

## Application Review

Issue Date: XXXX, 2021

**Region:** Asheville Regional Office  
**County:** Madison  
**NC Facility ID:** 5800063  
**Inspector's Name:** Michael Koerschner  
**Date of Last Inspection:** N/A  
**Compliance Code:** N/A

|  |   |  |  |
|--|---|--|--|
| <b>Facility Data</b>   |   |  | <b>Permit Applicability (this application only)</b>  |
| <p><b>Applicant (Facility's Name):</b> Madison Asphalt LLC</p> <p><b>Facility Address:</b><br/>Madison Asphalt LLC<br/>3807 US 25/70<br/>Marshall, NC 28753</p> <p><b>SIC:</b> 2951 / Paving Mixtures And Blocks<br/><b>NAICS:</b> 324121 / Asphalt Paving Mixture and Block Manufacturing</p> <p><b>Facility Classification: Before:</b> N/A <b>After:</b> Small<br/><b>Fee Classification: Before:</b> N/A <b>After:</b> Small</p> |   |  | <p><b>SIP:</b> Yes<br/><b>NSPS:</b> Yes<br/><b>NESHAP:</b> No<br/><b>PSD:</b> No<br/><b>PSD Avoidance:</b> No<br/><b>NC Toxics:</b> Yes<br/><b>112(r):</b> No<br/><b>Other:</b> N/A</p>  |
| <b>Contact Data</b>  |   |  | <b>Application Data</b>  |
| <b>Facility Contact</b>  | <b>Authorized Contact</b>   | <b>Technical Contact</b>   | <p><b>Application Number:</b> 5800063.19A<br/><b>Date Received:</b> 02/18/2019<br/><b>Application Type:</b> Greenfield Facility<br/><b>Application Schedule:</b> State</p> <p style="text-align: center;"><b>Existing Permit Data</b></p> <p><b>Existing Permit Number:</b> N/A<br/><b>Existing Permit Issue Date:</b> N/A<br/><b>Existing Permit Expiration Date:</b> N/A</p> |
| Tommy Reed<br>Vice President<br>(828) 777-3259<br>725 Bee Tree Road<br>Marshall, NC 28753  | Tommy Reed<br>Vice President<br>(828) 777-3259<br>725 Bee Tree Road<br>Marshall, NC 28753 | Tommy Reed<br>Vice President<br>(828) 777-3259<br>725 Bee Tree Road<br>Marshall, NC 28753                            |  |
| <b>Review Engineer:</b> Patrick Ballard  |   | <b>Comments / Recommendations:</b>   |  |
| <b>Review Engineer's Signature:</b> _____  |   | <p><b>Issue</b> 10611/R00<br/><b>Permit Issue Date:</b> XXXX, 2021<br/><b>Permit Expiration Date:</b> XXXX, 2029</p> |  |

### 1. Purpose of Application

Application is made to the Division of Air Quality (DAQ) for the issuance of a new air permit for a greenfield (new) asphalt plant in Marshall, North Carolina. The plant will be located within the existing McCrary Stone Quarry. This is a single drum counter flow drum-mix type asphalt plant that has applied to be permitted for the following equipment:

| One drum-mix asphalt plant (170 tons of asphalt per hour, maximum capacity), consisting of: |   |                   |   |
|---|---|-------------------|---|
| Emission Source ID  | Emission Source Description   | Control System ID | Control System Description  |
| ES-1<br>(NSPS)  | one ultra-low sulfur (15 ppm) No. 2 fuel oil fired aggregate dryer (50 million Btu per hour maximum heat input rate) and associated material handling equipment | CD-1              | one bagfilter (6,590 square feet of filter area) equipped with one knockout chamber pre-cleaner |
| ES-2.1 and<br>ES-2.2  | two hot mix asphalt storage silos (100 tons of storage capacity, each)  | N/A               | N/A   |
| ES-3  | one asphalt truck loadout operation   | N/A               | N/A   |

| <b>One drum-mix asphalt plant (170 tons of asphalt per hour, maximum capacity), consisting of:</b> |  |                          |                                   |
|--|--|--------------------------|-----------------------------------|
| <b>Emission Source ID</b>  | <b>Emission Source Description</b>   | <b>Control System ID</b> | <b>Control System Description</b> |
| ES-4   | one ultra-low sulfur (15 ppm) No. 2 fuel oil fired asphalt tank heater (1.41 mmBtu/hr) | N/A                      | N/A                               |

## 2. Application Chronology

- February 13, 2019 - Application for a greenfield asphalt plant air quality permit in Madison County was received by the Raleigh Central Office (RCO). A note on the application said that a copy of application was given to the Air Quality Analysis Branch (AQAB).
- February 18, 2019 - Application received by the Asheville Regional Office (ARO). Application did not include a signature, application fee, or zoning letter. Called Mr. Tommy Reed about the application. Left message.
- February 19, 2019 - Mr. Reed stopped by the ARO to sign the application and deliver the \$400 application fee. He also delivered additional manufacturers' specifications for the plant. We discussed the pending zoning requirements letter. Note, the application stated that the facility would be classified as a "synthetic minor" with an application fee of \$400. After further review (discussed below), it was determined that the facility would be classified as "small" based on the potential air emissions. The application fee for a "small" facility is \$50. However, this discovery was made after the fact and application fees are non-refundable.
- February 20, 2019 - An acknowledgement letter was sent to the facility stating that the application was not complete until the zoning requirements were met.
- February 21, 2019 - Mr. Jeff Hyder of the Madison County Zoning Department sent an email to ARO saying that they received the zoning air permit application and are awaiting further information in order to set a hearing with the Board of Adjustment for the site.
- April 2, 2019 - ARO sent an email requesting additional information about Toxics modeling. The main point of the request was that the asphalt heater was not included in the initial modeling.
- April 5, 2019 - The facility responded to the 04/02/2019 request for additional information stating that revised modeling would be submitted.
- April 22, 2019 - Revised modeling and air permit application for the asphalt heater was submitted by email.
- July 25, 2019 - The facility sent an email to ARO stating the Madison County Board of Adjustment had denied their request for zoning approval. The facility requested that the pending air permit application be placed "on hold" pending further court action on the air permit application.
- September 21, 2020 - Throughout the permit application timeframe, DAQ has received numerous emails from the public with concerns about the proposed asphalt plant. The proposed asphalt plant site is within a larger site that includes Carolina Ready Mix (a concrete batch plant, site No. 5800062, exempted from air permitting requirements) and McCrary Stone Service (a rock quarry, site No. 5800053, operating under Air Permit No. 02595R10 as a 'small' facility). Emails from the public have included a request that DAQ conduct a site wide analysis of all three sites. On September 21, 2020 DAQ conducted a phone call with

