Tambrands Inc.
Androscoggin County
Auburn, Maine
A-44-71-V-A

Departmental
Findings of Fact and Order
Air Emission License
Amendment #2

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

Tambrands Inc. (Tambrands) was issued Air Emission License A-44-71-T-R/M on September 25, 2017, for the operation of emission sources associated with their paper products manufacturing facility. The license was subsequently amended on September 11, 2018 (A-44-71-U-A).

Tambrands has requested an amendment to their license in order to add a new natural gas-fired boiler, Boiler #7, to their license, and to remove Boiler #4 from their license.

The equipment addressed in this license amendment is located at 2879 Hotel Road, Auburn, Maine.

B. Emission Equipment

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

Boilers

Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type	Date of Manuf.	Date of Install.	Stack #
Boiler #7	8.0	7,843 scf/hr	Natural gas	2019	2019 (anticipated)	TBD

As part of this amendment, Boiler #4 is being removed from the facility to make room for the installation of Boiler #7; therefore, Boiler #4 is hereby removed from this air emission license.

C. 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.

Although this amendment will not affect the facility's fuel limits or increase licensed emissions of any pollutant, it does include the installation of new equipment; therefore, this modification is determined to be a minor modification and has been processed as such.

D. Facility Classification

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

- As a synthetic minor source of air emissions, because Tambrands 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.

B. Project Description

Tambrands currently has two boiler rooms, Boiler Rooms #1 and #2, which supply two separate heating loops. This project is the second phase of a multi-year heating system upgrade project which will eventually result in the joining of the two heating loops and the decommissioning of Boiler Room #1. The first phase, addressed in A-44-71-U-A (September 11, 2018), consisted of the installation of a domestic hot water heater and a new boiler (Boiler #6) in Boiler Room #2, as well as the removal of one of the existing boilers (Boiler #5), to make room for Boiler #6. This project consists of the removal of another existing boiler (Boiler #4) to make room for a new natural gas-fired boiler (Boiler #7) in Boiler Room #2.

C. Boiler #7

Tambrands plans to operate Boiler #7 for facility steam and heat. The boiler is rated at 8.0 MMBtu/hr and fires natural gas. Boiler #7 will replace Boiler #4 in Tambrands' Boiler Room #2. Boiler #7 will be manufactured and installed in 2019 and will exhaust through its own stack.

1. BACT Findings

The following is a BACT analysis for control of emissions from Boiler #7:

a. Particulate Matter (PM and PM_{10})

PM emissions from fuel combustion consist of fine liquid and solid particles, such as dust, dirt, and soot, and are attributable to incomplete combustion of the fuel and the presence of non-combustible material in the fuel. PM emissions can be reduced by using add-on pollution control equipment such as baghouses, wet scrubbers, mechanical dust collectors, or electrostatic precipitators (ESP); by firing fuels with a low ash content, such as natural gas; by use of good combustion practices; or by a combination of options.

Emissions of PM and PM_{10} from the combustion of natural gas are inherently low due to the low ash content of natural gas. Given the relatively small size of the unit (8.0 MMBtu/hr), minimal projected PM/PM_{10} emissions from the combustion of natural gas, and the large additional expense of installing control equipment, the use of add-on pollution control equipment for control of PM and PM_{10} emissions from Boiler #7 is considered economically infeasible.

In addition to firing a low ash fuel such as natural gas, Tambrands has proposed the use of an oxygen trim system to optimize combustion. The Department finds use of an oxygen trim system and emission limits of 0.05 lb/MMBtu for PM and 0.4 lb/hr for PM and PM_{10} (each) to constitute BACT for PM and PM_{10} emissions from Boiler #7.

b. Sulfur Dioxide (SO_2)

Formation of SO_2 during combustion occurs as the result of oxidation of sulfur compounds contained in the fuel. Potential control options for reducing SO_2 emissions include SO_2 scrubbing technologies such as flue gas desulfurization with wet scrubber or dry sorbent injection, and the firing of low or ultra-low sulfur fuel such as natural gas.

Tambrands has proposed the use of natural gas exclusively in Boiler #7. Given the inherently low sulfur content of natural gas and the expense of installing control equipment, additional add-on pollution control equipment for control of SO_2 emissions from Boiler #7 are considered economically infeasible.

