Prepared for
Sterigenics US, LLC
Facility ID's 126191 and 126197
Vernon, California

Prepared by
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REVISED RISK REDUCTION PLAN

STERIGENICS U.S., LLC

VERNON, CALIFORNIA

RAMBOLL

CONTENTS

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

EtO:	Ethylene oxide
FDA:	Food and Drug Administration
GC:	Gas chromatograph
HARP:	Hot Spots Analysis and Reporting Program
LDAR:	Leak Detection and Repair
Measure or measure:	The measures expressed in Section 3.3 of this RRP
NAICS:	North American Industry Classification System
ppb:	Parts per billion
ppm:	Parts per million
PTE:	Permanent total enclosure
RRP:	Risk Reduction Plan
SCAQMD:	South Coast Air Quality Management District
SIC:	Standard Industrial Classification
TTE:	Temporary total enclosure
U.S. EPA	United States Environmental Protection Agency

1. INTRODUCTION

1.1 Facility Overview

Sterigenics U.S., LLC (Sterigenics) operates a medical sterilization business, including two facilities within the city of Vernon (Facility ID 126191, also referred to as the 50th Street Facility, and Facility ID 126197, also referred to as the 49th Street Facility). These facilities sterilize medical devices such as surgical kits, delivery systems, and COVID test swabs using ethylene oxide (EtO). The two Sterigenics facilities are joint operationally and subject to South Coast Air Quality Management District (SCAQMD or District) rules and regulations, including Rule 1405, "Control of Ethylene Oxide and Chlorofluorocarbon Emissions from Sterilization or Fumigation Processes."

Medical devices are shipped to the Vernon facilities via truck. These products are unloaded, sterilized with EtO, aerated, then shipped out to medical facilities and customers. At each facility, EtO process emissions are treated through scrubbers and abators. The operations also result in the release of fugitive emissions.

1.2 Risk Reduction Plan Overview

On June 7, 2022, SCAQMD issued a Notice of Designation (Notice) of Sterigenics U.S., Inc. – Los Angeles Facility (SCAQMD ID's 126191 & 126197) as a Potentially High Risk Level Facility. In response to that Notice, Ramboll is submitting this Risk Reduction Plan (RRP or Plan) on behalf of Sterigenics. This RRP has been prepared in accordance with the requirements of Rule 1402.

Per Rule 1402(f)(2) the required elements of an RRP are:

Rule 1402(f)(2) RRP Requirement	Location in RRP
1. The name, address, and SCAQMD facility identification number, and SIC and NAICS codes of the facility;	See Section 3.1 below
2. A facility risk characterization which includes an updated Air Toxics Inventory Report and Health Risk Assessment, if the risk due to total facility emissions has increased above or decreased below the levels indicated in the previously approved Health Risk Assessment;	N/A
3. Identification of each source from which risk needs to be reduced in order to achieve a risk below the Action Risk Level;	See Section 3.2 below
4. An evaluation of the risk reduction measures available to the owner or operator, including emission and risk reduction potential, and time necessary for implementation;	See Section 3.3 below
5. Specification of the risk reduction measures that shall be implemented by the owner or operator to achieve the Action Risk Level or the lowest achievable level;	See Section 3.3 below
6. A schedule for implementing the specified risk reduction measures as quickly as feasible;	See Section 3.3 below

Rule 1402(f)(2) RRP Requirement	Location in RRP
7. If requesting a time extension, provide a description of the measure(s) for which a time extension is needed, the reason(s) a time extension is needed, progress in implementing other risk reduction measures in the plan, estimated health risk level at the time of the time extension request and at the end of the risk reduction period, and the length of time requested;	N/A
8. An estimation of the residual health risk after implementation of the specified risk reduction measures; and	See Section 4
9. Proof of certification of the Risk Reduction Plan as meeting all requirements by an individual who is officially responsible for the processes and operations of the facility.	See Section 2.1 below

2. CERTIFICATION

I certify that this Risk Reduction Plan meets the requirements for such plans set forth in South Coast Air Quality Management District Rule 1402(f) and that I am officially responsible for the processes and operations of the Sterigenics U.S., LLC sterilization facility in Vernon, California.

Kevin Wagner
Vice President, Environmental Health and Safety

12 - JUL-2024

Date

3. RISK REDUCTION PLAN

Sterigenics began to implement reduction measures in April 2022. Additional risk reduction measures have since been identified, as provided in this Plan.

3.1 Facility Information

Sterigenics operates two neighboring facilities in Vernon, CA, separated by privately owned, non-public railroad tracks. Their addresses are:

Sterigenics, U.S., LLC (Facility ID 126191)
4801-63 E. 50th Street
Vernon, CA 90058

Sterigenics, U.S., LLC (Facility ID 126197)
4900 S. Gifford Avenue
Vernon, CA 90058

The NAICS code for each facility is 561910, "product sterilization and packaging services." The SIC code for each facility is 7389, "business services, necessary."

3.2 Key Health Risk Driver Identification

Per the June 7, 2022 Notice from SCAQMD to Sterigenics, Sterigenics was required to expeditiously reduce risks from the facility based on the levels of ethylene oxide from local ambient air quality monitoring data and other findings from site visits at the Sterigenics facilities. Based on this information and various discussions with SCAQMD staff, Sterigenics has identified ethylene oxide emissions from the following sources as key health risk drivers for the purposes of this RRP:

- Facility ID 126191
  - Scrubber (Permit No. G2974)
  - Abator (Permit No. G44886)
  - Various Fugitive Sources
- Facility ID 126197
  - Scrubber (Permit No. R-G43812)
  - Abator (Permit No. G44884)
  - Various Fugitive Sources

In addition, Sterigenics has identified risk-reducing procedural changes beyond specific devices or processes for implementation.

3.3 Emission Control Measures

Sterigenics has already implemented numerous risk reduction measures, has several in the design and procurement phase, and continues to assess others. As early as April 2022, after SCAQMD raised concerns based on the nearby air monitoring results, Sterigenics began identifying actions they could quickly take to further reduce emissions, and thus risk, through procedural changes, process changes, physical modifications, and curtailments. The subsequent report sections describe the risk-reduction measures that Sterigenics has implemented thus far and additional actions that they plan to take in both the short and long

term. Except as otherwise provided, these measures shall remain in place until the permanent total enclosures ("PTEs," as defined in Measure 24) are installed and operational and associated fugitive emission controls are constructed (such time for a facility, referred to as the "Completion Time"). For avoidance of doubt, except for any measures that relate to both the 49th Street Facility and 50th Street Facility collectively (such as air monitoring and curtailment), once the Completion Time is reached for either the 49th Street Facility or the 50th Street Facility, the measures in this RRP shall no longer remain in place for the facility for which the Completion Time has been reached, except as otherwise provided.

