State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

Stationary Source Permitting Program
4244 International Parkway, Suite 120
Atlanta, Georgia 30354
404/363-7000
Fax: 404/363-7100

RECEIVED

SIP AIR PERMIT APPLICATION

EPD Use Only

Date Received: SEP 25 2019 Air Protection Branch

Application No. 27244

FORM 1.00: GENERAL INFORMATION

1. Facility Information

Facility Name: Sterilization Services of Georgia

AIRS No. (if known): 04-13- 121 - 00010

Facility Location: Street: 6005 Boat Rock Boulevard

City: Atlanta Georgia Zip: 30336 County: Fulton

Is this facility a "small business" as defined in the instructions? Yes: ☒ No: ☐

2. Facility Coordinates

Latitude: 33° 43' 33" **NORTH** Longitude: 84° 35' 02" **WEST**

UTM Coordinates: _____ **EAST** _____ **NORTH** **ZONE** _____

3. Facility Owner

Name of Owner: _____

Owner Address Street: _____

City: _____ State: _____ Zip: _____

4. Permitting Contact and Mailing Address

Contact Person: Eric Welch Title: Plant Manager

Telephone No.: 404-344-8423 Ext. _____ Fax No.: 404-344-8665

Email Address: ewelch@sterilization-services.com

Mailing Address: Same as: Facility Location: ☒ Owner Address: ☐ Other: ☐

If Other: Street Address: _____

City: _____ State: _____ Zip: _____

5. Authorized Official

Name: Timothy David Connor Title: General Manager

Address of Official Street: 5635 Eastport Boulevard

City: Richmond State: VA Zip: 23231

This application is submitted in accordance with the provisions of the Georgia Rules for Air Quality Control and, to the best of my knowledge, is complete and correct.

Signature: _____ Date: September 27, 2019

6. **Reason for Application: (Check all that apply)**

☐ New Facility (to be constructed)

☒ Existing Facility (initial or modification application)

☒ Permit to Construct

☒ Permit to Operate

☐ Change of Location

☒ Permit to Modify Existing Equipment: Affected Permit No.: 3841-121-0010-s-02-0 & 3841-121-0010-s-02-1

☐ Revision of Data Submitted in an Earlier Application

Application No.: _____

Date of Original Submittal: _____

7. **Permitting Exemption Activities (for permitted facilities only):**

Have any exempt modifications based on emission level per Georgia Rule 391-3-1-.03(6)(i)(3) been performed at the facility that have not been previously incorporated in a permit?

☒ **No** ☐ **Yes, please fill out the SIP Exemption Attachment** (See Instructions for the attachment download)

8. **Has assistance been provided to you for any part of this application?**

☒ **No** ☐ **Yes, SBAP** ☐ **Yes, a consultant has been employed or will be employed.**

If yes, please provide the following information:

Name of Consulting Company: _____

Name of Contact: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

Mailing Address: Street: _____

City: _____ State: _____ Zip: _____

Describe the Consultant's Involvement:

9. **Submitted Application Forms:** Select only the necessary forms for the facility application that will be submitted.

No. of Forms	Form
	2.00 Emission Unit List
	2.01 Boilers and Fuel Burning Equipment
	2.02 Storage Tank Physical Data
	2.03 Printing Operations
	2.04 Surface Coating Operations
	2.05 Waste Incinerators (solid/liquid waste destruction)
	2.06 Manufacturing and Operational Data
	3.00 Air Pollution Control Devices (APCD)
	3.01 Scrubbers
	3.02 Baghouses & Other Filter Collectors
	3.03 Electrostatic Precipitators
	4.00 Emissions Data
	5.00 Monitoring Information
	6.00 Fugitive Emission Sources
	7.00 Air Modeling Information

10. **Construction or Modification Date**

Estimated Start Date: _____

11. **If confidential information is being submitted in this application, were the guidelines followed in the "Procedures for Requesting that Submitted Information be treated as Confidential"?**

☐ No ☐ Yes

12. **New Facility Emissions Summary**

Criteria Pollutant	New Facility	
	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)		
Nitrogen oxides (NOx)		
Particulate Matter (PM) (filterable only)		
PM <10 microns (PM10)		
PM <2.5 microns (PM2.5)		
Sulfur dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Greenhouse Gases (GHGs) (in CO2e)		
Total Hazardous Air Pollutants (HAPs)		
Individual HAPs Listed Below:		

