STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

Northeastern University **Cumberland County** **Brunswick, Maine** **A-1192-71-A-N**	**Departmental** **Findings of Fact and Order** **Air Emission License** **After-the-Fact**

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 (Department) finds the following facts:

I. REGISTRATION

A. Introduction

Northeastern University (NEU) has applied for an Air Emission License for the operation of emission sources associated with their Advanced & Additive Manufacturing Center facility.

The equipment addressed in this license is located at 148 Orion Rd, Brunswick, Maine.

B. Title, Right, or Interest

In their application, NEU submitted copies of a property lease demonstrating interest in the facility. NEU has provided sufficient evidence of title, right, or interest in the facility for purposes of this air emission license.

C. Emission Equipment

The following equipment is addressed in this air emission license:

Process Equipment

Equipment	Production Rate	Pollution Control Equipment
Cold Spray Booth	19.86 lb/hr material feed rate	Wet dust collector system

NEU also has a natural gas-fired make-up air unit not listed in the table above. It is considered an insignificant emissions unit because it has a maximum design heat input of less than 1.0 MMBtu/hr and will not be addressed further in this license. [06-096 C.M.R. ch. 115, Appendix B § B.2]

D. Definitions

Records or *Logs* mean either hardcopy or electronic records.

E. 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.

NEU is classified as an existing source that is applying for its first air emission license, after-the-fact. The Department has determined the facility is a minor source, and the application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 Code of Maine Rules (C.M.R.) ch. 115.

F. Facility Classification

The facility is licensed as follows:

- As a natural minor source of criteria pollutants, because no license restrictions are necessary to 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. Cold Spray Booth

NEU operates a Cold Spray Booth designed to apply metal coatings and/or build metal components. The process utilizes a VRC® Raptor High-Pressure Cold Spray System to deposit metal powders via a handheld or robotic arm applicator. The system utilizes high pressure (up to 1,000 psi) carrier gas to accelerate the powder material through a supersonic nozzle. Carrier gas options include nitrogen, helium, and air. The gas is heated to

approximately 1,292 °F via an electric heater. The high-speed deposition of the powdered metal on the substrate results in the mechanical and metallurgical bonding of the powder to form a smooth and high-strength coating.

The applied metal powders are 5-50 μm in diameter and can consist of single component powders or mixed specialty powders. Commonly applied metals include aluminum, copper, titanium, steel, nickel, chromium, silver, tin, and lead. The cold spray applicator has the potential to apply up to 19.86 lb/hr of powdered material with a typical deposit efficiency of greater than 80%. The applied metal powder has the potential to contain HAP, specifically nickel, lead, and chromium. The coating can consist of 100% HAP metal.

1. BACT Findings

NEU submitted a BACT analysis for control of emissions from the Cold Spray Booth at the facility.

The Cold Spray Booth has the potential to emit PM and HAP. NEU identified three potential strategies for minimizing PM and HAP emissions: use of high-transfer efficiency coating operations, use of low-HAP coatings, and add-on pollution controls. Potential add-on controls include enclosed spray booths; air filtration via multi-stage filters, cartridge filters, HEPA filters, or a combination thereof; electrostatic precipitators (ESP); and wet scrubbers.

Both the specific coating application technology and types of coatings applied are integral to the operation. Therefore, the use of higher efficiency coating operations and low-HAP coatings are not considered technically feasible.

NEU evaluated the above listed add-on control options and determined that all were capable of greater than 99% control efficiency for PM and HAP emissions from the Cold Spray Booth. NEU selected the use of a wet scrubber dust collection system due to the ease of operation, minimal maintenance requirements, and cost.

BACT for $PM/PM_{10}/PM_{2.5}$ and HAP is to exclusively conduct spray operations within a 100% capture (fully enclosed) spray booth, the use of a wet scrubber dust collection system with expected control of greater than 99% efficiency for PM and HAP emissions, and the emission limits listed in the below table.

The BACT emission limits for the Cold Spray Booth were based on a maximum application rate of 19.86 lb/hr, a deposit efficiency of 80%, and 99% control efficiency from the wet scrubber dust collection system.

The BACT emission limits for the Cold Spray Booth are the following:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	HAP (lb/hr)
Cold Spray Booth	0.04	0.04	0.04	0.04

2. Visible Emissions

Visible emissions from the Cold Spay Booth shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

The Department has determined that the BACT visible emission limit is more stringent than the applicable limit in 06-096 C.M.R. ch. 101. Therefore, the visible emission limit for the Cold Spray Booth has been streamlined to the more stringent BACT limit, and only this more stringent limit shall be included in the Order of this air emission license.