1. For process areas with fugitive Ethylene Oxide (EtO) emission sources, Sterigenics has:

   a. Installed and maintained temporary enclosures, where feasible, using physical barriers such as plastic sheeting (10 mil thickness or greater), plastic strip curtains, accordion doors, etc. These areas include the transfer corridor from chamber room(s) to the aeration room(s) at 49th Street facility; and the warehouse/shipping area(s) at both 49th and 50th Street facilities. The installation of temporary enclosures shall be reevaluated upon commissioning of the dry beds in the 49th Street and 50th Street facilities' shipping areas, and Sterigenics may propose, subject to the District's approval, the removal of some or all of these enclosures if it can be demonstrated that their presence reduces the overall effectiveness of the dry beds;

   b. Directed fugitive emissions to control equipment where feasible;

   c. Developed and submitted for District approval within ten calendar days of the Effective Date, a plan to conduct parameter monitoring for measures 1(a) and 1(b), such as via smoke tests, differential pressures, or inward face velocities, at an appropriate frequency. Sterigenics has implemented the approved plan; and

   d. Maintained records onsite to provide to the District upon request.

   Schedule: Temporary enclosures using physical barriers were installed between May 2022 and the present; installation efforts were ongoing and completed September 30, 2022. Fugitive emissions were directed to control equipment where feasible between April and May, 2022. A plan to conduct parameter monitoring was required to be submitted for District approval within 10 calendar days of the Effective Date. This Parameter Monitoring Plan was submitted on August 19, 2022 and the monitoring has been ongoing since that time.

   Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

2. For areas with fugitive EtO emissions, Sterigenics has:

   a. Vented (or otherwise direct air from) areas with fugitive EtO to capture and control equipment, including additional fans routed to existing emission controls, temporary portable Timilon filter systems, and dry bed systems; and

   b. Evaluated other interim measures and technologies and continued to implement any feasible control measures.

   Schedule: Sterigenics installed portable Timilon capture and control equipment throughout both facilities beginning May 2022 and further installation work was ongoing. Portable control

equipment was installed on August 25, 2022. This equipment has been removed when the PTE's were completed.

Estimated Emissions Reduction: The portable Timilon filter systems have expected EO control efficiencies of ~80%.

3. Sterigenics sealed off all building draft openings (except as otherwise specified in this RRP) that were not under negative pressure as verified by conducting smoke testing or differential pressure measurements (except as otherwise specified in these measures and consistent with Measure 1(c)). Plastic sheeting (10 mil thickness or greater), or other materials approved by the District, over openings is considered as acceptable sealing.

   Schedule: Sterigenics began sealing of all building draft openings on August 10, 2022. Work was completed by September 9, 2022.

   Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

4. Sterigenics has kept all access doors in process, storage, and shipping areas closed, except while they are in active use.

   Schedule: Sterigenics has been keeping access doors closed except when in active use since April 2022.

   Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

5. Sterigenics has installed signage on both sides of personnel and vehicle access doors for areas with known fugitive EtO emissions. The signs have the following wording: "Caution Ethylene Oxide. Door(s) will be kept closed when not in use," or other wording approved by the District. Letters are at least 85-point type and are visible to personnel using the doors.

   Schedule: Sterigenics installed required signage on August 11, 2022.

   Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

6. Sterigenics has been, where possible, keeping truck bay doors closed during loading and unloading, or ensuring that truck bay doors remain closed except when personnel are actively involved in truck movement and/or truck loading and unloading.

   Schedule: Sterigenics has been keeping truck bay doors closed except when in active use since April 2022.

   Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to

AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

7. Sterigenics has been inspecting all roll-up door(s) on a daily basis for any damage that may allow for potential fugitive EtO emissions to pass through such door(s). Sterigenics maintains a log that documents all daily inspections. If damage is observed, Sterigenics shall immediately make repairs or make arrangements for repairs at the earliest feasible time, record the repairs, and provide records sufficient to demonstrate compliance with this measure to the District upon request. Sterigenics shall submit a notification (Rule1405notifications@aqmd.gov) if a repair takes more than 3 business days to complete.

   Schedule: Sterigenics began daily inspections on August 10, 2022.

   Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

8. Sterigenics has developed and submitted (Rule1405notifications@aqmd.gov) for District review and approval a building differential pressure monitoring plan. Upon approval, the plan shall be implemented and considered enforceable as a measure under this Plan. The plan:

   a. Entails the installation, operation, maintenance of a differential pressure monitoring system for each total enclosure as follows:

      i. A minimum of one building differential pressure monitoring system shall be installed and maintained at each of the following three walls in each total enclosure having a total ground surface area of 10,000 square feet or more:

         1. The leeward wall;

         2. The windward wall, where possible; and

         3. An exterior wall that connects the leeward and windward wall at a location defined by the intersection of a perpendicular line between a point on the connecting wall and a point on its furthest opposite exterior wall, and intersecting within plus or minus ten (±10) meters of the midpoint of a straight line between the two other monitors specified for the leeward wall and windward wall. The midpoint monitor shall not be located on the same wall as either of the other two monitors specified for the leeward wall and windward wall.

   b. Includes provisions for maintenance, recordkeeping, and reporting unless already required by Paragraphs 1(c), 3 or 7.

      Schedule: The building differential pressure monitoring plan was submitted for District approval on September 9, 2022 and approved on January 27, 2023. The building differential pressure and monitoring plan was implemented on July 31, 2023 after the dry bed systems were installed and operational (per Item 16).

      Estimated Emissions Reduction: No emissions reductions have been quantified.

9. At least daily, Sterigenics inspects temporary enclosure measures for integrity against breaches. If breaches in temporary enclosures or seals are observed, Sterigenics shall make immediate repairs

or, if such repairs are not able to be immediately made, Sterigenics shall immediately make arrangements for repairs at the earliest feasible time. For temporary enclosures not already covered by Paragraphs 1(c), 3 or 7, records of inspection and any repairs shall be maintained daily and kept onsite. Sterigenics shall submit a notification (Rule1405notifications@aqmd.gov) if a repair takes more than 2 business days to complete.

Schedule: Sterigenics began daily inspection of temporary enclosure measures on August 10, 2022.

Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

10. Sterigenics has increased aeration time to 12 hours or more where practical in the aeration room(s) to the maximum extent of the allowable ranges, and Sterigenics uses its best efforts to ensure sufficient physical space in the aeration room(s) to achieve such increases in aeration time. Sterigenics shall not aerate materials less than minimum or more than maximum durations established in the U.S. FDA approved sterilization cycles for those materials. Sterigenics provided the District with records that demonstrate the increase over the baselines of aeration times in June 2022, compared to a baseline of January 2022, including percentage measurements. Records that identify the materials undergoing aeration and log the aeration times, and corresponding customer and/or U.S. FDA aeration specifications, along with records of warehouse holding times (between the time the product exits aeration and the time the product is shipped from the facilities), are maintained and shall be made available to the District upon request. Sterigenics has initiated a report that consolidates the relevant aforementioned data, including aeration times, U.S. FDA and/or customer aeration specifications, and warehouse holding times, and provides this report to the District (Rule1405notifications@aqmd.gov) on a monthly basis.

    a. Sterigenics and the District may meet and confer regarding evaluation of this data. Sterigenics acknowledges the District may evaluate records submitted under this measure and may, with a demonstration of good cause, seek modification of this Plan to seek to increase aeration times (without requiring Sterigenics to exceed maximum aeration times as specified in U.S. FDA and/or customer aeration specifications) or otherwise seek to enhance this measure.

