



TECHNICAL SUPPORT DOCUMENT

**Air Discharge Permit SWCAA 20-3441
Air Discharge Permit Application CL-3059**

**CITY OF VANCOUVER
Facilities Management
415 W 6th Street
Vancouver, WA 98668**

SWCAA ID: 2331

November 12, 2020

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Southwest Clean Air Agency

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Abbreviations

ADP	Air Discharge Permit (a.k.a. Order of Approval)
AP-42	<u>Compilation of Emission Factors, AP-42, Fifth Edition, Volume 1, Stationary Point and Area Sources</u> – published by the US Environmental Protection Agency
ASIL	Acceptable Source Impact Level from WAC 173-460
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
CAM	Compliance Assurance Monitoring (40 CFR 64)
CFR	Code of Federal Regulations
CO	Carbon monoxide
EPA	U.S. Environmental Protection Agency
HAP	Hazardous Air Pollutant listed pursuant to Section 112 of the Federal Clean Air Act
LAER	Lowest Achievable Emission Rate
g/hp-hr	Grams per horsepower per hour
lb/hr	Pounds per hour
lb/MMscf	Pounds per million standard cubic feet
lb/yr	Pounds per year
MMBtu/hr	Millions of British thermal units per hour
NO _x	Nitrogen oxides
PM	Particulate matter with an aerodynamic diameter less than or equal to 100 micrometers (includes both filterable particulate matter measured by EPA Method 5 that is less than 100 micrometers and condensable particulate matter measured by EPA Method 202)
PM ₁₀	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
PM _{2.5}	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
ppm	Parts per million
ppmvd @ X	Parts per million, dry volume basis correct to X
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RCW	Revised Code of Washington
SQER	Small Quantity Emission Rate listed in WAC 173-460
SO ₂	Sulfur dioxide
SO _x	Sulfur oxides
SWCAA	Southwest Clean Air Agency
TAP	Toxic Air Pollutant pursuant to Chapter 173-460 WAC
T-BACT	Best Available Control Technology for toxic air pollutants
tpy	Tons per year
VOC	Volatile Organic Compound
WAC	Washington Administrative Code

1. FACILITY IDENTIFICATION

Applicant Name: City of Vancouver
Applicant Address: 415 W 6th Street, PO Box 1995, Vancouver, WA 98668

Facility Name: City of Vancouver – Facilities Management
Facility Address: Multiple
SWCAA Identification: 2331
Contact Person: Justin Serface – Facilities Supervisor

Primary Process: City Government Offices
SIC / NAICS: 9199/919904
Facility Classifications: BACT / Minor Source

2. FACILITY DESCRIPTION

City of Vancouver operates multiple facilities throughout the city that have hot water heaters, fire pump engines, and/or emergency generators.

3. CURRENT PERMITTING ACTION

City of Vancouver submitted Air Discharge Permit application (ADP application) number CL-3059 on October 2, 2018, for approval of existing equipment at various locations throughout Vancouver. The existing equipment includes:

1. City Hall – emergency generator engines, boiler, water heater
2. Firstenburg Community Center – boilers, emergency generator engine, fire pump engine
3. Marshall Community Center – boilers, water heater, emergency generator engine
4. Luepke Center – boiler, furnaces, emergency generator engine
5. Fire Station #10 – emergency generator engine
6. Fire Station #9 – emergency generator engine
7. Fire Station #8 – emergency generator engine
8. Fire Station #7 – emergency generator engine
9. Fire Station #6 – emergency generator engine
10. Fire Station #5 – emergency generator engine, boiler, water heater
11. Fire Station #4 – emergency generator engine
12. Fire Station #3 – emergency generator engine
13. Fire Station #2 – emergency generator engine
14. Fire Station #1 – emergency generator engine
15. Police – West Precinct – emergency generator engine
16. Police – East Precinct – emergency generator engine
17. Police – Headquarters – emergency generator engine
18. Police – Evidence Storage – emergency generator engine

The ADP requirements for the equipment permitted at 415 West 6th Street in ADP 07-2729 will be superseded by this ADP in their entirety. The remainder of ADP 07-2729 will remain in effect. Equipment proposed under Small Unit Notifications (SUN) SUN-137, SUN-138, SUN-139 and SUN-140 for the Firstenburg Community Center are incorporated into this ADP.

4. PROCESS DESCRIPTION

Emergency generator engines are used to power equipment at various city locations in the event of an electrical power interruption. Fire pump engines are used to power emergency fire equipment. The boilers/hot water heaters are used to provide domestic hot water to these facilities.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a City Hall Boiler. This boiler is used to provide building heat. Equipment details are provided below:

Make/Model: Aerco / BMK 2000 / 2.0 Low NO_x
Serial Number: G-06-1726
State Identification Number: 00357-07W
Capacity: 2.0 MMBtu/hr
Year Built: 2006
Fuel Type: Natural gas
Stack Description: 8-inch diameter stack
Location: 415 West 6th Street. Seventh floor mechanical equipment room.

5.b City Hall Water Heater. This water heater is used to provide hot water for the restrooms and showers. Equipment details are provided below:

Make/Model: AO Smith / BTH 120 970
Serial Number: L05M000693
State Identification Number: 00362-07W
Capacity: 0.125 MMBtu/hr
Year Built: November 2, 2005
Fuel Type: Natural gas
Stack Description: 3-inch diameter stack
Location: 415 West 6th Street. Seventh floor mechanical equipment room.

5.c City Hall Emergency Generator Set Engine 1. Equipment details are provided below:

Generator Make/Model: Caterpillar / LC5
Generator Serial Number: G5A00902
Generator Rating: 250 kW
Engine Make/Model: Caterpillar / C9
Engine Serial Number: Cat00000CC9E00414 (S9L00943)
Engine Rating: 375 horsepower
Year Built: 2007
Fuel Type: Diesel (19.4 gallons per hour at maximum load)
Certification: EPA Tier 3
Location: 415 West 6th Street. Southeast of building in parking lot

5.d City Hall Emergency Generator Set Engine 2. Equipment details are provided below. The unit has a CARB certified Altronic, LLC Bi-Fuel system installed, allowing the diesel engine to use natural gas as a supplemental fuel. It will always run on diesel and start on diesel with a maximum of 70% natural gas supplementary fuel when the unit is under load.

Generator Make/Model: Caterpillar / C18-600 kW
Generator Serial Number: unknown
Generator Rating: 600 kW
Engine Make/Model: Caterpillar / C18 ACERT
Engine Serial Number: unknown
Engine Rating: 800 horsepower
Year Built: 2020
Fuel Type: Diesel (40.6 gallons per hour at maximum load / Natural gas fuel varies)

Certification: EPA Tier 2
Location: 415 West 6th Street. Southeast of building in parking lot

- 5.e Firstenburg Community Center Boiler B1. This boiler is used to provide hot water to the pool and spa in the event of a power outage as well as providing hydronic heat for the facility through the floors, wall-mounted draft barriers, and a few ceiling-mounted unit heaters. This boiler was previously proposed under SUN-137 in June 2017. That SUN was withdrawn and is now incorporated into this permitting action. Equipment details are provided below:

Make/Model: Aerco / BMK 1000
Serial Number: G-16-2892
State Identification Number: 00276-17W
Capacity: 1.0 MMBtu/hr
Year Built: November 2016
Fuel Type: Natural gas
Stack Description: 6-inch diameter vertical stack 5 feet above roof level, 30 feet above ground
Location: 700 NE 136th Ave. Second floor mechanical equipment room.

- 5.f Firstenburg Community Center Boiler B2. This boiler is used to provide hot water to the pool and spa in the event of a power outage as well as providing hydronic heat for the facility through the floors, wall-mounted draft barriers, and a few ceiling-mounted unit heaters. This boiler was previously proposed under SUN-138 in June 2017. That SUN was withdrawn and is now incorporated into this permitting action. Equipment details are provided below:

Make/Model: Aerco / BMK 1000
Serial Number: G-16-1628
State Identification Number: 00277-17W
Capacity: 1.0 MMBtu/hr
Year Built: March 2016
Fuel Type: Natural gas
Stack Description: 6-inch diameter vertical stack 5 feet above roof level, 30 feet above ground
Location: 700 NE 136th Ave. Second floor mechanical equipment room.

- 5.g Firstenburg Community Center Boiler B3. This boiler is used to provide hot water to the pool and spa in the event of a power outage as well as providing hydronic heat for the facility through the floors, wall-mounted draft barriers, and a few ceiling-mounted unit heaters. This boiler was previously proposed under SUN-139 in June 2017. That SUN was withdrawn and is now incorporated into this permitting action. Equipment details are provided below:

Make/Model: Aerco / BMK 1000
Serial Number: G-16-1627
Capacity: 1.0 MMBtu/hr
Year Built: March 2016
Fuel Type: Natural gas
Stack Description: 6-inch diameter vertical stack 5 feet above roof level, 30 feet above ground
Location: 700 NE 136th Ave. Second floor mechanical equipment room.

