NORTH CAROLINA
DIVISION OF AIR QUALITY

Air Permit Review

Issue Date: XX/XX/XXXX

Region: Winston-Salem Regional Office
County: Caswell
NC Facility ID: 1700016
Inspector's Name: To be assigned
Date of Last Inspection: N/A
Compliance Code: N/A

Facility Data	Permit Applicability (this application only)
Applicant (Facility's Name): Carolina Sunrock LLC - Burlington North **Facility Address:** 12971 S NC Highway 62 Burlington, NC 27127 **SIC:** 2951 / Paving Mixtures and Blocks **NAICS:** 324121 / Asphalt Paving Mixture and Block Manufacturing **Facility Classification: Before:** Permit Pending **After:** Synthetic Minor **Fee Classification: Before:** N/A **After:** Synthetic Minor	**SIP:** Yes **NSPS:** Yes (40 CFR 60, Subparts I and OOO) **NESHAP:** No **PSD:** No **PSD Avoidance:** Yes (SO_2) **NC Toxics:** Yes (2D .1100 and 2Q .0711) **112(r):** No **Other:** Recycled Fuel Oil

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Scott Martino Compliance Manager (984) 202-4761 200 Horizon Drive Suite 100 Raleigh, NC 27615	Gregg Bowler CFO (919) 747-6400 200 Horizon Drive Suite 100 Raleigh, NC 27615	Scott Martino Compliance Manager (984) 202-4761 200 Horizon Drive Suite 100 Raleigh, NC 27615

Application Data

Application Number: 1700016.19A
Date Received: 09/17/2019
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

Review Engineer: Leo L. Governale, P.E. **Review Engineer's Signature:** **Date:**	**Comments / Recommendations:** **Issue Permit Number:** 10628R00 **Permit Issue Date:** XX/XX/XXXX **Permit Expiration Date:** XX/XX/XXXX

I. PURPOSE OF APPLICATION

On September 17, 2019, WSRO-DAQ received an application package from Carolina Sunrock LLC, requesting an Air Permit for a new facility located at 12971 S NC Highway 62, Burlington, NC. Included in the submittal were the appropriate A, B, C and D forms along with supporting documentation and a check in the amount $400, the application fee required for a Synthetic Minor facility. The initial submittal also included a copy of a transmittal letter to the Caswell County Planning Department (date-stamped received by the County on September 5, 2019) requesting a "Determination of Compliance with the Caswell County zoning ordinance regarding the location's zoning status." It is noted that the site is located in an area without zoning and DAQ did not receive a determination from the Caswell County Planning Department; therefore, the applicant is required to publish a legal notice in accordance with 2Q .0113. The Applicant was notified of this requirement via email from Davis Murphy of the WSRO to Scott Martino, Compliance Manager, on November 26, 2019.

The contact information provided in the application was created in the IBEAM database. Carolina Sunrock LLC is duly registered under this name with the North Carolina Secretary of State (NCSOS) – Division of Corporations and holds a current-active status, as verified by this reviewer via online search of the NCSOS database.

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Application Chronology

Date	Event	Comment
September 17, 2019	Application received	Application deemed complete; Clock started
September 30, 2019	Request for additional information; need completed C1 forms for Bagfilters	Clock stopped
October 4, 2019	Completed C1 forms received	Clock restarted
November 26, 2019	Applicant notified via email that a legal notice is required per 2Q .0113 because facility is located in an area without zoning	Clock stopped
January 11, 2019	Legal notice compliance in accordance with 2Q .0113 fulfilled*	Clock restarted
January 15, 2020	Request for additional information re: revised equipment listing	Clock stopped
January 22, 2020	Additional information received	Clock restarted
February 13, 2020	Facility notified that the draft permit will be noticed to the public and posted for a public comment period	Clock stopped
XX/XX/XXXX	Permit issued	-----

* The requisite sign was posted on the property on December 2, 2019 and the legal notice was published in The Caswell Messenger on December 4, 2019. Chris Bryant of the WSRO verified that the sign was posted, via site visit on December 18, 2019.

II. DESCRIPTION OF BUSINESS

Information contained in the application states that this facility will include a Drum Mix Asphalt Plant (250 tons per hour maximum capacity), RAP Crushing System and a Truck Mix Concrete Batch Plant (120 cubic yards per hour). Expected operating schedule is 10 hr/day, 6 days/wk and 50 wk/yr (3,000 hr/yr). The Permitted Emission Sources and Insignificant/Exempt Activities are listed in the following tables:

Permitted Emission Sources

Emission Source ID	Emission Source Description	Control System ID	Control System Description
One Drum Mix Asphalt Plant (250 tons per hour maximum capacity), consisting of:			
HMA-1 **(NSPS-I)**	Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No. 4 Fuel Oil-fired Drum-type Hot Asphalt Plant (80 million Btu per hour maximum heat input capacity)	HMA-CD1	Cyclone in series with Bagfilter* (8,968 square feet of filter area)
HMA-Silo1	Hot Mix Asphalt Storage Silo (150 ton capacity)	N/A	N/A
HMA-Silo2	Hot Mix Asphalt Storage Silo (150 ton capacity)	N/A	N/A
HMA-Silo3	Hot Mix Asphalt Storage Silo (200 ton capacity)	N/A	N/A
HMA-Silo4	Hot Mix Asphalt Storage Silo (200 ton capacity)	N/A	N/A
HMA-Silo5	Hot Mix Asphalt Storage Silo (200 ton capacity)	N/A	N/A
HMA-LO1	Asphalt Loadout Operation Silo 1	N/A	N/A
HMA-LO2	Asphalt Loadout Operation Silo 2	N/A	N/A
HMA-LO3	Asphalt Loadout Operation Silo 3	N/A	N/A
HMA-LO4	Asphalt Loadout Operation Silo 4	N/A	N/A
HMA-LO5	Asphalt Loadout Operation Silo 5	N/A	N/A
HMA-H1	Natural Gas/No. 2 Fuel Oil-fired Liquid Asphalt Cement Heater (1.2 million Btu per hour maximum heat input)	N/A	N/A
HMA-H2	Natural Gas/No. 2 Fuel Oil-fired Liquid Asphalt Cement Heater (1.1 million Btu per hour maximum heat input)	N/A	N/A

* This control device a "packaged" unit that consists of a Bagfilter preceded by a Cyclone. According to information provided via email dated January 8, 2020 from Scott Martino, Environmental Compliance Manager, the Cyclone *"is physically part of the baghouse itself. The air from the drum first passes through the cyclone protecting the bags from the larger size fractions. This large size fraction drop*[s] *to the internal screw in the baghouse and is returned to the drum. Essentially the cyclone and baghouse is all one unit, the cyclone just pretreats the exhaust from the drum to help protect the bags as an internal function of the baghouse."* See Attachment A1.

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Permitted Emission Sources (continued)

Emission Source ID	Emission Source Description	Control System ID	Control System Description
RAP Crushing System consisting of:			
RAP-CRSH **[NSPS-OOO]**	RAP Impact Crusher (65 tons per hour maximum rated capacity)	N/A	N/A
RAP-CNV **[NSPS-OOO]**	Four (4) Conveyors	N/A	N/A
RAP-SCN **[NSPS-OOO]**	8' x 20' Double Deck Screen	N/A	N/A
Truck Mix Concrete Batch Plant (120 cubic yards per hour maximum capacity), consisting of:			
RM-1	Cement Storage Silo (200-ton capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RM-2	Flyash Storage Silo (150-ton capacity)		
RM-3	Truck Loadout Point		
RM-4	Cement/Flyash Weigh Batcher (25-ton maximum capacity)		
RM-5	Aggregate Weigh Batcher (50-ton maximum capacity)	N/A	N/A

Insignificant/Exempt Sources

Source	Exemption Regulation	Source of TAPs?	Source of Title V Pollutants?
IES-1, IES-2 – Two (2) No. 4 Fuel Oil or Used Oil Storage Tanks (20,000 gallon capacity, each)	2Q .0102 (g)(4)... "*storage tanks with no applicable requirements other than Stage I controls pursuant to 15A NCAC 02D .0928, Gasoline Service Stations Stage I*"	Yes	Yes
IES-3 – Diesel Fuel Storage Tank (20,000 gallon capacity)*			
IES-4 - Liquid Asphalt Storage Tank (30,000 gallon capacity)			
IES-5 - Liquid Asphalt Storage Tank (20,000 gallon capacity)			

* This tank was inadvertently described as a "Gasoline" Storage Tank in the original application; however, it will actually be used to store "Diesel" Fuel per email dated November 25, 2019 from Scott Martino. See Attachment A2.

III. REVIEW OF REGULATIONS

The following North Carolina Administrative Code Title 15A regulations were evaluated under this review:

2D .0202 – Registration of Air Pollution Sources
2D .0503 – Particulates from Fuel Burning Indirect Heat Exchangers
2D .0506 – Particulates from Hot Mix Asphalt (HMA) Plants
2D .0510 – Particulates from Sand, Gravel, or Crushed Stone Operations
2D .0515 – Particulates from Miscellaneous Industrial Processes
2D .0516 – Sulfur Dioxide (SO_2) Emissions from Combustion Sources
2D .0521 – Control of Visible Emissions (VE)
2D .0524 – New Source Performance Standards (NSPS)
2D .0535 – Excess Emissions Reporting and Malfunctions
2D .0540 – Particulates from Fugitive Dust Emission Sources
2D .0605 – General Recordkeeping and Reporting Requirements
2D .0611 – Monitoring Emissions from Other Sources
2D .1100 – Control of Toxic Air Pollutants (TAPs)
2D .1806 – Control and Prohibition of Odorous Emissions
2Q .0304 – Zoning Specific Condition
2Q .0315 – Synthetic Minor Facilities
2Q .0317 – Avoidance Condition (PSD and Toxics)
2Q .0711 – Emission Rates Requiring a Permit

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CONTROL DEVICE EVALUATION

Bagfilter HMA-CD1

The proposed Bagfilter, associated with the Hot Mix Asphalt Plant (HMA-1), was evaluated using the NCDENR Bagfilter Evaluation Spreadsheet - Version 3.3, September 23, 1999 (see Attachment B1). The following table lists the characteristics based on the data provided on Form C1.

Material Controlled	Abrasive Dust
No. of Compartments	3
No. of Bags per Compartment	246
Bag Length / Bag Diameter	120.5 in. / 4 5/8 in.
Filter Surface Area	8,968 ft^2
Inlet Air Flow Rate:	51,111 ACFM
Air to Cloth Ratio	5.70:1
Filter Material	Aramid (Nomex)
Max. Operation Temperature	325 ^0F
Cleaning Procedure	Air Pulse
Claimed Capture Efficiency	99.99% for PM/PM_{10}

According to the spreadsheet, the filtering velocity of 5.7 fpm does not exceed the typical filtering velocity of 10.0 fpm and the filter fabric is appropriate for both the maximum operating temperature and chemical resistance to acids, alkalis and organics. Also, the control efficiency as stated in the application seems reasonable, so the Bagfilter was assessed as an adequate control device. It is noted that, because the air flow rate exceeds 10,000 ACFM, a P.E. seal is required. This was provided on Application Form D5, bearing the seal and signature of Ted S. White, P.E., NC Professional Engineer No. 016884.

Bagfilter RMC-CD2

The proposed Bagfilter, associated with the Concrete Batch Plant, was evaluated using the NCDENR Bagfilter Evaluation Spreadsheet - Version 3.3, September 23, 1999 (see Attachment B2). The following table lists the characteristics based on the data provided on Form C1.

Material Controlled	Cement/Fly Ash
No. of Compartments	2
No. of Bags per Compartment	36
Bag Length / Bag Diameter	114 in. / 8 in.
Filter Surface Area	1,433 ft^2
Inlet Air Flow Rate:	6,500 ACFM
Air to Cloth Ratio	4.54:1
Filter Material	Dacron
Max. Operation Temperature	70 ^0F
Cleaning Procedure	Reverse Flow
Claimed Capture Efficiency	99.9% for PM

According to the spreadsheet, the filtering velocity of 4.5 fpm does not exceed the typical filtering velocity of 8.0 fpm and the filter fabric is appropriate for both the maximum operating temperature and chemical resistance to acids, alkalis and organics. Also, the control efficiency as stated in the application seems reasonable, so the Bagfilter was assessed as an adequate control device. It is noted that, because the air flow rate does not exceed 10,000 ACFM, a P.E. seal is not required.

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2D .0202 – Registration of Air Pollution Sources

This regulation allows the Director to require a facility to report, as in this case, total weights and kinds of air pollution released as well as any other information considered essential in evaluating the potential of the source to cause air pollution. In accordance with this regulation, the facility will be required to submit a CY 20XX Emissions Inventory at least ninety (90) days prior to [DATE to be determined], which is the expiration date of this Air Permit.

It is reasonable to anticipate compliance.

2D .0503 – Particulates from Fuel Burning Indirect Heat Exchangers

This regulation applies to the two (2) Natural Gas/No. 2 Fuel Oil-fired Asphalt Cement Heaters (HMA-H1 and HMA-H2), and it limits particulate emissions according to the following equation:

$$\mathbf{E = 1.09 \times Q^{-0.2594}}$$

where: **E** = allowable emission limit for particulate matter in lb/MMBtu
Q = maximum total heat input of all fuel burning indirect heat exchangers in MMBtu/hr,
except where the maximum total heat input is ≤ 10 MMBtu/hr, as in this case, then **E** = 0.60 lb/MMBtu

Using the AP-42 emission factor for Fuel Oil – Tables 1.3-1 and 1.3-2, rev 5/10, and Natural Gas – Table 1.4-2, rev 7/98, the actual emissions rates are calculated as follows:

$$E_{actual\ -\ Natural\ Gas} = 7.6\ lb\ PM_{total}/10^6\ scf \div 1{,}020\ MMBtu/10^6\ scf = 0.007\ lb\ PM/MMBtu$$

$$E_{actual\ -\ No.\ 2\ Fuel\ Oil} = (2\ lb\ PM_{filterable} + 1.3\ lb\ PM_{condensable})/10^3\ gallons \div 140\ MMBtu/10^3\ gallons = 0.024\ lb\ PM/MMBtu$$

0.007; 0.024 lb PM/MMBtu < 0.60 lb PM/MMBtu → O.K.

Based on the foregoing, actual emissions for combustion of No. 2 Fuel Oil and Natural Gas are less than the allowable emissions limit; therefore, compliance is demonstrated.

2D .0506 – "Particulates from Hot Mix Asphalt Plants"

This regulation is applicable to both filterable and condensable particulate emissions from the plant. It limits the allowable particulate matter emissions from Hot Mix Asphalt Plants as calculated by the following equations:

$$\mathbf{E = 4.9445(P)^{0.4376}} \quad \text{if } \mathbf{P} < 300 \text{ tons/hr}$$
$$\mathbf{E = 60.00} \quad \text{if } \mathbf{P} \geq 300 \text{ tons/hr}$$

where: **P** = the process rate in tons/hr
E = the maximum allowable emission rate for PM in lb/hr

Since the permitted process rate is 250 tons per hour, this plant's allowable PM emission rate is calculated as follows:

$$\mathbf{E = 4.9445(250)^{0.4376}} = 55.4\ lb\ PM/hr$$

Using AP-42 emission factor for Drum Mix Asphalt Plants (Table 11.1-3, 3/04), the emission factor total PM for a Drum Mix HMA plant controlled by a fabric filter is 0.033 lb PM/ton of asphalt; therefore, the actual expected PM emission rate is calculated as follows:

PM = 0.033 lb PM/ton x 250 ton/hr = 8.25 lb PM/hr

8.25 lb PM/hr < 55.4 lb PM/hr → O.K.

Also, this regulation requires requires that visible emissions from stacks or vents at a HMA plant shall be less than 20% opacity when averaged over a six-minute period and that fugitive dust shall be controlled as required by 2D .0540 (discussed below). A source test on the Drum-type Hot Asphalt Plant (HMA-1) controlled by a Bagfilter (HMA-CD1) will need to be conducted to determine the HMA plant's particulate matter emission rate. See 2D .0605 of this review for more details regarding testing. Per the Memorandum "Hot Mix Asphalt Plant Performance Testing/Emission Testing Frequency" issued August 13, 2013, by Sheila Holman, former DAQ Director, the facility must test for compliance at least once every ten (10) years. If the emission sources operate according to manufacturer specifications and with the permitted bagfilter, the sources should be in compliance with this regulation.

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2D .0510 – Particulates from Sand, Gravel, or Crushed Stone Operations

This facility, engaging in sand, gravel, recycled asphalt pavement (RAP), or crushed stone operations, must not cause, allow, or permit any material to be produced, handled, transported, or stockpiled without taking measures to reduce to a minimum any particulate matter from becoming airborne. This is in order to prevent exceeding the ambient air quality standards beyond the property line for particulate matter. Fugitive dust shall be controlled as required by 2D .0540 as discussed below. Process generated emissions from crushers, conveyors, screens, and transfer points shall be controlled so that opacity standards required by 2D .0521 and 2D. 0524, as applicable, are not exceeded. It seems reasonable to anticipate compliance.

2D .0515 – Particulates from Miscellaneous Industrial Processes

This regulation is applicable to particulate matter (PM) emissions from all Concrete Batch Plant sources at this facility and it limits the allowable PM emissions as derived by the following equations:

$$E = 4.10\ (P)^{0.67} \qquad \text{if } P \leq 30 \text{ tons per hour}$$

or

$$E = 55.0\ (P)^{0.11} - 40 \qquad \text{if } P > 30 \text{ tons per hour}$$

where: **P** = the process rate in tons per hour, and
E = maximum allowable emission rate of PM in pounds per hour

The NCDENR Concrete Batch Plant Emissions Calculator Spreadsheet, using emission factors from AP-42 Table 11.12-2 and DAQ Memorandum for Ready-Mix Concrete Facilities, dated June 5, 2005 (as indicated in the table footnote[4]) were used to calculate the uncontrolled and controlled emissions rates and the following table indicates that the facility can comply with this regulation when the Bagfilter (RMC-CD2) is installed and properly operated and maintained on the respective emission sources. Note that the process weight rates for the Cement Silo, Flyash Silo, Truck Loadout Point and Aggregate Weigh Batcher were taken from information provided with the application and presented on the aforementioned NCDENR Spreadsheet. Process weight rate for the Cement/Fly Ash Weigh Batcher was calculated by this reviewer as indicated in the table footnotes.

Emission Source	Process Weight Rate (P) [tons/hr]	Allowable Emissions Rate (E) 2D .0515 Limit [lb PM/hr]	Expected Controlled Actual Emissions Rate[3] [lb PM/hr]	Expected Uncontrolled Actual Emissions Rate[3] [lb PM/hr]
Cement Silo (RM-1)	25.00[1]	35.43	0.027	27.00[4]
Fly Ash Silo (RM-2)	25.00[1]	35.43	0.079	79.0[4]
Truck Loadout Operation (RM-3)	240.96[1]	60.55	1.001[5]	1,001.0[4]
Cement/Flyash Weigh Batcher (RM-4)	35.76[2]	41.51	1.001[5]	1,001.0[4]
Aggregate Weigh Batcher (RM-5)	205.20[1]	58.79	N/A	0.985[6]

[1] Taken from information provided with the application as shown on the NCDENR Spreadsheet. See Attachment C.
[2] 120 yd^3/hr × (448 lb Cement/yd^3 + 148 lb Flyash/yd^3) ÷ 2,000 lb/ton = 35.76 ton/hr.
[3] Emission factors for Cement Silo and Flyash Silo are from AP-42 Table 11.12-2. Emission factors for Truck Loadout Operation and Cement/Flyash Weigh Batcher are from DAQ Memorandum for Ready-Mix Concrete Facilities, dated June 5, 2005. Aggregate Weigh Batcher emissions are uncontrolled.
[4] Expected Uncontrolled Emissions Rate = Expected Controlled Emissions Rate ÷ (1 – 0.999 Bagfilter Control Efficiency)
[5] As noted in the spreadsheet *"Truck/Central Mix emission factors include emissions from cement and supplement weigh hoppers,"* and so, to be conservative, the Cement/Flyash Weigh Batcher emission rate is shown as the same as the Truck Loadout emission rate.
[6] 205.20 tons/hr x 0.0048 lb PM/ton (uncontrolled PM emission factor from AP-42 Table 11.12-2) = 0.98 lb PM/hr

2D .0516 – Sulfur Dioxide Emissions from Combustion Sources

This regulation applies to the Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No. 4 Fuel Oil-fired Drum-type Asphalt Plant (HMA-1) and the two (2) Natural Gas/No. 2 Fuel Oil-fired Asphalt Heaters (HMA-H1 and HMA-H2), and it limits the emissions of sulfur dioxide (SO_2) from any source of combustion that is discharged from any vent, stack, or chimney to 2.3 lb SO_2 /MMBtu input.

For the drum dryer/mixer associated with the Asphalt Plant (HMA-1), the SO_2 emission rate is equal to 0.011 lb/MMBtu when combusting Natural Gas, 0.28 lb/MMBtu when combusting No. 2 Fuel Oil, and 0.262 lb/MMBtu when combusting No. 4 Fuel Oil, as demonstrated below. It is assumed that No. 4 Fuel Oil has the same emission factor as Waste Oil and the emission factor for Propane is similar to that for Natural Gas.

Natural Gas (AP-42, Table 11.1-7)
SO_2 = 0.0034 lb/ton of asphalt produced × 250 ton/hr ÷ 80 MMBtu/hr = 0.011 lb/MMBtu < 2.3 lb/MMBtu → O.K.

No. 2 Fuel Oil (NCDENR Asphalt Emissions Calculator Spreadsheet Revision G, 08/30/2019)
SO_2 = 0.0897 lb/ton of asphalt produced × 250 ton/hr ÷ 80 MMBtu/hr = 0.28 lb/MMBtu < 2.3 lb/MMBtu → O.K.

No. 4 Fuel Oil (NCDENR Asphalt Emissions Calculator Spreadsheet Revision G, 08/30/2019)
SO_2 = 0.0837 lb/ton of asphalt produced × 250 ton/hr ÷ 80 MMBtu/hr = 0.262 lb/MMBtu < 2.3 lb/MMBtu → O.K.

For the two (2) Natural Gas/No. 2 Fuel Oil-fired Asphalt Heaters (HMA-H1 and HMA-H2), the SO_2 emission rate is equal to 0.00059 lb/MMBtu when combusting Natural Gas and 0.51 lb/MMBtu when combusting No. 2 Fuel Oil as demonstrated below. The first equation assumes the sulfur content of Natural Gas is 2,000 grains/10^6 scf, and the average heating value of Natural Gas is 1,020 Btu/scf. The second equation assumes a Fuel Oil sulfur content (S) of 0.5% by weight, and the average heating value of No. 2 Fuel Oil is 140,000 Btu/gal. Compliance is demonstrated.