    Schedule: Sterigenics began complying with this requirement in early May 2022.

    Estimated Emissions Reduction: This measure is one of many actions that Sterigenics took between April 2022 and the present in order to reduce their fugitive emissions. According to AQMD monitoring, monthly averaged ambient EtO concentrations at AQMD monitoring site #1 decreased from 71.4 ppbv to 0.70 ppbv between April 2022 and April 2024. These measures collectively contributed to the 99% reduction in ambient concentration during that period.

11. Sterigenics continues to conduct leak detection pursuant to the procedures in the current version of Rule 1405 at least monthly. Sterigenics maintains its other existing internal leak detection methods and practices, which include leak tests during every sterilization cycle and continuous measurement of EtO concentrations near EtO-containing equipment. The interior gas chromatograph ("GC") data for the 49th Street and 50th Street facilities shall be reviewed weekly to see if there are increased EtO levels near this equipment. If increased levels at or above 1 ppm are detected, Sterigenics shall further inspect and document equipment for EtO leaks using handheld instruments with an electrochemical detector or other EtO-specific instrumentation with

a low detection limit at or below 0.5 ppm. Leak detection procedures must be directed to any equipment or components handling EtO that are under positive pressure (e.g., vacuum pumps, control equipment piping, or storage). Sterigenics has also developed a supplemental EtO Leak Detection and Repair (LDAR) program for monthly inspection of the scrubber and oxidizer external piping that is under positive pressure (which, together with the vacuum pumps, control equipment piping, or storage described in the preceding sentence, comprises the "Relevant Equipment"). LDAR data is recorded in a format approved by the District and shall be provided to District personnel upon request.

Schedule: Sterigenics began preparation of a supplemental Leak Detection and Repair Plan in May 2022. This plan was implemented on August 29, 2022.

Estimated Emissions Reduction: No emissions reductions have been quantified, though this action is expected to result in early leak detection.

12. Sterigenics reports (to Rule1405notifications@aqmd.gov) any EtO leaks greater than or equal to 2 ppm from the Relevant Equipment within two hours of discovery, and the reports detail the action plan and repair timeline. For any leak greater than or equal to 2 ppm EtO, Sterigenics shall, within 3 calendar days of discovery of the leak, submit (to Rule1405notifications@aqmd.gov) a written report with a root cause analysis and details on corrective actions taken.

    Schedule: Sterigenics shall comply with this requirement as needed.

    Estimated Emissions Reduction: No emissions reductions have been quantified.

13. Sterigenics has developed and implemented a protocol that includes daily inspection of the acid scrubber systems for potential ethylene glycol leaks, and a protocol for repair or removal of components found to be leaking ethylene glycol. Sterigenics shall keep records of all such inspections and repairs and provide to District personnel upon request.

    Schedule: Sterigenics began development of the required protocol in conjunction with development of the LDAR program in May of 2022. The LDAR protocol was implemented beginning August 29, 2022. Additionally, Sterigenics has continued with its ongoing daily leak inspections, which include inspections for leaks of ethylene glycol.

    Estimated Emissions Reduction: No emissions reductions have been quantified.

14. Sterigenics shall immediately repair or take out of service any components with any instrument-detected leaks of EtO (as provided for in Measure 12) or ethylene glycol (as provided for in Measure 13). Leaking components shall be repaired before they are returned to service. Sterigenics shall maintain a log of all components taken out of service, including the date and time they were taken out of service, as well as the date and time they were reinstalled or brought back online.

    Schedule: Sterigenics shall comply with this requirement as needed.

    Estimated Emissions Reduction: No emissions reductions have been quantified.

15. Sterigenics submitted to (Rule1405notifications@aqmd.gov) a report that evaluated the use of interior GC systems as a tool for assessing and implementing other measures to ensure on-site worker safety while reducing exterior EtO emissions, including evaluating the development of a daily GC summary report that calculates and reports periodic average EtO concentrations for review and assessment. The evaluation included a prioritization of areas to locate ports where possible; an evaluation of relocating ports during construction of the PTE; and a review of the system daily calibration along with periodic testing at various ports with samples of known EtO gas concentration.

    Schedule: Sterigenics submitted the required report on September 9, 2022.

    Estimated Emissions Reduction: No emissions reductions have been quantified.

16. Sterigenics shall construct and operate the dry beds at the 49th and 50th Street facility as soon as possible after issuance of all applicable government approvals, but in no case later than August 2023 (exclusive of any additional dry bed(s) installed in conjunction with construction of the PTE at the 49th Street facility). These dry beds are intended to further control fugitive emissions, as indicated in permit applications submitted to the District on June 6, 2022. The GC system data will be used to determine the 8-hour rolling average and how often the data will be gathered. Upon full operation of the dry beds, if either facility exceeds an EtO concentration of 1.0 ppm on an 8-hour rolling average in the shipping area outside of the aeration room(s), Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 24 hours. If 8-hour rolling average EtO concentrations persist above 1.0 ppm in the shipping area outside of the aeration room(s) for more than 48 hours, then Sterigenics shall submit (Rule1405notifications@aqmd.gov) a written report with a root cause analysis within 2 business days. The report shall provide details on the airflow and capture of emissions by the dry beds, as demonstrated by a smoke test, or details on the relevant differential pressure monitor(s) to confirm that sufficient negative pressure exists. Sterigenics shall provide final notification to the District (Rule1405notifications@aqmd.gov) within 1 business day when the facility sustains 8-hour rolling average EtO concentrations less than 1.0 ppm for 24 hours. The internal GC, or in the event of the GC system's inaccuracy, another reasonable method put forth by Sterigenics, shall be used to monitor EtO concentrations in the shipping area outside of the 49th and 50th Street facilities' aeration room(s). Sterigenics shall maintain records sufficient to demonstrate compliance with this measure and provide them to the District upon request.

    Schedule: Sterigenics submitted applications for permits to operate new dry beds throughout their facilities on June 6, 2022, and has subsequently submitted a request for expedited processing of these applications. Per this measure, the dry beds should be fully operational as soon as possible after issuance of all applicable government approvals, but in no case later than August 2023 (exclusive of any additional dry bed(s) installed in conjunction with construction of the PTE at the 49th Street facility). Sterigenics requested an extension on the installation date on March 16, 2023. Construction was completed on July 31, 2023. Sterigenics notified the District (Rule1405notifications@aqmd.gov) of completion of construction of the dry beds on July 31, 2023.

    Estimated Emissions Reduction: Per manufacturer specifications, the dry beds are expected to reduce EtO emissions by approximately 80%.