Madison Asphalt and their consultant, TRC Environmental Corporation (TRC). During this conversation, DAQ informed Madison Asphalt that a site wide air pollutant modeling analysis would most likely be conducted. DAQ gave Madison Asphalt the option of conducting the site wide modeling and submitting the results to DAQ; or DAQ would conduct the site wide modeling. The site wide modeling was to include NC Toxics and Criteria air pollutant emissions. Madison Asphalt was given several days to consider the modeling.

- September 28, 2020 - DAQ, Madison Asphalt, and TRC conducted a phone conference as a follow-up to the 09/21/2020 call. Madison Asphalt chose not to conduct the combined NC Toxics and Criteria air emissions modeling and requested that DAQ conduct the modeling.
- November 3, 2020 - Throughout this permitting process, local zoning decisions and court actions were taken that involved Madison Asphalt, members of the public, and Madison County. After numerous days of hearing/testimony, the Madison County Board of Adjustment (BOA) voted to deny Madison Asphalt's conditional use permit. After subsequent appeal Superior Court ordered the BOA to issue the conditional use permit to Madison Asphalt. A copy of an approved zoning consistency determination from Madison County was received in the ARO 11/03/2020. The determination was emailed by Madison County Inspections and Zoning on 10/27/20. The zoning consistency determination was approved by Madison County on 10/2/20 and included additional local requirements for the asphalt plant site.
- November 6, 2020 - The facility committed, in an email, to combusting ultra-low sulfur diesel fuel (15ppm sulfur max) in the asphalt plant. This email also included a map of proposed site paving.
- November 10, 2020 - DAQ conducted a visit of the site and met with representatives of Madison Asphalt, Carolina Ready Mix, and McCrary Stone. The main purpose of the site visit was to gather information for the combined air emissions modeling.
- December 1, 2020 - DAQ sent Madison Asphalt an email with questions about site operations in reference to the combined modeling.
- December 4, 2020 - Madison Asphalt responded in an email to the 12/01/2020 request for additional information for the combined modeling.
- December 16, 2020 - The facility provided, in an email, updated information on the plant layout.
- December 17, 2020 - The facility provided, in an email, updated information on expected plant production.
- January 26-27, 2021 - Email exchange about the filter material of the baghouse.
- February 2, 2021 - Toxics modeling for the asphalt plant was completed by Mr. Matthew Porter of the Air Quality Analysis Branch (AQAB) / DAQ Raleigh Central Office. See attached memo.
- February 9, 2021 - DAQ having completed preliminary 'site wide' dispersion modeling analysis (including the concrete plant and quarry), the facility was presented with options for daily operational limitations regarding compliance concerns for the daily PM<sub>2.5</sub> and PM<sub>10</sub> National Ambient Air Quality Standards (NAAQS). The facility agreed by email on February 9, 2021 to operating under only one of two scenarios daily:
- A. Daytime scenario - Plant production only between 7 AM and 7 PM, with a maximum production of 1300 tons of asphalt during this time period; OR
  - B. Nighttime scenario - Plant production only between 6 PM and 3 AM, with a maximum production of 400 tons of asphalt during this time period. No plant operation during the daytime prior to a nighttime scenario.

Nighttime operation is limited by the zoning approval and is only expected a maximum of 10-14 days per year.

- February 25, 2021 - Site wide dispersion modeling for NC Toxic Air Pollutants and Federal Criteria Air Pollutants [nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>)] was completed by Mr. Matthew Porter of the AQAB. See attached memo and discussion below.
- XXXX, 2021 - Public Comment Period
- XXXX, 2021 - Public Hearing
- XXXX, 2021 - Hearing Officers Report
- XXXX, 2021 - Final Decision

### 3. Regulatory Review

The Company must comply with the following EMC Regulations for this application:

- 15A NCAC 2D .0501(c), "Compliance with National Ambient Air Quality Standards";
- 15A NCAC 2D .0503, "Particulates from Fuel Burning Indirect Heat Exchangers";
- 15A NCAC 2D .0506, "Particulates from Hot Mix Asphalt Plants";
- 15A NCAC 2D .0516, "Sulfur Dioxide Emissions from Combustion Sources";
- 15A NCAC 2D .0524, "New Source Performance Standards";
- 15A NCAC 2D .0535, "Excess Emissions Reporting and Malfunctions";
- 15A NCAC 2D .0540, "Particulates from Fugitive Non-Process Dust Emission Sources";
- 15A NCAC 2D .0605, "General Recordkeeping and Reporting Requirements";
- 15A NCAC 2D .0611, "Monitoring Emissions from Other Sources";
- 15A NCAC 2D .1100, "Control of Toxic Air Pollutants";
- 15A NCAC 2D .1806, "Control and Prohibition of Odorous Emissions";
- 15A NCAC 2Q .0102, "Activities Exempted from Permit Requirements"; and
- 15A NCAC 2Q .0711, "Emission Rates Requiring a Permit".