Natural Gas (AP-42, Table 1.4-2)
SO_2 = 0.6 lb/10^6 scf × (10^6 scf/1,020 MMBtu) = 0.00059 lb/MMBtu < 2.3 lb/MMBtu → O.K.

No. 2 Fuel Oil (AP-42, Table 1.3-1)
SO_2 = 142×S (S = 0.5) lb/10^3 gal × (10^3 gal/140 MMBtu) = 0.51 lb/MMBtu < 2.3 lb/MMBtu → O.K.

2D .0521 - Control of Visible Emissions

This regulation applies to all fuel burning operations and industrial processes where visible emissions can reasonably be expected to occur and limits visible emissions to 40% opacity for sources manufactured as of July 1, 1971 and to 20% opacity for sources manufactured after July 1, 1971, when averaged over a six minute period. The visible emissions from the HMA Plant (HMA-1) is subject to both 2D .0506 and 2D .0524, and the RAP Operations are subject to 2D .0524. Therefore, this rule regulates visible emissions from the rest of the emission sources. Because all sources are new, it is reasonable to assume that they were manufactured after July 1, 1971, and so the 20% opacity limit applies. Compliance is expected with proper operation and maintenance of the subject equipment and associated control devices, where applicable.

2D .0524 – New Source Performance Standards (NSPS)

This facility is subject to **40 CFR Part 60, Subpart I – "Standards of Performance for Hot Mix Asphalt Plants,"** and it applies to particulate emissions from hot mix asphalt facilities that commence construction or modification after June 11, 1973, as in this case. Within 15 days after start-up of the HMA plant, the Permittee is required to notify the DAQ of the start-up date in writing. The facility shall not discharge into the atmosphere from the affected source any gases which contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf) or exhibit 20% opacity or greater. A source test on the HMA plant (HMA-1), controlled by a Bagfilter (HMA-CD1) will need to be conducted to determine the HMA plant's particulate matter and visible emissions. See 2D .0605 below for additional details regarding testing. It is reasonable to anticipate compliance.

The facility is also subject to **40 CFR 60, Subpart OOO for "Nonmetallic Mineral Processing Plants."** This rule applies to each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck, or railcar loading station (sources) at fixed or portable nonmetallic mineral processing plants that commenced construction, reconstruction, or modification after August 31, 1983, except, in part, to fixed plants with capacities of 25 tons per hour or less or portable plants with capacities of 150 tons per hour or less. Also, crushers and grinding mills at hot mix asphalt facilities that reduce the size of nonmetallic minerals embedded in recycled asphalt pavement and subsequent affected facilities up to, but not including, the first storage silo or bin are subject to the provisions of this Subpart. Therefore, the RAP Crushing System, comprising of the Crusher, four (4) Conveyors and Screen (RAP-CRSH, RAP-CNV, and ES-SCN, respectively) is subject to this rule. Within 15 days after start-up of each source, the facility is required to notify the DAQ of the start-up date in writing. For affected sources that commenced construction, modification, or reconstruction after August 31, 1983, but before April 22, 2008, visible emissions are limited to 15% opacity for crushers and 10% opacity for fugitive emissions from conveyor belts, screening operations, and other affected sources.

For sources constructed, modified, or reconstructed on or after April 22, 2008, visible emissions are limited to 12% opacity for crushers and 7% opacity for fugitive emissions from conveyor belts, screening operations, and other affected sources. Monthly inspection requirements apply for affected sources that were constructed on or after April 22, 2008, and that use wet suppression to control emissions. A source test using EPA Method 9 on the crusher, screen, and conveyor will need to be conducted to determine their compliance with the respective opacity limits. It is reasonable to anticipate compliance.

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2D. 0535 – Excess Emissions Reporting and Malfunctions

This facility is subject to this regulation. In accordance with section (f) of this rule, the Permittee must notify DAQ in the event of a source of excess emissions that last for more than four (4) hours and that result from a malfunction, a breakdown of process or control equipment, or any other abnormal conditions. It is reasonable to anticipate compliance.

2D .0540 – Particulates from Fugitive Dust Emission Sources

This facility is subject to this regulation. It applies to particulate emissions that do not pass through a process stack or vent and are generated within plant property boundaries. If fugitive dust emissions cause excessive visible emissions beyond property boundaries, or cause substantive complaints, the Director may require the facility to develop, implement, and comply with a fugitive dust control plan. It is reasonable to anticipate compliance.

2D .0605 – General Recordkeeping and Reporting Requirements

This regulation allows the DAQ to require any monitoring, recordkeeping, reporting, or testing it deems necessary for the facility to demonstrate compliance with an emission standard or permit condition. As mentioned previously, a memorandum titled "Hot Mix Asphalt Plant Performance Testing/Emission Testing Frequency" was issued August 13, 2013, by Sheila Holman, former DAQ Director. This requires all hot mix asphalt plants to test for compliance with 2D .0506 at least once every 10 years. The results also happen to reinforce compliance with 2D .0524 (NSPS Subpart I). The stack testing is for filterable and condensable particulate matter using EPA Methods 5 and 202, respectively. Additionally, EPA Method 9 is required for visible emissions from the HMA plant, as this is the initial test. The tests must be conducted within 60 days after achieving the maximum production rate at which the affected source will be operated, but not later than 180 days after initial startup of the source. The results of the test for this facility must be submitted to the DAQ-WSRO 60 days after the testing. In accordance with 2D .2602, a testing protocol must be provided to DAQ prior to testing. Protocols are not required to be approved before the test date, but those that are received at least 45 days prior to the test date will be reviewed. The facility must provide at least 30 days notice in written form of any required performance testing, to provide DAQ the opportunity to have an observer present. It is reasonable to anticipate compliance.

2D .0611 – Monitoring Emissions from Other Sources

This regulation applies to the Cyclone in series with Bagfilter (HMA-CD1) associated with the Drum Mix Asphalt Plant and Bagfilter (RMC-CD2) associated with the Truck Mix Concrete Batch Plant. It allows the Director to require the facility to conduct monitoring in order to demonstrate compliance with rules in Subchapters 2D and 2Q and is the basis for requiring control device inspections in the Air Permit. This facility will be required to perform periodic inspections and maintenance (I&M) as recommended by the manufacturer. At a minimum, this facility will be required to perform an annual internal inspection of each bagfilter. Records of all inspections and maintenance with dates and descriptions should be kept in a log book (written or electronic format) located on-site. This log book should be made available to DAQ personnel upon request. It is reasonable to anticipate compliance.

2D .1100 – Control of Toxic Air Pollutants (TAPs)

A toxics review has been triggered due to the addition of the HMA plant and associated sources that emit toxic air pollutants (TAPs). The facility modeled for Arsenic, Benzene, Cadmium, Formaldehyde, Mercury and Nickel due to expected actual emissions of these TAPs being above their respective toxic permit emission rates (TPERs) listed at 2Q .0711. The sources of these TAP emissions are the HMA Plant (HMA1), the five (5) HMA Storage Silos (HMA-Silo1 through HMA-Silo5), the Asphalt Loadout Operations (HMA-LO1 through HMA-LO5), the two (2) Asphalt Cement Heaters (HMA-H1 and HMA-H2), and the Concrete Batch Plant. Note that the heaters cannot be exempt from toxics per 2Q .0702 (a)(18), because they are combustion sources permitted after July 10, 2010. TAPs are also expected to be emitted from the exempt storage tanks containing No. 4/Used Oil/Diesel Fuel[1] (IES-1, IES-2 and IES-3) and Liquid Asphalt[2] (IES-4 and IES-5), but these sources currently qualify for exemption from toxics rules per 2Q .0702 (a)(19)(B) for *"storage tanks used only to store: fuel oils […] or petroleum products with a true vapor pressure (TVP) less than 1.5 pounds per square inch absolute."*

On November 4, 2019, Nancy Jones, Meteorologist, Air Quality Analysis Branch (AQAB) issued a Memorandum regarding the analysis stating that the modeling adequately demonstrates compliance, on a source-by-source basis, for all toxics modeled. The memorandum was revised on January 21, 2020 due to adjustments made to the maximum concentration values for Cadmium, Mercury and Nickel. The following table illustrates the maximum impacts from the modeling based on optimized emission rates. The modeled emission rates and the potential emission rates are indicated for each of the emission sources.

[1] Distillate Fuel Oil has a TVP of 0.062 kPa (0.0090 psi) at 700 F (AP-42 7.1, Organic Liquid Storage Tanks, rev. 11/06, Table 7.1-2).

[2] Liquid asphalt has a TVP less than 0.12 kPa (0.017 psi) at 325º F (AP-42 11.1 HMA plants, background document, 2/2004, p. 4-82).

Emission(s) Source	TAP (CAS #)	Potential Emission Rates	Modeled Emission Rates	Averaging Period	Maximum Concentration [µg/m³]	AAL [µg/m³]	AAL [%]
Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No. 4 Fuel Oil-fired Drum-type Hot Asphalt Plant (HMA-1)	Arsenic unlisted compounds (ASC-other)	1.23 lb/yr[1]	14.37 lb/yr	Annual	0.0020	0.0021	95
	Benzene (71-43-2)	854.1 lb/yr	7,752.6 lb/yr		0.11	0.12	95
	Cadmium metal (7440-43-9)	0.90 lb/yr[1]	62.02 lb/yr		0.0052	0.0055	95
	Formaldehyde (50-00-0)	0.775 lb/hr	40.5 lb/hr	1-hr	143	150	95
	Mercury vapor (7439-97-6)	0.0156 lb/24-hr	0.581 lb/24-hr	24-hr	0.57	0.6	95
	Nickel metal (7440-02-0)	0.379 lb/24-hr[1]	5.904 lb/24-hr		5.7	6.0	95
Truck Mix Concrete Batch Plant (RM-1, RM-2, RM-3 and RM-4)	Arsenic unlisted compounds (ASC-other)	0.577 lb/yr[2]	6.77 lb/yr	Annual	See above – the above values are presented as facility-wide.		
	Cadmium metal (7440-43-9)	0.0044 lb/yr[2]	0.301 lb/yr				
	Nickel metal (7440-02-0)	0.0046 lb/24-hr[2]	0.072 lb/24-hr	24-hr			
Natural Gas/No. 2 Fuel Oil-fired Asphalt Cement Heater (HMA-H1)	Arsenic unlisted compounds (ASC-other)	0.034 lb/yr[3,4]	0.493 lb/yr	Annual			
	Benzene (71-43-2)	0.17 lb/yr[3,4]	0.194 lb/yr				
	Cadmium metal (7440-43-9)	0.025 lb/yr[3,4]	2.17 lb/yr				
	Formaldehyde (50-00-0)	0.00041 lb/hr[3,4]	0.0144 lb/hr	1-hr			
	Mercury vapor (7439-97-6)	0.000086 lb/24-hr[3,4]	0.0032 lb/24-hr	24-hr			
	Nickel metal (7440-02-0)	0.000086 lb/24-hr[3,4]	0.0013 lb/24-hr				
Natural Gas/No. 2 Fuel Oil-fired Asphalt Cement Heater (HMA-H2)	Arsenic unlisted compounds (ASC-other)	0.034 lb/yr[3,4]	0.452 lb/yr	Annual			
	Benzene (71-43-2)	0.17 lb/yr[3,4]	0.177 lb/yr				
	Cadmium metal (7440-43-9)	0.025 lb/yr[3,4]	1.99 lb/yr				
	Formaldehyde (50-00-0)	0.00038 lb/hr[3,4]	0.0132 lb/hr	1-hr			
	Mercury vapor (7439-97-6)	0.000079 lb/24-hr[3,4]	0.00295 lb/24-hr	24-hr			
	Nickel metal (7440-02-0)	0.000079 lb/24-hr[3,4]	0.0012 lb/24-hr				
Five Hot Mix Asphalt Storage Silos (HMA-Silo 1 through HMA-Silo 5) and Asphalt Loadout Operation Silos (HMA LO1 through HMA-LO5-5).	Benzene (71-43-2)	13.32 lb/yr[3,5]	42.57 lb/yr	Annual			
	Formaldehyde (50-00-0)	0.0219 lb/hr[3,5]	0.0466 lb/hr	1-hr			

[1] Control device HMA-CD1 is associated with this source; therefore, the potential emission rates shown for Arsenic, Cadmium and Nickel are controlled. Emission rates for all other pollutants are uncontrolled.

[2] Control device RMC-CD2 is associated with this source; therefore, the potential emission rates shown are controlled.

[3] There are no control devices associated with these sources; therefore, the potential emission rates shown are uncontrolled.

[4] In order to keep the Benzene emissions below the modeled rates, the No. 2 Fuel Oil usage will be limited to a maximum of 60,000 gal/yr for each source.

[5] The potential emission rates shown represent those expected from one (1) Asphalt Storage Silo, plus one (1) Asphalt Loadout Operation Silo as only one (1) of each can be operated at the same time. See Attachment A1 for email correspondence dated February 13, 2020 from Scott Martino.

Note that, in order to keep potential Benzene emissions below the modeled rates for the Asphalt Cement Heaters (HMA-H1 and HMA-H2), the No. 2 Fuel Oil consumption shall be less than 60,000 gallons per consecutive 12-month period per Heater. Also, the Permittee will be required to record monthly and total annually the No. 2 Fuel Oil usage, in gallons, per heater. These restrictions and recordkeeping requirements will be placed in the permit under this condition. The remaining sources' potential emissions are less than the modeled emissions rate, so no additional monitoring, recordkeeping, or reporting are necessary to demonstrate compliance with these limits.

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2D .1806 – Control and Prohibition of Odorous Emissions

This regulation requires the facility to utilize management practices or odor control equipment sufficient to prevent odorous emissions from causing or contributing to objectionable emissions beyond the facility's boundaries. It is reasonable to anticipate compliance.

2Q .0304 – Zoning Specific Condition

This regulation is the basis for requesting that, prior to construction or operation of the facility under this permit, as prescribed by NCGS 143-215.108(f), *"An applicant for a permit under this section for a new facility or for the expansion of a facility permitted under this section shall request each local government having jurisdiction over any part of the land on which the facility and its appurtenances are to be located to issue a determination as to whether the local government has in effect a zoning or subdivision ordinance applicable to the facility and whether the proposed facility or expansion would be consistent with the ordinance."* As mentioned under Section I. of this review, this site is located in an area without zoning and the Applicant was required to publish a legal notice pursuant to 15A NCAC 02Q .0113. On December 4, 2019, the required legal notice was published in The Caswell Messenger, a local publication that services the area of the proposed facility. In addition, a sign was posted on the property on December 2, 2019. It is DAQ policy to include a permit condition in permits for facilities located in areas without zoning requiring compliance with all lawfully adopted local ordinances that apply to the facility at the time of construction or operation of the facility.

2Q .0315 - Synthetic Minor Facilities

The facility is subject to this regulation. This regulation allows the facility to choose to have terms and conditions placed in their permit to restrict operation to limit the potential for the facility to emit in order to avoid Title V applicability and thus be classified as a Synthetic Minor facility. The facility has the potential without controls and limits to emit more than 100 tons of CO and SO_2 each per year. To ensure that the facility emits less than 100 tons of CO and SO_2 per year, the Permittee has requested that production be limited to 500,000 tons of asphalt per consecutive 12 month period (see Attachment A2 for email dated December 19, 2019 from Scott Martino requesting this production limit). According to the DAQ Asphalt Emissions Calculator Spreadsheet, Revision G – 08/30/2019 (Attachment E1), based on a maximum annual asphalt production of 500,000 tons per year and a fuel sulfur content of 0.5% for Recycled No. 4 Fuel Oil (worst case), this facility would remain under the Synthetic Minor limits for SO_2 and CO of 100 tons per year, each. Therefore, the requested annual production limit is acceptable. This production limit will be placed in the permit under the Synthetic Minor condition.

The Permittee will be required to record monthly and total annually the amount of asphalt produced and keep fuel supplier certifications on-site and made available to DAQ personnel upon request. Within 30 days after each calendar year, regardless of actual emissions, the following data, including monthly and 12 month totals for the previous 12 month totals, should be reported to the Regional Supervisor: CO and SO_2 emissions, monthly asphalt production, and a summary of the sulfur content of the fuel oils from the fuel certification records for the previous 12 months. It is noted that the above production limit is required only to keep CO emissions below 100 tons per year. Compliance with SO_2 emission limitations is achieved by burning No. 2 Fuel Oil with a maximum sulfur content of 0.5%. It is reasonable to anticipate compliance.

2Q .0317 – Avoidance Conditions (2D .0530 PSD – Sulfur Dioxide)

This facility has the potential to emit more than 250 tons per year of sulfur dioxide (SO_2) emissions after controls (see SECTION V. FACILITY-WIDE EMISSIONS). Compliance with the SO_2 emissions limit set forth under 2Q .0315 above ensures compliance with this regulation and will make the facility minor for PSD. Nonetheless, a PSD avoidance condition will be placed in this permit.

2Q .0317 – Avoidance Conditions (2Q .0700 – Recycled Fuel Oil)

This facility is subject to this rule for the avoidance of 2D .0530 "Prevention of Significant Deterioration" as previously mentioned above. It is also subject to this rule for the avoidance of 2Q .0700 "Toxic Air Pollutant Procedures" due to the use of recycled No. 2 and No. 4 fuel oils. The recycled fuel oil must be equivalent to its virgin counterpart. This can be met by following the allowable levels for arsenic, cadmium, chromium, lead, total halogens, flash point, sulfur, and ash as listed in the permit condition. The facility must record and maintain for a minimum of three (3) years the actual amount of recycled fuel oil delivered to and combusted on an annual basis. Each load received shall include a delivery manifest, a batch specific analytical report, batch signature information, and a certification indicating there were no detectable PCBs (<2ppm). It is reasonable to anticipate compliance.

2Q .0711 – Emission Rates Requiring a Permit (Toxics)

As previously discussed under 2D .1100, a toxics review has been triggered for this facility for certain TAP (i.e., Arsenic, Benzene, Cadmium, Formaldehyde, Mercury and Nickel) because they are expected to be emitted above their respective toxic permit emission rates (TPER). In addition, this facility will emit additional TAP as shown in the table below that are not expected to be emitted above their respective TPER.

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This facility must be operated and maintained so that any toxic air pollutant (TAP) emitted does not exceed its respective toxic permit emission rate (TPER). Prior to exceeding any TPER, the facility must modify their air quality permit. The Permittee shall maintain records of operational information demonstrating that the TAP emissions do not exceed the TPERs. A toxics review has been triggered for this initial review for the emissions of TAPs listed in the table below due to the new HMA and Concrete Batch plants. The Hot Mix Asphalt Plant (HMA-1), the five HMA Storage Silos (HMA-Silo 1 through HMA-Silo 5) and five (5) Asphalt Loadout Operation Silos (HMA LO1 through HMA-LO5-5), the two (2) Asphalt Cement Heaters (HMA-H1 and HMA-H2), and the Concrete Batch Plant will be sources of these TAPs. The expected actual emission rates of these TAPs were calculated by this reviewer using the NCDEQ Concrete Batch Plant, Asphalt, and Fuel Oil Combustion spreadsheets (Attachments C, D, E2 and E3). Expected actual emissions for the HMA plant are based on either Natural Gas or No. 4/No. 6 Fuel Oil combustion, to obtain the worst case TAP emissions, and 500,000 tons of asphalt production per year. These emission rates will not exceed the TPERs as demonstrated below. It is reasonable to anticipate compliance.

Toxic Air Pollutant (CAS #)	TPER	Expected Actual Emission Rate
Acetaldehyde (75-07-0)	6.8 lb/hr	0.325 lb/hr
Acrolein (107-02-8)	0.02 lb/hr	0.0065 lb/hr
Benzo(a)pyrene (Component of 83329/POMTV & 56553/7PAH) (50-32-8)	2.2 lb/yr	0.0088 lb/yr
Beryllium Metal (7440-41-7)	0.28 lb/yr	0.0607 lb/yr
Carbon disulfide (75-15-0)	3.9 lb/day	0.015 lb/day
Chromium (VI) Soluble Chromate Compounds (Component of CRC) (SolCR6)	0.013 lb/day	0.0067 lb/day
Fluorides (16984-48-8)	0.34 lb/day 0.064 lb/hr	0.0147 lb/day 0.00061 lb/hr
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (57653- 85-7)	0.0051 lb/yr	6.50×10^{-7} lb/yr
Hexane, n- (110-54-3)	23 lb/day	5.74 lb/day
Hydrogen sulfide (7783-06-4)	1.7 lb/day	0.328 lb/day
MEK (methyl ethyl ketone, 2-butanone) (78-93-3)	78 lb/day 22.4 lb/hr	0.161 lb/day 0.0067 lb/hr
Manganese unlisted compounds (MNC)	0.63 lb/day	0.0645 lb/day
Methyl chloroform (71-55-6)	250 lb/day 64 lb/hr	0.288 lb/day 0.012 lb/hr
Methylene chloride (75-09-2)	1,600 lb/yr 0.39 lb/hr	0.0165 lb/yr 8.23×10^{-6} lb/hr
Perchloroethylene (tetrachloroethylene) (127-18-4)	13,000 lb/yr	0.160 lb/yr
Phenol (108-95-2)	0.24 lb/hr	0.0010 lb/hr
Styrene (100-42-5)	2.7 lb/hr	0.00024 lb/hr
Tetrachlorodibenzo-p-dioxin 2,3,7,8 (1746-01-6)	0.00020 lb/yr	1.05×10^{-7} lb/yr
Toluene (108-88-3)	98 lb/day 14.4 lb/hr	17.53 lb/day 0.73 lb/hr
Xylene (mixed isomers) (1330-20-7)	57 lb/day 16.4 lb/hr	1.45 lb/day 0.0604 lb/hr

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IV. NEW SOURCE PERFORMANCE STANDARDS (NSPS) / NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) / PREVENTION OF SIGNIFICANT DETERIORATION (PSD) / EPA SECTION 112r / ATTAINMENT/NON-ATTAINMENT STATUS

- **NSPS APPLICABILITY** - As discussed in Section III. under 2D .0524, the facility **is** subject to 40 CFR 60 Subpart I – "Standards of Performance for Hot Mix Asphalt Facilities" and Subpart OOO for "Nonmetallic Mineral Processing Plants."

  The two Asphalt Cement Heaters (HMA-H1 and HMA-H2) **are not** subject to 40 CFR Part 60, Subpart Dc because the maximum heat input of each is less than 10 million Btu per hour.

  The insignificant aboveground storage tanks containing fuel oil and liquid asphalt (IES-1, IES-2, IES-4 and IES-5) are not subject to 40 CFR Part 60, Subpart Kb, because fuel oil has a true vapor pressure (TVP) less than 0.062 kilopascals (kPa), or 0.0090 psi, at 70^0 F. (AP-42 7.1, Organic Liquid Storage Tanks, rev. 11/06, Table 7.1-2), and liquid asphalt has a TVP of 0.12 kPa (0.017 psi) at 325 ºF (AP-42 11.1 HMA plants, background document, 2/2004, p. 4-82).