17. Within 7 calendar days of full operation of the dry beds in a facility, Sterigenics shall maintain continuous negative pressure of at least 0.001 inches of water within the facilities' shipping areas until construction of the PTEs is completed. To the extent that significant construction activities

may impede compliance with this measure, Sterigenics shall notify the District at (Rule1405notifications@aqmd.gov) 24 hours in advance, or as soon as practicable. Sterigenics shall install and maintain building pressure differential monitors, and shall log differential pressure readings at least once per shift (shifts are 8 hours), sufficient to demonstrate compliance with this measure. If Sterigenics does not maintain continuous negative pressure in accordance with this measure, and no prior notice due to significant construction activities has been provided, Sterigenics shall notify the District at (Rule1405notifications@aqmd.gov) within 24 hours. Sterigenics shall maintain records sufficient to demonstrate compliance with this measure and provide them to the District upon request.

Schedule: Sterigenics has implemented and is in compliance with this plan since July 31, 2023. Sterigenics notified the District (Rule1405notifications@aqmd.gov) on July 31, 2023.

Estimated Emissions Reduction: This measure will produce a significant reduction of fugitive emissions.

18. Sterigenics shall make the following updates to the facility stacks:

    a. As a temporary measure, Sterigenics shall connect the existing scrubber exhaust to the existing Donaldson abator stack at each facility. The purpose of this modification is to increase dispersion, as the oxidizer stacks are taller and hotter than the scrubber stacks. This measure is only expected to be in place until the permanent stack described in Measure 18b is installed.

    b. Sterigenics shall reroute the scrubber, dry beds, and Donaldson abator exhausts to one single stack at each facility. The purpose of this modification is to increase dispersion. The new stacks shall be taller than the previous scrubber exhaust stacks, and exhaust at a higher temperature and flow rate than the previous scrubber stacks.

    Schedule: Sterigenics submitted additional SCAQMD permit applications to reroute scrubber exhaust through the abator stacks on September 27, 2022 with a request for expedited processing. Permits were issued on December 13, 2022. Sterigenics completed the construction on February 15, 2023.

    Estimated Emissions Reduction: No emission reductions are expected from these modifications. However, the modifications are expected to reduce health risk due to increased dispersion.

19. Sterigenics shall submit a test protocol to the District for review and approval to conduct an enclosure testing program of representative pallets and products[1] coming out of the aeration room(s) to characterize and quantify residual off-gassing of EtO. The test protocol shall follow guidelines described below in subdivision (a). The source test program shall be initiated promptly following District approval of the protocol, subject to the District's availability to observe the test. Sterigenics shall notify the District of initiation of the enclosure testing program a reasonable time prior to data and sample collection, and the District shall be allowed to observe the test and collect duplicate samples. A final source test report shall be submitted to the District (Rule1405notifications@aqmd.gov) within 30 calendar days of completion of the test program. Sterigenics shall append the District's written comments or evaluation of the final report, if any, to the final report if Sterigenics distributes the final report to any working groups of the EtO sterilization industry or the U.S. FDA for participation in the development of post-sterilization process evaluations.

[1] "Products" in this measure shall refer to representative materials that are not customer products.

a. The Test Protocol shall include an initial method validation evaluation to determine the appropriate size of a pallet enclosure and inlet and exhaust ducts and air flow rate to allow effective capture and laminar flow required for quantitative emissions evaluation. Validation steps in the pilot evaluation shall include, at a minimum, release of a known mass and concentration of EtO relevant to residual expected from processing through normal operations, to allow recovery, repeatability and time to equilibrium to be established and calculation of the rate of depletion of the EtO over time. The validation step shall not include the use of sterilized material, since the amount of EtO in this test must be known and the goal is to validate the chamber parameters and monitoring equipment. Sterigenics shall notify the District of the initial method validation a reasonable time prior to the evaluation, and the District shall be allowed to observe. The results of the validation evaluation shall be submitted to the District. After demonstration of appropriate test conditions and ability to track degradation rates and approval of the developed methodology by the District, quantitative Pallet Enclosure Testing shall be conducted over a several-week period to test pallets of material processed via different cycles reflective of the range of normal operations. A Temporary Total Enclosure (TTE) shall be built for this purpose. The enclosure shall be designed to accommodate one (1) or more pallet(s) of materials representative of those processed via the range of sterilization cycles in normal operations and held after leaving the aeration room(s). The enclosure shall be equipped with inlet and exhaust ducting and shall not require contact with the sterilized products. Sterigenics shall use representative part(s) and pallet(s) for testing. Inlet air shall be supplied from a clean ambient source. The exhaust duct shall be connected to a blower and directed to an area under air pollution control. The exhaust duct shall be equipped with sample ports to enable measurement of air flow and EtO concentrations. Air flow and concentration shall be measured for the selected pallet(s) or part(s) on a continuous or semi-continuous basis as well as quantified at approved timepoints with integrated canister sample results throughout a period representative of the duration that different product batches would be held before shipping. Pallet Enclosure Testing results shall be made available to the District (Rule1405notifications@aqmd.gov) on a rolling 2-week basis following collection.

b. After Sterigenics has submitted the testing protocol to the District, if Sterigenics does not perform the testing as required, District personnel or District-authorized contractors may elect to perform the testing. Sterigenics shall facilitate such program of testing that shall be conducted by District personnel or District-authorized contractors. Specifically, Sterigenics shall make all reasonable accommodations for the District's program of work to initiate, conduct (for not more than 4 weeks), and conclude an enclosure testing program of representative pallets and products coming out of the aeration room(s) to characterize and quantify any residual off-gassing of EtO pursuant to the test protocol developed by Sterigenics and approved by the District, or pursuant to a test protocol developed by the District that takes into the account relevant variables (e.g., airflow and time). Sterigenics shall provide training to District personnel or District-authorized contractors regarding all health and safety requirement applicable in areas in which the study is to be conducted. The testing shall commence upon soonest availability of District personnel. After completion of testing, Sterigenics shall within 60 calendar days of billing notification pay the District the costs of materials and testing per applicable fee rates in District Rules 304 and 304.1.

Schedule: Sterigenics submitted the requested test protocol pursuant to the prior Early Action Reduction Plan on December 7, 2022. SCAQMD provided notice of conditional approval of the test protocol on May 5, 2023. Sterigenics submitted notice to SCAQMD that implementation of the test protocol was beginning on May 12, 2023 and that testing would occur at the

Sterigenics facility in the City of Ontario (Facility ID No. 126060). Sterigenics provided laboratory reports containing analytical measurements to SCAQMD on a rolling basis as individual tests were run through December 2023. The validation evaluation described above is ongoing. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of completion of the validation evaluation that the testing program is complete and shall submitted a testing report to the District for review and approval within 30 calendar days of the completion notice.

Estimated Emissions Reduction: No emissions reductions are expected from this testing.

20. Sterigenics shall install additional control to the scrubbers to further reduce emissions. One moisture removal system and one dry bed bunk shall be installed after each existing permitted scrubber.

    Schedule: Sterigenics submitted an application for a permit to construct these dry bed systems on June 6, 2022. The additional control equipment is expected to be installed by March 2025. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of completion of installation of additional control to the scrubbers.

