



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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## CONSTRUCTION PERMIT NESHAP SOURCE

### PERMITTEE

Sterigenics US, LLC  
Attn: Kevin Wagner, EHS Director  
2015 Spring Road, Suite 650  
Oak Brook, Illinois 60523

Application No.: 19060030

I.D. No.: 043110AAC

Applicant's Designation:

Date Received: June 25, 2019

Subject: Improved Control of the Emissions of the Willowbrook I Facility

Date Issued: September 20, 2019

Location: Willowbrook I, 7775 Quincy Street, Willowbrook, DuPage County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of improvements in the control of emissions of the Willowbrook I sterilization facility, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following conditions.

If you have any questions on this permit, please contact Daniel Rowell.

*Raymond E. Pilapil*

Raymond E. Pilapil  
Manager, Permit Section  
Bureau of Air

REP:DBR:mlm

*DBR  
9/20/19*

Conditions for the Project

1. Introduction

- a. This permit addresses improvements to the emission control measures for the ethylene oxide sterilization operations at the Willowbrook I facility. The Permittee is making these improvements to reduce the emissions of ethylene oxide of this facility and its impacts on air quality and to comply with the requirements for control of ethylene oxide emissions in Section 9.16(b) of the Illinois Environmental Protection Act (Act), "Control of Ethylene Oxide Sterilization Sources." These measures would also reduce emissions from any use of propylene oxide at this facility, which would be used to treat tree nuts and certain other food products.
- b. The improvements addressed by this permit involve the following:
  - i. Changes to enable the sterilization processes and related operations to be conducted with permanent total enclosure (PTE), with all exhaust gas streams containing ethylene oxide being captured and ducted to control systems and with all emissions through one stack. These changes include installation of fans and ductwork; construction of a transition room between the area in which unsterilized material is stored and the work aisle for the sterilization chambers; closing the equipment passage between the areas at the facility in which sterilized and unsterilized materials are stored; and installation of a new emission control device for gas streams that would otherwise vent to the atmosphere as general building ventilation air.
  - ii. Upgrades to the emission control system for ethylene oxide to improve overall control efficiency, as follows:
    - A. Ducting of the outlet gas stream from the existing control system for evacuation of the sterilization chambers, (i.e., a DEOXX™ acid scrubber) to the existing system that controls the gas streams from the backvents on the sterilization chambers and the aeration rooms (i.e., an AAT acid scrubber followed by a dry bed absorption (DBA) device).
    - B. Installation of two new multi-bed DBA control devices. One of the new DBA devices would be installed following the existing control devices for the sterilization chambers and aeration rooms. The other new DBA device would control emissions of ethylene oxide from the work aisle and the storage and loadout of sterilized material.
  - iii. Installation of a new or modified stack that would improve dispersion of emissions from the Willowbrook I facility, replacing the stacks that currently serve the existing

control systems for the sterilization chambers and the aeration rooms and resulting in one exhaust point for the facility.

- c. For the Willowbrook I facility, in conjunction with this construction permit, the Illinois EPA is certifying that with the permanent total enclosure and other improvements to the emission control system as addressed in Conditions 1(b)(ii), "... the facility's emission control system would use technology that produces the greatest reduction in ethylene oxide emissions currently available," so as to meet the criterion set forth in Section 9.16(g) of the Act. This certification is a formal finding that is separate and apart from this permit.
- d. This permit does not authorize changes to the Willowbrook I sterilization facility that would increase its sterilization capacity or emissions.
- e. For purposes of this permit, the ethylene oxide sterilization operations at the Willowbrook I facility, which includes fourteen sterilization chambers, three aeration rooms, and a storage area for sterilized material, are referred to as the "affected facility."

2-1. New Statutory Requirements for Control of Emissions of Ethylene Oxide

- a. For the affected facility, the Permittee will be subject to the requirements for control of emission of ethylene oxide in Section 9.16(b) of the Act, which provides that, beginning 180 days after the effective date of Section 9.16 of the Act (i.e., December 18, 2019), no person shall conduct ethylene oxide sterilization operations unless that person captures, and demonstrates that it captures, 100 percent of all ethylene oxide emissions and reduces ethylene oxide emissions to the atmosphere from each exhaust point at such source by at least 99.9 percent or to no more than 0.2 parts per million.
- b. Pursuant to Section 9.16(c) of the Act, if any emissions test conducted more than 180 days after the effective date of Section 9.16 of the Act fails to demonstrate that ethylene oxide emissions to the atmosphere from an exhaust point of the affected facility have been reduced by at least 99.9 percent or to no more than 0.2 parts per million, the Permittee shall immediately cease operation of the affected facility and notify the Illinois EPA within 24 hours of becoming aware of the failed emissions test. Within 60 days after the date of such test, the Permittee must do the following, as specified by Sections 9.16(c)(1), (2), (3) and (4) of the Act:
  - i. Complete an analysis to determine the root cause of the failed emissions test;
  - ii. Take any actions necessary to address that root cause;

- iii. Submit a report to the Illinois EPA; and
- iv. Upon approval by the Illinois EPA of the above required report, restart operation of the affected facility only to the extent necessary to conduct additional emissions test(s) and conduct such emissions test(s). The full operation of the affected facility may be restarted once an emissions test successfully demonstrates compliance, the results of emissions testing have been submitted to the Illinois EPA, and the Illinois EPA has approved the results demonstrating compliance.

