



DEPARTMENT ORDER

**Somerset County Jail
Somerset County
Madison, Maine
A-953-71-D-A**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #1**

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

Somerset County Jail was issued Air Emission License A-953-71-C-R on May 22, 2017, for the operation of emission sources associated with this correctional facility.

Somerset County Jail has requested an amendment to their license in order to change the classification of the existing generator from emergency to non-emergency to allow for participation in a demand response program.

The equipment addressed in this license amendment is located at 131 East Madison Rd, Madison, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Stationary Engines

Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity (HP)	Fuel Type, % sulfur	Firing Rate (gal/hr)	Date of Manuf.	Date of Install.
Generator #1 *	15.1	2,220	Distillate fuel, 0.00015%	109.7	2008	2008

* The size of the generator as well as its firing rate have been corrected to the nameplate data as found on the engine.

C. Definitions

Distillate Fuel means the following:

- Fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials (ASTM) in ASTM D396;
- Diesel fuel oil numbers 1 or 2, as defined in ASTM D975;
- Kerosene, as defined in ASTM D3699;
- Biodiesel, as defined in ASTM D6751; or
- Biodiesel blends, as defined in ASTM D7467.

Records or Logs mean either hardcopy or electronic records.

D. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the date this license was issued.

Somerset County Jail has proposed to limit operation of this non-emergency unit to 750 hours/year. Also, the maximum heat input capacity and fuel firing rate have been corrected in this license amendment to match information on the nameplate of the unit. Both of these changes cause increases in licensed emission totals for Generator #1.

The modification of a minor source is considered a major or minor modification based on whether or not expected emission increases exceed the “Significant Emission” levels as defined in the Department’s *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. The emission increases are determined by subtracting the current licensed annual emissions preceding the modification from the maximum future licensed annual emissions, as follows:

Pollutant	Current License (TPY)	Future License (TPY)	Net Change (TPY)	Significant Emission Levels
PM	1.8	2.4	0.6	100
PM ₁₀	1.8	2.4	0.6	100
SO ₂	10.7	10.7	0.0	100
NO _x	8.1	24.4	16.3	100
CO	1.3	5.6	4.3	100
VOC	0.2	0.6	0.4	50

This modification is determined to be a minor modification and has been processed as such.

E. Facility Classification

With the annual fuel limit on the boilers and the operating hours restriction on the generator, the facility is licensed as follows:

- As a synthetic minor source of air emissions NO_x, because Somerset County Jail is subject to license restrictions that keep facility emissions below major source thresholds for criteria pollutants; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment. BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts. Although this is not a new emissions unit, *Major and Minor Source Air Emission License Regulation*, 06-096 C.M.R. ch. 115 requires BACT for modified emissions units for those regulated pollutants that will be emitted in greater amounts as a result of the modification and BPT for regulated pollutants that will not be emitted in greater amounts from the modified units. The definition in 06-096 C.M.R. ch. 100 for “modification” includes any physical change in or change in the method of operation of a source that would result in an emissions increase of any regulated pollutant (except greenhouse gases). Use of Generator #1 in a demand response program is considered a change in the method of operation of the unit, and the increase in licensed hours of operation of the unit would result in emissions increases of combustion pollutants. Therefore, a summary of the BACT analysis is included in this amendment.

B. Generator #1

Somerset County Jail now operates Generator #1 in a demand response program and as such the requirements associated with that engine will be updated in this license. The generator set consists of an engine and an electrical generator. Generator #1 has an engine rated at 15.1 MMBtu/hr which fires distillate fuel. Generator #1 is a Cummins model QSK50-G4 which was manufactured in 2008.

In model year 2008 non-emergency engines were required to be certified to a Tier 2 standard as listed in 40 C.F.R. § 1039 Appendix 1, Table 2. Generator #1 is eligible to be used as a non-emergency generator because it is certified to this standard according to EPA Certificate of Conformity number CEX-NRCI-08-24.

