



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

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COMMISSIONER

**Lucerne Farms
Aroostook County
Fort Fairfield, Maine
A-445-71-I-R**

**Departmental
Findings of Fact and Order
Air Emission License
Renewal**

After review of the air emissions license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., §344 and §590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Lucerne Farms has applied to renew their Air Emission License permitting the operation of emission sources associated with their crop-drying facility. The renewal includes an updated process description and addresses the removal of various pieces of equipment from the facility after Lucerne Farms suffered a fire in 2010.

The equipment addressed in this license is located at 40 Easton Line Road, Fort Fairfield, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license:

Fuel Burning Equipment

Equipment		Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type	Post Combustion Control(s)	Stack
Dryer	Burner #1	20	2615 lb/hr	Wood	Cyclones	Dryer stack*
	Burner #2	13	92.9 gal/hr	#2 Oil	Cyclones	Dryer stack*

* During normal operations, Burners #1 and #2 vent through a common stack, but Burner #1 (wood burner) has a bypass stack that is used only during startup.

C. Application Classification

The application for Lucerne Farms does not include the licensing of increased emissions or the installation of new or modified equipment. Therefore, the license is considered to be a renewal of current licensed emission units only and

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has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (as amended).

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 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

Before proceeding with the control requirements for each unit, a general description is provided to identify where the equipment fits into the process.

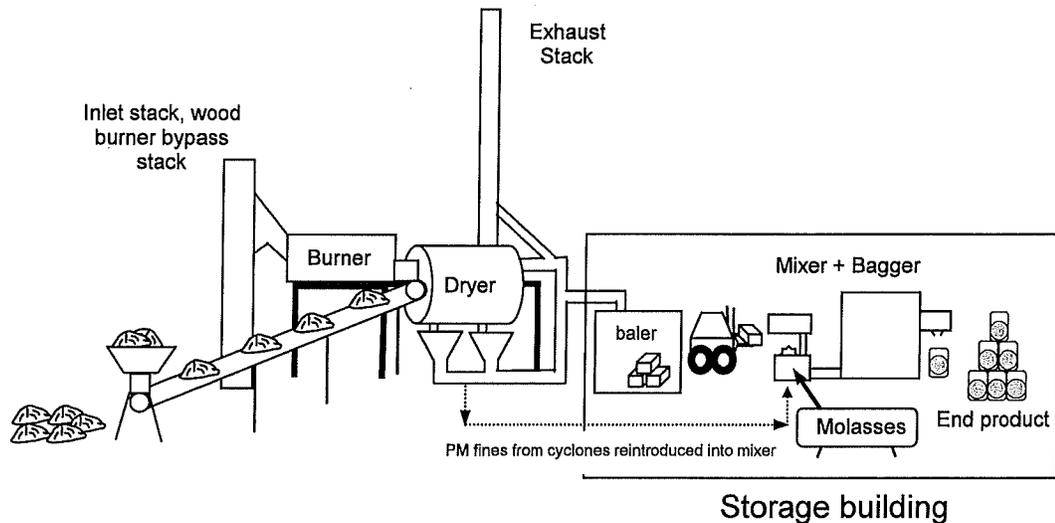
Process Description

In 2010, a fire occurred at Lucerne Farms' production facility. During the process of rebuilding, Lucerne Farms made several changes to the process to improve efficiency to the drying operation, as well as reducing PM emissions. As part of the reconfiguration, Lucerne Farms removed cyclone #3, the stack servicing cyclone #3 and the baghouse. The new process description is as follows:

Lucerne Farms produces specialty horse feeds. Various types of hay and straw are chopped into small pieces and then air-dried to a moisture content of approximately 50% (wet hay). The air-dried hay and straw are fed into the rotary crop dryer for further drying. The rotary dryer has a capacity of processing 4.7 tons per hour of wet hay and is equipped with two burners: Burner #1 which fires wood and Burner #2 which fires oil. The dryer capacity prevents the burners from firing at the same time. As the dryer drum rotates, particulate matter and dust separate from the material inside. The particulate matter then flows into a pretreatment settling tank before being collected by two cyclones. The dried hay, now with a moisture content of approximately 10%, exits the dryer and is mechanically conveyed to the baler system. Particles removed by the two

cyclones are reintroduced to the dried product at the baler. Baled hay is then stored for mixing.