- **NESHAP APPLICABILITY** - This facility **is not** subject to any current NESHAP regulation.

  The two Asphalt Cement Heaters (HMA-H1 and HMA-H2) **are not** subject to 40 CFR 63 Subpart JJJJJJ for Industrial, Commercial, and Institutional Boilers at Area Sources. This rule defines boilers as "an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam or hot water." These heaters are not considered boilers as defined by this rule, i.e., it is not used to create steam, and so this rule **does not** apply.

  The facility **is not** subject to 40 CFR 63 Subpart LLLLL - National Emission Standards for Hazardous Air Pollutants: Asphalt Processing and Asphalt Roofing Manufacturing. This facility is not defined as an asphalt processing plant or asphalt roofing manufacturer in this Subpart, and is classified as minor for HAP emissions, and so this rule **does not** apply.

- **PSD APPLICABILITY** - As discussed in Section III. under 2Q .0317, this facility has the potential to emit greater than 250 tons per year (after controls) of a criteria pollutant (SO_2) but has a permit condition under rule 2Q .0317 so that it can be considered minor for PSD purposes. This facility is not one of the twenty-eight named PSD source categories limited to 100 tons per year (after controls) of any criteria pollutant. Caswell County has not yet triggered a PSD baseline date. Therefore, increment tracking is not required.

- **TOXICS APPLICABILITY -** The facility will emit toxics and **is** subject to 2D .1100 and 2Q .0711. See Section III. for further discussion.

- **EPA SECTION 112(r) -** This facility **is** subject to the "General Duty Clause" of EPA Section 112(r) regulations; however, it **is not** subject to the Risk Management Plan (RMP) requirement.

- **ATTAINMENT/NON-ATTAINMENT STATUS -** Caswell County is considered in attainment or unclassifiable for all regulated pollutants.

V. FACILITY – WIDE EMISSIONS

The following table summarizes the facility-wide emissions. The expected actual and potential emissions (before and after controls/limits) were calculated by adding emissions from the NCDEQ Asphalt, Fuel Oil Combustion, and Concrete Batch spreadsheets (Attachments C, D, E3, E4 and E5) as applicable. Expected actual emissions for the HMA plant are based on No. 4/No. 6 Fuel Oil combustion and 500,000 tons of asphalt per year. Potential emissions before controls/limits are based on the maximum rate of 250 tons per hour, for 8,760 hours per year with a worst-case sulfur content of 2.1%. Potential emissions after controls/limits are based on the Synthetic Minor limits of 500,000 tons of asphalt per year limits and 0.5% sulfur content. As the asphalt spreadsheets do not include HAPs from the heaters, the NCDEQ Fuel Oil Combustion Emissions Calculator spreadsheet (Attachment D) was used to add potential HAPs from the heaters to the total potential HAPs from the plant.

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Pollutant	Expected Actual Emissions [tons/year]	Potential Emissions [tons/year]	
		Before controls/limits	After controls/limits
PM	33.92	541.72	34.08
PM_{10}	17.96	212.02	18.01
PM_{10} for Title V*		39.79+0.23* = 40.02	7.34+0.23* = 7.57
SO_2	27.79	688.00	31.15
NO_x	15.68	67.92	16.63
CO	33.61	147.04	33.85
VOC	12.05	52.78	12.06
HAP_{Total}	2.58	11.32	2.59
$HAP_{Highest}$ (Formaldehyde)	0.80	3.49	0.80

* For Title V applicability, only emissions from the cement and fly ash storage silos after controls are considered from the Concrete Batch Plant, because the EPA considers emissions from cement/fly ash scales (weigh batchers) and truck loading operations to be fugitive and uncontrolled. In addition, the EPA considers the bagfilter for the cement and fly ash silos to be integral. Therefore, the facility does not trigger Synthetic Minor for PM_{10}.

VI. COMPLIANCE

There is no compliance history as this is a Greenfield facility. This facility will be targeted for a compliance inspection upon issuance of this permit.

VII. APPLICATION FEE

An application fee of $400, the required fee for a new permit for a Greenfield facility, was submitted along with the application.

VIII. ZONING CONSISTENCY DETERMINATION (ZCD)

As mentioned previously, this site is located in an area without zoning; therefore, a legal notice is required per 2Q .0113. A sign was posted on the property on December 2, 2019 and the required legal notice was published in The Caswell Messenger on December 4, 2019. Chris Bryant of the WSRO verified that the sign was posted, via site visit on December 18, 2019 and compliance with legal notice requirements was fulfilled on January 11, 2020.

IX. RECOMMENDATION

It is recommended that Air Quality Permit No. 10628R00 be issued to Carolina Sunrock LLC – Burlington North.

X. SUMMARY OF ATTACHMENTS

The following attachments accompany this review:

Attachment	Description
A1	Email correspondence dated January 8 and February 13, 2020 from Scott Martino
A2	Email correspondence dated November 25 and December 19, 2019 from Scott Martino
B1	Bagfilter Evaluation for HMA-CD1
B2	Bagfilter Evaluation for RMC-CD2
C	NCDENR Concrete Batch Emissions Calculator spreadsheet
D	NCDENR Fuel Oil Emissions Calculator spreadsheet
E1	NCDENR Asphalt Emissions Calculator spreadsheet for Actual SO_2 and CO Emissions w/ Synthetic Minor Limits
E2	NCDENR Asphalt Emissions Calculator spreadsheet for Expected Actual Emissions using Natural Gas
E3	NCDENR Asphalt Emissions Calculator spreadsheet for Expected Actual Emissions using Waste/No. Fuel Oil

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Attachment	Description
E4	NCDENR Asphalt Emissions Calculator spreadsheet for Potential Emissions before controls/limits
E5	NCDENR Asphalt Emissions Calculator spreadsheet for Potential Emissions after controls/limits
E6	NCDENR Asphalt Emissions Calculator spreadsheet for Potential TAP Emissions using Natural Gas
E7	NCDENR Asphalt Emissions Calculator spreadsheet for Potential TAP Emissions using No.4/No 6 Fuel Oil
E8	NCDENR Fuel Oil Emissions Calculator spreadsheet for Potential TAP Emissions from HMA-H1
E9	NCDENR Fuel Oil Emissions Calculator spreadsheet for Potential TAP Emissions from HMA-H2
E10	NCDENR Concrete Batch Emissions Calculator spreadsheet for Potential TAP Emissions
E11	Facility-Wide Emissions Summary Spreadsheet

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DIVISION OF AIR QUALITY
January 21, 2020

MEMORANDUM

TO: Leo Governale, Environmental Engineer, WSRO
Davis Murphy, Permit Coordinator, WSRO

FROM: Nancy Jones, Meteorologist, Air Quality Analysis Branch (AQAB)

THROUGH: Tom Anderson, AQAB Supervisor, AQAB

SUBJECT: Corrected Review of Dispersion Modeling Analysis Carolina Sunrock, LLC
Burlington, Caswell County, North Carolina Facility ID: 1700016

This is a correction of the November 4, 2019 memo. I have corrected the maximum concentrations of cadmium, mercury, and nickel.

I have reviewed the dispersion modeling analysis, received September 23, 2019 for the Carolina Sunrock facility near Burlington, in Caswell County, North Carolina. The modeling was submitted as part of an application for a new hot mix asphalt plant and a concrete batch plant. The purpose for modeling was to demonstrate compliance with guidelines specified in 15A NCAC 2D .1104 for Toxic Air Pollutants (TAPs) emitted in excess of the Toxic Permitting Emission Rates (TPERs) listed in 15A NCAC 2Q .0711. The modeling adequately demonstrates compliance, on a source-by-source basis, for all toxics modeled.

Six air toxics, arsenic, benzene, cadmium, formaldehyde, mercury and nickel were evaluated using AERMOD (v18081) with the 2014-2018 Danville, VA surface and Greensboro upper air meteorological data. Direction-specific building dimensions, determined using EPA's BPIP-Prime program (04274), were used as input to the model for building wake effect determination. Release parameters and emission rates are attached. Receptors were spaced 50 meters apart along the property line and then spaced 100 meters apart extending out to 2,500 meters, 250 meters apart out to 7,500 meters. Release parameters and optimized emission rates are attached.

Maximum Modeled Toxics Impacts from Optimized Emission Rates
Carolina Sunrock – Burlington Facility, Caswell County, NC

Pollutant	Averaging Period	Max. Conc. ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% of AAL
Arsenic	Annual	0.0020	0.0021	95 %
Benzene	Annual	0.11	0.12	95 %
Cadmium	Annual	0.0052	0.0055	95 %
Formaldehyde	1-hr	143	150	95 %
Mercury	24-hr	0.57	0.6	95 %
Nickel	24-hr	5.7	6.0	95 %

This compliance demonstration assumes the source parameters and pollutant emission rates used in the dispersion modeling analysis are correct.

cc: Tom Anderson
Nancy Jones

Point Source ID	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temp.	Exit Velocity	Stack Diameter
	(m)	(m)	(m)	(ft)	(°F)	(fps)	(ft)
CD_1	650,208	4,013,087	201.32	30.2	240	96.5	3.1
CD_2	650,221	4,013,028	203.17	35	77	80	1.5
ESH_2	650,204	4,013,069	201.5	9	325	0.03	1
ESH_1	650,190	4,013,088	200.3	15	325	0.03	0.2

Area Source ID	Easting (X)	Northing (Y)	Base Elevation	Release Height	Init. Horiz. Dimension	Initial Vert. Dimension
	(m)	(m)	(m)	(ft)	(ft)	(ft)
F1	650,185	4,013,059	200.9	40.00	5.81	18.60
F2	650,231	4,013,024	203.91	32.5	5.81	15.12

Point Source ID	Arsenic	Benzene	Cadmium	Formaldehyde	Mercury	Nickel
	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
CD_1	0.00164	0.885	0.00708	40.5	0.0242	0.246
CD_2	7.73E-04		3.44E-05			0.00299
ESH_2	5.63E-05	2.21E-05	2.48E-04	0.0144	1.34E-04	5.60E-05
ESH_1	5.16E-05	2.02E-05	2.27E-04	0.0132	1.23E-04	5.14E-05

Area Source ID	Arsenic	Benzene	Cadmium	Formald	Mercury	Nickel
	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
F1		0.00486		0.0466		
F2	1.04E-04					

Governale, Leo

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Wednesday, January 8, 2020 1:50 PM
To: Governale, Leo
Subject: [External] Carolina Sunrock - Burlington North
Attachments: B9.xlsx; B Forms.xlsx

[redacted]

Hi Leo,

Attached are the two forms you requested with the corrections we discussed.

Also as for the cyclone on the baghouse for the asphalt plant. It is physically part of the baghouse itself. The air from the drum first passes through the cyclone protecting the bags from the larger size fractions. This large size fraction drop to the internal screw in the baghouse and is returned to the drum. Essentially the cyclone and baghouse is all one unit, the cyclone just pretreats the exhaust from the drum to help protect the bags as an internal function of the baghouse.

Keep me posted as to if you need anything else and I'll be happy to round it up for you.

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

ATTACHMENT A1

Governale, Leo

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Monday, November 25, 2019 10:00 AM
To: Governale, Leo
Subject: [External] Carolina Sunrock - Burlington North Air Permit

[redacted]

Hi Leo,

As we talked the 20,000-gallon gasoline tank should have been a 20,000-gallong Diesel fuel for all our Mobil equipment and over the road haulage fleet.

If you could make that change would be great, we do not have gasoline tanks on any of our facilities other than maybe a small 5 gallon container for odds and end type stuff.

Let me know if you need anything else and Ill be happy to help

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

ATTACHMENT A-2

Governale, Leo

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Thursday, December 19, 2019 8:40 AM
To: Governale, Leo
Subject: [External] RE: Carolina Sunrock - Burlington North Air Permit
Attachments: A2-A3 Burlington North Revised.xlsx

[redacted]

Hi Leo,

I fixed up the table to match everything as we discussed. If you want to use these labels in the permit that will be fine or you can keep what you have.

As far as staying within the synthetic minor world, that's exactly what we would like to do. We can accept a annually total production limit of 500K – tons per year.

Let me know if you need anything else and I'll be happy to help.

Thanks

Scott

From: Scott Martino
Sent: Wednesday, December 18, 2019 12:28 PM
To: Governale, Leo <Leo.Governale@ncdenr.gov>
Subject: Carolina Sunrock - Burlington North Air Permit

Hi Leo,

Attached is an updated AA2 for you with all the proper labeling for the facility. let me know if you have any further questions and I'll be happy to help out.

Happy Holidays

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

NC Department of Environmental Quality
Received
DEC 19 2019
Winston-Salem Regional Office

Bagfilter Evaluation - Carolina Sunrock, LLC - 1700016 - HMA-CD1

User Input

User must supply information in blue (double outline).

Optional user information is single outlined.

Particulate Material: Abrasive dust

Estimated Efficiency (%): 99.99

Actual Air Flow Rate (acfm): 51,111

Cloth Area (sq ft): 8,968

Maximum Operating Temperature (F): 325

Proposed Cloth Material: —

Pulse Jet?: yes

Uncontrolled Particulate Rate (lb/hr):

Process Rate (lb/hr): 500,000 **

Maximum Pressure Drop (in H2O):

No. of compartments: 3

Gas Stream Moisture (%):

Felted?: no

Time Between Cleanings (min):

Cleaning Time (min):

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
3	0 - 2.5	1	40.2
7.5	2.5 - 5	5	70.0
12.5	5 - 10	10	100.0
17.5	10 - 15	15	100.0
60	15 - 20	20	100.0
100	> 20	100	100.0

Information Source(s)

* Filter Material --> Aramid = Nomex

** Process Rate = 250 tons/hr x 2,000 lb/ton = 500,000 lb/hr

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (fpm): 10.0

Applicant Filtering Velocity (fpm): 5.7

Typical filtering velocity not exceeded.

Fabric Durability Analysis

	Chemical Resistance		
	Acid	Alkali	Organics
Fabric appropriate for max. oper. temp.	Fair	Good	Good

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr): 0.000

Gas Stream Particulate Loadings (gr/dscf)

Uncontrolled: 0.00

Controlled: 0.0000

Note: Correct gas stream temperature and moisture content must be entered!

The estimated collection efficiency may be unreasonable.
See bagfilter efficiency calculation below!

Allowable Emissions per 2D .0515 (lb/hr): 60.96

Maximum Areal Dust Loading (gr/sq ft): 0.0

Dust drag (K2) parameter ((inH2O/fpm)/(lb/sq ft)): 0

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-m (%)
40.2	99.90	40.16
29.8	99.90	29.77
30.0	99.99	30.00
0.0	99.99	0.00
0.0	99.99	0.00
0.0	99.99	0.00

Overall Control Efficiency = 99.93 %

Penetration = 0.07 %

Bagfilter evaluation developed by:

William D. Willets, M.S., E.I.T.
North Carolina Division of Environmental Management
Air Quality Permitting

Version 3.3; September 23, 1999

ATTACHMENT B1

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | C1

CONTROL DEVICE ID NO: **HMA-CD1**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2&A3**
EMISSION POINT (STACK) ID NO(S): **EP-1**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
	P.E. SEAL REQUIRED (PER 2q .0112)? ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM: **Hot Mix Asphalt Plant Bag House Model RBH 51-12 Ser No 03-201-3001,**

- **o 51,111 ACFM**
- **o (768) 4-5/8" Ø x 10' long 14oz aramid bags**
- **o 8,968 ft2 cloth area; 5.68 fpm filtering velocity (Air/Cloth Ratio)**
- **o 41-5/8" ID stack; 31'-0" discharge height above grade**
- **o Integral 9' Ø x 10' long horizontal cyclone primary collector**

POLLUTANTS COLLECTED:	PM	PM10		
BEFORE CONTROL EMISSION RATE (LB/HR):	See Appendix A			
CAPTURE EFFICIENCY:	99.99 %	99.99 %	%	%
CONTROL DEVICE EFFICIENCY:	90 %	90 %	%	%
CORRESPONDING OVERALL EFFICIENCY:	93 %	90 %	%	%
EFFICIENCY DETERMINATION CODE:	1	1		
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	8.25	5.75		

PRESSURE DROP (IN H_2O): MIN:	MAX:	GAUGE? ☑ YES ☐ NO	
BULK PARTICLE DENSITY (LB/FT^3): ~~54.444~~		INLET TEMPERATURE (^{o}f): MIN **Ambient**	MAX **325**
POLLUTANT LOADING RATE: ☑ LB/HR ☐ GR/FT^3		OUTLET TEMPERATURE (^{o}f) MIN **Ambient**	MAX **325**
INLET AIR FLOW RATE (ACFM): **51,111**		FILTER OPERATING TEMP (^{o}f): **325**	
NO. OF COMPARTMENTS: **3**	NO. OF BAGS PER COMPARTMENT: **246**	LENGTH OF BAG (IN.): **120.5**	
NO. OF CARTRIDGES: **738**	FILTER SURFACE AREA PER CARTRIDGE (FT^2): **12.11**	DIAMETER OF BAG (IN.): **4 5/8**	
TOTAL FILTER SURFACE AREA (FT^2): **8,968**	AIR TO CLOTH RATIO: **5.68**		
DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE		FILTER MATERIAL: ☑ WOVEN ☐ FELTED	

DESCRIBE CLEANING PROCEDURES:

- ☑ AIR PULSE
- ☐ REVERSE FLOW
- ☐ MECHANICAL/SHAKER
- ☐ OTHER:
- ☐ SONIC
- ☐ SIMPLE BAG COLLAPSE
- ☐ RING BAG COLLAPSE

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	40	40.2
1-10	60	100
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

DESCRIBE INCOMING AIR STREAM: **Hot Air from Drying and Mixing Drums in HMA Plant**

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

NC Department of Environmental Quality
Received
JAN 30 2020
Winston-Salem Regional Office

Attach Additional Sheets As Necessary

Bagfilter Evaluation - Carolina Sunrock, LLC - 1700016 - RMC-CD2

User Input

User must supply information in blue (double outline).

Optional user information is single outlined.

Particulate Material: Cement	Estimated Efficiency (%): 99.9
Actual Air Flow Rate (acfm): 6,500	Cloth Area (sq ft): 1,433
Maximum Operating Temperature (F): 70	Proposed Cloth Material: Dacron *
	Pulse Jet?: no
Uncontrolled Particulate Rate (lb/hr):	Process Rate (lb/hr): 4,156 **
Maximum Pressure Drop (in H2O):	No. of compartments: 2
Gas Stream Moisture (%):	Felted?: yes
Time Between Cleanings (min):	Cleaning Time (min):

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
3	0 - 2.5	1	40.2
7.5	2.5 - 5	5	70.0
12.5	5 - 10	10	100.0
17.5	10 - 15	15	100.0
60	15 - 20	20	100.0
100	> 20	100	100.0

Information Source(s)

* Filter Material --> Polyester = Dacron

**Form B9: Cement 448 lb/hr + Supplement 148 lb/hr + Aggregate 1,980 lb/hr + Sand 1,440lb/hr + Water 140 lb/hr = 4,156 lb/hr

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (fpm)	Applicant Filtering Velocity (fpm)
8.0	4.5

Typical filtering velocity not exceeded.

Fabric Durability Analysis

	Chemical Resistance: Acid	Alkali	Organics	
Fabric appropriate for max. oper. temp.	Good	Fair	Good >	Except phenol

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr): 0.000

Gas Stream Particulate Loadings (gr/dscf): Uncontrolled 0.00; Controlled 0.0000

Note: Correct gas stream temperature and moisture content must be entered!

The estimated collection efficiency is reasonable.

Allowable Emissions per 2D .0515 (lb/hr): 6.69

Maximum Areal Dust Loading (gr/sq ft)	Dust drag (K2) parameter ((inH2O/fpm)/(lb/sq ft))
0.0	0

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-m (%)
40.2	99.90	40.16
29.8	99.90	29.77
30.0	99.99	30.00
0.0	99.99	0.00
0.0	99.99	0.00
0.0	99.99	0.00
	Overall Control Efficiency =	99.93 %
	Penetration =	0.07 %

Bagfilter evaluation developed by:

William D. Willets, M.S., E.I.T.
North Carolina Division of Environmental Management
Air Quality Permitting

Version 3.3; September 23, 1999

ATTACHMENT B2

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: **RMC-CD2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2**
EMISSION POINT (STACK) ID NO: **EP-2**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
	P.E. SEAL REQUIRED (PER 2q .011): ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM: **C&W Manufacturing - RA-140 - 6500 CFM to control emissions from cement/fly ash silos and aggregate and truck loading.**

POLLUTANTS COLLECTED:	**PM**	**PM10**		
BEFORE CONTROL EMISSION RATE (LB/HR)	**See Appendix A4**			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	**99.9** %	**99.9** %	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (L	**See Appendix A4**			

PRESSURE DROP (IN H_2O): MIN: M/ GAUGE? ☑ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE MIN MAX	
POLLUTANT LOADING RATE: ☐ LB/HR ☐ GR/FT^3	OUTLET TEMPERATUR MIN MAX	
INLET AIR FLOW RATE (ACFM): **6,500 cfm**	FILTER OPERATING TEMP (°f): **Ambient**	
NO. OF COMPARTMENTS: **2**	NO. OF BAGS PER COMPARTMENT: **36**	LENGTH OF BAG (IN.): **114**
NO. OF CARTRIDGES: **72**	FILTER SURFACE AREA PER CARTRIDGE (FT^2):	DIAMETER OF BAG (IN.): **8**
TOTAL FILTER SURFACE AREA (FT^2): **1,43**	AIR TO CLOTH RATIO: **4.54:1**	Filter material: **felt polyester bags**
DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCED

☐ AIR PULSE ☐ SONIC
☑ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE
☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE
☐ OTHER:

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	**40**	**40.2**
1-10	**60**	**100**
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

DESCRIBE INCOMING AIR STREAM: **Hot Air from Drying and Mixing Drums in HMA Plant**

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOU

COMMENTS:

NC Department of Environmental Quality
Received
JAN 15 2020
Winston-Salem
Regional Office

Attach Additional Sheets As Necessary

RMC- CD2 BAGFILTER SPECS.