Note: This construction permit only addresses requirements of Section 9.16 of the Act that are relevant for the improvements in the control of emissions of ethylene oxide of the Willowbrook I facility that would be undertaken by the Permittee.

2-2. Existing Regulatory Requirements

This permit does not affect the applicability of existing emission standards for ethylene oxide and associated regulatory requirements for testing, monitoring, recordkeeping and reporting related to emissions, as are addressed in Sections 4.1 and 4.4 of the current operating permit for the source, Clean Air Act Permit Program (CAAPP), Permit 95120085, issued June 8, 2015. In particular, the sterilization chambers and aeration rooms at the affected facility will continue to be subject to the requirements of the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Ethylene Oxide Emissions from Sterilization Facilities, 40 CFR 63 Subpart O, and applicable requirements of the General Provisions of the NESHAP, 40 CFR 63 Subpart A.

Note: If the Permittee were to seek alternatives to the procedures for performance testing in 40 CFR 63.365 to address the new configuration of control devices for the affected facility, the Permittee would need to obtain approval from USEPA in accordance with 40 CFR 63.7(e)(2). In addition, if the Permittee were to seek to rely on the new DBA control devices for compliance with the emission standards of 40 CFR 63.362, it would need to obtain approval of an operational monitoring plan that addresses these new devices in accordance with 40 CFR 63.365(g).

2-3. Other Applicable Requirements

- a. This permit does not affect provisions of a Consent Order entered into for the affected facility by the Permittee, i.e., Consent Order, People of the State of Illinois, ex rel. Kwame Raoul, Attorney General of the State of Illinois, and ex rel. Robert Berlin, State's Attorney for DuPage County, Illinois, Plaintiff, v. Sterigenics U.S., LLC, a Delaware Limited Liability Company, Defendant, entered in the Circuit Court of the Eighteenth Judicial Circuit, DuPage County, Illinois Chancery Division, No. 2018 Ch 001329.

- b. This permit does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as other applicable Federal, State and Local requirements.
- c. This permit does not excuse the Permittee from the obligation to undertake any actions related to use of ethylene oxide at the affected facility that are applicable pursuant to Section 9.16 of the Act.

3. Emission Limits and Operational Requirements for Control of Emissions

- a. The emissions of ethylene oxide of the affected facility shall not exceed 8.5 pounds/month and 85 pounds/year. Compliance with these emission limits shall be determined by continuous emissions monitoring for ethylene oxide in accordance with Condition 7-1 except that during periods when monitoring data is not available, data for emissions shall be based on the usage of ethylene oxide, operating data for control devices and emission factors developed from emission testing in accordance with Condition 8-2. In addition, compliance with the annual limit shall be determined from a running total of 12 consecutive months of emission data, with the first determination of compliance with this annual limit addressing the 12-month period that begins with March 2019.
- b.
  - i. The Permittee shall operate the affected facility with permanent total enclosure (PTE) for all areas of the facility in which ethylene oxide is being used or may be released, including any storage and handling of sterilized material prior to loadout from the facility. This PTE shall be designed and operated to comply with the criteria for PTE in Section 6 of Method 204 in 40 CFR Part 51 Appendix M, as modified by Condition 3(b)(ii), so that 100 percent of the emissions of ethylene oxide of the facility are captured and ducted to control devices. Compliance with these criteria shall be demonstrated by testing in accordance with Condition 8-1 and continuous operational monitoring for differential pressure, comparing pressure inside and outside the PTE, in accordance with Condition 7-2.
  - ii. For the doors at the loading dock, through which the sterilized material is moved during loadout, the Permittee shall design and operate the PTE to comply with Criteria 5.4 of Method 204 (i.e., maintain an average facial velocity of air through of least 200 feet per minute through open doors, with air flow into the enclosure). However, the PTE need not comply with Criteria 5.1 of Method 204 for these doors (i.e., the doors need not be at least four equivalent diameters from the material that is being loaded out).
  - iii. In the drum storage area next to the affected facility, all drums for ethylene oxide shall be kept sealed and the Permittee shall not dispense or otherwise allow the release

of ethylene oxide from any of these drums while they are in this area.

