

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date: Draft – September 9, 2020

Region: Asheville Regional Office
County: Burke
NC Facility ID: 1200205
Inspector's Name: Michael Koerschner
Date of Last Inspection: 07/31/2019 Visit Report
Compliance Code: Operating, permit status pending

<p align="center">Facility Data</p> <p>Applicant (Facility's Name): Kleen Tech, Inc.</p> <p>Facility Address: Kleen Tech, Inc. 690 Lovelady Road Valdese, NC 28690</p> <p>SIC: 7218 / Industrial Launderers NAICS: 812332 / Industrial Launderers</p> <p>Facility Classification: Before: Permit Exempt After: Title V Fee Classification: Before: N/A After: Title V</p>				<p align="center">Permit Applicability (this application only)</p> <p>SIP: 15A NCAC 02D .0503, 02D .0515, 02D .0516, 02D .0521, and 02D .1806; 02D .0535, 02D .0540; 02Q .0207, 02Q .0304, and 02Q .0504 NSPS: N/A NESHAP: N/A PSD: N/A PSD Avoidance: 15A NCAC 02Q.0317 for 02D .0530 (VOC) and .1112 (HAP) NC Toxics: 15A NCAC 02D .1100 and 02Q .0711 112(r): N/A Other:</p> <p>Note: This facility will have one year from the issuance date of this "R" permit to file for a Title V permit.</p>																			
<p align="center">Contact Data</p> <table border="1"> <tr> <td> <p align="center">Facility Contact</p> <p>Sean Dotson General Manager Valdese (828) 962-8127 P.O. Box 1369 Hickory, NC 28603</p> </td> <td> <p align="center">Authorized Contact</p> <p>Tim Glenn President (828) 781-0488 P.O. Box 1369 Hickory, NC 28603</p> </td> <td> <p align="center">Technical Contact</p> <p>Sean Dotson General Manager Valdese (828) 962-8127 P.O. Box 1369 Hickory, NC 28603</p> </td> </tr> </table>				<p align="center">Facility Contact</p> <p>Sean Dotson General Manager Valdese (828) 962-8127 P.O. Box 1369 Hickory, NC 28603</p>	<p align="center">Authorized Contact</p> <p>Tim Glenn President (828) 781-0488 P.O. Box 1369 Hickory, NC 28603</p>	<p align="center">Technical Contact</p> <p>Sean Dotson General Manager Valdese (828) 962-8127 P.O. Box 1369 Hickory, NC 28603</p>	<p align="center">Application Data</p> <p>Application Number: 1200205.20A Date Received: 01/10/2020 Application Type: Greenfield Facility Application Schedule: State Existing Permit Data Existing Permit Number: N/A Existing Permit Issue Date: N/A Existing Permit Expiration Date: N/A</p>																
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<p>Total Actual emissions in TONS/YEAR:</p> <table border="1"> <tr> <td>CY</td> <td>SO2</td> <td>NOX</td> <td>VOC</td> <td>CO</td> <td>PM10</td> <td>Total HAP</td> <td>Largest HAP</td> </tr> <tr> <td colspan="8"><No Inventory></td> </tr> </table>								CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP	<No Inventory>							
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<No Inventory>																							
<p>Review Engineer: Judy Lee</p> <p>Review Engineer's Signature: _____ Date: _____</p>					<p align="center">Comments / Recommendations:</p> <p>Issue: 10647/R00 Permit Issue Date: XXXX, 2020 Permit Expiration Date: XXXX, 2028</p>																		

1. Purpose of Application

Kleen Tech, Inc. (referred to as Kleen Tech throughout this document) is a Greenfield facility and will hold Air Permit No. 10647R00 with an expiration date of XXXX, 2028 for an industrial laundering facility in Valdese, Burke County, North Carolina. Kleen Tech launders soiled shop towels, print towels, furniture towels, gloves and Reuseable Absorbent System Mats (RAS), as well as provides bleach/dye services for customers. Kleen Tech uses an all wet water (non-solvent) laundry process.

Kleen Tech is a locally owned industrial and hospitality laundry that was founded on the premises of providing unique, quality products and services, as well as specialized laundry service for facilities and businesses throughout the southeastern region of the United States from Maine to Florida with its own delivery fleet. The company was founded in 1991. The facility built the Valdese plant in 2013, partly with economic incentives from the Town of Valdese to bring local jobs to the community and to revitalize the Town's former wastewater treatment plant. The facility currently employs 65 individuals from Valdese and the surrounding communities.

Permit application No. 1200205.19A was received in the Division of Air Quality (DAQ) Asheville Regional Office (ARO) on October 18, 2019 for a new Synthetic Minor permit. It was later determined that the facility's emission estimates of regulated air pollutants (i.e., particulate matter (PM), sulfur dioxide (SO₂), nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon monoxide (CO), hazardous air pollutants (HAPs), and toxic air pollutants (TAPs)) exceed Title V threshold values for potential to emit (PTE) of VOC and HAP emissions; hence, a Title V Air permit was necessary.

On January 10, 2020 permit application No. 1200205.20A was received in ARO and subsequently in the Raleigh Central Office (RCO) for a State/Greenfield Title V facility. The application was deemed incomplete for processing and an additional information request was sent to the facility on February 11, 2020.

Kleen Tech does not currently have an Air Quality Permit in accordance with 15A North Carolina Administrative Code (NCAC) 02Q .0501(b) and 40 CFR Part 70. This application for a State/Greenfield Title V permit will bring the facility into compliance with the requirement to obtain a Title V Air Quality Permit (in accordance with 15A NCAC 02Q .0504) within one year of the issuance of this permit. The permit will go through a 30-day public notice and 45 day EPA review period at that time.

SIC: 7218 — Industrial Launderers

Industrial launderers are establishments that are primarily engaged in supplying laundered or dry-cleaned industrial work uniforms and related work clothing, such as protective apparel (flame and heat resistant) and clean room apparel; laundered mats and rugs; dust control items, such as treated mops, rugs, mats, dust tool covers, and cloths; laundered wiping towels; and other selected items to industrial, commercial, and government users. These items may belong to the industrial launderer and be supplied to users on a rental basis, or they may be the customers' own goods. Establishments included in this industry may or may not operate their own laundry or dry-cleaning facilities.

NAICS: 812332 — Industrial Launderers

This U.S. industry comprises establishments primarily engaged in supplying, on a rental or contract basis, laundered industrial work uniforms and related work clothing, such as protective apparel (flame and heat resistant) and clean room apparel; dust control items, such as treated mops, rugs, mats, dust tool covers, cloths, and shop or wiping towels.

2. History/Background/Application Chronology

Please see the attached Comprehensive Application Report for 1200205.19A and 20A; and email correspondence for more details.

April 30, 2019 – Brendan Davey, ARO Regional Supervisor, letter to Timothy Glenn, President, Kleen Tech, Inc. requesting air emissions estimates of all regulated air pollutants from industrial laundering and wastewater treatment operations at Kleen Tech based on recent information regarding updated emission estimates from laundering of industrial rags/wipes.

July 15, 2019 – Kleen Tech submitted air emission estimates which indicates that the emission rate of volatile organic compounds exceeded NC air permitting thresholds.

July 31, 2019 – Michael Koerschner, ARO met with Doug Punch, Plant Manager, to better understand the operations at Kleen Tech (refer to Section 3 below).

August 12, 2019 – Air permit applicability determination request for additional information letter was sent to Mr. Glenn, President, Kleen Tech indicating that the facility is required to apply for and maintain an Air Permit. Additional information was requested regarding the emission estimates and rationale for VOC emissions from the washers and the wastewater treatment plant operations.

October 16, 2019 – Air Toxics Screening Evaluation was received in ARO for Kleen Tech, Inc.

October 16, 2019 - Application 1200205.19A was received in ARO for a new permit/ registration (Synthetic Minor) air permit.

October 21, 2019 – Acknowledgement letter sent.

November 25, 2019 – Air toxics modeling analysis Memorandum to Mr. Koerschner, ARO from Mark Yoder, AQAB indicating the modeling adequately demonstrates compliance on a source-by-source basis for xylene.

December 16, 2019 – Email correspondence between DAQ (ARO and RCO staff) and Kleen Tech (facility, consultant and attorney) regarding the transition from Synthetic Minor to a Title V Air Permit application.

January 10, 2020 – DAQ received a written request from Kleen Tech to process the air permit application as a Title V application. Application No. 1200205.20A was received in the ARO for a Greenfield Title V facility and forwarded to RCO for processing. The application was deemed incomplete for processing (i.e., appropriate application fee, zoning, etc.).

January 24, 2020 – A Notice of Violation/Permitting Requirements/Notice of Recommendation for Enforcement (NOV/NRE) was sent to Kleen Tech from ARO citing violations of North Carolina General Statute (NCGS) 143-215.108 and 15A North Carolina Administrative Code (NCAC) 02Q .0501.

February 11, 2020 – A completeness additional information request was sent to Kleen Tech from RCO.

February 24, 2020 – A written response to the NOV/NRE was received in ARO from Kleen Tech.

March 12, 2020 – Completeness additional information response received from Kleen Tech's consultant, Jennifer Garvon, Civil & Environmental Consultants, Inc., via email.

April 1, 2020 – Technical additional information sent to Kleen Tech via email from RCO.

April 29, 2020 – Request for Additional Information from ARO to determine past Title V permit fees avoided by not applying for and maintaining a Title V permit.

May 8, 2020 – Technical additional information response received from Kleen Tech via email (RCO).

May 14, 2020 – Telephone call with Kleen Tech’s consultant, Ms. Garvon and this review engineer regarding the additional information response. A follow-up email was sent to Ms. Garvon with example forms and other supporting documentation necessary to process the application.

May 26, 2020 – Retroactive Invoice for Annual Permit Fees for Calendar Years 2017 through 2019 sent to Kleen Tech from ARO.

May 28, 2020 – Supplemental information (i.e., revised emissions and spreadsheet, completed Forms, etc.) received from Kleen Tech’s consultant via email (RCO).

July 2, 2020 – Kleen Tech paid retroactive invoice amount in full for Calendar Years 2017 through 2019.

July 14, 2020 – A first draft of the permit and review was sent to Booker Pullen, Supervisor and comments were received on July 24, 2020.

July 24, 2020 – A first draft of the permit and review was sent to Mr. Koerschner, ARO and Samir Parekh, SSCB.

July 30, 2020 – Mr. Parekh, SSCB indicated that SSCB has no comments.

August 11, 2020 – Kleen Tech was assessed a civil penalty by DAQ as a result of the NOV/NRE for one violation of NCGS 143-215.108 and one violation of 15A NCAC 02Q .0501.

August 12, 2020 – Mr. Koerschner, ARO submitted comments.

August 18, 2020 – A first draft of the permit was sent to facility representatives requesting comments within one week, due to the permit going through a 30 day public notice period.

August 12, 2020 – Kleen Tech’s consultant requested a week extension in providing comments prior to the public notice period. The Division granted the extension.

August 31, 2020 – Comments on the draft permit were received from Kleen Tech via email from Ms. Garvon through the RO of record, Mr. Glenn.

September 4, 2020 – DAQ provided the facility with a response to their comments prior to finalizing the draft to submit for public notice.

3. Facility Description

Excerpt from Kleen Tech’s website:

Kleen Tech provides textile processing for recyclable products for various industries. We provide special finishing for products before they are sold to the end user. These products include gloves, print shop towels, shop towels and RAS. The Company uses an all wet water process. All the wastewater is fully treated through a Dissolved Air Flotation (DAF) type treatment system. The

final process is a 4-day aeration in a Biomass Oxidation Basin. The water is then discharged to the town water treatment plant.

Cleaning Process

Kleen Tech provides industry with an environmentally safe solution for cleaning print towels, furniture wipers and other textile products utilizing a Wet Water Process. The Company processes the product by classification, as identified by the customer. All products are water washed in specially designed industrial washing machines, using non-hazardous cleaning chemicals. Towels are hand folded or bagged in bulk and then packed into lined containers for delivery to the customer. We operate our plants in a manner that protects the environment and the health of our community.

Waste Process

Waste from the water treatment plant is dry caked in a filter press operation. All waste is a non-hazardous product from the treatment plant and is disposed of as special industrial waste in an Industrial Permitted Landfill.

Inspection & Testing

Our operation facilities are inspected by permitted authorities twice per year. Our facilities take daily tests for jar testing and proper treatment. We work with a third party for quarterly testing to ensure that we maintain full Compliance Regulations. We maintain and provide documented proof of local and State compliance.

These steps and associated equipment as presented in the permit application are described in detail below (Refer to Sections 4 and 7).

✓ Facility name/address/legal name/responsible official check:

IBEAM compared with application submittal:

Legal Corporate/Owner Name per application (Form A) is: Kleen-Tech, Inc.

Site Name per application (Form A) is: Kleen-Tech Valdese

Site Name per IBEAM is: Originally entered as Kleen-Tech, Inc.

Site Address per application is: 690 Lovelady Lane, Valdese, N.C. 28690, Burke County

Site Address per IBEAM is: 690 Lovelady Road, Valdese, N.C. 28690, Burke County

Responsible Official (RO) on file:

Mr. Tim Glenn, President

Email correspondence with Ms. Garvon, through the RO (Mr. Glenn) dated August 13, 2020 confirms the site address as:

690 Lovelady Road, Valdese, N.C. 28690, Burke County

NC Secretary of State website:

https://www.sosnc.gov/online_services/search/Business_Registration_Results

Legal Name
Kleen-tech, Inc.

Per comment received from the facility's consultant, Ms. Garvon, on their draft permit sent via email on August 31, 2020 through the RO (Mr. Glenn) of record, "Kleen-tech, Inc." was revised to "Kleen Tech, Inc." in the permit and throughout this review.

IBEAM was modified accordingly.

4. Process Description

The following section contains information from the facility visit report prepared by Mr. Koerschner when he met with the Plant Manager, Mr. Dough Punch.

Facility Description

This facility is an industrial laundry. Industrial laundry including (but not limited to) soiled rags, shop towels, gloves, mops, and adsorbent pads are collected by route drivers (currently employ 7 drivers) in tractor-trailers and brought to this site for laundering. The trucks bringing in the materials to be laundered are under Kleen Tech's control and the drivers are Kleen Tech employees and drive set pickup "routes." All incoming material arrives in sealed totes or drums. The facility receives material from other industrial launderers (Cintas, Aramark, Unifirst, and others). The soiled materials are put in bags, weighed, loaded into washers, washed, transferred to dryers, dried, then go back out as "clean."

There are six "large" washers (800, 800, 450, 450, 450, and 450 lb capacities) and two "small" washers (100 and 60 lb capacities). From the washers, the washed materials are transferred to one of six dryers. There are four large natural gas-fired dryers (450, 450, 400, and 400 lb capacities) and two smaller steam-heated dryers (100 lb capacity, each).

The washers and dryers are all located **inside** the facility (all under one roof). The building has three roof monitors which run year-round during operations to ventilate the building. I asked Mr. Punch about odors and he stated that sometimes in the winter when they are starting up (in the mornings) there is a "sour" smell (like dirty laundry) but that dissipates.

In general, for the first ~5 wash "cycles," the washers are fed water which has been heated to ~130-135 degrees Fahrenheit. For each of these ~5 wash "cycles," the water is steam-heated – with saturated steam – to a set point of ~170 degrees Fahrenheit. The remaining ~3 "cycles" are rinses using normal water (tap water estimate 60 degrees F) NOT heated with steam. All of the water sewered from the facility flows to a bar screen (where lint/non soluble large material) is collected. The water flows to a level-controlled grinder/agitator tank that is just outside the facility. The tank is on level control and it pumps the water through a shaker screen (to further filter out non-solubles) and then through a heat exchanger – then to a pH treatment tank.