### 4. Compliance Determination

A. 2D .0501(c) - Compliance with National Ambient Air Quality Standards

In addition to any control or manner of operation necessary to meet emission standards in 2D.0500, any source of air pollution shall be operated with such control or in such manner that the source shall not cause the ambient air quality standards pursuant to 15A NCAC 02D .0400 to be exceeded at any point beyond the premises on which the source is located. When controls more stringent than those named in the applicable emission standards in this Section are required to prevent violation of the ambient air quality standards or are required to create an offset, the permit shall contain a condition requiring these controls.

See the 'Site Wide Modeling' in Section 5 below for more details and a full discussion of the multi-site modeling impact analysis. Preliminary site wide modeling was compliant for several criteria air pollutants (nitrogen dioxide, carbon monoxide, and sulfur dioxide) but demonstrated potential concerns for particulate matter during full plant production 24/7 under certain meteorology during nighttime hours. The model was re-run using production limitations for both a daytime and a nighttime scenario and demonstrated compliance with the particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) National Ambient Air Quality Standards.

To establish compliance with 2D.0501(c), the facility shall be limited to asphalt production under two operating scenarios. For daytime operation, production is limited to the hours of 7:00 AM to 7:00 PM and 1,300 tons of asphalt. For nighttime operation, production is limited to the hours of 6:00 PM to 3:00 AM and 400 tons of asphalt. If the facility runs at night, they cannot operate in the prior daytime hours.

B. 2D .0503 - Particulates from Fuel Burning Indirect Heat Exchangers

The asphalt tank heater (ID No. ES-4) has a heat input rate of 1.41 million Btu per hour. Particulate matter emissions from the heater are limited per this regulation to 0.6 pounds per million Btu.

The AP-42 emission factor for No. 2 fuel oil combustions is 2 lb/1000 gallons for filterable particulate (ref. Table 1.3-1) and 1.3 lb/1000 gallons for condensible particulate (ref. Table 1.3-2) for a total of 3.3 lb/1000 gallons. With a No. 2 fuel oil heating value of 140,000 Btu/gallon (ref. Table 1.3-2), the estimated particulate emission rate is:

$$3.3 \text{ lb PM/1000 gallons} * 1 \text{ gallon/140,000 Btu} = 0.024 \text{ lb PM/mmBtu}$$

Compliance with 2D .0503 is indicated based on the AP-42 emission factors.

C. 2D .0506 - Particulates from Hot Mix Asphalt Plants

Regulation 2D .0506(a) limits particulate from asphalt plants based on the equation:

$$E = 4.9445 * (P)^{0.4376}$$

where: E = allowable emissions (lb/hr)  
P = process rate (tons/hr)

Based on the 170 ton per hour maximum design capacity of the plant, maximum allowable particulate emissions are:

$$4.9445 * 170^{0.4376} = 46.79 \text{ pounds per hour}$$

A properly operated asphalt plant with bagfilter control will typically comply with this emissions limit. Expected hourly emissions of total particulate are 5.61 pounds per hour (ref. AP-42, Table 11.1-3, 0.033 lb/ton emission factor with bagfilter control) which demonstrates compliance with the above limit. Note, this facility is also subject to Federal New Source Performance Standards (NSPS), Subpart I, which has more stringent particulate limits than 2D .0506(a). Compliance with 2D .0506(a) is established through NSPS, Subpart I, see below. Initial stack testing will be required to verify compliance with both limits.

The facility is subject to 2D .0506 (b, d and e). Regulation (c) does not apply because this is not a batch plant; it is a drum mix plant.

Regulation 2D .0506(b) requires visible emissions from the plant stacks and vents be limited to 20% opacity. Compliance with 2D .0506(b) is expected with a properly operated and maintained bagfilter, and will be confirmed by inspection. Note, the aggregate dryer main stack is also subject to the 20% opacity limit of NSPS, Subpart I (see below). Also note that because the facility is subject to Regulation 2D .0506(b) it is not subject to Regulation 2D .0521 (redundant). Regulation 2D .0506(d) requires non-process fugitive dust emissions from the facility to comply with Regulation 2D .0540 as discussed below.

Regulation 2D .0506(e) limits all other plant emissions to 20% opacity. A properly operated asphalt plant will typically comply with this emissions limit. Compliance with 2D .0506(e) is expected and will be confirmed by inspection.

D. 2D .0516 - Sulfur Dioxide Emissions from Combustion Sources

This regulation limits sulfur dioxide (SO<sub>2</sub>) emissions from combustion sources to 2.3 pounds per million Btu. The EPA Document AP-42, Table 11.1-7, emission factor for SO<sub>2</sub> emissions from drum mix asphalt plants is 0.011 pounds per ton for No. 2 fuel oil combustion. However, footnote "c" of AP-42, Table 11.1-7 states the fuel usage emissions factors (AP-24, Chapter 1) can be used to calculate emissions on a heat input basis.