Specifications:

MATERIAL: POLYESTER

Specifications	RA-120	RA-140	RA-170	RA-200	RA-280	RA-340
Total filtration area (sq. ft.)	955	1433	1734	2148	2865	3468
Number of bags	48	72	72	108	144	144
Bag diameter and length	8"x114"	8"x114"	8"x138"	8"x114"	8"x114"	8"x138"
Normal air capacity (CFM)	5,000	6,500	8,000	10,000	13,000	15,000
Static pressure drop	6"W.C.	6"W.C.	6"W.C.	6"W.C.	6"W.C.	6"W.C.
Air to cloth ratio (ft/min)	5.2	4.54	4.61	4.66	4.54	4.33
Blower hp	10	10	15	20	25	30
Min design efficiency*	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%
Filtration velocity ft/min	5.2	4.54	4.61	4.66	4.54	4.33
Outlet area ft2	1.91	2.29	2.85	2.85	4.19	5.17
Outlet velocity ft/sec	43.6	47.31	46.78	58.48	51.71	48.36
Cleaning mechanism	reverse air	reverse air	reverse air	reverse air	reverse air	reverse air
*At standard test conditions						

Source: www.cwmfg.com

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - INPUT SCREEN

REVISION D; October 15, 2015

NCDENR

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Directions: Enter and select information in the boxes that are highlighted in blue:

General Facility Information

COMPANY NAME:	Carolina Sunrock, LLC - Burlington North
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10928R00
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	120	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	1,051,200	(yd^3/year)
MAXIMUM ANNUAL PRODUCTION*	1,051,200	(yd^3/year)

*Default maximum annual production is maximum hourly throughput times 8,760 hours per year. Enter another limit if applicable (i.e. for arsenic modeling).

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	100	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	2	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	1	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	[illegible]	lbs	*410 lbs*
Supplement	[illegible]	lbs	*120 lbs*
Coarse Aggregate	1980	lbs	*1884 lbs*
Sand	1440	lbs	*1443 lbs*
Water	140	lbs	*167 lbs*
Total	4156	lbs	*4024 lbs*

* *North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

PROCESS RATE FOR RM-4

$120\ yd^3/hr. \times (443 + 148\ lb/yd^3) \div 2{,}000\ lb/ton = 35.76\ tons/hr.$

15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes"

	Cement Silo	Flyash silo	Sand&Agg Weigh hopper	Truck mix[1]	Central mix[1]	
Enter the process rate if different from default, otherwise leave blank						
Process Rate[2]	25	25	205.200	240.96	0.000	tons/hr
Maximum Allowable Emission Rate[3]	35.4	35.4	58.8	60.5	0.0	lbs/hr
PM Emission Rate Before controls	18.250	78.500	0.985	52.210	0.000	lbs/hr
PM Emission Rate After Controls	0.025	0.223	0.001	1.001	0.000	lbs/hr
Assumed control device efficiency for weigh hopper[4]			99.9%			
Complies with 2D .0515?	yes	yes	yes	yes	yes	
Control device required to comply?	no	yes	no	no	no	

[1] *Emission factors for truck/central mix include emissions from cement & supplement weigh hoppers.*

[2] *Default process rate for silo loading is 25 tons per hour. Default process weight for sand & aggr weigh hopper includes only aggr & sand. Default process rate for truck mix and central mix includes all components except water since assumes water is added directly to truck.*

[3] *Allowable emission rate should be calculated to 3 significant digits.*

[4] *Default efficiency is 99.9% for bagfilters. Enter 0 if weigh hopper is not controlled.*

ATTACHMENT C

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

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General Facility Information

COMPANY NAME:	Carolina Sunrock, LLC - Burlington North
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10928R00
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	120	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	1051200	(yd^3/year)

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	100	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	2	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	1	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	448	lbs	*410 lbs*
Supplement	148	lbs	*120 lbs*
Coarse Aggregate	1980	lbs	*1884 lbs*
Sand	1440	lbs	*1443 lbs*
Water	140	lbs	*167 lbs*
Total	4156	lbs	*4024 lbs*

** North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

PARTICULATE EMISSIONS INFORMATION

PARTICULATE EMISSIONS	Pollutant	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
truck mix*	PM	1.001	4.386	52.210	228.678	1.001	4.386
	PM10	0.375	1.645	14.912	65.314	0.375	1.645
central mix*	PM	0.000	0.000	0.000	0.000	0.000	0.000
	PM10	0.000	0.000	0.000	0.000	0.000	0.000
cement silo	PM	0.027	0.117	19.622	85.946	0.027	0.117
	PM10	0.009	0.040	12.634	55.335	0.009	0.040
suppl. Silo	PM	0.079	0.346	27.883	122.128	0.079	0.346
	PM10	0.044	0.191	9.768	42.784	0.044	0.191
weigh hopper** [sand & aggr.]	PM	0.985	4.314	0.985	4.314	0.985	4.314
	PM10	0.575	2.517	0.575	2.517	0.575	2.517
sand & aggr.	PM	3.003	13.155	3.003	13.155	3.003	13.155
	PM10	1.433	6.275	1.433	6.275	1.433	6.275
TOTAL PM	PM	5.095	22.318	109.704	454.222	5.095	22.318
TOTAL PM10	PM10	2.435	10.667	39.321	172.225	2.435	10.667
Title V Potential	PM10						0.231

*Truck/Central mix emission factors include emissions from cement & supplement weigh hopper(s).

**Actual/Potential weigh hopper (sand & aggr) emissions assumed uncontrolled since AP-42 reports "no data" for controlled.

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

NCDENR

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POLLUTANT	CAS NUMBER	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS)	
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER	6.59E-05	5.77E-01	2.49E-03	2.18E+01	6.59E-05	5.77E-01
Beryllium metal (TH)	7440-41-7	4.53E-06	3.97E-02	1.00E-05	8.77E-02	4.53E-06	3.97E-02
Cadmium Metal (TH)	7440-43-9	5.00E-07	4.38E-03	7.69E-06	6.74E-02	5.00E-07	4.38E-03
Chromic Acid (TH)	7738-94-5	1.58E-04	1.39E+00	4.25E-04	3.73E+00	1.58E-04	1.39E+00
Lead Unlisted Compounds (H)	PBC-OTHER	5.96E-05	5.22E-01	1.32E-03	1.16E+01	5.96E-05	5.22E-01
Manganese Unlisted compounds (TH)	MNC-OTHER	7.49E-04	6.56E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00
Nickel metal (TH)	7440-02-0	1.92E-04	1.68E+00	9.19E-04	8.05E+00	1.92E-04	1.68E+00
Phosphorus Metal Yellow or White (H)	7223-14-0	4.71E-04	4.13E+00	1.72E-03	1.51E+01	4.71E-04	4.13E+00
Selenium compounds (H)	SEC	4.68E-06	4.10E-02	9.43E-05	8.26E-01	4.68E-06	4.10E-02
Total HAPs		1.71E-03	1.49E+01	1.47E-02	1.28E+02	1.71E-03	1.49E+01
Highest HAP Manganese		7.49E-04	6.56E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00

TOXIC AIR POLLUTANT EMISSION INPUT DATA

EXPECTED EMISSIONS AFTER CONTROLS / LIMITATIONS

(Daily calculations are based on maximum hourly plant capacity operating at 24 hours per day. If over the TPER, the facility should more closely analyze the maximum daily emisions based on actual operation. Annual calculations are based on the actual annual production as entered on the INPUT worksheet.)

POLLUTANT	CAS NUMBER	lb/hr	lb/day	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER			0.5769
Beryllium metal (TH)	7440-41-7			0.040
Cadmium Metal (TH)	7440-43-9			0.004
Chromic Acid (TH)	7738-94-5		0.0038	
Manganese Unlisted compounds (TH)	MNC-OTHER		0.018	
Nickel metal (TH)	7440-02-0		0.005	

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - TAP CALCULATIONS

REVISION D; October 15, 2015

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ARSENIC EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Arsenic	5.69E-05	4.98E-01	2.43E-03	2.13E+01	5.69E-05	4.98E-01
central mix	Arsenic	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Arsenic	1.14E-07	9.98E-04	4.52E-05	3.96E-01	1.14E-07	9.98E-04
supplement silo*	Arsenic	8.88E-06	7.78E-02	8.88E-06	7.78E-02	8.88E-06	7.78E-02
TOTAL	**Arsenic**	**6.59E-05**	**5.77E-01**	**2.49E-03**	**2.18E+01**	**6.59E-05**	**5.77E-01**
		(Arsenic TPER: 0.053 lb/yr)					

BERYLLIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Beryllium	3.72E-06	3.26E-02	8.73E-06	7.64E-02	3.72E-06	3.26E-02
central mix	Beryllium	-	-	-	-	-	-
cement silo	Beryllium	1.31E-08	1.14E-04	4.81E-07	4.21E-03	1.31E-08	1.14E-04
supplement silo*	Beryllium	8.03E-07	7.03E-03	8.03E-07	7.03E-03	8.03E-07	7.03E-03
TOTAL	**Beryllium**	**4.53E-06**	**3.97E-02**	**1.00E-05**	**8.77E-02**	**4.53E-06**	**3.97E-02**
		(Beryllium TPER: 0.28 lb/yr)					

CADMIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Cadmium	3.24E-07	2.84E-03	1.22E-06	1.07E-02	3.24E-07	2.84E-03
central mix	Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Cadmium	-	-	6.29E-06	5.51E-02	-	-
supplement silo*	Cadmium	1.76E-07	1.54E-03	1.76E-07	1.54E-03	1.76E-07	1.54E-03
TOTAL	**Cadmium**	**5.00E-07**	**4.38E-03**	**7.69E-06**	**6.74E-02**	**5.00E-07**	**4.38E-03**
		(Cadmium TPER: 0.37 lb/yr)					

CHROMIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Chromium	1.47E-04	1.28E+00	4.08E-04	3.57E+00	1.47E-04	1.28E+00
central mix	Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Chromium	7.80E-07	6.83E-03	6.77E-06	5.93E-02	7.80E-07	6.83E-03
supplement silo*	Chromium	1.08E-05	9.49E-02	1.08E-05	9.49E-02	1.08E-05	9.49E-02
TOTAL	**Chromium**	**1.58E-04**	**1.39E+00**	**4.25E-04**	**3.73E+00**	**1.58E-04**	**1.39E+00**
		(Chromium TPER: 0.013 lb/day)					

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - TAP CALCULATIONS

REVISION D; October 15, 2015

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LEAD EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Lead	5.47E-05	4.79E-01	1.29E-03	1.13E+01	5.47E-05	4.79E-01
central mix	Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Lead	2.93E-07	2.57E-03	1.98E-05	1.73E-01	2.93E-07	2.57E-03
supplement silo*	Lead	4.62E-06	4.05E-02	4.62E-06	4.05E-02	4.62E-06	4.05E-02
TOTAL	**Lead**	**5.96E-05**	**5.22E-01**	**1.32E-03**	**1.16E+01**	**5.96E-05**	**5.22E-01**

MANGANESE EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Manganese	7.44E-04	6.52E+00	2.19E-03	1.92E+01	7.44E-04	6.52E+00
central mix	Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Manganese	3.14E-06	2.75E-02	5.48E-03	4.80E+01	3.14E-06	2.75E-02
supplement silo*	Manganese	2.27E-06	1.99E-02	2.27E-06	1.99E-02	2.27E-06	1.99E-02
TOTAL	**Manganese**	**7.49E-04**	**6.56E+00**	**7.67E-03**	**6.72E+01**	**7.49E-04**	**6.56E+00**

(Manganese TPER: 0.63 lb/day)

NICKEL EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Nickel	1.71E-04	1.50E+00	4.26E-04	3.73E+00	1.71E-04	1.50E+00
central mix	Nickel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Nickel	1.12E-06	9.84E-03	4.73E-04	4.14E+00	1.12E-06	9.84E-03
supplement silo*	Nickel	2.02E-05	1.77E-01	2.02E-05	1.77E-01	2.02E-05	1.77E-01
TOTAL	**Nickel**	**1.92E-04**	**1.68E+00**	**9.19E-04**	**8.05E+00**	**1.92E-04**	**1.68E+00**

(Nickel TPER: 0.13 lb/day)

PHOSPHORUS EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Phosphorus	4.40E-04	3.85E+00	1.37E-03	1.20E+01	4.40E-04	3.85E+00
central mix	Phosphorus	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Phosphorus	-	-	3.17E-04	2.78E+00	-	-
supplement silo*	Phosphorus	3.14E-05	2.75E-01	3.14E-05	2.75E-01	3.14E-05	2.75E-01
TOTAL	**Phosphorus**	**4.71E-04**	**4.13E+00**	**1.72E-03**	**1.51E+01**	**4.71E-04**	**4.13E+00**

SELENIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Selenium	4.04E-06	3.54E-02	9.37E-05	8.21E-01	4.04E-06	3.54E-02
central mix	Selenium	-	-	-	-	-	-
cement silo	Selenium	-	-	-	-	-	-
supplement silo*	Selenium	6.43E-07	5.63E-03	6.43E-07	5.63E-03	6.43E-07	5.63E-03
TOTAL	**Selenium**	**4.68E-06**	**4.10E-02**	**9.43E-05**	**8.26E-01**	**4.68E-06**	**4.10E-02**

ACTUAL EMISSIONS - HMA-H1 & HMA-H2

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - INPUT SCREEN

NCDENR

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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Directions: Enter and select information in the boxes that are highlighted in blue:

COMPANY NAME:	Carolina Sunrock, LLC
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10682R00
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler
EMISSION SOURCE ID NO.:	HMA-H1 & HMA-H2
LATEST CONSTRUCTION/MODIFICATION DATE:	2020
SELECT THE TYPE OF BOILER FROM THE LISTS BELOW:	26

Boilers=>100 mmBtu/hr		Boilers=>100 mmBtu/hr (cont'd)	
1 =	No. 6 oil-fired, normal firing (U)	17 =	No. 2 oil-fired (C)
2 =	No. 6 oil-fired, normal firing (I)	18 =	No. 2 oil-fired, LNB/FGR (U)
3 =	No. 6 oil-fired, normal firing (C)	19 =	No. 2 oil-fired, LNB/FGR (I)
4 =	No. 6 oil-fired, normal firing, low Nox burner (U)	20 =	No. 2 oil-fired, LNB/FGR (C)
5 =	No. 6 oil-fired, normal firing, low Nox burner (I)		
6 =	No. 6 oil-fired, normal firing, low Nox burner (C)	21 =	Vertical fired utility boiler
7 =	No. 6 oil-fired, tangential firing (U)		
8 =	No. 6 oil fired, tangential firing, low Nox burner (U)	Small Boilers <100 mmBtu/hr	
9 =	No. 5 oil-fired, normal firing (U)	22 =	No. 6 oil-fired (I)
10 =	No. 5 oil-fired, normal firing (I)	23 =	No. 6 oil-fired (C)
11 =	No. 5 oil-fired, tangential firing (U)	24 =	No. 5 oil-fired (C)
12 =	No. 4 oil-fired, normal firing (U)	25 =	No. 4 oil-fired (C)
13 =	No. 4 oil-fired, normal firing (I)	26 =	No. 2 oil-fired (I)
14 =	No. 4 oil-fired, tangential firing (U)	27 =	No. 2 oil-fired (C)
15 =	No. 2 oil-fired (U)		
16 =	No. 2 oil-fired (I)	28 =	Residential Furnace

Note: The emission factors for fuel oil-fired boilers depend on the boiler size and application type. In the listing of boiler types, the following notation is used: U = Utility boilers (producing steam for the generation of electricity), I = Industrial boilers (generating steam or hot water for process heat, electricity generation, or space heat), C = Commercial or institutional (used for space heating of commercial or institutional facilities) and residential (furnaces used for space heating purposes). Please be sure to select the proper boiler from the lists above.

EMISSION SOURCE INPUT DATA

MAXIMUM HEAT INPUT (MILLION BTU PER HOUR):	2.30	MMBTU/HR
ACTUAL ANNUAL FUEL USAGE (GALLONS PER YEAR):	49,285.7	GAL/YR
MAXIMUM ANNUAL FUEL USAGE (GALLONS PER YEAR)	143,914.3	GAL/YR
MAXIMUM FUEL SULFUR CONTENT (%):	0.50	% - (TYPEOVER IF NECESSARY - DEFAULT VALUE = 2.1 FOR RESIDUAL FUEL OIL OR 0.5 FOR DISTILLATE FUEL OIL)

→ 2.3 MMBTU/hr x 3,000 hr/yr x (1,000,000 / 140,000 BTU/gal)

FUEL HEATING VALUE

FUEL HEATING VALUE (BTU/GAL): 140,000 BTU/GAL

DEFAULT WILL APPEAR AS FOLLOWS (not used for Greenhouse Gas calcs –See below for GHG defaults):
150,000 BTU/GAL FOR No. 6, 5, and 4 FUEL OIL
140,000 BTU/GAL ALL OTHERS
(TYPE OVER NUMBER AT RIGHT IF YOU HAVE SITE SPECIFIC DATA)

CONTROL DEVICE INPUT DATA

Note: Select the type of control devices from the pull-down menus below. Default control efficiencies will appear for each control device that is selected. The user may enter a different control efficiency to override these values if site specific data is available.

TYPE OF PARTICULATE CONTROL: NONE/OTHER	AVERAGE PARTICULATE CONTROL EFF.: 0
TYPE OF POSTCOMBUSTION SULFUR DIOXIDE CONTROL: NONE/OTHER	AVERAGE SULFUR DIOXIDE CONTROL EFF.: 0
TYPE OF NITROGEN OXIDE CONTROL: NONE/LOW NOX	AVERAGE NITROGEN OXIDE CONTROL EFF.: 0

REQUESTED PERMIT LIMITATIONS (IF APPLICABLE)

REQUESTED MAXIMUM FUEL USAGE LIMIT (GALLONS PER YEAR)	143,914.3	GAL/YR
REQUESTED MAXIMUM FUEL SULFUR CONTENT (%)	0.50	%

(TYPEOVER IF NECESSARY - DEFAULT VALUES ARE THE CALCULATED POTENTIAL AND THE MAXIMUM SULFUR CONTENT AS SHOWN IN THE EMISSION SOURCE INPUT DATA SECTION)

ADDITIONAL INFORMATION FOR GREENHOUSE GAS EMISSIONS

ENTER CALCULATION TIER
from EPA Mandatory Reporting Rule (MRR) Subpart C -
www.epa.gov/climatechange/emissions/ghgrulemaking.html
NOTE: EF is "Emission Factor"

SINCE TIER 3 IS NOT BEING USED, FUEL CARBON CONTENT WILL NOT BE USED: 2.7600 kg Carbon/gal

SELECT FUEL TYPE: Distillate Fuel Oil No. 2

HIGH HEAT VALUE (HHV) FOR GHGs
FOR TIER 1 and TIER 3, the FUEL HEATING VALUE entered above is overriden with the EPA DEFAULT from Table C-1 of the EPA MRR:

Distillate Fuel Oil No. 2	0.138 mmBTU/gal	THIS VALUE WILL BE USED FOR GHG calculations- actual emissions
Distillate Fuel Oil No. 4	0.146 mmBTU/gal	
Residual Fuel Oil No. 5	0.14 mmBTU/gal	
Residual Fuel Oil No. 6	0.15 mmBTU/gal	

FOR TIER 2, the FUEL HEATING VALUE entered above is used. The value entered must be the annual average HHV of the fuel determined using procedures in the EPA MRR (see 98.33(a)(2))

Distillate Fuel Oil No. 2 DEFAULT HHV OF 0.138 mmBTU/gal THIS VALUE WILL BE USED FOR GHG calculations- actual emissions

ATTACHMENT D

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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COMPANY:	Carolina Sunrock, LLC	MAX HEAT INPUT:	2.30	MMBTU/HR
FACILITY ID NO.:	1700016	FUEL HEAT VALUE:	140,000	BTU/GAL
PERMIT NUMBER:	10682R00	HHV for GHG CALCULATIONS:	0.138	mm BTU/GAL
FACILITY CITY:	Burlington	ACTUAL ANNUAL FUEL USAGE:	49,286	GAL/YR
FACILITY COUNTY:	Caswell	MAXIMUM ANNUAL FUEL USAGE:	143,914	GAL/YR
USER NAME:	LLG	MAXIMUM SULFUR CONTENT:	0.5	%
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler			
EMISSION SOURCE ID NO.:	HMA-H1 & HMA-H2	MAX. FUEL USAGE:	143,914	GAL/YR
		MAX. SULFUR CONTENT:	0.5	%

NONE/OTHER	PM	0
NONE/OTHER	SO2	0
NONE/OTHER	NOx	0

METHOD USED TO COMPUTE ACTUAL GHG EMISSIONS: TIER 1: DEFAULT HIGH HEAT VALUE AND DEFAULT EF

CARBON CONTENT USED FOR GHGS (kg C/gal): CARBON CONTENT NOT USED FOR CALCULATION TIER CHOSEN

	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/10³ gal)	
AIR POLLUTANT EMITTED	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	uncontrolled	controlled
TOTAL PARTICULATE MATTER (PM) (FPM+CPM)	0.05	0.08	0.05	0.24	0.05	0.24	3.30E+00	3.30E+00
FILTERABLE PM (FPM)	0.03	0.05	0.03	0.14	0.03	0.14	2.00E+00	2.00E+00
CONDENSABLE PM (CPM)	0.02	0.03	0.02	0.09	0.02	0.09	1.30E+00	1.30E+00
FILTERABLE PM<10 MICRONS (PM_{10})	0.02	0.02	0.02	0.07	0.02	0.07	1.00E+00	1.00E+00
FILTERABLE PM<2.5 MICRONS ($PM_{2.5}$)	0.00	0.01	0.00	0.02	0.00	0.02	2.50E-01	2.50E-01
SULFUR DIOXIDE (SO_2)	1.17	1.75	1.17	5.11	1.17	5.11	7.10E+01	7.10E+01
NITROGEN OXIDES (NO_x)	0.33	0.49	0.33	1.44	0.33	1.44	2.00E+01	2.00E+01
CARBON MONOXIDE (CO)	0.08	0.12	0.08	0.36	0.08	0.36	5.00E+00	5.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	0.00	0.00	0.00	0.01	0.00	0.01	2.00E-01	2.00E-01
LEAD	0.00	0.00	0.00	0.00	0.00	0.00	1.26E-03	1.26E-03

