



DEPARTMENT ORDER

**Catalyst Paper Operations Inc. and
Pacific Falcon Corporation
Oxford County
Rumford, Maine
A-214-77-14-A**

**Departmental
Findings of Fact and Order
New Source Review
NSR #14**

FINDINGS OF FACT

After review of the air emission license 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 (the Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Catalyst Paper Operations Inc. and Pacific Falcon Corporation
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	322121
NATURE OF BUSINESS	Tissue Machine at Pulp and Paper Mill
FACILITY LOCATION	35 Hartford Street, Rumford, Maine

B. NSR License Description

Catalyst Paper Operations Inc. (Catalyst) and Pacific Falcon Corporation (PF) have applied for a New Source Review (NSR) license to construct and operate a new tissue machine to be located at Catalyst's mill in Rumford, Maine.

Catalyst and PF have applied for this NSR license as co-applicants. The term "C&PF" is used throughout this document to refer to both entities equally and jointly. The tissue machine (TM-1) will be owned and operated by PF. The other equipment at the Mill will continue to be owned and operated by Catalyst. The project does not involve any changes to the Title, Right or Interest (TRI) of the equipment currently licensed by the Mill or of the buildings. A Memorandum of Lease between Catalyst and PF has been submitted to the Department and demonstrates sufficient TRI in the equipment.

C. Emission Equipment

The following are new emission units addressed in this NSR license:

New Production Equipment

Equipment	Maximum Capacity	Fuel Type	Pollution Control Equipment
TM-1 Tissue Machine	277 ADTFP/day*	N/A	Dust Collectors
Dryer Burners (2)	24.2 MMBtu/hr (each)	Natural Gas	Low-NO _x Burners

* ADTFP/day = air dried tons of finished product per day

The following are existing emission units affected (but not modified) by this project:

Affected Fuel-Burning Equipment

Equipment	Maximum Heat Input (MMBtu/hr)	Rate/Capacity	Fuel Type	Control Equipment
Lime Kiln	100 (#6 fuel oil)	350 tons/day CaO	fuel oil ($\leq 2.0\%$ S); Natural gas; Specification waste oil; LVHC gases	Wet Scrubber
	110 (natural gas)			
Recovery Boiler C	759 (fuel oil)	4.4 MMlb BLS/day	fuel oil ($\leq 2.0\%$ S); Natural gas; Specification waste oil; Black liquor; Soap	Electrostatic Precipitator (ESP)

Affected Production Equipment

Equipment	Production Rate/Capacity	Pollution Control Equipment
Smelt Tank C	4.4 MMlb BLS/day	2 Venturi scrubbers
Lime Slaker	1,050 gpm	Static scrubber

Additional pulp mill equipment is affected by this project. However, all changes in emissions from the pulp mill due to this project are accounted for in the emissions units listed above.

The mill boilers were not included as affected equipment as all additional steam needs for TM-1 will be provided by Recovery Boiler C which is already included as an affected

unit. Any increase in pulp production required to support TM-1 will result in sufficient additional steam production to meet the demands of TM-1.

None of the other licensed equipment at the facility is affected by this project.

D. Application Classification

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

The application for C&PF does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing, or recordkeeping requirements.

The modification of a major source is considered a major or minor modification based on whether or not expected emissions increases exceed the "Significant Emission Increase" levels as given in *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. For a major stationary source, the expected emissions increase from each modified or affected unit may be calculated as equal to the difference between the post-modification projected actual emissions and the baseline actual emissions for each NSR regulated pollutant.

1. Baseline Actual Emissions

Baseline actual emissions are equal to the average annual emissions from any consecutive 24-month period within the ten years prior to submittal of a complete license application. The selected 24-month baseline period can differ on a pollutant-by-pollutant basis. C&PF has proposed using calendar years 2012/2013 as the 24-month baseline period from which to determine baseline actual emissions for all pollutants for emission units affected as part of this project. The results of this baseline analysis are presented in the table below.