The Department finds the use of natural gas and an emission limit of 0.005 lb/hr to constitute BACT for SO_2 emissions from Boiler #7.

c. Nitrogen Oxides (NO_x)

Nitrogen oxides consist mainly of nitric oxide (NO) and nitrogen dioxide (NO_2). NO_x emissions from the combustion of natural gas are generated through one of three mechanisms: fuel NO_x, which is produced by the oxidation of nitrogen in the fuel source, thermal NO_x, which is formed in the high temperature area of the boiler and increases exponentially with increases in flame temperature and linearly with residence time, and prompt NO_x, which is formed by the oxidation of hydrocarbon radicals near the combustion flame and produces an insignificant amount of NO_x.

Control of NO_x from natural gas-fired boilers can be accomplished through one of three methods: the use of add on controls, such as selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR); the use of boiler design options, such as steam injection, flue gas recirculation (FGR), and premix burner technology; and good combustion practices.

SCR systems reduce NO_x emissions by reacting NO_x with ammonia in the presence of a catalyst to produce nitrogen and water. SNCR systems employ a similar reaction using either ammonia or urea without a catalyst present. Although SCR and SNCR are considered technically feasible control technologies for minimizing NO_x emissions from boilers, they are generally only installed on large combustion units. The EPA Air Pollution Control Technology fact sheets for both SCR and SNCR state that these pollution control technologies are only cost effective for units over 50 MMBtu/hr. Given the initial capital cost of SCR and SNCR, the annual operating costs of either system, and the minimal potential NOx reductions from a boiler of this size, SCR and SNCR are considered economically infeasible for control of NO_x emissions from Boiler #7.

Steam injection reduces NO_x emissions by injecting steam into the combustion zone to reduce the firing temperature. FGR similarly reduces NO_x emissions by recycling flue gas into the combustion air to reduce the oxygen content of the combustion air and ultimately cool the flame. Given the size (8.0 MMBtu/hr) and design of the unit, both steam injection and FGR are considered technically infeasible.

Premix burner technology reduces NO_x emissions by mixing the fuel and air at some point upstream from the burner nozzle, which offers a means to attain lower flame temperatures and therefore reduce NO_x emissions. Good combustion practices reduce NO_x emissions by optimizing the combustion temperature and fuel efficiency of the unit to reduce NO_x formation while limiting emissions of other pollutants through complete combustion. Tambrands has proposed to use a combination of premix burners and good combustion practices to reduce NO_x emissions from Boiler #7.

The Department finds use of premix burners and good combustion practices and a NO_x emission limit of 0.78 lb/hr to constitute BACT for NO_x emissions from Boiler #7.

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

CO and VOC are both formed as the result of incomplete combustion, which is caused by conditions such as insufficient residence time, limited oxygen availability, low combustion temperature, and excessive fuel moisture. Potential CO and VOC reduction methods include add-on pollution controls such as catalytic oxidizers and thermal oxidizers, combustion control techniques such as oxygen trim systems, and good combustion practices.

In catalytic oxidation, the combustion gases pass through a passive radiator consisting of a series of narrow honeycomb passages coated with a precious metal, such as palladium. Under favorable temperature conditions, the precious metal-coated passages aid in oxidizing CO and VOC by up to 90%. Thermal oxidizers reduce CO and VOC emissions by completing the oxidation of combustible materials by raising the temperature of the gases above the ignition point and maintaining that temperature for enough time to ensure complete combustion. Although both options are technically feasible, the high capital, maintenance, and operational costs of both catalytic oxidation and thermal oxidation relative to the cost of the unit and the minimal emissions of CO and VOC from the unit make catalytic oxidation and thermal oxidation economically infeasible for control of CO and VOC emissions from Boiler #7.

Combustion control techniques, such as oxygen trim systems, reduce CO and VOC emissions by controlling the air-to-fuel mixture in the unit to optimize efficiency and ensure that adequate combustion air is present for complete combustion. Tambrands has proposed to use an oxygen trim system along with good combustion practices to minimize CO and VOC emissions from Boiler #7.

The Department finds use of an oxygen trim system and good combustion practices and emission limits of 0.66 lb/hr for CO and 0.04 lb/hr for VOC to constitute BACT for CO and VOC emissions from Boiler #7.

e. Visible Emissions

Visible emissions from Boiler #7 shall not exceed 10% opacity on a six-minute block average basis.