1. BACT Findings

The following is a BACT analysis for emissions from Generator #1.

a. Particulate Matter (PM and PM₁₀)

PM emissions from distillate fuel-fired engines are generally controlled through proper operation and maintenance of the engines. Given the limited operating hours of 750 hrs/year, additional control for PM is not economically feasible.

BACT for PM/PM₁₀ emissions from Generator #1 shall be proper operation and maintenance of the unit, limiting the total operation to 750 hours per year, and emission limits listed in the table below.

b. Sulfur Dioxide (SO₂)

For an engine that fires distillate fuel and operates infrequently for short periods of time, the use of a wet scrubber or other additional SO₂ add-on control methods are not economically feasible considering the minimal emissions due to the limited use of the engine. The most practical method for limiting SO₂ emissions of such engines is the use of low sulfur fuel, such as distillate fuel with a sulfur content no greater than 0.0015% by weight.

BACT for SO₂ emissions from Generator #1 shall be the use of distillate fuel with a sulfur content no greater than 0.0015% by weight and SO₂ emission limits listed in the table below.

c. Nitrogen Oxides (NO_x)

Potentially available control options for reducing NO_x emissions from distillate fuel-fired engines include combustion controls, selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), using a certified engine under 40 C.F.R. Part 60, Subpart IIII, and limiting the total operating hours per year.

Combustion controls are implemented through design features such as electronic engine controls, injection systems, combustion chamber geometry, and turbocharging systems.

SCR and SNCR are both post-combustion NO_x reduction technologies. SCR injects ammonia to react with NO_x in the gas stream in the presence of a catalyst to form nitrogen and water. SNCR injects ammonia without the use of a catalyst to convert CO, NO_x, and hydrocarbons into carbon dioxide, nitrogen, and water, and requires strict air-to-fuel control to maintain high reduction effectiveness without increasing hydrocarbon emissions. For units of this size (15.1 MMBtu/hr) and limited usage,

neither SCR nor SNCR are economically feasible considering the small size of the unit and the minimal emissions due to the limited use of the engine.

BACT for NO_x emissions from Generator #1 shall be the use of a certified engine under 40 C.F.R. Part 60, Subpart IIII, proper operation and maintenance of the unit, limiting the total operation to 750 hours per year, and the NO_x emission limit listed in the table below.

d. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

CO and VOC emissions are a result of incomplete combustion caused by conditions such as insufficient residence time or limited oxygen availability. CO and VOC emissions from distillate fuel-fired engines are generally controlled through proper operation and maintenance. Oxidation catalysts have been used on larger engines to reduce CO and VOC emission levels in the exhaust; however, like SCR and NSCR, use of an oxidation catalyst on an engine with limited yearly use would not provide a significant environmental benefit and would not be economically feasible.

BACT for CO and VOC emissions from Generator #1 shall be proper operation and maintenance of the unit and emission limits listed in the table below.

2. BACT Emission Limits

The BACT emission limits for Generator #1 are based on the following:

- PM/PM₁₀ - 0.12 lb/MMBtu from 06-096 C.M.R. ch. 103
- SO₂ - combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
- NO_x - 3.2 lb/MMBtu from AP-42, Table 3.4-1 dated 10/96
- CO - 0.85 lb/MMBtu from AP-42, Table 3.4-1 dated 10/96
- VOC - 0.09 lb/MMBtu from AP-42, Table 3.4-1 dated 10/96
- Visible Emissions - 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Generator #1 are the following:

Unit	Pollutant	lb/MMBtu
Generator #1	PM	0.12

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generator #1	1.80	1.80	0.02	48.06	12.77	1.35

Visible emissions from Generator #1 shall not exceed 20% opacity on a six-minute block average basis.