Baseline Actual Emissions (2012/2013 Average)

Equipment	PM (ton/yr)	PM₁₀ (ton/yr)	PM_{2.5} (ton/yr)	SO₂ (ton/yr)	NO_x (ton/yr)	CO (ton/yr)	VOC (ton/yr)
Recovery Boiler C	128.80	96.35	86.65	64.35	519.75	430.65	15.85
Lime Kiln	22.85	22.45	21.90	2.25	109.65	2.35	2.10
Smelt Tank C	0.30	0.30	0.30	0.00	0.00	0.00	8.80
Lime Slaker	30.45	27.30	24.75	5.35	0.00	0.00	22.10
Total	182.40	146.40	133.60	71.95	629.40	433.00	48.85

2. Projected Actual Emissions

Projected actual emissions are the maximum actual annual emissions anticipated to occur in the ten-year period following completion of the proposed project for TM-1 and in the five year period following completion of the proposed project for the existing, affected units.

New emission units must use potential to emit emissions for projected actual emissions.

Affected equipment includes upstream activities such as the pulp mill equipment. Projected actual emissions from this equipment were conservatively calculated assuming the pulp mill operating at maximum capacity.

In determining projected actual emissions, C&PF excluded increases in emissions that the existing equipment could have accommodated during the baseline period and are unrelated to the current project. This is known as the Demand Growth Exclusion.

Current and future plans for Catalyst Paper Operations Inc. are to maximize pulp production due to a growing market demand. Any pulp not utilized by the mill itself is, and will continue to be, sold for use off-site. This project does not include any physical or operational changes to the existing pulp mill equipment. The existing paper machines and pulp dryer are capable of handling the maximum production of the pulp mill both physically and within the constraints of their current license. Production has already increased above baseline years. These and any future increases in utilization of the pulp mill equipment are unrelated to the tissue machine project. They are a reflection of an increase in market demand and Catalyst Paper Operations Inc.'s intent to maximize pulp production, regardless of whether that pulp is used internally or shipped off-site.

Therefore, emissions increases from the affected pulp mill equipment qualify for the Demand Growth Exclusion and are not included in (i.e. subtracted from) this part of the analysis. Thus in this instance, the projected actual emissions are equivalent to the baseline actual emissions for existing equipment once the Demand Growth Exclusion is applied.

The results of this projected actual emissions analysis is presented in the table below.

Projected Actual Emissions

Equipment	PM (ton/yr)	PM₁₀ (ton/yr)	PM_{2.5} (ton/yr)	SO₂ (ton/yr)	NO_x (ton/yr)	CO (ton/yr)	VOC (ton/yr)
TM-1 (and dryers)	19.27	9.72	7.48	0.12	11.72	57.05	39.07
Recovery Boiler C	128.80	96.35	86.65	64.35	519.75	430.65	15.85
Lime Kiln	22.85	22.45	21.90	2.25	109.65	2.35	2.10
Smelt Tank C	0.30	0.30	0.30	0.00	0.00	0.00	8.80
Lime Slaker	30.45	27.30	24.75	5.35	0.00	0.00	22.10
Total	201.67	156.12	141.08	72.07	641.12	490.05	87.92

3. Emissions Increases

The differences between the baseline actual emissions and projected actual emissions are compared to the significant emissions increase levels.

Pollutant	Baseline Actual Emissions 2012-2013 (ton/year)	Projected Actual Emissions (ton/year)	Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	182.40	201.67	19.27	25
PM ₁₀	146.40	156.12	9.72	15
PM _{2.5}	133.60	141.08	7.48	10
SO ₂	71.95	72.07	0.12	40
NO _x	629.40	641.12	11.72	40
CO	433.00	490.05	57.05	100
VOC	48.85	87.92	39.07	40

4. Classification

Since emissions increases do not exceed significant emissions increase levels, this NSR license is determined to be a minor modification under *Minor and Major Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115. An application to incorporate the requirements of this NSR license into the Part 70 air emission license shall be submitted no later than 12 months from commencement of operation of TM-1.

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 as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 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. TM-1 Tissue Machine

PF proposes to install and operate a new tissue machine (TM-1) with a maximum capacity of 277 ADTFP/day. TM-1 will remove water from the sheet using both steam and high-temperature air produced by two natural gas-fired dryer burners with a maximum heat input of 24.2 MMBtu/hr each when using ambient air for combustion. TM-1 will also have the ability to use pre-heated combustion air which lowers the maximum heat input of each burner to 22.3 MMBtu/hr in those conditions.