The AP-42, Table 1.3-1, emission factor for SO<sub>2</sub> emissions from No. 2 fuel oil combustion is 142(S) pounds per 1000 gallons, where S = sulfur content. The heat content of No. 2 fuel oil is 140,000 Btu per gallon (ref. AP-42, Section 1.3.4.3). The sulfur content of "standard" No. 2 fuel oil is limited to 0.5% by

weight according to ASTM standards. However, the facility has committed to combusting only ultra-low sulfur fuel at 15ppm (or 0.0015%). SO<sub>2</sub> emissions from ultra-low sulfur No. 2 fuel oil combustion are calculated as:

$$(142) (0.0015) \text{ lb/1000 gal.} / (140,000 \text{ Btu/gal}) * 1,000,000 \text{ Btu/million Btu} = 0.0015 \text{ lb/million Btu}$$

Compliance with 2D .0516 is indicated based on the AP-42 calculations. The ultra-low sulfur No. 2 fuel oil requirement will be included in the air permit.

- E. 2D .0524 - New Source Performance Standards, Subpart I “Standards of Performance for Hot Mix Asphalt Facilities”  
The 2019 air permit application lists this asphalt plant manufacture date as “TBD” (to be determined). The applicability date of NSPS, Subpart I, is June 11, 1973. For this review, the plant manufacture date will be considered after June 11, 1973 and the plant will be considered new and subject to NSPS, Subpart I. NSPS, Subpart I, limits particulate emissions from the asphalt plant to less than 0.04 grains per dry standard cubic foot of exhaust gas and opacity to less than 20%. A properly operated and maintained bagfilter installed on an asphalt plant drum dryer is expected to comply with these requirements. The facility shall conduct a stack test [EPA Reference Method 5 (particulate) and Method 9 (visible emissions)] within 60 days after achieving maximum production, but not later than 180 days after start-up. The permit will include these stack testing requirements to establish compliance with NSPS, Subpart I. Compliance with the opacity limit will also be confirmed by DAQ inspection.
- F. 2D .0535 - Excess Emissions Reporting and Malfunctions  
This regulation requires timely reporting and appropriate actions during periods of excess emissions and malfunctions. Compliance with 2D .0535 is expected and will be evaluated once the facility is operational.
- G. 2D .0540 - Particulates From Fugitive Non-Process Dust Emission Sources  
This regulation addresses facilities with activities such as: unloading and loading areas, process areas, stockpiles, stock pile working, plant parking lots, and plant roads (including access roads and haul roads). The regulation requires a fugitive process dust plan and abatement measures if substantive complaints are verified. Compliance with 2D .0540 is expected and will be verified during compliance inspections.
- H. 2D .0605 – General Recordkeeping and Reporting Requirements  
The facility has agreed to combust only ultra-low sulfur No. 2 fuel oil in the asphalt plant. Ultra-low sulfur No. 2 fuel oil is limited to 15ppm sulfur (0.0015% by weight). This requirement will be listed in the permit equipment list. Compliance will be established by fuel oil certification purchase records for review upon inspection.  
  
This regulation also requires the Permittee to conduct EPA Reference Methods 5 and 202 particulate emissions testing to assure that particulate emission do not exceed permitted emission rates listed in regulation 2D .0506(a) (listed above). Testing results are required to be submitted to the DAQ within 180 days of startup (to coincide with the NSPS, Subpart I testing requirement listed above). Compliance will be verified by inspection and stack testing results.
- I. 2D .0611 - Monitoring Emissions from Other Sources - This regulation and air permit condition requires the Permittee to conduct periodic inspections and maintenance of the bagfilter (ID No. CD-1) as recommended by the manufacturer as well as an annual internal inspection. A logbook documenting inspections and any variance from the manufacture’s recommendation is also required. Compliance with 2D .0611 is expected and will be verified by inspection.
- J. 2D .1806 - Control and Prohibition of Odorous Emissions  
This regulation provides for the control and prohibition of objectionable odorous emissions. The facility can be required to implement an odor management plan and/or maximum feasible odor controls if the DAQ determines that the facility is causing or contributing to objectionable odors beyond its property boundary. The rule clearly specifies the requirements for an objectionable odor determination. This is a new facility, not in production yet. DAQ will conduct routine compliance inspections and surveillance to establish compliance with this rule.

K. 2D .1100 - Control of Toxic Air Pollutants

With the application for this new asphalt plant, the facility has triggered a NC Air Toxics review. The facility has conducted a dispersion modeling analysis for arsenic, benzene and formaldehyde. Several other toxic air pollutants (TAPs) are emitted below the modeling thresholds and are discussed in 2Q .0711 below. Based on modeling conducted for the new plant, the facility has requested an asphalt production limit of 100,000 tons per year and 170 tons per hour. To establish compliance with these limits the facility will have asphalt production recordkeeping and an annual reporting requirements. Compliance with the hourly modeled production limit is established by the design capacity of the facility at 170 tons per hour. See the table below for the modeled emissions as compared to the percent impact of the corresponding acceptable ambient level (AAL). Potential emissions listed in the table are referenced from the attached DAQ spreadsheets for Asphalt Plants. If the facility establishes a history of actual asphalt production greater than 75% of the permit limits the annual reporting requirement may be increased to a quarterly reporting requirement at a later date. Modeling results were approved by Mr. Matthew Porter, AQAB, on February 2, 2021 (see attached memo from Mr. Porter). Note, nickel was also modeled, but emissions are below the TPER; thus nickel is listed under regulation 2Q .0711 (see discussion below).

| TAP          | Potential (Modeled) Emissions at 170 TPH | Percent AAL         |
|--------------|--|---------------------|
| Arsenic      | Dryer 0.83 lb/yr                         | 9.0% Facility-wide  |
|              | Asphalt Heater 0.05 lb/yr                |                     |
|              | Total 0.88 lb/yr                         |                     |
| Benzene      | Dryer 580.79 lb/yr                       | 77.6% Facility-wide |
|              | Loadout 3.20 lb/yr                       |                     |
|              | Silos 5.84 lb/yr                         |                     |
|              | Asphalt Heater 0.24 lb/yr                |                     |
|              | Total 590.07 lb/yr                       |                     |
| Formaldehyde | Dryer 0.527 lb/hr                        | 21.5% Facility-wide |
|              | Loadout 0.000671 lb/hr                   |                     |
|              | Silos 0.0143 lb/hr                       |                     |
|              | Asphalt Heater 0.000484 lb/hr            |                     |
|              | Total 0.542 lb/hr                        |                     |

This modeling was performed conservatively using the leased property boundary for the analysis. It would have been acceptable to use the entire quarry property boundary. In addition, and also conservatively, the annual modeled rates for benzene and arsenic are at the maximum annual design capacity instead of the 100,000 TPY requested production limitation.

