



TECHNICAL SUPPORT DOCUMENT

**Air Discharge Permit 24-3676
Air Discharge Permit Application CL-3276**

Issued: December 18, 2024

Cascade Middle School

SWCAA ID – 418

Prepared By: Abraham Apfel
Air Quality Engineer
Southwest Clean Air Agency

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ABBREVIATIONS

List of Acronyms

| | | | |
|--------------|---|----------------|---|
| ADP | Air Discharge Permit | PSD | Prevention of Significant Deterioration |
| AP-42 | Compilation of Emission Factors, AP-42, 5th Edition, Volume 1, Stationary Point and Area Sources – published by EPA | R | |
| BACT | Best available control technology | RCW | Revised Code of Washington |
| CAM | Compliance Assurance Monitoring | SCC | Source Classification Code |
| CFR | Code of Federal Regulations | SDS | Safety Data Sheet |
| EPA | U.S. Environmental Protection Agency | SQER | Small Quantity Emission Rate listed in WAC 173-460 |
| EU | Emission Unit | Standard | Standard conditions at a temperature of 68°F (20°C) and a pressure of 29.92 in Hg (760 mm Hg) |
| mfr | Manufacturer | SWCAA | Southwest Clean Air Agency |
| NESHAP | National Emission Standards for Hazardous Air Pollutants | T-BACT | Best Available Control Technology for toxic air pollutants |
| NOV | Notice of Violation/ | WAC | Washington Administrative Code |
| NSPS | New Source Performance Standard | | |

List of Units and Measures

| | | | |
|---------------|------------------------------------|-------------|----------------------------------|
| acfm | Actual cubic foot per minute | MMBtu | Million British thermal unit |
| bhp | Brake horsepower | MMcf | Million cubic feet |
| dscfm | Dry Standard cubic foot per minute | ppm | Parts per million |
| g/dscm | Grams per dry Standard cubic meter | ppmv | Parts per million by volume |
| gpm | Gallon per minute | ppmvd | Parts per million by volume, dry |
| gr/dscf | Grain per dry standard cubic foot | ppmw | Parts per million by weight |
| hp | Horsepower | psig | Pounds per square inch, gauge |
| hp-hr | Horsepower-hour | rpm | Revolution per minute |
| kW | Kilowatt | scfm | Standard cubic foot per minute |
| | | tph | Ton per hour |
| | | tpy | Tons per year |

List of Chemical Symbols, Formulas, and Pollutants

| | | | |
|------------------------|---|-------------------------|--|
| CO..... | Carbon monoxide | PM | Particulate Matter with an aerodynamic diameter 100 µm or less |
| CO ₂ | Carbon dioxide | | |
| CO _{2e} | Carbon dioxide equivalent | PM ₁₀ | PM with an aerodynamic diameter 10 µm or less |
| HAP | Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act | PM _{2.5} | PM with an aerodynamic diameter 2.5 µm or less |
| NO ₂ | Nitrogen dioxide | SO ₂ | Sulfur dioxide |
| NO _x | Nitrogen oxides | SO _x | Sulfur oxides |
| O ₂ | Oxygen | TAP..... | Toxic air pollutant pursuant to Chapter 173-460 WAC |
| O ₃ | Ozone | VOC..... | Volatile organic compound |

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
Applicant Address: PO Box 8910, Vancouver, WA 98668

Facility Name: Cascade Middle School
Facility Address: 13900 NE 18th Street, Vancouver, WA 98684

SWCAA Identification: 418

Contact Person: Martin Madarieta

Primary Process: Middle School
SIC/NAICS Code: 8211: Educational Services
611110: Elementary and Secondary Schools

Facility Latitude and Longitude: 45°38'14.77"N
122°31'43.86"W

Facility Classification: Natural Minor

2. FACILITY DESCRIPTION

Evergreen School District 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 for Cascade Middle School.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit (ADP) application number CL-3276 dated September 19, 2024. Evergreen School District submitted ADP application CL-3276 requesting the following:

- Two 3.0 MMBtu/hr natural gas-fired ATH model KN-30+ boilers
- Three 0.199 MMBtu/hr natural gas-fired Rheem-Ruud model HE119-199 water heaters
- One 90 kW Caterpillar generator set, model D90P1 driven by a Perkins model 1006TG1A diesel engine

Permit application CL-3276 was submitted in response to NOV 11182 in response to the corrective action. ADP 24-3676 will supersede ADP 04-2547R1 in its entirety.