1. BACT Findings

C&PF submitted a BACT analysis for control of emissions from TM-1.

a. Particulate Matter (PM/PM₁₀)

Vent gases from paper machines often contain trace amounts of PM. The quantity of PM is difficult to measure due to the low PM concentrations and high exhaust gas flow rates. Particle size is difficult to discern due to entrained water vapor. PM emissions from tissue machines are generally higher than PM emissions from paper machines due to the use of a doctor blade to separate the tissue sheet from the dryers. PM emissions from TM-1 will also include emissions generated from the dryers firing natural gas.

Due to the high volume and high moisture content of exhausts from tissue machines, economically feasible add-on control technologies are very limited. However, C&PF have proposed installing a tissue machine that includes a dust cap over the yankee roll and above the sheet to help contain PM from the dry end of TM-1. The surface of the dust cap is designed to minimize dust accumulation and is automatically rinsed.

In addition, TM-1 will vent through a wet dust collection system. The wet dust collector system consists of four collectors, including an upper sheet collector, an under sheet collector, a pulper exhaust collector, and a dust cap collector. The upper sheet, under sheet, and pulper exhaust collectors are high efficiency wet vortex collectors. The dust cap collector uses an in-line venturi to remove dust from the air stream.

C&PF proposed a PM limit for TM-1 of 4.40 lb/hr, based on a combination of PM emissions from natural gas combustion (0.36 lb/hr) and process emissions (4.04 lb/hr). PM emissions from natural gas combustion were based on AP-42 Table 1.4-2 dated 7/98. PM emissions from the process were based on a factor of 0.35 lb/ADTFP provided by the equipment manufacturer.

C&PF proposed a PM₁₀ emission limit of 2.22 lb/hr. This limit is based on prorating the process component of the emissions based on 42.3% derived from National Council for Air and Stream Improvement (NCASI) Technical Bulletin 942, Table 5.1.

General Process Source Particulate Emission Standard, 06-096 C.M.R. ch. 105 contains an applicable PM emission limit of 16.36 lb/hr for TM-1 and its associated dryers. This limit was calculated using a process weight of 11.54 ton/hr (equivalent to 277 ton/day assuming 24-hr/day operation) and the equation found in 06-096 C.M.R. ch. 105. The PM emission limit proposed by the facility is more stringent.

The primary purpose of the fuel burning in TM-1 and its associated dryers is not to produce heat and power as specified in the definition of "fuel-burning equipment" as found in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Therefore, *Fuel Burning Equipment Particulate Emission Standard*, 06-096 C.M.R. ch. 103 is not applicable to this equipment.

BACT for PM/PM₁₀ emissions from TM-1 and its associated dryers is determined to be the use of a dust cap, the proposed wet dust collection system, and emission limits of 4.40 lb/hr for PM and 2.22 lb/hr for PM₁₀.

b. Sulfur Dioxide (SO₂)

Sulfur dioxide emissions from TM-1 are attributable to the oxidation of sulfur compounds in the natural gas fired to dry the product. The options to control SO₂ emissions from fuel combustion include low sulfur fuel and add-on treatment of the combustion exhaust gases.

Based on review of the RACT/BACT/LAER Clearinghouse (RBLC), EPA's AP-42 emissions data, and other Maine DEP air licenses, add-on controls for SO₂ emissions from direct-fired dryer paper machines of similar size firing natural gas were not identified. Due to the inherently low sulfur content of natural gas, additional SO₂ control from natural gas combustion is not economically feasible.

C&PF proposed an SO₂ emission limit of 0.03 lb/hr based on AP-42 Table 1.4-2 dated 7/98.

BACT for SO₂ emissions from TM-1 and its associated dryers is determined to be the firing of natural gas and an emission limit of 0.03 lb/hr.

c. Nitrogen Oxide (NO_x)

Emissions of NO_x from TM-1 are attributable to the oxidation of nitrogen in the combustion air and the oxidation of nitrogen compounds contained in the natural gas fired to generate hot air in the dryer section of the machine.

NO_x can be controlled through combustion practices and equipment including low excess air (LEA) firing, flue gas recirculation (FGR), and low NO_x burners (LNBS) as well as add-on controls such as selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR).

LEA involves limiting the net excess air flow to the combustion chamber to under 2%. However, this often results in reduced combustion efficiency and causes increases in CO emissions. Due to the energy and environmental trade-offs, LEA is not a feasible control technology for TM-1.

FGR recirculates a portion of the flue gas back into the main combustion chamber where thermal NO_x formation is reduced by decreasing the peak flame temperatures.

