ENVIVA PELLETS 2014
P/N 10203
NORTHAMPTON COUNTY

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

November 17, 2014

Michael Doniger
Director Plant Operations
Enviva Pellets Northampton, LLC
7200 Wisconsin Avenue, Suite 1000
Bethesda, Maryland 20814

Subject: Enviva Pellets Northampton, LLC
Garysburg, Northampton County, North Carolina
Facility ID 6600167, Permit No. 10203R03
VOC Emissions Testing Protocols for ES-DRYER, ES-HM2, and ES-CLR2
Tracking Nos. 2014-216st, 2014-217st, and 2014-221st
Proposed Test Date: November 20, 2014

Dear Mr. Doniger:

The North Carolina Division of Air Quality (DAQ) has reviewed the protocol submittal forms (PSF) for the emissions testing of the dryer ES-DRYER, the hammermill ES-HM2, and the pellet cooler ES-CLR2. The proposed methods are acceptable for VOC emissions while processing a blended feed of up to 15% softwood and 85% hardwood. The purpose of testing is "to modify [the] permit to allow up to 15% softwood."

The emissions sources and control devices are direct heat wood-dryer ES-DRYER controlled by simple cyclone CD-DC in series with wet electrostatic precipitator CD-WESP, hammermill ES-HM2 controlled by simple cyclone CD-HM-CYC-2 in series with three fabric filters CD-HM-BF1 through CD-HM-BF3, and pellet cooler ES-CLR2 controlled by simple cyclone CD-CLR-2. 15A NCAC 2Q .0317 *Avoidance Conditions* for 15A NCAC 2D .0530 *Prevention of Significant Deterioration* applies. Permit Condition 2.1.A.4 limits VOC emissions from ES-DRYER to 250 tons per consecutive 12 month period. The VOC emission factor for ES-DRYER is currently 0.95 pounds per oven dry ton (lb/ODT).

Air Control Techniques proposes EPA Method 1, 2, 3A, 4, and 25A to determine the VOC emissions from the subject sources. Three 60-minute runs are proposed for each sampling location. The locations shall meet EPA Method 1 requirements including verification of the absence of cyclonic flow unless otherwise approved by DAQ. The proposed rates and process control parameters to be recorded during testing are tabulated on the following page.

1641 Mail Service Center, Raleigh, North Carolina 27699-1641
Phone: 919-707-8400 \ Internet: www.ncdenr.gov

Tracking No.	Source	Proposed Rate	Process Parameters
2014-216st	ES-DRYER	72 ODT/hr	WESP secondary voltages, dryer inlet/outlet temperatures, total feed rate (ODT/hr), material outlet moisture content
2014-217st	ES-HM2	10 ODT/hr	Fabric filter pressure drops, product throughput (tons/hr)
2014-221st	ES-CLR2	12 ODT/hr	Cyclone static Pressure Drop, Product throughput (tons/hr)

The proposed testing is acceptable. All relevant process and operating data shall be included in the final test report. Approval of the sampling protocols does not exempt the tester from the minimum requirements of the methods. Any deviations from the methods remain subject to approval by DAQ. If you have any questions, please contact me at (919) 707-8416 or Shannon.vogel@ncdenr.gov.

Sincerely,

Shannon M. Vogel

Shannon M. Vogel, Environmental Engineer
Division of Air Quality, DENR

cc: Central Files, Northampton County
John Richards, Air Control Techniques
Patrick Butler, Raleigh Regional Office
IBEAM Documents - 6600167

Central Files

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

May 13, 2014

Mr. Michael Doniger
Vice President of Operations
Enviva, LP
7200 Wisconsin Avenue, Suite 1000
Bethesda, Maryland 20814

Dear Mr. Doniger:

SUBJECT: Air Quality Permit No. 10203R03
Facility ID: 6600167
Enviva Pellets Northampton, LLC
Gaston, North Carolina
Northampton County
Fee Class: Title V

In accordance with your completed Air Quality Permit Application for a modification of your permit received April 22, 2014, we are forwarding herewith Air Quality Permit No. 10203R03 to Enviva Pellets Northampton, LLC, Lebanon Church Road, Gaston, North Carolina authorizing the construction and operation, of the emission source(s) and associated air pollution control device(s) specified herein. Additionally, any emissions activities determined from your Air Quality Permit Application as being insignificant per 15A North Carolina Administrative Code 2Q .0503(8) have been listed for informational purposes as an "ATTACHMENT." Please note the requirements for the annual compliance certification are contained in General Condition P in Section 3. The current owner is responsible for submitting a compliance certification for the entire year regardless of who owned the facility during the year.

The Permittee shall file a Title V Air Quality Permit Application pursuant to 15A NCAC 2Q .0504 for those air emission source(s) (ID No(s). ES-HM-8) on or before 12 months after commencing operation of the first unit.

As the designated responsible official it is your responsibility to review, understand, and abide by all of the terms and conditions of the attached permit. It is also your responsibility to ensure that any person who operates any emission source and associated air pollution control device subject to any term or condition of the attached permit reviews, understands, and abides by the condition(s) of the attached permit that are applicable to that particular emission source.

If any parts, requirements, or limitations contained in this Air Quality Permit are unacceptable to you, you have the right to request a formal adjudicatory hearing within 30 days following receipt of this permit, identifying the specific issues to be contested. This hearing request must be in the form of a written petition, conforming to NCGS (North Carolina General Statutes) 150B-23, and filed with both the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714 and the Division of Air Quality, Permitting Section, 1641 Mail Service Center, Raleigh, North Carolina 27699-1641. The form for requesting a formal adjudicatory

hearing may be obtained upon request from the Office of Administrative Hearings. Please note that this permit will be stayed in its entirety upon receipt of the request for a hearing. Unless a request for a hearing is made pursuant to NCGS 150B-23, this Air Quality Permit shall be final and binding 30 days after issuance.

You may request modification of your Air Quality Permit through informal means pursuant to NCGS 150B-22. This request must be submitted in writing to the Director and must identify the specific provisions or issues for which the modification is sought. Please note that this Air Quality Permit will become final and binding regardless of a request for informal modification unless a request for a hearing is also made under NCGS 150B-23.

The construction of new air pollution emission source(s) and associated air pollution control device(s), or modifications to the emission source(s) and air pollution control device(s) described in this permit must be covered under an Air Quality Permit issued by the Division of Air Quality prior to construction unless the Permittee has fulfilled the requirements of GS 143-215-108A(b) and received written approval from the Director of the Division of Air Quality to commence construction. Failure to receive an Air Quality Permit or written approval prior to commencing construction is a violation of GS 143-215.108A and may subject the Permittee to civil or criminal penalties as described in GS 143-215.114A and 143-215.114B.

