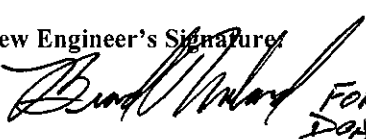


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| NORTH CAROLINA DIVISION OF AIR QUALITY Application Review | | Region: Wilmington Regional Office County: New Hanover NC Facility ID: 6500356 Inspector's Name: Linda Willis Date of Last Inspection: 07/30/2020 Compliance Code: 3 / Compliance - inspection |
| Issue Date: September 29, 2021 | | |
| Facility Data Applicant (Facility's Name): Ecolab, Inc. Facility Address: Ecolab, Inc. 2202 Burnett Boulevard Wilmington, NC 28402 SIC: 7342 / Disinfecting And Exterminating NAICS: 56171 / Exterminating and Pest Control Services Facility Classification: Before: Synthetic Minor After: Syn Minor Fee Classification: Before: Synthetic Minor After: Syn Minor | | Permit Applicability (this application only) SIP: X NSPS: NESHAP: PSD: PSD Avoidance: NC Toxics: X (methyl bromide, phosphine) I12(r): Other: |
| Contact Data | | Application Data |
| Facility Contact James Fealey Regional Manager (919) 809-2989 2202 Burnett Blvd Wilmington, NC 28402 | Authorized Contact John Achzet Regional Manager, Eastern Region (302) 218-6375 53 McCullough Dr New Castle, DE 19720 | Technical Contact James Fealey Regional Manager (919) 809-2989 2202 Burnett Blvd Wilmington, NC 28402 |
| | | Application Number: 6500356.20A Date Received: 11/23/2020 Application Type: Modification Application Schedule: State Existing Permit Data Existing Permit Number: 10313/R02 Existing Permit Issue Date: 11/03/2020* Existing Permit Expiration Date: 05/31/2018 |
| Review Engineer: Dean Carroll Review Engineer's Signature:  Date: 9/29/21 FOR DEAN CARROLL | | Comments / Recommendations: Issue: 10313/R03 Permit Issue Date: September 29, 2021 Permit Expiration Date: August 31, 2029 |

* Name change only not renewal

1. Application Summary

Ecolab, Inc. submitted a permit modification application on 11/23/2020 to incorporate requirements of the recently promulgated rule 15A NCAC 2D .0546 for fumigation of logs with methyl bromide (.0546) and to incorporate the fumigation of other commodities with the use of phosphine. The facility was previously permitted under Air Quality Permit 10313R02 issued on 11/03/2020 and was operating under a permit renewal application shield per NCGS 150B-3(a) based on a renewal application submitted on February 16, 2018 (App. 6500356.18A). With this application the facility has requested to remain a synthetic minor (methyl bromide is a HAP) and to add the applicability of .0546. No insignificant activities as defined by 02Q .0102 were included in the application. Ecolab, Inc. will be fumigating logs and other commodities in containers using methyl bromide and phosphine. A second fumigation operation of other commodities is being proposed in a cold storage / enclosed warehouse under tarpaulins. These fumigation operations are being conducted at the NC State Port of Wilmington utilizing two 40-foot tall, 20 inch by 20 inch square stacks. Modeling was submitted with the application to demonstrate compliance with 02D .0546. The permit renewal application mentioned above is also being incorporated in this proposed permit revision.

DAQ Washington Regional Office (WaRO) is also processing a permit application (9600280.20A) for Flowers Timber Company, Inc. for methyl bromide and phosphine fumigation. The Flowers permit for bulk log and other commodity fumigation located in Seven Springs, NC will be issued consistent with the Ecolab permit format issued by WiRO.

2. Application Chronology

| | | |
|-----------------------------|------------|---------------|
| Application received | 11/23/2020 | |
| Add info request | 01/08/2021 | Recvd 1/19/21 |
| Add info request | 01/21/2021 | Recvd 2/5/21 |
| Add info request | 02/11/2021 | Recvd 4/29/21 |
| Add info request | 05/14/2021 | Recvd 7/14/21 |
| Public Hearing | 08/31/2021 | |
| Hearing Officer's Report | 09/27/2021 | |
| Director's transmittal memo | 09/27/2021 | |
| Permit signed | 09/29/2021 | |

3. Process and Regulatory Review

Ecolab, Inc. proposes to conduct pest fumigation of logs (with methyl bromide) and other commodities (with phosphine) in shipping containers on leased property at the NC State Port - Wilmington. The fumigation of logs will take place in a location on the property that has been previously permitted for log fumigation and which is dictated by the modeling analysis demonstrating compliance with .0546. Methyl bromide is a volatile organic compound (VOC), a federal hazardous air pollutant (HAP), and a North Carolina toxic air pollutant (TAP). Phosphine is not a VOC but is both a HAP and a TAP.