SCR reduces NO_x emissions through the injection of ammonia in the gas exhaust stream in the presence of a catalyst to produce nitrogen and water. SNCR reduces NO_x to nitrogen and water by reacting NO_x in the exhaust gas with a reagent such as ammonia or urea, similar to SCR. However, the use of a catalyst is negated when the chemical reaction takes place at temperatures ranging between 1600°F and 2100°F.

A review of the RBLC did not identify any similar equipment that utilized FGR, SCR, or SNCR to control emissions of NO_x. The costs associated with these controls make them economically infeasible.

LNBs control air and fuel mixing to minimize the production of NO_x. Several existing tissue machines were identified which used LNBs.

C&PF proposed a NO_x emission limit of 2.68 lb/hr based on data from the tissue machine manufacturer and the use of LNBs.

BACT for NO_x emissions from TM-1 and its associated dryers is determined to be the use of LNBs and an emission limit of 2.68 lb/hr.

d. Carbon Monoxide (CO)

The formation of CO occurs as a result of incomplete combustion of organic compounds contained in the natural gas fired to generate hot air for drying the product.

No CO emissions control technologies were identified that are technically feasible for application to TM-1. This is consistent with the findings regarding control technologies employed on other direct-fired dryer paper machines.

C&PF proposed a CO emission limit of 13.03 lb/hr based on data from the tissue machine manufacturer.

BACT for CO emissions from TM-1 and its associated dryers is determined to be the use of good combustion practices and an emission limit of 13.03 lb/hr.

e. Volatile Organic Compounds (VOC)

Emissions of VOC from TM-1 can be attributed to many different sources. VOC are present in the water carrying the pulp to the tissue machine and can be released as the water is removed from the sheet. The most often detected compound is methanol, a byproduct of the pulping and bleaching process. VOCs are sometimes present in papermaking additives, such as defoamers, slimicides, retention aids, wet strength agents, wire and felt cleaners, etc. and can be released in the papermaking process. VOCs will also be emitted from the combustion of fuel in the dryer burners.

Add-on controls for emissions of VOC from paper machine vents are not economically feasible because of the small pollutant concentration, the high moisture content, and the high volume of the vent exhaust gases. No technically feasible VOC control technologies for application to TM-1 were identified. This is consistent with findings regarding control technologies employed on other, direct-fired dryer paper machines.

C&PF proposed a VOC emission limit of 8.92 lb/hr based on a combination of VOC emissions from natural gas combustion (0.26 lb/hr) and process emissions (8.66 lb/hr). VOC emissions from natural gas combustion were based on AP-42 Table 1.4-2 dated 7/98. VOC emissions from the process were based on a factor of 0.75 lb/ADTFP which was developed based on the most VOC-intensive product grade and the assumption that all VOC is volatilized. This is a highly conservative approach to estimating VOC emissions since most additives will react with the web substrate limiting actual VOC emissions to the unreacted portion only.

BACT for VOC emissions from TM-1 and its associated dryers is determined to be the use of good combustion practices and emission limits of 8.92 lb/hr and 39.1 ton/yr.

2. Emission Limits

The BACT emission limits for TM-1 and its associated dryers firing natural gas are the following:

PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)	VOC (ton/yr)
4.40	2.22	0.03	2.68	13.03	8.92	39.1

Visible emissions from TM-1 and its associated dryers shall not exceed 10% opacity on a six-minute block average basis.

C. Incorporation Into the Part 70 Air Emission License

The requirements in this 06-096 C.M.R. ch. 115 New Source Review license shall apply to the facility upon issuance. Per *Part 70 Air Emission License Regulations*, 06-096 C.M.R. ch. 140 § 1(C)(8), for a modification at the facility that has undergone NSR requirements or been processed through 06-096 C.M.R. ch. 115, the source must apply for an amendment to their Part 70 license within one year of commencing the proposed operations, as provided in 40 C.F.R. Part 70.5.

D. Annual Emissions

1. Emission Totals

Catalyst Paper Operations Inc. is licensed for the following annual emissions. Calculation of these annual emission rates was based on constant operation of each emission unit at its maximum licensed capacity, including those limited either by firing rate, hours of operation, or via an annual fuel use cap.