This Air Quality Permit shall be effective from May 13, 2014 until February 28, 2017, is nontransferable to future owners and operators, and shall be subject to the conditions and limitations as specified therein. Should you have any questions concerning this matter, please contact Ms. Jenny Sheppard at (919) 707-8727.

Sincerely yours,

Mark J. Cuilla, CPM, Acting Chief, Permitting Section
Division of Air Quality, NCDENR

Enclosure

c: Patrick Butler, Supervisor, Raleigh Regional Office
✓Central Files

State of North Carolina,
Department of Environment,
and Natural Resources

Division of Air Quality

AIR QUALITY PERMIT

Permit No.	Replaces Permit No.	Effective Date	Expiration Date
10203R03	10203R02	May 13, 2014	February 28, 2017

Until such time as this permit expires or is modified or revoked, the below named Permittee is permitted to construct and operate the emission source(s) and associated air pollution control device(s) specified herein, in accordance with the terms, conditions, and limitations within this permit. This permit is issued under the provisions of Article 21B of Chapter 143, General Statutes of North Carolina as amended, and Title 15A North Carolina Administrative Codes (15A NCAC), Subchapters 2D and 2Q, and other applicable Laws.

Pursuant to Title 15A NCAC, Subchapter 2Q, the Permittee shall not construct, operate, or modify any emission source(s) or air pollution control device(s) without having first submitted a complete Air Quality Permit Application to the permitting authority and received an Air Quality Permit, except as provided in this permit.

Permittee:	**Enviva Pellets Northampton, LLC**
Facility ID:	**4600107**
Facility Site Location: **City, County, State, Zip:**	**874 Lebanon Church Road** **Garysburg, Northampton County, North Carolina, 27831**
Mailing Address: **City, State, Zip:**	**7200 Wisconsin Avenue** **Bethesda, Maryland, 20814**
Application Number: **Complete Application Date:**	**6600167.14A** **April 22, 2014**
Primary SIC Code: **Division of Air Quality,** **Regional Office Address:**	**2499** **Raleigh Regional Office** **3800 Barrett Drive** **Raleigh, North Carolina, 27609**

ATTACHMENT to Permit No. 10203R03

Insignificant Activities under 15A NCAC 2Q .0503(8)

Emission Source ID No.	Emission Source Description
IES-DWH	Dried wood handling
IES-PP	Pellet press system
IES-FPH	Finished product handling
IS-TK1 and IS-TK2	Two diesel storage tanks (2,500 gallon and 500 gallon capacity)
IES-EPWC	Electric powered green wood chipper
IES-RCHP-1 and IES-RCHP-2	Two electric powered wood re-chippers
IES-GWHS	Green wood handling and storage
IES-GWFB	Green wood fuel storage bin
IES-GN **NSPS IIII, MACT ZZZZ**	One emergency use generator (350 brake horsepower)
IES-FWP **NSPS IIII, MACT ZZZZ**	One fire water pump (300 brake horsepower)
IES-CHIP-1	Log Chipping

1. Because an activity is insignificant does not mean that the activity is exempted from an applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement.
2. When applicable, emissions from stationary source activities identified above shall be included in determining compliance with the permit requirements for toxic air pollutants under 15A NCAC 2D .1100 "Control of Toxic Air Pollutants" or 2Q .0711 "Emission Rates Requiring a Permit".
3. For additional information regarding the applicability of GACT see the DAQ page titled "The Regulatory Guide for Insignificant Activities/Permits Exempt Activities". The link to this site is as follows: http://daq.state.nc.us/permits/insig/

Table Of Contents

SECTION 1- PERMITTED EMISSION SOURCES AND ASSOCIATED AIR POLLUTION CONTROL DEVICES AND APPURTENANCES

The following table contains a summary of all permitted emission sources and associated air pollution control devices and appurtenances:

Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-DRYER	Direct heat, wood-fired dryer (174 million Btu per hour heat input)	CD-DC -and- CD-WESP	One simple cyclone (149 inches in diameter) in series with one wet electrostatic precipitator (29,904 square feet of total collection plate area)
ES-HM-1 through ES-HM-8	Eight hammermills	CD-HM-CYC-1 through CD-HM-CYC-8 –and- CD-HM-BF1, through CD-HM-BF3	Eight simple cyclones (120 inches in diameter each) in series with three fabric filters (6,250 square feet of filter area each)
ES-NDS	Nuisance dust system	CD-HM-BF-3	One fabric filter (6,250 square feet of filter area)
ES-PMFS	Pellet feed mill silo	CD-PMFS-BV	One bin vent filter (377 square feet of filter area)
ES-PFB-1	Pellet fines bin	CD-PFB-BV-1	One bin vent filter (780 square feet of filter area)
ES-CLR1, through ES-CLR-6	Pellet coolers	CD-CLR-1 through CD-CLR-6	Six simple cyclones (54 inches in diameter each)
ES-FPH ES-PB-1 through ES-PB-12 ES-PL-1 and ES-PL-2	Finished product handling Twelve (12) pellet load-out bins Pellet mill load-out 1 and 2	CD-FPH-BF	One fabric filter (4,842 square feet of filter area)

SECTION 2 - SPECIFIC LIMITATIONS AND CONDITIONS

2.1- Emission Sources and Control Devices Specific Limitations and Conditions

The emission sources and associated air pollution control devices and appurtenances listed below are subject to the following specific terms, conditions, and limitations, including the testing, monitoring, recordkeeping, and reporting requirements as specified herein:

A. **Wood-fired dryer system (ID No. ES-DRYER) with associated cyclone and wet electrostatic precipitator (ID Nos. CD-DC and CD-WESP);**

Hammermills (ID Nos. ES-HM-1 through ES-HM-8) with associated cyclones (ID Nos. CD-HM-CYC-1 through CD-HM-CYC-8) and fabric filters (ID Nos. CD-HM-BF1 through CD-HM-BF3);

Nuisance dust system (ID No. ES-NDS) with associated fabric filter (ID No. CD-HM-BF-3);

Pellet mill feed silo (ID No. ES-PMFS) with associated bin vent filter (ID No. CD-PMFS-BV);

Pellet fines bin (ID No. ES-PFB-1) with associated fabric filter (ID No. CD-PFB-BV-1);

Pellet coolers (ID Nos. ES-CLR1 through ES-CLR6) with associated cyclones (ID Nos. CD-CLR-1 through CD-CLR-6);

Finished product handling (ID No. ES-FPH), pellet load-out bins (ID Nos. ES-PB-1 through ES-PB-12), and pellet mill load-out (ID Nos. ES-PL-1 and ES-PL-2) with associated fabric filter (ID No. CD-FPH-BF)