Per the USDA requirements and recommendations, the logs will be loaded into shipping containers. Fans, monitoring lines, and gas lines will be placed amid the stacked logs. With one door closed, a plastic "aeration barrier" will be affixed in the remaining door opening utilizing magnets. The aeration barrier will stop 8 inches down from the top of the opening leaving a space which will serve as the air intake during aeration which occurs later in the process. The doors of the containers will then be closed and sealed utilizing existing door gaskets. Monitoring lines and gas introduction lines will penetrate between the gasketed door frame and the door. Spray adhesive and plastic tape will be utilized to seal any potential sources of fugitive emissions from the containers and methyl bromide cylinders will be used to inject the gas. The amount of gas that is used for each fumigation will be determined by weighing the cylinder on a scale before, during, and after gas application.

The logs in the containers will be left alone for 16 to 72 hours to ensure complete exposure prior to aeration. With the aeration blower turned on, a technician will then open the door where the aeration barrier was installed and lift the plastic, inserting the suction duct under the plastic barrier which will then be tucked around the duct to minimize any potential leaking. Air will enter the container thru the 8 inch opening left at the top of the aeration barrier. The containers will then be aerated using fans that pull the residual fumigant through horizontal flexible ductwork to a vertical ventilation stack 40 feet high and 2 feet in "equivalent diameter" as indicated in the modeling run (20"x20" square actual size). The concentrations of fumigant in

the containers will be monitored with USDA approved equipment and methods. When the concentrations in the containers are at or below the acceptable level set by the USDA, the doors may be opened. Monitoring device(s) will be used to check for methyl bromide concentrations outside the containers (fugitive emissions) during the activities described above. Any detection of fumigant requires immediate corrective action and monitoring.

Other commodity fumigation will also take place in shipping containers utilizing phosphine. Fumicells (solid phosphine tablets) and/or Eco2fume (gaseous phosphine in cylinders) will be utilized. When used, Fumicells will be opened at the start of the aeration and placed inside the containers. Solid phosphine does not immediately volatilize, leaving time for the operator to set the plastic aeration barrier and close the container door. Eco2Fume will be introduced into the container from a pressurized cylinder in a manner identical to the introduction of methyl bromide. The fumigation and aeration portions are also performed in an identical manner to the log container fumigation described above.

Fumigation of commodities (primarily imported produce) will be conducted in a cold storage facility yet to be constructed on the Port. Inside the cold storage facility, commodities will be placed on pallets and covered by an imperious tarp which is secured to the concrete floor utilizing sand snakes and/or spray adhesive and impervious tape. Fans, monitoring lines, and gas lines will be placed amid the commodity under the tarp. Methyl bromide cylinders will be used to inject the gas. The amount of gas that is used for each fumigation will be determined by weighing the cylinder on a scale before, during, and after gas application. Monitoring device(s) will be used to check for methyl bromide concentrations outside of the tarped commodity (fugitive emissions) during application of fumigant and aeration. Any detection of fumigant requires corrective action and monitoring.

After an exposure period dictated by the commodity and USDA, the tarped “bulk pile” will be aerated. A blower is attached to duct work exiting a port in the side of the cold storage building and attached to a vertical ventilation stack 40 feet high and 2 feet in “equivalent diameter” as indicated in the modeling run (20”x20” square actual size). Next, the blower is placed next to the pile, and the tarp is lifted and draped over the blower and the sand snakes are placed on top of the blower extending down its sides and additional sand snakes are placed along the floor and against the bottom edges of the blower creating a seal around the blower. The blower is turned on and once a suction is created on the pile, the opposite end of the tarp is lifted enough to facilitate an air intake to the pile which creates enough vacuum to minimize and/or prevent leaks. The concentrations of fumigant in the bulk pile will be monitored with USDA approved equipment and methods. When the concentrations in the bulk pile are at or below the acceptable level set by the USDA, the tarp may be removed. This second emission source will utilize a second stack with the same dimensions, height, flow, and velocity as that used to aerate containers. It’s location and those parameters are dictated by modeling inputs showing compliance with 2D .0546.