		CAS	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/10³ gal)	
TOXIC / HAZARDOUS AIR POLLUTANT		NUMBER	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	uncontrolled	controlled
Antimony Unlisted Compounds	(H)	SBC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Arsenic Unlisted Compounds	(TH)	ASC-Other	9.2E-06	2.8E-02	9.2E-06	8.1E-02	9.2E-06	8.1E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	4.5E-05	1.4E-01	4.5E-05	4.0E-01	4.5E-05	4.0E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	6.9E-06	2.1E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	6.9E-06	2.1E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Chromic Acid (VI)	(TH)	7738945	6.9E-06	2.1E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Cobalt Unlisted Compounds	(H)	COC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Ethylbenzene	(H)	100414	1.3E-05	4.0E-02	1.3E-05	1.2E-01	1.3E-05	1.2E-01	8.17E-04	8.17E-04
Fluorides (sum fluoride compounds)	(T)	16984488	6.1E-04	1.8E+00	6.1E-04	5.4E+00	6.1E-04	5.4E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	7.9E-04	2.4E+00	7.9E-04	6.9E+00	7.9E-04	6.9E+00	4.80E-02	4.80E-02
Lead Unlisted Compounds	(H)	PBC-Other	2.1E-05	6.2E-02	2.1E-05	1.8E-01	2.1E-05	1.8E-01	1.26E-03	1.26E-03
Manganese Unlisted Compounds	(TH)	MNC-Other	1.4E-05	4.1E-02	1.4E-05	1.2E-01	1.4E-05	1.2E-01	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	6.9E-06	2.1E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71566	3.9E-06	1.2E-02	3.9E-06	3.4E-02	3.9E-06	3.4E-02	2.36E-04	2.36E-04
Napthalene	(H)	91203	5.5E-06	1.6E-02	5.5E-06	4.8E-02	5.5E-06	4.8E-02	3.33E-04	3.33E-04
Nickle Metal	(TH)	7440020	6.9E-06	2.1E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Phosphorus Metal, Yellow or White	(H)	7723140	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
POM rates uncontrolled	(H)	POM	5.4E-05	1.6E-01	5.4E-05	4.7E-01	5.4E-05	4.7E-01	3.30E-03	3.30E-03
Selenium compounds	(H)	SEC	3.5E-05	1.0E-01	3.5E-05	3.0E-01	3.5E-05	3.0E-01	2.10E-03	2.10E-03
Toluene	(TH)	108883	1.3E-03	3.9E+00	1.3E-03	1.1E+01	1.3E-03	1.1E+01	7.97E-02	7.97E-02
Xylene	(TH)	1330207	2.3E-05	6.9E-02	2.3E-05	2.0E-01	2.3E-05	2.0E-01	1.40E-03	1.40E-03
Total HAP	(H)		2.4E-03	7.1E+00	2.4E-03	2.1E+01	2.4E-03	2.1E+01	1.4E-01	1.4E-01
Largest HAP	(H)		1.31E-03	3.93E+00	1.31E-03	1.15E+01	1.31E-03	1.15E+01	7.97E-02	7.97E-02

			EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS			EMISSION FACTOR (lb/10³ gal)	
TOXIC AIR POLLUTANT		CAS Num.	lb/hr	lb/day	lb/yr	uncontrolled	controlled
Arsenic Unlisted Compounds	(TH)	ASC-Other	9.20E-06	2.21E-04	8.06E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	4.52E-05	1.08E-03	3.96E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Soluble chromate compounds, as chromium (VI	(TH)	SolCR6	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Fluorides (sum fluoride compounds)	(T)	16984488	6.13E-04	1.47E-02	5.37E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	7.89E-04	1.89E-02	6.91E+00	4.80E-02	4.80E-02
Manganese Unlisted Compounds	(TH)	MNC-Other	1.38E-05	3.31E-04	1.21E-01	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71566	3.88E-06	9.31E-05	3.40E-02	2.36E-04	2.36E-04
Nickle Metal	(TH)	7440020	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Toluene	(TH)	108883	1.31E-03	3.14E-02	1.15E+01	7.97E-02	7.97E-02
Xylene	(TH)	1330207	2.30E-05	5.52E-04	2.02E-01	1.40E-03	1.40E-03

GREENHOUSE GAS POLLUTANT	ACTUAL EMISSIONS — EPA MRR CALCULATION METHOD: TIER 1			POTENTIAL EMISSIONS - utilize max heat input capacity and EPA MRR Emission Factors		POTENTIAL EMISSIONS With Requested Emission Limitation - utilize requested fuel limit and EPA MRR Emission Factors	
	metric tons/yr	metric tons/yr, CO2e	short tons/yr	short tons/yr	short tons/yr, CO2e	short tons/yr	short tons/yr, CO2e
CARBON DIOXIDE (CO_2)	503.03	503.03	554.50	1,642.60	1,642.60	1,642.60	1,642.60
METHANE (CH_4)	2.04E-02	4.28E-01	2.25E-02	6.66E-02	1.40E+00	6.66E-02	1.40E+00
NITROUS OXIDE (N_2O)	4.08E-03	1.27E+00	4.50E-03	1.33E-02	4.13E+00	1.33E-02	4.13E+00
	TOTAL	504.73		TOTAL	1,648.13	TOTAL	1,648.13

NOTES: 1) CO2e means CO2 equivalent

2) The DAQ Air Emissions Reporting Online (AERO) system requires short tons and the EPA MRR requires metric tons

ACTUAL SO2 & CO EMISSIONS / TAP EMISSIONS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO		
* Plant type:	Drum mix		
* Fuel type:	Waste, No.4 or No.5 fuel oil-fired		
* Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
* Controls:	Fabric filter controls		

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees F	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

* Calculated Annual Production Limit:	1,488,581	tons per year	
* Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data :	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

* SYNTHETIC MINOR LIMITS

ATTACHMENT E1

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10628R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=0.5%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit: 500,000 ton/year | **Daily Production Limit:** n/a ton/day

SPREADSHEET PREPARED BY: LLG

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	22.10	26.04		96.80		26.04
NITROGEN OXIDES (NOx)	14.08	15.19		61.66		15.19
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	2.57	2.57		11.25		2.57
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	6.50E+02	3.25E-01	2847.00	3.25E-01	6.50E+02	1.3E-03
Acrolein (TH)	107028	6.50E-03	1.30E+01	6.50E-03	56.94	6.50E-03	1.30E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	6.50E-07	3.25E-10	0.00	3.25E-10	6.50E-07	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.05E+02	5.25E-02	459.90	5.25E-02	1.05E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	7.50E+00	3.75E-03	32.85	3.75E-03	7.50E+00	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.30E+00	6.50E-04	5.69	6.50E-04	1.30E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.34E+01	6.70E-03	58.67	6.70E-03	1.34E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	3.29E+02	1.65E-01	1442.95	1.65E-01	3.29E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	4.40E+02	2.20E-01	1927.20	2.20E-01	4.40E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	6.50E+01	3.25E-02	284.70	3.25E-02	6.50E+01	1.3E-04
Quinone (H)	106514	4.00E-02	8.00E+01	4.00E-02	350.40	4.00E-02	8.00E+01	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07
Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07

* BELOW SYNTHETIC MINOR LIMITS OF 100 TONS/YR, EACH

Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.05E-07	5.25E-11	0.00	5.25E-11	1.05E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	1.46E+03	7.29E-01	6386.67	7.29E-01	1.46E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	7.80E+00	6.50E+02	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	1.56E-01	1.30E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	7.80E-09	6.50E-07	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E-02	1.30E+00	YES. Modeling required	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E-01	1.34E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	3.15E+01	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-09	1.05E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	1.75E+01	1.46E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

EXPECTED ACTUAL EMISSIONS - NATURAL GAS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO	
Plant type:	Drum mix	
Fuel type:	Natural gas-fired	
Fuel Sulfur Content:	0.50	%
Controls:	Fabric filter controls	

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees F	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES			
Crushing Capacity?	65	tons per hour	No. of crushers:	1
Hours of operation:	8760	hours per year	No. of screens:	1
			No. of conveyors:	4

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	48.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E.2

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0001	0.0001	0.02	0.02	0.10	0.10	0.02
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0260	0.026	6.5	6.5	28.5	28.5	6.5
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.005		1.325	5.8	5.8	1.3

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	1.19E+00	5.2	5.2	5.1
CO	3.32E+01	145.5	145.5	33.5
NOx	6.83E+00	29.9	29.9	7.9
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	1.39E+00	6.1	6.1	1.4

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 1
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10628R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Natural gas-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=n/a%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit: **500,000** ton/year **Daily Production Limit:** **n/a** ton/day

SPREADSHEET PREPARED BY: LLG

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	1.19	5.13		5.21		5.13
NITROGEN OXIDES (NOx)	6.83	7.94		29.91		7.94
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	1.39	1.39		6.10		1.39
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	1.55E-04	3.10E-01	1.55E-04	1.36	1.55E-04	3.10E-01	6.2E-07
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.00E-05	1.20E-01	6.00E-05	0.53	6.00E-05	1.20E-01	2.4E-07
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	1.70E-03	3.40E+00	1.70E-03	14.87	1.70E-03	3.40E+00	6.8E-06
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	2.47E-02	4.94E+01	2.47E-02	216.55	2.47E-02	4.94E+01	9.9E-05
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	4.75E-02	9.50E+01	4.75E-02	416.10	4.75E-02	9.50E+01	1.9E-04
Propionaldehyde (H)	123386	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Quinone (H)	106514	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07
Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07

Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Toluene (TH)	108883	4.16E-02	8.31E+01	4.16E-02	364.17	4.16E-02	8.31E+01	1.7E-04
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.00E-05	1.44E-03	1.20E-01	NO. Based on facility-wide potential.	2.40E-07
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	1.70E-03	4.07E-02	3.40E+00	NO. Based on facility-wide potential.	6.79E-06
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	3.15E+01	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Toluene (TH)	108883	4.16E-02	9.98E-01	8.31E+01	NO. Based on facility-wide potential.	1.66E-04
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

EXPECTED ACTUAL EMISSIONS - WASTE OIL / NO.4 FO

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10682R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO		
Plant type:	Drum mix		
Fuel type:	Waste, No.4 or No.6 fuel oil-fired		
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Controls:	Fabric filter controls		

Dryer heat input:	80	million Btu per hour	
Plant maximum production capacity:	250	tons per hour	

Asphalt Properties			
Asphalt temperature:	325	degrees F	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E3

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10682R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=0.5%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit: 500,000 ton/year

Daily Production Limit: n/a ton/day

SPREADSHEET PREPARED BY: LLG

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	22.10	26.04		96.80		26.04
NITROGEN OXIDES (NOx)	14.08	15.19		61.66		15.19
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	2.57	2.57		11.25		2.57
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	6.50E+02	3.25E-01	2847.00	3.25E-01	6.50E+02	1.3E-03
Acrolein (TH)	107028	6.50E-03	1.30E+01	6.50E-03	56.94	6.50E-03	1.30E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	6.50E-07	3.25E-10	0.00	3.25E-10	6.50E-07	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.05E+02	5.25E-02	459.90	5.25E-02	1.05E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	7.50E+00	3.75E-03	32.85	3.75E-03	7.50E+00	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.30E+00	6.50E-04	5.69	6.50E-04	1.30E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.34E+01	6.70E-03	58.67	6.70E-03	1.34E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	3.29E+02	1.65E-01	1442.95	1.65E-01	3.29E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	4.40E+02	2.20E-01	1927.20	2.20E-01	4.40E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	6.50E+01	3.25E-02	284.70	3.25E-02	6.50E+01	1.3E-04
Quinone (H)	106514	4.00E-02	8.00E+01	4.00E-02	350.40	4.00E-02	8.00E+01	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07
Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07

Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.05E-07	5.25E-11	0.00	5.25E-11	1.05E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	1.46E+03	7.29E-01	6386.67	7.29E-01	1.46E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	7.80E+00	6.50E+02	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	1.56E-01	1.30E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	7.80E-09	6.50E-07	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E-02	1.30E+00	YES. Modeling required	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E-01	1.34E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	3.15E+01	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-09	1.05E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	1.75E+01	1.46E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

POTENTIAL EMISSIONS - BEFORE CONTROLS / LIMITS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10682R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO		
Plant type:	Drum mix		
Fuel type:	Waste, No.4 or No.6 fuel oil-fired		
Fuel Sulfur Content:	2.10	%	(default value is 0.5 %)
Controls:	Fabric filter controls		

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees F	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	10	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	254,532	tons per year	
Requested Annual Production Limit:	2,190,000	tons per year	**INVALID ENTRY. Value must be less than or equal to 254532 tpy.**
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E4

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	36.1
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	25.2
SO2	0.6034	0.6034	150.84	150.84	660.68	660.68	660.68
CO	0.1300	0.130	32.5	32.5	142.4	142.4	142.4
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	60.2
VOC	0.0320	0.032	8	8	35.0	35.0	35.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	11.0

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	1.2
CO	2.53E-03	6.32E-01	2.8	2.8	2.8
VOC	1.61E-02	4.02E+00	17.6	17.6	17.6
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.3

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	12.1
Total PM10	0.0155	1.01E+00	4.4	4.4	4.4

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	2.36E-01	1.0	1.0	1.0
Total PM10	0.0235714	2.36E-01	1.0	1.0	1.0
SO2	0.5071429	5.07E+00	22.2	22.2	22.2
CO	0.0357143	3.57E-01	1.6	1.6	1.6
NOx	0.1428571	1.43E+00	6.3	6.3	6.3
VOC	0.0024286	2.43E-02	0.1	0.1	0.1

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.12E+01	87.3	50.5	50.5
Total PM10	6.99E+00	39.7	31.8	31.8
SO2	1.56E+02	682.9	682.9	682.9
CO	3.35E+01	146.7	146.7	146.7
NOx	1.52E+01	66.5	66.5	66.5
VOC	1.20E+01	52.8	52.8	52.8
HAPs, TOTAL	2.57E+00	11.3	11.3	11.3

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic,unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 3
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10682R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=2.1%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit: **2,190,000** ton/year

Daily Production Limit: **n/a** ton/day

SPREADSHEET PREPARED BY: LLG

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.24	50.45		87.28		50.45
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.99	31.84		39.72		31.84
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	155.91	682.89		682.89		682.89
NITROGEN OXIDES (NOx)	15.18	66.48		66.48		66.48
CARBON MONOXIDE (CO)	33.49	146.68		146.68		146.68
VOLATILE ORGANIC COMPOUNDS (VOC)	12.05	52.77		52.77		52.77
TOTAL HAP	2.57	11.25		11.25		11.25
LARGEST HAP (formaldehyde)	0.80	3.49		3.49		3.49

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	2.85E+03	3.25E-01	2847.00	3.25E-01	2.85E+03	1.3E-03
Acrolein (TH)	107028	6.50E-03	5.69E+01	6.50E-03	56.94	6.50E-03	5.69E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	3.94E-01	4.50E-05	0.39	4.50E-05	3.94E-01	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	1.23E+00	1.40E-04	1.23	1.40E-04	1.23E+00	5.6E-07
Benzene (TH)	71432	9.90E-02	8.67E+02	9.90E-02	867.38	9.90E-02	8.67E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	3.86E-02	4.41E-06	0.04	4.41E-06	3.86E-02	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	8.98E-01	1.03E-04	0.90	1.03E-04	8.98E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	5.45E+00	6.23E-04	5.45	6.23E-04	5.45E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	1.11E+01	1.26E-03	11.06	1.26E-03	1.11E+01	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	9.86E-01	1.13E-04	0.99	1.13E-04	9.86E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	5.69E-02	6.50E-06	0.06	6.50E-06	5.69E-02	2.6E-08
Cumene (H)	98828	1.14E-03	1.00E+01	1.14E-03	10.02	1.14E-03	1.00E+01	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	5.61E+02	6.41E-02	561.24	6.41E-02	5.61E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	1.91E-02	2.18E-06	0.02	2.18E-06	1.91E-02	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	6.98E+03	7.97E-01	6981.17	7.97E-01	6.98E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	2.85E-06	3.25E-10	0.00	3.25E-10	2.85E-06	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	2.10E+03	2.39E-01	2095.50	2.39E-01	2.10E+03	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	4.60E+02	5.25E-02	459.90	5.25E-02	4.60E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	1.20E+02	1.37E-02	119.84	1.37E-02	1.20E+02	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	3.29E+01	3.75E-03	32.85	3.75E-03	3.29E+01	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	1.69E+01	1.93E-03	16.86	1.93E-03	1.69E+01	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	5.69E+00	6.50E-04	5.69	6.50E-04	5.69E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	2.18E+00	2.49E-04	2.18	2.49E-04	2.18E+00	1.0E-06
Methyl chloride (H)	74873	1.56E-04	1.37E+00	1.56E-04	1.37	1.56E-04	1.37E+00	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	1.05E+02	1.20E-02	105.12	1.20E-02	1.05E+02	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	5.87E+01	6.70E-03	58.67	6.70E-03	5.87E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	7.21E-02	8.23E-06	0.07	8.23E-06	7.21E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	1.44E+03	1.65E-01	1442.95	1.65E-01	1.44E+03	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	1.38E+02	1.58E-02	137.97	1.58E-02	1.38E+02	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	7.01E-01	8.01E-05	0.70	8.01E-05	7.01E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	8.81E+00	1.01E-03	8.81	1.01E-03	8.81E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	6.13E+01	7.00E-03	61.32	7.00E-03	6.13E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	1.93E+03	2.20E-01	1927.20	2.20E-01	1.93E+03	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	2.85E+02	3.25E-02	284.70	3.25E-02	2.85E+02	1.3E-04
Quinone (H)	106514	4.00E-02	3.50E+02	4.00E-02	350.40	4.00E-02	3.50E+02	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	7.67E-01	8.75E-05	0.77	8.75E-05	7.67E-01	3.5E-07
Styrene (TH)	100425	2.40E-04	2.11E+00	2.40E-04	2.11	2.40E-04	2.11E+00	9.6E-07

Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	4.60E-07	5.25E-11	0.00	5.25E-11	4.60E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	6.39E+03	7.29E-01	6386.67	7.29E-01	6.39E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	8.78E+01	1.00E-02	87.85	1.00E-02	8.78E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	5.29E+02	6.04E-02	528.72	6.04E-02	5.29E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	2.25E+01	2.57E-03	22.50	2.57E-03	2.25E+01	1.0E-05

Expected actual emissions after controls and limitations consisting of an annual production limit of 2190000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	7.80E+00	2.85E+03	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	1.56E-01	5.69E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	1.23E+00	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	8.67E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	3.86E-02	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	8.98E-01	YES. Modeling required	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	5.45E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	9.86E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	6.98E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	2.10E+03	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	7.80E-09	2.85E-06	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	1.20E+02	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	1.69E+01	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E-02	5.69E+00	YES. Modeling required	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	7.21E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	1.05E+02	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E-01	5.87E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	1.38E+02	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	7.01E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	8.81E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	2.11E+00	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-09	4.60E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	1.75E+01	6.39E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	5.29E+02	NO. Based on facility-wide potential.	2.41E-04

POTENTIAL EMISSIONS - AFTER CONTROLS LIMITS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

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Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10682R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO		
Plant type:	Drum mix		
Fuel type:	Waste, No.4 or No.6 fuel oil-fired		
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Controls:	Fabric filter controls		

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees F	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No:2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	48.00	lb/hr
Control efficiency based on test data:	99.129	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E5

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10682R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=0.5%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit: **500,000** ton/year | **Daily Production Limit:** n/a ton/day

SPREADSHEET PREPARED BY: LLG

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	22.10	26.04		96.80		26.04
NITROGEN OXIDES (NOx)	14.08	15.19		61.66		15.19
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	2.57	2.57		11.25		2.57
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	6.50E+02	3.25E-01	2847.00	3.25E-01	6.50E+02	1.3E-03
Acrolein (TH)	107028	6.50E-03	1.30E+01	6.50E-03	56.94	6.50E-03	1.30E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	6.50E-07	3.25E-10	0.00	3.25E-10	6.50E-07	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.05E+02	5.25E-02	459.90	5.25E-02	1.05E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	7.50E+00	3.75E-03	32.85	3.75E-03	7.50E+00	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.30E+00	6.50E-04	5.69	6.50E-04	1.30E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.34E+01	6.70E-03	58.67	6.70E-03	1.34E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	3.29E+02	1.65E-01	1442.95	1.65E-01	3.29E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	4.40E+02	2.20E-01	1927.20	2.20E-01	4.40E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	6.50E+01	3.25E-02	284.70	3.25E-02	6.50E+01	1.3E-04
Quinone (H)	106514	4.00E-02	8.00E+01	4.00E-02	350.40	4.00E-02	8.00E+01	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07
Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07

Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.05E-07	5.25E-11	0.00	5.25E-11	1.06E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	1.46E+03	7.29E-01	6386.67	7.29E-01	1.46E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	7.80E+00	6.50E+02	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	1.56E-01	1.30E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	7.80E-09	6.50E-07	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E-02	1.30E+00	YES. Modeling required	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E-01	1.34E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	3.15E+01	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-09	1.05E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	1.75E+01	1.46E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

POTENTIAL TAP EMISSIONS (NATURAL GAS)

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10682R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO
Plant type:	Drum mix
Fuel type:	Natural gas-fired
Fuel Sulfur Content:	0.50 %
Controls:	Fabric filter controls

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees F	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	49.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E6

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0001	0.0001	0.02	0.02	0.10	0.10	0.02
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0260	0.026	6.5	6.5	28.5	28.5	6.5
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.005		1.325	5.8	5.8	1.3

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	1.19E+00	5.2	5.2	5.1
CO	3.32E+01	145.5	145.5	33.5
NOx	6.83E+00	29.9	29.9	7.9
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	1.39E+00	6.1	6.1	1.4

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 1
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

Toxic Air Pollutant (TAP) emission rate calculations page

This sheet presents the emission rate calculations that are necessary for modeling determinations.