4. PROCESS DESCRIPTION

4.a. Boilers – Process Steam. Two Advanced Thermal hydronics natural gas-fired boilers provide steam for heating.

- 4.b. Water Heaters. Three Rheem-Ruud natural gas-fired water heaters are used to provide domestic hot water.
- 4.c. Emergency Power Generation. One diesel driven generator is used to generate emergency electrical power at the school campus.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

- 5.a. Boiler 1 (new). One natural gas-fired boiler used to provide heat on campus. Details are as follows:

| | |
|--------------------------|----------------------------|
| Boiler Manufacturer: | Advanced Thermal Hydronics |
| Model Number: | KN 30+ |
| Serial Number: | 8229087 |
| Heat Rate: | 3.0 MMBtu/hr |
| Stack Latitude: | 45°38'15.05"N |
| Stack Longitude: | 122°31'45.23"W |
| Turndown Ratio: | 5:1 |
| Stack Diameter: | 8" |
| Stack Height: | 21' |
| Stack Flow: | 796 acfm |
| Stack Temperature: | 145 °F |
| 40 CFR 60 Subpart Dc: | No |
| 40 CFR 63 Subpart JJJJJ: | No |

- 5.b. Boiler 2 (new). One natural gas-fired boiler used to provide heat on campus. Details are as follows:

| | |
|--------------------------|----------------------------|
| Boiler Manufacturer: | Advanced Thermal Hydronics |
| Model Number: | KN 30+ |
| Serial Number: | 8229086 |
| Heat Rate: | 3.0 MMBtu/hr |
| Stack Latitude: | 45°38'14.86"N |
| Stack Longitude: | 122°31'45.06"W |
| Turndown Ratio: | 5:1 |
| Stack Diameter: | 8" |
| Stack Height: | 21' |
| Stack Flow: | 796 acfm |
| Stack Temperature: | 145 °F |
| 40 CFR 60 Subpart Dc: | No |
| 40 CFR 63 Subpart JJJJJ: | No |

- 5.c. Water heaters. Three natural gas fired water heaters are used to provide domestic hot water on campus. Details are as follows:

Boiler Manufacturer: Rheem-Ruud
 Model Number: HE119-199
 Heat Rate: 0.199 MMBtu/hr

5.d. Emergency Generator Engine. One generator driven by a diesel engine is used to provide emergency power. Details are as follows:

Engine Make: Perkins
 Engine Model: 1006TG1A
 Engine Output Rating: 150 bhp
 Certification: EPA Tier 2
 Fuel Consumption: 7.15 gal/hr at full standby load
 Generator Rating: 90 kW
 Generator Make: Caterpillar
 Generator Model: D90P1
 Generator Serial Number: OLY00000ENPS 01276
 Exhaust Flow Rate: 357 cfm
 Stack Height: 21' from ground
 Stack Diameter: 6"
 Stack Temperature: 1088°F
 Regulations of Note: 40 CFR 63 Subpart ZZZZ

5.e. Equipment/Activity Summary.

| ID No. | Equipment/Activity | Control Equipment/Measure |
|---------------|--|--|
| 1 | Boiler 1 (ATH model KN-30+) | Low Emission Burner Low-sulfur Fuel (Natural Gas) |
| 2 | Boiler 2 (ATH model KN-30+) | Low Emission Burner Low-sulfur Fuel (Natural Gas) |
| 3 | Water Heater 1 (Rheem-Ruud Model HE119-199) | Low Emission Burner Low-sulfur Fuel (Natural Gas) |
| 4 | Water Heater 2 (Rheem-Ruud Model HE119-199) | Low Emission Burner Low-sulfur Fuel (Natural Gas) |
| 5 | Water Heater 3 (Rheem-Ruud Model HE119-199) | Low Emission Burner Low-sulfur Fuel (Natural Gas) |
| 6 | Emergency Generator Engine (Perkins Model 1006TG1A) | Ultra-low-sulfur diesel, EPA Tier 2 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.