The following table provides a summary of limits and standards for the emission sources described above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	$E = 4.10 \times P^{0.67}$ for process weight rate < 30 tph $E = 55 \times P^{0.11} - 40$ for process weight rate ≥ 30 tph Where, E = allowable emission rate (pounds per hour) P = process weight rate (tons per hour)	15A NCAC 2D .0515
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity when averaged over a six minute period	15A NCAC 2D .0521
Toxic air pollutants	See Section 2.2 A.	15A NCAC 2D .1100
Volatile organic compounds and carbon monoxide	For Dryer System (**ID No. ES-DRYER**) Less than 250 tons per consecutive 12 month period.	15A NCAC 2Q .0317 for avoidance of 15A NCAC 2D .0530

1. **15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES**
   a. Emissions of particulate matter from these sources shall not exceed an allowable emission rate as

calculated by the following equation: [15A NCAC 2D .0515(a)]

$E = 4.10 \times P^{0.67}$ for process weight rate < 30 tph
$E = 55 \times P^{0.11} - 40$ for process weight rate ≥ 30 tph

Where E = allowable emission rate in pounds per hour
P = process weight in tons per hour

Liquid and gaseous fuels and combustion air are not considered as part of the process weight.

Testing

b. Under the provisions of NCGS 143-215.108, the Permittee shall test the wet electrostatic precipitator (**ID No. CD-WESP**) for total suspended particulate (TSP) control efficiency in accordance with a testing protocol approved by the DAQ. Testing shall be completed and the results submitted within 180 days of commencement of operation unless an alternate date is approved by the DAQ.

Monitoring/Recordkeeping

c. Particulate matter emissions shall be controlled as follows:

- Particulate matter emissions from the wood dryer system (**ID No. ES-DRYER**) shall be controlled by a simple cyclone (**ID No. CD-DC**) in series with a wet electrostatic precipitator (**ID No. CD-WESP**).
- Particulate matter emissions from the eight hammermills (**ID Nos. ES-HM-1 through ES-HM-8**) shall be controlled by eight simple cyclones (**ID Nos. CD-HM-CYC-1 through CD-HM-CYC-8**) in series with three fabric filters (**ID Nos. CD-HM-BF1 through CD-HM-BF3**).
- Particulate matter emissions from the nuisance dust system (**ID No. ES-NDS**) shall be controlled by one fabric filter (**ID No. CD-HM-BF3**).
- Particulate d. matter emissions from the pellet mill feed silo (**ID No. ES-PMFS**) shall be controlled by a bin vent filter (**ID No. CD-PMFS-BV**).
- Particulate matter emissions from the pellet mill fines bin (**ID No. ES-PFB-1**) shall be controlled by a fabric filter (**ID No. CD-PFB-BV-1**).
- Particulate matter emissions from the pellet coolers (**ID Nos. ES-CLR-1 through ES-CLR-6**) shall be controlled by six simple cyclones (**ID Nos. CD-CLR-C1 through CD-CLR-C6**).
- Particulate matter emissions from the finished product handling (**ID No. ES-FPH**), pellet load-out bins (**ID Nos. ES-PB-1 through ES-PB-12**), and pellet mill load-out (**ID No. ES-PL-1 and ES-PB-2**) shall be controlled by one fabric filter (**ID No. CD-FPH-BF**).

For bagfilters and cyclones:

d. To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations, or if there is no manufacturer's inspection and maintenance requirement shall include the following:
   i. a monthly visual inspection of the system ductwork and material collection unit for leaks.
   ii. an annual (for each 12 month period following the initial inspection) internal inspection of the bagfilters' structural integrity.

For wet electrostatic precipitator:

e. To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations,

or if there is no manufacturer's inspection and maintenance recommendations, as a minimum, the Permittee shall establish the minimum primary voltage and minimum current within the first 30 days following operation of the dryer. To assure compliance and effective operation of the wet electrostatic precipitator, the Permittee shall monitor and record the primary voltage and current through the precipitator daily. The daily observation must be made for each day of the calendar year period. The Permittee shall be allowed three (3) days of absent observations per semi-annual period.

f. The results of inspection and maintenance shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:
   i. the date and time of each recorded action;
   ii. the results of each inspection;
   iii. the results of any maintenance performed; and
   iv. any variance from manufacturer's recommendations, if any, and corrections made.

Reporting

g. The Permittee shall submit the results of any maintenance performed on the WESP, cyclones and bagfilters within 30 days of a written request by the DAQ.

2. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

a. Emissions of sulfur dioxide from the wood dryer system (**ID No. ES-DRYER**) shall not exceed 2.3 pounds per million Btu heat input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. [15A NCAC 2D .0516]

Testing

b. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601.

Monitoring/Recordkeeping

c. No monitoring/recordkeeping is required for sulfur dioxide emissions from firing wood for the wood dryer system.

3. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

a. Visible emissions from these sources **(ID Nos. ES-DRYER, ES-HM-1 through ES-HM-8, ES-NDS, ES-PMFS, ES-PFB, ES-CLR-1 through ES-CLR-6, ES-FPH, ES-PB-1 through ES-PB-12, ES-PL-1 and ES-PL-2)** shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 2D .0521 (d)]

Testing

b. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .2601.

Monitoring

c. To assure compliance, once a month the Permittee shall observe the emission points of this source for any visible emissions above normal. The monthly observation must be made for each month of the calendar year period to ensure compliance with this requirement. The Permittee shall establish "normal" for the source in the first 30 days following the effective date of the permit. If visible

emissions from this source are observed to be above normal, the Permittee shall either:

i. take appropriate action to correct the above-normal emissions as soon as practicable and within the monitoring period and record the action taken as provided in the recordkeeping requirements below, or

ii. demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 2D .2601 (Method 9) for 12 minutes is below the limit given in Section 2.1 A.3. a. above.

Recordkeeping

d. The results of the monitoring shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:
   i. the date and time of each recorded action;
   ii. the results of each observation and/or test noting those sources with emissions that were observed to be in noncompliance along with any corrective actions taken to reduce visible emissions; and
   iii. the results of any corrective actions performed.

4. 15A NCAC 2Q. 0317: AVOIDANCE CONDITIONS
15A NCAC 2D. 0530: PREVENTION OF SIGNIFICANT DETERIORATION

a. In order to avoid applicability of this regulation, the dryer system (**ID No. ES-DRYER**) shall discharge into the atmosphere less than 250 tons of volatile organic compounds (VOCs) and carbon monoxide (CO) each per consecutive 12-month period. [15A NCAC 2D .0530]

Testing

b. Under the provisions of NCGS 143-215.108, the Permittee shall establish emission factors for calculating total VOC and CO used in compliance calculations under Section 2.1 A.4. c. below by testing the dryer system (**ID No. ES-DRYER**) in accordance with a testing protocol approved by the DAQ. Testing shall be completed and the results submitted within 180 days of commencement of operation unless an alternate date is approved by the DAQ.