- c. The Permittee shall operate each control system or segment of a control system for ethylene oxide at the affected facility at all times that a gas stream containing any ethylene oxide or propylene oxide is ducted to it, as follows:
  - i. When a sterilization chamber is being evacuated, the control system for the evacuation of the sterilization chambers shall be in operation, i.e., the DEOXX™ scrubber, the AAT scrubber, the initial DBA device and the final DBA device shall be in operation.
  - ii. When a sterilization chamber is being ventilated through the backvent, the segment of the control system for the backvents shall be in operation, i.e., the AAT scrubber, the initial DBA device and the final DBA device.
  - iii. When sterilized material is being moved from a sterilization chamber to an aeration room or sterilized material is stored at the facility, the new DBA device for these activities shall be in operation.
4. Construction of a New or Modified Stack for the Affected Facility
  - a.
    - i. The Permittee shall construct a new stack for the affected facility or modify an existing stack at the facility so that the facility has a single exhaust point, replacing the facility's existing stacks and roof vents, which shall be closed off.
    - ii. The construction of this new or modified stack to replace the existing stacks shall be completed before the resumption of operation of the affected facility, provided however, that the Permittee may subsequently add or construct a stack extension to increase the height of this stack pursuant to this permit if such activity is begun within one year of completion of the initial construction of this stack.
  - b.
    - i. The height of the new or modified stack shall be at least the lower of the following:
      - A. The maximum height allowed under the ordinances of the Village of Willowbrook or such greater height otherwise approved by the village; or
      - B. 87 feet above ground level.
    - ii. The Permittee shall apply to the Village of Willowbrook for approval for construction of a new or modified stack with a height that is 87 feet above ground level. This application shall be submitted not later than 15 days after

the effectiveness of this permit. Thereafter, the Permittee shall take reasonable actions, e.g., supplementing the application with information as requested by the Village, if any, to support approval of construction of a new or modified stack with a height of at least 87 feet above ground level.

- c. Within 30 days of completion of construction of the new or modified stack, the existing stacks and roof vents of the affected facility shall be closed, provided however that this requirement shall not apply during reasonable period(s) as needed to accommodate the construction of a stack extension for the new or modified stack or to modify an existing stack.

5. Operational Limits for the Affected Facility

- a.
  - i. The usage of ethylene oxide by the affected facility shall not exceed 15.0 tons/month and 150 tons/year.  
  
Note: The above limits lower the permitted usage of ethylene oxide by the affected facility.
  - ii. The usage of propylene oxide by the affected facility shall not exceed 2.0 tons/month and 17.0 tons/year.
- b. For purposes of the annual limits in Condition 5(a)(i) and (ii), compliance shall be determined from a running total of 12 consecutive months of data, with the first determination of compliance with these annual limits addressing the 12-month period that begins with March 2019.

6-1. Operational Requirements Related to Permanent Total Enclosure (PTE)

- a. When the affected facility is in operation, the Permittee shall operate the PTE for the affected facility to maintain:
  - i. The pressure differential across the enclosure to at least 0.007 inches of water, rolling 3-hour average, as demonstrated by operational monitoring in accordance with Condition 7-2; and
  - ii. The direction of air flow through openings in the enclosure into the enclosure at all times.

6-2. Design and Operating Requirements for Control Devices

- a. The DBA control devices at the affected facility shall be equipped and operated so that internal inspections, maintenance and repair of these devices are conducted without interrupting the control of emissions or releasing gas streams containing ethylene oxide inside the building. In particular, each DBA device shall be equipped so that an individual bed in the device may be temporarily removed from service for replacement of

sorbent or other activities with all gas flow going to beds that are in service.

- b. If aeration will continue during inspections, maintenance or repair of the AAT scrubber, the gas streams from aeration shall be able to be ducted directly to the initial DBA device during such periods.
- c. i. If the Permittee elects to comply with Section 9.16(b) of the Act (see Condition 2-1) by reducing emissions of ethylene oxide from the affected facility by at least 99.9 percent overall control efficiency), the Permittee shall operate the control devices in the emission control systems to comply with operational limits that are consistent with operation during the most recent emission testing of the affected facility pursuant to Condition 8-2, that shows compliance with this requirement, as follows, as demonstrated by the operational monitoring required by Condition 7-3:
  - A. DEOXX™ and AAT scrubbers: flow rate and pH of the scrubbant, both on a rolling 3-hour average, as measured pursuant to Condition 7-3(a).
  - B. Other control devices: Concentration of ethylene oxide in the stack, on a rolling 3-hour average, as monitored pursuant to Condition 7-1(a).
- ii. During the period before emission testing is conducted and results are compiled showing compliance, control systems shall be operated in accordance with good air pollution control practice, as required by Condition 6-3(a).
- iii. Notwithstanding Condition 6-2(b)(i), the Permittee may operate control systems at different values for operating parameters for purposes of conducting emissions testing provided that the Permittee notifies the Illinois EPA prior to such operation.