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
Power Boiler #3	65.7	65.7	341.6	525.6	262.8	19.7
Cogen Boiler #6	82.8	82.8	772.6	1,655.6	1,090.0	22.1
Cogen Boiler #7	82.8	82.8	772.6	1,655.6	1,090.0	22.1
Lime Kiln	105.1	105.1	100.7	227.8	170.8	8.8
Recovery Boiler C	379.7	284.7	903.6	941.7	972.4	16.2
Smelt Tank C	70.1	69.2	24.1	--	--	--
R10 Air Floatation Dryers	15.2	15.2	0.1	19.6	2.7	0.7
TM-1 and dryers	19.3	9.7	0.1	11.7	57.1	39.1
Building Air Heaters	2.0	2.0	0.2	40.6	40.6	2.2
Cogen Emergency Generator	0.1	0.1	0.1	1.6	0.4	0.1
R15 Emergency Generator	0.1	0.1	0.1	1.4	0.3	0.1
Mill Emergency Diesel Generator	0.2	0.2	0.1	4.4	1.2	0.1
Diesel Fire Water Pump	0.1	0.1	0.1	1.8	0.4	0.1
Lift Pump Emergency Generator	0.1	0.1	0.1	2.1	1.1	2.1
Lime Kiln Auxiliary Drive	0.1	0.1	0.1	0.3	0.1	0.1
Groundwood Operations	--	--	--	--	--	36.0
Total TPY	823.4	717.9	2,916.2	5,089.8	3,689.9	169.5

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 C.F.R. Part 52, Subpart A, § 52.21, *Prevention of Significant Deterioration of Air Quality* rule. Greenhouse gases, as defined in 06-096 C.M.R. ch. 100 are the aggregate group of the following gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. For licensing purposes, greenhouse gases (GHG) are calculated and reported as carbon dioxide equivalents (CO₂e).

The quantity of CO₂e emissions from this facility is greater than 100,000 tons per year, based on the following:

- the facility's fuel use limits;
- worst case emission factors from the following sources: U.S. EPA's AP-42, the Intergovernmental Panel on Climate Change (IPCC), and *Mandatory Greenhouse Gas Reporting*, 40 C.F.R. Part 98,; and
- global warming potentials contained in 40 C.F.R. Part 98.

No additional licensing actions to address GHG emissions are required at this time.

III. AMBIENT AIR QUALITY ANALYSIS

Catalyst Paper Operations Inc. previously submitted an ambient air quality analysis demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards. [See NO_x modeling results in license A-214-71-AN-A (April 9, 2002) and modeling results for other pollutants in license A-214-71-S-A/R (September 3, 1996).] An additional ambient air quality analysis is not required for this NSR License.

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

The Department hereby grants New Source Review License A-214-77-14-A pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the specific conditions below.

Severability. The invalidity or unenforceability of any provision of this License or part thereof 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.

SPECIFIC CONDITIONS

(1) TM-1 and Associated Dryers

- A. PF is licensed to install and operate TM-1. TM-1 shall use hot air produced by associated natural gas fired dryers with a combined maximum heat input rate of 48.4 MMBtu/hour. [06-096 C.M.R. ch. 115, BACT]
- B. Emissions from TM-1 and its associated dryers shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
4.40	2.22	0.03	2.68	13.03	8.92

- C. VOC emissions from TM-1 and its associated dryers shall not exceed 39.1 ton/yr, based on a 12-month rolling total. PF shall calculate and keep records of VOC emissions from this equipment on a monthly and 12-month rolling total basis. [06-096 C.M.R. ch. 115, BACT]
- D. PF shall operate and maintain a dust cap and a wet dust collection system for control of PM emissions from TM-1. [06-096 C.M.R. ch. 115, BACT]
- E. PF shall inspect the dust cap and wet dust collection system monthly for leaks or malfunctioning equipment and shall keep records of these inspections as well as any maintenance (planned or unplanned) performed on the dust cap and wet dust collection system. [06-096 C.M.R. ch. 115, BACT]
- F. Visible emissions from TM-1 and its associated dryers shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

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Pacific Falcon Corporation
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- (2) C&PF shall submit an application to incorporate this NSR license into the facility's Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 C.M.R. ch. 140 § 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS 30 DAY OF June, 2017.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PAUL MERCER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 4/14/17

Date of application acceptance: 4/19/17

Date filed with the Board of Environmental Protection:

This Order prepared by Lynn Muzzey, Bureau of Air Quality.