Particulate metal emissions (arsenic) listed above assume bagfilter control (ref. AP-42, Table 11.1-12, 12/00 Edition). For this reason, a reference requiring bagfilter control for these emissions is included in the permit.

Note: This modeling analysis was for the asphalt plant impacts only, as required by the stated regulation. A multi-site analysis including the quarry and the concrete batch plant (not required by this regulation) is discussed in Section 5. below.

L. 2Q .0102 - Activities Exempted from Permit Requirements

The liquid asphaltic cement storage tank (30,000-gallon capacity) will be listed on the permit as an insignificant activity per 2Q .0102(g)(4). The ultra-low sulfur No. 2 fuel oil storage tank (15,000-gallon capacity) will be listed on the permit as an insignificant activity per 2Q .0102(g)(4). The asphalt storage tank heater is rated at 1.41 million Btu per hour and will combust ultra-low No. 2 fuel oil. This heater could be exempt from permitting per 2Q .0102(h)(5). However, since emissions from this heater have been included in the NC Toxics modeling, it is listed as a permitted source per 2Q .0102(b)(2).

M. 2Q .0711 - Emission Rates Requiring a Permit

The facility emits several toxic air pollutants below the modeling thresholds, or the 'toxic air pollutant permitting emission rates' (TPERs), as listed in 2Q .0711. These pollutants are not required to be modeled, but the air permit will include the TPER limits for the TAPs as listed in the following tables and 2Q .0711. Listed TAP emissions are based on the 100,000 tons per year Toxics production limit and 170 tons per hour maximum capacity of the facility (no daily production limits for this regulation) and compared to the TPERs. Daily limits assume 24 hours of operation per day (worst case). All TAP emissions listed below are below their respective TPERs. Emissions are referenced from the attached DAQ Asphalt Spreadsheet. Modeling has been conducted for arsenic, benzene and formaldehyde emissions (see 2D .1100 discussion above). A specific reference to the Toxics production limit is included with the 2Q .0711 requirement of the permit. TAP emissions from only the main dryer stack are compared to the TPERs for vertical and un-obstructed stacks. All other TAP emissions are compared to the TPERs for non-vertical and obstructed stacks.

Vertical and Un-Obstructed Stack TPERs

| Pollutant   | Emissions                   | TPER                          |
|---|-----------------------------|-------------------------------|
| Cadmium   | 0.041 lb/yr                 | 0.507 lb/yr                   |
| Chromium (VI) Soluble Chromate Compounds (Component of CRC) | 0.00184 lb/day              | 0.026 lb/day                  |
| Hexachlorodibenzo-p-dioxin                                  | 0.00000013 lb/yr            | 0.007 lb/yr                   |
| Manganese   | 0.0314 lb/day               | 1.3 lb/day                    |
| Mercury   | 0.0106 lb/day               | 0.025 lb/day                  |
| Methyl Chloroform   | 0.196 lb/day and 4.80 lb/yr | 505.4 lb/day and 257.98 lb/hr |
| Nickel  | 0.257 lb/day                | 0.3 lb/day                    |
| Tetrachlorodibenzo-p-dioxin                                 | 0.000000021 lb/yr           | 0.0002767 lb/yr               |

Note, particulate metal emissions (manganese, nickel, etc.) listed above assume bagfilter control (ref. AP-42, Table 11.1-12, 12/00 Edition). For this reason, a reference requiring bagfilter control for these emissions is included in the permit.

Non-Vertical and Obstructed Stack TPERs

| Pollutant           | Emissions                            | TPER                      |
|---------------------|--------------------------------------|---------------------------|
| Benzo(a)pyrene      | 0.00176 lb/yr                        | 2.2 lb/yr                 |
| Carbon Disulfide    | 0.0102 lb/day                        | 3.9 lb/day                |
| n-Hexane            | 3.9 lb/day                           | 23 lb/day                 |
| Hydrogen Sulfide    | 0.223 lb/day                         | 1.7 lb/day                |
| Methyl Ethyl Ketone | 0.0277 lb/day and 0.00115 lb/hr      | 78 lb/day and 22.4 lb/hr  |
| Methylene Chloride  | 0.000134 lb/day and 0.00000559 lb/hr | 1600 lb/yr and 0.39 lb/hr |
| Perchloroethylene   | 0.032 lb/yr                          | 13000 lb/yr               |
| Phenol              | 0.000684 lb/hr                       | 0.24 lb/hr                |
| Styrene             | 0.000163 lb/hr                       | 2.7 lb/hr                 |
| Toluene             | 11.9 lb/day and 0.496 lb/hr          | 98 lb/day and 14.4 lb/hr  |
| Xylene              | 0.985 lb/day and 0.041 lb/hr         | 57 lb/day and 16.4 lb/hr  |



N. Bagfilter Review

The application lists the bagfilter with an air flow rate of 34,400 acfm and a filter area of 6,590 square feet. This gives an air-to-cloth ratio of 5.2, which appears adequate. The current application "C2" form lists a control efficiency of 99.9 %. The DAQ control device evaluation spreadsheet (see attached) for the bagfilter lists a control efficiency of 99.99%. Particle size distribution was referenced from EPA AP-42 Table 11.1-4 (Drum Mix Dryers with Bagfilter Control). The bag fabric material (Meta-Aramid aka Nomex) appears adequate for the asphalt plant maximum operating temperature of 350 Deg F (see 01/27/2021 email from the facility). The application was sealed by Mr. Daryl J. Whitt, a registered North Carolina Professional Engineer. The performance of the bagfilter will be verified through on-site stack testing for particulate matter using EPA Reference Method 5. The bagfilter has a knockout chamber as a pre-cleaner. No additional control efficiency (beyond that of the bagfilter) is calculated for the knockout chamber installed prior to the bagfilter.