- 5.h Firstenburg Community Center Boiler B4. This boiler is used to provide hot water for the restrooms and showers. The boiler system has a heat exchanger. This boiler was previously proposed under SUN-140 in June 2017. That SUN was withdrawn and is now incorporated into this permitting action. Equipment details are provided below:

Make/Model: Aerco / BMK 1000
Serial Number: G-16-1629
Capacity: 1.0 MMBtu/hr
Year Built: March 2016
Fuel Type: Natural gas
Stack Description: 6-inch diameter vertical stack 5 feet above roof level, 30 feet above ground
Location: 700 NE 136th Ave. Second floor mechanical equipment room.

5.i Firstenburg Community Center Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Caterpillar Olympian / D30P3
Generator Serial Number: OLY00000ANPF03780
Generator Rating: 30.4 kW
Engine Make/Model: Perkins / 2320/1500
Engine Serial Number: AG51240 U631132L
Engine Rating: 40.8 horsepower
Year Built: 2004
Fuel Type: Diesel (2.07 gallons per hour at maximum load)
Certification: uncertified
Location: 700 NE 136th Avenue. Northwest of building in parking lot.

5.j Firstenburg Community Center Fire Pump Engine. Equipment details are provided below:

Fire Pump Make: Clarke
Fire Pump Model: JU4H-UF10
Fire Pump Serial Number: PE4045D425334
Engine Make: John Deere / PowerTech 4045DF120R02
Engine Serial Number: PE4045D425334
Engine Rating: 51 horsepower @ 2100 rpm
Year Built: April 2005
Fuel Type: Diesel (2.6 gallons per hour at maximum load)
Certification: uncertified
Location: 700 NE 136th Avenue. Northwest of building in parking lot.

5.k Marshall Community Center Boiler B1. This boiler is used to provide hot water to the pool and spa. Equipment details are provided below:

Make/Model: Aerco / BMK 2000
Serial Number: G-19-2449
Capacity: 2.00 MMBtu/hr
Year Built: 2019
Fuel Type: Natural Gas
Stack Description: 6-inch diameter stack, 20 feet above ground
Location: 1009 E McLoughlin Blvd. Basement boiler room.

5.l Marshall Community Center Boiler B2. This boiler is used to provide hot water to the pool and spa. Equipment details are provided below:

Make/Model: HydroTherm / KN-20
Serial Number: KN-H-NET-M09NB-3852
Capacity: 1.999 MMBtu/hr

Year Built: 2014
Fuel Type: Natural gas
Stack Description: 6-inch diameter stack, 20 feet above ground
Location: 1009 E McLoughlin Blvd. Basement boiler room.

5.m Marshall Community Center Water Heater. This water heater is used to provide hot water for the restrooms and showers. Equipment details are provided below:

Make/Model: Bradford White / EF100T250E3NA2
Serial Number: CM8535509
State Identification Number: 296-07W
Capacity: 0.25 MMBtu/hr
Year Built: 2006
Fuel Type: Natural gas
Stack Description: 4-inch diameter stack
Location: 1009 E McLoughlin Blvd. Basement boiler room.

5.n Marshall Community Center Emergency Generator Set Engine. Equipment details are provided below. The unit has a CARB certified Altronic, LLC Bi-Fuel system installed, allowing the diesel engine to use natural gas as a supplemental fuel. It will always run on diesel and start on diesel with a maximum of 70% natural gas supplementary fuel when the unit is under load.

Generator Make/Model: Caterpillar / 300
Generator SET Serial Number: CAT000C9PNTX00339 / G5A09962
Generator Rating: 300 kW
Engine Make/Model: Caterpillar / C9
Engine Serial Number: S9P01739
Engine Rating: 480 horsepower
Year Built: April 2018
Fuel Type: Diesel (24.35 gallons per hour at maximum load) / Natural gas fuel varies)
Certification: EPA Tier 3
Location: 1009 E McLoughlin Blvd. East side of building.

5.o Luepke Senior Center Water Heater. This water heater is used to provide hot water for the restrooms and showers. Equipment details are provided below:

Make/Model: AO Smith / BTH-199-970
Serial Number: MM02-2102835-970
State Identification Number: 00754-03W
Capacity: 0.199 MMBtu/hr
Year Built: December 2002
Fuel Type: Natural gas
Stack Description: 3-inch diameter stack, 15 feet above ground
Location: 1009 E McLoughlin Blvd. Fire alarm panel room.

5.p Luepke Senior Center Furnace F1. This furnace is used to heat the building offices. Equipment details are provided below:

Make/Model: Carrier / 58PAV135-20
Product Number: 58PAV135-16120
Serial Number: 4596A05515
Capacity: 0.132 MMBtu/hr

Year Built: 1996
Fuel Type: Natural gas
Stack Description: 6-inch diameter vertical stack 3 feet above roof level, 20 feet above ground
Location: 1009 E McLoughlin Blvd. Furnace closet south side of building.

5.q Luepke Senior Center Furnace F2. This furnace is used to heat the building offices. Equipment details are provided below:

Make/Model: Carrier / 58PAV070-08
Product Number: 58PAV070-16108
Serial Number: 4696A03763
Capacity: 0.066 MMBtu/hr
Year Built: 1996
Fuel Type: Natural gas
Stack Description: 4-inch diameter vertical stack 3 feet above roof level, 20 feet above ground
Location: 1009 E McLoughlin Blvd. Furnace closet south side of building.

5.r Luepke Senior Center Emergency Generator Set Engine. Equipment details are provided below. The unit has a CARB certified Altronic, LLC Bi-Fuel system installed, allowing the diesel engine to use natural gas as a supplemental fuel. It will always run on diesel and start on diesel with a maximum of 70% natural gas supplementary fuel when the unit is under load.

Generator Make/Model: Caterpillar / D150-10
Generator Serial Number: 00C71EWG 200578
Generator Rating: 150 kW
Engine Make/Model: Caterpillar / C7.1
Engine Serial Number: 45501507
Engine Rating: 250 horsepower
Year Built: March 2019
Fuel Type: Diesel (12.68 gallons per hour at maximum load) / Natural gas fuel varies)
Certification: EPA Tier 3
Location: 1009 E McLoughlin Blvd. South side of building.

5.s Fire Station #10 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Cummins - Onan / DSHAB-546769
Generator Serial Number: F090010073
Generator Rating: 175 kW
Engine Make: Cummins / QSL9-G2 NR3
Engine Family Number: 9CEXL0f40AAB
Engine Serial Number: F090010073
Engine Rating: 320 horsepower
Year Built: June 10, 2009
Fuel Type: Diesel (16.23 gallons per hour at maximum load)
Certification: EPA Tier 3
Location: 1501 NE 164th Avenue

5.t Fire Station #9 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Cummins - Onan / 150DGFA 50252F
Generator Serial Number: A910368638
Generator Rating: 150 kW

Engine Make: Cummins / 6CTA8.3-G2
Engine Serial Number: 44571354
Engine Rating: 277 horsepower
Year Built: January 17, 1991
Fuel Type: Diesel (14.05 gallons per hour at maximum load)
Certification: uncertified
Location: 17408 SE 15th Street

5.u Fire Station #8 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Cummins - Onan / DGDA 5003969
Generator Serial Number: J010301213
Generator Rating: 115 kW
Engine Make: Cummins / 6BT5.9-G6
Engine Serial Number: 46158708
Engine Rating: 155 horsepower
Year Built: October 29, 2001
Fuel Type: Diesel (7.86 gallons per hour at maximum load)
Certification: EPA Tier 1
Location: 213 NE 120th Avenue

5.v Fire Station #7 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Caterpillar Olympian / D125P1 / OLY00000CNAT01544
Generator Serial Number: 176712/30
Generator Rating: 129 kW
Engine Make: Perkins / 2332/1800
Engine Serial Number: YD51130 U841126M
Engine Rating: estimated 168 horsepower
Year Built: 2005
Fuel Type: Diesel (8.52 gallons per hour at maximum load)
Certification: uncertified
Location: 12603 NE 72nd Avenue

5.w Fire Station #6 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Onan 60
Generator Serial Number: ODGB-C 31545A
Generator Rating: 76 kW
Engine Make: Cummins / 4BT-3.9
Engine Serial Number: 44237561
Engine Rating: 102 horsepower @ 1800 rpm
Year Built: January 9, 1988
Fuel Type: Diesel (5.17 gallons per hour at maximum load)
Certification: uncertified
Location: 3216 NE 112th Avenue