6-3. General Operational Requirements for Capture and Control Systems

- a. At all times, the Permittee shall maintain and operate the affected facility, including the emission capture and control systems and required monitoring equipment, in a manner consistent with safety and good air pollution control practice for minimizing emissions.

7-1. Emissions Monitoring

- a. The Permittee shall install, operate, calibrate and maintain a continuous emissions monitoring system (CEMS) on the stack of the affected facility to measure the concentration of ethylene oxide in the exhaust stream in parts per billion by volume (ppbv). This monitoring system shall be designed and operated to meet the



requirements in USEPA's Performance Specification 15 (PS-15), "Performance Specifications for Extractive Fourier Transform Infrared Spectroscopy (FTIR) Continuous Emissions Monitor Systems in Stationary Sources," and to maintain a limit of quantification that is no greater than 20 ppbv.

- b. The Permittee shall install, operate, calibrate and maintain a continuous monitoring system (CMS) on the stack of the affected facility to measure the gas flow rate in the stack so as to be able to determine the mass emissions of the affected facility in pounds/hour. This CMS shall be located in the same area as the required CEMS and be designed and operated to meet the requirements in USEPA's Performance Specification 6, "Specifications and Test Procedures for Continuous Emission Rate Monitoring Systems in Stationary Sources," 40 CFR Part 60, Appendix B, PS-6.
- c. For the monitoring systems required by Conditions 7-1(a) and (b):
  - i. In addition to automatically recording the data measured by each of these monitoring systems, the Permittee shall automatically record the emissions of ethylene oxide as measured by these systems.
  - ii. The Permittee shall operate and maintain these monitoring systems to comply with the requirements of 40 CFR 63.8(c), provided, however, that the Illinois EPA shall serve as the "Administrator" for purposes of these rules, rather than the Administrator of USEPA or his or her authorized representative.
- d. The Permittee shall submit an Emissions Monitoring Plan to the Illinois EPA for review and approval at least 15 days before purchasing monitoring equipment that is intended to be used to satisfy Condition 7-1(a) and (b). This plan shall include the manufacturer, model number, performance specifications, including the limit of quantification for ethylene oxide, and recommended operation and maintenance procedure for the equipment that is proposed to be purchased and the specific location(s) at which they would be proposed to be installed, with explanation.
- e. The requirements of Condition 7-1(a) through (c) shall not apply to the monitoring system(s) as needed to accommodate difficulties in the initial calibrations or certification of the monitoring system(s), e.g., difficulty in obtaining suitable calibration gases, or the relocation and recertification of these system(s), provided the Permittee notifies the Illinois EPA. For relocation of the monitor, this notification shall be provided in advance of the relocation of the system(s), including a description of the relocation (e.g., to a higher location in the new or modified stack), the reason(s), and the expected duration of the period until the monitoring system(s) will be certified at their new location. For other difficulties this notification shall be provided as soon as practicable

7-2. Operational Monitoring for Permanent Total Enclosure (PTE)

- a. For the affected facility, the Permittee shall install, operate, calibrate and maintain a continuous monitoring system, as follows, to verify the presence of PTE, which system shall be operated and shall be used to demonstrate compliance with Condition 3(b).
  - i. This monitoring system shall measure the pressure differential between the interior and exterior of the PTE, with at least the following monitoring devices being operated for pressure inside the PTE.
    - A. For the work aisle, in which the doors to the sterilization chambers, two monitoring devices (one for the east and one for the west sections of the work aisle).
    - B. For the east aeration room, one monitoring device if this room is being used for aeration or for otherwise holding sterilized material.
    - C. For the room in which the vacuum pumps for the group of sterilization chambers at the west side of the facility (Area A) are located, one monitoring device.
    - D. For the room in which the AAT scrubber and DBA devices are located, one monitoring device.
    - E. For the area in which sterilized material is stored at the affected facility, one monitoring device.
    - F. For the area in which sterilized material loaded out from the affected facility, one monitoring device.
  - ii. The monitoring system shall be designed to provide measurements of pressure differential to at least the nearest 0.001 inches of water and take measurements no less frequently than every 1 minute, with the data collected by each monitoring device recorded on an hourly average and on a rolling 3-hour average, provided, however, that if data is not recorded from an alternative monitoring device during a malfunction of principal monitoring device(s) or the automatic recorder, the Permittee shall manually record the measured data at least hourly.
- b. The Permittee shall keep a log or other records for the operation and maintenance of this monitoring system that includes information detailing all routine and non-routine maintenance performed and dates and duration of any outages.
- c. The Permittee shall submit a Pressure Differential Monitoring Plan to the Illinois EPA for review and approval at least 15 days before purchasing the monitoring equipment that is intended to be

used to satisfy Condition 7-2(a). This plan shall include the manufacturer, model number, performance specifications, including the precision of measurement, and recommended operation and maintenance procedure for the equipment that is proposed to be purchased and the location(s) at which such equipment would be proposed to be installed, with explanation.