Several varieties of horse feed are created by mixing the different types of hay in particular quantities with molasses. Fork trucks deliver the appropriate ratios of crop types to a rotating mixer. The addition of the molasses helps the mixture stick together and prevents dust. From the mixer, the product is bagged and stored for sale.



B. Dryer #1 - Burner #1

Lucerne Farms operates Burner #1 to provide heat to the rotary dryer. The burner is rated at 20 MMBtu/hr and fires wood. The burner was installed in 1980 and exhausts through the dryer, settling chamber and through two cyclones before leaving the dryer stack.

1. BACT/BPT Findings

The BACT/BPT emission limits for Burner #1 were based on the following:

PM/PM ₁₀	0.3 lb/MMBtu, based on 06-096 CMR 103
SO ₂	0.025 lb/MMBtu, AP-42 Table 1.6-2, dated 09/03
NO _x	0.49 lb/MMBtu, AP-42 Table 1.6-2, dated 09/03
CO	0.4 lb/MMBtu, based on manufacturer's data and MEDEP experience
VOC	0.017 lb/MMBtu, AP-42, Table 1.6-3, dated 09/03
Opacity	When the burner is firing wood, visible emissions from the dryer stack shall not exceed 30% opacity on a six-minute block average, except for no more than two six-minute block averages in a three-hour period.

The BPT emission limits for Burner #1 are the following:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Burner #1 – 20 MMBTU/hr – Wood Fuel	6.00	6.00	0.50	9.80	8.00	0.34

Fuel use for Burner #1 shall not exceed 2500 tons/year of wood at 15% moisture (heating value of 7,650 Btu/lb) or equivalent, based on a twelve-month rolling total.

Periodic Monitoring

Periodic monitoring for Burner #1 shall include recordkeeping to document fuel use on a twelve-month rolling total basis.

C. Dryer #1 - Burner #2

Lucerne Farms operates Burner #2 to provide heat to the rotary dryer. The burner is rated at 13 MMBtu/hr and fires ASTM D396 #2 compliant fuel oil. The burner was installed in 1980 and exhausts through the dryer, settling chamber and through two cyclones before leaving the dryer stack.

The BPT emission limits for Burner #2 were based upon the following:

- PM/PM₁₀ 0.2 lb/MMBtu, based on 06-096 CMR 103
- SO₂ 0.35 lb/MMBtu, firing ASTM D396 #2 compliant fuel oil
- NO_x 0.4 lb/MMBtu, limit from previous license
- CO 5.0 lb/1000 gallons, AP-42, Table 1.3-1, dated 5/10
- VOC 0.2 lb/1000 gallons, AP-42, Table 1.3-3, dated 5/10
- Opacity When the burner is firing oil, visible emissions from the dryer stack shall not exceed 20% opacity on a six-minute block average, except for no more than one six-minute block average in a three-hour period.

The BPT emission limits for Burner #2 are the following:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Burner #2 – 13 MMBTU/hr - #2 fuel	2.60	2.60	4.55	5.20	0.46	0.02

Fuel use for Burner #2 shall not exceed 25,000 gallons/year of ASTM D396 compliant #2 fuel oil, based on a twelve-month rolling total.

If firing #2 oil, per 38 MRSA §603-A(2)(A)(3), beginning January 1, 2016, the #2 fuel oil shall meet a maximum sulfur content limit of 0.005% by weight (50 ppm), and beginning January 1, 2018, the #2 fuel oil shall meet a maximum sulfur content limit of 0.0015% by weight (15 ppm).

Periodic Monitoring

Periodic monitoring for Burner #2 shall include recordkeeping to document fuel use on a twelve-month rolling total basis.

D. Crop Dryer

The drying of crops at Lucerne Farms produces particulate matter (PM) emissions. Emissions from the dryer are conservatively assumed to consist solely of PM₁₀.