Pollutant	CAS No.	emissions from dryer	emissions from handling	TPER	Units	TPER	Units	dryer: Controlled Emission Factor (lb/ton)	dryer: Controlled Emission Rate (lb/hour)	Silo Filling: Emission factor (lb/ton)	Silo Filling: Emission Rate (lb/hr)	Loadout: Emission factor (lb/ton)	Loadout: Emission Rate (lb/hr)	total handling: Emission Factor (lb/ton)	total handling: Emission Rate (lb/hour)	total: Controlled Emission Factor (lb/ton)	total: Controlled Emission Rate (lb/hour)	Controlled Emission Rate (lb/day)	Controlled Emission Rate (lb/year)	Controlled wt.Limitations Emission Rate (lb/day)	Controlled wt.Limitations Emission Rate (lb/year)	Controlled ER greater than TPER ?	Controlled wt/Limitations ER greater than TPER ?	Comments
Acetaldehyde (TH)	75070	yes	no	6.8	lb/hr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No		NOTE 1
Acrolein (TH)	107028	yes	no	0.02	lb/hr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No		NOTE 1
Formaldehyde (TH)	50000	yes	yes	0.04	lb/hr			3.19E-03	7.75E-01	8.41E-05	2.10E-02	3.68E-06	9.15E-04	8.775E-05	2.19E-02	3.19E-03	7.97E-01	1.91E+01	6.98E+03	1.91E+01	1.59E+03	Yes		NOTE 3
Phenol (TH)	108952	no	yes	0.24	lb/hr					0.00E+00	0.00E+00	4.02E-06	1.01E-03	4.02E-06	1.01E-03	4.02E-06	1.01E-03	2.41E-02	8.81E+00	2.41E-02	2.01E+00	No		NOTE 1
Styrene (TH)	100425	no	yes	2.7	lb/hr					6.58E-07	1.65E-04	3.04E-07	7.59E-05	9.62E-07	2.40E-04	9.62E-07	2.40E-04	5.77E-03	2.11E+00	5.77E-03	4.81E-01	No		NOTE 1
Methyl chloroform (TH)	71556	yes	yes	64	lb/hr	250	lb/day	4.80E-05	1.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.80E-05	1.20E-02	2.88E-01	1.05E+02	2.88E-01	2.40E+01	No	No	NOTE 1
Methyl ethyl ketone (TH)	78933	yes	yes	22.4	lb/hr	78	lb/day	0.00E+00	0.00E+00	4.75E-06	1.19E-03	2.04E-06	5.09E-04	6.79E-06	1.70E-03	6.79E-06	1.70E-03	4.07E-02	1.49E+01	4.07E-02	3.40E+00	No	No	NOTE 1
Toluene (TH)	108883	yes	yes	14.4	lb/hr	98	lb/day	1.50E-04	3.75E-02	7.58E-06	1.89E-03	8.73E-06	2.18E-03	1.63E-05	4.07E-03	1.66E-04	4.16E-02	9.98E-01	3.64E+02	9.98E-01	8.31E+01	No	No	NOTE 1
Xylene (TH)	1330207	yes	yes	16.4	lb/hr	57	lb/day	2.00E-04	5.00E-02	2.44E-05	6.09E-03	1.71E-05	4.26E-03	4.14E-05	1.04E-02	2.41E-04	6.04E-02	1.45E+00	5.29E+02	1.45E+00	1.21E+02	No	No	NOTE 1
Methylene chloride (TH)	75092	no	yes	0.39	lb/hr	1600	lb/year			3.29E-08	8.23E-06	0.00E+00	0.00E+00	3.29E-08	8.23E-06	3.29E-06	8.23E-06	1.97E-04	7.21E-02	1.97E-04	1.65E-02	No	No	NOTE 1
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	yes	no	0.013	lb/day			4.50E-07	1.13E-04							4.50E-07	1.13E-04	2.70E-03	9.86E-01	2.70E-03	2.25E-01	No	No	NOTE 1
Hexane, n- (TH)	110543	yes	yes	23	lb/day			9.38E-04	2.35E-01	1.22E-05	3.05E-03	6.24E-06	1.56E-03	1.84E-05	4.61E-03	9.57E-04	2.39E-01	5.74E+00	2.10E+03	5.74E+00	4.78E+02	No	No	NOTE 1
Manganese unlisted compounds (T)	MNC-other	yes	no	0.63	lb/day			7.70E-06	1.93E-03							7.70E-06	1.93E-03	4.62E-02	1.69E+01	4.62E-02	3.85E+00	No	No	NOTE 1
Mercury, vapor (TH)	7439976	yes	no	0.013	lb/day			2.40E-07	6.00E-05							2.40E-07	6.00E-05	1.44E-03	5.25E-01	1.44E-03	1.20E-01	No	No	NOTE 1
Nickel metal (TH)	7440020	yes	no	0.13	lb/day			6.30E-05	1.58E-02							6.30E-05	1.58E-02	3.78E-01	1.38E+02	3.78E-01	3.15E+01	Yes	Yes	NOTE 3
Carbon disulfide (TH)	75150	no	yes	3.9	lb/day					1.99E-06	4.87E-04	5.41E-07	1.35E-04	2.49E-06	6.23E-04	2.49E-06	6.23E-04	1.49E-02	5.45E+00	1.49E-02	1.25E+00	No	No	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	yes	no	0.0002	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	yes	no	0.016	lb/yr			5.60E-07	1.40E-04							5.60E-07	1.40E-04	3.36E-03	1.23E+00	3.36E-03	2.80E-01	Yes	Yes	NOTE 3
Benzene (TH)	71432	yes	yes	8.1	lb/yr			3.50E-04	9.75E-02	3.80E-06	9.75E-04	2.16E-06	5.41E-04	6.06E-06	1.52E-03	3.96E-04	9.90E-02	2.38E+00	8.67E+02	2.38E+00	1.98E+02	Yes	Yes	NOTE 3
Benzo(a)pyrene (T)	50328	yes	yes	2.2	lb/yr			9.80E-09	2.45E-06	0.00E+00	0.00E+00	7.84E-09	1.96E-06	7.84E-09	1.96E-06	1.76E-08	4.41E-06	1.06E-04	3.86E-02	1.06E-04	8.82E-03	No	No	NOTE 1
Hydrogen Sulfide (T)	7783064	yes	yes	1.7	lb/day			5.18E-05	1.30E-02	1.46E-06	3.65E-04	1.46E-06	3.65E-04	2.92E-06	7.30E-04	5.47E-05	1.37E-02	3.28E-01	1.20E+02	3.28E-01	2.74E+01	No	No	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	yes	no	0.28	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	yes	no	0.37	lb/yr			4.10E-07	1.03E-04							4.10E-07	1.03E-04	2.46E-03	8.98E-01	2.46E-03	2.05E-01	Yes	No	NOTE 2
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	yes	no	0.0051	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	yes	no	0.18	lb/hr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No		NOTE 1
Perchloroethylene (tetrachloroethylene) (TH)	127184	no	yes	13000	lb/yr					0.00E+00	0.00E+00	3.20E-07	8.01E-05	3.20E-07	8.01E-05	3.20E-07	8.01E-05	1.92E-03	7.01E-01	1.92E-03	1.60E-01	No	No	NOTE 1
Trichloroethylene (TH)	79016	no	yes	4000	lb/yr					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Napthalene (H)	91203	yes	yes					9.00E-05	2.25E-02	4.62E-06	1.16E-03	4.26E-06	1.07E-03	8.88E-06	2.22E-03	9.89E-05	2.47E-02	5.93E-01	2.17E+02	5.93E-01	4.94E+01			
Phosphorus Metal, Yellow or White (H)	7723140	yes	no					2.80E-05	7.00E-03							2.80E-05	7.00E-03	1.68E-01	6.13E+01	1.68E-01	1.40E+01			
Polycyclic Organic Matter (H)	POM	yes	no					1.90E-04	4.75E-02							1.90E-04	4.75E-02	1.14E+00	4.16E+02	1.14E+00	9.50E+01			
Propionaldehyde (H)	123386	yes	no					0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Quinone (H)	106514	yes	no					0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Selenium compounds (H)	SEC	yes	no					3.50E-07	8.75E-05							3.50E-07	8.75E-05	2.10E-03	7.67E-01	2.10E-03	1.75E-01			
Trimethylpentane, 2,2,4- (H)	540841	yes	yes					4.00E-05	1.00E-02	3.78E-06	9.44E-04	7.49E-06	1.87E-03	1.13E-07	2.82E-05	4.01E-05	1.00E-02	2.41E-01	8.78E+01	2.41E-01	2.01E+01			
Antimony unlisted compounds (H)	SBC-other	yes	no					1.80E-07	4.50E-05							1.80E-07	4.50E-05	1.08E-03	3.94E-01	1.08E-03	9.00E-02			
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	yes	no					5.05E-06	1.26E-03							5.05E-06	1.26E-03	3.03E-02	1.11E+01	3.03E-02	2.53E+00			
Cobalt unlisted compounds (H)	COC-other	yes	no					2.60E-08	6.50E-06							2.60E-08	6.50E-06	1.56E-04	5.69E-02	1.56E-04	1.30E-02			
Ethyl benzene (H)	100414	yes	yes					2.40E-04	6.00E-02	4.83E-06	1.18E-03	1.16E-05	2.91E-03	1.63E-05	4.07E-03	2.56E-04	6.41E-02	1.54E+00	5.61E+02	1.54E+00	1.28E+02			
Lead unlisted compounds (H)	PBC-other	yes	no					6.20E-07	1.55E-04							6.20E-07	1.55E-04	3.72E-03	1.35E+00	3.72E-03	3.10E-01			
Methyl bromide (H)	74839	no	yes							5.97E-07	1.49E-04	3.99E-07	9.98E-05	9.96E-07	2.49E-04	9.96E-07	2.49E-04	5.98E-03	2.18E+00	5.98E-03	4.98E-01			
Cumene (H)	98828	no	yes							0.00E+00	0.00E+00	4.57E-06	1.14E-03	4.57E-06	1.14E-03	4.57E-06	1.14E-03	2.74E-02	1.00E+01	2.74E-02	2.28E+00			
Ethyl chloride (chloroethane) (H)	75003	no	yes							0.00E+00	0.00E+00	8.73E-09	2.18E-06	8.73E-09	2.18E-06	8.73E-09	2.18E-06	5.24E-05	1.91E-02	5.24E-05	4.37E-03			
Methyl chloride (H)	74873	no	yes							0.00E+00	0.00E+00	6.24E-07	1.56E-04	6.24E-07	1.56E-04	6.24E-07	1.56E-04	3.74E-03	1.37E+00	3.74E-03	3.12E-01			
Xylene, o- (H)	95476	no	yes							6.95E-06	1.74E-03	3.33E-06	8.32E-04	1.03E-05	2.57E-03	1.03E-05	2.57E-03	6.16E-02	2.25E+01	6.16E-02	5.14E+00			
HAPs, TOTAL								5.30E-03	1.33E+00	1.87E-04	4.68E-02	6.66E-05	2.17E-02	2.74E-04	6.85E-02	5.57E-03	1.39E+00	3.34E+01	1.22E+04	3.34E+01	2.79E+03			

POTENTIAL TAP EMISSIONS (No. 4/10 FUEL OIL)

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10682R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO	
Plant type:	Drum mix	
Fuel type:	Waste, No.4 or No.6 fuel oil-fired	
Fuel Sulfur Content:	0.50	% (default value is 0.5 %)
Controls:	Fabric filter controls	

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees F	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES			
Crushing Capacity?	65	tons per hour	No. of crushers:	1
Hours of operation:	8760	hours per year	No. of screens:	1
			No. of conveyors:	4

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.419	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E7

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

Toxic Air Pollutant (TAP) emission rate calculations page

This sheet presents the emission rate calculations that are necessary for modeling determinations.

								dryer		Silo Filling		Loadout		total handling		total							
Pollutant	CAS No.	emissions from dryer	emissions from handling	TPER	Units	TPER	Units	Controlled Emission Factor (lb/ton)	Controlled Emission Rate (lb/hour)	Emission factor (lb/ton)	Emission Rate (lb/hr)	Emission factor (lb/ton)	Emission Rate (lb/hr)	Emission Factor (lb/ton)	Emission Rate (lb/hour)	Controlled Emission Factor (lb/ton)	Controlled Emission Rate (lb/hour)	Controlled Emission Rate (lb/day)	Controlled Emission Rate (lb/year)	Controlled w/Limitations Emission Rate (lb/day)	Controlled w/Limitations Emission Rate (lb/year)	Controlled ER greater than TPER ?	Controlled w/Limitations ER greater than TPER ?	Comments
Acetaldehyde (TH)	75070	yes	no	6.8	lb/hr			1.30E-03	3.25E-01							1.30E-03	3.25E-01	7.80E+00	2.85E+03	7.80E+00	6.50E+02	No		NOTE 1
Acrolein (TH)	107028	yes	no	0.02	lb/hr			2.60E-05	6.50E-03							2.60E-05	6.50E-03	1.56E-01	5.69E+01	1.56E-01	1.30E+01	No		NOTE 1
Formaldehyde (TH)	50000	yes	yes	0.04	lb/hr			3.10E-03	7.75E-01	8.41E-05	2.10E-02	3.86E-06	9.15E-04	8.77E-05	2.19E-02	3.19E-03	7.97E-01	1.91E+01	6.98E+03	1.91E+01	1.59E+03	Yes		NOTE 3
Phenol (TH)	108952	no	yes	0.24	lb/hr					0.00E+00	0.00E+00	4.02E-06	1.01E-03	4.02E-06	1.01E-03	4.02E-06	1.01E-03	2.41E-02	8.81E+00	2.41E-02	2.01E+00	No		NOTE 1
Styrene (TH)	100425	no	yes	2.7	lb/hr					6.58E-07	1.65E-04	3.04E-07	7.59E-05	9.62E-07	2.40E-04	9.62E-07	2.40E-04	5.77E-03	2.11E+00	5.77E-03	4.81E-01	No		NOTE 1
Methyl chloroform (TH)	71556	yes	yes	64	lb/hr	250	lb/day	4.80E-05	1.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.80E-05	1.20E-02	2.88E-01	1.05E+02	2.88E-01	2.40E+01	No	No	NOTE 1
Methyl ethyl ketone (TH)	78933	yes	yes	22.4	lb/hr	78	lb/day	2.00E-05	5.00E-03	4.75E-06	1.19E-03	2.04E-06	5.09E-04	6.79E-06	1.70E-03	2.68E-05	6.70E-03	1.61E-01	5.87E+01	1.61E-01	1.34E+01	No	No	NOTE 1
Toluene (TH)	108883	yes	yes	14.4	lb/hr	98	lb/day	2.90E-03	7.25E-01	7.56E-06	1.89E-03	8.73E-06	2.18E-03	1.63E-05	4.07E-03	2.92E-03	7.29E-01	1.75E+01	6.39E+03	1.75E+01	1.46E+03	No	No	NOTE 1
Xylene (TH)	1330207	yes	yes	16.4	lb/hr	57	lb/day	2.00E-04	5.00E-02	2.44E-05	6.09E-03	1.71E-05	4.26E-03	4.14E-05	1.04E-02	2.41E-04	6.04E-02	1.45E+00	5.29E+02	1.45E+00	1.21E+02	No	No	NOTE 1
Methylene chloride (TH)	75092	no	yes	0.39	lb/hr	1600	lb/year			3.29E-08	8.23E-06	0.00E+00	0.00E+00	3.29E-08	8.23E-06	3.29E-08	8.23E-06	1.97E-04	7.21E-02	1.97E-04	1.65E-02	No	No	NOTE 1
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	yes	no	0.013	lb/day			4.50E-07	1.13E-04							4.50E-07	1.13E-04	2.70E-03	9.86E-01	2.70E-03	2.25E-01	No	No	NOTE 1
Hexane, n- (TH)	110543	yes	yes	23	lb/day			9.36E-04	2.36E-01	1.22E-05	3.05E-03	6.24E-06	1.56E-03	1.84E-05	4.61E-03	9.57E-04	2.39E-01	5.74E+00	2.10E+03	5.74E+00	4.78E+02	No	No	NOTE 1
Manganese unlisted compounds (T)	MNC-other	yes	no	0.63	lb/day			7.70E-06	1.93E-03							7.70E-06	1.93E-03	4.62E-02	1.69E+01	4.62E-02	3.85E+00	No	No	NOTE 1
Mercury, vapor (TH)	7439976	yes	no	0.013	lb/day			2.60E-06	6.50E-04							2.60E-06	6.50E-04	1.56E-02	5.69E+00	1.56E-02	1.30E+00	Yes	Yes	NOTE 3
Nickel metal (TH)	7440020	yes	no	0.13	lb/day			6.30E-05	1.58E-02							6.30E-05	1.58E-02	3.78E-01	1.38E+02	3.78E-01	3.15E+01	Yes	Yes	NOTE 3
Carbon disulfide (TH)	75150	no	yes	3.9	lb/day					1.95E-06	4.87E-04	5.41E-07	1.35E-04	2.49E-06	6.23E-04	2.49E-06	6.23E-04	1.49E-02	5.45E+00	1.49E-02	1.25E+00	No	No	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	yes	no	0.0002	lb/yr			2.10E-13	5.25E-11							2.10E-13	5.25E-11	1.26E-09	4.60E-07	1.26E-09	1.05E-07	No	No	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	yes	no	0.016	lb/yr			5.60E-07	1.40E-04							5.60E-07	1.40E-04	3.36E-03	1.23E+00	3.36E-03	2.80E-01	Yes	Yes	NOTE 3
Benzene (TH)	71432	yes	yes	8.1	lb/yr			3.90E-04	9.75E-02	3.90E-06	9.75E-04	2.16E-06	5.41E-04	6.06E-06	1.52E-03	3.96E-04	9.90E-02	2.38E+00	8.67E+02	2.38E+00	1.98E+02	Yes	Yes	NOTE 3
Benzo(a)pyrene (T)	50328	yes	yes	2.2	lb/yr			9.80E-09	2.45E-06	0.00E+00	0.00E+00	7.84E-09	1.96E-06	7.84E-09	1.96E-06	1.76E-08	4.41E-06	1.06E-04	3.86E-02	1.06E-04	8.82E-03	No	No	NOTE 1
Hydrogen Sulfide (T)	7783064	yes	yes	1.7	lb/day			5.18E-05	1.30E-02	1.46E-06	3.65E-04	1.46E-06	3.65E-04	2.92E-06	7.30E-04	5.47E-05	1.37E-02	3.28E-01	1.20E+02	3.28E-01	2.74E+01	No	No	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	yes	no	0.26	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	yes	no	0.37	lb/yr			4.10E-07	1.03E-04							4.10E-07	1.03E-04	2.46E-03	8.98E-01	2.46E-03	2.05E-01	Yes	No	NOTE 2
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	yes	no	0.0051	lb/yr			1.30E-12	3.25E-10							1.30E-12	3.25E-10	7.80E-09	2.85E-06	7.80E-09	6.50E-07	No	No	NOTE 1
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	yes	no	0.18	lb/hr			2.10E-04	5.25E-02							2.10E-04	5.25E-02	1.26E+00	4.60E+02	1.26E+00	1.05E+02	No		NOTE 1
Perchloroethylene (tetrachloroethylene) (TH)	127184	no	yes	13000	lb/yr					0.00E+00	0.00E+00	3.20E-07	8.01E-05	3.20E-07	8.01E-05	3.20E-07	8.01E-05	1.92E-03	7.01E-01	1.92E-03	1.60E-01	No	No	NOTE 1
Trichloroethylene (TH)	79016	no	yes	4000	lb/yr					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Napthalene (H)	91203	yes	yes					6.50E-04	1.63E-01	4.62E-06	1.16E-03	4.26E-06	1.07E-03	8.88E-06	2.22E-03	6.59E-04	1.65E-01	3.95E+00	1.44E+03	3.95E+00	3.29E+02			
Phosphorus Metal, Yellow or White (H)	7723140	yes	no					2.80E-05	7.00E-03							2.80E-05	7.00E-03	1.68E-01	6.13E+01	1.68E-01	1.40E+01			
Polycyclic Organic Matter (H)	POM	yes	no					8.80E-04	2.20E-01							8.80E-04	2.20E-01	5.28E+00	1.93E+03	5.28E+00	4.40E+02			
Propionaldehyde (H)	123386	yes	no					1.30E-04	3.25E-02							1.30E-04	3.25E-02	7.80E-01	2.85E+02	7.80E-01	6.50E+01			
Quinone (H)	106514	yes	no					1.60E-04	4.00E-02							1.60E-04	4.00E-02	9.60E-01	3.50E+02	9.60E-01	8.00E+01			
Selenium compounds (H)	SEC	yes	no					3.50E-07	8.75E-05							3.50E-07	8.75E-05	2.10E-03	7.67E-01	2.10E-03	1.75E-01			
Trimethylpentane, 2,2,4- (H)	540841	yes	yes					4.00E-05	1.00E-02	3.78E-08	9.44E-06	7.49E-08	1.87E-05	1.13E-07	2.82E-06	4.01E-05	1.00E-02	2.41E-01	8.78E+01	2.41E-01	2.01E+01			
Antimony unlisted compounds (H)	SBC-other	yes	no					1.80E-07	4.50E-05							1.80E-07	4.50E-05	1.08E-03	3.94E-01	1.08E-03	9.00E-02			
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	yes	no					5.05E-06	1.26E-03							5.05E-06	1.26E-03	3.03E-02	1.11E+01	3.03E-02	2.53E+00			
Cobalt unlisted compounds (H)	COC-other	yes	no					2.60E-08	6.50E-06							2.60E-08	6.50E-06	1.56E-04	5.69E-02	1.56E-04	1.30E-02			
Ethyl benzene (H)	100414	yes	yes					2.40E-04	6.00E-02	4.63E-06	1.16E-03	1.16E-05	2.91E-03	1.63E-06	4.07E-03	2.56E-04	6.41E-02	1.54E+00	5.61E+02	1.54E+00	1.28E+02			
Lead unlisted compounds (H)	PBC-other	yes	no					1.50E-05	3.75E-03							1.50E-05	3.75E-03	9.00E-02	3.29E+01	9.00E-02	7.50E+00			
Methyl bromide (H)	74839	no	yes							5.97E-07	1.49E-04	3.99E-07	9.98E-05	9.96E-07	2.49E-04	9.96E-07	2.49E-04	5.98E-03	2.18E+00	5.98E-03	4.98E-01			
Cumene (H)	98828	no	yes							0.00E+00	0.00E+00	4.57E-06	1.14E-03	4.57E-06	1.14E-03	4.57E-06	1.14E-03	2.74E-02	1.00E+01	2.74E-02	2.29E+00			
Ethyl chloride (chloroethane) (H)	75003	no	yes							0.00E+00	0.00E+00	8.73E-09	2.18E-06	8.73E-09	2.18E-06	8.73E-09	2.18E-06	5.24E-05	1.91E-02	5.24E-05	4.37E-03			
Methyl chloride (H)	74873	no	yes							0.00E+00	0.00E+00	6.24E-07	1.56E-04	6.24E-07	1.56E-04	6.24E-07	1.56E-04	3.74E-03	1.37E+00	3.74E-03	3.12E-01			
Xylene, o- (H)	95476	no	yes							6.95E-06	1.74E-03	3.33E-06	8.32E-04	1.03E-05	2.57E-03	1.03E-05	2.57E-03	6.16E-02	2.25E+01	6.16E-02	5.14E+00			
HAPs, TOTAL								1.00E-02	2.50E+00	1.87E-04	4.68E-02	8.66E-05	2.17E-02	2.74E-04	6.85E-02	1.03E-02	2.57E+00	6.16E+01	2.25E+04	6.16E+01	5.14E+03			

POTENTIAL TAP EMISSIONS - HMA-H1

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - INPUT SCREEN

NCDENR

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Directions: Enter and select information in the boxes that are highlighted in blue:

COMPANY NAME:	Carolina Sunrock, LLC
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10682R00
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler
EMISSION SOURCE ID NO.:	HMA-H1
LATEST CONSTRUCTION/MODIFICATION DATE:	2020
SELECT THE TYPE OF BOILER FROM THE LISTS BELOW:	28

Boilers=>100 mmBtu/hr		Boilers=>100 mmBtu/hr (cont'd)	
1 =	No. 6 oil-fired, normal firing (U)	17 =	No. 2 oil-fired (C)
2 =	No. 6 oil-fired, normal firing (I)	18 =	No. 2 oil-fired, LNB/FGR (U)
3 =	No. 6 oil-fired, normal firing (C)	19 =	No. 2 oil-fired, LNB/FGR (I)
4 =	No. 6 oil-fired, normal firing, low Nox burner (U)	20 =	No. 2 oil-fired, LNB/FGR (C)
5 =	No. 6 oil-fired, normal firing, low Nox burner (I)		
6 =	No. 6 oil-fired, normal firing, low Nox burner (C)	21 =	Vertical fired utility boiler
7 =	No. 6 oil-fired, tangential firing (U)		
8 =	No. 6 oil fired, tangential firing, low Nox burner (U)	**Small Boilers <100 mmBtu/hr**	
9 =	No. 5 oil-fired, normal firing (U)	22 =	No. 6 oil-fired (I)
10 =	No. 5 oil-fired, normal firing (I)	23 =	No. 6 oil-fired (C)
11 =	No. 5 oil-fired, tangential firing (U)	24 =	No. 5 oil-fired (C)
12 =	No. 4 oil-fired, normal firing (U)	25 =	No. 4 oil-fired (C)
13 =	No. 4 oil-fired, normal firing (I)	26 =	No. 2 oil-fired (I)
14 =	No. 4 oil-fired, tangential firing (U)	27 =	No. 2 oil-fired (C)
15 =	No. 2 oil-fired (U)		
16 =	No. 2 oil-fired (I)	28 =	Residential Furnace

Note: The emission factors for fuel oil-fired boilers depend on the boiler size and application type. In the listing of boiler types, the following notation is used: U = Utility boilers (producing steam for the generation of electricity), I = Industrial boilers (generating steam or hot water for process heat, electricity generation, or space heat), C = Commercial or institutional (used for space heating of commercial or institutional facilities) and residential (furnaces used for space heating purposes). Please be sure to select the proper boiler from the lists above.