The following sources will be described in the permit:

| Emission Source ID | Emission Source Description | Control System ID | Control System Description |
|---------------------------|--|--------------------------|-----------------------------------|
| ES-1 | One log fumigation process in shipping containers utilizing methyl bromide and one fumigation process in | N/A | N/A |

| | | | |
|------|--|-----|-----|
| | shipping containers using phosphine. Emissions exhausted to an aeration tower stack 40 feet in height and 20 inches by 20 inches square discharge or equivalent surface area. (Hours of operation {aeration} for ES-1 are 8 a.m. to 6 p.m. only.) | | |
| ES-2 | one bulk fruit fumigation process inside a cold storage building and under a tarpaulin utilizing methyl bromide. Emissions exhausted to an aeration tower stack 40 feet in height and 20 inches by 20 inches square discharge or equivalent surface area. (Hours of operation {aeration} are 10 p.m. to 2 a.m. only.) | N/A | N/A |

The following are the applicable DAQ regulations for this facility:

02D .0202 “Registration of Air Pollution Sources”

This Rule gives the Director the authority to require the registration of air pollution sources, and to require the facility to submit information about the source. It is under this Rule that the Division is requiring facilities to submit an emissions inventory 90 days before a permit expires. Permits are effective for a period of 8 years, so Ecolab, Inc. will be required to submit a 2027 emissions inventory prior to the permit expiration date of August 31, 2029.

02D .0521 “Control of Visible Emissions”

Each emission source at the facility is subject to this regulation. It does not apply to visible emissions generated during startup, shut down, or malfunctions approved under 15A NCAC 02D .0535. Visible emissions are limited to 20% opacity or less when averaged over a six-minute period. One exceedance in an hour is acceptable (if less than 87%), up to four times in a 24-hour period. No visible emissions are expected from the fumigation operations.

02D .0535 “Excess Emissions Reporting and Malfunctions”

The facility is required to report excess emissions which last for more than four hours and result from a malfunction, a breakdown of process or control equipment or any other abnormal conditions. Any excess emissions that do not occur during start-up or shutdown are considered a violation of the applicable standard unless the facility demonstrates to the Director that the excess emissions are the result of a malfunction.

02D .0540 “Particulates from Fugitive Dust Emission Sources”

This rule requires the facility to prevent fugitive dust emissions from causing or contributing to substantive complaints or excess visible emissions beyond the property boundary. Fugitive dust is particulate from processes that do not pass through a stack or vent. Examples of fugitive dust are unloading areas, stockpiles, parking lots, and facility haul roads. If substantive complaints or excessive fugitive dust emissions are observed beyond the property boundaries for six minutes in any one hour (using Reference Method 22 in 40 CFR, Appendix A), the facility may be required to submit a fugitive dust plan as described in 02D .0540(f).

02D .1806 "Control and Prohibition of Odorous Emissions"

This Rule states that the permittee shall not operate the facility without implementing management practices that prevent objectionable odors from going beyond the facility property boundaries. See A.8. Methyl bromide and pure phosphine are reportedly odorless however, "technical grade" phosphine is reported to have a strong fishy odor. No odors are anticipated and if present would be considered an indication of potential compliance issues with this and other permit requirements.

02D .0546 "Control of Emissions from Log Fumigation Operations."

This Rule applies to new, existing, and modified bulk, chamber, and container log fumigation operations that use a hazardous air pollutant or toxic air pollutant as a fumigant. Per paragraph (d) in the rule, Emission Control Requirements: The owner or operator of a log fumigation operation shall comply with the Toxic Air Pollutant Guidelines specified in 15A NCAC 02D .1104 and follow the procedures specified in 15A NCAC 02D .1106, 15A NCAC 02Q .0709, and .0710. This new regulation became effective on November 1, 2020 and required an application demonstrating compliance within 60 days. While the last full compliance inspection was conducted on July 30, 2020, a compliance audit was conducted on January 13, 2021 which verified that a stack with the appropriate height and apparent velocity requirement were being employed to comply with the proposed modeling inputs which demonstrated compliance with .0546. The initial application demonstrating compliance with .0546 was submitted within 60 days on November 23, 2020. While the initial application was submitted on November 23, 2020, it had significant deficiencies and after numerous additional information requests it was deemed complete on July 14, 2021. Below is the text of the newly promulgated rule:

(a) Purpose. The purpose of this Rule is to establish emission control requirements for hazardous air pollutants and toxic air pollutants from log fumigation operations.

(b) Definitions. For the purpose of this Rule, the following definitions and definitions in this Subchapter or 15A NCAC 02Q apply: (1) "Bulk or tarpaulin log fumigation" means the fumigation of logs that are placed in piles on an impermeable surface and covered with a weighted-down tarpaulin. (2) "Chamber log fumigation" means the fumigation of logs inside a sealed building or structure that is specifically used for fumigation. Chambers used for fumigation may be either atmospheric or vacuum type. (3) "Container log fumigation" means the fumigation of logs inside a container where the doors of the container are closed and sealed. (4) "Fumigant" means the hazardous air pollutant or toxic air pollutant that is used to eliminate the pests within the logs. (5) "Fumigation operation" means the period of time that the fumigant is injected and retained in the container, chamber, or bulk piles for the purposes of treating the logs for insects and other pests to prevent the transfer of exotic organisms. (6) "Hazardous air pollutant" means any pollutant listed under Section 112(b) of the federal Clean Air Act in 42 U.S.C. 7412(b). (7) "Public right-of-way" means an access area where people can reasonably be expected to be present for any or all parts of a 24-hour period. (8) "Toxic air pollutant" means any of the carcinogens, chronic toxicants, acute systemic toxicants, or acute irritants that are listed in 15A NCAC 02D .1104.

