

5 March 2015

Henry Huppert
Environmental Compliance Officer
Brown University
164 Angell Street, P.O. Box 1914
Providence, RI 02912

Dear Mr. Huppert:

The Department of Environmental Management, Office of Air Resources has reviewed and approved your request for a revision to your minor source permit and for the installation of process and air pollution control equipment for your facility located at the Animal Care Department at 38 Olive Street, Providence.

Enclosed is a revised minor source permit issued pursuant to our review of your request (Approval Nos. 2265, 2283 & 2284).

The issuance of this minor source permit qualifies as an Off-Permit Change for your Title V Operating Permit under subsection 29.11.2 of Air Pollution Control Regulation No. 29. This minor source permit will be incorporated into your operating permit at the time of renewal or re-opening.

A copy of this minor source permit and a copy of your application should be maintained with your operating permit at all times until this permit is incorporated into your operating permit. In addition, as stated in subsection 29.11.2(d) of Air Pollution Control Regulation No. 29, the permit shield in Section II of your operating permit shall not apply to this permit until it is incorporated into your operating permit.

If there are any questions concerning this permit, please contact me at 401-222-2808, extension 7177 or at kasandra.mckenzie@dem.ri.gov.

Sincerely,

Kasandra McKenzie, EIT
Air Quality Specialist
Office of Air Resources

cc: Charlotte Head, PE

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

MINOR SOURCE PERMIT

BROWN UNIVERSITY-ANIMAL CARE DEPARTMENT

APPROVAL NOs. 2265, 2283 & 2284

Pursuant to the provisions of Air Pollution Control Regulation No. 9, this minor source permit is issued to:

Brown University-Animal Care Department and Cognitive, Linguistic and Psychological Sciences

For the following:

The replacement of the existing Anderson Products Ethylene Oxide Sterilizer Model ANPro 310 with an Anderson Products EOGas 4 Ethylene Oxide Sterilizer (Approval No. 2283). Also the replacement of the existing Anderson Products Dry Bed Scrubber, Model AS-12 Safe Cell II with an Anderson Products Abator/Dry Bed Scrubber Model 5100 (Approval No. 2284). The existing Anderson Products Ethylene Oxide Sterilizer, Model No. Anprolene AN74i (Approval No. 2265) and the new Anderson Products EOGas 4 Ethylene Oxide Sterilizer will discharge to the new Anderson 5100 Abator, Dry Bed Scrubber to treat EtO emissions prior to discharge to the atmosphere.

Located at: *38 Olive Street, Providence, Rhode Island*

This permit shall be effective from the date of its issuance and shall remain in effect until revoked by or surrendered to the Department. This permit does not relieve *Brown University* from compliance with applicable state and federal air pollution control rules and regulations. The design, construction and operation of this equipment shall be subject to the attached permit conditions and emission limitations.

Douglas L. McVay, Chief
Office of Air Resources

Date of issuance

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

Brown University - Animal Care Department

APPROVAL NOs. 2265, 2283 & 2284

(Revised March 2015)

Permit Conditions and Emissions Limitations

A. Emission Limitations

1. Emissions of ethylene oxide discharged during the sterilization and purge exhaust cycle of the EOGas 4 sterilizer and the Anprolene AN74i sterilizer shall be reduced by 99.0% or greater before discharge to the atmosphere.
2. Emissions of ethylene oxide discharged to the atmosphere during the sterilization and purge exhaust cycle, including fugitives, shall not exceed 0.032 lbs. per month from both sterilizers combined.

B. Operating Requirements

1. Maximum monthly usage of ethylene oxide at the Animal Care Department and Cognitive, Linguistic and Psychological Sciences shall not exceed 2.87 lbs.
2. Each sterilization/aeration cycle in the EOGas 4 sterilizer shall be conducted for a minimum of 3.5 hours.
3. Each sterilization/aeration cycle in the Anprolene AN74i sterilizer shall be conducted for a minimum of 14 hours.
4. The EOGas 4 sterilizer and the Anprolene AN74i sterilizer shall not be operated simultaneously.
5. Following completion of the sterilization/aeration cycle each diffusion bag shall be opened inside the EOGas 4 sterilizer or the Anprolene AN74i sterilizer prior to removal.
6. The reactant bed in the air pollution control device shall be replaced when the combined quantity of EtO used in the EOGas 4 sterilizer and the Anprolene AN74i sterilizer, since the reactant bed was last changed, exceeds 7.71 pounds.

C. Emissions Testing

1. Within 180 days of initial start up of the EOGas 4 sterilizer and the Anderson 5100 Abator/Dry Bed Scrubber, emission testing shall be conducted to demonstrate that the required efficiency of the air pollution control device is being achieved.

2. A stack testing protocol shall be submitted to the Office of Air Resources for review at least 60 days prior to the performance of any stack tests.. The owner/operator shall provide the Office of Air Resources at least 60 days prior notice of any emissions test.
3. All test procedures used for emission testing shall be approved by the Office of Air Resources prior to the performance of any emissions test.
4. The owner/operator shall install any and all test ports or platforms necessary to conduct the required testing, provide safe access to any platforms and provide the necessary utilities for sampling and testing equipment.
5. All testing shall be conducted under operating conditions deemed acceptable and representative for the purpose of assessing compliance with the applicable emission limitations.
6. A final report of the results of emissions testing shall be submitted to the Office of Air Resources no later than 60 days following completion of the testing.
7. All stack testing must be observed by the Office of Air Resources or its authorized representatives to be considered acceptable, unless the Office of Air Resources provides prior written authorization to the owner/operator to conduct the testing without an observer present.

D. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records:
 - a. The quantity of ethylene oxide, in grams, used in the EOGas 4 sterilizer and the Anprolene AN74i sterilizer each day and each month for each sterilizer.
 - b. The total quantity of ethylene oxide, in grams, used in the EOGas 4 sterilizer and the Anprolene AN74i sterilizer since the reactant bed was last replaced.
 - c. The date and the amount of reactant added or replenished in the dry bed scrubber.
2. The owner/operator shall notify the Office of Air Resources, in writing, of the date of actual initial start-up of each sterilizer and air pollution control device no later than fifteen days after such date.
3. The owner/operator shall notify the Office of Air Resources of any noncompliance with the terms of this permit, in writing, within 48 hours of the occurrence.
4. The owner/operator shall notify the Office of Air Resources in writing of any planned physical or operational change to any equipment that would:
 - a. Change the representation of the facility in the application.

- b. Alter the applicability of any state or federal air pollution rules or regulations.
- c. Result in the violation of any terms or conditions of this permit.
- d. Qualify as a modification under APC Regulation No. 9.

Such notification shall include:

- Information describing the nature of the change.
- Information describing the effect of the change on the emission of any air contaminant.
- The scheduled completion date of the planned change.

Any such change shall be consistent with the appropriate regulation and have the prior approval of the Director.

5. The Office of Air Resources shall be notified, in writing, if the quantity of EtO processed through either sterilizer exceeds 17.5 grams per sterilization batch.
6. The Office of Air Resources shall be notified, in writing, if the combined quantity of EtO processed through both sterilizers, since the reactant bed was last changed, exceeds 7.71 pounds.
7. Deviations from permit conditions, including those attributable to upset conditions as defined in this permit, shall be reported, in writing, within five (5) business days of the deviation, to the Office of Air Resources. A copy of any such report shall be sent to the USEPA Region 1. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken.
8. All records required in this permit shall be maintained for a minimum of 5 years after the date of each record and shall be available to representatives of the Office of Air Resources upon request.

E. Malfunctions

1. The owner/operator may seek to establish that a malfunction of any air pollution control system that would result in noncompliance with any of the terms of this permit or any other applicable air pollution control rule and regulations was due to unavoidable increases in emissions attributable to the malfunction. To do so, the owner/operator must demonstrate to the Office of Air Resources that:
 - a. The malfunction was not attributable to improperly designed equipment, lack of preventative maintenance, careless or improper operation or operator error;
 - b. The malfunction is not part of a recurring pattern indicative of inadequate design, operation or maintenance;

- c. Repairs were performed in an expeditious fashion. Off-shift labor and overtime should be utilized, to the extent practicable, to ensure that such repairs were completed as expeditiously as practicable.
- d. All possible steps were taken to minimize emissions during the period of time that repairs were performed.
- e. Emissions during the period of time that the repairs were performed will not:
 - (1) Cause an increase in the ground level ambient concentration at or beyond the property line in excess of that allowed by Air Pollution Control Regulation No. 22 and any Calculated Acceptable Ambient Levels; and
 - (2) Cause or contribute to air pollution in violation of any applicable state or national ambient air quality standard.
- f. The reason that it would be impossible or impractical to cease the source operation during said period.
- g. The owner/operator's actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs or other relevant evidence.

This demonstration must be provided to the Office of Air Resources within two working days of the time when the malfunction occurred and contain a description of the malfunction, any steps taken to minimize emissions and corrective actions taken.

The owner/operator shall have the burden of proof in seeking to establish that noncompliance was due to unavoidable increases in emissions attributable to the malfunction.

F. Other Permit Conditions

- 1. There shall be no bypassing of the air pollution control equipment during times when ethylene oxide is being discharged to the device.
- 2. To the extent consistent with the requirements of this permit and applicable federal and state laws, the equipment shall be designed, constructed and operated in accordance with the representation of the equipment in the most recent permit application.
- 3. Employees of the Office of Air Resources and its authorized representatives shall be allowed to enter the facility at all times for the purpose of inspecting any air pollution source, investigating any condition it believes may be causing air pollution or examining any records required to be maintained by the Office of Air Resources.

4. Sterilization with EtO at the Animal Care Department shall only be conducted in the EOGas 4 sterilizer and in compliance with the terms and conditions of this permit.
5. Sterilization with EtO at the Cognitive, Linguistic, and Psychological Sciences shall only be conducted in the Anprolene AN74i sterilizer and in compliance with the terms and conditions of this permit.
6. At all times, including periods of startup, shutdown and malfunction, the owner/operator shall, to the extent practicable, maintain and operate the facility in a manner consistent with good air pollution control practice for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this permit have been achieved. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Office of Air Resources which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures and inspection of the source.
7. Approval Nos. 1398 and 1399 issued for the installation of the Anderson Products Ethylene Oxide Sterilizer, Model AnPro AN310 and the Anderson Dry Bed Scrubber (Safe Cell II), Model AAT AS-12, are revoked. This revocation will become effective upon startup of the Anderson Products EOGas 4 Ethylene Oxide Sterilizer and the Anderson Products Abator/Dry Bed Scrubber, Model 5100.