Monitoring/Recordkeeping

c. Calculations of the monthly VOC and CO emissions from the dryer system (**ID No. ES-DRYER**) shall be made at the end of each month. Until stack testing for VOC and CO is conducted, VOC and CO emissions shall be determined by multiplying the approved VOC and CO emission factors (**0.95 lb/ODT for VOC and 0.81 lb/ODT for CO**) by the plant process rate. Once testing. conducted pursuant to Section 2.1 A.4. b. above, has been completed in accordance with an approved NC DAQ testing protocol, the facility shall calculate VOC and CO emissions using the lb/ODT emission factors derived from testing. Calculations and the total amount of VOC and CO emissions shall be recorded monthly in a log (written or electronic format).

d. The Permittee shall not process more than 10% softwood on an annual basis. The hardwood/ softwood mix shall be recorded in a monthly log.

e. The product moisture content shall not be less than 13% from the dryer outlet. The Permittee shall monitor and record average moisture content on a 30 day rolling average.

Reporting

f. The Permittee shall submit a semi-annual summary report, acceptable to the Regional Air Quality Supervisor, of monitoring and recordkeeping activities postmarked on or before January 30 of each calendar year for the preceding six-month period between July and December, and July 30 of each calendar year for the preceding six-month period between January and June. The report shall contain the following:
   i. The monthly hardwood/softwood mix for the previous 17 months.
   ii. The 30 day rolling average product moisture content.

iii. The monthly VOC and CO emissions for the previous 17 months. The emissions must be calculated for each of the 12-month periods over the previous 17 months.

2.2- Multiple Emission Sources Specific Limitations and Conditions

A. Facility-wide sources

STATE-ONLY REQUIREMENT:

1. **TOXIC AIR POLLUTANT EMISSIONS LIMITATION AND REQUIREMENT** - Pursuant to 15A NCAC 2D .1100 and in accordance with the approved application for an air toxic compliance demonstration, the following permit limit shall not be exceeded:

EMISSION SOURCE	TOXIC AIR POLLUTANTS	EMISSION LIMITS
Dryer system (ID No. ES-DRYER)	Acrolein	1.41 lb/hr
	Arsenic & compounds	2.43 lb/year
	Benzene	4,094.25 lb/year
	Benzo(a)pyrene	3.96 lb/year
	Cadmium	0.453 lb/year
	Chlorine	3.29 lb/day
	Formaldehyde	8.61 lb/hr
	Hexachlorodibenzo-p-dioxin	2.43 lb/year
	Hydrogen chloride	0.331 lb/hr
	Phenol	1.72 lb/hr
	Mercury	0.0146 lb/day
	Nickel	0.138 lb/day
	Vinyl chloride	27.43 lb/year

a. No reporting is required.

STATE-ONLY REQUIREMENT:

2. **TOXIC AIR POLLUTANT EMISSION RATES REQUIRING A PERMIT** – Pursuant to 15A NCAC 2Q .0711, a permit to emit toxic air pollutants is required for any facility whose actual rate of emissions from all sources are greater than any one of the following rates:

Pollutant (CAS Number)	Carcinogens (lb/yr)	Chronic Toxicants (lb/day)	Acute Systemic Toxicants (lb/hr)	Acute Irritants (lb/hr)
1,3-Butadiene (106-99-0)	11			
Acetaldehyde (75-07-0)				6.8
Beryllium (7440-41-7)	0.28			
Carbon tetrachloride (56-23-5)	460			
Chlorobenzene (108-90-7)		46		
Chloroform (67-66-3)	290			
Di(2-ethylhexyl)phthalate (117-81-7)		0.63		

Pollutant (CAS Number)	Carcinogens (lb/yr)	Chronic Toxicants (lb/day)	Acute Systemic Toxicants (lb/hr)	Acute Irritants (lb/hr)
Ethylene dichloride (107-06-2)	260			
Manganese & compounds		0.63		
Methyl chloroform (71-55-6)		250		
Methyl ethyl ketone (78-93-3)		78		
Methyl isobutyl ketone (108-10-1)		52		7.6
Methylene chloride (75-09-2)	1600		0.39	
Pentachlorophenol (87-86-5)		0.063	0.0064	
Perchloroethylene (127-18-4)	13000			
Polychlorinated biphenyls (1336-36-3)	5.6			
Styrene (100-42-5)			2.7	
Tetrachlorodibenzo-p-dioxin (1746-01-6)	0.00020			
Trichloroethylene (79-01-6)	4000			
Toluene (108-88-3)		98		14.4
Trichlorofluoromethane (75-01-4)			140	
Xylene (1330-20-7)		57		16.4

SECTION 3 - GENERAL CONDITIONS

1. REPORTS, TEST DATA, MONITORING DATA, NOTIFICATIONS, AND REQUESTS FOR RENEWAL shall be submitted to:

   Mr. Patrick Butler
   Regional Air Quality Supervisor
   North Carolina Division of Air Quality
   Raleigh Regional Office
   3800 Barrett Drive
   Raleigh, NC 27609
   (919) 791-4200

2. PERMIT RENEWAL REQUIREMENT - The Permittee, at least 90 days prior to the expiration date of this permit, shall request permit renewal by letter in accordance with 15A NCAC 2Q .0304(d) and (f). Pursuant to 15A NCAC 2Q .0203(i), no permit application fee is required for renewal of an existing air permit. The renewal request should be submitted to the Regional Supervisor, DAQ.

3. ANNUAL FEE PAYMENT - Pursuant to 15A NCAC 2Q .0203(a), the Permittee shall pay the annual permit fee within 30 days of being billed by the DAQ. Failure to pay the fee in a timely manner will cause the DAQ to initiate action to revoke the permit.

4. ANNUAL EMISSION INVENTORY REQUIREMENTS – The Permittee shall report by June 30 of each year the actual emissions of each air pollutant listed in 15A NCAC 02Q .0207(a) from each emission source within the facility during the previous calendar year. The report shall be in or on such form as may be established by the Director. The accuracy of the report shall be certified by the responsible official of the facility.

5. EQUIPMENT RELOCATION - A new air permit shall be obtained by the Permittee prior to establishing, building, erecting, using, or operating the emission sources or air cleaning equipment at a site or location not specified in this permit.

6. This permit is subject to revocation or modification by the DAQ upon a determination that information contained in the application or presented in the support thereof is incorrect, conditions under which this permit was granted have changed, or violations of conditions contained in this permit have occurred. The facility shall be properly operated and maintained at all times in a manner that will effect an overall reduction in air pollution. Unless otherwise specified by this permit, no emission source may be operated without the concurrent operation of its associated air cleaning device(s) and appurtenance(s).