    Estimated Emissions Reduction: The additional control equipment is expected to increase the overall scrubber control efficiency. The scrubbers at the 49th and 50th Street facilities shall continue to control process emissions from the sterilizers by 99.969% and 99.985%, respectively. The remaining emissions, previously emitted as fugitives, shall be controlled by the new dry bed at 80% efficiency.

21. Sterigenics shall, within 14 calendar days of the Effective Date, commence the fenceline air monitoring plan included here as Appendix A. Monitoring pursuant to Appendix A shall continue for 60 days after the completion of the final PTE or as required or modified by any applicable South Coast AQMD Rule.

    Schedule: Sterigenics commenced the fenceline monitoring plan on August 24, 2022 at the M1 and M3 locations for which access is available. Sterigenics subsequently added the fenceline monitoring at two other locations: M5 on September 15, 2023 and M2 on January 1, 2024 after the site access to the other two locations was secured.

    Estimated Emissions Reduction: No emission reductions are expected from this measure. However, fenceline monitoring is expected to ensure immediate actions taken to reduce risks if elevated ethylene oxide concentrations are measured.

22. Sterigenics shall install a wind monitoring system and data logging system at a location approved by the District. Sterigenics shall conduct annual cleaning and calibration of the wind monitoring sensor per manufacturer's specification.

    Schedule: Sterigenics shall install a wind monitoring system and data logging system at a location approved by the District within two weeks of receiving approval from the District. The proposed location of the wind monitoring system was submitted to the District for approval on August 18, 2022 and received comments from SCAQMD dated 15 December 2022. Although the SCAQMD has not provided approval, Sterigenics has activated the weather station and began recording wind direction and wind speed onsite on August 31, 2022.

    Estimated Emissions Reduction: No emission reductions are expected from this measure.

23. Sterigenics shall submit (Rule1405notifications@aqmd.gov) all internal EtO monitoring data (e.g., GC data) on a weekly basis, except as otherwise provided in the measures herein, to the District. All data shall include individual readings and shall be provided in Excel format.

    Schedule: Sterigenics began submitting required monitoring data on a weekly basis on August 18, 2022.

    Estimated Emissions Reduction: No emission reductions are expected from this measure.

24. Sterigenics shall construct and operate PTEs within twelve months of all applicable permit approvals, unless Sterigenics seeks an extension of time from the Executive Officer. In any case, PTEs shall be constructed and operational no later than June 30, 2024 for the 50th Street facility, and July 31, 2024 for the 49th Street facility. The PTEs shall be constructed consistent with U.S. EPA Method 204, except as otherwise specified in the permits for PTEs issued by the District. ("PTEs" as used in this Plan means the PTEs as described in the immediately preceding sentence).

    Schedule: Sterigenics shall construct the PTEs within 12 months of applicable permit approvals unless an extension is needed. The PTE construction for 50th Street facility was completed on June 30, 2024 and a notification was sent to SCAQMD on June 30, 2024. The PTE construction for 49th Street facility shall be completed no later than July 31, 2024. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of completion of the 49th Street facility PTE.

    Estimated Emissions Reduction: This measure is expected to capture 100% of fugitive emissions from the facility. These emissions shall be controlled by the dry beds referenced in Control Measure #16.

25. Sterigenics shall notify the District within 3 calendar days of completion of construction of each of the PTEs. Until satisfaction of this measure, Sterigenics shall submit (Rule1405notifications@aqmd.gov) a monthly report to the District with status updates in relation to increments of progress for construction of the PTEs.

    Schedule: Sterigenics shall notify the District within 3 calendar days of construction completion for each of the PTEs. Upon Plan approval, Sterigenics shall begin submitting a monthly report to the District with updates on construction increments of progress on September 23,2022.

    Estimated Emissions Reduction: No additional emissions reductions are expected from this notification.

26. The PTEs shall be source tested (consistent with the Permit to Construct requirements).

    a. The source test report shall be submitted to South Coast AQMD for review and approval; and

    b. The approved source test results shall be used to reevaluate the health risks posed by the facility.

    Schedule: Sterigenics shall submit a source test protocol within 60 calendar days of PTE permit issuance. Sterigenics shall conduct an initial source test within 180 days of completion of modification of the PTE and no later than September 1, 2025 unless otherwise approved in writing by the Executive Officer to demonstrate compliance with the stack emission requirements of Rule 1405.

Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

27. Appendix A to the Early Action Reduction Plan (EARP), the Fenceline Monitoring Plan, specifies how this monitoring shall be conducted and provides that results from the monitoring specified in Appendix A shall be reported to the District. As soon as reasonably possible, but no later than three (3) hours of discovering or receiving notification that laboratory-validated ambient air monitoring results (each, a "Monitoring Result") are at or above a Trigger Level (as defined below) at any ambient air monitoring location specified in Appendix A for a single 24-hour sample, Sterigenics shall notify the District via e-mail to Rule1405notifications@aqmd.gov of the result. The email shall include the laboratory results package and any other information to be reviewed by South Coast AQMD. As used in this Section 2.3.5, "Lower Trigger Level" means 10 ppb and "Upper Trigger Level" means 16 ppb, and the Lower Trigger Level and Upper Trigger Level collectively are referred to as "Trigger Levels". Upon a determination, pursuant to measure 31, by the District that curtailment is required, or if no such determination is made then within 24 hours of notification to the District of the monitoring result at or above the Trigger Level, Sterigenics shall commence curtailment activities, subject to other provisions of this Section 2.3.5, in steps as follows: for each Monitoring Result above the Lower Trigger Level (but not above the Upper Trigger Level), Sterigenics shall move one step on the following schedule, and for each Monitoring Result above the Upper Trigger Level, Sterigenics shall move two steps on the following schedule:

    a. First Step – 20% curtailment (maximum 800 pounds of EtO used per day)

    b. Second Step – 40% curtailment (maximum 600 pounds of EtO used per day)

    c. Third Step – 60% curtailment (maximum 400 pounds of EtO used per day)

    d. Fourth Step – 80% curtailment (maximum 200 pounds of EtO used per day)

    e. Fifth Step – 100% curtailment (maximum 0 pounds of EtO used per day)

    Multiple monitors exceeding thresholds on the same day shall not constitute multiple results for this provision and the highest value shall be used to determine curtailment.

    Schedule: Sterigenics shall comply with the timelines in this measure upon approval of this risk reduction plan. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of demonstrated compliance.

    Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

28. If curtailment is triggered:

    a. Sterigenics may resume normal operations upon the first subsequent monitoring result below the Lower Trigger Level from the monitor yielding the elevated result that triggered curtailment, so long as subsequent, available monitoring results at all monitors are also below the Lower Trigger Level.

    b. If a period of at least 15 calendar days demonstrates consecutive results below the Lower Trigger Level from all monitors, a subsequent result at or above a Trigger Level shall recommence the curtailment provisions of measure 27(a) through (e) as an initial result under 27(a) through (e).

c. If three invalid samples are reported for any single monitor location during a consecutive 30-Day period, then South Coast AQMD may elect to conduct monitoring at that location. The District shall be reimbursed by Sterigenics for monitoring efforts conducted pursuant to this section. Sterigenics may resume their own sampling at the site once a Quality Assurance plan has been submitted and approved by South Coast AQMD.