O. Recycle Asphalt Processing (RAP)

The application states that the facility will process recycled asphalt product (RAP), at a maximum process rate of 43 tons per hour. The RAP equipment is included in the equipment listing of "associated material handling equipment". Emissions from RAP equipment are included in the DAQ Asphalt Emissions Calculator spreadsheet.

**5. Site Wide Modeling of NC Toxic Air Pollutants and Criteria Air Pollutants**

Throughout the permitting process DAQ has received numerous emails from the public with concerns about the proposed asphalt plant. The proposed asphalt plant site is within a larger site that includes Carolina Ready Mix (a concrete batch plant, site No. 5800062, exempted from air permitting requirements) and McCrary Stone Service (a rock quarry, site No. 5800053, operating under Air Permit No. 02595R10 as a "small" facility). Emails from the public have included a request that DAQ conduct a site wide analysis of all three sites.

NCDAQ conducted site wide dispersion modeling for Criteria and Toxic pollutant emissions to include emissions from the concrete batch plant, the asphalt plant, and the quarry. Modeling was conducted for both point sources (such as bagfilter or engine exhaust) and fugitive emissions (haul roads, truck traffic, stock piles, material handling, and quarry pit operations). See the tables below for the modeled emissions as compared to the percent impact of the corresponding National Ambient Air Quality Standards (NAAQS/Criteria pollutants) and AALs (Toxic pollutants). Modeling was conducted and results were approved by Mr. Matthew Porter, AQAB, on 2/25/21 (see attached memorandum from Mr. Porter). Numerous citizen inquiries address concerns for model adequacy for local conditions and inversions. **See the referenced 2/25/21 memorandum for a discussion of model adequacy, meteorological, and inversion concerns.**

A. Toxic Air Pollutant Modeling: North Carolina Toxics Air Pollutant emissions summary from the entire site are attached. Most toxic air pollutants were estimated below the modeling thresholds 'site wide' with four toxics being modeled (benzene, arsenic, formaldehyde, and nickel). Dispersion modeling inputs and results are discussed in the 2/25/21 Modeling Review Memorandum by Mr. Matthew Porter. Results are summarized as follows:

| TAP          | Averaging Time | Percent AAL (Acceptable Ambient Level) |
|--------------|----------------|--|
| Arsenic      | Annual         | 5.71% Site Wide                        |
| Benzene      | Annual         | 43.7% Site Wide                        |
| Formaldehyde | 1 Hour         | 12.1% Site Wide                        |
| Nickel       | 24 Hour        | 1.83% Site Wide                        |

Note that the site-wide modeling results were lower than the modeling results provided by Madison Asphalt because the site-wide modeling expanded the ambient air boundary receptors beyond the leased boundary to represent the impacts at the quarry property boundary, in accordance with NC DAQ policy.

Receptor results for nearby sensitive sites (nearest residence, nursing home, childcare center, ballfields) were also reported in the memorandum all well below the maximum impacts cited above. See the 2/25/21 memorandum for more information.

- B. Criteria Pollutant Modeling [nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and carbon monoxide (CO)]: Emissions of NO<sub>2</sub>, SO<sub>2</sub>, and CO from the entire site are attached. Dispersion modeling inputs and results are discussed in the 2/25/21 Modeling Review Memorandum by Mr. Matthew Porter. Results are summarized as follows:

| Pollutant       | Averaging Time | Percent of NAAQS (maximum impact) |
|-----------------|----------------|-----------------------------------|
| NO <sub>2</sub> | 1 Hour         | 79% Site Wide                     |
|                 | Annual         | 11% Site Wide                     |
| SO <sub>2</sub> | 1 Hour         | 68% Site Wide                     |
|                 | 3 Hour         | 8% Site Wide                      |
| CO              | 1 Hour         | 6% Site Wide                      |
|                 | 8 Hour         | 14% Site Wide                     |

Receptor results for nearby sensitive sites (nearest residence, nursing home, childcare center, ballfields) were also reported in the memorandum all well below the maximum impacts cited above. See the 2/25/21 memorandum for more information.

- C. Criteria Pollutant Modeling (PM<sub>10</sub> and PM<sub>2.5</sub>): Emission estimates of particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) from the entire site are attached. Dispersion modeling inputs and results are discussed in the 2/25/21 Modeling Review Memorandum by Mr. Matthew Porter. Preliminary site wide modeling demonstrated potential concerns for particulate matter during full plant production under certain meteorology during nighttime hours. In order to comply with the daily PM<sub>10</sub> and PM<sub>2.5</sub> NAAQS the facility shall be limited to asphalt production under two operating scenarios. For daytime operation, production is limited to the hours of 7:00 AM to 7:00 PM and 1,300 tons of asphalt. For nighttime operation, production is limited to the hours of 6:00 PM to 3:00 AM and 400 tons of asphalt. If the facility runs at night, they cannot operate in the prior daytime hours. These limits will be incorporated into the air permit with applicable recordkeeping and reporting. The company has agreed to these limitations in their email dated 2/9/21.