2. Emission Limits

The BACT emission limits for Boiler #7 were based on the following:

PM/PM_{10}	–	0.05 lb/MMBtu based on 06-096 C.M.R. ch. 115, BACT
SO_2	–	0.6 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
NO_x	–	100 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
CO	–	84 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
VOC	–	5.5 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
Visible Emissions	–	06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Boiler #7 are the following:

Unit	Pollutant	lb/MMBtu
Boiler #7	PM	0.05

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #7	0.40	0.40	negl.	0.78	0.66	0.04

Visible emissions from Boiler #7 shall not exceed 10% opacity on a six-minute block average basis.

Boiler #7 shall be included in the current facility-wide boiler heat input limit of 43,500 MMBtu/year, based on a 12-month rolling total.

3. Periodic Monitoring

Periodic monitoring for the boiler shall include recordkeeping to document fuel use both on a monthly and 12-month rolling total basis. Documentation shall include the type and amount of fuel used.

4. New Source Performance Standards (NSPS): 40 C.F.R. Part 60, Subpart Dc

Due to the size of the unit, Boiler #7 is not subject to *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* 40 C.F.R. Part 60, Subpart Dc for units greater than 10 MMBtu/hr manufactured after June 9, 1989. [40 C.F.R. § 60.40c]

5. National Emission Standards for Hazardous Air Pollutants (NESHAP): 40 C.F.R. Part 63, Subpart JJJJJJ

   Boiler #7 is not subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 C.F.R. Part 63, Subpart JJJJJJ. The unit is considered a new gas-fired boiler rated less than 10 MMBtu/hr. Gas-fired boilers are specifically exempted from 40 C.F.R. Part 63, Subpart JJJJJJ. [40 C.F.R. § 63.11195(e)]

D. Annual Emissions

This license amendment will not change Tambrands' licensed annual emission totals.

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-44-71-V-A subject to the conditions found in Air Emission License A-44-71-T-R/M, in amendment A-44-71-U-A, and the following Condition.

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 Condition replaces Condition (16) of Air Emission License Amendment A-44-71-U-A (September 11, 2018):

(16) **Boilers #1-3 and #6-7**

A. Fuel

1. Boilers #3, #6, and #7 shall only fire natural gas. [06-096 C.M.R. ch. 115, BPT (Boiler #3) and BACT (Boilers #6 and #7)]
2. Total fuel use for the boilers shall not exceed 43,500 MMBtu/yr on a 12-month rolling total basis, assuming the following heating values for #4 fuel oil and natural gas:

Fuel	Heating Value
#4 fuel oil	145 MMBtu/1,000 gal
Natural gas	1,020 MMBtu/MMscf

[06-096 C.M.R. ch. 115, BPT and BACT]

3. The facility shall not purchase or otherwise obtain #4 fuel oil with a maximum sulfur content that exceeds 0.5% by weight. [06-096 C.M.R. ch. 115, BPT]
4. Compliance with the fuel requirements shall be demonstrated by fuel records showing the quantity, type, and the percent sulfur of the fuel delivered (if applicable). Records of annual fuel use shall be kept and converted to heat input on a monthly and 12-month rolling total basis. Fuel sulfur content compliance 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. [06-096 C.M.R. ch. 115, BPT]

B. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler #1	PM	0.12 [each]	06-096 C.M.R. ch. 103, § 2.B.(1)(a)
Boiler #2	PM		
Boiler #3	PM	0.05 [each]	06-096 C.M.R. ch. 115, BPT
Boiler #6	PM		06-096 C.M.R. ch. 115, BACT
Boiler #7	PM		

C. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BPT (Boilers #1-3) and BACT (Boilers #6-7)]:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #1 #4 fuel oil	0.76	0.76	6.35	1.97	0.21	0.03
Boiler #2 #4 fuel oil	0.76	0.76	6.35	1.97	0.21	0.03
Boiler #3 Natural gas	0.32	0.32	negl.	0.61	0.51	0.03
Boiler #6 Natural gas	0.40	0.40	negl.	0.78	0.66	0.04
Boiler #7 Natural gas	0.40	0.40	negl.	0.78	0.66	0.04