5.x Fire Station #5 Boiler. This boiler is used to provide hot water to HVAC equipment. Equipment details are provided below:

Make/Model: HydroTherm / KN-6
Serial Number: KN-H-NET-M11NB – 6240

State Identification: 00345-11W
Capacity: 0.6 MMBtu/hr
Year Built: May 10, 2010
Fuel Type: Natural gas
Stack Description: 6-inch diameter stack, 20 feet above ground
Location: 7110 NE 63rd Street

- 5.y Fire Station #5 Water Heater. This water heater is used to provide hot water for the restrooms and showers. Equipment details are provided below:

Make/Model: AO Smith / BTR-197 100
Part Number: BRT 197 L00N000000100
Serial Number: MG990856281
State Identification Number: 20201-00W
Capacity: 0.199 MMBtu/hr
Year Built: November 24, 1999
Fuel Type: Natural gas
Stack Description: 3-inch diameter stack, 15 feet above ground
Location: 7110 NE 63rd Street

- 5.z Fire Station #5 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Onan / 250 ODYH - 17R/18939D
Generator Serial Number: J800534075
Generator Rating: 250 kW
Engine Make: Allis-Chalmers / 6138-T
Catalogue Number: 1-7451-8641
Engine Serial Number: 14-03293
Engine Rating: 335 horsepower
Year Built: June 4, 1981
Fuel Type: Diesel (16.99 gallons per hour at maximum load)
Certification: uncertified
Location: 7110 NE 63rd Street

- 5.aa Fire Station #4 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Onan / 150DGFA 79158J
Generator Serial Number: K950592203
Generator Rating: 150 kW
Engine Make: Cummins / 6CTA8.3-G2
Engine Serial Number: 45265631
Engine Rating: 277 horsepower
Year Built: November 8, 1995
Fuel Type: Diesel (14.05 gallons per hour at maximum load)
Certification: uncertified
Location: 6701 NE 147th Avenue

- 5.bb Fire Station #3 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Onan / 12 5JC 3CR/8389AA
Generator Serial Number: 474797612
Generator Rating: 12.5 kW

Engine Make: Onan
Engine Serial Number: P2297
Engine Rating: 20 horsepower
Year Built: not listed
Fuel Type: Propane (1.54 gallons per hour at maximum load)
Certification: uncertified
Location: 1110 N. Devine Road

5.cc Fire Station #2 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Cummins / C100 D6C - 1729753
Generator Serial Number: E170193507
Generator Rating: 100 kW
Engine Make: Cummins / 6BTA5.9 G6
Engine Serial Number: 74140902
Engine Rating: 176 horsepower
Year Built: May 4, 2017
Fuel Type: Diesel (8.47 gallons per hour at maximum load)
Certification: EPA Tier 3
Location: 2106 Norris Road

5.dd Fire Station #1 Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Cummins / C100 D6C - 1729743
Generator Serial Number: E170193506
Generator Rating: 100 kW
Engine Make: Cummins / 6BTA5.9 G6
Engine Serial Number: 74142564
Engine Rating: 176 horsepower
Year Built: May 4, 2017
Fuel Type: Diesel (8.47 gallons per hour at maximum load)
Certification: EPA Tier 3
Location: 2607 Main St

5.ee Police – West Precinct Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Kohler / 250 REOZJD
Generator Serial Number: 2235120
Generator Rating: 250 kW
Engine Make: John Deere
Engine Serial Number: 6069HF484
Engine Rating: 335 horsepower
Year Built: 2008
Fuel Type: Diesel (16.99 gallons per hour at maximum load)
Certification: EPA Tier 3
Location: 2800 NE Stapleton Road

5.ff Police – East Precinct Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Caterpillar
Generator Serial Number: 8DR01511
Generator Rating: 250 kW

Engine Make: Caterpillar / 3306 DI
 Engine Serial Number: EPS01165
 Engine Rating: 335 horsepower
 Year Built: 2005
 Fuel Type: Diesel (16.99 gallons per hour at maximum load)
 Certification: EPA Tier 2
 Location: 520 SE 155th Avenue

5.gg Police – Headquarters Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Kato / 36SX9E
 Generator Serial Number: 78710-2
 Type Number: 13683
 Generator Rating: 30 kW
 Engine Make: John Deere / Type 4219DF 01
 Engine Serial Number: 466076 T
 Engine Rating: ~ 68 horsepower
 Year Built: pre 1981
 Fuel Type: Diesel (2.03 gallons per hour at maximum load)
 Certification: uncertified
 Location: 605 E. Evergreen Blvd. In generator closet.

5.hh Police – Evidence Storage Emergency Generator Set Engine. Equipment details are provided below:

Generator Make/Model: Kohler / 40REOZJB
 Generator Serial Number: 2188364
 Generator Rating: 40 kW
 Engine Make: John Deere / 3029TF270D
 Engine Family: 7JDXL02.9050
 Engine Serial Number: 11 97/68GA 2002/88 0271 01
 Engine Rating: 53 horsepower
 Year Built: January 2008
 Fuel Type: Diesel (2.69 gallons per hour at maximum load)
 Certification: EPA Tier 2
 Location: 2325 W Mill Plain Blvd.

5.ii Equipment/Activity Summary.

ID No.	Equipment/Activity	Control Equipment / Measure
1	City Hall – 1 Boiler (2.0 MMBtu/hr), 1 Heater (0.125 MMBtu/hr)	Low Sulfur Fuel (natural gas)
2	City Hall – Emergency Generator Engine (Cat 375 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
3	City Hall – Emergency Generator Engine (Cat 800 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Low Sulfur Fuel (natural gas), Limited Operation
4	Firstenburg Community Center – 4 Boilers (1.0 MMBtu/hr each)	Low Sulfur Fuel (natural gas)

ID No.	Equipment/Activity	Control Equipment / Measure
5	Firstenburg Community Center – Emergency Generator Engine (Perkins 40.5 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
6	Firstenburg Community Center – Fire Pump Engine (John Deere 51 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
7	Marshall Community Center – 2 Boilers (2.0 MMBtu/hr, 1.999 MMBtu/hr), 1 Heater (0.25 MMBtu/hr)	Low Sulfur Fuel (natural gas)
8	Marshall Community Center – Emergency Generator Engine (Cat 480 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Low Sulfur Fuel (natural gas), Limited Operation
9	Luepke Senior Center – 1 Heater (0.199 MMBtu/hr), 2 Furnaces (0.132 MMBtu/hr, 0.066 MMBtu/hr)	Low Sulfur Fuel (natural gas)
10	Luepke Senior Center – Emergency Generator Engine (Cat 250 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Low Sulfur Fuel (natural gas), Limited Operation
11	Fire Station 10 – Emergency Generator Engine (Cummins 320 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
12	Fire Station 9 – Emergency Generator Engine (Cummins 277 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
13	Fire Station 8 – Emergency Generator Engine (Cummins 155 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
14	Fire Station 7 – Emergency Generator Engine (Perkins 168 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
15	Fire Station 6 – Emergency Generator Engine (Cummins 105 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
16	Fire Station 5 – 1 Boiler (0.6 MMBtu/hr), 1 Heater (0.199 MMBtu/hr)	Low Sulfur Fuel (natural gas)
17	Fire Station 5 – Emergency Generator Engine (AC 335 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
18	Fire Station 4 – Emergency Generator Engine (Cummins 277 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
19	Fire Station 3 – Emergency Generator Engine (Onan 20 bhp)	Low Sulfur Fuel (propane), Limited Operation
20	Fire Station 2 – Emergency Generator Engine (Cummins 176 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
21	Fire Station 1 – Emergency Generator Engine (Cummins 176 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
22	Police – West Precinct – Emergency Generator Engine (John Deere 335 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation

ID No.	Equipment/Activity	Control Equipment / Measure
23	Police – East Precinct – Emergency Generator Engine (Cat 335 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
24	Police – Headquarters – Emergency Generator Engine (John Deere 68 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation
25	Police – Evidence Storage – Emergency Generator Engine (John Deere 53 bhp)	Ultra-Low Sulfur Diesel ($\leq 0.0015\%$ S), Limited Operation

6. EMISSIONS DETERMINATION

Emissions to the ambient atmosphere from the equipment proposed in ADP application CL-3059 consist of carbon monoxide (CO), oxides of nitrogen (NO_x), volatile organic compounds (VOC), sulfur dioxide (SO₂), particulate matter (PM), toxic air pollutants (TAPs), and hazardous air pollutants (HAPs).