EMISSION SOURCE INPUT DATA

MAXIMUM HEAT INPUT (MILLION BTU PER HOUR):	1.20	MMBTU/HR
ACTUAL ANNUAL FUEL USAGE (GALLONS PER YEAR):	60,000.0	GAL/YR
MAXIMUM ANNUAL FUEL USAGE (GALLONS PER YEAR)	75,085.7	GAL/YR
MAXIMUM FUEL SULFUR CONTENT (%):	0.50	% - (TYPEOVER IF NECESSARY - DEFAULT VALUE = 2.1 FOR RESIDUAL FUEL OIL OR 0.5 FOR DISTILLATE FUEL OIL)

NO-2 FUEL OIL USAGE LIMITED TO 60,000 GAL/YR TO KEEP BENZENE POTENTIAL EMISSIONS BELOW MODELED RATE (0.194 lb/hr.)

FUEL HEATING VALUE

FUEL HEATING VALUE (BTU/GAL): 140,000 BTU/GAL

DEFAULT WILL APPEAR AS FOLLOWS (not used for Greenhouse Gas calcs --See below for GHG defaults):
150,000 BTU/GAL FOR No. 6, 5, and 4 FUEL OIL
140,000 BTU/GAL ALL OTHERS
(TYPE OVER NUMBER AT RIGHT IF YOU HAVE SITE SPECIFIC DATA)

CONTROL DEVICE INPUT DATA

Note: Select the type of control devices from the pull-down menus below. Default control effiencies will appear for each control device that is selected. The user may enter a different control efficiency to override these values if site specific data is available.

TYPE OF PARTICULATE CONTROL:	AVERAGE PARTICULATE CONTROL EFF.: 0
TYPE OF POSTCOMBUSTION SULFUR DIOXIDE CONTROL:	AVERAGE SULFUR DIOXIDE CONTROL EFF.: 0
TYPE OF NITROGEN OXIDE CONTROL:	AVERAGE NITROGEN OXIDE CONTROL EFF.: 0

REQUESTED PERMIT LIMITATIONS (IF APPLICABLE)

REQUESTED MAXIMUM FUEL USAGE LIMIT (GALLONS PER YEAR)	60,000.0	GAL/YR
REQUESTED MAXIMUM FUEL SULFUR CONTENT (%)	0.50	%

(TYPEOVER IF NECESSARY - DEFAULT VALUES ARE THE CALCULATED POTENTIAL AND THE MAXIMUM SULFUR CONTENT AS SHOWN IN THE EMISSION SOURCE INPUT DATA SECTION)

ADDITIONAL INFORMATION FOR GREENHOUSE GAS EMISSIONS

ENTER CALCULATION TIER
from EPA Mandatory Reporting Rule (MRR) Subpart C -
www.epa.gov/climatechange/emissions/ghgrulemaking.html
NOTE: EF is "Emission Factor"

SINCE TIER 3 IS NOT BEING USED, FUEL CARBON CONTENT WILL NOT BE USED: 2.7600 kg Carbon/gal

SELECT FUEL TYPE

HIGH HEAT VALUE (HHV) FOR GHGs
FOR TIER 1 and TIER 3, the FUEL HEATING VALUE entered above is overriden with the EPA DEFAULT from Table C-1 of the EPA MRR:

Distillate Fuel Oil No. 2	0.138 mmBTU/gal	THIS VALUE WILL BE USED FOR GHG calcuations- actual emissions
Distillate Fuel Oil No. 4	0.146 mmBTU/gal	
Residual Fuel Oil No. 5	0.14 mmBTU/gal	
Residual Fuel Oil No. 6	0.15 mmBTU/gal	

FOR TIER 2, the FUEL HEATING VALUE entered above is used. The value entered must be the annual average HHV of the fuel determined using procedures in the EPA MRR (see 98.33(a)(2))

Distillate Fuel Oil No. 2 DEFAULT HHV OF 0.138 mmBTU/gal THIS VALUE WILL BE USED FOR GHG calcuations- actual emissions

ATTACHMENT E.2

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

COMPANY:	Carolina Sunrock, LLC	MAX HEAT INPUT:	1.20	MMBTU/HR
FACILITY ID NO.:	1700016	FUEL HEAT VALUE:	140,000	BTU/GAL
PERMIT NUMBER:	10682R00	HHV for GHG CALCULATIONS:	0.138	mm BTU/GAL
FACILITY CITY:	Burlington	ACTUAL ANNUAL FUEL USAGE:	60,000	GAL/YR
FACILITY COUNTY:	Caswell	MAXIMUM ANNUAL FUEL USAGE:	75,086	GAL/YR
USER NAME:	LLG	MAXIMUM SULFUR CONTENT:	0.5	%
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler			
EMISSION SOURCE ID NO.:	HMA-H1	MAX. FUEL USAGE:	60,000	GAL/YR
		MAX. SULFUR CONTENT:	0.5	%

	NONE/OTHER	PM	0
	NONE/OTHER	SO2	0
	NONE/OTHER	NOx	0

METHOD USED TO COMPUTE ACTUAL GHG EMISSIONS: TIER 1: DEFAULT HIGH HEAT VALUE AND DEFAULT EF

CARBON CONTENT USED FOR GHGS (kg C/gal): CARBON CONTENT NOT USED FOR CALCULATION TIER CHOSEN

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr	EMISSION FACTOR (lb/10³ gal) uncontrolled	EMISSION FACTOR (lb/10³ gal) controlled
TOTAL PARTICULATE MATTER (PM) (FPM+CPM)	0.03	0.10	0.03	0.12	0.02	0.10	3.30E+00	3.30E+00
FILTERABLE PM (FPM)	0.02	0.06	0.02	0.08	0.01	0.06	2.00E+00	2.00E+00
CONDENSABLE PM (CPM)	0.01	0.04	0.01	0.05	0.01	0.04	1.30E+00	1.30E+00
FILTERABLE PM<10 MICRONS (PM_{10})	0.01	0.03	0.01	0.04	0.01	0.03	1.00E+00	1.00E+00
FILTERABLE PM<2.5 MICRONS ($PM_{2.5}$)	0.00	0.01	0.00	0.01	0.00	0.01	2.50E-01	2.50E-01
SULFUR DIOXIDE (SO_2)	0.61	2.13	0.61	2.67	0.49	2.13	7.10E+01	7.10E+01
NITROGEN OXIDES (NO_x)	0.17	0.60	0.17	0.75	0.14	0.60	2.00E+01	2.00E+01
CARBON MONOXIDE (CO)	0.04	0.15	0.04	0.19	0.03	0.15	5.00E+00	5.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	0.00	0.01	0.00	0.01	0.00	0.01	2.00E-01	2.00E-01
LEAD	0.00	0.00	0.00	0.00	0.00	0.00	1.26E-03	1.26E-03

TOXIC / HAZARDOUS AIR POLLUTANT		CAS NUMBER	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/yr	EMISSION FACTOR (lb/10³ gal) uncontrolled	EMISSION FACTOR (lb/10³ gal) controlled
Antimony Unlisted Compounds	(H)	SBC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Arsenic Unlisted Compounds	(TH)	ASC-Other	4.8E-06	3.4E-02	4.8E-06	4.2E-02	4.8E-06	3.4E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	2.4E-05	1.7E-01	2.4E-05	2.1E-01	2.4E-05	1.7E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	3.6E-06	2.5E-02	3.6E-06	3.2E-02	3.6E-06	2.5E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	3.6E-06	2.5E-02	3.6E-06	3.2E-02	3.6E-06	2.5E-02	4.20E-04	4.20E-04
Chromic Acid (VI)	(TH)	7738945	3.6E-06	2.5E-02	3.6E-06	3.2E-02	3.6E-06	2.5E-02	4.20E-04	4.20E-04
Cobalt Unlisted Compounds	(H)	COC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Ethylbenzene	(H)	100414	7.0E-06	4.9E-02	7.0E-06	6.1E-02	7.0E-06	4.9E-02	8.17E-04	8.17E-04
Fluorides (sum fluoride compounds)	(T)	16984488	3.2E-04	2.2E+00	3.2E-04	2.8E+00	3.2E-04	2.2E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	4.1E-04	2.9E+00	4.1E-04	3.6E+00	4.1E-04	2.9E+00	4.80E-02	4.80E-02
Lead Unlisted Compounds	(H)	PBC-Other	1.1E-05	7.6E-02	1.1E-05	9.5E-02	1.1E-05	7.6E-02	1.26E-03	1.26E-03
Manganese Unlisted Compounds	(TH)	MNC-Other	7.2E-06	5.0E-02	7.2E-06	6.3E-02	7.2E-06	5.0E-02	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	3.6E-06	2.5E-02	3.6E-06	3.2E-02	3.6E-06	2.5E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71556	2.0E-06	1.4E-02	2.0E-06	1.8E-02	2.0E-06	1.4E-02	2.36E-04	2.36E-04
Napthalene	(H)	91203	2.9E-06	2.0E-02	2.9E-06	2.5E-02	2.9E-06	2.0E-02	3.33E-04	3.33E-04
Nickle Metal	(TH)	7440020	3.6E-06	2.5E-02	3.6E-06	3.2E-02	3.6E-06	2.5E-02	4.20E-04	4.20E-04
Phosphorus Metal, Yellow or White	(H)	7723140	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
POM rates uncontrolled	(H)	POM	2.8E-05	2.0E-01	2.8E-05	2.5E-01	2.8E-05	2.0E-01	3.30E-03	3.30E-03
Selenium compounds	(H)	SEC	1.8E-05	1.3E-01	1.8E-05	1.6E-01	1.8E-05	1.3E-01	2.10E-03	2.10E-03
Toluene	(TH)	108883	6.8E-04	4.8E+00	6.8E-04	6.0E+00	6.8E-04	4.8E+00	7.97E-02	7.97E-02
Xylene	(TH)	1330207	1.2E-05	8.4E-02	1.2E-05	1.1E-01	1.2E-05	8.4E-02	1.40E-03	1.40E-03
Total HAP	(H)		1.2E-03	8.6E+00	1.2E-03	1.1E+01	1.2E-03	8.6E+00	1.4E-01	1.4E-01
Largest HAP	(H)		6.83E-04	4.78E+00	6.83E-04	5.98E+00	6.83E-04	4.78E+00	7.97E-02	7.97E-02

NO. 2 FUEL OIL LIMIT: 60,000 GAL/YR.

→ 0.0000036 lb/hr X 24 = 0.000086 lb/24 hr.

→ 0.0000036 lb/hr X 24 = 0.000086 lb/24 hr.

EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS						EMISSION FACTOR (lb/10³ gal)	
TOXIC AIR POLLUTANT		CAS Num.	lb/hr	lb/day	lb/yr	uncontrolled	controlled
Arsenic Unlisted Compounds	(TH)	ASC-Other	4.80E-06	1.15E-04	3.36E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	2.36E-05	5.66E-04	1.65E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	3.60E-06	8.64E-05	2.52E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	3.60E-06	8.64E-05	2.52E-02	4.20E-04	4.20E-04
Soluble chromate compounds, as chromium (VI	(TH)	SolCR6	3.60E-06	8.64E-05	2.52E-02	4.20E-04	4.20E-04
Fluorides (sum fluoride compounds)	(T)	16984488	3.20E-04	7.67E-03	2.24E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	4.11E-04	9.87E-03	2.88E+00	4.80E-02	4.80E-02
Manganese Unlisted Compounds	(TH)	MNC-Other	7.20E-06	1.73E-04	5.04E-02	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	3.60E-06	8.64E-05	2.52E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71556	2.02E-06	4.85E-05	1.42E-02	2.36E-04	2.36E-04
Nickle Metal	(TH)	7440020	3.60E-06	8.64E-05	2.52E-02	4.20E-04	4.20E-04
Toluene	(TH)	108883	6.83E-04	1.64E-02	4.78E+00	7.97E-02	7.97E-02
Xylene	(TH)	1330207	1.20E-05	2.88E-04	8.40E-02	1.40E-03	1.40E-03

GREENHOUSE GAS POLLUTANT	ACTUAL EMISSIONS — EPA MRR CALCULATION METHOD: TIER 1 metric tons/yr	ACTUAL EMISSIONS — metric tons/yr, CO2e	ACTUAL EMISSIONS — short tons/yr	POTENTIAL EMISSIONS - utilize max heat input capacity and EPA MRR Emission Factors short tons/yr	POTENTIAL EMISSIONS - utilize max heat input capacity and EPA MRR Emission Factors short tons/yr, CO2e	POTENTIAL EMISSIONS With Requested Emission Limitation - utilize requested fuel limit and EPA MRR Emission Factors short tons/yr	POTENTIAL EMISSIONS With Requested Emission Limitation - utilize requested fuel limit and EPA MRR Emission Factors short tons/yr, CO2e
CARBON DIOXIDE (CO_2)	612.39	612.39	675.04	857.01	857.01	684.83	684.83
METHANE (CH_4)	2.48E-02	5.22E-01	2.74E-02	3.48E-02	7.30E-01	2.78E-02	5.83E-01
NITROUS OXIDE (N_2O)	4.97E-03	1.54E+00	5.48E-03	6.95E-03	2.16E+00	5.56E-03	1.72E+00
	TOTAL	614.45		TOTAL	859.90	TOTAL	687.13

NOTES: 1) CO2e means CO2 equivalent

2) The DAQ Air Emissions Reporting Online (AERO) system requires short tons and the EPA MRR requires metric tons

POTENTIAL TAP EMISSIONS - HMA - H2

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - INPUT SCREEN

NCDENR

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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Directions: Enter and select information in the boxes that are highlighted in blue:

COMPANY NAME:	Carolina Sunrock, LLC
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10682R00
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler
EMISSION SOURCE ID NO.:	HMA-H2
LATEST CONSTRUCTION/MODIFICATION DATE:	2020
SELECT THE TYPE OF BOILER FROM THE LISTS BELOW:	26

Boilers=>100 mmBtu/hr	
1 =	No. 6 oil-fired, normal firing (U)
2 =	No. 6 oil-fired, normal firing (I)
3 =	No. 6 oil-fired, normal firing (C)
4 =	No. 6 oil-fired, normal firing, low Nox burner (U)
5 =	No. 6 oil-fired, normal firing, low Nox burner (I)
6 =	No. 6 oil-fired, normal firing, low Nox burner (C)
7 =	No. 6 oil-fired, tangential firing (U)
8 =	No. 6 oil fired, tangential firing, low Nox burner (U)
9 =	No. 5 oil-fired, normal firing (U)
10 =	No. 5 oil-fired, normal firing (I)
11 =	No. 5 oil-fired, tangential firing (U)
12 =	No. 4 oil-fired, normal firing (U)
13 =	No. 4 oil-fired, normal firing (I)
14 =	No. 4 oil-fired, tangential firing (U)
15 =	No. 2 oil-fired (U)
16 =	No. 2 oil-fired (I)
Boilers=>100 mmBtu/hr (cont'd)	
17 =	No. 2 oil-fired (C)
18 =	No. 2 oil-fired, LNB/FGR (U)
19 =	No. 2 oil-fired, LNB/FGR (I)
20 =	No. 2 oil-fired, LNB/FGR (C)
21 =	Vertical fired utility boiler
Small Boilers <100 mmBtu/hr	
22 =	No. 6 oil-fired (I)
23 =	No. 6 oil-fired (C)
24 =	No. 5 oil-fired (C)
25 =	No. 4 oil-fired (C)
26 =	No. 2 oil-fired (I)
27 =	No. 2 oil-fired (C)
28 =	Residential Furnace

Note: The emission factors for fuel oil-fired boilers depend on the boiler size and application type. In the listing of boiler types, the following notation is used: U = Utility boilers (producing steam for the generation of electricity), I = Industrial boilers (generating steam or hot water for process heat, electricity generation, or space heat), C = Commercial or institutional (used for space heating of commercial or institutional facilities) and residential (furnaces used for space heating purposes). Please be sure to select the proper boiler from the lists above.

EMISSION SOURCE INPUT DATA

MAXIMUM HEAT INPUT (MILLION BTU PER HOUR):	1.10	MMBTU/HR
ACTUAL ANNUAL FUEL USAGE (GALLONS PER YEAR):	60,000.0	GAL/YR
MAXIMUM ANNUAL FUEL USAGE (GALLONS PER YEAR)	68,828.6	GAL/YR
MAXIMUM FUEL SULFUR CONTENT (%):	0.50	% - (TYPEOVER IF NECESSARY - DEFAULT VALUE = 2.1 FOR RESIDUAL FUEL OIL OR 0.5 FOR DISTILLATE FUEL OIL)

NO.2 FUEL OIL USAGE LIMITED TO 60,000 GAL/YR. TO KEEP BENZENE POTENTIAL EMISSIONS BELOW MODELED RATE (0.194 lb/yr)

FUEL HEATING VALUE

FUEL HEATING VALUE (BTU/GAL): 140,000 BTU/GAL

DEFAULT WILL APPEAR AS FOLLOWS (not used for Greenhouse Gas calcs –See below for GHG defaults):
150,000 BTU/GAL FOR No. 6, 5, and 4 FUEL OIL
140,000 BTU/GAL ALL OTHERS
(TYPE OVER NUMBER AT RIGHT IF YOU HAVE SITE SPECIFIC DATA)

CONTROL DEVICE INPUT DATA

Note: Select the type of control devices from the pull-down menus below. Default control effiencies will appear for each control device that is selected. The user may enter a different control efficiency to override these values if site specific data is available.

TYPE OF PARTICULATE CONTROL:	AVERAGE PARTICULATE CONTROL EFF.: 0
TYPE OF POSTCOMBUSTION SULFUR DIOXIDE CONTROL:	AVERAGE SULFUR DIOXIDE CONTROL EFF.: 0
TYPE OF NITROGEN OXIDE CONTROL:	AVERAGE NITROGEN OXIDE CONTROL EFF.: 0

REQUESTED PERMIT LIMITATIONS (IF APPLICABLE)

REQUESTED MAXIMUM FUEL USAGE LIMIT (GALLONS PER YEAR)	60,000.0	GAL/YR
REQUESTED MAXIMUM FUEL SULFUR CONTENT (%)	0.50	%

(TYPEOVER IF NECESSARY - DEFAULT VALUES ARE THE CALCULATED POTENTIAL AND THE MAXIMUM SULFUR CONTENT AS SHOWN IN THE EMISSION SOURCE INPUT DATA SECTION)

ADDITIONAL INFORMATION FOR GREENHOUSE GAS EMISSIONS

ENTER CALCULATION TIER
from EPA Mandatory Reporting Rule (MRR) Subpart C -
www.epa.gov/climatechange/emissions/ghgrulemaking.html
NOTE: EF is "Emission Factor"

SINCE TIER 3 IS NOT BEING USED, FUEL CARBON CONTENT WILL NOT BE USED: 2.7600 kg Carbon/gal

SELECT FUEL TYPE

HIGH HEAT VALUE (HHV) FOR GHGs
FOR TIER 1 and TIER 3, the FUEL HEATING VALUE entered above is overriden with the EPA DEFAULT from Table C-1 of the EPA MRR:

Distillate Fuel Oil No. 2	0.138 mmBTU/gal	THIS VALUE WILL BE USED FOR GHG calcuations- actual emissions
Distillate Fuel Oil No. 4	0.146 mmBTU/gal	
Residual Fuel Oil No. 5	0.14 mmBTU/gal	
Residual Fuel Oil No. 6	0.15 mmBTU/gal	

FOR TIER 2, the FUEL HEATING VALUE entered above is used. The value entered must be the annual average HHV of the fuel determined using procedures in the EPA MRR (see 98.33(a)(2))

Distillate Fuel Oil No. 2 DEFAULT HHV OF 0.138 mmBTU/gal THIS VALUE WILL BE USED FOR GHG calcuations- actual emissions

ATTACHMENT E.9

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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COMPANY:	Carolina Sunrock, LLC	MAX HEAT INPUT:	1.10	MMBTU/HR
FACILITY ID NO.:	1700016	FUEL HEAT VALUE:	140,000	BTU/GAL
PERMIT NUMBER:	10682R00	HHV for GHG CALCULATIONS:	0.138	mm BTU/GAL
FACILITY CITY:	Burlington	ACTUAL ANNUAL FUEL USAGE:	60,000	GAL/YR
FACILITY COUNTY:	Caswell	MAXIMUM ANNUAL FUEL USAGE:	68,829	GAL/YR
USER NAME:	LLG	MAXIMUM SULFUR CONTENT:	0.5	%
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler			
EMISSION SOURCE ID NO.:	HMA-H2	MAX. FUEL USAGE:	60,000	GAL/YR
		MAX. SULFUR CONTENT:	0.5	%

NONE/OTHER	PM	0
NONE/OTHER	SO2	0
NONE/OTHER	NOx	0

METHOD USED TO COMPUTE ACTUAL GHG EMISSIONS: TIER 1: DEFAULT HIGH HEAT VALUE AND DEFAULT EF

CARBON CONTENT USED FOR GHGS (kg C/gal): CARBON CONTENT NOT USED FOR CALCULATION TIER CHOSEN

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr	EMISSION FACTOR (lb/10³ gal) uncontrolled	EMISSION FACTOR (lb/10³ gal) controlled
TOTAL PARTICULATE MATTER (PM) (FPM+CPM)	0.03	0.10	0.03	0.11	0.02	0.10	3.30E+00	3.30E+00
FILTERABLE PM (FPM)	0.02	0.06	0.02	0.07	0.01	0.06	2.00E+00	2.00E+00
CONDENSABLE PM (CPM)	0.01	0.04	0.01	0.04	0.01	0.04	1.30E+00	1.30E+00
FILTERABLE PM<10 MICRONS (PM_{10})	0.01	0.03	0.01	0.03	0.01	0.03	1.00E+00	1.00E+00
FILTERABLE PM<2.5 MICRONS ($PM_{2.5}$)	0.00	0.01	0.00	0.01	0.00	0.01	2.50E-01	2.50E-01
SULFUR DIOXIDE (SO_2)	0.56	2.13	0.56	2.44	0.49	2.13	7.10E+01	7.10E+01
NITROGEN OXIDES (NO_x)	0.16	0.60	0.16	0.69	0.14	0.60	2.00E+01	2.00E+01
CARBON MONOXIDE (CO)	0.04	0.15	0.04	0.17	0.03	0.15	5.00E+00	5.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	0.00	0.01	0.00	0.01	0.00	0.01	2.00E-01	2.00E-01
LEAD	0.00	0.00	0.00	0.00	0.00	0.00	1.26E-03	1.26E-03