Nothing precludes the use, including the exclusive use of any credible evidence or information relevant to identifying or quantifying emissions if methods identified above, in the ADP, or elsewhere in this TSD have not provided adequate quantification of actual emissions.

6.a. **Boiler 1.** Emissions 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 = | 3.00 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 = | 25.765 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 | 0.109 | 0.48 | BACT |
| CO | 50 | 0.0370 | 37.7 | 0.111 | 0.49 | BACT |
| VOC | | 0.0054 | 5.5 | 0.016 | 0.071 | AP-42 Sec. 1.4 (7/98) |
| SO _x as SO ₂ | | 0.00059 | 0.6 | 0.0018 | 0.0077 | AP-42 Sec. 1.4 (7/98) |
| PM | | 0.0075 | 7.6 | 0.022 | 0.098 | AP-42 Sec. 1.4 (7/98) |
| PM ₁₀ | | 0.0075 | 7.6 | 0.022 | 0.098 | AP-42 Sec. 1.4 (7/98) |
| PM _{2.5} | | 0.0075 | 7.6 | 0.022 | 0.098 | AP-42 Sec. 1.4 (7/98) |
| Benzene | | 2.06E-06 | 0.0021 | 6.2E-06 | 2.7E-05 | AP-42 Sec. 1.4 (7/98) |
| Formaldehyde | | 7.35E-05 | 0.075 | 2.2E-04 | 9.7E-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 | 1,537.1 | 40 CFR 98 |
| CH ₄ | 0.001 | 25 | 0.055 | 56.55 | 0.7 | 40 CFR 98 |
| N ₂ O | 0.0001 | 298 | 0.066 | 67.41 | 0.9 | 40 CFR 98 |
| Total GHG - CO ₂ e | | | 117.098 | 120,143 | 1,538.7 | |

6.b. Boiler 2. Emissions 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 = | 3.00 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 = | 25.765 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 | 0.109 | 0.48 | BACT |
| CO | 50 | 0.0370 | 37.7 | 0.111 | 0.49 | BACT |
| VOC | | 0.0054 | 5.5 | 0.016 | 0.071 | AP-42 Sec. 1.4 (7/98) |
| SO _x as SO ₂ | | 0.00059 | 0.6 | 0.0018 | 0.0077 | AP-42 Sec. 1.4 (7/98) |
| PM | | 0.0075 | 7.6 | 0.022 | 0.098 | AP-42 Sec. 1.4 (7/98) |
| PM ₁₀ | | 0.0075 | 7.6 | 0.022 | 0.098 | AP-42 Sec. 1.4 (7/98) |
| PM _{2.5} | | 0.0075 | 7.6 | 0.022 | 0.098 | AP-42 Sec. 1.4 (7/98) |
| Benzene | | 2.06E-06 | 0.0021 | 6.2E-06 | 2.7E-05 | AP-42 Sec. 1.4 (7/98) |
| Formaldehyde | | 7.35E-05 | 0.075 | 2.2E-04 | 9.7E-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 | 1,537.1 | 40 CFR 98 |
| CH ₄ | 0.001 | 25 | 0.055 | 56.55 | 0.7 | 40 CFR 98 |
| N ₂ O | 0.0001 | 298 | 0.066 | 67.41 | 0.9 | 40 CFR 98 |
| Total GHG - CO₂e | | | 117.098 | 120,143 | 1,538.7 | |

6.c. Water Heater 1. Emissions from the combustion of natural gas by this water heater were calculated with the assumption that the water heater could operate at full rated capacity for 8,760 hours per year.