Schedule: Sterigenics shall comply with the timelines in this measure upon approval of this risk reduction plan. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of demonstrated compliance.

Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

29. For curtailment under measure 27(a)-(e), the reduction in operations shall be based on a curtailment baseline of 1,000 pounds of EtO per day, as expressed in measure 27(a)-(e). In such cases, Sterigenics shall reduce daily EtO use to a percent of this baseline, as expressed in measure 27(a)-(e). This reduction shall be achieved by initiating fewer loads into preconditioning, such that less EtO is required for sterilization cycles. At any such time Sterigenics is required to fully curtail operations, if products are already in the preconditioning chamber, Sterigenics may finish the sterilization cycle for those products.

    Schedule: Sterigenics shall comply with the timelines in this measure upon approval of this risk reduction plan. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of demonstrated compliance.

    Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

30. Sterigenics shall maintain daily EtO usage records for the 49th St and 50th St. facilities for at least two years, and shall maintain any records required. The records shall be provided to District personnel upon request.

    Schedule: Sterigenics shall comply with the timelines in this measure upon approval of this risk reduction plan. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of demonstrated compliance.

    Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

31. Any result at or above a Trigger Level shall be subject to review by the District for determination of curtailment action as follows: Upon informing the District of a reading above a Trigger Level, Sterigenics may present, within 24-hours, evidence to the District, including data from Sterigenics' meteorological stations, security camera footage, or other credible sources that would demonstrate that the sample result does not accurately capture Sterigenics' contribution to the ambient concentration recorded by the monitor or is invalid due to equipment or sampling failures. The District shall consider such evidence in determining whether the result shall trigger a curtailment action, and shall meet and confer with Sterigenics regarding its determination. Curtailment shall begin after the 24-hour period unless the District provides written notification to end the curtailment based on the data presented.

    Schedule: Sterigenics shall comply with the timelines in this measure upon approval of this risk reduction plan. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of demonstrated compliance.

Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

32. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) no later than three hours after any changes in curtailment status in measure 28.

    Schedule: Sterigenics shall comply with the timelines in this measure upon approval of this risk reduction plan. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of demonstrated compliance.

    Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

33. A result from a District monitor in the vicinity of the Vernon Facilities, generally consistent with the proximity of the District's monitors at Site 1, 2 and 3 during the period of June-August 2022, shall constitute a result in measures 27 and 28. Upon notification by the District of an elevated result, all conditions shall apply to Sterigenics, except Sterigenics shall not be required to provide the laboratory results package in measure 27.

    Schedule: Sterigenics shall comply with the timelines in this measure upon approval of this risk reduction plan. Sterigenics shall notify the District (Rule1405notifications@aqmd.gov) within 3 calendar days of demonstrated compliance.

    Estimated Emissions Reduction: No additional emissions reductions are expected from this measure.

34. Upon presentation of appropriate credentials, Sterigenics allows District personnel or authorized representatives to enter and inspect the premises, have access to records, and take samples, with the understanding that all records identified or marked "confidential" and/or "trade secret" (or any similar term or phrase) by Sterigenics shall be handled as confidential records pursuant to the California Public Records Act. During inspection or sampling, Sterigenics shall not alter normal business operations or equipment to suppress emissions for the purpose of evading detection or concealing emissions during monitoring or testing.

    Schedule: The District has been allowed to enter and inspect the premises, have access to records, and take samples on an ongoing basis. This shall continue.

    Estimated Emissions Reduction: No emissions reductions are expected for this measure.

35. Sterigenics may request a postponement of a scheduled sampling day (for any air monitoring under Section 2.3.3 above) due to anticipated meteorological or other exceptional conditions. However, Sterigenics shall not postpone any scheduled sampling without prior written approval from District staff.

    Schedule: Sterigenics may request use of this measure if necessary due to meteorological or other exceptional conditions.

4. POST-IMPLEMENTATION RISK

Ramboll evaluated the emissions and associated health risks from Sterigenics before and after implementation of the items listed in this Risk Reduction Plan. Per the requirements in the June 7, 2022 Notice from SCAQMD to Sterigenics, Ramboll has prepared a health risk assessment associated with the facility's 2021 operation. A modified health risk assessment (Modified HRA) was prepared by SCAQMD and approved on June 12, 2024. Based on the HRA results, Sterigenics has identified emission sources from which risk needs to be reduced. As discussed in the Modified HRA, over 90% of the calculated cancer risks at maximum impact receptors are due to process ethylene oxide emissions from the scrubbers and the abators. For this reason, the risk reduction focus is on further control of the ethylene oxide emission sources, including fugitive emissions. The updated emissions and risk estimates take several key facility changes into account after the full Risk Reduction Plan has been implemented.

The post-implementation risk accounts for the construction of the PTE to capture all the indoor air. This measure (#21) eliminates the fugitive emissions that were analyzed in the 2021 health risk assessment. The ethylene oxide usage that was previously assumed to be released as fugitive emissions shall be controlled by newly constructed dry beds. Additionally, the scrubber emissions at both 49th and 50th Street facilities shall be further controlled by routing through dry beds before they are released into the atmosphere per Measure #20. The post-implementation risk assumes that all process emissions are emitted through one stack. In 2021, the 49th and 50th Street facilities had separate stacks for sterilizer and abator emissions. After implementation of the measures listed in this RRP, Sterigenics shall have one stack at each site to exhaust emissions controlled by the scrubber, abator, and dry beds. This stack shall be taller than the previous scrubber exhaust stacks, and exhaust at a higher temperature and flow rate than the previous scrubber and abator stacks as well. These changes shall help increase dispersion.

The future post-RRP TAC emissions and associated air pollution devices are presented in Attachment A, and assume EtO usage from 50th street at the current permit limit, and from 49th street at the maximum physical potential throughput.

4.1 Health Risk Assessment

Ramboll conducted a post-RRP HRA to evaluate the potential future offsite health impacts after Sterigenics implements additional emission controls for ethylene oxide and completes the stack reconfiguration as part of the risk reduction measures. Ramboll performed AERMOD dispersion modeling based on the post-RRP configuration using a unit emission factor (e.g., 1 g/s) approach to estimate the air dispersion factors for the future single stack at each site.[2] Ramboll used CARB's Hotspots Analysis and Reporting Program (HARP2) Air Dispersion and Modeling and Risk Tool[3] (ADMRT) with post-RRP emission rates to estimate the TAC concentrations and calculate the health risks associated with emissions following implementation of risk reduction measures.

[2] USEPA. 2022. The AMS/EPA Regulatory Model Improvement Committee (AERMIC) Model (AERMOD), Version 22112.

[3] CARB. 2019. Hot Spots Analysis and Reporting Program (HARP). May. Available at: https://ww3.arb.ca.gov/toxics/harp/harp.htm. Accessed: November 2022.

Table 1, below, summarizes the risk changes as a result of the implementation of the above key risk reduction measures.