(c) Applicability. This Rule applies to new, existing, and modified bulk, chamber, and container log fumigation operations that use a hazardous air pollutant or toxic air pollutant as a fumigant.

(d) Emission Control Requirements. The owner or operator of a log fumigation operation shall comply with the Toxic Air Pollutant Guidelines specified in 15A NCAC 02D .1104 and follow the procedures specified in 15A NCAC 02D .1106, 15A NCAC 02Q .0709, and .0710.

(e) The owner or operator shall post signs notifying the public of fumigation operations. The signs shall be visible and legible to the public at the fence or property line closest to any public right-of-way. The signs shall remain in place at all times and shall conform to the format for placards mandated by the federally approved fumigant label.

(f) Monitoring, Recordkeeping and Reporting. The owner or operator of a bulk, chamber, or container log fumigation operation shall comply with the requirements pursuant to 15A NCAC 02D .0600: (1) The owner or operator shall send an initial notification of commencement of operations to the appropriate Division of Air Quality regional office within 15 days of initial fumigation start-up. (2) The owner or operator shall submit a quarterly summary report, with the original signature of the permittee or the authorized responsible official, of the monitoring and recordkeeping activities postmarked no later than 30 days after the end of each calendar year quarter. The report shall contain the following: (A) the company name, address, and facility ID number; (B) the calendar year quarter represented by the report; (C) the daily and total fumigant usage in pounds for each quarter; (D) a summary of the monitoring data required by the permit that was collected during the quarter; and (E) a summary of exceedances from the levels established in the permit that occurred during the quarter of any monitoring parameters.

(g) Compliance Schedule. The owner or operator of an existing log fumigation operation subject to this Rule shall achieve compliance within 60 days after the Rule is effective or in accordance with an alternate compliance schedule approved by the Director. In establishing an alternate compliance schedule, the Director shall consider whether the compliance approach chosen by the facility involves the purchase and installation of a control device. New and modified facilities shall achieve compliance with this Rule upon start-up.

15A NCAC 02D .1104 TOXIC AIR POLLUTANT GUIDELINES –

Emission limits in the toxics table below shall not be exceeded. Ecolab, Inc. submitted a toxic air pollutant dispersion modeling analysis dated July 8, 2021 for the facility's toxic air pollutant emissions. The modeling analysis was reviewed and approved by the DAQ Air Quality Analysis Branch (AQAB) on July 23, 2021. Placement of the emission sources, configuration of the emission points, and operation of the sources shall be in accordance with the approved dispersion modeling analysis and should reflect any changes from the original analysis submittal as outlined in the AQAB review memo. Below are the emissions limits established via modeling which demonstrate compliance with 2D .0546. In addition, modeling was submitted which demonstrates compliance with the Phosphine hourly AAL established in 15A NCAC 2D .1104. More detail regarding how stack emissions were modeled and what fugitive emissions were assumed is presented in Section 6 of this review “Emissions Review”.

| Affected Source | Toxic Air Pollutant | Emission Limit | 2D .1104 AAL | % of the AAL |
|---------------------------|---------------------|----------------|-------------------------|--------------|
| ES-1 (logs) in containers | Methyl Bromide | 2,234 lb/day | 1.0 mg/m ³ | 99.7% |
| ES-1 (logs) in containers | Methyl Bromide | 20,000 lb/yr* | 0.005 mg/m ³ | 94.4% |

| | | | | |
|------------------------------|-----------|-----------|------------------------|-------|
| ES-1 (tobacco) in containers | Phosphine | 2.5 lb/hr | 0.13 mg/m ³ | 98.6% |
|------------------------------|-----------|-----------|------------------------|-------|

* 20,000 lb/yr is 10 ton/yr; this is a NC toxics limit. The facility also has a 10 ton/yr methyl bromide synthetic minor limit (rolling total) in permit condition A.7.

| Affected Source | Toxic Air Pollutant | Emission Limit | 2D .1104 AAL | % of the AAL |
|----------------------------|---------------------|----------------|-------------------------|--------------|
| ES-2 (fruit) in bulk piles | Methyl Bromide | 400 lb/day | 1.0 mg/m ³ | 99.7% |
| ES-2 (fruit) in bulk piles | Methyl Bromide | 9,500 lb/yr | 0.005 mg/m ³ | 94.4% |