- d. The requirements of Condition 7-2(a) and (b) shall be met prior to resuming operation of the affected facility, provided, however, that the Illinois EPA may provide additional time to address specific difficulties in installation and certification of the monitoring system, e.g., difficulty in locating monitoring devices outside the enclosure to appropriately account for ambient air flow around the building.

7-3. Operational Monitoring and Instrumentation for Control Devices

- a. For each scrubber, the Permittee shall install, calibrate, operate and maintain continuous monitoring systems for: 1) Scrubbant flow rate, 2) pH of the scrubbant, and 3) Temperature at the inlet of the device. Data collected by each monitoring device shall be recorded on an hourly average and on a rolling 3-hour average, provided, however, that during a malfunction that prevents automatic recording of data, the Permittee shall manually record measured data for scrubbant flow rate and temperature at least hourly and pH shall be recorded from a sample of the scrubbant at least once per day.
- b. For the DBA device that follows the AAT scrubber, the Permittee shall install, operate and maintain instrumentation to measure the temperatures before and after the heat exchanger for the inlet gas stream. This information shall be recorded at least twice during each operating day.
- c. For each DBA device, the Permittee shall install, operate and maintain instrumentation to indicate the flow of gas to individual beds, which may either be determined directly by measuring gas flow to individual beds or indirectly by identifying gas flow to beds based on the temperature of the gas entering the bed or the position of the damper (open or closed). This information shall be recorded whenever the Permittee changes the flow of gas to individual beds in the device, e.g., a bed is taken out of service for replacement of sorbent or a bed is returned to service after replacement of sorbent.
- d. The Permittee shall keep a log or other records for the operation, calibration and maintenance of the monitoring systems and instrumentation required by Conditions 7-3(a) through (c) that includes information detailing all routine and non-routine maintenance performed and dates and duration of any outages.

8-1. Requirements for Testing for Permanent Total Enclosure (PTE)

- a. The Permittee shall have testing for the presence of PTE on the affected facility, as required by Section 9.16(b) of the Act (Condition 2-1), conducted by a qualified third-party testing service that is independent of the Permittee and is experienced in such testing, as follows. This testing shall be conducted in accordance with the procedures specified in Sections 8.2, 8.3 and 8.4 of Method 204.
- b. The timing for this testing for PTE shall be as follows:
  - i. Initial testing shall be completed and results compiled before the initial testing of emissions required by Condition 8-2(a) is conducted.
  - ii. Thereafter, testing shall be conducted upon written request by the Illinois EPA, with such testing conducted within 60 days of the request or such later date agreed to by the Illinois EPA.
- c. At least 30 days prior to the scheduled date for testing of PTE, the Permittee shall submit a proposed test protocol to the Illinois EPA for review. The test protocol submitted to the Illinois EPA shall address the manner in which testing will be conducted, including, the following. This emissions testing shall be performed in accordance with the test protocol, subject to any conditions on or revisions to the test protocol by the Illinois EPA.
  - i. The person or persons who will be performing measurements and analysis, their experience with similar tests, the firm by which they are employed, and confirmation that the firm is independent of the Permittee.
  - ii. The measurement and verification methods to be used.
  - iii. The conditions under which the test will be performed, including a discussion of why these conditions will be representative and the means by which the operating parameters for the sterilization process and control systems will be determined.
  - iv. The planned location in the stack for measurement of gas flow from the facility.
- d. The Permittee shall notify the Illinois EPA prior to conducting this testing to enable the Illinois EPA to observe testing. Notification for the expected date of testing shall be submitted a minimum of 20 days prior to the expected date. Notification of the actual dates and expected times of testing shall be submitted a minimum of 5 working days prior to the actual date of the test.

- e. Copies of the Final Reports(s) for required tests shall be submitted to the Illinois EPA as soon as practicable but no later than 30 days after the date of testing. The Final Report shall include as a minimum:
  - i. A summary of results.
  - ii. General information.
  - iii. Description of test method(s), including description of sample points, analysis equipment, and test schedule.
  - iv. Detailed description of test conditions, including process information and control equipment information, e.g., equipment condition and operating parameters during testing.
  - v. Data and calculations, including copies of all raw data sheets, records of laboratory analyses, sample calculations, and data on equipment calibration.