Receptor and Health Effect	2021 HRA	Post-RRP HRA
Maximum Cancer Risk per million at the Facility Boundary[a]	4760.2	0.60
Maximum Residential Cancer Risk	40.8	0.14
Maximum Worker Cancer Risk	77.1	0.53
Cancer Burden[b]	0.11	N/A
Maximum Residential Chronic Hazard Index	6.48E-03	9.12E-05
Maximum Worker Chronic Hazard Index	1.47E-01	6.65E-04
Maximum 8-Hour Chronic Hazard Index	1.60E-04	1.49E-04
Maximum Acute Hazard Index	5.86E-04	5.35E-04

Note:

[a] This is the hypothetical cancer risk conservatively assuming residential exposure assumptions.

[b] Cancer burden is not analyzed for future HRA as the maximum cancer risk based on the 30-year residential exposure assumptions is below 1 in a million.

ATTACHMENT A
POST RRP TAC EMISSIONS

Table A.1. Combustion Emissions
Sterigenics US, LLC.
Vernon, California

TAC	Emission Factor[1] (lb/mmscf)	Emissions for Different Equipment (lb/hr)						
		49th St. Boiler #1	*49th St. Boiler #2*	*49th St. Abator*	*50th St. Boiler #1*	*50th St. Boiler #2*	*50th St. Abator*	*Total*
Benzene	0.0080	2.27E-06	2.27E-06	6.82E-06	2.78E-06	2.78E-06	8.34E-06	**2.53E-05**
Formaldehyde	0.0170	4.83E-06	4.83E-06	1.45E-05	5.91E-06	5.91E-06	1.77E-05	**5.37E-05**
Total PAHs [excluding naphthalene]	0.0001	2.84E-08	2.84E-08	8.53E-08	3.47E-08	3.47E-08	1.04E-07	**3.16E-07**
Naphthalene	0.0003	8.53E-08	8.53E-08	2.56E-07	1.04E-07	1.04E-07	3.13E-07	**9.48E-07**
Acetaldehyde	0.0043	1.22E-06	1.22E-06	3.67E-06	1.49E-06	1.49E-06	4.48E-06	**1.36E-05**
Acrolein	0.0027	7.67E-07	7.67E-07	2.30E-06	9.38E-07	9.38E-07	2.81E-06	**8.53E-06**
Ammonia	3.2000	9.10E-04	9.10E-04	2.73E-03	1.11E-03	1.11E-03	3.34E-03	**1.01E-02**
Ethyl benzene	0.0095	2.70E-06	2.70E-06	8.10E-06	3.30E-06	3.30E-06	9.90E-06	**3.00E-05**
Hexane	0.0063	1.79E-06	1.79E-06	5.37E-06	2.19E-06	2.19E-06	6.57E-06	**1.99E-05**
Toluene	0.0366	1.04E-05	1.04E-05	3.12E-05	1.27E-05	1.27E-05	3.81E-05	**1.16E-04**
Xylene	0.0272	7.73E-06	7.73E-06	2.32E-05	9.45E-06	9.45E-06	2.83E-05	**8.59E-05**

Conversion Factors:

8,760 hours/year

Annual Fuel Usage (mmscf/year):

2.49 49th Street Boiler #1
2.49 49th Street Boiler #2
7.47 49th Street Abator
3.04 50th Street Boiler #1
3.04 50th Street Boiler #2
9.13 50th Street Abator

Abbreviations:

btu - British thermal unit
hr - hour
lb - pound
mmbtu - million British thermal units
mmscf - million standard cubic feet
SCAQMD - South Coast Air Quality Management District
scf - standard cubic foot
SCR - selective catalytic reduction
SNCR - selective non-catalytic reduction
TAC - toxic air contaminant
yr - year

Notes:

[1] Emission factors shown are SCAQMD AB2588 reporting tool defaults for natural gas external combustion equipment <10 MMBtu/hr without SCR or SNCR.

Table A.1. Combustion Emissions
Sterigenics US, LLC.
Vernon, California

TAC	Emission Factor[1] (lb/mmscf)	Emissions for Different Equipment (lb/yr)						
		49th St. Boiler #1	***49th St. Boiler #2***	***49th St. Abator***	***50th St. Boiler #1***	***50th St. Boiler #2***	***50th St. Abator***	***Total***
Benzene	0.0080	1.99E-02	1.99E-02	5.98E-02	2.43E-02	2.43E-02	7.30E-02	**2.21E-01**
Formaldehyde	0.0170	4.23E-02	4.23E-02	1.27E-01	5.17E-02	5.17E-02	1.55E-01	**4.70E-01**
Total PAHs [excluding naphthalene]	0.0001	2.49E-04	2.49E-04	7.47E-04	3.04E-04	3.04E-04	9.13E-04	**2.77E-03**
Naphthalene	0.0003	7.47E-04	7.47E-04	2.24E-03	9.13E-04	9.13E-04	2.74E-03	**8.30E-03**
Acetaldehyde	0.0043	1.07E-02	1.07E-02	3.21E-02	1.31E-02	1.31E-02	3.93E-02	**1.19E-01**
Acrolein	0.0027	6.72E-03	6.72E-03	2.02E-02	8.22E-03	8.22E-03	2.47E-02	**7.47E-02**
Ammonia	3.2000	7.97E+00	7.97E+00	2.39E+01	9.74E+00	9.74E+00	2.92E+01	**8.85E+01**
Ethyl benzene	0.0095	2.37E-02	2.37E-02	7.10E-02	2.89E-02	2.89E-02	8.67E-02	**2.63E-01**
Hexane	0.0063	1.57E-02	1.57E-02	4.71E-02	1.92E-02	1.92E-02	5.75E-02	**1.74E-01**
Toluene	0.0366	9.11E-02	9.11E-02	2.73E-01	1.11E-01	1.11E-01	3.34E-01	**1.01E+00**
Xylene	0.0272	6.77E-02	6.77E-02	2.03E-01	8.28E-02	8.28E-02	2.48E-01	**7.53E-01**

Conversion Factors:

8,760 hours/year

Annual Fuel Usage (mmscf/year):

2.49 49th Street Boiler #1
2.49 49th Street Boiler #2
7.47 49th Street Abator
3.04 50th Street Boiler #1
3.04 50th Street Boiler #2
9.13 50th Street Abator

Abbreviations:

btu - British thermal unit
hr - hour
lb - pound
mmbtu - million British thermal units
mmscf - million standard cubic feet
SCAQMD - South Coast Air Quality Management District
scf - standard cubic foot
SCR - selective catalytic reduction
SNCR - selective non-catalytic reduction
TAC - toxic air contaminant
yr - year

Notes:

[1] Emission factors shown are SCAQMD AB2588 reporting tool defaults for natural gas external combustion equipment <10 MMBtu/hr without SCR or SNCR.