The heat exchanger, shaker screen and pH treatment tank are located within the building. In the pH treatment tank, the pH is adjusted to 10.0 pH using addition of 93% Sulfuric Acid. From the treatment tank the water is pumped to a large holding tank (EQ tank; 186,000 gallons) approximately 75 yards away at the old Valdese municipal WTP – which has been converted by Kleen Tech to an Activated Sludge wastewater treatment plant. The old Valdese municipal WTP is NOT on Kleen Tech's property but is leased (along with the two "clarifiers/aeration basins" to Kleen Tech by the city of Valdese. From the 186,000 gallon tank the wastewater treatment process begins (per Mr. Punch) with Dissolved Air Flotation (DAF) → settling tank → Post treatment aeration → Final DAF polishing. Solids from the

process are pressed in a continuous belt press and then landfilled. The Kleen Tech WTP (land owned by the city of Valdese) was drastically improved by Kleen Tech when they began operations here.

The dryers have different programs but generally heat each laundered load to 300-320 degrees Fahrenheit. Each of the dryers has an individual stack. The larger dryers have cyclone-like lint traps with filters which are routinely cleaned out.

One natural gas-fired boiler provides steam for process heat. The boiler is rated at ~3.4 million Btu/hour (maximum natural gas firing of 3,360 cubic feet/hour). It appears that the steam pressure at the facility is 50 psig (analog gauge at boiler). This boiler was replaced with the 200 HP Cleaver Brooks boiler (listed below) in January 2020 per Mr. Koerschner's telephone conversation with Mr. Punch on August 11, 2020.

This facility currently operates four days per week (Monday - Thursday) with limited production on Fridays (36-40) hours per week.

Per the May 8, 2020 application submittal, some of the information provided to Mr. Koerschner, ARO, from plant personnel during the plant visit was erroneous. Mr. Glenn, owner of Kleen Tech provided an updated equipment inventory that has been incorporated into this review under the sections that follow (refer to Form A2 under Section 5 and Table 1 under Section 7).

5. Permit Modifications/Changes and TVEE Discussion

The following table summarizes changes to the Kleen Tech, Inc., Valdese, NC, Air Permit No. 10647R00:

Page No.	Section	Description of Changes
N/A	N/A	Greenfield facility, all sources are new. See Section 1 above.

All sources and/or control devices will be entered in the Emission Source Module (ESM) under this permit modification.

Proposed Equipment Changes

Per the application for this permit modification, the following list of emission sources was requested (see Form A2 and Attachments for more details):

Equipment to be ADDED

FORMs A2, A3
EMISSION SOURCE LISTING FOR THIS APPLICATION - A2
112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate A2

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted			
EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
ES-001A	Four Each Brim Model 6644 Washers (400 lb)	N/A	N/A
ES-001B	Two Each Jenson Model 415 Washers (400-500 lb)	N/A	N/A
ES-001C	One Tairwoei Model TCW30 Washer (30 lb)	N/A	N/A
ES-001D	One Tairwoei Model T2W-70 Washer (70 lb)	N/A	N/A
ES-002A	Two Each CLM Model 264GP NG Dryers (2.7 MMBtu/hr)	N/A	N/A
ES-002B	Two Each Challenge Model CPG4 NG Dryers (2.75 MMBtu/hr)	N/A	N/A
ES-002C	One Tairwoei Model JYDR70 Steam-Heated Dryer (70 lb)	N/A	N/A
ES-002D	One Tairwoei Model JTDR100 Steam-Heated Dryer (100 lb)	N/A	N/A
ES-003	Wastewater Treatment Plant	N/A	N/A
IES-001	8.0 MMBtu/hr Cleaver Brooks NG Boiler	N/A	N/A
Existing Permitted Equipment To Be MODIFIED By This Application			
N/A			

Equipment to be MODIFIED – N/A

Equipment to be REMOVED – N/A

Title V Equipment Editor (TVEE) was approved on XXXXX. See Permit Modification Tracking slip for confirmation.

6. Statement of Compliance

There have been no inspections since Kleen Tech is a new Greenfield facility. A site visit was conducted on July 31, 2019 by ARO as discussed under Section 4 above.

Responsible Official Certification - The original application did not contain a Form E5. However, the application submittal received on May 8, 2020 contained a Form E5 signed by Mr. Glenn, President of Kleen Tech (RO of record) on May 8, 2020.

The facility is not currently in compliance because they are operating without an air permit. However, it is expected, compliance will be achieved with the issuance of this State Title V permit.

7. Facility Emissions Review

Data available to date for industrial launderers indicates expected emissions from the laundering process include PM, VOC, HAP and TAP from handling/sorting, washing, drying and wastewater treatment (where applicable). In addition, combustion emissions from the facility's dryers, steam tunnels and/or boilers (where applicable). VOC and HAP are the primary pollutants of concern with regards to applicability of Title V and/or New Source Review (NSR) requirements.

Kleen Tech generates air emissions from three primary activities:

- Laundering process (consisting of sorting, handling, washing and drying of soiled textiles)
- Natural gas combustion (dryers and boiler)
- Wastewater treatment plant

The application submittal indicates that the facility launders three categories of soiled materials: shop towels, print towels and furniture towels. Print towels typically have the highest VOC content of materials laundered (based on industry data reviewed to date, on average print towels are 5 times that of shop towels). Kleen Tech originally based their PTE on processing 100% print towels (worse-case) and limited hours of 6,552 annually due to wash cycles and drying times. Their application further broke down total throughput by the type of towels laundered (i.e., print/furniture towels and shop towels) based on CY2018 customer invoices under the maximum operating scenario of 19,200 pounds of product per day as presented in Table 5 – Facility-wide Emissions Summary of the original application and carried through to the application supplement received on May 28, 2020 as shown below:

Potential Throughput		
	% of total	lb/yr
Total Throughput*	100.0%	5,990,400
Print / Furniture Towels	98.7%	5,910,168
Shop Towels	1.3%	80,232

*Potential Throughput (lbs laundry per year) = washing machine maximum load (lbs laundry per day) x 312 days/yr

Operational restrictions as presented in their original application submittal received by DAQ on January 1, 2020, Section 3.3.1 Operational Limits – Kleen Tech has three operational factors that limit the maximum throughput of towels that can be laundered at the facility:

- Washing machine capacity and cycle time – due to required maintenance, the washing machines can only operate a maximum of twenty-one (21) hours per day
- The facility is restricted by the Town of Valdeese to 200,000 gallons of water per day
- The wastewater treatment plant (WWTP) is rated at 200 gallons per minute (maximum capacity of 288,000 gal/day) – due to required maintenance, the WWTP can only operate a maximum of six days per week (312 days per year)

Potential Operating Hours		
	24	hrs/day
<i>Less required maintenance</i>	3	hrs/day
	21	operating hours/day
	7	days/wk
<i>Less required WWTP maintenance</i>	24	hrs/week
	6	days/week
	52	wk/yr
	312	days/yr
Requested Limit (Potential)	6,552	hrs/yr

Pursuant to 15A NCAC 02Q .0103 Definitions (28) “Potential emissions” means the rate of emissions of any air pollutant that would occur at the facility's maximum capacity to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a facility to emit an air pollutant shall be treated as a part of its design if the limitation is federally enforceable. Such physical or operational limitations shall include air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed. Potential emissions shall include fugitive emissions as specified in the definition of major source in 40 CFR 70.2. Hence, the applicant’s PTE after limitations will be based on 6,552 hrs/yr and 19,200 lbs laundry/day as requested. Expected actual hours of operation as presented in the application are provided below:

Actual Operating Hours (06:00 to 20:30)		
	14.5	hours/day
	4	days/wk
	52	wks/yr
	208	days/yr
	3,016	hrs/yr

The application utilizes emission rates from stack testing performed on December 17 & 18, 2014 at a Clean Uniforms (Clean Rentals, Inc.)¹ industrial launderer located in New Bedford, Massachusetts, report dated January 28, 2015. The testing was required as part of a Consent Decree² due to the facility

¹ Clean Uniforms (Clean Rentals, Inc.) located in New Bedford, Massachusetts, test report dated January 28, 2015; Compliance Testing VOC and HAP Emissions, CK Environmental, Inc., CK Project No. 4778.

² Consent Decree filed on March 13, 2017 between United States of America and Clean Rentals, Inc., Civil No. 1:17-cv-10419. No permit has been issued to date.

installing new laundry equipment at the facility without installing air pollution control equipment and without applying for a permit when it began operating at its new location in May 1998. The testing was performed on two dryers, two temporary total enclosures (TTE) exhausts and a process exhaust duct (sorting table vent). Emissions from the two washers being used at the time of testing were included in the TTE exhausts and are referred to as “main room” in the report. VOC (total and speciated) EFs from the test are broken down by main room, dryers, sorting and wastewater treatment.

Based on the data collected to date, most laundering facilities are synthetic minor or small due to restrictions placed in their permits to stay below Title V thresholds and/or to only launder shop towels. There is little stack testing data available for industrial launderers. There are a couple of BACT determinations that have been conducted in Minnesota. These facilities were required to submit a BACT analysis to the Minnesota Pollution Control Agency (MPCA) as part of an Injunctive Relief to bring them into compliance due to previously operating without a permit with PTE greater than the applicable NSR major source threshold for VOC. Some facilities were fined by EPA, especially in Region 1; however, MPCA has an Environmental Audit Program to assist facilities found operating without a permit with potentials that exceed Title V Major source thresholds; yet, actual emissions have never exceeded Title V limits. Based on the BACT analysis performed, VOC emissions from the facility are primarily based on the reconditioning of two distinct types of textile products: soiled shop towels and soiled print towels.

Excerpt from Technical Support Document (TSD), Permit Action Number 05300209-001 for AmeriPride³ located in Minnesota:

VOC and HAP emission factors (EF) for shop and print towels are based on emissions testing conducted at two other industrial laundry facilities. The MPCA has reviewed and approved the use of these EFs. These EFs should be used in future emissions calculation exercises (e.g., emissions inventory, permit modification applications, etc.) unless site-specific testing is conducted. The EFs are included in Appendix B of the permit (MPCA Approved EF).

VOC and HAP are expected to be emitted at a number of stages in the process, including: staging of towels, loading washers, during the washing cycle, unloading the washers, loading the dryers, and during the dryer cycle. The dryers are vented directly to the atmosphere through stacks and exhaust fans; the other processes are vented inside the building and exhaust through the general room exhaust. For emissions calculation purposes, it was assumed that 100% of the VOC and HAP emissions are emitted through the dryers. Dryers are considered the bottleneck in the laundry process; PTE calculations are based on the maximum potential dryer throughput.

Lint emissions from the dryers are the largest source of particulate matter (PM, PM10 and PM2.5) emissions at the facility. All of the dryers have lint traps for the purpose of capturing lint and preventing it from becoming airborne, however, there are no requirements in the permit to operate the lint traps. Therefore, the particulate emissions calculated from the lint traps are uncontrolled emissions. The EFs used for PM and PM10 emissions are based on EFs from a similar facility (G&K Services, Permit No. 00900034-001, see page 6 of the TSD). PM10 emissions are assumed to be 10% of PM emissions; lint particles are inherently larger particles, so this assumption by the Permittee was considered reasonable. PM2.5 emissions are assumed to equal PM10 emissions.

Particulate emissions are not limited by the throughput limits on print and shop towels because the facility washes and dries lint bearing items that are not shop or print towels.

³ AmeriPride Services Inc. – Minneapolis – Air Emissions Permit No. 05300209-001 issued July 28, 2015. BACT Analysis uses average from stack test data for two similar facilities (G&K Services and Leef Services). Kleen Tech’s proposed PM EF of 2.97 lb/1,000 lb soiled is based on information from this TSD.

The final dispositions of VOC in soiled towels from traditional towel laundry process, such as AmeriPride Minneapolis, are as follows:

- a. Fugitive air emissions from handling and sorting of soiled towels.
- b. Air emissions from the washer exhaust vented inside the building.
- c. Air emissions from the dryer exhaust vented outside, and/or
- d. Water discharge from the washer, which is discharged in the effluent from the facility for further treatment at the City of Minneapolis's Publicly Owned Treatment Works (POTW).

Currently, fugitive emissions from handling and sorting soiled towels in the washroom area are controlled by minimizing air contact with the soiled towels prior to the washing process, by washing them by the evening of the day of their arrival.

The MPCA approved (BACT) EFs are based on an average of emissions testing conducted at similar facilities (see summary table below). This approach is consistent with an Air Program Fact Sheet for Industrial Laundry Facilities dated April 2019 from Wisconsin Department of Natural Resources and our WSRO's permitting of Cintas, formerly G&K in Graham, NC. The EFs used in permitting of the G&K facility located in Graham, NC when processing both shop and print towels only included washing and drying. These EFs were averages based on product type (i.e., print and shop towels) from testing conducted at other G&K facilities. G&K's EFs are more in line with the BACT EFs used by other industrial launderers.

VOC and HAP emission rates (EF) found to date vary significantly. Emission rates for VOC and toluene from laundering towels, especially print towels, are much higher than the emission rates proposed in the application. A summary table of Kleen Tech's proposed emission rates (Table 2 of January 10, 2020 application) compared with BACT EFs and the highest and lowest emission rates found to date is provided below:

Pollutant	VOC (lb/1,000 lb soiled towels)		Total HAP (lb/1,000 lb soiled towels)		Toluene (lb/1,000 lb soiled towels)	
	Print	Shop	Print	Shop	Print	Shop
Highest	127	26.04	22.88	9.16	22.55	1.67
Lowest	56.5	4.59	11.4	1.24	8.55	0.50
Proposed*	78.1	16.9	11.4 11.28	2.44 2.29	5.7 5.59	1.14 1.11
BACT	116.12	20.92	21.42	9.16	15.76	1.085

*Proposed factors changed slightly with latest submittal

Due to the range of EFs, DAQ believes the proposed emission rates in the application may not be representative and underestimate emissions. In an additional information letter sent to Kleen Tech on February 11, 2020, DAQ proposed the use of the approved BACT EFs in determining VOC, HAP and toluene emissions since they are more in line with generally accepted EFs incorporated in permits across the industry approved by other agencies including DAQ.

In Kleen Tech's response to DAQ's additional information request received via email on March 12, 2020, the facility states that using the BACT EFs would grossly overestimate emissions and they believe the proposed EFs (from Clean Uniforms) are most representative. Due to being at an impasse with the facility, DAQ will allow Kleen Tech to use the proposed EFs with a requirement for testing to confirm the proposed emission rates.

EPA Region 1 provided the following summary table⁴ of VOC emissions from industrial laundering in response to an inquiry from this review engineer regarding permitting of Clean Uniforms. Per EPA Region 1, Massachusetts has not yet issued a permit to Clean Uniforms. However, the facility is in the process of installing the air pollution control system described in the consent decree.

Industrial Laundry Shop and Print Towel Emission Rates
Results of Volatile Organic Compound (VOC) Emissions Testing

Facility	Year of Test	PRINT Towels	SHOP Towels
		Emission Rate (lbs VOC/ 1000 lbs soiled towels)	Emission Rate (lbs VOC/ 1000 lbs soiled towels)
G&K Manchester	2009	103.8	9.50
Coyne	2011	51.15	9.27
Cintas	2012	--	6.78
Unifirst	2012	--	8.29
Clean Rentals	2015	78.0	15.80
Ameripride*		110.95	26.04
G&K Minneapolis*		--	15.80

Rates come from permit applications to CT DEEP and MassDEP, not emissions testing

As presented in the two tables above, limited test data indicates VOC and HAP emissions vary considerably from industrial laundering facilities.