This permit condition (A.6. for 2D .1104) is 15 pages long in the permit document and covers the main topics described below. The main purpose of the following permit conditions is to achieve consistency between assumptions used in the dispersion modeling analysis and actual operations with a focus on limiting fugitive emissions and insuring stack parameters in the model are met:

- | | |
|--|--|
| 1. <u>Fumigation Preparation for Containers</u> | 1. <u>Fumigation for bulk piles</u> |
| 2. <u>Container Fumigation</u> | 2. <u>Bulk pile fumigation</u> |
| 3. <u>Leak Detection and Repair Program (LDAR)</u> | 3. <u>LDAR</u> |
| 4. <u>Exhaust Stack for Containers</u> | 4. <u>Exhaust Stack for bulk piles</u> |
| 5. <u>Aeration</u> | 5. <u>Aeration</u> |
| 6. <u>Opening Containers</u> | 6. <u>Removing the tarpaulins</u> |

02Q .0315 “Synthetic Minor Facilities”

Methyl bromide and phosphine are listed as Hazardous Air Pollutants (HAP). Since there is no physical bottle-neck other than available acreage on the property, Ecolab, Inc. could potentially exceed 10 tons per year of methyl bromide or phosphine emissions. It is unlikely phosphine emissions would approach this limit due to the NC toxics hourly limit however, in an abundance of caution, tracking and reporting of phosphine is included in this federally enforceable limit. The applicant has requested a synthetic minor limit of 10 tons per year for each fumigant to avoid having to submit an application for a Title V permit.

The synthetic minor condition (A.7.) will be exactly the same as that in the Washington Flowers permit (Permit Number 10549R01):

4. NSPS, NESHAPS, PSD, Attainment Status, and 112r

- **NSPS** – No NSPS Subpart is applicable to the permitted sources.
- **NESHAPS** – No NESHAP subpart is applicable to the permitted sources.
- **PSD** - This facility is minor for PSD. New Hanover County has been triggered for increment tracking for NOx (NO₂), PM10, and SO₂. NOx and SO₂ are both 0.0 lbs/hr (based on 2,080 hrs/yr operation). PM10 actual emissions in this revision are also 0.
- **Attainment Status** - This facility is in an attainment area.

- **112r** - The facility has not indicated it handles, stores, or uses any 112R pollutants in sufficient quantities to be subject to this regulation.
- **NC Toxics** - Methyl Bromide and Phosphine are North Carolina toxics as defined in 15A NCAC 02D .1104

5. Facility Compliance Status

The facility was inspected on 7/30/2020 by Linda Willis at which time “The facility appeared to operate in compliance with all applicable air quality regulations and permit conditions at the time of inspection.” In addition to that audit, a compliance audit was conducted on January 13, 2021 which verified that a stack with the appropriate height and apparent velocity were being employed to comply with the proposed modeling submitted with the application which demonstrated compliance with 2D .0546.

6. Emissions Review

15A NCAC 02D .0546 requires Ecolab to demonstrate compliance with the Toxic Air Pollutant (TAP) Acceptable Ambient Levels (AAL) for log fumigation. Phosphine is also a TAP, so compliance must be demonstrated with its AAL. The fumigation monitoring, recordkeeping, and reporting conditions created in this permit revision are based on requirements of the 02D .0546 rule and work practices provided by the United States Department of Agriculture’s Animal and Plant Health Inspection Service (USDA APHIS) fumigation treatment manual. Ecolab, Inc. also provided Standard Operating Procedures (SOP) on April 14, 2021, which were considered as part of the application and were used to help inform the permit conditions. The permit conditions were drafted to ensure compliance with 02D .0546 and 02D .1104.

The applicant redid the original modeling analysis for ES-1 using an assumed fugitive emission rate of 5% during the aeration period (8am-6pm) and an assumed fugitive emission rate of 1% for the remaining hours in a 24 hr period for both fumigants permitted. Fugitive emissions could come from: the container door seals, piping, or when the container doors are opened for aeration. The revised modeling analysis for ES-2 assumed a fugitive emission rate of 1% from 6pm to 6am which also covers the allowed aeration hours of 10pm to 2am. A condition was added which prohibits fumigated commodities awaiting aeration on site outside of those hours.

In this permit, the DAQ is requiring Ecolab, Inc. to follow a Leak Detection and Repair (LDAR) program to minimize the amount of fugitive emissions from any leaks around the log containers or from other commodities (fruit / tobacco fumigation).