6.a City Hall Boiler. Potential 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 - Aerco BMK 2000						
Heat Rate =	2.000 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	17.176 MMscf/yr					
Pollutant	ppmvd	Emission Factor		lb/hr	tpy	Emission Factor Source
	@ 3% O ₂	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	0.0108	0.047	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00118	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	1,024.7	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 - CO₂e			117.098	120,143	1,025.8	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.b City Hall Water Heater. Potential annual 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.

Water Heater - AO Smith BTA 120 920						
Heat Rate =	0.125 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	1.074 MMscf/yr					
Pollutant	Emission Factor		Emissions	Emissions	Emission Factor Source	
	lb/MMBtu	lb/MMscf	lb/hr	tpy		
NO _x	0.0980	100	0.01	0.05	AP-42 Sec. 1.4 (7/98)	
CO	0.0824	84	0.01	0.05	AP-42 Sec. 1.4 (7/98)	
VOC	0.0054	5.5	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
SO _x as SO ₂	0.0006	0.6	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
PM	0.0075	7.6	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
PM ₁₀	0.0075	7.6	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
PM _{2.5}	0.0075	7.6	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
Benzene	2.06E-06	0.0021	2.574E-07	1.127E-06	AP-42 Sec. 1.4 (7/98)	
Formaldehyde	7.35E-05	0.075	9.191E-06	4.026E-05	AP-42 Sec. 1.4 (7/98)	
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e	CO ₂ e	tpy, CO ₂ e	Emission Factor Source
			lb/MMBtu	lb/MMscf		
CO ₂	53.06	1	116.98	120,019	64.0	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	0.0	40 CFR 98
Total GHG - CO₂e			117.098	120,143	64.1	

6.c City Hall Emergency Generator Set Engine 1. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cat C9						
Hours of Operation =	200 hours					
Power Output =	375 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	19.02 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	3,804 gallons					
Pollutant	Emission Factor lb/hp-hr	Emission Factor lb/hr	Emissions tpy	Emission Factor Source		
NO _x	0.0063	2.36	0.24	EPA Tier III		
CO	0.0057	2.14	0.21	EPA Tier III		
VOC	0.00031	0.12	0.012	EPA Tier III		
SO _x as SO ₂	0.000011	0.0041	0.00041	Mass Balance		
PM	0.00033	0.12	0.012	EPA Tier III		
PM ₁₀	0.00033	0.12	0.012	EPA Tier III		
PM _{2.5}	0.00033	0.12	0.012	EPA Tier III		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	42.802	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.043	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.103	40 CFR 98
Total GHG - CO₂e			163.613	22.579	42.949	

6.d City Hall Emergency Generator Set Engine 2. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load. The unit has the capability of also burning natural gas as a back-up fuel. All emissions are determined assuming 100% operation on #2 diesel.

Emergency Generator Engine - Cat C18						
Hours of Operation =	200 hours					
Power Output =	800 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	40.58 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	8,116 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0104	8.32	0.83	EPA Tier II		
CO	0.0057	4.56	0.46	EPA Tier II		
VOC	0.00020	0.16	0.016	EPA Tier II		
SO _x as SO ₂	0.000011	0.0088	0.00088	Mass Balance		
PM	0.00033	0.26	0.026	EPA Tier II		
PM ₁₀	0.00033	0.26	0.026	EPA Tier II		
PM _{2.5}	0.00033	0.26	0.026	EPA Tier II		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	91.310	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.093	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.221	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	91.624	

6.e Firstenburg Community Center Boiler B1. Potential annual 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 - Aerco BMK 1000						
Heat Rate =	1.000 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	8.588 MMscf/yr					
Pollutant	ppmvd	Emission Factor		lb/hr	tpy	Emission Factor Source
	@ 3% O ₂	lb/MMBtu	lb/MMscf			
NO _x	30	0.0364	37.1	0.036	0.16	BACT
CO	50	0.0370	37.7	0.037	0.16	BACT
VOC		0.0054	5.5	0.0054	0.024	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00059	0.0026	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.1E-06	9.0E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	7.4E-05	3.2E-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	512.4	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.2	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.3	40 CFR 98
Total GHG - CO₂e			117.098	120,143	512.9	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.f Firstenburg Community Center Boiler B2. Potential 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 - Aerco BMK 1000						
Heat Rate =	1.000 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	8.588 MMscf/yr					
Pollutant	ppmvd	Emission Factor		lb/hr	tpy	Emission Factor Source
	@ 3% O ₂	lb/MMBtu	lb/MMscf			
NO _x	30	0.0364	37.1	0.036	0.16	BACT
CO	50	0.0370	37.7	0.037	0.16	BACT
VOC		0.0054	5.5	0.0054	0.024	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00059	0.0026	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.1E-06	9.0E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	7.4E-05	3.2E-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	512.4	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.2	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.3	40 CFR 98
Total GHG - CO₂e			117.098	120,143	512.9	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.g Firstenburg Community Center Boiler B3. Potential annual 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 - Aerco BMK 1000						
Heat Rate =	1.000 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	8.588 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	0.036	0.16	BACT
CO	50	0.0370	37.7	0.037	0.16	BACT
VOC		0.0054	5.5	0.0054	0.024	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00059	0.0026	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.1E-06	9.0E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	7.4E-05	3.2E-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	512.4	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.2	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.3	40 CFR 98
Total GHG - CO₂e			117.098	120,143	512.9	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.h Firstenburg Community Center Boiler B4. Potential 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 - Aerco BMK 1000						
Heat Rate =				1.000 MMBtu/hr		
Fuel Type =				Natural Gas		
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 =				8.588 MMscf/yr		
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
NO _x	30	0.0364	37.1	0.036	0.16	BACT
CO	50	0.0370	37.7	0.037	0.16	BACT
VOC		0.0054	5.5	0.0054	0.024	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00059	0.0026	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.007	0.033	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.1E-06	9.0E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	7.4E-05	3.2E-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	512.4	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.2	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.3	40 CFR 98
Total GHG - CO₂e			117.098	120,143	512.9	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.j Firstenburg Community Center Fire Pump Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Fire Pump Engine - John Deere 4045 DF120 R02						
Hours of Operation =	200 hours					
Power Output =	51 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	2.59 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	517 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0310	1.58	0.16	AP-42 Table 3.3-1 (10/96)		
CO	0.0067	0.34	0.03	AP-42 Table 3.3-1 (10/96)		
VOC	0.00247	0.13	0.013	AP-42 Table 3.3-1 (10/96)		
SO _x as SO ₂	0.000011	0.0006	0.00006	Mass Balance		
PM	0.00220	0.11	0.011	AP-42 Table 3.3-1 (10/96)		
PM ₁₀	0.00220	0.11	0.011	AP-42 Table 3.3-1 (10/96)		
PM _{2.5}	0.00220	0.11	0.011	AP-42 Table 3.3-1 (10/96)		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	5.821	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.006	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.014	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	5.841	

6.k Marshall Community Center Boiler B1. Potential 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 - Aerco BMK 2000						
Heat Rate =	2.000 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	17.176 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	0.0108	0.047	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00118	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	1,024.7	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 - CO₂e			117.098	120,143	1,025.8	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.1 Marshall Community Center Boiler B2. Potential 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 - Hydrotherm KN-20						
Heat Rate =	1.999 MMBtu/hr					
Fuel Type =	Natural Gas					
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	0.0108	0.047	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00118	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 - CO₂e			117.098	120,143	1,025.3	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.m Marshall Community Center Water Heater. Potential 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.

Water Heater - Bradford White EF100T 250 E3NA2						
Heat Rate =	0.250 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	2.147 MMscf/yr					
Pollutant	Emission Factor		Emissions	Emissions	Emission Factor Source	
	lb/MMBtu	lb/MMscf	lb/hr	tpy		
NO _x	0.0980	100	0.02	0.11	AP-42 Sec. 1.4 (7/98)	
CO	0.0824	84	0.02	0.09	AP-42 Sec. 1.4 (7/98)	
VOC	0.0054	5.5	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
SO _x as SO ₂	0.0006	0.6	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
PM	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
PM ₁₀	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
PM _{2.5}	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
Benzene	2.06E-06	0.0021	5.147E-07	2.254E-06	AP-42 Sec. 1.4 (7/98)	
Formaldehyde	7.35E-05	0.075	1.838E-05	8.051E-05	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	128.1	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.1	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.1	40 CFR 98
Total GHG - CO₂e			117.098	120,143	128.2	

6.n Marshall Community Center Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load. The unit has the capability of also burning natural gas as a back-up fuel. All emissions are determined assuming 100% operation on #2 diesel.