Kleen Tech's Proposed Equipment List:

Per Table 1 of the latest application received by DAQ on May 8, 2020, the source of air pollutants identified and proposed with this submittal is an Industrial laundry process consisting of the following equipment (as presented in Section 5 above):

Table 1 – Valdese Equipment List

Equipment Description	Permit Application ID	Point of Discharge ID
(4) Brim Model 6644 Washers (400 lb)	ES-001A	N/A
(2) Jenson Model 415 Washers (400-500 lb)	ES-001B	N/A
(1) Tairwoei Model TCW30 Washer (30 lb)	ES-001C	N/A
(1) Tairwoei Model T2W-70 Washer (70 lb)	ES-001D	N/A
(2) CLM Model 264GP NG Dryers (2.70 MMBtu/hr)	ES-002A	EP-002A
(2) Challenge Model CPG4 NG Dryers (2.75 MMBtu/hr)	ES-002B	EP-002B
(1) Tairwoei Model JYDR70 Steam-Heated Dryer (70 lb)	ES-002C	EP-002C
(1) Tairwoei Model JTDR100 Steam-Heated Dryer (100 lb)	ES-002D	EP-002D
(1) Wastewater Treatment Plant	ES-003	N/A
(1) 8.0 MMBtu/hr Cleaver Brooks NG Boiler	IES-001	IEP-001

Permit applicability of the WWTP (ID No. ES-003) and natural gas-fired boiler (ID No. IES-001) is discussed in Section 8 below.

⁴ Email exchange between Christine Sansevero, Senior Enforcement Coordinator, US EPA Region 1, Boston, MA. May 22, 2010.

Potential and actual emissions of Criteria Air Pollutants from Form D1 – Facility-wide Emissions Summary were updated with emissions from the supplemental information received on May 28, 2020 and emissions evaluations performed during this review process. The results are summarized in the following table:

Pollutant	Actual Emissions (tpy)	Potential Emissions – Before controls/limitations (tpy)	Potential Emissions – After controls/limitations (tpy)
PARTICULATE MATTER (PM) ⁵	4.17	9.18	9.18
PM<10 MICRONS (PM ₁₀)	4.17	9.18	9.18
PM<2.5 MICRONS (PM _{2.5})	4.17	9.18	9.18
SULFUR DIOXIDE (SO ₂)	0.02	0.05	0.05
NITROGEN OXIDES (NO _x)	3.06	7.83	6.65
CARBON MONOXIDE (CO)	3.16	7.86	6.87
VOC ⁶	105.35	305.43	231.69
Lead (Pb)	0.0000252	0.0000406	0.0000347
Greenhouse gases (GHG) (short tons)	6,070.58	9,686.3	9,686.3
Total HAP ⁷	15.36	44.11	34.48
Single HAP (Toluene)	7.53	22.16	16.57

Combustion emissions are expected from the natural gas-fired dryers and boiler. The boiler provides steam to the 2 steam heated dryers and to heat the washwater.

Emissions Expected from Each Emission Source or Group of Emission Sources:

➤ Industrial washers (ID Nos. ES-001A through ES-001D)

The washers are located in a central room referred to as “main room.” Any air pollutant emissions from the washers will discharge into the room and exit through openings in the building (exhaust fans, doors). Intake of soiled towels also occurs in this area. The EF for “main room” from the Clean Uniforms stack test report which included washing machines, and the EF for “sorting” from the same stack test were combined to characterize emissions from washing.

As listed above the facility has a total of eight (8) washers. Two Tairwoei washers (ID Nos. ES-001C and ES-001D) are currently used for testing non-VOC containing materials. The facility would like to avoid a restriction for VOC containing products in these washers; therefore, they have included them with the equipment to be permitted. An eight (8) million Btu natural gas-fired steam boiler provides heat for the washwater (see boiler information below).

⁵ Per July 12, 2019 letter from Kleen Tech, Inc., Attachment 1 – Emission Factor Review: Testing at a similar facility, Ameripride Permit No. 05300209-001 provided an EF of 2.97 lb PM per 1,000 lb soiled towels from test for PM from dryers exhaust (lint traps).

⁶ Ibid 1. VOC results and EFs are summarized in Table 3-2 (shop towels) and Table 3-3 (print towels).

⁷ Ibid 1. HAP results (speciated VOC) and EFs are summarized in Tables 3-4 (shop towels) and 3-5 (print towels).

Expected emissions and proposed EFs in pounds (lb) pollutant per 1,000 pounds (lb/1,000 lb) of soiled towels from Wash and Sort Calculation worksheet in the application supplement, including HAP⁸ are provided in the following table:

WASH / SORT: VOC, PM and HAP Emission Factors			
	VOC	PM	HAP*
	lb/1,000 lb soiled towels		
Print / Furniture Towels	24	--	7.4
Shop Towels	5.5	--	1.24

*Added HAP EF column to table from application and corrected EF (Facility included MEK (a TAP and VOC) with total HAP emission. MEK was de-listed by the EPA as a HAP in December 2005.

Potential emissions based on the facility's requested limit of 6,552 hr/yr, which equates to processing of 5,910,168 lb print & furniture towels/yr and 80,232 lb shop towels/yr using the above EFs are calculated below:

$$\frac{5,910,168 \text{ lbs print towels laundered}}{\text{yr}} * \frac{24 \text{ lb VOC}}{1,000 \text{ lb soiled towels}} = 141,844.03 \frac{\text{lb VOC}}{\text{yr}}$$

$$\frac{141,844.03 \text{ lb VOC}}{\text{yr}} * \frac{\text{ton}}{2,000 \text{ lb}} = 70.92 \text{ tpy VOC from print towels}$$

$$\frac{5,910,168 \text{ lbs print towels laundered}}{\text{yr}} * \frac{7.4 \text{ lb HAP}}{1,000 \text{ lb soiled towels}} = 43,735.24 \frac{\text{lb HAP}}{\text{yr}}$$

$$\frac{43,735.24 \text{ lb HAP}}{\text{yr}} * \frac{\text{ton}}{2,000 \text{ lb}} = 21.87 \text{ tpy HAP from print towels}$$

$$\frac{80,232 \text{ lbs shop towels laundered}}{\text{yr}} * \frac{5.5 \text{ lb VOC}}{1,000 \text{ lb soiled towels}} = 441.3 \frac{\text{lb VOC}}{\text{yr}}$$

$$\frac{441.3 \text{ lb VOC}}{\text{yr}} * \frac{\text{ton}}{2,000 \text{ lb}} = 0.22 \text{ tpy VOC from shop towels}$$

$$\frac{80,232 \text{ lbs shop towels laundered}}{\text{yr}} * \frac{1.24 \text{ lb HAP}}{1,000 \text{ lb soiled towels}} = 99.49 \frac{\text{lb HAP}}{\text{yr}}$$

$$\frac{99.49 \text{ lb HAP}}{\text{yr}} * \frac{\text{ton}}{2,000 \text{ lb}} = 0.05 \text{ tpy HAP from shop towels}$$

Emission summary from Wash and Sort Calculation worksheet in application supplement includes total HAP. However, as calculated above, total HAP values were corrected (the facility had included MEK with total HAP):

⁸ The facility included methyl ethyl ketone (MEK) with their HAP emissions. On December 19, 2005, the EPA signed the final rule removing MEK as a HAP from Section 112 (b) (1) under the Clean Air Act (CAA).

WASH / SORT: Potential Emission Calculations						
	VOC	PM	Total HAP	VOC	PM	Total HAP
	lbs/yr			tons/yr		
Print / Furniture Towels	141,844.03	--	60,194.38	70.92	--	30.10 21.87
Shop Towels	441.28	--	173.37	0.22	--	0.09 0.05
Total	142,285.31	--	60,367.75	71.14	--	30.18 21.92

A summary table of EFs for each pollutant from the laundering process will be included at the end of this section with the corrected HAP EFs.

- Natural gas-fired dryers (ID Nos. ES-002A through ES-002B) and steam-heated dryers (ID Nos. ES-002C and ES-002D)

Per the application, the dryers are matched up to the washers, load for load. As listed above the facility has a total of 6 dryers. Four dryers are natural gas-fired (direct-fired). Two Tairwoei dryers (ID Nos. ES-002C and ES-002D) are steam heated (steam is provided from the natural gas-fired boiler). These dryers correspond with the test washers and are not currently used for VOC-containing products. However, Kleen Tech included them in the equipment to be permitted to avoid a restriction for non-VOC containing material. An eight (8) million Btu natural gas-fired steam boiler provides heat for the two steam heated dryers (see boiler information below).

The application submittal received on May 8, 2020 did not list the capacities of the dryers, nor did it contain Form B9 - EMISSION SOURCE (OTHER). Without the capacity of each dryer, compliance with 15A NCAC 02D .0515 cannot be demonstrated (refer to Section 8 below).

A dryer specifications sheet was found from the manufacturer by searching the model number: CLM Model 264GP natural gas fired dryer (2.7 million Btu/hr)

<https://www.clmco.com/pdfs/CLM-264GP-Specs-2017.pdf>

The dryer has a 264 cubic foot basket frame. Recommended capacity 600-800 lb dry weight.

Lo-NOx Heating System:

A high-efficiency burner is coupled to a full flame spectrum modulating system with pre-air/gas mixing for proper combustion before entering the drying chamber. The combustion chamber is constructed of a steel inner chamber with a steel outer jacket separated by a cooling space using the intake air as an insulator and to pre-heat the incoming air. The maximum firing rate of the burner shall be 2,700,000 Btu/hr and the average firing rate shall be 1,700,000 Btu/hr at 26" wc (water column) pressure.

Confirmation from the manufacturer that the dryer heating mechanism is direct-fired.

This information was discussed with Ms. Garvon on May 14, 2020 along with other items needed to complete the permit and review. A follow-up email was sent to Ms. Garvon with the dryer specification sheet and example B Forms (i.e., Form B, B1 and B9) for the above dryer.

An email with supplemental information, including the dryer capacities and completed B Forms, was received from Ms. Garvon on May 28, 2020.

Expected emissions and proposed EFs in lb pollutant/1,000 lb of soiled towels from Dryer Process Calculation worksheet in the application supplement are:

DRYERS: VOC, PM and HAP Emission Factors			
	VOC	PM	HAP*
	lb/1,000 lb soiled towels		
Print / Furniture Towels	45.5	2.97	2.468
Shop Towels	6.1	2.97	0.42

*Added HAP EF column to table from application and corrected EF (Facility included MEK (a TAP and VOC) with total HAP emission. MEK was de-listed by the EPA as a HAP in December 2005.

- PM emissions are expected from the dryer exhaust and combustion.

Estimates of the criteria air pollutant emissions expected from the dryer from firing natural gas are based on EFs from US EPA AP-42⁹ guidance from TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION the EF for Total PM is: 7.6 lb/10⁶ scf while firing Natural gas. Units are in pounds of pollutant per million standard cubic feet (scf) of natural gas fired. To convert to an energy basis (lb/million Btu), divide by a heating value of 1,020 million Btu/10⁶ scf.

The PM emissions from the drying process are based on the proposed tested EF¹⁰ of 2.97 lb PM/1,000 lb of soiled towels from dryer lint.

To calculate total PM from the dryers, PM emissions from the drying process are added to PM from dryer combustion as calculated below:

Drying process:

Methodology provided in application to calculate PM (lb/hr) use tpy PM x (1 year/# hrs) x (2,000 lb/ton):

Actuals = 4.05 tpy PM x (2000 lb/ton x year/3,016 hrs) = 2.68 lb/hr PM

Potentials based on limitation = 8.91 tpy PM x (2000 lb/ton x year/6,552 hrs) = 2.72 lb/hr PM

Combustion PM emissions:

Total maximum firing rate of all natural gas-fired dryers:

Emission Source ID No(s).	Emission Source Description	Maximum firing rate (million Btu/hr)
ES-002A.1 and ES-002A.2	Two (2) CLM Model 264GP natural gas-fired dryers (2.7 million Btu per hour maximum firing rate; 800 lb dry weight capacity; direct-fired)	2.7 x 2 = 5.4
ES-002B.1 and ES-002B.2	Two (2) Challenge Model CPG4 natural gas-fired dryers (2.75 million Btu per hour maximum firing rate; 400 lb dry weight capacity; direct-fired)	2.75 x 2 = 5.5
ES-002C	One (1) Tairwoei Model JYDR70 steam heated dryer (70 lb dry weight capacity; indirect-fired)	N/A
ES-002D	One (1) Tairwoei Model JTDR100 steam heated dryer (100 lb dry weight capacity; indirect-fired)	N/A
Total maximum dryer firing rate		10.90

⁹ US EPA AP-42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources; Chapter 1: External Combustion Sources; Section 1.4 Natural Gas Combustion

¹⁰ Ibid 3

7.6 lb PM/10⁶ scf (AP-42 EF) x 10.9 million Btu/hr (maximum firing rate of all dryers) x million scf/1,020 million Btu (default heating value of natural gas fuel):

$$\frac{7.6 \text{ lb PM}}{\text{million scf}} * \frac{\text{million scf}}{1,020 \text{ million Btu}} = 0.007 \frac{\text{lb PM}}{\text{million Btu}}$$

$$\frac{0.007 \text{ lb PM}}{\text{million Btu}} * \frac{10.9 \text{ million Btu}}{\text{hr}} = 0.0763 \frac{\text{lb}}{\text{hr}} \text{ PM from combustion}$$

Total PM Emission Rates:

Actuals = (2.68 + 0.0763) lb/hr PM = 2.756 lb/hr PM = 2.76 lb/hr PM

Potentials based on limitation = (2.72 + 0.0763) lb/hr PM = 2.796 lb/hr PM = 2.80 lb/hr PM

- VOC emissions are expected from the dryer exhaust and combustion

Drying process:

To calculate VOC (lb/hr) use tpy VOC drying process x (1 year/# hrs) x (2,000 lb/ton):

Actuals = 61.2 tpy VOC x (2000 lb/ton x yr/3,016 hrs) = 40.58 lb/hr VOC

Potentials based on limitation = 134.7 tpy VOC x (2000 lb/ton x yr/6,552 hrs) = 41.12 lb/hr VOC

Combustion VOC emissions:

VOC emissions based on EF from AP-42¹¹ of 5.5 lb VOC/million scf:

$$\frac{5.5 \text{ lb VOC}}{\text{million scf}} * \frac{10.9 \text{ million Btu}}{\text{hr}} * \frac{\text{million scf}}{1,020 \text{ million Btu}} = 0.05877 \frac{\text{lb}}{\text{hr}} \text{ VOC}$$

$$0.05877 \frac{\text{lb}}{\text{hr}} \text{ VOC} * 6,552 \frac{\text{hr}}{\text{yr}} * \frac{\text{ton}}{2,000 \text{ lb}} = 0.19 \text{ tpy VOC}$$

Total VOC Emission Rates:

Actuals = (40.58 + 0.05877) lb/hr VOC = 40.638 lb/hr VOC = 40.64 lb/hr VOC

Potentials based on limitation = (41.12 + 0.05877) lb/hr VOC = 41.178 lb/hr VOC = 41.18 lb/hr VOC

- HAP emissions are expected from the dryer exhaust and combustion

Drying process:

To calculate HAP (lb/hr) use tpy HAP drying process x (1 year/# hrs) x (2,000 lb/ton):

Actuals = 3.32 tpy HAP x (2000 lb/ton x yr/3,016 hrs) = 2.20 lb/hr HAP

Potentials based on limitation = 7.31 tpy HAP x (2000 lb/ton x yr/6,552 hrs) = 2.23 lb/hr HAP

¹¹ Ibid 9. TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.

Combustion HAP emissions:

HAP combustion emissions are based on EF from AP-42¹² for HAPs from natural gas combustion that are also in common with the drying process. Hexane is included because it was emitted from laundering of soiled print towels at a similar facility, Cintas, formerly G&K (Facility ID No. 0100301) located in the WSRO (EF of 0.066 lb n-hexane/1,000 lb soiled print towels). The facility no longer processes print towels.