Ecolab, Inc. submitted the final toxic air pollutant dispersion modeling analysis on July 8, 2021 for the facility's toxic air pollutant emissions (which included the fugitive emissions described above). The modeling analysis was reviewed and approved by the DAQ Air Quality Analysis Branch (AQAB) on July 23, 2021. Placement of the emission sources, configuration of the emission points, and operation of the sources shall be in accordance with the approved dispersion modeling analysis and should reflect any changes from the original analysis submittal as outlined in the AQAB review memo.

As part of the application, Ecolab, Inc. shall only actively aerate between 8 am and 6 pm for ES-1. The fumigation process shall utilize a single stationary 40-foot-tall, 20 inch X 20 inch square

or equivalent stack in accordance with design specifications used in the modeling analysis conducted on 07/23/2021 (memo attached). ES-2 hours of aeration shall be 10 pm to 2 am only.

The application submitted by Ecolab, Inc. has both fumigation of logs in containers using Methyl Bromide and other commodities in containers using Phosphine in ES-1. Each of the fumigants have been addressed in the modeling and in the conditions of the permit. Commodity (produce) fumigation under a tarp inside a cold storage facility was also applied for in ES-2.

Ecolab, Inc. has daily limits of 2,234 lb/day and 10 tons/year annual limits for Methyl Bromide and has a limit of 2.5 lbs/hr for Phosphine. Ecolab, Inc. is also limited to 10 tons/year for each fumigant in order to remain a synthetic minor.

7.

The Director of the Division of Air Quality determined there would be sufficient public interest in this permit application, so a public comment period began on July 30, 2021, culminating in a virtual Public Hearing for the draft Ecolab permit August 31, 2021, starting at 6:05 PM. The public comment period ended on September 2, 2021. Eleven commenters spoke at the hearing and two commenters left verbal comments on the voice mailbox designated for comments. Thirty Nine written comments were also submitted.

All comments received during the public comment period, both oral and written, have been evaluated by the Hearing Officer and copies of all written comments and any attachments to those written comments can be made available by the DAQ upon request. All comments were given equal consideration, whether they were written or made verbally at the August 31, 2021, virtual Public Hearing.

The Hearing Officer submitted his report to the Director on September 27, 2021. The Director issued a Transmittal Memo to Brad Newland, Regional Supervisor, confirming the recommendations of the Hearing Officer to issue the permit with modifications.

The following modifications were recommended to draft Air Quality Permit No. 10549R01:

- The test deadlines in Permit Conditions A.6.A.5.a.v and A.6.B.5.a.iv should be changed to 90 days.
- The DAQ/WIRO should review the text of Permit Condition A.5 of the draft Air Quality Permit, ensure it is grammatically correct and consistent with the regulatory intent 15A NCAC 2D .0546 “Control of Emissions from Log Fumigation Operations,” and make any necessary changes.
- Permit Conditions A.6.A.5.a.ix and A.6.B.5.aA.viii should be revised to allow for the test run with the lowest average total pressure be used to demonstrate compliance, provided that compliance with the minimum velocity and flow are met.
- The DAQ/WIRO should change references to “bulk fruit” in the equipment list and permit conditions of the draft Air Quality Permit to instead reference “bulk perishable commodity.”

- The units in Permit Condition A.6.A.2.b.iv should be changed from cubic meters to cubic feet.
- The DAQ/WIRO should revise Permit Conditions A.6.A.3.a.ii, A.6.A.6.a.i, A.6.B.3.a.ii, and A.6.B.6.a.i to remove the detection limit and require use of USDA-recommended instrumentation that will detect and analyze fumigant gases.
- A reference to Section 8.3.2 of Method 21 of 40 CFR part 60, Appendix A should be incorporated into the LDAR requirements of the draft Air Quality Permit (Conditions A.6.A.3 and A.6.B.3).
- Permit Conditions A.6.A.3.c.iv and A.6.B.3.c.iv should be revised to require a leak check at the onset and end of fumigant addition.
- Permit Condition A.6.A.3.c.v related to recirculation fans should be removed.

8. Comments and Recommendations

- The draft permit underwent public notice and a virtual public hearing to ensure that all interested parties had a chance to comment on the draft. The recommendations made by the Hearing Officer are incorporated into the draft permit
- Recommend issuance of Permit 10313R03 to Ecolab, Inc., located in Wilmington, NC.