7. REPORTING REQUIREMENT - Any of the following that would result in previously unpermitted, new, or increased emissions must be reported to the Regional Supervisor, DAQ:
   a. changes in the information submitted in the application regarding facility emissions;
   b. changes that modify equipment or processes of existing permitted facilities; or
   c. changes in the quantity or quality of materials processed.
   If appropriate, modifications to the permit may then be made by the DAQ to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause a violation of the emission limitations specified herein.

8. This permit is nontransferable by the Permittee. Future owners and operators must obtain a new air permit from the DAQ.

9. This issuance of this permit in no way absolves the Permittee of liability for any potential civil penalties which may be assessed for violations of State law which have occurred prior to the effective date of this permit.

10. This permit does not relieve the Permittee of the responsibility of complying with all applicable requirements of any Federal, State, or Local water quality or land quality control authority.

11. Reports on the operation and maintenance of the facility shall be submitted by the Permittee to the Regional Supervisor, DAQ at such intervals and in such form and detail as may be required by the DAQ. Information required in such reports may include, but is not limited to, process weight rates, firing rates, hours of operation, and preventive maintenance schedules.

12. A violation of any term or condition of this permit shall subject the Permittee to enforcement pursuant to G.S. 143-215.114A, 143-215.114B, and 143-215.114C, including assessment of civil and/or criminal penalties.

13. Pursuant to North Carolina General Statute 143-215.3(a)(2), no person shall refuse entry or access to any authorized representative of the DAQ who requests entry or access for purposes of inspection, and who presents appropriate credentials, nor shall any person obstruct, hamper, or interfere with any such representative while in the process of carrying out his official duties. Refusal of entry or access may constitute grounds for permit revocation and assessment of civil penalties.

14. The Permittee must comply with any applicable Federal, State, or Local requirements governing the handling, disposal, or incineration of hazardous, solid, or medical wastes, including the Resource Conservation and Recovery Act (RCRA) administered by the Division of Waste Management.

15. PERMIT RETENTION REQUIREMENT - The Permittee shall retain a current copy of the air permit at the site. The Permittee must make available to personnel of the DAQ, upon request, the current copy of the air permit for the site.

16. CLEAN AIR ACT SECTION 112(r) REQUIREMENTS - Pursuant to 40 CFR Part 68 "Accidental Release Prevention Requirements: Risk Management Programs Under the Clean Air Act, Section 112(r)," if the Permittee is required to develop and register a risk management plan pursuant to Section 112(r) of the Federal Clean Air Act, then the Permittee is required to register this plan in accordance with 40 CFR Part 68.

17. PREVENTION OF ACCIDENTAL RELEASES - GENERAL DUTY - Pursuant to Title I Part A Section 112(r)(1) of the Clean Air Act "Hazardous Air Pollutants - Prevention of Accidental Releases - Purpose and General Duty," although a risk management plan may not be required, if the Permittee produces, processes, handles, or stores any amount of a listed hazardous substance, the Permittee has a general duty to take such steps as are necessary to prevent the accidental release of such substance and to minimize the consequences of any release. This condition is federally-enforceable only.

Permit issued this the 13th day of May, 2014.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Mark J. Cuilla, CPM, Acting Chief,
Air Permitting Section Division of Air Quality
By Authority of the Environmental Management Commission

Air Permit No. 10203R03

List of Acronyms

AOS	Alternate Operating Scenario
BACT	Best Available Control Technology
Btu	British thermal unit
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CEM	Continuous Emission Monitor
CFR	Code of Federal Regulations
DAQ	Division of Air Quality
DENR	Department of Environment and Natural Resources
EMC	Environmental Management Commission
EPA	Environmental Protection Agency
FR	Federal Register
GACT	Generally Available Control Technology
HAP	Hazardous Air Pollutant
MACT	Maximum Achievable Control Technology
NAA	Non-Attainment Area
NCAC	North Carolina Administrative Code
NCGS	North Carolina General Statutes
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standard
OAH	Office of Administrative Hearings
PM	Particulate Matter
PM_{10}	Particulate Matter with Nominal Aerodynamic Diameter of 10 Micrometers or Less
POS	Primary Operating Scenario
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
tpy	Tons per Year
VOC	Volatile Organic Compound

NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date: May 13, 2014

Region: Raleigh Regional Office
County: Northampton
NC Facility ID: 6600167
Inspector's Name: Will Wike
Date of Last Inspection: 08/20/2013
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Enviva Pellets Northampton, LLC

Facility Address:
Enviva Pellets Northampton, LLC
874 Lebanon Church Road
Garysburg, NC 27866

SIC: 2499 / Wood Products, Nec
NAICS: 321999 / All Other Miscellaneous Wood Product Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP:
NSPS:
NESHAP:
PSD:
PSD Avoidance:
NC Toxics:
112(r):
Other:

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Heath Lucy (910) 318-2743 874 Lebanon Church Road Garysburg, NC 27866	Michael Doniger Director Plant Operations (804) 929-8418 7200 Wisconsin Avenue Bethesda, MD 20814	Joe Harrell EHS Manager (252) 209-6032 142 NC Route 561 East Ahoskie, NC 27910

Application Data

Application Number: 6600167.14A
Date Received: 04/22/2014
Application Type: Modification
Application Schedule: State

Existing Permit Data
Existing Permit Number: 10203/R02
Existing Permit Issue Date: 09/09/2013
Existing Permit Expiration Date: 02/28/2017

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP

No emissions inventory on record. The emissions inventory is due June 30th of every year.

Review Engineer: Jenny Sheppard

Review Engineer's Signature: **Date: May 13, 2014**

Comments / Recommendations:
Issue 10203/R03
Permit Issue Date: May 13, 2014
Permit Expiration Date: February 28, 2017

I. Introduction and Purpose of Application

Enviva Pellets Northampton, LLC (Enviva) is permitted to construct and operate a wood pellet mill at their plant site located in Garysburg, Northampton County, North Carolina. Green wood consisting of whole logs and/or chipped wood, is delivered by truck. Logs are debarked and chipped. The bark fuels the dryer system which dries chipped wood to a 13% moisture content. Dry wood is then transferred to hammermills for further size reduction and then collected in the in-feed screw pellet mill feed silo prior to pelletization. Screw presses compact the wood into pellets. Finally, pellets are conveyed to one of six pellet coolers and then to storage and load-out.

This application is for the addition of an eighth hammermill **(ID No. ES-HM-8)** with associated simple cyclone (120 inches in diameter). The hammermill will also utilize one of the 3 bagfilters already installed and used to control hammermill 7. Equipment list will now read as specified below:

Source ID No.	Emission Source Description	Control ID No.	Control Device Description
ES-HM-1 through ES-HM-8	Eight hammermills	CD-HM- CYC-1 through CD-HM-CYC-8 – and- CD-HM-BF1, through CD-HM-BF3	Eight simple cyclones (120 inches in diameter each) in series with three fabric filters (6,250 square feet of filter area each)

The bin vent filter collects dust from fines loading.