Example calculation for Toluene: EF of 3.4E-03 lb toluene/million scf:

$$0.0034 \frac{\text{lb Toluene}}{\text{million scf}} * 10.9 \frac{\text{million Btu}}{\text{hr}} * \frac{\text{million scf}}{1,020 \text{ million Btu}} = 0.0000363 \frac{\text{lb}}{\text{hr}} \text{ Toluene}$$

Pollutant	EF AP-42	Total all dryers	Conversion	Emission Rate	
	lb/million scf	million Btu/hr	lb/million scf to lb/million Btu	lb/hr pollutant	PTE (tpy) pollutant
Toluene	0.0034	10.90	0.000980392	0.00004	0.00018
Naphthalene	0.00061			0.00001	0.000044
Hexane	1.8			0.01924	0.0845
HAP (in common with drying process) Combustion Emission Rate				0.01928	0.0847

HAP Emission Rates:

Actuals = (2.20 + 0.01928) lb/hr HAP = 2.219 lb/hr HAP = 2.22 lb/hr HAP

Potentials based on limitation = (2.23 + 0.01928) lb/hr HAP = 2.249 lb/hr HAP = 2.25 lb/hr HAP

- SO₂ emissions (combustion only) based on EF from AP-42¹³ of 0.6 lb SO₂/million scf:

$$0.6 \frac{\text{lb SO}_2}{\text{million scf}} * 10.9 \frac{\text{million Btu}}{\text{hr}} * \frac{\text{million scf}}{1,020 \text{ million Btu}} = 0.0064 \frac{\text{lb}}{\text{hr}} \text{ SO}_2$$

Criteria emissions from the drying process and dryer combustion (highest EF from AP-42 or DAQ Combustion Spreadsheet¹⁴ was used) are summarized below (modified Form B):

¹² Ibid 9. TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION.

¹³ Ibid 9. TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.

¹⁴ NC DAQ NATURAL GAS COMBUSTION EMISSIONS CALCULATOR REVISION N; 01/05/2017

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE							
AIR POLLUTANT EMITTED	SOURCE OF EF	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PM	2, 8, 9	2.761	4.1639	2.801	12.269	2.801	9.1768
PM ₁₀	2, 8, 9	2.761	4.1639	2.801	12.269	2.801	9.1768
PM _{2.5}	2, 8, 9	2.761	4.1639	2.801	12.269	2.801	9.1768
SO ₂	8, 9	0.006412	0.009669	0.006412	0.02808	0.006412	0.021005
NO _x	8, 9	1.06863	1.6115	1.06863	4.6806	1.06863	3.5008
CO	8, 9	0.89765	1.3536	0.89765	3.9317	0.89765	2.9407
VOC	2, 8, 9	40.639	61.283	41.179	180.363	41.179	134.902
LEAD	8, 9	5.343E-06	8.057E-06	5.343E-06	2.34E-05	5.343E-06	1.75E-05
OTHER – Process HAP	2	2.20	3.32	2.23	9.76	2.23	7.31
OTHER – Combustion Total HAP	9	0.0201	0.0303	0.0201	0.088	0.0201	0.066
OTHER – Combustion Highest HAP (Hexane)	9	0.019	0.029	0.019	0.0845	0.019	0.063

EF Source – 2 = Engineering Judgement with documentation

EF Source – 8 = US EPA AP-42

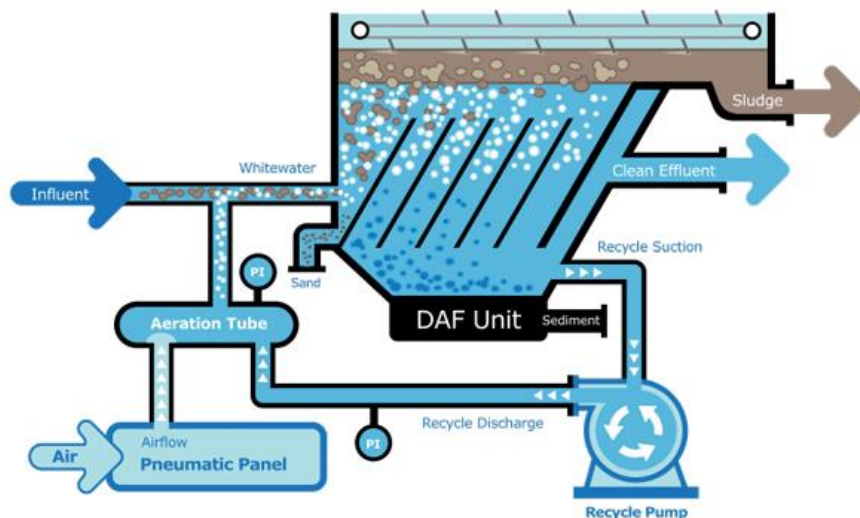
EF Source – 9 = NC DAQ Combustion Spreadsheet

A summary table of EFs for each pollutant from the laundering process will be included at the end of this section with the corrected HAP EF.

➤ Wastewater Treatment Plant (ID Nos. ES-003)

The WWTP is located in a separate building. As stated previously, any air pollutant emissions from the washers will discharge into the room and exit through openings in the building. The WWTP consists of a DAF¹⁵ from which effluent from the washers is charged to a biological treatment system. Wastewater is pumped into a DAF system and mixed with a stream of “whitewater”, which is recirculated clarified water from the DAF that is super saturated with dissolved air. As these two stream mix together, microscopic bubbles attach to solid particulates, giving them enough buoyancy to go to the surface of the DAF tank. Effluent from the biological treatment system is polished in a biomass oxidation basin prior to discharge to the local publicly owned treatment works (POTW).

¹⁵ How Does a DAF System Work? <https://www.waterform.com.au/2019/03/01/how-does-a-daf-system-work/>



Expected emissions and proposed EFs in lb pollutant per 1,000 lb of soiled towels from WWTP Calculation worksheet in the application supplement are:

WWTP: VOC and PM Emission Factors			
	VOC	PM	HAP*
	lb/lb 1,000 soiled towels		
Print / Furniture Towels	8.6	--	1.41
Shop Towels	5.3	--	0.6345

*Added HAP EF column to table from application and corrected EF (Facility included MEK (a TAP and VOC) with total HAP emission. MEK was de-listed by the EPA as a HAP in December 2005.

Potential emissions based on requested limit of 6,552 hr/yr, which equates to processing of 5,910,168 lb print/furniture towels/yr and 80,232 lb shop towels/yr using the above EFs are calculated below for total HAPs:

$$5,910,168 \frac{\text{lbs print towels laundered}}{\text{yr}} * \frac{1.41 \text{ lb HAP}}{1,000 \text{ lb soiled towels}} = 8,333.34 \frac{\text{lb HAP}}{\text{yr}}$$

$$8,333.34 \frac{\text{lb HAP}}{\text{yr}} * \frac{\text{ton}}{2,000 \text{ lb}} = 4.17 \text{ tpy HAP from print towels}$$

$$80,232 \frac{\text{lbs shop towels laundered}}{\text{yr}} * \frac{0.6345 \text{ lb HAP}}{1,000 \text{ lb soiled towels}} = 50.91 \frac{\text{lb HAP}}{\text{yr}}$$

$$50.91 \frac{\text{lb HAP}}{\text{yr}} * \frac{\text{ton}}{2,000 \text{ lb}} = 0.025 \text{ tpy HAP from shop towels}$$

WWTP: Potential Emission Calculations						
	VOC	PM	Total HAP	VOC	PM	Total HAP
	lbs/yr			tons/yr		
Print / Furniture Towels	50,827.45	--	11,498.33	25.41	--	5.75 4.17
Shop Towels	425.23	--	0.00	0.21	--	0.00 0.025
Total	51,252.67	--	11,498.33	25.63	--	5.75 4.20

A summary table of EFs for each pollutant from the laundering process will be included at the end of this section with the corrected HAP EF.

➤ Cleaver Brooks 8 million Btu per hour Boiler (ID No. IES-001)

The eight (8) million Btu natural gas-fired steam boiler is a Cleaver Brooks Model No. CB200-400 process heat boiler. The boiler provides heat for the washwater and two steam heated dryers as previously mentioned. The applicant has indicated that this source is an insignificant activity. Emissions provided with the application are based on use of the DAQ Combustion Spreadsheet¹⁶ which results in all criteria pollutants being less than 5 tpy.

However, based on boiler emissions data from the manufacturer, the criteria air pollutant emission rates expected from the boiler are slightly higher than determined using DAQ's combustion spreadsheet. The boiler data sheet¹⁷ and the following link was provided to Ms. Garvon via email on May 14, 2020:

https://www.boilerdata.com/uploads/7/4/1/4/7414458/boiler_tech_guide_-_emission_levels_-_cb_-_cb.pdf

The application supplement received by Ms. Garvon on May 28, 2020 contained revised criteria pollutant emission calculations based on the following EFs from the boiler data sheet:

Model CB Boilers

Firetube Boilers

Table A2-13. Model CB Boiler Emission Data

POLLUTANT		ESTIMATED LEVELS - UNCONTROLLED		
		NATURAL GAS	NO. 2 OIL ^B	NO. 6 OIL ^C
CO	ppm ^A	200	90	95
	Lb/MMBtu	0.15	0.07	0.075
NO _x	ppm ^A	100	185	502
	Lb/MMBtu	0.12	0.25	0.67
SO _x	ppm ^A	1	278	278
	Lb/MMBtu	0.001	0.52	0.52
HC/VOCs	ppm ^A	40	50	70
	Lb/MMBtu	0.016	0.025	0.035
PM	ppm ^A	-	-	-
	Lb/MMBtu	0.01	0.025	0.160

NOTES:
Refer to Section E for detailed emission information.
A. ppm levels corrected to 3% O₂, dry basis.
B. Based on fuel constituent levels of:
Fuel-bound nitrogen content = 0.05% by weight
Sulfur content = 0.5% by weight
Ash content = 0.01% by weight
C. Based on fuel constituent levels of:
Fuel-bound nitrogen content = 0.7% by weight
Sulfur content = 0.5% by weight
Ash content = 0.1% by weight
Conradson carbon residue = 16% by weight

¹⁶ Ibid 14

¹⁷ Cleaver Brooks website: https://www.boilerdata.com/uploads/7/4/1/4/7414458/boiler_tech_guide_-_emission_levels_-_cb_-_cb.pdf; Table A2-13. Model CB Boiler Emissions Data

Natural Gas-fired Boiler Emission Calculations per Table A2-13					
Pollutant	lb/MMBtu	lb/hr	Expected Actuals	Potentials	
			@ 3,016 hrs/yr	@ 6,552 hrs/yr	@ 8760 hrs/yr
			tpy		
CO	0.15	1.2	1.81	3.93	5.256
NO _x	0.12	0.96	1.45	3.14	4.205
SO _x	0.001	0.008	0.01	0.03	0.03504
VOC	0.016	0.128	0.19	0.42	0.5606
PM	0.01	0.08	0.12	0.26	0.3504

The highest emission rate (EF) is from CO. Based on the boilers PTE, using the EF above, CO emissions are calculated as follows:

$$8 \frac{\text{million Btu}}{\text{hr}} * 0.15 \frac{\text{lb CO}}{\text{million Btu}} * \frac{\text{ton}}{2,000 \text{ lb}} * 8,760 \frac{\text{hours}}{\text{year}} = 5.256 \text{ tpy CO PTE}$$

Pursuant to 15A NCAC 02Q .0503(8) the boiler is not insignificant and will be placed in the permit as ES-Boiler1 (refer to Section 8 below for more details).

Combustion HAP emissions:

HAP combustion emissions based on EF from AP-42¹⁸ for HAPs from natural gas combustion that are also in common with the laundering process are summarized below:

Example calculation for Toluene – EF of 3.4E-03 lb Toluene/million scf:

$$0.0034 \frac{\text{lb Toluene}}{\text{million scf}} * 8 \frac{\text{million Btu}}{\text{hr}} * \frac{\text{million scf}}{1,020 \text{ million Btu}} = 0.00002667 \frac{\text{lb}}{\text{hr}} \text{ Toluene}$$

Pollutant	EF AP-42	Total all dryers	Conversion	Emission Rate	
	lb/million scf	million Btu/hr	lb/million scf to lb/million Btu	lb/hr pollutant	PTE (tpy) pollutant
Toluene	0.0034	8.0	0.000980392	0.00003	0.00013
Naphthalene	0.00061			0.000005	0.000022
Hexane	1.8			0.01412	0.062
HAP (in common with drying process) Combustion Emission Rate				0.01415	0.0622

Per NC DAQ Combustion Spreadsheet¹⁹ Total and Highest HAP emissions from the boiler are:

¹⁸ Ibid 9. TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION.

¹⁹ Ibid 14

		ACTUAL EMISSIONS		POTENTIAL EMISSIONS			
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Total HAPs		0.0148	0.0223	0.0148	0.0648	0.0148	0.0485
Highest HAP	Hexane	0.0141	0.0213	0.0141	0.0618	0.0141	0.0462

- PM (facility assumes PM=PM₁₀/PM_{2.5}), VOC, total HAP and speciated HAP/TAP EFs for laundering of soiled print/furniture (facility assumes print/furniture towels are the same) and shop towels are summarized in the following table (this table does not include combustion emissions or EFs):

Pollutant	CAS NO.	Print Towels			Shop Towels		
		Washing	Drying	WWTP	Washing	Drying	WWTP
		lb/1,000 lb soiled					
PM/PM ₁₀ /PM _{2.5}			2.97			2.97	
VOC		24.11	45.43	8.59	5.50	6.1478	5.320
Total HAP		7.399	2.47	1.41	1.235	0.420	0.6345
Ethyl benzene (Phenylethane)*	100-41-4	0.4898	0.19799	0.09333	0.03090	0.02213	0.02975
Methyl ethyl ketone (MEK or 2-Butanone)**	78-93-3	0.0369	0.00316	0.01529	0.75099	0.1009	0.15524
Methyl isobutyl ketone (MIBK) or 4-Methyl-2-pentanone or Hexon	108-10-1	0.0186	0.00438	0.00282	0.00212	0.00051	0.00108
Naphthalene*	91-20-3	0.01379	0.02486	0.00201	0.00296	0.00243	0.00108
Perchloroethylene (PCE) or Tetrachloroethylene or Tetrachloroethene	127-18-4	0.0658	0.00726	0.04586	0.3503	0.09364	0.14443
Styrene	100-42-5	0.01103	0.00460	0.00161	0.00212	0.00124	0.00108
Toluene	108-88-3	4.0374	0.8113	0.7447	0.6651	0.1745	0.2705
Trichloroethylene (TCE or Trichloroethene)	79-01-6	0.01379	0.00575	0.00201	0.00720	0.00265	0.00595
Xylene	1330-20-7	2.7489	1.4124	0.51897	0.1746	0.12299	0.1807

*Ethyl benzene and Naphthalene are not a TAP. They are a HAP and VOC.

**MEK was de-listed by the EPA as a HAP in December 2005. It is a TAP and VOC.

The EFs for ethyl benzene and naphthalene presented in the above table vary from the EFs presented in the original application received on January 20, 2020 (Appendix C) and the revised May 8, 2020 submittal (Table 3, page 6). In addition, other speciated HAP EFs vary from the EFs presented in the original application; however, they are the same as presented with the revised application received on May 8, 2020 and the supplement received on May 28, 2020.

As previously mentioned, the facility will be required to test to determine the appropriate site-specific emission rates for VOC and HAP from their laundering process.

8. Regulatory Review

15A NCAC 02Q .0102 ACTIVITIES EXEMPTED FROM PERMIT REQUIREMENTS

(a) For the purposes of this Rule, the definitions listed in 15A NCAC 02D .0101 and 15A NCAC 02Q .0103 shall apply.

(b) This Rule shall not apply to:

(1) facilities whose potential emissions require a permit pursuant to 15A NCAC 02Q .0500 (Title V Procedures); or

(2) a source emitting a pollutant that is part of the facility's 15A NCAC 02D .1100 (Control of Toxic Air Pollutants) modeling demonstration if that source is not exempted pursuant to 15A NCAC 02Q .0702.

...

(d) Any facility whose actual emissions of particulate matter (PM₁₀), sulfur dioxide, nitrogen oxides, volatile organic compounds, carbon monoxide, hazardous air pollutants, and toxic air pollutants are each less than five tons per year and whose actual total aggregate emissions are less than 10 tons per year shall not be required to obtain a permit pursuant to 15A NCAC 02Q .0300. This Paragraph shall not apply to synthetic minor facilities that are regulated pursuant to 15A NCAC 02Q .0315.