The basis for determining emissions from the dryer is as follows:

- Wet hay entering the dryer is assumed to have a moisture content of 50%.
- The 50% moisture hay is then dried to 10% before exiting the dryer.
- The rotary dryer has an input capacity of 4.7 tons (9,400 pounds) per hour.

$$\frac{9400 \text{ lbs wet hay}}{\text{hour}} \times 0.50 (\text{moisture}) \times 0.90 (\text{dry weight}) = \frac{4230 \text{ lbs water removed}}{\text{hour}}$$

$$\frac{9400 \text{ lbs wet hay}}{\text{hour}} - \frac{4230 \text{ lb water removed}}{\text{hour}} = \frac{5170 \text{ lb dry hay @ 10\% moisture}}{\text{hour}}$$

Once the hay exits the dryer, the hay is sent through a settling tank. Based on previous operational experience, the settling tank is assumed to remove 95% of the hay, resulting in a PM load to the cyclones of:

$$\frac{5170 \text{ lb dry hay}}{\text{hour}} \times (1 - 0.95) = \frac{258.5 \text{ lb dry hay}}{\text{hour}}$$

Lucerne Farms uses two cyclones in series following the settling tank. EPA documentation estimates the average efficiency of conventional single cyclones for PM removal to be 90%. Two cyclones in series would then have a 99% removal efficiency.

$$\frac{258.5 \text{ lb dry hay}}{\text{hour}} \times (1 - 0.99) = \frac{2.59 \text{ lb dry hay}}{\text{hour}}$$

This emission rate is more stringent than the limit from 06-096 CMR 105 of the Department's regulations (General Process Source Particulate Emission Standard), using 4.7 tons/hour as the process weight rate.

Visible emissions from each of the two dryer cyclones shall not exceed 20% opacity based on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period.

E. General Process Emissions

Prior to drying, the crops are chopped into small pieces. Process emissions from the hay chopping operation may be vented outdoors. Visible emissions from the hay chopping operations source shall not exceed an opacity of 20% on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period.

F. Fugitive Emissions

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed an opacity of 20%, except for no more than five-minutes in any one-hour period. Compliance shall be determined by an aggregate of the individual fifteen-second opacity observations which exceed 20% in any one-hour.

G. Annual Emissions

1. Lucerne Farms shall be restricted to the following annual emissions, based on a twelve-month rolling total:
 1. Burner #1 firing 2500 tons/year of wood at 15% moisture
 2. Burner #2 firing 25,000 gallons/year of ASTM D396 compliant #2 fuel oil
 3. The crop dryer operating at maximum capacity for every hour Burner #1 or Burner #2 is operational (hours based on fuel limit)

Total Licensed Annual Emissions for the Facility - Tons/year
(used to calculate the annual license fee)

Unit	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Burner #1 - Wood	5.74	5.74	0.48	9.37	7.66	0.33
Burner #2 - Oil	0.35	0.35	0.62	0.70	0.07	0.01
Crop Dryer	2.82	2.82	-	-	-	-
Total TPY	8.60	8.60	1.10	10.07	7.67	0.34

2. Greenhouse Gases

Greenhouse gases are considered regulated pollutants as of January 2, 2011 through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans*, 40 CFR Part 52, Subpart A, §52.21 Prevention of Significant Deterioration of Air Quality rule. "Greenhouse gases" as defined in 06-096 CMR 100 (as amended) means the aggregate group of the following gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Greenhouse gases (GHG) for purposes of licensing are calculated and reported as carbon dioxide equivalents (CO₂e).

Based on the facility's fuel use limit(s), the worst case emission factors from AP-42, IPCC (Intergovernmental Panel on Climate Change), and Mandatory Greenhouse Gas Reporting, 40 CFR Part 98, and the global warming potentials contained in 40 CFR Part 98, Lucerne Farms is below the major source threshold of 100,000 tons of CO₂e per year. Therefore, no additional licensing requirements are needed to address GHG emissions at this time.

III. AMBIENT AIR QUALITY ANALYSIS

According to 06-096 CMR 115, the level of air quality analyses required for a renewal source shall be determined on a case-by case basis. Modeling is not required for a renewal if the total emissions of any pollutant released do not exceed the following and there are no extenuating circumstances:

Pollutant	Tons/Year
PM	25
PM ₁₀	25
SO ₂	50
NO _x	100
CO	250

Based on the total facility licensed emissions, Lucerne Farms is below the emissions level required for modeling.