| Water Heater 1 | | | | | | |
|------------------------------------|--|-----------------|-------------------|-------------------|------------------------|------------------------|
| Heat Rate = | 0.199 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 = | 1.709 MMscf/yr | | | | | |
| Pollutant | ppmvd | Emission Factor | | lb/hr | tpy | Emission Factor Source |
| | @ 3% O ₂ | lb/MMBtu | lb/MMscf | | | |
| NO _x | 26 | 0.0316 | 32.2 | 0.006 | 0.028 | AP-42 Sec. 1.4 (7/98) |
| CO | 111.4 | 0.0823 | 84.0 | 0.016 | 0.07 | AP-42 Sec. 1.4 (7/98) |
| VOC | | 0.0054 | 5.5 | 0.0011 | 0.0047 | AP-42 Sec. 1.4 (7/98) |
| SO _x as SO ₂ | | 0.00059 | 0.6 | 0.00012 | 0.0005 | AP-42 Sec. 1.4 (7/98) |
| PM | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| PM ₁₀ | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| PM _{2.5} | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| Benzene | | 2.06E-06 | 0.0021 | 4.1E-07 | 1.8E-06 | AP-42 Sec. 1.4 (7/98) |
| Formaldehyde | | 7.35E-05 | 0.075 | 1.5E-05 | 6.4E-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 | 102.0 | 40 CFR 98 |
| CH ₄ | 0.001 | 25 | 0.055 | 56.55 | 0.0 | 40 CFR 98 |
| N ₂ O | 0.0001 | 298 | 0.066 | 67.41 | 0.1 | 40 CFR 98 |
| Total GHG - CO ₂ e | | | 117.098 | 120,143 | 102.1 | |

- 6.d. Water Heater 2. Emissions from the combustion of natural gas by this water heater were calculated with the assumption that the water heater could operate at full rated capacity for 8,760 hours per year.

| Water Heater 2 | | | | | | |
|------------------------------------|--|-----------------|-------------------|-------------------|------------------------|------------------------|
| Heat Rate = | 0.199 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 = | 1.709 MMscf/yr | | | | | |
| Pollutant | ppmvd | Emission Factor | | lb/hr | tpy | Emission Factor Source |
| | @ 3% O ₂ | lb/MMBtu | lb/MMscf | | | |
| NO _x | 26 | 0.0316 | 32.2 | 0.006 | 0.028 | AP-42 Sec. 1.4 (7/98) |
| CO | 111.4 | 0.0823 | 84.0 | 0.016 | 0.07 | AP-42 Sec. 1.4 (7/98) |
| VOC | | 0.0054 | 5.5 | 0.0011 | 0.0047 | AP-42 Sec. 1.4 (7/98) |
| SO _x as SO ₂ | | 0.00059 | 0.6 | 0.00012 | 0.0005 | AP-42 Sec. 1.4 (7/98) |
| PM | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| PM ₁₀ | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| PM _{2.5} | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| Benzene | | 2.06E-06 | 0.0021 | 4.1E-07 | 1.8E-06 | AP-42 Sec. 1.4 (7/98) |
| Formaldehyde | | 7.35E-05 | 0.075 | 1.5E-05 | 6.4E-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 | 102.0 | 40 CFR 98 |
| CH ₄ | 0.001 | 25 | 0.055 | 56.55 | 0.0 | 40 CFR 98 |
| N ₂ O | 0.0001 | 298 | 0.066 | 67.41 | 0.1 | 40 CFR 98 |
| Total GHG - CO ₂ e | | | 117.098 | 120,143 | 102.1 | |

6.e. Water Heater 3. Emissions from the combustion of natural gas by this water heater were calculated with the assumption that the water heater could operate at full rated capacity for 8,760 hours per year.