Table A.2. Process Emissions
Sterigenics US, LLC.
Vernon, California

Facility ID	Device ID	Control Device	Annual Emissions[1,2] (lb/yr)	Hourly Emissions (lb/hr)[2]
126191	50_Sterilizer_A	Scrubber, G2974	2.04	2.33E-04
	50_Sterilizer_B		2.04	2.33E-04
	50_Sterilizer_C		2.04	2.33E-04
	50_Sterilizer_D		2.04	2.33E-04
	50_Sterilizer_E		2.04	2.33E-04
	50_Sterilizer_F		2.04	2.33E-04
	50_Aeration	Abator, G44886		
	50_Backvent		18.81	2.15E-03
	50_Drybed	Drybeds	18.81	2.15E-03
126197	49_Sterilizer_A	Scrubber, G43812	0.87	9.91E-05
	49_Sterilizer_B		0.87	9.91E-05
	49_Sterilizer_C		0.87	9.91E-05
	49_Sterilizer_D		0.87	9.91E-05
	49_Sterilizer_E		0.87	9.91E-05
	49_Sterilizer_F		0.87	9.91E-05
	49_Sterilizer_G		0.87	9.91E-05
	49_Sterilizer_H		0.87	9.91E-05
	49_Aeration	Abator, G44884		
	49_Backvent		9.29	1.06E-03
	49_Drybed	Drybeds	9.29	1.06E-03
Total			**75.41**	**0.009**

Constants and Conversion Factors:[3]

438,000 lb/year, total EtO usage at Facility ID 126191
120,000 lb/year, total EtO usage at Facility ID 126197
93.36% EtO vented through scrubber
8,760 hours/year
99.985% Scrubber (Facility ID 126191)[4]
99.969% Scrubber (Facility ID 126197)[4]
30,808 scfm, Consolidated Stack at Facility ID 126191
48,000 acfm, Consolidated Stack at Facility ID 126191
15,224 scfm, Consolidated Stack at Facility ID 126197

Abbreviations:

ATIR - Air Toxics Inventory Report
EIM - Emissions Inventory Module
EtO - ethylene oxide

hr - hour
lb - pound
R - Rankine
yr - year

Table A.2. Process Emissions
Sterigenics US, LLC.
Vernon, California

23,720	acfm, Consolidated Stack at Facility ID 126197
44.5	EtO molecular weight
29.92	in Hg, Stack pressure
350	°F, Stack temperature
809.67	°R, Stack temperature
29.92	in Hg, Standard absolute pressure
519.67	°R, Standard temperature at 60°F

Notes:

[1] Total emissions associated with sterlization chambers will be controlled by the scrubber and dry beds. The emissions were calculated based on a mass balance approach using the maximum EtO usage, scrubber control efficiencies from the previous source test results, and a drybed control efficiency of 80%. The total emissions were divided evenly amongst all sterilizers controlled by the scrubber.

[2] At each facility, emissions associated with the aeration rooms and chamber exhaust vents will be routed and controlled by the abator. Indoor air will be captured by the permanent total enclosure (PTE) and controlled by the drybeds. The emissions for the abator and drybeds were calculated based on an effluent concentration of 0.01 ppm ethylene oxide by volume at stack conditions, per the requirement in the SCAQMD Rule 1405 (d)(1)(c)(ii). Available at: https://www.aqmd.gov/docs/default-source/rule-book/reg-xiv/rule-1405.pdf. Accessed: July 2024.

[3] Maximum EtO usages shown are as provided by the facility.

[4] Control efficiencies were obtained from the source tests provided as Attachment C of the modified ATIR.

Table A.3. Point Source Stack Data
Sterigenics US, LLC.
Vernon, California

Facility ID	Stack ID	Stack Location[1]			Stack Parameters[2]				
		X (km)	Y (km)	Release Type	Release Height (ft)	Stack Diameter (ft)	Exhaust Temperature (F)	Exhaust Flow Rate (acfm)	Exit Velocity (ft/min)
126191	50SS	390,066.00	3,762,417.00	Vertical	80.00	4.50	350	48,000	3,018
	50B1	390,097.00	3,762,388.00	Capped	31.75	1.00	430	1,095	1,395
	50B2	390,099.00	3,762,389.00	Capped	32.75	1.00	430	1,095	1,395
126197	49SS	390,070.69	3,762,432.88	Vertical	80.00	3.33	350	23,720	2,718
	49B1	390,032.00	3,762,448.00	Capped	30.17	1.00	430	685	872
	49B2	390,034.00	3,762,447.00	Capped	30.17	1.00	430	685	872

Abbreviations:

cfm - cubic feet per minute
EIM - Emissions Inventory Module
F - degrees Fahrenheit
ft - foot
km - kilometer
min - minute
UTM - Universal Transverse Mercator
WGS - World Geodetic System

Notes:

[1] Coordinates shown are in a projected coordinate system of UTM zone 11N, with a datum based on WGS 1984.

[2] All stack parameters are as provided by the facility.

RAMBØLL

ATTACHMENT B
FORM A

FORM A	SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AB 2588 Program, 21865 COPLEY DR., DIAMOND BAR CA 91765-0949	INVENTORY YEAR 2021

AB 2588 AIR TOXICS DOCUMENT CERTIFICATION & SUBMITTAL FORM

Please check the appropriate boxes for purpose of submittal:

☐ *INITIAL INFORMATION for ATIR*	☐ *EARLY ACTION REDUCTION PLAN (EARP)*	☐ *INITIAL*
☐ *AIR TOXICS INVENTORY REPORT (ATIR)*	☐ *VOLUNTARY RISK REDUCTION PLAN (VRRP)*	☑ *REVISION*
☐ *HEALTH RISK ASSESSMENT (HRA)*	☐ *IMPLEMENTATION PROGRESS REPORT for VRRP/RRP*	☐ *FINAL*
☑ *RISK REDUCTION PLAN (RRP)*	☐ *OTHER:*	

Does your facility participate or wish to participate in VRRP program pursuant to Rule 1402(h)? *YES* ☐ *NO* ☒

Please provide the following information:

Facility name: Sterigenics U.S., LLC

South Coast AQMD ID: 126191, 126197

Facility SIC/NAICS CODE: SIC: 7389 NAICS: 561910

Facility Location Address: 4801-63 E. 50th St. and 4900 S. Gifford Ave.
Vernon, CA 90058

Mailing Address: 2015 Spring Road, Suite 650
Oak Brook, IL 60523

Contact Person (Company Official)

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Preparer (if different from above)

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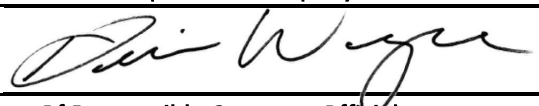
Telephone: 213-943-6342 **eMail:** ystutz@ramboll.com

FAILURE TO SUBMIT REQUIRED INFORMATION OR KNOWINGLY SUPPLYING FALSE INFORMATION IS PUNISHABLE TO THE EXTENT DEFINED IN HEALTH AND SAFETY CODE SECTIONS 44381(a) AND 44381(b), WHICH INCLUDES MINIMUM FINES OF NOT LESS THAN FIVE HUNDRED DOLLARS.

Signature Of Responsible Company Official



Date: 12-JUL-2024

Name Of Responsible Company Official: Kevin Wagner

Title: Vice President, EH&S