...

(g) The following activities shall not require a permit or permit modification pursuant to 15A NCAC 02Q .0300:

...

(6) wastewater treatment processes: industrial wastewater treatment processes or municipal wastewater treatment processes for which there are no state or federal air requirements; ...

Sources listed under 02Q .0102(g) at this facility are not exempt under this rule per 02Q .0102(b)(1) and (2) due to xylene exceeding its respective toxics air pollutant permitting emissions rate (TPER) under 15A NCAC 02Q .0711; thus, requiring a modeling demonstration under 15A NCAC 02D .1100. In addition, the sources are not one of the listed activities identified in 15A NCAC 02Q .0702(a) as exempt under 15A NCAC 02Q .0702 Exemptions.

➤ WWTP (ID No. ES-003) is included in the air toxics modeling analysis. Therefore, this source loses the exemption from permitting requirements.

Per 15A NCAC 02Q .0102(a) the definitions in 02D .0101 and 02Q .0103 apply:

15A NCAC 02Q .0103 DEFINITIONS

For the purposes of this Subchapter, the definitions in G.S. 143-212 and G.S. 143-213 and the following definitions apply:

...

(15) "Facility" means all of the pollutant-emitting activities, except transportation facilities, that are located on one or more adjacent properties under common control.

(16) "Federally enforceable" or "federal-enforceable" means enforceable by EPA.

...

(19) "Hazardous air pollutant" means any pollutant that has been listed pursuant to Section 112(b) of the federal Clean Air Act. Pollutants listed only in 15A NCAC 02D .1104 (Toxic Air Pollutant Guidelines), but not pursuant to Section 112(b), shall not be included in this definition.

(20) "Insignificant activities" means activities defined as insignificant activities because of category or as insignificant activities because of size or production rate pursuant to 15A NCAC 02Q .0503.

15A NCAC 02Q .0503 DEFINITIONS

For the purposes of this Section, the definitions in G.S. 143-212, G.S. 143-213, 15A NCAC 02Q .0103, and the following definitions apply:

...

(8) “Insignificant activities because of size or production rate” means any activity whose emissions would not violate any applicable emissions standard and whose potential emission of particulate, sulfur dioxide, nitrogen oxides, volatile organic compounds, and carbon monoxide before air pollution control devices, are each no more than five tons per year and whose potential emissions of hazardous air pollutants before air pollution control devices, are each below 1,000 pounds per year.

- Cleaver Brooks natural gas-fired (8 million Btu per hour) boiler (ID No. IES-001) potential emissions of CO are greater than 5 tpy (see calculation in Section 7 above); thus, not an insignificant activity. Total HAPs are 129 lb/yr (largest HAP is hexane with emissions of 124 lb/yr) per DAQ Spreadsheet.²⁰ Therefore, the natural gas-fired boiler will be included on the permit as ES-Boiler1 due to PTE of CO emissions exceeding the 5 tpy threshold.

The facility will be subject to the following regulations upon permit issuance:

15A NCAC 02D .0503, Particulates from Fuel Burning Indirect Heat Exchangers
15A NCAC 02D .0515, Particulates from Miscellaneous Industrial Processes
15A NCAC 02D .0516, Sulfur Dioxide Emissions from Combustion Sources
15A NCAC 02D .0521, Control of Visible Emissions
15A NCAC 02D .1100, Toxic Air Pollutants Emissions Limitation Requirement
15A NCAC 02D .1806, Control and Prohibition of Odorous Emissions
15A NCAC 02Q .0317, Avoidance Conditions (for 15A NCAC 02D .0530, Prevention of Significant Deterioration, for 15A NCAC 02D .1111, Maximum Achievable Control Technologies and for 15A NCAC 02D .1112, 112G Case by Case Maximum Achievable Control Technology)
15A NCAC 02Q .0711, Toxic Air Pollutants Emissions Limitation Requirement

Due to this modification being processed as a State/TV Greenfield facility, the following additional regulations will apply:

15A NCAC 02D .0535, Excess Emissions Reporting and Malfunction
15A NCAC 02D .0540, Particulates from Fugitive Dust Emission Sources
15A NCAC 02Q .0207, Annual Emissions Reporting
15A NCAC 02Q .0304, Renewal Application
15A NCAC 02Q .0504, Option for Obtaining Construction And Operation Permit

15A NCAC 02D .0503, Particulates from Fuel Burning Indirect Heat Exchangers – Emissions of particulate matter from the combustion of a fuel that are discharged from any stack or chimney into the atmosphere shall not exceed the allowable emission limit for particulate matter (PM) emissions as determined from the equation:

$$E = 1.090(Q)^{-0.2594}$$

Where,

E = allowable emission limit for PM in pounds per million Btu (lbs/million Btu), and
Q = maximum heat input in million Btu per hour.

²⁰ Ibid 14

For the purpose of this Rule, the maximum heat input shall be the total heat content of all fuels which are burned in a fuel burning indirect heat exchanger, of which the combustion products are emitted through a stack or stacks. The sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site which are in operation, under construction, or permitted pursuant to 15A NCAC 02Q, shall be considered as the total heat input for the purpose of determining the allowable emission limit for particulate matter for each fuel burning indirect heat exchanger.

- The eight washing machines (ID Nos. ES-001A through ES-001D) are not heat exchangers; thus, not subject to 02D .0503.
- The four natural gas-fired dryers (ID Nos. ES-002A through ES-002B) are direct-fired; thus, not subject to 02D .0503.
- The two steam heated dryers (ID Nos. ES-002C and ES-002D) are heated indirectly from the natural gas-fired boiler; thus, not subject to 02D .0503.
- The wastewater treatment plant (No. WWTP) is not a heat exchanger; thus, not subject to 02D .0503.
- The Cleaver Brooks listed as an 8 million Btu per hour (400 horsepower) natural gas-fired boiler (ES-Boiler1) is indirect-fired; thus, subject to 02D .0503.

The maximum heat input from the natural gas-fired boiler is used to calculate the allowable emissions below:

$$Q = 8 \text{ million Btu per hour maximum heat input}$$

$$E = 1.090(8)^{-0.2594} = \underline{0.635 \text{ lb/million Btu allowable emissions}}$$

PM emissions rate based on AP-42 EF²¹ for Total PM (as presented in Section 7 above) of 7.6 lb/10⁶ scf while firing Natural gas:

$$7.6 \frac{\text{lb PM}}{\text{million scf}} * \frac{\text{million scf}}{1,020 \text{ million Btu}} = 0.007 \frac{\text{lb PM}}{\text{million Btu}} < \text{than } 0.635 \frac{\text{lb}}{\text{million Btu}} \text{ PM}$$

PM emissions rate based on EF in Table A2-13 (from manufacturer) above:

$$0.01 \frac{\text{lb PM}}{\text{million Btu}} < \text{than } 0.635 \frac{\text{lb}}{\text{million Btu}} \text{ PM}$$

Compliance is demonstrated since the allowable emissions rate is greater than expected PM emissions.

15A NCAC 02D .0515, Particulates from Miscellaneous Industrial Processes – This regulation establishes an allowable emission rate for particulate matter (PM) from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable. The regulation applies to Total Suspended Particulate (TSP) or PM less than 100 micrometers (µm). The particulate standard is based on a process weight equation. The allowable PM limit is calculated by the following equations:

For process weight rates up to 30 tons per hour (tph), allowable emission rates are calculated by the equation:

$$E = 4.10(P)^{0.67}$$

²¹ Ibid 9. TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.

For process weight rates greater than 30 tph, allowable emission rates are calculated by the equation:

$$E = 55.0(P)^{0.11} - 40$$

For both equations:

E = allowable emission limit for PM in pounds per hour (lbs/hr); and

P = process weight rate in tph.

Process rate means the total weight of all materials introduced into any specific process that may cause any emission of PM. Solid fuels charged are considered as part of the process weight, but liquid and gaseous fuels and combustion air are not. For a cyclical or batch operation, the process rate is derived by dividing the total process weight by the number of hours in one complete operation from the beginning of any given process to the completion thereof, excluding any time during which the equipment is idle.

- The eight washing machines (ID Nos. ES-001A through ES-001D) are not subject to other PM standards; thus, subject to 02D .0515.
- The four natural gas-fired dryers (ID Nos. ES-002A through ES-002B) are direct-fired and not subject to other PM standards; thus, subject to 02D .0515.
- The two steam heated dryers (ID Nos. ES-002C and ES-002D) are not subject to other PM standards; thus, subject to 02D .0515.
- The wastewater treatment plant (No. WWTP) is not subject to other PM standards; thus, subject to 02D .0515.
- The natural gas-fired boiler (ES-Boiler1) is indirect-fired and subject to 02D .0503; thus, not subject to 02D .0515.

Based on information gathered to date, the washing machines emit no particulate pollutants, and no condensable particulates have been associated with the industrial washers. In addition, no particulates are expected from the WWTP. Based on testing at similar facilities, lint from the dryers is a source of PM.²²

Each emission source is considered a separate industrial process and will have its respective allowable emissions rate. Section 4.2.1 of the original application combines the entire facility into one process with a maximum process rate of 19,200 lb/day (0.46 tph), which is incorrect. The revised application combines all washers and all dryers together, which is also incorrect. As discussed under Section 7 above, 02D .0515 applicability and compliance demonstration for one of the dryers, one of the washers and the WWTP was discussed and a follow up email sent to the facility's consultant on May 14, 2020 with an example 02D .0515 compliance demonstration calculation for each. The application supplement received on May 28, 2020 included the capacities of each emission source. A calculation for the maximum allowable emission rate for PM (lb/hr) to demonstrate compliance with 02D .0515 was included on Form B9 under the comments section (as provided with the example Form B9 prepared by this review engineer) for the 800 lb capacity CLM Model 264GP dryers of E=2.2 lbs/hr. The application supplement also included a completed Form B9 for the 400 lb capacity Challenge Model CPG4 dryers with a 02D .0515 calculation under the comments section of E=1.39 lbs/hr. No additional 02D .0515 calculations were provided with the application.

Calculations for each type of source are presented below:

²² Ibid 3

E (lbs/hr) for 400 lb capacity washers = $4.10(0.2)^{0.67} = 1.395$ lbs/hr PM
 E (lbs/hr) for 600-800 lb capacity dryers = $4.10(0.4)^{0.67} = 2.22$ lbs/hr PM
 E (lbs/hr) for WWTP = $55(50.1)^{0.11} - 40 = 44.595$ lbs/hr PM

Each emission sources maximum design capacity (lb and gpm) are listed in the table below with their tph process rate, 02D .0515 PM allowable emission limit and expected actual PM emissions.

Emission Source	Maximum Capacity	Process Rate (tph)	02D .0515 PM Emissions Limit (lb/hr)	Expected Actual PM* (lb/hr)
ES-001A.1	400 lb	0.2	1.395	0
ES-001A.2	400 lb	0.2	1.395	0
ES-001A.3	400 lb	0.2	1.395	0
ES-001A.4	400 lb	0.2	1.395	0
ES-001B.1	500 lb	0.25	1.62	0
ES-001B.2	500 lb	0.25	1.62	0
ES-200A.1	800 lb	0.4	2.22	2.68
ES-200A.2	800 lb	0.4	2.22	2.68
ES-200B.1	400 lb	0.2	1.395	2.68
ES-200B.2	400 lb	0.2	1.395	2.68
ES-002C	70 lb	0.035	0.434	2.68
ES-002D	100 lb	0.05	0.551	2.68
ES-WWTP	200 gpm	50.1	44.595	0

*Expected PM (lb/hr) from the drying process, excluding combustion emissions as presented in Section 7 above.

The application did not provide a 02D .0515 compliance demonstration for the WWTP; thus, this review engineer used the density of water (8.345 lbs/gallon) in determining the allowable emissions from the WWTP (maximum capacity of 200 gallons per minute):

$$200 \frac{gal}{min} * 60 \frac{min}{hr} * 8.345 \frac{lb}{gal} * \frac{ton}{2,000 lb} = 50.1 \text{ tph}$$

No PM emissions are expected from the washers or the WWTP; thus, compliance is demonstrated for these processes. As shown in the above table, compliance for the drying process is not demonstrated based on the expected PM emissions provided in the application and supplemental information.

The expected actual PM emission rates for the dryers were calculated using the data presented in the application and Section 7 above. However, based on this data, all of the dryers expected actual PM emission rates exceed the maximum allowable emission rate for PM. Since the information as presented indicates noncompliance with 02D .0515 for the dryers, a more thorough review of the Clean Uniforms test report²³ was performed. The Per Run Dryer Summary in Appendix A for determining VOC emissions from shop (Table 3, page 3) and print (Table 3, page 13) towels were averaged and presented in the table below:

²³ Ibid 1

Appendix A - Per Run Dryer Summary			
p. 5		p. 13	
Table 3 - Shop		Table 3 - Print	
Sources of VOC	Run time (hours)	Sources of VOC	Run time (hours)
Dryer 1 – Run 2	1.17	Dryer 1 – Run 1	1.29
Dryer 3 – Run 1	0.58	Dryer 1 – Run 3	1.22
Dryer 3 – Run 3	0.62	Dryer 3 – Run 2	0.57
--	--	Dryer 3 – Run 4	0.50
Total Dryer Runs	Total run time (hours)	Total Dryer Runs	Total run time (hours)
3	2.37	4	3.58
Average per run dryer time (hrs)			
0.79		0.895	

The expected actual PM emission rates were recalculated for the dryers using the average per run dryer times (hrs) for shop and print towels presented above, the PM EF (lb/1,000 lb soiled) of 2.97²⁴ and the maximum dryer capacities, as calculated and summarized below:

$$\frac{\text{Maximum dryer capacity of 400 lbs}}{\text{Average dryer run times for print towels of 0.895 hrs}} * \left(\frac{2.97 \text{ lb PM}}{1,000 \text{ lb soiled}} \right) = 1.32 \frac{\text{lb PM}}{\text{hr}} \text{ for ES - 200B}$$

Emission Source	02D .0515 PM Emissions Limit (lb/hr)	Shop Towels - Expected Actual PM (lb/hr)	Print Towels - Expected Actual PM (lb/hr)
ES-200A.1	2.22	3.01	2.64
ES-200A.2	2.22	3.01	2.64
ES-200B.1	1.395	1.50	1.32
ES-200B.2	1.395	1.50	1.32
ES-002C	0.434	0.263	0.231
ES-002D	0.551	0.376	0.330

Based on the above calculations, compliance is demonstrated for four of the six dryers while drying print towels and for only two of the dryers while drying shop towels.

During the May 14, 2020 telephone conversation with Ms. Garvon, this review engineer requested the spreadsheet used to determine the EFs used in the application. As part of the application supplement received on May 28, 2020, a worksheet referred to as “Clean Rent Speciated EF” was included. Data pulled from this worksheet indicates the following hours of operations for the dryers were used to determine VOC and HAP EFs:

Appendix A	Table 2 – Shop (p. 4)	Table 2 – Print (p. 12)
Hours of Operation – Dryer Max	1.2	2.5
Source of VOC	Dryer 1 – Run 2	Dryer 1 – Run 1 & 3 total hours*

*This worksheet uses the combined run time of Dryer 1 – Run 1 and Run 3 of 2.5 hours. To be consistent, the total hours of operation for Dryer 1 – Run 1 of 1.29 hours should be used (see Per Run Dryer Summary above).