D. Visible Emissions

1. Visible emissions from Stack #1, serving Boilers #1 and #2, shall not exceed 30% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BPT]
2. Visible emissions from Stack #2, serving Boiler #3, shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BPT]
3. Visible emissions from Stack #3, serving Boiler #6, shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]
4. Visible emissions from the stack serving Boiler #7 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

E. Tambrands shall comply with all requirements of 40 C.F.R. Part 63, Subpart JJJJJJ applicable to Boilers #1 and #2 including, but not limited to, the following [incorporated under 06-096 C.M.R. ch. 115, BPT]:

1. The facility shall implement a boiler tune-up program. [40 C.F.R. § 63.11223]

   a. Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. As existing oil-fired boilers rated higher than 5 MMBtu/hr, Boilers #1 and #2 are required to be tuned up every two years. [40 C.F.R. § 63.11223(a) and Table 2]

   b. The boiler tune-up program, conducted to demonstrate continuous compliance, shall be performed as specified below:

      (1) As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled shutdown is permitted, not to exceed 36 months from the previous inspection. [40 C.F.R. § 63.11223(b)(1)]
      (2) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 C.F..R § 63.11223(b)(2)]
      (3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is permitted, not to exceed 36 months from the previous inspection. [40 C.F.R. § 63.11223(b)(3)]
      (4) Optimize total emissions of CO, consistent with manufacturer's specifications. [40 C.F.R. § 63.11223(b)(4)]
      (5) Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 C.F.R. § 63.11223(b)(5)]
      (6) If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 C.F.R. § 63.11223(b)(7)]

c. Tune-Up Report: A tune-up report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the following information [40 C.F.R. § 63.11223(b)(6)]:

(1) The concentration of CO in the effluent stream (ppmv) and oxygen (volume percent) measured at high fire or typical operating load both **before** and **after** the boiler tune-up;
(2) A description of any corrective actions taken as part of the tune-up of the boiler; and
(3) The types and amounts of fuels used over the 12 months prior to the tune-up of the boiler, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel use by each unit.

2. Compliance Report

A compliance report shall be prepared by March 1st biennially which covers the previous two calendar years. The report shall be maintained by the source and submitted to the Department and/or to the EPA upon request. The report must include the items contained in 40 C.F.R. §§ 63.11225(b)(1) and (2), including the following [40 C.F.R. § 63.11225(b)]:

a. Company name and address;
b. A statement of whether the source has complied with all the relevant requirements of this Subpart;
c. A statement certifying truth, accuracy, and completeness of the notification and signed by a responsible official and containing the official's name, title, phone number, email address, and signature;
d. The following certifications, as applicable:

(1) "This facility complies with the requirements in 40 C.F.R. § 63.11223 to conduct tune-ups of each boiler in accordance with the frequency specified in this Subpart."
(2) "No secondary materials that are solid waste were combusted in any affected unit."
(3) "This facility complies with the requirement in 40 C.F.R. §§ 63.11214(d) and 63.11223(g) to minimize the boiler's time spent during startup and shutdown and to conduct startups and shutdowns according to the manufacturer's recommended procedures or procedures specified for a boiler of similar design if manufacturer's recommended procedures are not available."

3. Records shall be maintained consistent with the requirements of 40 C.F.R. Part 63, Subpart JJJJJ including the following [40 C.F.R. § 63.11225(c)]:

   a. Copies of notifications and reports with supporting compliance documentation;
   b. Identification of each boiler, the date of tune-up, procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned;
   c. Records of the occurrence and duration of each malfunction of each applicable boiler; and
   d. Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore the malfunctioning boiler.

   Records shall be in a form suitable and readily available for expeditious review. EPA requires submission of Notification of Compliance Status reports for tune-ups and energy assessments through their electronic reporting system. [40 C.F.R. § 63.11225(a)(4)(vi)]

DONE AND DATED IN AUGUSTA, MAINE THIS 29th DAY OF May, 2019.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: ______________________________
GERALD D. REID, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-44-71-T-R/M.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: April 18, 2019
Date of application acceptance: April 19, 2019

Date filed with the Board of Environmental Protection:

This Order prepared by Jonathan E. Rice, Bureau of Air Quality.

Filed
MAY 29 2019
State of Maine
Board of Environmental Protection