13. **Existing Facility Emissions Summary**

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)				
Nitrogen oxides (NOx)				
Particulate Matter (PM) (filterable only)				
PM <10 microns (PM10)				
PM <2.5 microns (PM2.5)				
Sulfur dioxide (SO_2)				
Volatile Organic Compounds (VOC)				
Greenhouse Gases (GHGs) (in CO2e)				
Total Hazardous Air Pollutants (HAPs)				
Individual HAPs Listed Below:				

14. 4-Digit Facility Identification Code:

SIC Code: 3559 SIC Description: Special Industry Machinery, Not Elsewhere Classified

NAICS Code: 561910 NAICS Description: Packaging and Labeling Services

15. Description of general production process and operation for which a permit is being requested. If necessary, attach additional sheets to give an adequate description. Include layout drawings, as necessary, to describe each process. References should be made to source codes used in the application.

Gas Sterilization Facility using Ethylene Oxide

Products to be sterilized are placed in vacuum chambers. The air in the chamber is then evacuated. Ethylene Oxide (EO) is introduced into the chamber as the sterilant to surround and penetrate the product being sterilized. When the sterilization process is completed the used EO is evacuated from the chamber to a scrubber. The product is then removed from the chamber and placed in aeration rooms for further outgassing of EO. When the product is removed from the chamber a back vent removes the remaining, very small amount of EO which previously had been vented to the atmosphere.

The purpose of this permit application is to add pollution abatement (dry bed reactors) to the chamber back vents.

See Attachment A - Ethylene Oxide Gas Sterilization Process Description

16. Additional information provided in attachments as listed below:

Attachment A - Ethylene Oxide Gas Sterilization Process Description

Attachment B - Process Block Diagram

Attachment C -

Attachment D -

Attachment E -

Attachment F -

17. Additional Information: Unless previously submitted, include the following two items:

☐ Plot plan/map of facility location or date of previous submittal:

☐ Flow Diagram or date of previous submittal:

18. Other Environmental Permitting Needs:

Will this facility/modification trigger the need for environmental permits/approvals (other than air) such as Hazardous Waste Generation, Solid Waste Handling, Water withdrawal, water discharge, SWPPP, mining, landfill, etc.?

☒ **No** ☐ **Yes, please list below:**

19. List requested permit limits including synthetic minor (SM) limits.

20. Effective March 1, 2019, permit application fees will be assessed. The fee amount varies based on type of permit application. Application acknowledgement emails will be sent to the current registered fee contact in the GECO system. If fee contacts have changed, please list that below:

Fee Contact name:

Fee Contact email address:

Fee Contact phone number:

Fee invoices will be created through the GECO system shortly after the application is received. It is the applicant's responsibility to access the facility GECO account, generate the fee invoice, and submit payment within 10 days after notification.

Facility Name: Sterilization Services of Georgia **Date of Application:** September 27, 2019

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
DB1	Dry Scrubber	Advanced Air Technologies DR490A Safe-Cell II	Dry bed reactor to eliminate Ethylene Oxide
DB2	Dry Scrubber	Advanced Air Technologies DR490A Safe-Cell II	Dry bed reactor to eliminate Ethylene Oxide
DB3	Dry Scrubber	Advanced Air Technologies DR490A Safe-Cell II	Dry bed reactor to eliminate Ethylene Oxide
DB4	Dry Scrubber	Advanced Air Technologies DR490A Safe-Cell II	Dry bed reactor to eliminate Ethylene Oxide

Facility Name: Sterilization Services of Georgia **Date of Application:** September 27, 2019

Form 3.00 – AIR POLLUTION CONTROL DEVICES - PART A: GENERAL EQUIPMENT INFORMATION

APCD Unit ID	Emission Unit ID	APCD Type (Baghouse, ESP, Scrubber etc)	Date Installed	Make & Model Number (Attach Mfg. Specifications & Literature)	Unit Modified from Mfg Specifications?	Gas Temp. °F		Inlet Gas Flow Rate (acfm)
						Inlet	Outlet	
CH1-CH3	DB1	Dry Scrubber	Dec 19	AAT Safe-Cell II DR490A	No	t.b.d.	t.b.d.	t.b.d.
CH1-CH3	DB2	Dry Scrubber	Dec 19	AAT Safe-Cell II DR490A	No	t.b.d.	t.b.d.	t.b.d.
CH1-CH3	DB3	Dry Scrubber	Dec 19	AAT Safe-Cell II DR490A	No	t.b.d.	t.b.d.	t.b.d.
CH1-CH3	DB4	Dry Scrubber	Dec 19	AAT Safe-Cell II DR490A	No	t.b.d.	t.b.d.	t.b.d.