²⁴ Ibid 3

Using the same hours of operations for the dryers that was used in determining the VOC and HAP EFs, as provided in the above table, the expected PM emissions were recalculated. The revised PM emission rates are summarized in the following table:

Emission Source	02D .0515 PM Emissions Limit (lb/hr)	Shop Towels - Expected Actual PM (lb/hr)	Print Towels - Expected Actual PM (lb/hr)
ES-200A.1	2.22	1.980	0.950
ES-200A.2	2.22	1.980	0.950
ES-200B.1	1.395	0.990	0.475
ES-200B.2	1.395	0.990	0.475
ES-002C	0.434	0.173	0.083
ES-002D	0.551	0.248	0.119

This methodology demonstrates compliance with 02D .0515 for all dryers. However, this review engineer does not agree with the use of the combined dryer run times (Dryer 1 – Run 1 and Run 3 of 2.5 hours) used throughout the application for VOC/HAP EF calculations or to demonstrate compliance with 02D .0515. The data presented above (taken from the application) uses a PM emission rate and VOC drying times taken from two different sets of test data for two separate facilities to determine an estimate of PM emissions from Kleen Tech’s drying process. In addition, cycle times for each process vary depending on the type of towels (print/furniture or shop) being laundered and the machine’s capacity. Due to a lack of available data, the use of test data from AmeriPride and Clean Uniforms to estimate emissions for Kleen Tech’s facility will be allowed for estimating emissions until site specific testing can be performed. Therefore, it is recommended that the facility be required to test for PM emissions in addition to VOC and HAP emissions (as previously mentioned, the facility will be required to test for VOC/HAP emissions per DAQ’s additional information request letter dated April 1, 2020) expected from this launderer’s drying process and for determining the appropriate emission rates of PM, VOC, total HAP and individual HAPs from this facility’s laundering processes to determine facility-wide emissions.

The facility is required to maintain production records such that the process rate “P” as specified under this regulation can be derived to allow calculation of the allowable PM emissions. A testing requirement for PM will be added to the permit under 02D .0515.

15A NCAC 02D .0516, Sulfur Dioxide Emissions from Combustion Sources – Under this regulation, sulfur dioxide emissions from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 lb/million Btu heat input. SO₂ formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. A source subject to an emission standard for SO₂ in Rules 02D .0524, .0527, .1110, .1111, .1205, .1206, .1210, or .1211 shall meet the standard in that particular rule instead of the 2.3 lb/million Btu standard of this Rule.

Kleen Tech is not subject to any of the rules listed in 02D .0516(b).

- The eight washing machines (ID Nos. ES-001A through ES-001D) are not sources of combustion; thus, not subject to 02D .0516.
- The four natural gas-fired dryers (ID Nos. ES-002A through ES-002B) are direct-fired combustion sources; thus, subject to 02D .0516.
- The two steam heated dryers (ID Nos. ES-002C and ES-002D) are not sources of combustion; thus, not subject to 02D .0516.
- The wastewater treatment plant (No. WWTP) is not a source of combustion; thus, not subject to 02D .0516.

- The natural gas-fired boiler (ES-Boiler1) is an indirect-fired combustion source; thus, subject to 02D .0516.

Estimations for SO₂ emission rates from the direct-fired dryers are based on AP-42 EF²⁵ for SO₂ (as presented in Section 7 above) of 0.6 lb/10⁶ scf while firing Natural gas:

$$0.6 \frac{\text{lb SO}_2}{\text{million scf}} * \frac{\text{million scf}}{1,020 \text{ million Btu}} = 0.00059 \text{ lb} \frac{\text{SO}_2}{\text{million Btu}} < \text{than } 2.3 \frac{\text{lb}}{\text{million Btu}} \text{ SO}_2$$

Per the boiler manufacturer's data,²⁶ the SO_x emission rate (in Table A2-13 above) is less than the allowable emission rate of SO₂ presented below:

$$0.001 \frac{\text{lb SO}_x}{\text{million Btu}} < \text{than } 2.3 \text{ lb} \frac{\text{SO}_2}{\text{million Btu}}$$

Natural gas will not cause this limit to be exceeded. Compliance is demonstrated since the allowable emissions rate is greater than expected emissions.

15A NCAC 02D .0521, Control of Visible Emissions – The intent of this rule is to prevent, abate and control emissions generated from fuel burning operations and industrial processes where an emission can reasonably be expected to occur, except during startup, shutdowns, and malfunctions approved according to procedures set out in Rule 02D .0535. This regulation establishes a visible emission standard for sources based on the manufacture date.

The Kleen Tech facility was established in 1991 prior to relocating to their current location in Valdese, NC during 2013. Hence, all equipment was manufactured after July 1, 1971.

This Rule shall apply to all fuel burning sources and to other processes that may have a visible emission. However, sources subject to a visible emission standard in Rules 02D .0506, .0508, .0524, .0543, .0544, .1110, .1111, .1205, .1206, .1210, .1211, or .1212 shall meet that standard instead of the opacity standard contained in this Rule.

Kleen Tech is not subject to any of the rules listed in 02D .0521(b).

For sources manufactured after July 1, 1971, the visible emission (VE) standard is 20 percent (%) opacity when averaged over a 6-minute period.

- The eight washing machines (ID Nos. ES-001A through ES-001D) are subject to 02D .0521.
- The four natural gas-fired dryers (ID Nos. ES-002A through ES-002B) are subject to 02D .0521.
- The two steam heated dryers (ID Nos. ES-002C and ES-002D) are subject to 02D .0521.
- The wastewater treatment plant (No. WWTP) is subject to 02D .0521.
- The natural gas-fired boiler (ES-Boiler1) is subject to 02D .0521.

The Permittee will be required to establish 'normal' visible emissions from these sources within the first 30-days following the effective date of the permit.

²⁵ Ibid 9. TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION.

²⁶ Ibid 17

In order to demonstrate compliance, the Permittee will be required to observe actual visible emissions on a monthly basis for comparison to ‘normal’. If emissions are observed outside of ‘normal’, the Permittee shall take corrective action. Recordkeeping and reporting are required.

15A NCAC 02D .0524, New Source Performance Standards (40 CFR Part 60 Subpart Dc) – With the exception of Paragraph (b) and (c) of 02D .0524, sources subject to new source performance standards (NSPS) promulgated in 40 CFR Part 60 shall comply with emission standards, monitoring and reporting requirements, maintenance requirements, notification and record keeping requirements, performance test requirements, test method and procedural provisions, and any other provisions, as required therein, rather than with any otherwise-applicable rule in this Section which would be in conflict therewith.

Title 40: Protection of Environment

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Subpart Dc—Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

§60.40c Applicability and delegation of authority.

(a) Except as provided in paragraphs (d), (e), (f), and (g) of this section, the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/h)) or less, but greater than or equal to 2.9 MW (10 MMBtu/h).

[72 FR 32759, June 13, 2007, as amended at 74 FR 5090, Jan. 28, 2009; 77 FR 9461, Feb. 16, 2012]

This rule is not applicable to the natural gas-fired boiler (**ID Nos. ES-Boiler1**) because the boiler is less than 10 million Btu/hr.

15A NCAC 02D .0535, Excess Emissions Reporting and Malfunction – This rule requires owners and operators to report excess emissions, malfunctions and/or a breakdown of process or control equipment or any other abnormal conditions.

15A NCAC 02D .0540, Particulate from Fugitive Dust Emission Sources – This rule requires owners and operators to not cause or allow fugitive dust emissions to cause or contribute to substantive complaints or excess visible emissions beyond the property boundary.

15A NCAC 02D .0958, Work Practices for Sources of Volatile Organic Compounds – This regulation establishes work practices that use VOCs such as solvents, carriers, material processing media, or industrial chemical reactants, or in similar uses that mix, blend, or manufacture VOCs, or emit VOCs as a product of chemical reactions.

Effective November 1, 2016 – 15A NCAC 02D .0958 is applicable only to following counties/areas in NC:

- Cabarrus County;
- Gaston County;
- Lincoln County;
- Mecklenburg County;
- Rowan County;
- Union County; and
- Davidson Township and Coddle Creek Township in Iredell County

This rule does not apply because it is no longer applicable in Burke County; thus, not required for this facility.

15A NCAC 02D .1100, Toxic Air Pollutants Emissions Limitation Requirement – Pursuant to 02D .1104 Toxic Air Pollutant Guidelines, a facility shall not emit any of the toxic air pollutants (TAP) in such quantities that may cause or contribute beyond the facility's premises to any significant ambient air concentration that may adversely affect human health, except as allowed pursuant to 15A NCAC 02Q .0700 (refer to 02Q .0711 below). In determining these significant ambient air concentrations, the Division shall be governed by the list of acceptable ambient levels (AALs) in milligrams per cubic meter at 77° F (25° C) and 29.92 inches (760 mm) of mercury pressure, except for asbestos found in 02D .1104.

Kleen Tech emits one TAP in excess of its respective TPER (as discussed under 02Q .0102 above), xylene. An Air Toxics Screening Evaluation prepared for Kleen Tech, Inc. was received by the ARO on October 16, 2019. This evaluation was forwarded to Tom Anderson, Air Quality Analysis Branch (AQAB) that same day.

A memorandum from Mark Yoder, AQAB, was sent to Mr. Koerschner, ARO on November 25, 2019 indicating that the modeling adequately demonstrates compliance on a source-by-source basis for xylene.

The following modeled emission limitations will be placed in Kleen Tech's permit:

EMISSION SOURCE	TOXIC AIR POLLUTANT	EMISSION LIMIT (lb/hr)	% AAL	
			1-hour	24-hour
Main Building	Xylene (1330-20-7)	1.43	3.9	56
Dryers		2.71		
WWTP		0.51		
Facility-wide Total		4.65		

To demonstrate compliance, the facility is required to report within 30 days after each calendar year quarter as defined in 15A NCAC 02D .0602, the maximum emission rate of each TAP listed above from the various sources.

15A NCAC 02D. 1111, MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY – This Rule shall apply to sources subject to national emission standards for hazardous air pollutants (NESHAPs) for source categories promulgated in 40 CFR Part 63.

The NESHAPs are found in 40 CFR Part 63 of the Clean Air Act (CAA). These standards require application of technology-based emissions standards referred to as Maximum Achievable Control Technology (MACT) or Generally Available Control Technology (GACT). The NESHAPs are delegated to the states, but both the EPA and the states implement and enforce these standards. Compliance with an applicable federal and/or state rule is the responsibility of the facility.

Kleen Tech has requested an avoidance condition for HAPs to remain a minor source of HAPs. Thus, subjecting them to area source standards, GACT. Refer to 02Q .0317 avoidance conditions below.

Title 40: Protection of Environment

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

Subpart JJJJJ—National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

§63.11193 Am I subject to this subpart?

You are subject to this subpart if you own or operate an industrial, commercial, or institutional boiler as defined in §63.11237 that is located at, or is part of, an area source of hazardous air pollutants (HAP), as defined in §63.2, except as specified in §63.11195.

§63.11195 Are any boilers not subject to this subpart?

The types of boilers listed in paragraphs (a) through (k) of this section are not subject to this subpart and to any requirements in this subpart.

...

(e) A gas-fired boiler as defined in this subpart.

§63.11237 What definitions apply to this subpart?

Terms used in this subpart are defined in the Clean Air Act, in §63.2 (the General Provisions), and in this section as follows:

...

Gaseous fuels includes, but is not limited to, natural gas, process gas, landfill gas, coal derived gas, refinery gas, hydrogen, and biogas.

Gas-fired boiler includes any boiler that burns gaseous fuels not combined with any solid fuels and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or for periodic testing, maintenance, or operator training on liquid fuel. Periodic testing, maintenance, or operator training on liquid fuel shall not exceed a combined total of 48 hours during any calendar year.

[76 FR 15591, Mar. 21, 2011, as amended at 78 FR 7506, Feb. 1, 2013; 81 FR 63125, Sept. 14, 2016]

40 CFR Part 63 Subpart JJJJJ, is not applicable to the natural gas-fired boiler (**ID Nos. ES-Boiler1**) because the boiler is gas-fired pursuant to 40 CFR Part 63.11195(e).

15A NCAC 02D .1112, 112(G) CASE BY CASE MAXIMUM ACHIEVABLE CONTROL

TECHNOLOGY – This rule shall apply to the construction or reconstruction of major sources of hazardous air pollutants unless:

(1) the major source has been specifically regulated or exempted from regulation under:

(A) Rule .1109 or .1111 of this Section (15A NCAC 02D); or

(B) a standard issued pursuant to Section 112(d), 112(h), or 112(j) of the federal Clean Air Act and incorporated in another Subpart of 40 CFR Part 63; or

(2) the owner or operator of such major source has received all necessary air quality permits for such construction or reconstruction project before July 1, 1998.

There are currently no MACT standards applicable to industrial launderers; thus, Kleen Tech has requested an avoidance condition for HAPs to remain a minor source of HAPs and avoid applicability of 112(G). Refer to 02Q .0317 avoidance conditions below.

15A NCAC 02D .1806, Control and Prohibition of Odorous Emissions – The purpose of this Rule is to provide for the control and prohibition of objectionable odorous emissions. The Permittee shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

15A NCAC 02Q .0207, Annual Emissions Reporting – The owner or operator of a Title V facility shall report by June 30th of each year the actual emissions during the previous calendar year pursuant to 02Q .0207.

15A NCAC 02Q .0304, Application – Permit Renewals:

(a) Obtaining and filing application. Permit, permit modification, or permit renewal applications may be obtained and shall be filed in writing according to 15A NCAC 02Q .0104.

...

(f) When to file applications for permit renewal. Applicants shall file applications for renewals such that they are mailed to the Director at the address specified in 15A NCAC 02Q .0104 and postmarked at least 90 days before expiration of the permit.

15A NCAC 02Q .0317, Avoidance Conditions (for 15A NCAC 02D .0530, Prevention of Significant Deterioration and for 15A NCAC 02D .1112 112(G) Case By Case Maximum Achievable Control Technology)

- Avoidance of 15A NCAC 02D .0530, Prevention of Significant Deterioration – A major stationary source under PSD rules is defined as any one of 28 named source categories in 40 CFR 51.166(b)(1)(i)(a) that has the potential to emit 100 tons per year of any regulated pollutant or any other stationary source that has the potential to emit 250 tons per year of any PSD regulated pollutant (other than GHG). The industrial laundering facility is not one of the 28 major stationary source categories; thus, subject if the 250 tpy threshold is exceeded.

Potential to emit (PTE) is defined in 40 C.F.R. § 52.21 as the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Physical or operational limitations on the capacity of a source to emit a pollutant are treated as part of its design if the limitation, or the effect it would have on emissions, is federally enforceable or legally and practicably enforceable by a state or local air pollution control agency. VOCs are produced by the facility as it washes and dries soiled print and shop towels.

The PTE without limitations of VOC emissions are above 250 tpy (i.e., 305 tpy VOC). The facility requested limits based on the maximum throughput of towels that can be laundered per day at the facility to ensure emissions of VOC remain below the 250 tpy PSD major source thresholds. The total PTE for the Kleen Tech facility was calculated by scaling up calendar year (CY) 2018 annual throughput under the maximum operating scenario of 19,200 lbs/day (21 hours per day; six days per week; and 52 weeks per year) or 6,552 hrs/yr using proposed EFs from testing at a similar facility.²⁷

The operational limits and PTE after limitations as presented in Kleen Tech's application are discussed in more detail under Section 7 above. The maximum industrial laundering process capacity, after limitations (e.g., washing machine capacity and cycle time; and discharge restriction by the Town of Valdese) derived from the 19,200 lbs per day operational restriction of the facility, result in an annual combined total weight of soiled print, furniture and shop towels laundered of:

$$\frac{19,200 \text{ lbs}}{\text{day}} \text{ capacity of washers} * \frac{6 \text{ days}}{\text{week}} * \frac{52 \text{ weeks}}{\text{yr}} = 5,990,400 \frac{\text{lb soiled towels}}{\text{year}}$$

The application further broke down the total annual weight restriction of soiled towels laundered by the type of towel laundered (i.e., print/furniture and shop towels) of:

²⁷ Ibid 1.

- 5,910,168 pounds print towels
- 80,232 pounds of shop towels

Note: The Permittee assumes Print and Furniture Towels are the same.