8-2. Requirements for Initial and Annual Emission Testing for Ethylene Oxide

- a. For the affected facility, the Permittee shall conduct emission testing for the affected facility in accordance with Sections 9.16(b) (1), (2), (3), (4) and (5) of the Act to verify that the ethylene oxide emissions from the affected facility have been reduced to meet the emission control requirement in the Section 9.16(b) of the Act (Condition 2-1(a)), provided, however, that emission testing will not be required if the affected facility does not resume operation or operation is discontinued before such testing would otherwise initially be required to be conducted.
- b. All required emissions testing shall be conducted under operating conditions that are representative of maximum emissions by a qualified third-party testing company that is independent of the Permittee and is experienced in conducted such testing.
- c.
  - i. Compliance with Condition 2-1(a) shall be determined from the average of the results of three test runs, except as the average of the results of two test runs would be provided for by 35 IAC 283.240.
  - ii. The scope of the required testing shall be as follows:
    - A. If the Permittee intends to comply by means of the emission reduction requirement, testing shall be conducted for each inlet gas stream to the control systems and for the stack for the emissions of the affected facility, with at least three separate test runs attempted in each required test and at least two runs successfully completed.

- B. If the Permittee intends to comply by means of the concentration of ethylene oxide, testing shall be conducted at the stack for the emission of the affected facility, with at least three separate test runs attempted and at least two runs successfully completed.
- iii. For the gas stream from the sterilization chambers, the duration of each test run shall be sufficient to span the "middle portion" of the sterilization cycle for all chambers that are in operation during the period of testing. For this purpose, the middle portion of the sterilization cycle begins with the initial evacuation of ethylene oxide laden air from a chamber and ends 60 minutes after the sterilized material from that chamber is transferred to an aeration room.
- iv. A. The following USEPA methods and procedures shall be used for testing, unless another USEPA method is approved by the Illinois EPA as part of the approval of the required emission test protocol:

Traverse Points	Method 1
Flowrate	Method 2, 2A, 2B, 2C or 2D
Molecular Weight	Method 3 or 320
Moisture Content	Method 4 or 320
Ethylene Oxide	Method 320
- B. Notwithstanding Condition 8-2(c)(iv)(A), once the continuous monitoring systems required by Condition 7-1 are certified, measurements of ethylene oxide emissions in the stack of the affected facility may be made using those monitoring systems provided that the certification and use of these systems is addressed in the approved emission test protocol for the test.
- v. If a required periodic, annual emissions test will be conducted by the same company and by the same individuals in accordance with the emissions test protocol previously approved by the Illinois EPA, including any conditions or revisions to that test protocol imposed by the Illinois EPA, unless the Illinois EPA has notified the Permittee that submittal of a new test protocol is needed for the next test, the Permittee may resubmit the previous test protocol, including any conditions or revisions to that protocol imposed by the Illinois EPA, as the protocol for the forthcoming emissions test.
- d. In addition to submitting notifications for scheduled emission test dates at least 30 days prior to such dates, the Permittee shall also submit notifications for the actual dates and expected times of testing at least 5 working days prior to the actual dates of emission tests.

- e. The Permittee shall submit reports for all required emissions testing, including test results and accompanying documentation, to the Illinois EPA as soon as practicable but no later than 30 days after the emission test date. Notwithstanding Condition 9(e), the Permittee shall retain a copy of a report for emissions testing submitted to the Illinois EPA for at least five years beyond the date that the testing is supplanted by subsequent emission testing.
- f. If after conducting an emissions test, the Permittee plans to expeditiously conduct new testing, the following provisions for test protocols and test notifications shall apply for that new test. For this purpose, the Permittee shall be considered to plan to expeditiously conduct new testing if it plans to conduct the new test within 60 days of the previous test.
  - i. The Permittee shall notify the Illinois EPA of its intent to conduct a new test as soon as is practical, with the reason for conducting the new test.
  - ii. Unless the Illinois EPA informs the Permittee that submittal of a new test protocol is needed, a new protocol need not be submitted for the new test if the new test will be conducted in accordance with the test protocol that has been approved by the Illinois EPA, including any conditions or revisions to that protocol imposed by the Illinois EPA.
  - iii. A new notification is not needed for the scheduled date of testing and the Permittee shall instead only provide notification for the actual date and expected times of the new test at least 5 working days prior to the actual date of the test.

9. Recordkeeping

- a. The Permittee shall maintain the following records for each DBA device:
  - i. A file containing information for:
    - A. The design parameters of the device, including number of beds, dimensions of each bed (length, width and depth), sorbent capacity of each bed (pounds of sorbent) and gas flow capacity (scfm).
    - B. The sorbent used in the device, including material name or trade name, manufacturer's name, manufacturer's guarantees for ethylene oxide removal efficiency (percent) and absorption capacity (pounds ethylene oxide removed per pound of material), with supporting documentation and/or calculations.
    - C. A copy of manufacturer's recommended operation and maintenance procedures for the device.