| Water Heater 3 | | | | | | |
|------------------------------------|--|-----------------|-------------------|-------------------|------------------------|------------------------|
| Heat Rate = | 0.199 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 = | 1.709 MMscf/yr | | | | | |
| Pollutant | ppmvd | Emission Factor | | lb/hr | tpy | Emission Factor Source |
| | @ 3% O ₂ | lb/MMBtu | lb/MMscf | | | |
| NO _x | 26 | 0.0316 | 32.2 | 0.006 | 0.028 | AP-42 Sec. 1.4 (7/98) |
| CO | 111.4 | 0.0823 | 84.0 | 0.016 | 0.07 | AP-42 Sec. 1.4 (7/98) |
| VOC | | 0.0054 | 5.5 | 0.0011 | 0.0047 | AP-42 Sec. 1.4 (7/98) |
| SO _x as SO ₂ | | 0.00059 | 0.6 | 0.00012 | 0.0005 | AP-42 Sec. 1.4 (7/98) |
| PM | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| PM ₁₀ | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| PM _{2.5} | | 0.0075 | 7.6 | 0.0015 | 0.006 | AP-42 Sec. 1.4 (7/98) |
| Benzene | | 2.06E-06 | 0.0021 | 4.1E-07 | 1.8E-06 | AP-42 Sec. 1.4 (7/98) |
| Formaldehyde | | 7.35E-05 | 0.075 | 1.5E-05 | 6.4E-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 | 102.0 | 40 CFR 98 |
| CH ₄ | 0.001 | 25 | 0.055 | 56.55 | 0.0 | 40 CFR 98 |
| N ₂ O | 0.0001 | 298 | 0.066 | 67.41 | 0.1 | 40 CFR 98 |
| Total GHG - CO ₂ e | | | 117.098 | 120,143 | 102.1 | |

6.f. Emergency Generator Diesel Engine. 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 Engine | | | | | | | |
|------------------------------------|---|-----------------------------|-------------------------------|--------------------------------|------------------------|------------------------|--|
| Hours of Operation = | 200 hours | | | | | | |
| Power Output = | 150 horsepower | | | | | | |
| Diesel Density = | 7.206 pounds per gallon | | | | | | |
| Fuel Sulfur Content = | 0.0015 % by weight | | | | | | |
| Fuel Consumption Rate = | 7.2 gal/hr | | | | | | |
| Fuel Heat Content = | 0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98) | | | | | | |
| Pollutant | Emission Factor lb/bhp-hr | Emission Factor g/bhp-hr | Emissions lb/hr | Emissions tpy | Emission Factor Source | | |
| NO _x | 0.018 | 8.16 | 2.70 | 0.27 | Manufacturer | | |
| CO | 0.0058 | 2.63 | 0.87 | 0.087 | Manufacturer | | |
| VOC | 0.0025 | 1.13 | 0.375 | 0.0375 | Manufacturer | | |
| SO _x as SO ₂ | | | 0.0015 | 0.00015 | Mass Balance | | |
| PM | 0.00049 | 0.22 | 0.074 | 0.0074 | EPA Tier 2 | | |
| PM ₁₀ | 0.00049 | 0.22 | 0.074 | 0.0074 | EPA Tier 2 | | |
| PM _{2.5} | 0.00049 | 0.22 | 0.074 | 0.0074 | EPA Tier 2 | | |
| Greenhouse Gases | kg/MMBtu | GWP | CO ₂ e lb/MMBtu | CO ₂ e lb/gallon | tpy, CO ₂ e | Emission Factor Source | |
| CO ₂ | 73.96 | 1 | 163.05 | 23 | 16 | 40 CFR 98 | |
| CH ₄ | 0.003 | 25 | 0.165 | 0.023 | 0.02 | 40 CFR 98 | |
| N ₂ O | 0.0006 | 298 | 0.394 | 0.054 | 0.04 | 40 CFR 98 | |

6.g. Emissions Summary

| Air Pollutant | Potential to Emit (tpy) |
|-------------------|----------------------------|
| NO _x | 1.31 |
| CO | 1.27 |
| VOC | 0.19 |
| SO ₂ | 0.017 |
| PM | 0.22 |
| PM ₁₀ | 0.22 |
| PM _{2.5} | 0.22 |
| TAPs | 0.002 |

| Air Pollutant | Potential to Emit (tpy) |
|-----------------------------------|----------------------------|
| HAPs | 0.002 |
| CO ₂ /CO _{2e} | 3,400 |

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. 40 Code of Federal Regulations (CFR) 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 generator engine is a CI ICE configuration and was manufactured before April 1, 2006; therefore, this regulation is not applicable to the emergency generator engine.