Facility Name: Sterilization Services of Georgia **Date of Application:** September 27, 2019

Form 3.00 – AIR POLLUTION CONTROL DEVICES – PART B: EMISSION INFORMATION

APCD Unit ID	Pollutants Controlled	Percent Control Efficiency		Inlet Stream To APCD		Exit Stream From APCD		Pressure Drop Across Unit (Inches of water)
		Design	Actual	lb/hr	Method of Determination	lb/hr	Method of Determination	
CH1-CH3	Ethylene Oxide	99	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.

Attachment A

Ethylene Oxide Gas Sterilization Process Description

The gas sterilization process introduces Ethylene Oxide (EtO) gas, under vacuum, into a sealed chamber that contains packaged products to be sterilized. The products are typically pre-humidified, generally at elevated temperatures, prior to the introduction of EtO into the evacuated chamber. The products to be sterilized are typically enclosed in packaging and are exposed to the EtO for controlled periods of time that are known to destroy any biological contaminants that may have become part of the product or product packaging. A graphical depiction indicating the flow of EtO in a typical gas sterilization process is shown below in Figure 1. Arrows indicate the flow or movement of EtO through the process. The numbers refer to the descriptive content on the following pages.

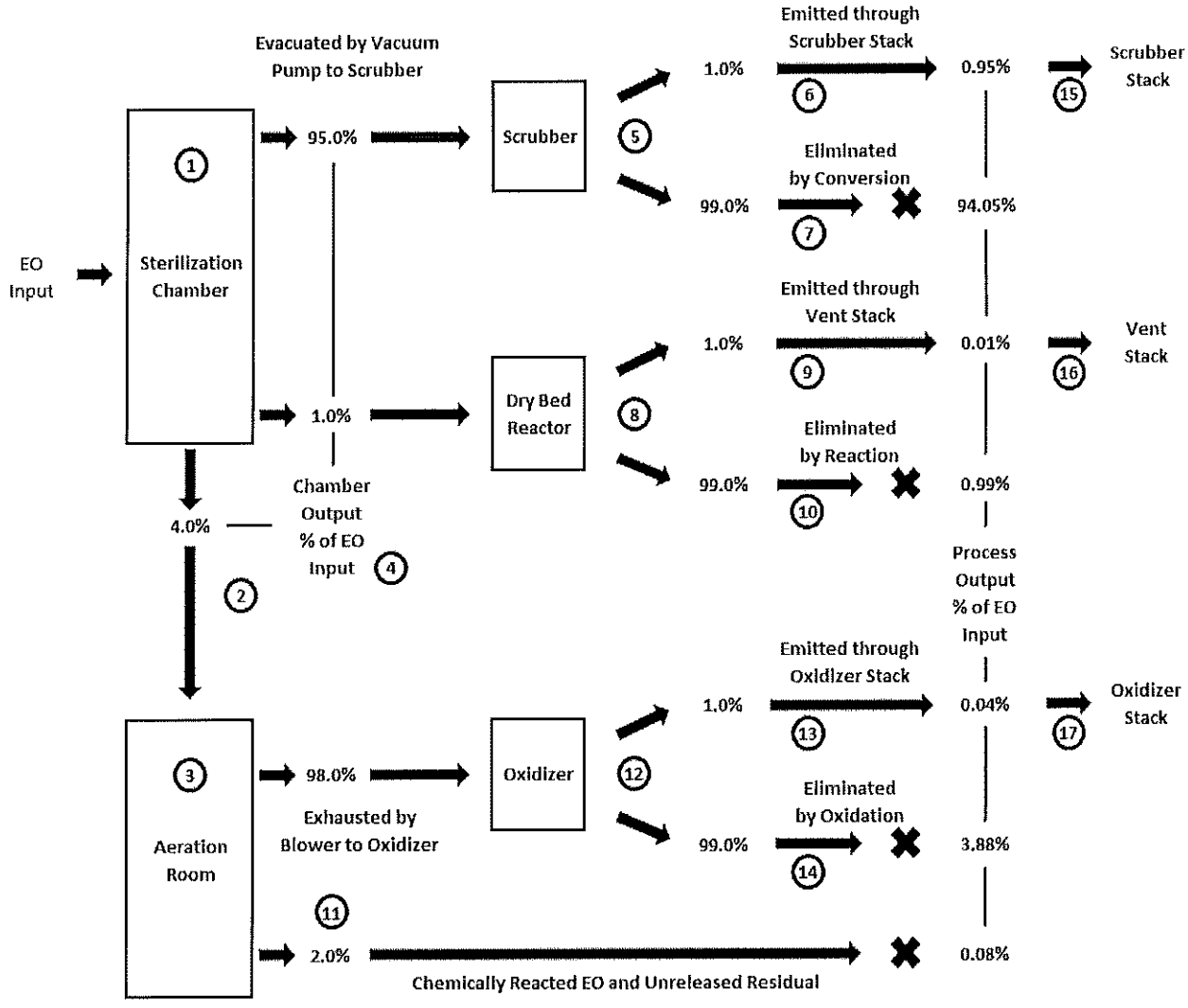

Figure 1 –Ethylene Oxide Gas Sterilization Process

EtO Sterilization

1. Product to be sterilized is loaded into the sterilization chamber. The chamber is evacuated and EtO is introduced into the chamber. Some of the EtO is absorbed by the product or packaging. Most of the EtO is continuously recirculated in the chamber open space. By the end of the sterilization process most of the EtO is evacuated from the chamber.
2. After the sterilization process is completed, product is removed from the sterilization chamber and transported to aeration rooms.
3. In the aeration room, air is continuously recirculated around the product as it continues to outgas absorbed EtO.
4. Studies and experience show that typically no more than 4% of the EtO used is carried with the sterilized product into the aeration room. Typically, at least 95% of the EtO used is evacuated from the chamber to a scrubber during the sterilization process. The rest of the EtO used, typically no more than 1%, remains in the chamber and is vented to atmosphere through a dry bed reactor.

EtO Scrubbing