The application was received on April 22, 2014 and was considered complete for processing. The zoning consistency determination was received April 29, 2014. The application was deemed complete on April 23, 2014.

II. Statement of Compliance

The facility was last inspected on August 20, 2013 by Mr. Will Wike. At the time, the facility was deemed incompliance with all applicable regulations.

III. Regulatory Review – Specific Emission Source Limitations

A. 15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes" – This regulation establishes an allowable emission rate for particulate matter from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable. It applies to particulate matter (PM) less than 100 micrometers (μm). The allowable emission rate is calculated using the following equation:

$$E = 4.10 \times P^{0.67} \quad \text{for } P < 30 \text{ tph}$$
$$E = 55 \times P^{0.11} - 40 \quad \text{for } P \geq 30 \text{ tph}$$

where, E = allowable emission rate (lb/hr)
P = process weight rate (tph)

According to application, the hammermills process up to 71.71 ODT/hr. The allowable PM emission rate is calculated to be 47.9 lb/hr. The hourly PM emission rate after 99.0% control is expected to be 1.54 lb/hr.

DAQ Bagfilter and Cyclone Design Evaluation spreadsheets are used to verify proper design to yield expected control device efficiencies. Compliance is indicated. **Note that this is an addition of one hammermill to seven existing hammermills.

Monitoring, recordkeeping, and reporting requirements will be the same for the new hammermill and cyclone as the seven hammermills and cyclones already installed. Compliance is expected.

B. 15A NCAC 2D .0521 "Control of Visible Emissions" – This regulation establishes a visible emission standard for sources based on the manufacture date. For sources manufactured after July 1, 1971, the standard is 20% opacity when averaged over a 6-minute period. The Permittee will be required to establish 'normal' visible emissions from the hammermills within the first 30-days of the permit

effective date. In order to demonstrate compliance, the Permittee must observe visible emissions on a monthly basis for comparison to 'normal'. If emissions are observed outside of 'normal', the Permittee shall take corrective action. Recordkeeping and reporting are required. Compliance is expected.

IV. Facility Wide Emissions

The permit application included the following facility wide potential controlled emissions:

Source Description	**CO** (tpy)	**NOx** (tpy)	**TSP** (tpy)	**PM_{10}** (tpy)	**$PM_{2.5}$** (tpy)	**SO2** (tpy)	**VOC** (tpy)	**CO_2e** (tpy)
Dryer System *(ES-DRYER)*	193.09	125.50	22.12	27.77	27.77	19.20	189.78	60.82
Emergency Generator *(ES-EG)*	0.50	0.58	0.03	0.03	0.03	0.0003	0.0006	93.04
Fire Water Pump *(ES-FWP)*	0.43	0.49	0.02	0.02	0.02	0.0003	0.0005	79.75
Hammermills/Nuisance Dust System *(ES-HM-1 to ES-HM-8 and ES-NDS)*	-	-	20..27	20.27	20.27	-	20.45	-
Pellet Mill Feed Silo *(ES-PMFS)*	-	-	0.38	0.38	0.38	-	-	-
Pellet Mill Fines Bin *(ES-PFB-1)*	-	-	0.54	0.54	0.54	-	-	-
Pellet Coolers *(ES-CLR1 to ES-CLR6)*	-	-	38.52	35.05	21.19	-	17.96	-
Log Debarking/Chipping & Rechipping *(ES-RCHP-1 and ES-RCHP-2)*	-	-	-	-	-	-	2.17	-
Finished Product Handling *(ES-FPH)*	-	-	5.33	4.85	2.93	-	-	-
Load-out Bins *(ES-PB1 to ES-PB12)*	-	-				-	-	-
Green Wood Handling			0.016	0.007	0.0011		2.93	
Green Wood Piles			2.65	1.33	0.20			
Green Wood Handling			0.07	0.03	0.00			
Diesel Storage Tanks (*TK1 and TK2)*	-	-	-	-	-	-	3.79E-03	-
Facility Wide Total	***194.0***	***126.57***	***89.95***	***84.63***	***67.69***	***19.20***	***233.30***	***233.6***

Enviva is a minor source with respect to PSD and has previously accepted CO and VOC limits from their dryer system (**ID No. ES-DRYER**) to avoid PSD review. There is an increase of VOC emissions of around 7 tpy from the hammermills indicated by adding the eighth hammermill. The increase is not significant.

V. Other Regulatory Considerations

- An application fee of $904.00 is required and was received April 22, 2014.
- The appropriate number of application copies was submitted.
- A Professional Engineer's Seal was provided by Dale M. Overcash.

- A zoning consistency determination was submitted and received from the Zoning Office indicating the application is consistent with applicable zoning and subdivision ordinances.
- The facility does not store any materials above the 112r applicability threshold.
- The application was signed by Mr. Michael Doniger, Director Plant Operations, on April 16, 2014.
- Modeling was submitted as part of the First Time Title V application that was received with the modification and is being processed separately. This modification does not pose an unacceptable risk for any emitted toxic pollutants based on the modeling results.

VI. Recommendations

This application has been reviewed to determine compliance with all procedures and requirements for the proposed hammermill and cyclone addition. DAQ has determined that the facility appears to be complying or is expected to achieve compliance as specified in the permit with all applicable requirements.

On May 6, 2014, Mr. Charles McEachern, RRO, responded by email that they were no comments on the application. **Recommend issuance of Permit No. 10203R03**

Comprehensive Application Report for 6600167.14A

05/16/2014

Enviva Pellets Northampton, LLC - Garysburg (6600167)

Northampton County

General Information:	Permit/Latest Revision: 10203/ R03
Permit code:	State
Application type:	Modification
Engineer/Rev. location:	Jenny Sheppard/RCO
Regional Contact:	Charles McEachern
Facility location:	Raleigh Regional Office
Facility classification:	Title V
Clock is ON	Application is COMPLETE
Status is :	Issued

Application Dates

Received	Completeness Due	Clock Start	Calculated Issue Due
04/22/2014	06/06/2014	04/22/2014	07/21/2014

Fee Information

Initial amount:	Date received:	Amount Due:	Add. Amt Rcv'd:	Date Rcv'd:
$904.00	04/22/2014	0.00		

Fund type:	Deposit Slip #:	Location rec'd:	Location deposited:
2333			

Contact Information

Type	Name	Address	City State ZIP	Telephone
Authorized	Michael Doniger, Director Plant Operations	7200 Wisconsin Avenue	Bethesda, MD 20814	(804) 929-8418
Technical/Permit	Joe Harrell, EHS Manager	142 NC Route 561 East	Ahoskie, NC 27910	(252) 209-6032