3. Periodic Monitoring

Periodic monitoring for the Cold Spray Booth shall include recordkeeping to document coating material usage on a monthly and calendar year total basis. Documentation shall include the HAP content of all materials used and calculations of HAP emissions on a monthly and calendar year total basis. [06-096 C.M.R. ch. 115, BACT]

C. Solvents, Lubricants, and Other Materials

NEU will use small quantities of materials which have the potential to emit VOC and HAP. These materials are primarily solvents, epoxy, lubricants, cutting fluid, mold sprays, and cleaners.

1. Standards

NEU shall implement the following work practices:

a. Utilize proper operating practices including keeping containers closed when not in use, minimizing evaporative losses, and good housekeeping; and
b. Use low VOC and HAP materials when they are viable alternatives.

2. Recordkeeping

NEU shall maintain monthly purchase or use records of all VOC and/or HAP containing materials, including the following information:

a. Name and description of each substance;
b. VOC and HAP content of each substance;
c. Amount of each substance purchased or used; and

d. Safety Data Sheets (SDS) for each substance.

3. NEU shall track emissions from usage of solvents, lubricants, and other VOC- and/or HAP-containing materials by utilizing purchase, usage, and inventory data, Safety Data Sheet (SDS) component concentration and VOC and HAP content information, and assuming 100% of the VOC and HAP content in the products evaporate to the atmosphere. Emissions from material usage shall be calculated on a monthly and calendar year total basis. [06-096 C.M.R. ch. 115, BACT]

4. Emissions for solvents, lubricants, and other materials usage shall not exceed 5.0 tons/yr of VOC or HAP. [06-096 C.M.R. ch. 115, BACT]

D. Fugitive Emissions

NEU shall not cause emissions of any fugitive dust during any period of construction, reconstruction, or operation without taking reasonable precautions. Such reasonable precautions shall be included in the facility's continuing program of best management practices for suppression of fugitive particulate matter. See 06-096 C.M.R. ch. 101, § 4(C) for a list of potential reasonable precautions.

NEU shall not cause or allow visible emissions within 20 feet of ground level, measured as any level of opacity and not including water vapor, beyond the legal boundary of the property on which such emissions occur. Compliance with this standard shall be determined pursuant to 40 C.F.R. Part 60, Appendix A, Method 22.

E. 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 and establishing the facility's potential to emit (PTE). Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included except when required by state or federal regulations. Maximum potential emissions were calculated based on the following assumptions:

- Operating the Cold Spray Booth for 8,760 hr/yr;
- A VOC limit of 5.0 tpy from solvents, lubricants, and other materials usage;
- A HAP limit of 5.0 tpy from solvents, lubricants, and other materials usage.

This information does not 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}	$PM_{2.5}$	VOC	Single HAP	Total HAP
Cold Spray Booth	0.2	0.2	0.2	--	0.2	0.2
Solvents, Lubricants, and Other Materials Usage	--	--	--	5.0	5.0	5.0
Total TPY	**0.2**	**0.2**	**0.2**	**5.0**	**5.2**	**5.2**

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
$PM_{2.5}$	15
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.

This determination is based on information provided by the applicant regarding the expected construction and operation of the proposed emission units. If the Department determines that any parameter (e.g., stack size, configuration, flow rate, emission rates, nearby structures, etc.) deviates from what was included in the application, the Department may require NEU to submit additional information and may require an ambient air quality impact analysis at that time.

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 A-1192-71-A-N subject to the following conditions.

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.

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. § 347-C).

(2) The licensee shall acquire a new or amended air emission license prior to beginning actual construction of a modification, unless specifically provided for in Chapter 115. [06-096 C.M.R. ch. 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 C.M.R. ch. 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 C.M.R. ch. 115]

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S. § 353-A. [06-096 C.M.R. ch. 115] Payment of the annual air emission license fee for NEU is due by the end of February of each year. [38 M.R.S. § 353-A(3)]

(6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 C.M.R. ch. 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 C.M.R. ch. 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 C.M.R. ch. 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 C.M.R. ch. 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 C.M.R. ch. 115]