ORDER

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

- will receive BPT,
- will not violate applicable emission standards,

- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-445-71-I-R subject to the following conditions.

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

STANDARD CONDITIONS

- (1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S.A. §347-C).
- (2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 CMR 115]
- (3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 CMR 115]
- (4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 CMR 115]
- (5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. §353-A. [06-096 CMR 115]
- (6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 CMR 115]

- (7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 CMR 115]
- (8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 CMR 115]
- (9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license. [06-096 CMR 115]
- (10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license. [06-096 CMR 115]
- (11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:
 - A. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
 1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
 2. pursuant to any other requirement of this license to perform stack testing.
 - B. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and
 - C. submit a written report to the Department within thirty (30) days from date of test completion.[06-096 CMR 115]
- (12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:
 - A. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance

with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and

- B. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and
- C. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

[06-096 CMR 115]

- (13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement. [06-096 CMR 115]
- (14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emission and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 CMR 115]
- (15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status. [06-096 CMR 115]

SPECIFIC CONDITIONS

- (16) **Burner #1**

- A. **Fuel**

Total fuel use for Burner #1 shall not exceed 2500 tons/year of wood at 15% moisture or equivalent. Fuel use records shall be kept on a twelve-month rolling total basis.

B. Emissions from Burner #1 shall not exceed the following:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Burner #1 – 20 MMBTU/hr - Wood	6.00	6.00	0.50	9.80	8.00	0.34

C. Visible emissions from the dryer stack, when firing wood, shall not exceed 30% opacity on a six-minute block average, except for no more than two six-minute block averages in a three-hour period. [06-096 CMR 101]

(17) **Burner #2**

A. Fuel

1. Total fuel use for Burner #2 shall not exceed 25,000 gallons/year of ASTM D396 compliant #2 fuel oil, based on a twelve-month rolling total basis. [06-096 CMR 115, BPT]
2. When firing oil, beginning January 1, 2016, Burner #2 shall fire #2 fuel oil with a maximum sulfur content limit of 0.005% by weight (50 ppm). [38 MRSA §603-A(2)(A)(3)]
3. When firing oil, beginning January 1, 2018, Burner #2 shall fire #2 fuel oil with a maximum sulfur content limit of 0.0015% by weight (15 ppm). [38 MRSA §603-A(2)(A)(3)]
4. Compliance shall be demonstrated by fuel records from the supplier showing the quantity, type, and the percent sulfur of the fuel delivered (if applicable). Records of annual fuel use shall be kept on a monthly and twelve-month rolling total basis. [06-096 CMR 115, BPT]

B. Emissions shall not exceed the following:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Burner #2 – 13 MMBTU/hr - #2 fuel	2.60	2.60	4.55	5.20	0.46	0.02

C. Visible emissions from the dryer stack, when firing oil, shall not exceed 20% opacity on a six-minute block average, except for no more than one six-minute block average in a three-hour period. [06-096 CMR 101]

(18) **Cyclones**

- A. Lucerne Farms shall continuously operate both cyclones when Burner #1 or Burner #2 is operational.

- B. Lucerne Farms shall maintain a log of any cyclone downtime due to malfunction and/or maintenance.
- C. Visible emissions from each of the two dryer cyclones shall not exceed 20% opacity based on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period.

(19) **General Process Sources**

Visible emissions from any general operations source shall not exceed an opacity of 20% on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period. [06-096 CMR 101]

(20) **Fugitive Emissions**

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed an opacity of 20%, except for no more than five-minutes in any one-hour period. Compliance shall be determined by an aggregate of the individual fifteen-second opacity observations which exceed 20% in any one-hour. [06-096 CMR 101]

- (21) Lucerne Farms shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (38 M.R.S.A. §605).

DONE AND DATED IN AUGUSTA, MAINE THIS 2nd DAY OF April, 2012.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: *Patricia W. Bator*
PATRICIA W. BATOR, COMMISSIONER

The term of this license shall be five (5) years from the signature date above.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: January 16, 2009
Date of application acceptance: January 29, 2009

Date filed with the Board of Environmental Protection:

This Order prepared by Kevin J. Ostrowski, Bureau of Air Quality.