Acceptance Criteria

Received?	Acceptance Criteria Description
Yes	Application fee
Yes	Appropriate number of apps submitted
Yes	Zoning Addressed
N/A	Source recycling/reduction form
Yes	Authorized signature
Yes	PE Seal
Yes-	Application contains toxic modification(s)

Completeness Criteria

Received?	Complete Item Description

Application Events

Event	Start	Due	Complete	Comments	Staff
Regional technical review completed/mailed	04/22/2014	05/22/2014	05/05/2014		cmmceachern
TV - Acknowledgment/Complete	04/22/2014	05/02/2014	04/23/2014		kmhash
Permit issued	05/13/2014		05/13/2014		kmhash
Draft to coordinator/supervisor for review	05/13/2014	06/26/2014	05/13/2014		jlsheppard

Outcome Information

Class before: Title V Class after: Title V

2Q .0711: No 2D .1100: No

NSPS: No NESHAPS/MACT: No PSD/NSR: No

PSD/NSR Avoid: No Prohibitory Small: No

PSD/NSR Status After: Minor General permit: No

Multi-site permit: No Multi. permits at facility: No

Quarry permit: No HAP Major (10/25 tpy): Major

2Q .0705 Last MACT/Toxics: NO NESHAPS/GACT: NO

New Source RACT/LAER: NO Existing Source RACT: NO

RACT/LAER Added Fee: NO RACT Avoidance: NO

2Q .0702 (a)(18) - Toxics/Combustion Source(s) After 07/10/10: NO

Permit/Revision: 10203/R03

Revision Issue Date: 05/13/2014

Accumulated process days (includes public notice periods): 21

Public notice/hearing/add info after 80 days:

Manager's discretion: Appealed? No

Current Permit Information:

Issue	Effective	Expiration	Revision #
05/13/2014	05/13/2014	02/28/2017	R03

Regulations Pertaining to this Permit

Reference Rule		Regulation Description
2Q	.0317	Avoidance Conditions
Part 60 - NSPS	Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
2D	.0515	Particulates Miscellaneous Industrial Processes
2D	.0516	Sulfur Dioxide Emissions Combustion Sources
2D	.0521	Control of Visible Emissions
2D	.0524	New Source Performance Standards
2D	.1100	Control of Toxic Air Pollutants
2D	.1111	Maximum Achievable Control Technology
Part 63 - NESHAP/MACT	Subpart ZZZZ	Reciprocating Internal Combustion Engines
Avoidance	2D .0530	Prevention of Significant Deterioration

Audit Information Pertaining to this Application

Column Name	Date Changed	Old Value	New Value	Editor
engineer	05/05/2014	763 (Kevin Godwin)	874 (Jenny Sheppard)	Jenny Sheppard

CENTRAL OFFICE PERMIT TRACKING SLIP

Facility Name: Enviva Pellets Northampton, LLC **Facility/Application ID:** 6600167.14A

County/Regional Office: Northampton/RRO **Engineer:** ~~Kevin Godwin~~ J. SHEPPARD

Send Regional Office Copy of Application: ◉ Yes ○ No

PART I - ACCEPTANCE CHECKLIST

Acknowledgement Letter: ○ Already Sent ◉ Please Send

Initial Event(s): ☑ TV-Ack./Complete ☐ State Ack. Letter due

☐ TV-Ack./Incomplete add info ☐ State App. not accepted – add info request

file

Fee Information:

Amount Due:
- ☐ PSD or NSR/NAA $14,072
- ☐ PSD and NSR/NAA $27,369
- ☐ TV Greenfield $ 9,295
- ☑ TV $ 904
- ☐ Ownership Change $60, $50, $25
- ☐ Renewal/Name Change – NA

Initial Amount Received: $904.00

Additional Amount Due: $0.00

Acceptance Check List:

	Yes	No	N/A
Appropriate Number of Apps Submitted *# Received_____, #Needed_____*	☑	☐	☐
Application Fee Submitted	☑	☐	☐
Zoning Addressed	☑	☐	☐
Authorized Signature	☑	☐	☐
PE Seal	☑	☐	☐
Request for Confidentiality	☐	☑	
Application Contains Toxics Modification(s)	☑	☐	☐

PART II - IBEAM UPDATES

Application Type:

- ☐ Additional Permit
- ☐ Administrative Amendment
- ☐ Appeal
- ☐ Greenfield Facility
- ☐ Last GACT/Toxics
- ☐ Last MACT/Toxics
- ☑ Modification
- ☐ Name Change
- ☐ New Permit
- ☐ Ownership Change
- ☐ Renewal
- ☐ Renewal w/Modification

Permit Application Schedule:

- ☐ Appeal
- ☐ Expedited State
- ☐ PSD
- ☐ Director Administrative Amendment
- ☑ State
- ☐ TV – State Only
- ☐ TV – Expedited
- ☐ TV – Greenfield
- ☐ TV – Reopen for Cause
- ☐ TV – Administrative
- ☐ TV – Ownership Change
- ☐ TV – 502(b)(10)
- ☐ TV – Minor
- ☐ TV – Renewal
- ☐ TV – Significant (2Q .0501(c)(2))
- ☐ TV – Significant
- ☐ TV – 1st Time

PART III - COMPLETENESS CHECKLIST

- ☐ Required Application Forms Submitted and Completed
- ☐ Supporting Materials & Calculations Received
- ☐ PE Seal (If 15A NCAC 2Q .0112)
- ☐ Modeling Protocol Acceptance
- ☐ Confirmation of Pollutants Modeled
- ☐ E5 Form (Significant Modifications)

PART IV - GENERAL COMMENTS

PART V - SUPERVISOR REVIEW CHECKLIST

TVEE Updated (by Engineer):_____ TVEE Verified: ~~JS~~ 5/13/2014 Supervisor: WDW 5/13/2014 Chief: MJC 5/13/14

PART VI - CLOSEOUT INFORMATION

Regulations Applicable to This Application (indicate all new regulations):

- ☐ NESHAPS/MACT
- ☐ NESHAPS/GACT
- ☐ NSPS
- ☐ 2D .1100
- ☐ 2Q .0711
- ☐ 2Q .0705 Last MACT/Toxics
- ☐ PSD/NSR
- ☐ PSD/NSR Avoidance
- ☐ Existing Source RACT/LAER
- ☐ New Source RACT/LAER
- ☐ RACT Avoidance
- ☐ RACT/LAER Added Fee*
  **(Notify Connie Horne)*
- ☐ Toxics/Combustion Sources After 7/10/10
- ☐ SIP Regulations (list all new):