| Pollutant                    | Asphalt Plant Operating Scenario | Percent of NAAQS (maximum impact) |
|------------------------------|----------------------------------|-----------------------------------|
| PM <sub>10</sub><br>24 Hour  | Daytime (7-am to 7-pm)           | 85% Site Wide                     |
|                              | Nighttime (6-pm to 3-am)         | 84% Site Wide                     |
| PM <sub>2.5</sub><br>24 Hour | Daytime (7-am to 7-pm)           | 57% Site Wide                     |
|                              | Nighttime (6-pm to 3-am)         | 71% Site Wide                     |
| PM <sub>2.5</sub><br>Annual  | Annual                           | 66% Site Wide                     |

Receptor results for nearby sensitive sites (nearest residence, nursing home, childcare center, ballfields) were also reported in the memorandum all well below the maximum impacts cited above. See the 2/25/21 memorandum for more information.

## 6. **Environmental Justice Review**

In accordance with the “Memorandum of Understanding on Environmental Justice and Executive Order 12898”, the EPA is required to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

On February 24, 2021, The NC Department of Environmental Quality, Environmental Justice Team addressed this issue for this application as follows:

“The Environmental Justice Team conducted an initial EJ screening and determined that the area surrounding this location does not meet the Department’s definition of an ‘underserved’ community, and therefore did not prepare a full Environmental Justice Report.

Underserved populations meet the following racial and poverty criteria:

*Racial composition:*

- Share of nonwhites is over fifty percent OR
- Share of nonwhites is at least ten percent higher than county or state share

AND

*Poverty rate:*

- Share of population experiencing poverty is over twenty percent AND
- Share of households in poverty is at least five percent higher than the county or state share.”

Therefore, there do not appear to be any environmental justice concerns for this facility.

## 7. **Public Comments / Public Hearing**

### A. Public Comments Prior to Public Hearing/Public Comment Period:

Over 100 public comments were received by email in 2019 and 2020 prior to the preparation of the draft permit review and permit. Several phone calls inquiries were conducted as well by concerned citizens. Comments received can be summarized in the following categories. In addition, individual comments of interest are listed below.

- i. Most commenters requested a public hearing. This has been granted by the Director of the Division of Air Quality.
- ii. Numerous commenters requested the air permit be denied for various reasons but predominantly due to the location of the facility. DAQ reviews air permit applications based on North Carolina’s air quality statutes and regulations. One of the purposes of North Carolina’s air quality statutes and regulations is to ensure that, no matter where a facility is located, it is constructed with all required pollution control technology and does not emit pollutants that violate air quality standards. If an application demonstrates that the facility will be operated with appropriate permit conditions in compliance with all federal and state requirements, DAQ will issue the permit.

In reviewing an air permit application, DAQ does not have statutory authority to require a facility to relocate or to deny a permit application for reasons other than a failure to adhere to federal and state requirements applicable to the air permitting process. Rather, county and local jurisdictions typically define the types of businesses authorized to operate in a geographic area through land use and zoning ordinances.

- iii. Several commenters requested a multi-site study of air emissions impacts to include the nearby concrete batch plant and quarry. This was conducted for NC Toxic Air Pollutants and Criteria Air Pollutants, and is included in this air permit review Section 5. and accompanying attachments.
- iv. Several commenters expressed concerns regarding the local meteorology and presence of strong nighttime atmospheric inversions. See the 2/25/21 Modeling Review Memorandum by Mr. Matthew Porter for a discussion of model adequacy, meteorology, and inversions.

- v. Several commenters expressed concerns regarding the proximity of sensitive receptors such as a day care and elderly living centers. Sensitive populations are considered in Federal and State pollutant standards development. In addition, nearby sensitive receptors and impacts are identified in the 2/25/21 Modeling Review Memorandum by Mr. Matthew Porter as discussed in Section 5 above.
- vi. The 10/8/20 citizen email with the attached Mr. George Schewe Report contained modeling and meteorology concerns. See the 2/25/21 Modeling Review Memorandum by Mr. Matthew Porter for a discussion of model adequacy, meteorology, and inversions.
- vii. The 12/1/20 citizen email included Criteria Pollutant Dispersion Modeling by Mr. George Schewe claiming an exceedance of the 1-hr sulfur dioxide NAAQS. The DAQ response to this submittal dated 12/2/20 indicated:

*Thank you for your interest in your local air quality and the Madison Asphalt air permitting process. The air permit application for the asphalt plant is still under technical review and consideration by the Division of Air Quality. I am in receipt of the email below and the additional one you mention from October 8, 2020. The Division is aware of and considering the modeling/meteorological concerns contained within your comments and Mr. Schewe's reports.*

*I have an update regarding your primary concern below for sulfur dioxide (SO<sub>2</sub>) emissions and the supplied modeling analysis. We had heard possibly through the zoning meetings or some other pathway the plant may be using ultra low sulfur diesel (ULSD - 15 ppm sulfur) instead of traditional No. 2 fuel oil (can be 0.5% sulfur). The sulfur dioxide that is emitted from the stack comes from the sulfur contained in the fuel oil. In the course of our technical review I reached out to Mr. Reed in early November and asked if he would commit to the use of that cleaner fuel instead of No. 2 fuel oil. He agreed. Therefore, our regulatory analysis will consider the use of and the air quality permit will legally require the use of ULSD and preclude the use of traditional No. 2 fuel oil.*

*This requirement will have a significant effect on the expected sulfur dioxide emissions from the facility. The fuel sulfur content will be lowered from a possible 0.5% to 0.0015%. The maximum sulfur dioxide emission rate will drop from 13.4 lb/hr to 0.04 lb/hr and reduce SO<sub>2</sub> modeling impacts by roughly ~99% of what Mr. Schewe documents in his report. This should address your primary concern discussed below.*

- B. Public Comment Period / Public Hearing:  
XXX The draft permit and permit review were posted for public notice on ....., 2021.  
[comments received, hearing officer's report, response to comments, etc.]