Emergency Generator Engine - Cat C9						
Hours of Operation =	200 hours					
Power Output =	480 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	24.35 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	4,870 gallons					
Pollutant	Emission Factor lb/hp-hr	Emission Factor lb/hr	Emissions tpy	Emission Factor Source		
NO _x	0.0063	3.02	0.30	EPA Tier III		
CO	0.0057	2.74	0.27	EPA Tier III		
VOC	0.00031	0.15	0.015	EPA Tier III		
SO _x as SO ₂	0.000011	0.0053	0.00053	Mass Balance		
PM	0.00033	0.16	0.016	EPA Tier III		
PM ₁₀	0.00033	0.16	0.016	EPA Tier III		
PM _{2.5}	0.00033	0.16	0.016	EPA Tier III		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	54.786	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.056	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.132	40 CFR 98
Total GHG - CO₂e			163.613	22.579	54.974	

6.0 Luepke Senior Center Water Heater. Potential 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.

Water Heater - AO Smith BTH 199 970						
Heat Rate =	0.199 MMBtu/hr					
Fuel Type =	Natural Gas					
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	Emission Factor		Emissions lb/hr	Emissions tpy	Emission Factor Source	
	lb/MMBtu	lb/MMscf				
NO _x	0.0980	100	0.02	0.09	AP-42 Sec. 1.4 (7/98)	
CO	0.0824	84	0.02	0.07	AP-42 Sec. 1.4 (7/98)	
VOC	0.0054	5.5	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
SO _x as SO ₂	0.0006	0.6	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
PM	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
PM ₁₀	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
PM _{2.5}	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
Benzene	2.06E-06	0.0021	4.10E-07	1.79E-06	AP-42 Sec. 1.4 (7/98)	
Formaldehyde	7.35E-05	0.075	1.46E-05	6.41E-05	AP-42 Sec. 1.4 (7/98)	
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e	CO ₂ e	tpy, CO ₂ e	Emission Factor Source
			lb/MMBtu	lb/MMscf		
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.p Leupke Senior Center Furnace 1. Potential emissions from the combustion of natural gas by this furnace were calculated with the assumption that the furnace could operate at full rated capacity for 8,760 hours per year.

Leupke Furnace F1 - Carrier 58PAV 135-16120						
Heat Input Rating =	0.132 MMBtu/hr					
Fuel Type =	Natural Gas					
Natural Gas Heat Value =	1,026 Btu/scf for 40 CFR 98 GHG emission factors					
Natural Gas Heat Content =	1,020 Btu/scf for AP-42 emission factors					
Natural Gas Firing Rate =	129 scfh					
Natural Gas Consumption =	1.13 MMscf/yr					
Pollutant	Emissions lb/MMscf	Emissions lb/MMBtu	Emissions lb/hr	Emissions tpy	Emission Factor Source	
NO _x	94	0.0922	0.012	0.05	AP-42 Section 1.4 (07/98)	
CO	40	0.0392	0.005	0.02	AP-42 Section 1.4 (07/98)	
VOC	5.5	0.0054	0.0007	0.0031	AP-42 Section 1.4 (07/98)	
SO _x as SO ₂	0.6	0.0006	0.0001	0.0003	AP-42 Section 1.4 (07/98)	
PM	7.6	0.0075	0.0010	0.0043	AP-42 Section 1.4 (07/98)	
PM ₁₀	7.6	0.0075	0.0010	0.0043	AP-42 Section 1.4 (07/98)	
PM _{2.5}	7.6	0.0075	0.0010	0.0043	AP-42 Section 1.4 (07/98)	
Benzene	0.0021	2.1E-06	2.7E-07	1.2E-06	AP-42 Section 1.4 (07/98)	
Formaldehyde	0.075	7.4E-05	9.7E-06	4.2E-05	AP-42 Section 1.4 (07/98)	
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	CO ₂ e tpy	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	68	40 CFR 98
CH ₄	0.001	25	0.055	57	0.0	40 CFR 98
N ₂ O	0.0001	298	0.066	67	0.0	40 CFR 98
Total GHG - CO₂e			117.098	120,143	68	

6.q Leupke Senior Center Furnace 2. Potential emissions from the combustion of natural gas by this furnace were calculated with the assumption that the furnace could operate at full rated capacity for 8,760 hours per year.

Leupke Furnace F2 - Carrier 58PAV 070-16108						
Heat Input Rating =	0.066 MMBtu/hr					
Fuel Type =	Natural Gas					
Natural Gas Heat Content =	1,020 Btu/scf for AP-42 emission factors					
Natural Gas Heat Value =	1,026 Btu/scf for 40 CFR 98 GHG emission factors					
Natural Gas Firing Rate =	65 scfh					
Natural Gas Consumption =	0.57 MMscf/yr					
Pollutant	Emissions lb/MMscf	Emissions lb/MMBtu	Emissions lb/hr	Emissions tpy	Emission Factor Source	
NO _x	94	0.0922	57.381	0.03	AP-42 Section 1.4 (07/98)	
CO	40	0.0392	0.003	0.01	AP-42 Section 1.4 (07/98)	
VOC	5.5	0.0054	0.0004	0.0016	AP-42 Section 1.4 (07/98)	
SO _x as SO ₂	0.6	0.0006	0.0000	0.0002	AP-42 Section 1.4 (07/98)	
PM	7.6	0.0075	0.0005	0.0022	AP-42 Section 1.4 (07/98)	
PM ₁₀	7.6	0.0075	0.0005	0.0022	AP-42 Section 1.4 (07/98)	
PM _{2.5}	7.6	0.0075	0.0005	0.0022	AP-42 Section 1.4 (07/98)	
Benzene	0.0021	2.1E-06	1.4E-07	6.0E-07	AP-42 Section 1.4 (07/98)	
Formaldehyde	0.075	7.4E-05	4.9E-06	2.1E-05	AP-42 Section 1.4 (07/98)	
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	CO ₂ e tpy	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	34	40 CFR 98
CH ₄	0.001	25	0.055	57	0.0	40 CFR 98
N ₂ O	0.0001	298	0.066	67	0.0	40 CFR 98
Total GHG - CO₂e			117.098	120,143	34	

6.r Luepke Senior Center Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load. The unit has the capability of also burning natural gas as a back-up fuel. All emissions are determined assuming 100% operation on #2 diesel.

Emergency Generator Engine - Cat C7.1						
Hours of Operation =	200 hours					
Power Output =	250 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	12.68 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	2,536 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0063	1.58	0.16	EPA Tier III		
CO	0.0057	1.43	0.14	EPA Tier III		
VOC	0.00031	0.08	0.008	EPA Tier III		
SO _x as SO ₂	0.000011	0.0027	0.00027	Mass Balance		
PM	0.00033	0.08	0.008	EPA Tier III		
PM ₁₀	0.00033	0.08	0.008	EPA Tier III		
PM _{2.5}	0.00033	0.08	0.008	EPA Tier III		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	28.534	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.029	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.069	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	28.632	

6.s Fire Station #10 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cummins QSL9-G2 NR3						
Hours of Operation =	200 hours					
Power Output =	320 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	16.23 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	3,246 gallons					
Pollutant	Emission Factor lb/hp-hr	Emission Factor lb/hr	Emissions tpy	Emission Factor Source		
NO _x	0.0063	2.02	0.20	EPA Tier III		
CO	0.0057	1.82	0.18	EPA Tier III		
VOC	0.00031	0.10	0.010	EPA Tier III		
SO _x as SO ₂	0.000011	0.0035	0.00035	Mass Balance		
PM	0.00033	0.11	0.011	EPA Tier III		
PM ₁₀	0.00033	0.11	0.011	EPA Tier III		
PM _{2.5}	0.00033	0.11	0.011	EPA Tier III		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	36.524	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.037	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.088	40 CFR 98
Total GHG - CO₂e			163.613	22.579	36.649	

6.t Fire Station #9 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cummins 6CTA 8.3-G						
Hours of Operation =	200 hours					
Power Output =	277 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	14.05 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	2,810 gallons					
	Emission	Emission				
	Factor	Factor	Emissions			
Pollutant	lb/hp-hr	lb/hr	tpy	Emission Factor Source		
NO _x	0.0310	8.59	0.86	AP-42 Table 3.3-1 (10/96)		
CO	0.0067	1.85	0.19	AP-42 Table 3.3-1 (10/96)		
VOC	0.00247	0.68	0.068	AP-42 Table 3.3-1 (10/96)		
SO _x as SO ₂	0.000011	0.0030	0.00030	Mass Balance		
PM	0.00220	0.61	0.061	AP-42 Table 3.3-1 (10/96)		
PM ₁₀	0.00220	0.61	0.061	AP-42 Table 3.3-1 (10/96)		
PM _{2.5}	0.00220	0.61	0.061	AP-42 Table 3.3-1 (10/96)		
			CO ₂ e	CO ₂ e		
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	31.616	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.032	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.076	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	31.725	