- 7.b. 40 CFR 63.9 "Notification Requirements" requires that the delegated authority be notified when any unit subject to 40 CFR 63 begins initial startup.

- 7.c. 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 existing Emergency Generator Engine is located at an area source of HAP and used in emergency situations; therefore, this regulation applies to the existing engine.

For existing emergency engines at an area source, the owner or operator is required to:

- Change oil and filter every 500 hours of operation or annually, whichever comes first except as allowed by 40 CFR 63.6625(i) [Table 2d(4)(a)];
- Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first [Table 2d(4)(b)];
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary [Table 2d(4)(c)];
- Install a non-resettable hour meter if one is not already installed. [§ 63.6625(f)]

- Report each instance in which the owner did not meet each operating limitation [§ 63.6640(b)];
- Limit operation of the engine to emergency use and maintenance checks and readiness testing. Operation for maintenance checks and readiness testing may be conducted only to the extent that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Operation for maintenance checks and readiness testing is limited to 100 hours per year [§ 63.6640(f)(2)(i)];
- Record the occurrence and duration of each malfunction of operation (i.e., process equipment) [§ 63.6655(a)(2)];
- Record maintenance conducted on the engine in order to demonstrate that the engine was operated and maintained according to the applicable maintenance plan [§ 63.6655(e)]; and
- Record the hours of operation of the engine by use of a non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation [§ 63.6655(f)].

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.d. 40 CFR 63 Subpart JJJJJ [§63.11193 et seq] "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources" establishes national emission limitations and operating limitations for HAP emitted from boilers fired on specific fuels at area sources.

The facility is an area source of HAP, and all of the boilers are classified as gas boilers. Gas-fired boilers, which burn gaseous fuel and only burn liquid fuel during periods of gas curtailment, gas supply interruption, and periodic testing up to 48 hr/yr, are not covered under the regulation; therefore, this regulation does not apply to the boilers.

- 7.e. 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.f. 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.g. Washington Administrative Code (WAC) 173-401 "Operating Permit Regulation" requires all major sources and other sources as defined in WAC 173-401-300 to obtain an operating permit. This regulation is not applicable because this source is not a potential major source and does not meet the applicability criteria set forth in WAC 173-401-300. The facility does not emit any criteria pollutants or HAP above major thresholds; therefore, this regulation does not apply to the facility.
- 7.h. WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" requires 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. This regulation applies to the facility.
- 7.i. 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.j. 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.k. 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.l. SWCAA 400-040(2) "Fallout" requires that emissions of PM from any source must not be deposited beyond the property under direct control of the owner(s) or operator(s) of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited. This regulation applies to the facility.
- 7.m. SWCAA 400-040(3) "Fugitive Emissions" requires that reasonable precautions be taken to prevent the fugitive release of air contaminants to the atmosphere. This regulation applies to the facility.
- 7.n. SWCAA 400-040(4) "Odors" requires any source which generates odors that may unreasonably interfere with any other property owner's use and enjoyment of their property to use recognized good practice and procedures to reduce these odors to a reasonable

minimum. This source must be managed properly to maintain compliance with this regulation. This regulation applies to the facility.

- 7.o. SWCAA 400-040(6) "Sulfur Dioxide" requires that no person is allowed to emit a gas containing in excess of 1,000 ppm of SO₂, corrected to 7% O₂ or 12% CO₂ as required by the applicable emission standard for combustion sources.

The facility emits SO₂; therefore, this regulation applies to the facility.

- 7.p. SWCAA 400-040(8) "Fugitive Dust Sources" requires that reasonable precautions be taken to prevent fugitive dust from becoming airborne and to minimize emissions. This regulation applies to the facility.

- 7.q. 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 g/Nm³_{dry} (0.1 gr/dscf) of exhaust gas at standard conditions.

The facility has combustion units; therefore, this regulation applies to the facility.