Using the above worse-case scenario, the expected PTE of VOC emissions after limitations are below PSD major source thresholds (i.e., 232 tpy). The above restrictions were placed in Kleen Tech's draft permit under their PSD avoidance condition for VOC.

After reviewing comments received from Kleen Tech on their draft permit, in order to provide flexibility on the types of towels laundered, these limits were combined and the PSD and HAP avoidance conditions were revised to reflect this change. This change allows the facility to process more shop towels, which is expected to result in less emissions (i.e. based on proposed EF, emissions from print/furniture towels are approximately 4.6 times that of shop towels) while remaining below PSD significance levels as calculated below:

$$5,990,400 \frac{lb \text{ soiled towels}}{year} * 78.13 \frac{lbs \text{ VOC}}{1,000 \text{ lb}} \text{ soiled print towels} * \frac{ton}{2,000 \text{ lb}} = 234 \text{ tpy VOC}$$

Due to PTE of HAP (refer to 02Q .0317 avoidance condition for 02D .1112 below) exceeding Title V thresholds, the facility is required to track the types of towels laundered to ensure that speciated VOC emissions (HAP emissions) do not exceed the Title V thresholds.

The facility has demonstrated that past actual emissions never exceeded the major source thresholds for NSR. The majority of the VOC emissions are from the washers, dryers, and WWTP. A negligible amount of VOC emissions (PTE of 0.818 tpy) are from combustion (i.e., natural gas-fired boiler and dryers). In order to demonstrate compliance, the facility is required to record and report annually the monthly and 12-month totals of the amount and types of textiles laundered at the facility and the facility-wide VOC emissions. The facility will use the EFs proposed in the application to calculate VOC emissions until site-specific testing is completed.

In an effort to reduce monitoring, recordkeeping and reporting requirements for negligible sources (i.e., combustion from the dryers and boiler), the less than 250 tpy avoidance limit has been reduced based on the worse-case PTE (refer to Section 7 above for calculations) as summarized below:

Emission Source(s)	PTE VOC Combustion (tpy)
Natural Gas-fired Dryers (ID Nos. ES-002A through ES-002B)	0.257
Natural Gas-fired Boiler (ID No. ES-Boiler1)	0.561
Total VOC emissions from combustion	0.818
Safety Factor (PTE times 1.5)	1.23

The adjusted PSD Avoidance limit is less than 248 tpy VOC. The following PSD Avoidance condition will be added to Kleen Tech's permit:

**1. 15A NCAC 02Q .0317: AVOIDANCE CONDITIONS
for Avoidance of 15A NCAC 02D. 0530 PREVENTION OF SIGNIFICANT
DETERIORATION**

- In order to avoid applicability of this regulation, 15A NCAC 02D .0530(g), the facility-wide emission sources shall discharge into the atmosphere less than 248 tons of VOCs per consecutive 12-month period.

Testing [15A NCAC 02Q .0308(a)]

- b. If emission testing is required, the Permittee shall perform such testing in accordance with General Condition 17.
- c. Under the provisions of NCGS 143-215.108, the Permittee shall conduct a performance test to establish the appropriate VOC mass emission rates from all affected sources (**ID Nos. ES-001A through ES-001D, ES-002A through ES-002D and ES-003**) in accordance with a testing protocol approved by the DAQ.
 - i. Testing of the industrial laundering process shall be completed and the results submitted within 180 days of permit issuance [XXXX, 2020], unless an alternate date is approved by DAQ.
 - ii. Operating parameters or emission factors as specified in this permit do not apply during performance tests or emissions tests conducted in an attempt to establish new operating parameters or emission factors.
- d. The source shall be responsible for ensuring, within the limits of practicality, that the equipment or process being tested is operated at or near its maximum normal production rate, or at a lesser rate if specified by the Director or his delegate.

Production/Operational Limits [15A NCAC 02Q .0308(a)]

- e. To ensure compliance with the avoidance limit above, the following production/operational limits shall apply:
 - i. The Permittee shall not operate more than 6,552 hours per consecutive 12-month period.
 - ii. The total weight of all soiled products processed shall not exceed 19,200 pounds per day.
 - iii. The total annual weight of all soiled products (i.e., print, furniture and shop towels combined) processed shall not exceed 5,990,400 pounds per consecutive 12-month period.

Monitoring/Recordkeeping Requirements [15A NCAC 02Q .0308(a)]

- f. Calculations of VOC emissions from all emission sources per month shall be made at the end of each month. The VOC emissions shall be calculated in a manner consistent with the calculation methodologies provided in the permit application (Application No. 1200205.20A). Emission factors used in the calculations for each source shall be appropriate for the soiled product that has been processed. All emission factors used shall be reviewed and approved by DAQ.
- g. Each calendar month, the Permittee shall calculate and record the VOC emissions for the previous month and the previous 12-month consecutive period to ensure compliance with Section 2.2 A.1.a. above. Monthly VOC emissions, in tons, from the industrial laundering operations shall be calculated as follows:
 - i. VOC emissions shall be determined from processing the soiled print/furniture towels and soiled shop towels, in tons, by the following equation and emission factors:

$$E = \frac{[(P \times EF_p) + (S \times EF_s)]}{month} * \frac{ton}{2,000 lb} = \frac{tons VOC}{month}$$

Where:

E = the total monthly VOC emissions from industrial laundering operations, in tons

P = the total weight of soiled print/furniture towels processed during the month by the facility, in 1,000 pounds

EF_p = the emission factor for soiled print towels processed by the facility, in pounds of VOC per 1,000 pounds of soiled print/furniture towels

S = the total weight of soiled shop towels processed during the month by the facility, in 1,000 pounds

EFs = the emission factor for soiled shop towels processed by the facility, in pounds of VOC per 1,000 pounds of soiled print/furniture towels

Note: The Permittee assumes Print and Furniture Towels are the same.

ii. VOC emission factors:

Type of Soiled Textile Laundered	VOC Emission Factors (lb/1,000 lb soiled)			
	Print Towel Washing	Print Towel Drying	Print Towel WWTP	Print Towel Total
Print/Furniture Towels	24.1	45.5	8.59	78.13
Shop Towels	Shop Towel Washing	Shop Towel Drying	Shop Towel WWTP	Shop Towel Total
	5.5	6.15	5.32	16.97

- h. The Permittee shall keep monthly records in a logbook (written or electronic format) of:
 - i. The monthly hours of operation of the laundering process, including WWTP;
 - ii. The total weight in pounds of all soiled print and shop towels processed by the facility on a daily basis;
 - iii. The monthly process rates and percent soiled product (i.e., print towels and shop towels).
- i. Calculations and the facility-wide VOC emissions shall be recorded monthly in a logbook (written or electronic format):
 - i. Consecutive 12-month rolling VOC emissions, in tons, shall be calculated by summing the monthly emissions as determined above, for the previous 12-month period to ensure compliance with Section 2.2 A.1.a. above.

The above records shall be recorded monthly in a logbook (written or electronic format), maintained on-site and made available to officials of the Division of Air Quality (DAQ), upon request. The Permittee must keep each entry in the log and all required records on file for a minimum of five years.

Reporting [15A NCAC 02Q .0508(f)]

- j. The Permittee shall submit a semiannual summary report of monitoring and recordkeeping activities given in Sections 2.2 A.1.f. through 2.2 A.1.i. above postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December, and July 30 of each calendar year for the preceding six-month period between January and June. The report shall contain the following:
 - i. The monthly hours of operation of the laundering process, including WWTP;
 - ii. The total weight in pounds of all soiled print and shop towels processed by the facility on a daily basis;
 - iii. The monthly process rates of each type of soiled product (i.e., print towels and shop towels);
 - iv. The monthly VOC emissions for the previous 17 months. The emissions must be calculated for each of the 12-month periods over the previous 17 months; and
 - v. All instances of deviations from the requirements of this permit must be clearly identified.
- Avoidance of 15A NCAC 02D .1112 112(G) CASE BY CASE MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY – Under Title III of the Clean Air Act, a major source is defined as any new or existing source with the PTE any single HAP at a rate greater than 10 tons per year and/or the PTE total combination of HAPs at a rate of greater than 25 tpy. HAP emissions, per the HAP list of Section 112 (Air Toxics) (b) List of Pollutants of the CAA, at these rates would classify the facility as a major source of HAPs. However, after taking the requested limits, the facility will be limited to no more than 10 tpy of any single HAP and no more than 25 tpy of total HAPs. Therefore, the facility

will be a Title III minor source and considered an area source under 40 CFR Part 63. Thus, no major source NESHAPs apply, or Case-by-Case MACT (Applicability of 02D .1112 discussed above).

The majority of the HAP emissions are from the washers, dryers, and WWTP. Some HAP emissions are from combustion (i.e., natural gas-fired boiler and dryers). In order to demonstrate compliance, the facility is required to record and report annually the monthly and 12-month totals of the amount and types of textiles laundered at the facility and the facility-wide total HAPs and individual HAP emissions. The facility will use the EFs proposed in the application (corrected total HAP EF) to calculate HAP emissions until site-specific testing is completed. Per the original application submittal received by RCO on January 15, 2020, Section 5.0 “Proposed Permit Limits”, the limiting production throughput factor is toluene. Processing of 100% print towels at the maximum lb/day throughput of the washing machines keeps the facility below PSD significance levels for VOC emissions (as calculated above). However, based on EFs proposed with the application, processing 100% print towels at the maximum throughput of the washing machines indicates that both single (toluene) and total combined HAP emissions exceed the Title V thresholds (as calculated below); thus, the requirement to track the total weight in pounds of all soiled print and shop towels processed by the facility on a daily basis is necessary to ensure compliance with the HAP avoidance limits in Kleen Tech’s draft permit.

Total HAP emissions based on the annual weight limit and 100% print towels are calculated below:

$$5,990,400 \frac{\text{lb soiled towels}}{\text{year}} * 11.3 \frac{\text{lbs HAP}}{1,000 \text{ lb}} \text{ soiled print towels} * \frac{\text{ton}}{2,000 \text{ lb}} = 33.8 \text{ tpy HAP}$$

$$5,990,400 \frac{\text{lb soiled towels}}{\text{year}} * 5.59 \frac{\text{lbs toluene}}{1,000 \text{ lb}} \text{ soiled print towels} * \frac{\text{ton}}{2,000 \text{ lb}} =$$

16.7 tpy toluene (largest single HAP)

Total HAP emissions based on the annual weight limit and 100% shop towels are calculated below:

$$5,990,400 \frac{\text{lb soiled towels}}{\text{year}} * 2.3 \frac{\text{lbs HAP}}{1,000 \text{ lb}} \text{ soiled shop towels} * \frac{\text{ton}}{2,000 \text{ lb}} = 6.9 \text{ tpy HAP}$$

$$5,990,400 \frac{\text{lb soiled towels}}{\text{year}} * 1.1 \frac{\text{lbs toluene}}{1,000 \text{ lb}} \text{ soiled shop towels} * \frac{\text{ton}}{2,000 \text{ lb}} =$$

3.3 tpy toluene (largest single HAP)

The HAP avoidance condition will contain a table for total HAP, toluene and other individual HAP EFs as discussed in detail under Section 7 above. The facility’s expected actual hours of operation are 3,016 hrs/yr. As summarized under Section 7 above, the expected actual HAP emissions are below the less than 10/25 tpy HAP avoidance limits.

In an effort to reduce monitoring, recordkeeping and reporting requirements for negligible sources (i.e., combustion from the dryers and boiler), the less than 10/25 tpy HAP avoidance limits have been reduced based on the worse-case PTE (refer to Section 7 above for calculations) as summarized below:

Emission Source(s)	PTE Total HAP Combustion	PTE Highest HAP Combustion	PTE Toluene Combustion
	(tpy)		
Natural Gas-fired Dryers (ID Nos. ES-002A through ES-002B)	0.088	0.0845	0.00018
Natural Gas-fired Boiler (ID No. ES-Boiler1)	0.0648	0.0618	0.00013
HAP emissions from combustion	0.153	0.146	0.00031
Safety Factor (PTE times 1.5)	0.23	0.22	0.000465

The adjusted HAP Avoidance limits (reduced by HAP combustion emissions) will be less than:

- 24.8 tpy total HAP; and
- 9.9 tpy for any single HAP.

Based on data submitted with the application, toluene is the largest single HAP. The limit of 10 tpy for any single HAP was adjusted based on the PTE of toluene from combustion; however, if this changes upon review of Kleen Tech's Initial Title V application submittal the limit maybe adjusted accordingly.

The following HAP Avoidance condition will be added to Kleen Tech's permit:

**2. 15A NCAC 02Q .0317: AVOIDANCE CONDITIONS
for Avoidance of 15A NCAC 02D .1112: 112(G) CASE BY CASE MAXIMUM ACHIEVABLE
CONTROL TECHNOLOGY**

- In order to remain classified a minor source for hazardous air pollutants and avoid applicability of this regulation, 15A NCAC 02D .1112, facility-wide emissions shall be less than the following limitations:
 - 24.8 tons per consecutive 12-month period of total, combined hazardous air pollutants; and
 - 9.9 tons per consecutive 12-month period of any individual hazardous air pollutant.

Testing [15A NCAC 02Q .0308(a)]

- If emission testing is required, the Permittee shall perform such testing in accordance with General Condition 17.
- Under the provisions of NCGS 143-215.108, the Permittee shall conduct a performance test to establish the appropriate HAP mass emission rates from all affected sources (**ID Nos. ES-001A through ES-001D, ES-002A through ES-002D and ES-003**) in accordance with a testing protocol approved by the DAQ.
 - Testing of the industrial laundering process shall be completed and the results submitted within 180 days of permit issuance **[XXXX, 2020]**, unless an alternate date is approved by DAQ.
 - Operating parameters or emission factors as specified in this permit do not apply during performance tests or emissions tests conducted in an attempt to establish new operating parameters or emission factors.
- The source shall be responsible for ensuring, within the limits of practicality, that the equipment or process being tested is operated at or near its maximum normal production rate, or at a lesser rate if specified by the Director or his delegate.

Production/Operational Limits [15A NCAC 02Q .0308(a)]

- e. To ensure compliance with the avoidance limit above, the production/operational limits in Section 2.2 A.1.e. above shall apply.

Monitoring/Recordkeeping Requirements [15A NCAC 02Q .0308(a)]

- f. Monitoring, recordkeeping, and reporting shall be performed in accordance with Sections 2.2 A.1.f. through 2.2 A.1.j. above using the following HAP emission factors (as proposed with Application No. 1200205.20A):
- i. Emission factors used in the calculations for each source shall be appropriate for the soiled product that has been processed. All emission factors used shall be reviewed and approved by DAQ.
- ii. Total HAP emission factors:

Type of Soiled Textile Laundered	Total HAP Emission Factors (lb/1,000 lb soiled)			
Print/Furniture Towels	Print Towel Washing	Print Towel Drying	Print Towel WWTP	Print Towel Total
	7.4	2.47	1.41	11.28
Shop Towels	Shop Towel Washing	Shop Towel Drying	Shop Towel WWTP	Shop Towel Total
	1.24	0.42	0.63	2.29

- iii. Toluene²⁸ emission factors:

Type of Soiled Textile Laundered	Toluene Emission Factors (lb/1,000 lb soiled)			
Print/Furniture Towels	Print Towel Washing	Print Towel Drying	Print Towel WWTP	Print Towel Total
	4.04	0.81	0.745	5.59
Shop Towels	Shop Towel Washing	Shop Towel Drying	Shop Towel WWTP	Shop Towel Total
	0.67	0.174	0.27	1.11

- iv. Other Individual HAP emission factors:

Type of Soiled Textile Laundered	Print/Furniture Towels				Shop Towels			
Pollutant	EF (lbs/1,000 lbs soiled textile)				EF (lbs/1,000 lbs soiled textile)			
	Washing	Drying	WWTP	Total	Washing	Drying	WWTP	Total
Ethylbenzene	0.49	0.198	0.093	0.78	0.031	0.022	0.03	0.083
Methyl isobutyl ketone	0.019	0.0044	0.0028	0.026	0.0021	0.00051	0.0011	0.004
Naphthalene	0.014	0.025	0.002	0.041	0.003	0.0024	0.0011	0.006
Perchloroethylene	0.066	0.0073	0.046	0.12	0.35	0.094	0.14	0.588
Styrene	0.011	0.0046	0.0016	0.017	0.0021	0.0012	0.0011	0.004

²⁸ Per the original application submittal received by RCO on January 15, 2020, Section 5.0 Proposed Permit Limits, the limiting production throughput factor is toluene.