## 8. NSPS, NESHAPS, PSD, Toxics and 112(r) and Attainment Status

The facility is not subject to the requirements of NESHAPS, PSD or 112(r). Based on this facility's potential emissions shown below, this facility is not a PSD major source. Madison County is considered "attainment" for all National Ambient Air Quality Standards.

- A. NSPS - The facility is subject to Federal NSPS, Subpart I, "Standards of Performance for Hot Mix Asphalt Facilities", as listed above.
- B. NC Toxics - The facility has both modeled and TPER limits as listed above.

## 9. Facility Compliance Status

This is a new facility, not in production yet, and does not have a compliance history.

## 10. Facility Emissions Review

Based on the potential emissions shown below, this facility is classified as a “small” facility.

### Facility Emissions Summary:

| <b>Pollutant</b>              | <b>Potential Emissions<br/>(at 100,000 tpy production limit) (TPY)</b> | <b>Potential Emissions<br/>(TPY)</b> |
|-------------------------------|--|--------------------------------------|
| PM                            | 2.31   | 48.07                                |
| PM <sub>10</sub>              | 1.52   | 23.82                                |
| SO <sub>2</sub>               | 0.02   | 0.18                                 |
| NO <sub>x</sub>               | 3.63   | 41.84                                |
| VOCs                          | 2.42   | 35.83                                |
| CO                            | 6.85   | 98.90                                |
| Total HAPs*                   | 0.45   | 6.68                                 |
| Highest HAP<br>(Formaldehyde) | 0.16   | 2.37                                 |

\*Federal Hazardous Air Pollutants

This is a new facility, not in production yet, and thus there are no actual emissions data currently available. Potential emissions are referenced from the attached DAQ spreadsheets. The Toxics production limit is 100,000 tons of asphalt per year. Potential particulate emissions are calculated based on the NSPS, Subpart I, limit of 0.04 grains per dry standard cubic foot of exhaust gas. The application lists an exhaust flow rate of 34,000 actual standard cubic feet per minute. Based on the DAQ spreadsheet default values of 240°F stack temperature and 33% moisture, NSPS, Subpart I, limits particulate emissions from the dryer stack to 5.89 pounds per hour (25.80 tons per year). SO<sub>2</sub> emissions are based on the facility’s commitment to combusting only ultra-low sulfur No. 2 fuel oil at 15ppm (0.0015% by weight).

## 11. Changes to the Permit/Stipulation Review

This is a new permit and thus there are no changes from a previous permit.

## 12. Conclusions, Comments, and Recommendations

I checked the NC Secretary of State Webpage on February 18, 2019 and verified that Madison Asphalt LLC is registered as a North Carolina corporate entity. ARO will issue Air Permit No. 10611R00 to Madison Asphalt LLC, Madison, North Carolina.

## 13. Attachments

| <b>A</b> | <b>Permit Review Support Documents</b>  |
|----------|---|
| A-1      | Permit Application received February 13, 2019   |
| A-2      | Manufacturer’s Technical Document received February 19, 2019                            |
| A-3      | Permit Application Amendment received April 22, 2019                                    |
| A-4      | NCDAQ Permit Review - Asphalt Plant Emissions Calculation Spreadsheet                   |
| A-5      | NCDAQ Permit Review - Control Device Evaluation Spreadsheet                             |
| A-6      | Zoning Approval from Madison County   |
| A-7      | AQAB Modeling Review Memorandum dated February 2, 2021 for the Asphalt Plant Air Toxics |
| A-8      | Miscellaneous Documents: Acknowledgement Letter, Emails, etc.                           |
| <b>B</b> | <b>Air Toxics Emissions - Multi-site</b>  |
| B-1      | Site-wide Air Toxics Summary  |
| B-2      | McCrary Engine Spreadsheet  |
| B-3      | Carolina Ready Mix Emissions Spreadsheet  |

|          |  |
|----------|--|
| <b>C</b> | <b>SO<sub>2</sub>-NO<sub>x</sub>-CO Emissions - Multi-site</b>         |
| C-1      | SO <sub>2</sub> -NO <sub>x</sub> -CO Emissions Summary                 |
| C-2      | Madison Asphalt Emissions Spreadsheet with ULSD                        |
| <b>D</b> | <b>Particulate Matter Emissions - Multi-site</b>                       |
| D-1a     | Madison Asphalt PM Worksheets Scenario 1 (daytime)                     |
| D-1b     | Madison Asphalt PM Worksheets Scenario 2 (nighttime)                   |
| D-2      | Carolina Ready Mix PM Worksheets                                       |
| D-3      | McCrary Quarry PM Worksheets   |
| <b>E</b> | <b>Site-Wide Modeling Analysis</b>                                     |
| E-1      | AQAB Modeling Review Memorandum dated 2/25/21 for Site-Wide Pollutants |
| E-2a     | Roads Modeling Input Data Scenario 1 (daytime)                         |
| E-2b     | Roads Modeling Input Data Scenario 2 (nighttime)                       |
| E-3      | Piles Modeling Input Data  |
| E-4a     | Points Modeling Input Data Scenario 1 (daytime)                        |
| E-4b     | Points Modeling Input Data Scenario 2 (nighttime)                      |
| <b>F</b> | <b>Public Comments Received by Email prior to Public Notice</b>        |