- 7.r. 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.s. 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.t. 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. BACT/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. 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.
- 8.b. BACT Determination – Water Heaters. The water heaters have heating values of 0.199 MMBtu/hr. These units meet the requirements of SWCAA 400-070 (13). Meeting the requirements of SWCAA 400-070 (13) has been determined to meet the requirement of BACT at the Permittee's facilities for equipment with a heat input of less than 0.4 MMBtu/hr.
- 8.c. BACT Determination – Emergency 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.d. 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.e. 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. Emissions of NO_x, CO, PM, VOC (as a precursor to O₃), and SO₂ are emitted at levels where 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 therefore, toxic impacts are presumed to be below regulatory significance.

Conclusions

- 9.c. Operation of the boilers, water heater, and emergency generator, as proposed in ADP application CL-3276, will not cause the ambient air quality requirements of 40 CFR 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.
- 9.d. Operation of the boilers, water heater, and emergency generator, as proposed in ADP application CL-3276, will not cause the requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" or WAC 173-476 "Ambient Air Quality Standards" to be violated.
- 9.e. Operation of the boilers, water heater, and emergency generator, as proposed in ADP application CL-3276, will not violate emission standards for sources as established under SWCAA General Regulations Sections 400-040 "General Standards for Maximum Emissions," 400-050 "Emission Standards for Combustion and Incineration Units," and 400-060 "Emission Standards for General Process Units."

10. DISCUSSION OF APPROVAL CONDITIONS

SWCAA has made a determination to issue ADP 24-3676 in response to ADP application CL-3276. ADP 24-3676 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

- 10.a. Supersession of Previous Permits. ADP 24-3676 supersedes ADP 04-2547R1 in its entirety.
- 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.

Only ultra-low-sulfur (15 ppm or less) fuel may be used for the emergency generator engine. This is consistent with BACT and the requirements of 40 CFR 60 Subpart IIII.

- 10.d. Monitoring and Recordkeeping Requirements. ADP 24-3676 establishes monitoring and recordkeeping requirements sufficient to document compliance with applicable emission limits, ensure proper operation of approved equipment, and provide for compliance with generally applicable requirements.

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. ADP 24-3676 establishes general reporting requirements for annual air emissions, upset conditions, and excess emissions. Specific reporting requirements are established for natural gas consumption, hours of operation, and maintenance. Reports are to be submitted on an annual basis.

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 must 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 will include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

To SWCAA's knowledge, this facility can comply with all applicable standards during start-up and shutdown.

- 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 ongoing compliance with the permitted emission limits.

13. FACILITY HISTORY

- 13.a. General History. Cascade Middle School was first permitted in 2004 by SWCAA. This school currently has 800+ students.
- 13.b. Previous Permitting Actions. The following past permitting actions have been taken by SWCAA for this facility:

| Permit | Application | Date Issued | Description |
|-----------|-------------|-------------|--|
| 04-2547R1 | CL-1743 | 8/15/2006 | Addition of an Emergency Generator |
| 04-2547 | CL-1644 | 5/26/2004 | Permitting two hot water boilers and three water heaters |

- 13.c. Compliance History. The following compliance issues in the past five (5) years have been identified for this facility:

| NOV | Date | Violation |
|-------|------------|---|
| 11182 | 03/27/2024 | Replacement of two boilers without approval |

14. PUBLIC INVOLVEMENT OPPORTUNITY

- 14.a. Public Notice for ADP Application CL-3276. Public notice for ADP application CL-3267 was published on the SWCAA website for a minimum of fifteen (15) days beginning on November 1, 2024.
- 14.b. Public/Applicant Comment for ADP Application CL-3276. SWCAA did not receive specific comments, a comment period request, or any other inquiry from the public or the applicant regarding ADP application CL-3276. Therefore, no public comment period was provided for this permitting action.

- 14.c. State Environmental Policy Act. After review of the SEPA Checklist for this project, SWCAA has determined that it is exempt from SEPA requirements pursuant to WAC 197-11-800(3) and has issued Determination of SEPA Exemption 24-046. This project only involves the replacement of existing equipment and will not involve material expansion or changes in use. There is no physical change proposed in the project that would have an adverse impact on the environment beyond that which has already been evaluated under previous SEPA reviews.