TOXIC / HAZARDOUS AIR POLLUTANT		CAS NUMBER	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/yr	EMISSION FACTOR (lb/10³ gal) uncontrolled	EMISSION FACTOR (lb/10³ gal) controlled
Antimony Unlisted Compounds	(H)	SBC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Arsenic Unlisted Compounds	(TH)	ASC-Other	4.4E-06	3.4E-02	4.4E-06	3.9E-02	4.4E-06	3.4E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	2.2E-05	1.7E-01	2.2E-05	1.9E-01	2.2E-05	1.7E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	3.3E-06	2.5E-02	3.3E-06	2.9E-02	3.3E-06	2.5E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	3.3E-06	2.5E-02	3.3E-06	2.9E-02	3.3E-06	2.5E-02	4.20E-04	4.20E-04
Chromic Acid (VI)	(TH)	7738945	3.3E-06	2.5E-02	3.3E-06	2.9E-02	3.3E-06	2.5E-02	4.20E-04	4.20E-04
Cobalt Unlisted Compounds	(H)	COC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Ethylbenzene	(H)	100414	6.4E-06	4.9E-02	6.4E-06	5.6E-02	6.4E-06	4.9E-02	8.17E-04	8.17E-04
Fluorides (sum fluoride compounds)	(T)	16984488	2.9E-04	2.2E+00	2.9E-04	2.6E+00	2.9E-04	2.2E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	3.8E-04	2.9E+00	3.8E-04	3.3E+00	3.8E-04	2.9E+00	4.80E-02	4.80E-02
Lead Unlisted Compounds	(H)	PBC-Other	9.9E-06	7.6E-02	9.9E-06	8.7E-02	9.9E-06	7.6E-02	1.26E-03	1.26E-03
Manganese Unlisted Compounds	(TH)	MNC-Other	6.6E-06	5.0E-02	6.6E-06	5.8E-02	6.6E-06	5.0E-02	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	3.3E-06	2.5E-02	3.3E-06	2.9E-02	3.3E-06	2.5E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71556	1.9E-06	1.4E-02	1.9E-06	1.6E-02	1.9E-06	1.4E-02	2.36E-04	2.36E-04
Napthalene	(H)	91203	2.6E-06	2.0E-02	2.6E-06	2.3E-02	2.6E-06	2.0E-02	3.33E-04	3.33E-04
Nickle Metal	(TH)	7440020	3.3E-06	2.5E-02	3.3E-06	2.9E-02	3.3E-06	2.5E-02	4.20E-04	4.20E-04
Phosphorus Metal, Yellow or White	(H)	7723140	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
POM rates uncontrolled	(H)	POM	2.6E-05	2.0E-01	2.6E-05	2.3E-01	2.6E-05	2.0E-01	3.30E-03	3.30E-03
Selenium compounds	(H)	SEC	1.7E-05	1.3E-01	1.7E-05	1.4E-01	1.7E-05	1.3E-01	2.10E-03	2.10E-03
Toluene	(TH)	108883	6.3E-04	4.8E+00	6.3E-04	5.5E+00	6.3E-04	4.8E+00	7.97E-02	7.97E-02
Xylene	(TH)	1330207	1.1E-05	8.4E-02	1.1E-05	9.6E-02	1.1E-05	8.4E-02	1.40E-03	1.40E-03
Total HAP	(H)		1.1E-03	8.6E+00	1.1E-03	9.9E+00	1.1E-03	8.6E+00	1.4E-01	1.4E-01
Largest HAP	(H)		6.2BE-04	4.78E+00	6.26E-04	5.48E+00	6.26E-04	4.78E+00	7.97E-02	7.97E-02

No. 2 FUEL OIL LIMIT: 60,000 GAL/YR

→ 0.0000033 lb/hr × 24 = 0.000079 lb/24hr

→ 0.0000033 lb/hr × 24 = 0.000079 lb/24hr.

EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS						EMISSION FACTOR (lb/10³ gal)	
TOXIC AIR POLLUTANT		CAS Num.	lb/hr	lb/day	lb/yr	uncontrolled	controlled
Arsenic Unlisted Compounds	(TH)	ASC-Other	4.40E-06	1.06E-04	3.36E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	2.16E-05	5.19E-04	1.65E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	3.30E-06	7.92E-05	2.52E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	3.30E-06	7.92E-05	2.52E-02	4.20E-04	4.20E-04
Soluble chromate compounds, as chromium (VI	(TH)	SolCR6	3.30E-06	7.92E-05	2.52E-02	4.20E-04	4.20E-04
Fluorides (sum fluoride compounds)	(T)	16984488	2.93E-04	7.03E-03	2.24E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	3.77E-04	9.05E-03	2.88E+00	4.80E-02	4.80E-02
Manganese Unlisted Compounds	(TH)	MNC-Other	6.60E-06	1.58E-04	5.04E-02	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	3.30E-06	7.92E-05	2.52E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71556	1.85E-06	4.45E-05	1.42E-02	2.36E-04	2.36E-04
Nickle Metal	(TH)	7440020	3.30E-06	7.92E-05	2.52E-02	4.20E-04	4.20E-04
Toluene	(TH)	108883	6.26E-04	1.50E-02	4.78E+00	7.97E-02	7.97E-02
Xylene	(TH)	1330207	1.10E-05	2.64E-04	8.40E-02	1.40E-03	1.40E-03

GREENHOUSE GAS POLLUTANT	ACTUAL EMISSIONS — EPA MRR CALCULATION METHOD: TIER 1 metric tons/yr	ACTUAL EMISSIONS metric tons/yr, CO2e	ACTUAL EMISSIONS short tons/yr	POTENTIAL EMISSIONS - utilize max heat input capacity and EPA MRR Emission Factors short tons/yr	POTENTIAL EMISSIONS short tons/yr, CO2e	POTENTIAL EMISSIONS With Requested Emission Limitation - utilize requested fuel limit and EPA MRR Emission Factors short tons/yr	POTENTIAL EMISSIONS With Requested Emission Limitation short tons/yr, CO2e
CARBON DIOXIDE (CO_2)	612.39	612.39	675.04	785.59	785.59	684.83	684.83
METHANE (CH_4)	2.48E-02	5.22E-01	2.74E-02	3.19E-02	6.69E-01	2.78E-02	5.83E-01
NITROUS OXIDE (N_2O)	4.97E-03	1.54E+00	5.48E-03	6.37E-03	1.98E+00	5.56E-03	1.72E+00
	TOTAL	614.45		TOTAL	788.24	TOTAL	687.13

NOTES: 1) CO2e means CO2 equivalent

2) The DAQ Air Emissions Reporting Online (AERO) system requires short tons and the EPA MRR requires metric tons

POTENTIAL TAP EMISSION RATES (ARSENIC, CADMIUM, NICKEL)

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - INPUT SCREEN

REVISION D; October 15, 2015

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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Directions: Enter and select information in the boxes that are highlighted in blue:

General Facility Information

COMPANY NAME:	Carolina Sunrock, LLC
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10682R00
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	120	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	1,051,200	(yd^3/year)
MAXIMUM ANNUAL PRODUCTION*	1,051,200	(yd^3/year)

*Default maximum annual production is maximum hourly throughput times 8,760 hours per year. Enter another limit if applicable (i.e. for arsenic modeling).

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	100	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	2	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	1	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	448	lbs	*410 lbs*
Supplement	148	lbs	*120 lbs*
Coarse Aggregate	1980	lbs	*1884 lbs*
Sand	1440	lbs	*1443 lbs*
Water	140	lbs	*167 lbs*
Total	4158	lbs	*4024 lbs*

** North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes"

	Cement Silo	Flyash silo	Sand&Agg Weigh hopper	Truck mix[1]	Central mix[1]	
Enter the process rate if different from default, otherwise leave blank						
Process Rate[2]	25	25	205.200	240.96	0.000	tons/hr
Maximum Allowable Emission Rate[3]	35.4	35.4	58.8	60.5	0.0	lbs/hr
PM Emission Rate Before controls	18.250	78.500	0.985	52.210	0.000	lbs/hr
PM Emission Rate After Controls	0.025	0.223	0.001	1.001	0.000	lbs/hr
Assumed control device efficiency for weigh hopper[4]			99.9%			
Complies with 2D .0515?	yes	yes	yes	yes	yes	
Control device required to comply?	no	yes	no	no	no	

[1] *Emission factors for truck/central mix include emissions from cement & supplement weigh hoppers.*

[2] *Default process rate for silo loading is 25 tons per hour. Default process weight for sand & aggr weigh hopper includes only aggr & sand. Default process rate for truck mix and central mix includes all components except water since assumes water is added directly to truck.*

[3] *Allowable emission rate should be calculated to 3 significant digits.*

[4] *Default efficiency is 99.9% for baghilters. Enter 0 if weigh hopper is not controlled.*

ATTACHMENT E.10

→

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

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General Facility Information

COMPANY NAME:	**Carolina Sunrock, LLC**
FACILITY ID NUMBER:	**1700016**
PERMIT NUMBER	**10682R00**
FACILITY CITY:	**Burlington**
FACILITY COUNTY:	**Caswell**
SPREADSHEET PREPARED BY:	**LLG**

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	**120**	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	**1051200**	(yd^3/year)

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	**100**	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	**0**	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	**2**	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	**1**	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	**448**	lbs	*410 lbs*
Supplement	**148**	lbs	*120 lbs*
Coarse Aggregate	**1980**	lbs	*1884 lbs*
Sand	**1440**	lbs	*1443 lbs*
Water	**140**	lbs	*167 lbs*
Total	**4158**	lbs	*4024 lbs*

** North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

PARTICULATE EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	Pollutant	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
truck mix*	PM	1.001	4.386	52.210	228.678	1.001	4.386
	PM10	0.375	1.645	14.912	65.314	0.375	1.645
central mix*	PM	0.000	0.000	0.000	0.000	0.000	0.000
	PM10	0.000	0.000	0.000	0.000	0.000	0.000
cement silo	PM	0.027	0.117	19.622	85.946	0.027	0.117
	PM10	0.009	0.040	12.634	55.335	0.009	0.040
suppl. Silo	PM	0.079	0.346	27.883	122.128	0.079	0.346
	PM10	0.044	0.191	9.768	42.784	0.044	0.191
weigh hopper** [sand & aggr.]	PM	0.985	4.314	0.985	4.314	0.985	4.314
	PM10	0.575	2.517	0.575	2.517	0.575	2.517
sand & aggr.	PM	3.003	13.155	3.003	13.155	3.003	13.155
	PM10	1.433	6.275	1.433	6.275	1.433	6.275
TOTAL PM	PM	5.095	22.318	103.704	454.222	5.095	22.318
TOTAL PM10	PM10	2.436	10.667	39.320	172.225	2.436	10.667
Title V Potential	PM10						0.231

*Truck/Central mix emission factors include emissions from cement & supplement weigh hopper(s).

**Actual/Potential weigh hopper (sand & aggr) emissions assumed uncontrolled since AP-42 reports "no data" for controlled.

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

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POLLUTANT	CAS NUMBER	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS)	
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER	6.59E-05	5.77E-01	2.49E-03	2.18E+01	6.59E-05	5.77E-01
Beryllium metal (TH)	7440-41-7	4.53E-06	3.97E-02	1.00E-05	8.77E-02	4.53E-06	3.97E-02
Cadmium Metal (TH)	7440-43-9	5.00E-07	4.38E-03	7.69E-06	6.74E-02	5.00E-07	4.38E-03
Chromic Acid (TH)	7738-94-5	1.58E-04	1.39E+00	4.25E-04	3.73E+00	1.58E-04	1.39E+00
Lead Unlisted Compounds (H)	PBC-OTHER	5.96E-05	5.22E-01	1.32E-03	1.16E+01	5.96E-05	5.22E-01
Manganese Unlisted compounds (TH)	MNC-OTHER	7.49E-04	6.56E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00
Nickel metal (TH)	7440-02-0	1.92E-04	1.68E+00	9.19E-04	8.05E+00	1.92E-04	1.68E+00
Phosphorus Metal Yellow or White (H)	7223-14-0	4.71E-04	4.13E+00	1.72E-03	1.51E+01	4.71E-04	4.13E+00
Selenium compounds (H)	SEC	4.68E-06	4.10E-02	9.43E-05	8.26E-01	4.68E-06	4.10E-02
Total HAPs		1.71E-03	1.49E+01	1.47E-02	1.28E+02	1.71E-03	1.49E+01
Highest HAP Manganese		7.49E-04	6.56E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00

EXPECTED EMISSIONS AFTER CONTROLS / LIMITATIONS

(Daily calculations are based on maximum hourly plant capacity operating at 24 hours per day. If over the TPER, the facility should more closely analyze the maximum daily emisions based on actual operation. Annual calculations are based on the actual annual production as entered on the INPUT worksheet.)

POLLUTANT	CAS NUMBER	lb/hr	lb/day	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER			0.5769
Beryllium metal (TH)	7440-41-7			0.040
Cadmium Metal (TH)	7440-43-9			0.004
Chromic Acid (TH)	7738-94-5		0.0038	
Manganese Unlisted compounds (TH)	MNC-OTHER		0.018	
Nickel metal (TH)	7440-02-0		0.005	

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - TAP CALCULATIONS

REVISION D; October 15, 2015

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ARSENIC EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Arsenic	5.69E-05	4.98E-01	2.43E-03	2.13E+01	5.69E-05	4.98E-01
central mix	Arsenic	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Arsenic	1.14E-07	9.98E-04	4.52E-05	3.96E-01	1.14E-07	9.98E-04
supplement silo*	Arsenic	8.88E-06	7.78E-02	8.88E-06	7.78E-02	8.88E-06	7.78E-02
TOTAL	**Arsenic**	**6.59E-05**	**5.77E-01**	**2.49E-03**	**2.18E+01**	**6.59E-05**	**5.77E-01**
		(Arsenic TPER: 0.053 lb/yr)					

BERYLLIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Beryllium	3.72E-06	3.26E-02	8.73E-06	7.64E-02	3.72E-06	3.26E-02
central mix	Beryllium	-	-	-	-	-	-
cement silo	Beryllium	1.31E-08	1.14E-04	4.81E-07	4.21E-03	1.31E-08	1.14E-04
supplement silo*	Beryllium	8.03E-07	7.03E-03	8.03E-07	7.03E-03	8.03E-07	7.03E-03
TOTAL	**Beryllium**	**4.53E-06**	**3.97E-02**	**1.00E-05**	**8.77E-02**	**4.53E-06**	**3.97E-02**
		(Beryllium TPER: 0.28 lb/yr)					

CADMIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Cadmium	3.24E-07	2.84E-03	1.22E-06	1.07E-02	3.24E-07	2.84E-03
central mix	Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Cadmium	-	-	6.29E-06	5.51E-02	-	-
supplement silo*	Cadmium	1.76E-07	1.54E-03	1.76E-07	1.54E-03	1.76E-07	1.54E-03
TOTAL	**Cadmium**	**5.00E-07**	**4.38E-03**	**7.69E-06**	**6.74E-02**	**5.00E-07**	**4.38E-03**
		(Cadmium TPER: 0.37 lb/yr)					

CHROMIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Chromium	1.47E-04	1.28E+00	4.08E-04	3.57E+00	1.47E-04	1.28E+00
central mix	Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Chromium	7.80E-07	6.83E-03	6.77E-06	5.93E-02	7.80E-07	6.83E-03
supplement silo*	Chromium	1.08E-05	9.49E-02	1.08E-05	9.49E-02	1.08E-05	9.49E-02
TOTAL	**Chromium**	**1.58E-04**	**1.39E+00**	**4.25E-04**	**3.73E+00**	**1.58E-04**	**1.39E+00**
		(Chromium TPER: 0.013 lb/day)					

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - TAP CALCULATIONS

REVISION D; October 15, 2015

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LEAD EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Lead	5.47E-05	4.79E-01	1.29E-03	1.13E+01	5.47E-05	4.79E-01
central mix	Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Lead	2.93E-07	2.57E-03	1.98E-05	1.73E-01	2.93E-07	2.57E-03
supplement silo*	Lead	4.62E-06	4.05E-02	4.62E-06	4.05E-02	4.62E-06	4.05E-02
TOTAL	**Lead**	**5.96E-05**	**5.22E-01**	**1.32E-03**	**1.16E+01**	**5.96E-05**	**5.22E-01**

MANGANESE EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Manganese	7.44E-04	6.52E+00	2.19E-03	1.92E+01	7.44E-04	6.52E+00
central mix	Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Manganese	3.14E-06	2.75E-02	5.48E-03	4.80E+01	3.14E-06	2.75E-02
supplement silo*	Manganese	2.27E-06	1.99E-02	2.27E-06	1.99E-02	2.27E-06	1.99E-02
TOTAL	**Manganese**	**7.49E-04**	**6.56E+00**	**7.67E-03**	**6.72E+01**	**7.49E-04**	**6.56E+00**

(Manganese TPER: 0.63 lb/day)

NICKEL EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Nickel	1.71E-04	1.50E+00	4.26E-04	3.73E+00	1.71E-04	1.50E+00
central mix	Nickel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Nickel	1.12E-06	9.84E-03	4.73E-04	4.14E+00	1.12E-06	9.84E-03
supplement silo*	Nickel	2.02E-05	1.77E-01	2.02E-05	1.77E-01	2.02E-05	1.77E-01
TOTAL	**Nickel**	**1.92E-04**	**1.68E+00**	**9.19E-04**	**8.05E+00**	**1.92E-04**	**1.68E+00**

(Nickel TPER: 0.13 lb/day)

↳ 0.000192 lb/hr × 24 = 0.0046 lb/24hr

PHOSPHORUS EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Phosphorus	4.40E-04	3.85E+00	1.37E-03	1.20E+01	4.40E-04	3.85E+00
central mix	Phosphorus	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Phosphorus	-	-	3.17E-04	2.78E+00	-	-
supplement silo*	Phosphorus	3.14E-05	2.75E-01	3.14E-05	2.75E-01	3.14E-05	2.75E-01
TOTAL	**Phosphorus**	**4.71E-04**	**4.13E+00**	**1.72E-03**	**1.51E+01**	**4.71E-04**	**4.13E+00**

SELENIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	**Pollutant**	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Selenium	4.04E-06	3.54E-02	9.37E-05	8.21E-01	4.04E-06	3.54E-02
central mix	Selenium	-	-	-	-	-	-
cement silo	Selenium	-	-	-	-	-	-
supplement silo*	Selenium	6.43E-07	5.63E-03	6.43E-07	5.63E-03	6.43E-07	5.63E-03
TOTAL	**Selenium**	**4.68E-06**	**4.10E-02**	**9.43E-05**	**8.26E-01**	**4.68E-06**	**4.10E-02**

FACILITY Carolina Sunrock - Burlington North **I.D. NO.** 1700016 **DATE** 2/7/2020 REV. 2/18/2020
LOCATION Caswell **PERMIT NO.** 10628R00 **BY** LLG

FACILITY-WIDE EMISSIONS SUMMARY

ACTUAL EMISSIONS

	SOURCE	PM ton/yr	PM_{10} ton/yr	SO_2 ton/yr	NOx ton/yr	CO ton/yr	VOC ton/yr	Total HAP lb/yr	Highest HAP lb/yr	
	HMA-1	11.52	7.27	26.04	15.19	33.49	12.05	5,140.00	1,600.00	Formaldehyde
*	HMA-H1 / HMA-H2	0.08	0.02	1.75	0.49	0.12	0.00	7.10	3.93	Toluene
	RMC - Conc. Plant	22.32	10.67	0.00	0.00	0.00	0.00	14.90	6.56	Manganese
	TOTALS	33.92	17.96	27.79	15.68	33.61	12.05	5,162.00	1,600.00	Formaldehyde
								2.5810	0.8000	
								ton/yr	ton/yr	

POTENTIAL EMISSIONS BEFORE CONTROLS/LIMITS

	SOURCE	PM ton/yr	PM_{10} ton/yr	SO_2 ton/yr	NOx ton/yr	CO ton/yr	VOC ton/yr	Total HAP lb/yr	Highest HAP lb/yr	
	HMA-H1	87.28	39.72	682.89	66.48	146.68	52.77	22,500.00	6,980.00	Formaldehyde
*	HMA-H1 & HMA-H2	0.24	0.07	5.11	1.44	0.36	0.01	21.00	11.50	Toluene
	RMC - Conc. Plant	454.22	172.23	0.00	0.00	0.00	0.00	128.00	67.20	Manganese
	TOTALS	541.74	212.02	688.00	67.92	147.04	52.78	22,649.00	6,980.00	Formaldehyde
			40.02	(39.72 + 0.07 + 0.23)**				11.32	3.49	
								ton/yr	ton/yr	

POTENTIAL EMISSIONS AFTER CONTROLS/LIMITS

	SOURCE	PM ton/yr	PM_{10} ton/yr	SO_2 ton/yr	NOx ton/yr	CO ton/yr	VOC ton/yr	Total HAP lb/yr	Highest HAP lb/yr	
	HMA-1	11.52	7.27	26.04	15.19	33.49	12.05	5,140.00	1,600.00	Formaldehyde
*	HMA-H1 & HMA-H2	0.24	0.07	5.11	1.44	0.36	0.01	21.00	11.50	Toluene
	RMC - Conc. Plant	22.32	10.67	0.00	0.00	0.00	0.00	14.90	6.56	Manganese
	TOTALS	34.08	18.01	31.15	16.63	33.85	12.06	5,175.90	1,600.00	Formaldehyde
			7.57	(7.27 + 0.07 + 0.23)**				2.5880	0.8000	
								ton/yr	ton/yr	

* From No. 2 Fuel Oil Combustion

** For Title V applicability, only emissions from the cement and fly ash storage silos after controls are considered from the Concrete Batch Plant, because the EPA considers emissions from cement/fly ash scales (weigh batchers) and truck loading operations to be fugitive and uncontrolled. In addition, the EPA considers the bagfilter for the cement and fly ash silos to be integral. Therefore, the facility does not trigger Synthetic Minor for PM10.

ATTACHMENT E11