5. Ethylene Oxide gas that is evacuated from the chamber is sent to a liquid scrubber. The scrubber mixes the EtO with an acid/water solution. This converts EtO gas to liquid Ethylene Glycol. The scrubbing process is designed to be at least 99% efficient in converting the EtO gas to Ethylene Glycol.
6. No more than 1% of the EtO gas processed by the scrubber is emitted to the atmosphere through the scrubber stack.
7. At least 99% of the EtO gas processed by the scrubber is eliminated through conversion to Ethylene Glycol.

EtO Ventilation

8. The relatively small amount of EtO left in the chamber after sterilization, already stated as typically not more than 1%, is sent to a dry bed reactor.
9. No more than 1% of the EtO processed by the dry bed reactor is emitted to the atmosphere through the vent stack.
10. At least 99% of the EtO gas processed by the dry bed reactor is eliminated through reaction with reactant converting the gas to a disposable polymer.

EtO Oxidation

11. Product outgassing of EtO continues in the aeration room. Air is continuously recirculated around the sterilized product. A portion of the recirculating air containing outgassed EtO is continuously removed from the aeration room by exhaust blowers. Studies and experience suggest that about 98% of the residual EtO carried in the product and packaging is released during the aeration process and sent to a thermal oxidizer. Typically, this results in less than 2% remains in the sterilized product as chemically reacted or unreleased residual EtO.

Thermal Oxidation

12. Ethylene oxide gas that is exhausted from the aeration room is sent to a thermal oxidizer. The thermal oxidizer is designed to be at least 99% efficient in eliminating EtO gas through combustion.
13. No more than 1% of the EtO gas processed by the oxidizer is emitted to the atmosphere through the oxidizer stack.
14. At least 99% of the EtO gas processed by the oxidizer is eliminated through the oxidation process.

EtO Emissions

15. Typically, about 0.95% of the EtO used by the process is emitted through the Scrubber Stack. This is calculated as no more than 1% (after scrubbing) of 95% (after sterilizing) of the EtO used in the sterilization process.
16. Typically, about 0.01% of the EtO used by the process is emitted through the Vent Stack. This is calculated as no more than 1% (after reaction) of 1% (post sterilization) of the EtO gas used in the sterilizing process.
17. Typically, about 0.04% of the EtO used by the process is emitted through the Oxidizer Stack. This is calculated as no more than 1% (after oxidizing) of 98% (after aeration) of 4% (after sterilization) of the EtO used in the sterilization process.

Attachment B
Process Block Diagram