DIVISION OF AIR QUALITY
July 23, 2021

MEMORANDUM

TO: Dean Carroll, Permit Coordinator, WIRO

FROM: Matthew Porter, Meteorologist, Air Quality Analysis Branch (AQAB)

THROUGH: Tom Anderson, Supervisor, AQAB

SUBJECT: Review of Dispersion Modeling Analysis Ecolab Port of Wilmington
Facility ID: 6500356
Permit Application ID: 6500356.20A – MOD – 300
Wilmington, NC New Hanover County

I have reviewed the revised dispersion modeling analysis, received July 8, 2021 for the fumigation activities owned and operated by Ecolab, Inc. located at the Port of Wilmington, New Hanover County, North Carolina. The modeling was conducted to evaluate ambient impacts from proposed emission limits representing log fumigation and fruit emission activities at the facility in accordance with 15A NCAC 02D .0546 Control of Emissions from Log Fumigation Operations. Revisions to the modeling include assumptions related to passive fumigation leakage and active aeration leakage rates from log containers and fruit tarps. The modeling demonstration shows compliance with the guidelines specified in 15A NCAC 2D .1104 for the Toxic Air Pollutants (TAPs) methyl bromide and phosphine on a source-by-source basis.

Modeled point source and volume source release parameters are provided in the attached Tables A1 and A2, respectively. TAP emissions modeled for each source are shown in the attached Table A3. The modeling demonstration included six point sources and one volume source.

The log fumigation modeling scenario included one point source (ES1) and one volume source (ES1LEAK) located on the central eastside of the property. ES1 represents active aeration emissions from log fumigation containers through a stack ducting methyl bromide and phosphine emissions 8am-6pm. ES1LEAK represents fugitive fumigant leaks from the tall-boy log container opening. ES1LEAK was co-located with ES1 and represented hourly fumigant 1% and 5% leak emissions assumed during active aeration and passive fumigation (6pm-8am) operations, respectively. The hourly leakage rate percentages were derived from the daily and annual total aeration limits proposed.

The fruit fumigation modeling scenario included one stack point source (ES2) and four rooftop vent point sources (ES2LEAK1-4) located at a warehouse on the west side of the property on the waterfront. Active aeration emissions were modeled from ES2 10pm-2am. Fugitive fumigant leak emissions were modeled from the rooftop vents 6pm-6am. The hourly leakage rate percentages were derived from the daily and annual total aeration limits proposed.

The 'HROFDAY' emission factor option in AERMOD was used to represent active aeration and passive fumigation daily operating scenarios for both log and fruit fumigation activities. Model parameters used for point and volume sources were generally found to follow NC DAQ

modeling guidelines. The active aeration and passive log and fruit fumigation daily operating scenarios were modeled 365 days per year for each year of the 5-year meteorological data period.

AERMOD (version 21212) was applied with five years (2014-2018) of Wilmington Airport surface meteorology and Morehead City vertical profile data (upper air) to evaluate impacts in both simple and complex terrain. AERMET (version 18081) was used to process the airport surface and upper air data to generate vertical meteorological and atmospheric turbulence profiles for hourly AERMOD dispersion modeling calculations. AERMET processing included the regulatory default option for adjusted friction velocity which improves model performance for low-wind, stable boundary layer conditions. The AERMET processing was conducted by NC DAQ and emailed to the applicant. Direction-specific building downwash parameters, calculated using EPA’s BPIP-PRIME program (04274), were used as input to AERMOD to determine building downwash effects on plume rise and effects on entrainment and dispersion of stack emissions into the cavity and turbulent wake zones downwind of existing buildings. The building downwash analysis included the fruit fumigation warehouse building and five associated point sources. Receptors were modeled around the facility property lines at 25-meter intervals. Gridded receptors were modeled approximately 2.5 km from the property line with 100-meter spacing. In all, a total of 2,088 receptors were modeled. Source and receptor elevations and receptor dividing streamline heights were calculated from 1-arc-second resolution (~30-meter) USGS NED terrain data using the AERMOD terrain pre-processor AERMAP (version 18081). All model sources and receptors were geo-located within the modeling domain based on the horizontal North American Datum of 1983 (NAD83) and Zone 18 of the Universal Transverse Mercator (UTM) coordinate system.

Modeled maximum emissions impacts for each TAP and associated averaging period are shown in Table 1 below as a percentage of the applicable AAL.

**Maximum Modeled Toxics Impacts
Ecolab, Inc., Port of Wilmington, New Hanover County, NC**

| Pollutant | Averaging Period | Max. Conc. (µg/m³) | AAL (µg/m³) | % of AAL |
|------------------|-------------------------|--------------------------------------|-------------------------------|-----------------|
| Methyl bromide | 24-hr | 997.02 | 1000 | 99.7 % |
| | Annual | 4.72 | 5 | 94.4 % |
| Phosphine | 1-hr | 128.16 | 130 | 98.6 % |

This dispersion modeling review assumes the emissions scenarios, specific sources modeled, source parameters, and pollutant emission rates used in the dispersion modeling analysis are correct.