(11) In accordance with the Department's air emission compliance test protocol and 40 C.F.R. 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 C.F.R. 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 C.M.R. ch. 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 the written test report by the Department, or another alternative timeframe approved by the Department, 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 C.F.R. 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 C.M.R. ch. 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 license requirement. [06-096 C.M.R. ch. 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 emissions 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 C.M.R. ch. 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 C.M.R. ch. 115]

(16) The licensee 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. § 605). [06-096 C.M.R. ch. 115]

SPECIFIC CONDITIONS

(17) **Cold Spray Booth**

A. Emissions from the Cold Spray Booth shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	HAP (lb/hr)
Cold Spray Booth	0.04	0.04	0.04	0.04

B. Visible emissions from the Cold Spay Booth shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

C. NEU shall exclusively conduct spray operations within a 100% capture spray booth. [06-096 C.M.R. ch. 115, BACT]

D. NEU shall utilize a wet scrubber dust collection system for control of emissions from the Cold Spray Booth. The wet scrubber dust collection system shall be in use at all times that the Cold Spray Booth is in use. [06-096 C.M.R. ch. 115, BACT]

E. NEU shall keep records documenting coating material usage on a monthly and calendar year total basis. Documentation shall include the HAP content of all materials used and calculations of HAP emissions on a monthly and calendar year total basis. [06-096 C.M.R. ch. 115, BACT]

(18) **Solvents, Lubricants, and Other Materials**

A. Standards

NEU shall implement the following work practices:

1. Utilize proper operating practices including keeping containers for solvents, lubricants, and other materials closed when not in use, minimizing evaporative losses, and good housekeeping; and

2. Use low VOC and HAP materials when they are viable alternatives.

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

B. Recordkeeping

NEU shall maintain monthly purchase or use records of all VOC and/or HAP containing materials, including the following information:

1. Name and description of each chemical;
2. VOC and HAP content of each material;
3. Amount of each material purchased or used; and
4. Safety Data Sheets (SDS) for each material.

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

C. NEU shall track emissions from material usage by utilizing purchase, usage, and inventory data, Safety Data Sheet (SDS) component concentration and VOC and HAP content information, and assuming 100% of the VOC and HAP content in the materials evaporate to the atmosphere. Emissions from material usage shall be calculated on a monthly and calendar year total basis. [06-096 C.M.R. ch. 115, BACT]

D. Emissions from usage of solvents, lubricants, and other materials shall not exceed 5.0 tons/yr of VOC or HAP. [06-096 C.M.R. ch. 115, BACT]

(19) **Fugitive Emissions**

A. NEU shall not cause emissions of any fugitive dust during any period of construction, reconstruction, or operation without taking reasonable precautions. Such reasonable precautions shall be included in the facility's continuing program of best management practices for suppression of fugitive particulate matter. See 06-096 C.M.R. ch. 101, § 4(C) for a list of potential reasonable precautions.

B. NEU shall not cause or allow visible emissions within 20 feet of ground level, measured as any level of opacity and not including water vapor, beyond the legal boundary of the property on which such emissions occur. Compliance with this standard shall be determined pursuant to 40 C.F.R. Part 60, Appendix A, Method 22.

[06-096 C.M.R. ch. 101, § 4(C)]

(20) If the Department determines that any parameter value pertaining to construction and operation of the emissions units, including but not limited to stack size, configuration, flow rate, emission rates, nearby structures, etc., deviates from what was submitted in the application or ambient air quality impact analysis for this air emission license, NEU may be required to submit additional information. Upon written request from the Department, NEU shall provide information necessary to demonstrate AAQS will not be exceeded, potentially including submission of an ambient air quality impact analysis or an application to amend this air emission license to resolve any deficiencies and ensure compliance with AAQS. Submission of this information is due within 60 days of the Department's written request unless otherwise stated in the Department's letter.
[06-096 C.M.R. ch. 115, § 2(O)]

DONE AND DATED IN AUGUSTA, MAINE THIS 16th DAY OF JANUARY, 2026.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____ for ____
MELANIE LOYZIM, COMMISSIONER

The term of this license shall be ten (10) years from the signature date above.

[Note: If a renewal application, determined as complete by the Department, is submitted prior to expiration of this license, then pursuant to Title 5 M.R.S. § 10002, all terms and conditions of the license shall remain in effect until the Department takes final action on the license renewal application.]

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: May 16, 2025
Date of application acceptance: May 29, 2025

This Order prepared by Benjamin Goundie, Bureau of Air Quality.