6.u Fire Station #8 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cummins 6BT5.9-G6						
Hours of Operation =	200 hours					
Power Output =	155 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	7.86 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	1,572 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0177	2.74	0.27	Cummins		
CO	0.0036	0.56	0.06	Cummins		
VOC	0.00037	0.06	0.006	Cummins		
SO _x as SO ₂	0.000011	0.0017	0.00017	Mass Balance		
PM	0.00062	0.10	0.010	Cummins		
PM ₁₀	0.00062	0.10	0.010	Cummins		
PM _{2.5}	0.00062	0.10	0.010	Cummins		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	17.691	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.018	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.043	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	17.752	

6.v Fire Station #7 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cat/Perkins 2332/1800						
Hours of Operation =	200 hours					
Power Output =	168 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	8.52 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	1,704 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0310	5.21	0.52	AP-42 Table 3.3-1 (10/96)		
CO	0.0067	1.12	0.11	AP-42 Table 3.3-1 (10/96)		
VOC	0.00247	0.41	0.041	AP-42 Table 3.3-1 (10/96)		
SO _x as SO ₂	0.000011	0.0018	0.00018	Mass Balance		
PM	0.00220	0.37	0.037	AP-42 Table 3.3-1 (10/96)		
PM ₁₀	0.00220	0.37	0.037	AP-42 Table 3.3-1 (10/96)		
PM _{2.5}	0.00220	0.37	0.037	AP-42 Table 3.3-1 (10/96)		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	19.175	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.019	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.046	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	19.241	

6.w Fire Station #6 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cummins 4BT-3.9						
Hours of Operation =	200 hours					
Power Output =	105 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	5.33 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	1,065 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0310	3.26	0.33	AP-42 Table 3.3-1 (10/96)		
CO	0.0067	0.70	0.07	AP-42 Table 3.3-1 (10/96)		
VOC	0.00247	0.26	0.026	AP-42 Table 3.3-1 (10/96)		
SO _x as SO ₂	0.000011	0.0012	0.00012	Mass Balance		
PM	0.00220	0.23	0.023	AP-42 Table 3.3-1 (10/96)		
PM ₁₀	0.00220	0.23	0.023	AP-42 Table 3.3-1 (10/96)		
PM _{2.5}	0.00220	0.23	0.023	AP-42 Table 3.3-1 (10/96)		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	11.984	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.012	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.029	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	12.026	

6.x Fire Station #5 Boiler. Potential 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 - HydroTherm KN-6						
Heat Rate =	0.600 MMBtu/hr					
Fuel Type =	Natural Gas					
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 =	5.153 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	0.022	0.10	BACT
CO	50	0.0370	37.7	0.022	0.10	BACT
VOC		0.0054	5.5	0.0032	0.014	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00035	0.0015	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.004	0.020	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.004	0.020	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.004	0.020	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	1.2E-06	5.4E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	4.4E-05	1.9E-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	307.4	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.1	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.2	40 CFR 98
Total GHG - CO₂e			117.098	120,143	307.7	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing and are approved by SWCAA.

6.y Fire Station #5 Water Heater. Potential 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.

Water Heater - AO Smith BTR 197 100						
Heat Rate =	0.199 MMBtu/hr					
Fuel Type =	Natural Gas					
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	Emission Factor		Emissions lb/hr	Emissions tpy	Emission Factor Source	
	lb/MMBtu	lb/MMscf				
NO _x	0.0980	100	0.02	0.09	AP-42 Sec. 1.4 (7/98)	
CO	0.0824	84	0.02	0.07	AP-42 Sec. 1.4 (7/98)	
VOC	0.0054	5.5	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
SO _x as SO ₂	0.0006	0.6	0.00	0.00	AP-42 Sec. 1.4 (7/98)	
PM	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
PM ₁₀	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
PM _{2.5}	0.0075	7.6	0.00	0.01	AP-42 Sec. 1.4 (7/98)	
Benzene	2.06E-06	0.0021	4.10E-07	1.79E-06	AP-42 Sec. 1.4 (7/98)	
Formaldehyde	7.35E-05	0.075	1.46E-05	6.41E-05	AP-42 Sec. 1.4 (7/98)	
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e		tpy, CO ₂ e	Emission Factor Source
			lb/MMBtu	lb/MMscf		
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.z Fire Station #5 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Allis-Chalmers 6138-T						
Hours of Operation =	200 hours					
Power Output =	335 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	16.99 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	3,399 gallons					
Pollutant	Emission Factor lb/hp-hr	Emission Factor lb/hr	Emissions tpy	Emission Factor Source		
NO _x	0.0310	10.39	1.04	AP-42 Table 3.3-1 (10/96)		
CO	0.0067	2.24	0.22	AP-42 Table 3.3-1 (10/96)		
VOC	0.00247	0.83	0.083	AP-42 Table 3.3-1 (10/96)		
SO _x as SO ₂	0.000011	0.0037	0.00037	Mass Balance		
PM	0.00220	0.74	0.074	AP-42 Table 3.3-1 (10/96)		
PM ₁₀	0.00220	0.74	0.074	AP-42 Table 3.3-1 (10/96)		
PM _{2.5}	0.00220	0.74	0.074	AP-42 Table 3.3-1 (10/96)		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	38.236	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.039	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.092	40 CFR 98
Total GHG - CO₂e			163.613	22.579	38.367	

6.aa Fire Station #4 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cummins 6CTA8.3-G						
Hours of Operation =	200 hours					
Power Output =	277 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	14.05 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	2,810 gallons					
	Emission Factor	Emission Factor	Emissions tpy	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0310	8.59	0.86	AP-42 Table 3.3-1 (10/96)		
CO	0.0067	1.85	0.19	AP-42 Table 3.3-1 (10/96)		
VOC	0.00247	0.68	0.068	AP-42 Table 3.3-1 (10/96)		
SO _x as SO ₂	0.000011	0.0030	0.00030	Mass Balance		
PM	0.00220	0.61	0.061	AP-42 Table 3.3-1 (10/96)		
PM ₁₀	0.00220	0.61	0.061	AP-42 Table 3.3-1 (10/96)		
PM _{2.5}	0.00220	0.61	0.061	AP-42 Table 3.3-1 (10/96)		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	31.616	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.032	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.076	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	31.725	

6.bb Fire Station #3 Emergency Generator Set Engine. Potential emissions from the combustion of propane (sulfur of 14.8 gr/100 ft³) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Onan P2297						
Hours of Operation =	200 hours					
Power Output =	20 horsepower					
Fuel Type =	Propane (Commercial)					
Fuel Consumption Rate =	1.54 gallons per hour (estimate)					
Fuel Heat Content =	0.091 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	308 gallons					
Pollutant	Emission Factor lb/1000 gal	Emission Factor lb/hr	Emissions tpy	Emission Factor Source		
NO _x	13.0000	4.00	0.40	AP-42 Table 1.5-1 (7/08)		
CO	7.5000	2.31	0.23	AP-42 Table 1.5-1 (7/08)		
VOC	1.0000	0.31	0.03	AP-42 Table 1.5-1 (7/08)		
SO _x as SO ₂	1.4800	0.46	0.05	AP-42 Table 1.5-1 (7/08)		
PM	0.7000	0.22	0.02	AP-42 Table 1.5-1 (7/08)		
PM ₁₀	0.7000	0.22	0.02	AP-42 Table 1.5-1 (7/08)		
PM _{2.5}	0.7000	0.22	0.02	AP-42 Table 1.5-1 (7/08)		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	
CO ₂	61.46	1	135.496	12.330	1.897	40 CFR 98
CH ₄	0.003	25	0.165	0.015	0.002	40 CFR 98
N ₂ O	0.0006	298	0.394	0.036	0.006	40 CFR 98
Total GHG - CO ₂ e			136.056	12.381	1.905	

6.dd Fire Station #1 Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - Cummins 6BTA5.9 G6						
Hours of Operation =	200 hours					
Power Output =	176 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	8.93 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	1,786 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0063	1.11	0.11	EPA Tier III		
CO	0.0057	1.00	0.10	EPA Tier III		
VOC	0.00031	0.05	0.005	EPA Tier III		
SO _x as SO ₂	0.000011	0.0019	0.00019	Mass Balance		
PM	0.00033	0.06	0.006	EPA Tier III		
PM ₁₀	0.00033	0.06	0.006	EPA Tier III		
PM _{2.5}	0.00033	0.06	0.006	EPA Tier III		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	20.088	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.020	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.049	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	20.157	

