT considerations. Therefore, none were included in the approval conditions.

12. EMISSION MONITORING AND TESTING

Performance monitoring of Boilers 1 and 2 with a combustion analyzer or equivalent is required at least annually. In SWCAA's experience this monitoring is relatively inexpensive compared to the quantity of emissions that can be prevented by this procedure. It is unlikely that emissions will degrade rapidly enough that more frequent monitoring is necessary to maintain proper operation. SWCAA believes that this testing regime provides a reasonable assurance of on-going compliance with the permitted emission limits.

13. FACILITY HISTORY

This is a new school building that opened in August 2021.

14. PUBLIC INVOLVEMENT OPPORTUNITY

- 14.a. Public Notice for ADP Application CL-3174. Public notice for ADP Application CL-3174 was published on the SWCAA website for a minimum of 15 days beginning on August 26, 2021.
- 14.b. Public/Applicant Comment for ADP Application CL-3174. SWCAA did not receive specific comments, a comment period request, or any other inquiry from the public or the applicant regarding ADP Application CL-3174. Therefore no public comment period was provided for this permitting action.
- 14.c. State Environmental Policy Act. On June 27, 2021 the Evergreen School District issued a Determination of Nonsignificance for demolition of the existing Ellsworth Elementary School and construction of the new Elementary School.