Type of Soiled Textile Laundered	Print/Furniture Towels				Shop Towels			
Pollutant	EF (lbs/1,000 lbs soiled textile)				EF (lbs/1,000 lbs soiled textile)			
	Washing	Drying	WWTP	Total	Washing	Drying	WWTP	Total
Trichloroethene	0.014	0.0058	0.002	0.022	0.0072	0.0027	0.006	0.016
Xylene	2.75	1.41	0.52	4.68	0.18	0.12	0.18	0.478

15A NCAC 02Q .0504, Option for Obtaining Construction and Operation Permit

This application is being processed under the state construction and operating permit program in accordance with the procedures in 15A NCAC 02Q .0300 for a State/Greenfield Title V permit.

Pursuant to 02Q .0504(d), if the procedures in 15A NCAC 02Q .0300 are followed, the permittee shall have one year from the date of beginning operation of the facility or source to file an amended application following the procedures in this 15A NCAC 02Q .0500. The Director shall place a condition in the construction and operation permit stating this requirement.

In this case, the facility is currently operating without a permit. Issuance of this permit is the mechanism for bringing them back into compliance; hence, a complete Title V application will be required within one year of the permit effective date.

15A NCAC 02Q .0711, Toxic Air Pollutant Emission Rates Requiring a Permit – Any facility that emits a TAP listed in 15A NCAC 02Q .0711 based on its actual emission rate that exceeds its respective TAP permitting emission rates (TPER) must first obtain an air permit to emit the TAP(s). A permit to emit TAPs shall be required for any facility, excluding sources exempt from evaluation by 15A NCAC 02Q .0702. The exemptions in 02Q .0702 do not apply to the sources located at Kleen Tech's facility. The Permittee shall maintain at the facility records of operational information sufficient for demonstrating to DAQ staff that actual TAPs are less than the rate listed.

As discussed above, xylene exceeded its respective TPER; hence, a toxics analysis was required and the modelled emission rates will be added to Kleen Tech's permit. The following TAPs and actual emission rates were listed in the permit application, except n-hexane (emitted from combustion and laundering at similar sources), which was added to the summary table below:

Pollutant	CAS NO.	lb/hr	lb/day (14.5 hrs/day)	lb/yr (3,016 hrs/yr)
Methyl ethyl ketone (MEK or 2-Butanone)	78-93-3	0.0614	0.89	185.31
Methyl isobutyl ketone (MIBK) or 4-Methyl-2-pentanone or Hexon	108-10-1	0.023	0.33	69.47
n-Hexane*	110-54-3	0.03336	0.484	101.34
Perchloroethylene (PCE) or Tetrachloroethylene or Tetrachloroethene	127-18-4	0.113	1.64	340.76
Styrene	100-42-5	0.0154	0.22	46.46
Toluene**	108-88-3	4.99	72.40	15,050

Pollutant	CAS NO.	lb/hr	lb/day (14.5 hrs/day)	lb/yr (3,016 hrs/yr)
Trichloroethylene (TCE or Trichloroethene)	79-01-6	0.02	0.28	58.44

*Combustion emissions from dryers and boiler

**Process and combustion emissions

The permit will contain a 02Q .0711 TPER condition that includes the above TAPs.

9. NSPS, NESHAP (MACT or GACT), NSR/PSD, Attainment, 112(r), CAM

NSPS

The boiler at Kleen Tech is potentially subject to the following New Source Performance Standards (NSPS):

Subpart Dc—Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

As discussed under Section 8 above, the boiler is not subject to Subpart Dc because the boiler is less than 10 million Btu per hour.

NESHAPS/MACT

The Kleen Tech facility has the potential to emit more than 10 tons per year for a single HAP/25 tpy or more for total combined HAPs. The facility has requested limits to avoid being major for HAPs. Thus, the facility will be a Title III minor HAP source (refer to HAP Avoidance condition under Section 8 above).

The facility is potentially subject to the following area source MACT standard:

Subpart JJJJJ—National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

As discussed under Section 8 above, the boiler is not subject to Subpart JJJJJ.

NSR/PSD

A major stationary source under PSD rules is defined as any one of 28 named source categories in 40 CFR 51.166(b)(1)(i)(a) that has the potential to emit 100 tons per year of any regulated pollutant or any other stationary source that has the potential to emit 250 tpy of any PSD regulated pollutant (other than GHG). GHG emission sources are deemed major if they exceed the PSD threshold of 100,000 tons per year of GHG and are PSD major for another pollutant.

Kleen Tech is not one of the 28 named source categories. Therefore, potential emissions of PSD regulated pollutants (with the exception of GHG) must exceed 250 tpy for Kleen Tech to be considered a major PSD source. As shown above in Section 7, actual emissions of all PSD regulated pollutants (except GHG) are below the major source threshold of 250 tpy, and GHG emissions are below the major source threshold of 100,000 tpy. However, Kleen Tech's PTE of VOC emissions exceeds 250 tpy. The Permittee has requested limits to stay below NSR/PSD thresholds; thus, Kleen Tech will be a minor source under PSD (refer to PSD Avoidance condition under Section 8 above).

Attainment/Increment Tracking

Per 40 CFR § 81.334 – North Carolina: Burke County is considered an attainment/unclassifiable/better than national standards area with respect to ozone (O₃), PM, PM_{2.5}, CO, NO₂ or SO₂.

Burke County has not triggered increment tracking under PSD for any pollutant (PM₁₀, PM_{2.5}, SO₂, or NO_x (as NO₂)), so no tracking of emissions is required.

112(r)

Per Form A3 – 112(r) Applicability Information, the facility is not subject to 40 CFR Part 68 “Prevention of Accidental Releases” – Section 112(r) of the Federal Clean Air Act requirements because it does not store any of the regulated substances in quantities above the reporting thresholds in 112(r).

CAM

The CAM rule (40 CFR 64; 15A NCAC 02D .0614) applies to each pollutant specific emissions unit (PSEU) at major TV facilities that meets all three following criteria:

- the unit is subject to any (non-exempt: e.g. pre November 15, 1990, Section 111 or Section 112 standard) emission limitation or standard for the applicable regulated pollutant.
- the unit uses any control device to achieve compliance with any such emission limitation or standard.
- the unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source (i.e., 100 tons per year for criteria pollutants or 10/25 tons per year for HAPs).

Kleen Tech does not use any controls that are not integral to the process (e.g. dryer lint filters); therefore, CAM is not applicable to this facility.

10. Facility Wide Air Toxics

North Carolina G.S. 143-215.107(a)(5)(a) exempts certain emission sources subject to federal regulations – including sources subject to MACT standards – from NC Air Toxics regulations provided their emissions do not “present an unacceptable risk to human health,” in accordance with NC G.S. 143-215.107(a)(5)(b), as codified on May 1, 2014. There are no applicable MACT standards for industrial launderers; thus, a toxics evaluation and modeling analysis was required.

Based on the application submittal and a review of emission sources, the following TAPs are emitted from the facility:

Pollutant	CAS NO.
Methyl ethyl ketone (MEK or 2-Butanone)	78-93-3
Methyl isobutyl ketone (MIBK) or 4-Methyl-2-pentanone or Hexon	108-10-1
n-Hexane	110-54-3
Perchloroethylene (PCE) or Tetrachloroethylene or Tetrachloroethene	127-18-4
Styrene	100-42-5
Toluene	108-88-3
Trichloroethylene (TCE or Trichloroethene)	79-01-6
Xylene	1330-20-7

The application indicates the facilities actual hours of operation are 3,016 hours per year (hrs/yr). The most the facility can operate is 6,552 hrs/yr due to operational limits discussed under Section 7 above.

As previously discussed, emissions of xylene exceed the daily TPER specified in 15A NCAC 02Q.711(a). Modeling was submitted and a review performed by DAQ's AQAB. Per modeling Memorandum from Mark Yoder, AQAB, dated November 25, 2019 the modeling adequately demonstrates compliance on a source-by-source basis for xylene. Modeled emission rates will be placed in Kleen Tech's permit as discussed under 15A NCAC 02D .1100 in Section 8 above.

11. Public Notice

Public notice is not required for a permit for a greenfield facility issued under 15A NCAC 02Q .0504, "Option for Obtaining Construction and Operating Permit" if the procedures in 15A NCAC 02Q .0300 are followed.

However, for this Greenfield facility, the Director has decided to send the application and permit through a 30-day public notice and alerted the Environmental Justice Group of the new facility location. The EJ group reviewed and evaluated the location of this new facility and decided that an EJ report is not necessary based on their screen of the area in North Carolina.

30-day Public Notice: September XX, 2020 through October XX, 2020
XXXX comments were received during the 30-day comment period.

As previously stated, this permit will require Kleen Tech to submit a Title V permit application within one year of the effective date of this permit. At that time, a notice of the draft Title V Permit will be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period for the public, with an opportunity for a public hearing. Consistent with 15 A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period.

12. Conclusions/Comments/Recommendations and Other Regulatory Considerations

Professional Engineering Seal

A Professional Engineering Seal (PE Seal) is required for this application pursuant to 15A NCAC 02Q .0112 – Applications Requiring Professional Engineer Seal. A PE shall seal technical portions of air permit applications for new sources and modifications of existing sources as defined in 15A NCAC 02Q .0103 that involve:

- (1) design;
- (2) determination of applicability and appropriateness;
- (3) or determination and interpretation of performance; of air pollution capture and control systems.

The original application submittal was sealed by Ms. Garvon, Civil and Environmental Consultants, Inc. (NC PE Seal 036881) on October 14, 2019.

Zoning Consistency Determination

A consistency determination is required for this application pursuant to 15A NCAC 02Q .0507(d)(1) for a new facility. Since this industrial laundering facility has been constructed and currently operating without a permit, it is considered a Greenfield facility and requires a consistency determination in accordance with GS 143-215.108(f). The zoning request sent to Mr. Larry Johnson, Director, Planning and Community

Development Department, Town of Valdese on October 14, 2019 indicated the proposed operation is consistent with applicable zoning ordinances and was received with the application.

This application has been reviewed by DAQ to determine compliance with all procedures and requirements. The Division has determined that this facility appears to be or is expected to achieve compliance as specified in the permit with all applicable requirements.

A draft permit was provided to the Asheville Regional Office (ARO) on July 24, 2020. ARO responded with comments to the draft on August 12, 2020. All comments have been addressed.

A draft permit was provided to the applicant on August 18, 2020. The applicant responded with comments on August 31, 2020. All comments have been addressed. Comments not already addressed throughout this review and that required a more thorough response are summarized below:

The following comments were under the draft avoidance conditions (Section 2.2 A.1) for VOC and HAP (Section 2.2 A.2) emissions, in addition to the draft 02D .1100 toxics condition (Section 2.2 A.4):

Comments:

Kleen Tech requests that the throughput be revised from a daily to weekly basis. Production rates will be used to demonstrate compliance with the 12-month rolling avoidance conditions. Production rates will also be used to demonstrate compliance with TPERs (annual, daily and hourly) and the AAL for xylene (hourly).

Note that the modeled emission rate for xylene resulted in a modeled concentration of 51% of the AAL. As part of this review, Kleen Tech is requesting that the permitted emission rate be scaled up to 95% of the AAL (see comments on Section 2.2.A.4 below). Based on the compliance margin between the modelled emission rate and the maximum emission rate, Kleen Tech believes the weekly recordkeeping requirement is sufficient to demonstrate compliance with the applicable state-enforceable TAP requirements.

Modeling results indicate xylene is 51% of the annual AAL and toluene is 35% of the annual AAL; otherwise all other identified TAPs are less than 5% of the AAL. Based on the compliance margin between the modeled emission rate and the maximum emission rate, Kleen Tech believes that the weekly recordkeeping requirement is sufficient to demonstrate compliance with the applicable state-enforceable TAP requirements.

Response:

VOC and HAP avoidance conditions have separate requirements from toxics (TAP); however, to avoid redundancy, we are addressing them together.

Currently, we do not have site-specific test data for Kleen Tech. Hence, we do not know if the emission rates proposed in the application are representative due to the range of emission rates from these types of facilities and limited test data. DAQ suggests that the facility wait to optimize toxics after site-specific testing is performed (as required by this draft permit). Once site-specific testing is performed, both DAQ and the facility will know what the actual site-specific emissions are. After testing, DAQ can revise toxics emissions during the processing of Kleen tech's Initial Title V permit, if warranted. For now, to avoid holding up permit issuance further, especially since the facility is currently in noncompliance for operating without a permit, DAQ plans to proceed with draft the permit for public notice with the xylene emission rates in the draft permit. The xylene emission rates in the draft permit are from the air toxics modeling analysis prepared by Kleen Tech's consultant and reviewed for compliance on a source by source basis by AQAB (refer to discussion under 02D .1100 toxics above). Since Kleen Tech is not a

MACT source (refer to discussion under 02Q .0317 HAP avoidance above), toxics that exceed their respective TPERs must be evaluated to ensure they are not emitted in quantities that may cause or contribute to any significant ambient air concentration that may adversely affect human health. The facility's request to optimize toxics would require the facility to remodel (i.e., a new toxics dispersion modeling analysis), emission rates be rechecked and maximum impacts approved by AQAB, which will further delay permit issuance.

The proposed 02Q .0317 avoidance and 02D .1100 conditions are consistent with other Title V fee class permitting requirements for Greenfield facilities. Since this is a Greenfield facility with no established compliance history, the conditions were drafted based on regulatory guidance as follows:

Per 15A NCAC 02D .1105 (toxics) facility reporting, recordkeeping; pursuant to 15A NCAC 02D .0600. Per 15A NCAC 2D .0605(b), authority by NCGS 143-215.65 (excerpt below).

Pursuant to 15A NCAC 02Q .0317(b) (VOC and HAP) the Director may require the monitoring, recordkeeping, and reporting necessary to assure compliance with the terms and conditions in the permit that includes an avoidance condition. Authority by NCGS 143-215.65 (excerpt below).

Thus, the request to change from daily to weekly monitoring and recordkeeping requirements for VOC, HAP and TAP emissions is denied at this time. On a case-by-case basis, requirements may be less frequently than daily and quarterly for facilities that have demonstrated a good compliance history, if the regional office is in agreement.

§ 143-215.65. Reports required.

All persons subject to the provisions of G.S. 143-215.1, 143-215.108, or 143-215.109 who discharge wastes to the waters or emit air contaminants to the outdoor atmosphere of this State shall file at such frequencies as the Commission may specify and at least quarterly reports with the Commission setting forth the volume and characteristics of wastes discharged or air contaminants emitted daily or such other period of time as may be specified by the Commission in its rules. Such reports may be required less frequently than quarterly for any permit for a minor activity as defined in G.S. 143-215.1(b)(4)d. and e. Such reports shall be filed on forms provided by the Department and approved by the Commission and shall include such pertinent data with reference to the total and average volume of wastes or air contaminants discharged, the strength and amount of each waste substance or air contaminant discharged, the type and degree of treatment such wastes or air contaminants received prior to discharge and such other information as may be specified by the Commission in its rules. The information shall be used by the Commission only for the purpose of air and water pollution control. The Department shall provide proper and adequate facilities and procedures and the Commission shall adopt rules to safeguard the confidentiality of proprietary manufacturing processes except that confidentiality shall not extend to wastes discharged or air contaminants emitted.

ARO recommends issuance of the permit and was presented with a DRAFT permit prior to issuance.

RCO concurs with ARO's recommendation to issue this State/Greenfield permit.

Issue Permit **010647R00**