3. 40 C.F.R. Part 60, Subpart IIII

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart IIII is applicable to the engine listed above since the unit was ordered after July 11, 2005, and manufactured after April 1, 2006. [40 C.F.R. § 60.4200] By meeting the requirements of 40 C.F.R. Part 60, Subpart IIII, the unit also meets the requirements found in the National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

A summary of the currently applicable federal 40 C.F.R. Part 60, Subpart IIII requirements is listed below.

a. Manufacturer Certification Requirement

The engine shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 C.F.R. § 60.4202. [40 C.F.R. § 60.4205(b)]

b. Ultra-Low Sulfur Fuel Requirement

The fuel fired in the engine shall not exceed 15 ppm sulfur (0.0015% sulfur). [40 C.F.R. § 60.4207(b)]

c. Operation and Maintenance Requirements

The engine shall be operated and maintained according to the manufacturer's emission-related written instructions. Somerset County Jail may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)]

C. Annual Emissions

The table below provides an estimate of facility-wide annual emissions for the purposes of calculating the facility's annual air license fee. Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included. Maximum potential emissions were calculated based on the following assumptions:

- Firing 300,000 gal/yr distillate fuel in the boilers;
- Operating Generator #1 for 750 hrs/yr.

Please note, this information provides the basis for fee calculation only and should not be construed to represent a comprehensive list of license restrictions or permissions. That information is provided in the Order section of this license.

**Total Licensed Annual Emissions for the Facility
Tons/year**

(used to calculate the annual license fee)

	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Boilers #1 & #2	1.7	1.7	10.6	6.3	0.8	0.1
Generator #1	0.7	0.7	0.1	18.1	4.8	0.5
Total TPY	2.4	2.4	10.7	24.4	5.6	0.6

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 C.M.R. ch. 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM ₁₀	25
SO ₂	50
NO _x	50
CO	250

The total licensed annual emissions for the facility are below the emission levels contained in the table above and there are no extenuating circumstances; therefore, an ambient air quality impact analysis is not required as part of this license amendment.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-953-71-D-A subject to the conditions found in Air Emission License A-953-71-C-R and the following conditions.

Severability. The invalidity or unenforceability of any provision of this License Amendment or part thereof shall not affect the remainder of the provision or any other provisions. This License Amendment shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

The following will replace Condition (17) of Air Emission License A-953-71-C-R.

(17) **Generator #1**

- A. Generator #1 shall be limited to 750 hours of operation per calendar year, including operating hours during emergency situations. [06-096 C.M.R. ch. 115, BACT]
- B. Somerset County Jail shall keep records of the hours of operation of the engine recorded through the non-resettable hour meter. [06-096 C.M.R. ch. 115, BPT]
- C. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Generator #1	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)

- D. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generator #1	1.80	1.80	0.02	48.06	12.77	1.35

- E. Visible Emissions

Visible emissions from Generator #1 shall not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

- F. Generator #1 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart III, including the following:
[incorporated under 06-096 C.M.R. ch. 115, BACT]

1. Manufacturer Certification

The engine shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in § 60.4202.
[40 C.F.R. § 60.4205(b)]

2. Ultra-Low Sulfur Fuel

The fuel fired in the engine shall not exceed 15 ppm sulfur (0.0015% sulfur). Compliance with the fuel sulfur content limit shall be demonstrated by fuel delivery receipts from the supplier, fuel supplier certification, certificate of analysis, or testing of the tank containing the fuel to be fired.
[40 C.F.R. § 60.4207(b) and 06-096 C.M.R. ch. 115, BACT]

3. Operation and Maintenance

The engine shall be operated and maintained according to the manufacturer's emission-related written instructions. Somerset County Jail may only change those emission-related settings that are permitted by the manufacturer.
[40 C.F.R. § 60.4211(a)]

DONE AND DATED IN AUGUSTA, MAINE THIS 29th DAY OF NOVEMBER, 2021.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for
MELANIE LOYZIM, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-953-71-C-R.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 7/15/21

Date of application acceptance: 7/21/21

Date filed with the Board of Environmental Protection:

This Order prepared by Chris Ham, Bureau of Air Quality.

FILED
NOV 29, 2021
State of Maine
Board of Environmental Protection