cc: Brad Newland
Tom Anderson
Matthew Porter

Table A1. Modeled Release Parameters for Point Sources

| Source ID | Source Description | Easting (X) (m) | Northing (Y) (m) | Base Elevation (m) | Stack Height (ft) | Temp. (°F) | Exit Velocity (fps) | Stack Diameter (ft) | Operating Scenario |
|-----------|--|-----------------|------------------|--------------------|-------------------|------------|---------------------|---------------------|-------------------------|
| ES1 | MeBr and Phosphine Log Container Stack | 228129.0 | 3787893.0 | 2.8 | 40 | Ambient | 57.6 | 2 | Log Aeration 8am-6pm |
| ES2 | Fruit tarp fumigation (inside warehouse) | 227694.9 | 3788351.3 | 2.6 | 40 | Ambient | 57.6 | 2 | Fruit Aeration 10pm-2am |
| ES2LEAK1 | Fruit Fumigation Rooftop Vent | 227674.5 | 3788358.0 | 2.4 | 32 | Ambient | 0.0328 | 13.5 | 1% leak 6pm-6am |
| ES2LEAK2 | Fruit Fumigation Rooftop Vent | 227687.4 | 3788359.4 | 2.5 | 32 | Ambient | 0.0328 | 13.5 | 1% leak 6pm-6am |
| ES2LEAK3 | Fruit Fumigation Rooftop Vent | 227700.4 | 3788360.7 | 2.6 | 32 | Ambient | 0.0328 | 13.5 | 1% leak 6pm-6am |
| ES2LEAK4 | Fruit Fumigation Rooftop Vent | 227713.3 | 3788362.1 | 2.7 | 32 | Ambient | 0.0328 | 13.5 | 1% leak 6pm-6am |

Table A2. Modeled Release Parameters for Volume Sources

| Model ID | Source Description | X-utm (m) | Y-utm (m) | Elev. (m) | Release Ht. (m) | Init. Horizontal (m) | Init. Vertical (m) | Operating Scenario |
|----------|------------------------------|-----------|------------|-----------|-----------------|----------------------|--------------------|----------------------------------|
| ES1LEAK | MeBr Container Opening leaks | 228124.00 | 3787893.00 | 2.80 | 1.45 | 0.56 | 1.35 | 5% leak 8am-6pm, 1% leak 6pm-8am |

Table A3. Modeled Emission Rates (lb/hr)

| Model ID | Operating Scenario | 24hr MeBr | | Annual MeBr | | Phosphine lb/hr |
|--------------------|--------------------------|-----------|--------|-------------|-------|--------------------|
| | | lb/hr | lb/day | lb/hr | lb/yr | |
| ES1 | 8am-6pm (10hrs) | 223 | 2230 | 5 | 20000 | 2.5 |
| ES1LEAK (aeration) | 8am-6pm (10hrs) 5 % leak | 11.15 | 112 | 0.274 | 1000 | 0.125 |
| ES1LEAK (passive) | 6pm-8am (14hrs) 1 % leak | 2.23 | 31 | 0.0548 | 280 | 0.025 |
| ES2 | 10pm-2am (4hrs) | 100 | 400 | 6.51 | 9500 | -- |
| ES2LEAK1 | 6pm-6am (12hrs) 1% leak | 0.25 | 3 | 0.0163 | 71.3 | -- |
| ES2LEAK2 | 6pm-6am (12hrs) 1% leak | 0.25 | 3 | 0.0163 | 71.3 | -- |
| ES2LEAK3 | 6pm-6am (12hrs) 1% leak | 0.25 | 3 | 0.0163 | 71.3 | -- |
| ES2LEAK4 | 6pm-6am (12hrs) 1% leak | 0.25 | 3 | 0.0163 | 71.3 | -- |

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
MICHAEL ABRACZINSKAS
Director



NORTH CAROLINA
Environmental Quality

September 27, 2021

MEMORANDUM

TO: Brad Newland
Regional Supervisor
Division of Air Quality-WIRO

FROM: Michael A. Abraczinskas, Director

A handwritten signature in black ink, appearing to read "M. Abraczinskas", with a long, sweeping horizontal line extending to the right.

SUBJECT: Ecolab, Inc., Permit Application Numbers 6500356.18A and 6500356.20A and
Draft Air Permit Number 10313R03

I have reviewed the Hearing Officer's Report and Recommendations for the Ecolab, Inc. public comment period and virtual public hearing. The Hearing Officer has considered all comments and information in the record and I believe the Hearing Officer has adequately addressed all comments received. I agree with the Conclusions and Recommendations section of the Hearing Officer's Report. After making the recommended amendments, I ask that you proceed with issuing the air quality permit.

You may reach me at (919) 707-8447 if you have questions regarding this memorandum.

Cc: Ray Stewart, Hearing Officer, Winston-Salem Regional Office



North Carolina Department of Environmental Quality | Division of Air Quality
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919.707.8400