- D. A copy of the Permittee's operation and maintenance procedures for the device, including the procedures for disposal of spent sorbent, which procedures may incorporate the manufacturer's recommended procedures.
- ii. An operating log or other records that include:
  - A. The dates that the performance of individual beds for control of ethylene oxide was evaluated, with: 1) The measured concentration of ethylene oxide in the exhaust stream from the bed, the measured concentrations of ethylene oxide with and without the bed in service, or data for another operational parameter of the bed that is indicative of the current performance of the bed and the need for replacement of sorbent; and 2) The projected date by which the sorbent in the bed will need to be replaced, with explanation.
  - B. The dates that the sorbent in individual beds is replaced, with confirmation that the DBA device continued in operation during replacement of the sorbent, as required by Condition 6-2(a), and representative data for the monitored concentrations of ethylene oxide before and after the replacement of the sorbent.
  - C. Information identifying circumstances when the Permittee's current operating and maintenance procedures were not followed, with description and information discussing the reason and the effect on emissions, if any.
- iii. Records for the amount of sorbent added to the DBA device (pounds/month and pounds/year).
- b. The Permittee shall maintain an operating log or other records that identify periods when the control device(s) were not in operation and confirm compliance with Condition 3(c) (i), (ii) or (iii), as applicable.
- c. The Permittee shall maintain records of the following information related to the operation of the affected facility, with supporting data:
  - i. The usages of ethylene oxide and propylene oxide of the affected facility (tons/month and tons/year, of each material).
  - ii. The amount of new sorbent for the DBA devices in inventory at the facility at the end of each month (pounds).



- d. The Permittee shall maintain records of the emissions of ethylene oxide and propylene oxide of the affected facility (pounds/month and pounds/year, of each pollutant), with supporting data and calculations.
- e. The records that the Permittee keeps for ethylene oxide drums, both full and empty, prior to placing these drums in the drum storage area, which document that inspections of these drums are conducted to confirm that the drums are sealed, shall be considered records required by this permit as the inspection of drums for leakage is addressed.
- f.
  - i. The Permittee shall retain all records, including logs, required by this permit for at least five years from the date of entry unless a longer retention period is specified by a particular provision and keep the records at a location at the facility that is readily accessible to the Illinois EPA and USEPA.
  - ii. The Permittee shall make records available for inspection and copying by the Illinois EPA or USEPA upon request, including retrieving and printing on paper any records retained in an electronic format (e.g., computer) in response to an Illinois EPA or USEPA request for records during the course of a facility inspection, or provide an electronic copy of such information in a format that is acceptable to the agency making the request.
  - iii. For the records of data that is automatically recorded, such as continuous emissions monitoring data, the Permittee shall maintain a computer terminal at a location at the source so that authorized personnel or representatives of the Illinois EPA can readily view and evaluate the recorded data during the course of an on-site inspection.

10. Additional Requirements for Reporting

- a.
  - i. Beginning when results for the initial testing required by Condition 8-2 have been submitted to the Illinois EPA, the Permittee shall submit quarterly reports to the Illinois EPA that include the following information for the quarter. These reports shall be submitted within 30 days of the end of each calendar quarter.
    - A. The monthly emissions of ethylene oxide.
    - B. Information for changes to the emission monitoring systems, if any, to improve the limit of quantification of these systems, including a description of the changes, the rationale for the changes, a description of the expected and actual result of the changes, and confirmation that the changes did not negatively affect the performance of the monitoring systems.

- C. The results of any testing of the emission control system for ethylene oxide that the Permittee conducted or had conducted, other than testing addressed by Condition 8-2, accompanied by information describing this testing, including the procedures for testing and the operational conditions under which it was conducted.
  - D. A summary of the results of the ambient air monitoring conducted in accordance with Section 9.16(e) of the Act for the previous quarter.
  - E. A summary of the notifications required to be submitted by Condition 10(b) for deviations from the requirements of this permit, if any, during the quarter.
- ii. With the quarterly report for the fourth quarter in each calendar year, the Permittee shall submit the following information for the entire calendar year:
- A. Emissions of ethylene oxide for each month in the year and the total emissions (pounds).
  - B. Usage of ethylene oxide (tons).
- b. The Permittee shall notify the Illinois EPA of deviation(s) from the requirements of this construction permit, which notifications shall include information describing the deviation(s), the probable cause of the deviation(s), the corrective actions taken, and any preventative measures taken. The timing for these notifications shall be as follows unless otherwise provided for in an operating permit for the source that addresses the requirements of this construction permit.
- i. These notifications shall be submitted to the Illinois EPA within five days of the deviation(s), provided, however, that the Permittee may submit an initial notification within five days of the deviation(s) with a follow-up notification submitted within 30 days of the deviation if more time is needed to fully investigate the deviation(s) and assemble the information that must be included in such notifications. In such case, the initial notification need only include information describing the deviation(s) and the corrective actions that were taken.
  - ii. In addition to the notifications for deviations required by Condition 10(b)(i), if any test for permanent total enclosure conducted pursuant to Conditions 8-1 does not demonstrate compliance with the capture requirement for emissions of ethylene oxide in Condition 2-1(a), the Permittee shall notify the Illinois EPA within 24 hours of becoming aware the results of that test.