6.ee Police – West Precinct Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - John Deere 6069HF						
Hours of Operation =	200 hours					
Power Output =	335 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	16.99 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	3,399 gallons					
	Emission Factor	Emission Factor	Emissions	Emission Factor Source		
Pollutant	lb/hp-hr	lb/hr	tpy			
NO _x	0.0063	2.11	0.21	EPA Tier III		
CO	0.0057	1.91	0.19	EPA Tier III		
VOC	0.00031	0.10	0.010	EPA Tier III		
SO _x as SO ₂	0.000011	0.0037	0.00037	Mass Balance		
PM	0.00033	0.11	0.011	EPA Tier III		
PM ₁₀	0.00033	0.11	0.011	EPA Tier III		
PM _{2.5}	0.00033	0.11	0.011	EPA Tier III		
				CO ₂ e	CO ₂ e	
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	38.236	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.039	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.092	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	38.367	

6.gg Police – Headquarters Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - John Deere - Type 4219DF01						
Hours of Operation =	200 hours					
Power Output =	68 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	3.45 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	690 gallons					
Pollutant	Emission Factor lb/hp-hr	Emission Factor lb/hr	Emissions tpy	Emission Factor Source		
NO _x	0.0310	2.11	0.21	AP-42 Table 3.3-1 (10/96)		
CO	0.0067	0.45	0.05	AP-42 Table 3.3-1 (10/96)		
VOC	0.00247	0.17	0.017	AP-42 Table 3.3-1 (10/96)		
SO _x as SO ₂	0.000011	0.0007	0.00007	Mass Balance		
PM	0.00220	0.15	0.015	AP-42 Table 3.3-1 (10/96)		
PM ₁₀	0.00220	0.15	0.015	AP-42 Table 3.3-1 (10/96)		
PM _{2.5}	0.00220	0.15	0.015	AP-42 Table 3.3-1 (10/96)		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	7.761	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.008	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.019	40 CFR 98
Total GHG - CO₂e			163.613	22.579	7.788	

6.hh Police – Evidence Storage Emergency Generator Set Engine. Potential emissions from the combustion of road-grade #2 diesel (0.0015% or less sulfur by weight) in the emergency generator engine were estimated assuming that the generator is operated 200 hours per year at full load.

Emergency Generator Engine - John Deere 3029TF270D						
Hours of Operation =	200 hours					
Power Output =	53 horsepower					
Fuel Type =	Ultra-low Sulfur Diesel					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	2.69 gallons per hour (estimate)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Annual Fuel Consumption =	538 gallons					
Pollutant	Emission Factor lb/hp-hr	Emission Factor lb/hr	Emissions tpy	Emission Factor Source		
NO _x	0.0101	0.54	0.05	EPA Tier II		
CO	0.0082	0.43	0.04	EPA Tier II		
VOC	0.00220	0.12	0.012	EPA Tier II		
SO _x as SO ₂	0.000011	0.0006	0.00006	Mass Balance		
PM	0.00066	0.03	0.003	EPA Tier II		
PM ₁₀	0.00066	0.03	0.003	EPA Tier II		
PM _{2.5}	0.00066	0.03	0.003	EPA Tier II		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	
CO ₂	73.96	1	163.054	22.501	6.049	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.006	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.015	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	6.070	

6.ii Facility-wide Potential Emissions Summary:

Pollutant	Potential Annual Emissions (tpy)
Nitrogen oxides	9.38
Carbon monoxide	5.09
Volatile organic compounds	0.79
Sulfur oxides as sulfur dioxide	0.08
Particulate matter	0.81
PM ₁₀	0.81
PM _{2.5}	0.81
Toxic Air Pollutants	0.004
Hazardous Air Pollutants	0.004

7. REGULATIONS AND EMISSION STANDARDS

Regulations 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 regulations, codes, or requirements listed below.

- 7.a Title 40 Code of Federal Regulations (40 CFR) 60.7 "Notification and Recordkeeping" requires that notification shall be submitted to SWCAA, the delegated authority, for date construction commenced, anticipated initial startup, and initial startup.
- 7.b 40 CFR Part 60.8 "Performance Tests" requires that emission tests be conducted according to test methods approved in advance by the permitting authority and a copy of the results be submitted to the permitting authority.
- 7.c 40 CFR Part 60.40c "Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" applies to any steam generating unit with a heat input greater than or equal to 10 MMBtu/hr, but less than or equal to 100 MMBtu/hr constructed, modified, or reconstructed after June 9, 1989. None of the boilers or water heaters exceed 10 MMBtu/hr; therefore, this regulation does not apply.
- 7.d 40 CFR Part 60.4200 et seq. "Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" 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 established. The emergency generator engines at the following locations are affected sources because they were manufactured after the relevant applicability date (April 1, 2006): City Hall, Luepke Senior Center, Fire Station #10, Fire Station #2, Fire Station #1, Police West Precinct, and Police Evidence Storage. For affected emergency engines, the following is required:
- (1) Owners or operators must comply with the emission standards as specified in §60.4205, for all pollutants. [40 CFR 60.4205]
 - (2) For engines with less than 30 liters of displacement per cylinder, owners or operators must use diesel fuel with a maximum sulfur content of 15 ppm and a minimum cetane index of 40 or a maximum aromatic content of 35 percent. [40 CFR 60.4207(b)]
 - (3) Owners or operators must operate and maintain each stationary CI internal combustion engine and control device according to the manufacturer's written instructions. In addition, owners and operators may only change those settings that are permitted by the manufacturer; and [40 CFR 60.4211(a)]
 - (4) Emergency engines may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year. [40 CFR 60.4211(f)(2)(i)]
- 7.e 40 CFR Part 63.7 "Performance Testing Requirements" requires that emission tests be conducted according to test methods approved in advance by the permitting authority and a copy of the results be submitted to the permitting authority.
- 7.f 40 CFR Part 63.6580 et seq. "Subpart ZZZZ - 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 (RICE) located at major and area sources of HAP emissions. Diesel engines installed at area sources before June 12, 2006, are "existing" for the purposes of this rule. Existing diesel engines at institutional sources (which includes fire stations and other institutional establishments) are not subject to this subpart. New diesel engines at

institutional sources are not exempt from this regulation. 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. The emergency generator engines were installed after June 12, 2006, and are therefore new sources and are subject to this regulation. SWCAA does not have minor source delegation for this regulation, and has chosen not to independently implement the associated requirements. Requirements from this regulation have not been included in the ADP.

- 7.g 40 CFR Part 63.11193 et seq. "Subpart JJJJJ - 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 industrial, commercial, or institutional boilers at an area source of HAP emissions. Gas-fired boilers and hot water heaters are not subject to this subpart.
- 7.h 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 70.94] 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.
- 7.i 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 Order of Approval (ADP) for installation and establishment of an air contaminant source.
- 7.j Washington Administrative Code (WAC) 173-460 "Controls for New Sources of Toxic Air Pollutants" (as in effect August 21, 1998) requires Best Available Control Technology for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.
- 7.k WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM₁₀, PM_{2.5}, lead, sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide in the ambient air, which shall not be exceeded.
- 7.l 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, sulfur dioxide, concealment and masking, and fugitive dust.
- 7.m SWCAA 400-040(1) "Visible Emissions" requires that no emission of an air contaminant from any emissions unit shall 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.
- 7.n SWCAA 400-040(4) "Odors" requires that any person who shall cause or allow the generation of any odor from any source, which may unreasonably interfere with any other property owner's use and enjoyment of their property must use recognized good practices and procedures to reduce these odors to a reasonable minimum.
- 7.o SWCAA 400-040(6) "Sulfur Dioxide" requires that no person shall 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.
- 7.p SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person shall cause or permit the emission of particulate matter 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.

- 7.q SWCAA 400-060 "Emission Standards for General Process Units" requires that all new and existing sources not emit particulate matter in excess of 0.1 grains per dry standard cubic foot of exhaust gas.
- 7.r SWCAA 400-070(13) " General Requirements for Certain Source Categories: Natural Gas-Fired Water Heaters."
- (a) Applicability. The requirements of this section apply to all natural gas-fired water heaters with a rated heat input less than 400,000 Btu/hr. For the purposes of this subsection, the term "water heater" means a closed vessel in which water is heated by combustion of gaseous fuel and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210°F.
 - (b) Requirements.
 - (i) On or after January 1, 2010, no person shall offer for sale, or install, a water heater that emits NO_x at levels in excess of 55 ppmv at 3% O₂, dry (0.067 lb per million Btu of heat input).
 - (ii) On or after January 1, 2013, no person shall offer for sale, or install, a water heater that emits NO_x at levels in excess of 20 ppmv at 3% O₂, dry (0.024 lb per million Btu of heat input).
- 7.s 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.
- 7.t SWCAA 400-110 "New Source Review" requires that an ADP be issued by SWCAA prior to establishment of the new source, emission unit, or modification.
- 7.u SWCAA 400-111 "Requirements for Sources in a Maintenance Plan Area" requires that no approval to construct or alter an air contaminant source shall 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) Best Available Control Technology 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.

This facility is located in the Portland/Vancouver Maintenance Plan Area, therefore this regulation is applicable to this facility.

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

The proposed equipment and control systems have been evaluated to determine if they meet the requirements of Best Available Control Technology (BACT) and Best Available Control Technology for toxics (T-BACT) for the types and amounts of air contaminants emitted by the processes and equipment as described below:

- 8.a BACT Determination – Diesel and Propane-Fired Emergency Generator Engines. Available control measures for diesel and propane engines include low sulfur fuel and add-on control equipment such as selective catalytic reduction units. The use of add-on control equipment is not economically or technically feasible because the engines will be operated only for short periods of time for testing, maintenance, and to provide emergency

electricity. Because the engines will normally be operated only for short periods of time, the stable operating temperature required for operation of add-on control equipment will not be achieved.

The use of modern diesel-fired internal combustion engine design, ultra-low sulfur diesel fuel ($\leq 0.0015\%$ sulfur by weight) and propane, limitation of visible emissions to 5% opacity or less, and limitation of engine operation to maintenance checks, readiness testing, and emergency use (≤ 100 hours per year) has been determined to meet the requirements of BACT for the types and quantities of air contaminants emitted from these engines.

- 8.b BACT Determination – Natural Gas-Fired Boilers and Water Heaters. The larger (greater than 0.5 MMBtu/hr) boilers are equipped with burner packages capable of maintaining average NO_x emissions at or below 30 ppmvd @ 3% O₂, and average CO emissions at or below 50 ppmvd @ 3% O₂. These levels meet the requirements of BACT for this facility. In order to assure that the larger (greater than 0.5 MMBtu/hr) boilers remain within emission levels that meet the requirements for BACT, the permit will require corrective action when the average NO_x and CO emissions exceed 30 ppmvd or 50 ppmvd respectively when corrected to 3% O₂.
- 8.c Prevention of Significant Deterioration (PSD) Applicability Determination. This permitting action will not result in a potential emissions increase equal to or greater than applicable PSD thresholds. Therefore, requirements of the PSD program are not applicable to this action.
- 8.d Compliance Assurance Monitoring (CAM). CAM is not applicable to any emission unit at this facility because this facility is not a major source required to obtain a Part 70 or 71 permit.

9. AMBIENT IMPACT ANALYSIS

- 9.a TAP Small Quantity Review. The TAP emissions associated with this facility are quantified in Section 6 of this Technical Support Document. All incremental increases in individual TAP emissions are less than the applicable small quantity emission rate (SQER) identified in WAC 173-460 [effective 8/21/98].

Conclusions

- 9.b Operation of the existing emergency generator engines, boilers, and water heaters, as proposed in ADP application CL-3059, will not cause a violation of the ambient air quality standards established by 40 CFR 50 "National Primary and Secondary Ambient Air Quality Standards."
- 9.d The existing emergency generator engines, boilers, and water heaters, as proposed in ADP application CL-3059, will not cause a violation of 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."
- 9.c Operation of the existing emergency generator engines, boilers, and water heaters, as proposed in ADP application CL-3059, will not cause a violation of 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 SWCAA 20-3441 in response to ADP application CL-3059. ADP 20-3441 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

- 10.a Supersession of Previous Permits. The permit requirements for the equipment permitted at 415 West 6th Street in ADP 07-2729 are superseded in their entirety by this ADP. The remainder of ADP 07-2729 will remain in effect.

10.b General Basis. Approval conditions for equipment affected by this permitting action incorporate the operating schemes proposed by the permittee in the ADP application and previous applications for the facility.

10.c Emission Limits. Emissions from the emergency generator engines were estimated at the quantity generated from operation of each engine for 200 hours per year for emergency use, maintenance checks, and readiness testing using the emission factors supplied in Section 6. The engines can operate for unlimited hours per year for actual emergency conditions. Visible emissions from the diesel-fired emergency generator engines were limited to 5% opacity.

Emissions from all the boilers and hot water heaters were limited to the quantity of emissions anticipated from operation of each emissions unit for 8,760 hours per year at full rated load using the emission factors supplied in Section 6. Visible emissions from the natural gas-fired emission units were limited to 0% opacity.

10.d Operating Limits and Requirements. Only ultra-low sulfur (15 ppm or less) fuel may be used for the emergency generator engines. This is consistent with BACT and the requirements of 40 CFR 60 Subpart III.

Consistent with 40 CFR 60 Subpart III, except for emergency operation, the emergency generator engines may only operate 100 hours or less per year for maintenance and readiness testing. This limitation also assures that emissions from the engine will be below a threshold where additional control equipment would be necessary to meet the requirements of BACT.

If the results of performance monitoring of the larger (greater than 0.5 MMBtu/hr) boilers indicate emissions in excess of the level of emissions indicating proper operation and BACT (30 ppmvd NO_x @ 3% O₂ and 50 ppmvd CO @ 3% O₂), corrective action must be taken to restore proper operation. This is consistent with good air pollution practice to minimize emissions.

10.e Monitoring and Recordkeeping. The hours of operation of the emergency generator engines and the amount of natural gas consumed by the boilers, hot water heaters, and furnaces must be recorded once per year to calculate annual emissions.

Fuel certificates for the emergency generator engine fuel purchases must be kept to demonstrate that ultra-low sulfur fuel is being purchased for the emergency generator engines.

The permittee is required to record each occurrence of maintenance and repairs to applicable equipment so that SWCAA and the permittee can assure that the equipment is being maintained properly and evaluate whether emission factors remain valid.

10.f Emission Monitoring and Testing Requirements. See Section 12.

10.g Reporting. 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.

The permit requires reporting of the annual air emissions inventory. 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.

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

11.a Startup 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 startup or shutdown, SWCAA shall include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during startup or shutdown.

The diesel-fired emergency generator engines may exhibit excess opacity upon startup. Accordingly, the opacity limit for these engines is not applicable during the startup period defined in the permit.

11.b Alternate Operating Scenarios. SWCAA conducted a review of alternate operating scenarios applicable to equipment affected by this permitting action. The applicant did not propose or identify any applicable alternate operating scenarios. Because neither SWCAA nor the applicant identified any alternate operating scenarios, none were accommodated 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 other than the control measures identified in the permit were identified by either the permittee or SWCAA. Therefore, none were included in the approval conditions.

12. EMISSION MONITORING AND TESTING

Due to the nature and quantity of air pollutant emissions from the emergency generator engines and the fact that post-combustion controls are not utilized, performance monitoring and/or testing requirements were not established in the Permit for the emergency generator engines.

Performance monitoring of the larger (greater than 0.5 MMBtu/hr) boilers 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 boiler emissions will degrade rapidly enough that more frequent monitoring is necessary to maintain proper operation. Potential emissions from hot water heaters are too small to warrant performance monitoring.

13. HISTORY

13.a Previous Approvals/Permits/Orders. The following approvals, Permits, and Orders have been issued for this facility:

Permit / Order #	Application #	Date Issued	Description
07-2729	CL-1783	6-7-07	Installation of one 250 kW diesel-fired emergency generator set, one 2.0 MMBtu/hr natural-gas fired water heater, and one 0.125 MMBtu/hr natural-gas fired water heater. Portions of this Permit are superseded by 20-3441.

City Hall, at 415 West 6th Street, was previously permitted by The Columbian.

14. PUBLIC INVOLVEMENT

- 14.a Public Notice for Air Discharge Permit Application CL-3059. Public notice for ADP application CL-1782 was published on the SWCAA internet website on October 12, 2018.
- 14.b Public/Applicant Comment for Air Discharge Permit Application CL-1782. SWCAA did not receive formal comments, a comment period request, or any other inquiry from the public or the applicant regarding this ADP application. Therefore no public comment period was provided for this permitting action.
- 14.c State Environmental Policy Act. The existing equipment permitted under this ADP are all located at existing facilities owned and/or operated by the City of Vancouver; therefore, SEPA would have been initially performed by the City of Vancouver as the lead agency. The replacement of any equipment at these facilities is exempt from SEPA requirements pursuant to WAC 197-11-800(3) since it only involves repair, remodeling, maintenance, or minor alteration of existing structures, equipment, or facilities, and does not involve material expansions or changes in use. SWCAA issued a determination that the project is exempt from SEPA review (Determination of SEPA Exempt - SWCAA 20-041). The City of Vancouver previously issued the following Optional Determinations of Non-significance (ODNS) for these facilities:
- Firstenburg Community Center – ODNS #03-6183
 - Fire Station #1 – ODNS 201600384
 - Fire Station #2 – ODNS 201600387