- c. The Permittee submit Progress Reports to the Illinois EPA on a semi-monthly basis addressing progress toward completing the improvements addressed by this permit, continuing until all improvements are completed and the results for the initial testing required by Condition 8-2 have been submitted to and approved by the Illinois EPA. These reports shall address actions during the first and second halves of each month, with the first report for a month addressing the period ending on the 15<sup>th</sup> of the month and the second report addressing the remainder of the month. These reports shall be submitted, respectively, by the end of the month or the 15<sup>th</sup> of the following month. Among other information, these reports shall include the following information:
- i. For each new control device, the dates for ordering, beginning installation, completing installation and commencing routine operation of the device.
  - ii. For the upgrade to the emission control system for the evacuation of sterilization chambers, the dates of completion of the design, completion of construction, completion of installation of new ductwork and completion of the upgrade.
  - iii. For the changes to achieve permanent total enclosure (PTE), the dates of completion of the design, completion of construction of the wall or partition separating the receiving and shipping storage areas, completion of installation of new ductwork and completion of the PTE.
  - iv. For the new or modified stack, the dates for submittal of the application and an any subsequent supporting information to the Village of Willowbrook for this stack, the Village's action on the application, the completion of the design, entering into the construction contract, starting construction and commencing operation. With the report that provides the completion of design, the Permittee shall include a diagram for the new or modified stack that includes the height and the location of the CEMS and the test port(s) on the stack, confirming that they comply with USEPA Method 1.
  - v. For the existing stacks and vents that are to be removed from service and sealed, the dates of closure.
- d. If a stack extension will be added or constructed for the new or modified stack or for an existing stack, the Permittee shall notify the Illinois EPA at least 15 days in advance. In this notification, the Permittee shall provide height of the stack with the extension, a description of any changes to the location of monitoring equipment, the expected duration of any period(s) when the new or modified stack will be out of service, and a demonstration that the Permittee will reduce the operation of the affected facility during those period(s) to the extent that is reasonably practicable.

11. Addresses for the Illinois EPA

- a. Plans, notifications and reports required by this permit shall be sent to:

Illinois Environmental Protection Agency  
Bureau of Air  
Compliance Section (#40)  
1021 North Grand Avenue, East  
P.O. Box 19276  
Springfield, Illinois 62794-9276

Telephone: 217/782-5811

- b. In addition, a copy of each plan, notification or report required by this permit that concerns emissions monitoring or emission testing shall also be sent electronically to the Illinois EPA, Bureau of Air, Compliance Section, Source Monitoring Unit, using the State of Illinois File Transfer Website, unless otherwise instructed by the Illinois EPA:

<http://filet.illinois.gov>

Recipient Email Address: EPA.BOA.SMU@illinois.gov  
File Transfer Email Subject: Sterigenics, Willowbrook  
Illinois EPA I.D. 043110AAC

12. Authorization for Operation

- a. Until an operating permit is issued for the affected facility that provides for operation of the improvements to control measures addressed by this construction permit, the Permittee may operate the affected facility with these improvements pursuant to this construction permit provided that the affected facility is otherwise allowed to operate. This condition supersedes Standard Condition 6.



STATE OF ILLINOIS  
ENVIRONMENTAL PROTECTION AGENCY  
DIVISION OF AIR POLLUTION CONTROL  
P. O. BOX 19506  
SPRINGFIELD, ILLINOIS 62794-9506

**STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS  
ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY**

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.
2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.
3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.
4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:
  - a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,
  - b. to have access to and copy any records required to be kept under the terms and conditions of this permit,
  - c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,
  - d. to obtain and remove samples of any discharge or emission of pollutants, and
  - e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.
5. The issuance of this permit:
  - a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,
  - b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,
  - c. does not release the Permittee from compliance with the other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,
  - d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

- e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.
- 6.
- a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.
  - b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.
7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:
- a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or
  - b. upon finding that any standard or special conditions have been violated, or
  - c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.