NA

Permit Class Information

Before	*After*
☐ Small	☒ ~~Title V~~
☐ Syn. Minor	
☒ ~~Title V~~	
☐ Proh. Small	
☐ General	

HAP Major Status (after) ☒ ~~Major~~ ☐ Minor ☐ Not Determined

PSD or NSR Status (after) ☐ Major ☒ ~~Minor~~

Miscellaneous ☐ ~~Multiple Permits at Facility~~ ☐ ~~Multi-Site Permit~~ ☐ ~~Recycled Oil Condition~~

Permit Dates Issue: May 13, 2014 Effective: May 13, 2014 Expiration: Feb 28, 2017

IBEAM Closed Out By:_____ Permit Number: 10203 Revision Number: R03

☐ ~~Public Notice Published~~ ☐ ~~Public Notice Affidavit (if not noticed via DAQ Website)~~

Document Manager Updated by Engineer:_____ Date:_____

Tracking Slip v41 – cjh 6/17/13

Mailed 5-16-14 Loretta Kuchnia

Comprehensive Application Report for 6600167.14A

Enviva Pellets Northampton, LLC - Garysburg (6600167)

Northampton County

05/13/2014

General Information: Permit/Latest Revision: 10203/ R02

Permit code:	State
Application type:	Modification
Engineer/Rev. location:	Jenny Sheppard/RCO
Regional Contact:	Charles McEachern
Facility location:	Raleigh Regional Office
Facility classification:	Title V
Clock is ON	Application is COMPLETE
Status is :	In progress

Application Dates

Received	Completeness Due	Clock Start	Calculated Issue Due
04/22/2014	06/06/2014	04/22/2014	07/21/2014

Fee Information

Initial amount:	Date received:	Amount Due:	Add. Amt Rcv'd:	Date Rcv'd:
$904.00	04/22/2014	0.00		

Fund type:	Deposit Slip #:	Location rec'd:	Location deposited:
2333			

Contact Information

Type	Name	Address	City State ZIP	Telephone
Authorized	Michael Doniger, Director Plant Operations	7200 Wisconsin Avenue	Bethesda, MD 20814	(804) 929-8418
Technical/Permit	Joe Harrell, EHS Manager	142 NC Route 561 East	Ahoskie, NC 27910	(252) 209-6032

Acceptance Criteria

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Yes	Zoning Addressed
N/A	Source recycling/reduction form
Yes	Authorized signature
Yes	PE Seal
Yes	Application contains toxic modification(s)

Completeness Criteria

Received?	Complete Item Description

Comprehensive Application Report for 6600167.14A
Enviva Pellets Northampton, LLC - Garysburg (6600167)

Northampton County

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Comprehensive Application Report for 6600167.14A

Enviva Pellets Northampton, LLC - Garysburg (6600167)

Northampton County

05/13/2014

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Comprehensive Application Report for 6600167.14A
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Northampton County

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Comprehensive Application Report for 6600167.14A

Enviva Pellets Northampton, LLC - Garysburg (6600167)

Northampton County

04/23/2014

General Information: Permit/Latest Revision: 10203/ R02

Permit code:	State
Application type:	Modification
Engineer/Rev. location:	Kevin Godwin/RCO
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Type	Name	Address	City State ZIP	Telephone
Authorized	Michael Doniger, Director Plant Operations	7200 Wisconsin Avenue	Bethesda, MD 20814	(804) 929-8418
Technical/Permit	Joe Harrell, EHS Manager	142 NC Route 561 East	Ahoskie, NC 27910	(252) 209-6032

Acceptance Criteria

Received?	Acceptance Criteria Description
Yes	Application fee
Yes	Appropriate number of apps submitted
Yes	Zoning Addressed
N/A	Source recycling/reduction form
Yes	Authorized signature
Yes	PE Seal
Yes	Application contains toxic modification(s)

Completeness Criteria

Received?	Complete Item Description

Application Events

Event	Start	Due	Complete	Comments	Staff
TV - Acknowledgment/Complete	04/22/2014	05/02/2014	04/23/2014		kmhash

Regulations Pertaining to this Permit

Reference Rule		Regulation Description
2Q	.0317	Avoidance Conditions
Part 60 - NSPS	Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
2D	.0515	Particulates Miscellaneous Industrial Processes
2D	.0516	Sulfur Dioxide Emissions Combustion Sources
2D	.0521	Control of Visible Emissions
2D	.0524	New Source Performance Standards
2D	.1100	Control of Toxic Air Pollutants
2D	.1111	Maximum Achievable Control Technology
Part 63 - NESHAP/MACT	Subpart ZZZZ	Reciprocating Internal Combustion Engines
Avoidance	2D .0530	Prevention of Significant Deterioration

Audit Information Pertaining to this Application

Column Name	Date Changed	Old Value	New Value	Editor

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

April 23, 2014

Mr. Michael Doniger
Director Plant Operations
Enviva Pellets Northampton, LLC
7200 Wisconsin Avenue
Suite 1000
Bethesda, MD 20814

SUBJECT: Receipt of Permit Application
Modification of Permit No. 10203R02
Application No. 6600167.14A
Enviva Pellets Northampton, LLC
Facility ID: 6600167, Garysburg, Northampton County

Dear Mr. Doniger:

Your air permit application (6600167.14A) for Enviva Pellets Northampton, LLC, located in Northampton County, North Carolina was received by this Division on April 22, 2014.

This application submittal **did** contain all the required elements as indicated and has been accepted for processing. Your application will be considered complete as of April 22, 2014, unless informed otherwise by this office within 60 days.

Should you have any questions concerning this matter, please contact Kevin Godwin at 919-707-8480.

Sincerely,

Mark J. Cuilla, CPM, Acting Chief, Permits Section
Division of Air Quality, NCDENR

cc: Raleigh Regional Office Files

1641 Mail Service Center, Raleigh, North Carolina 27699-1641
Phone: 919-707-8400 \ Internet: www.ncdenr.gov

Sheppard, Jenny

From: Godwin, Kevin
Sent: Tuesday, May 06, 2014 5:56 AM
To: Sheppard, Jenny
Subject: FW: P&O for Enviva Pellets, Application Nos. 6600167.14A and B

From: Mceachern, Charles
Sent: Monday, May 05, 2014 4:26 PM
To: Godwin, Kevin
Subject: P&O for Enviva Pellets, Application Nos. 6600167.14A and B

Hi Kevin, I have reviewed the application submitted by Enviva Pellets (6600167.14A and B) to install a new hammermill and to apply for the initial Title V permit, and have looked over the RRO files and most recent inspection report. The RRO has no additional comment at this time.

Thank you.

Charles M. McEachern, III, P.E.
Environmental Engineer/Permits Coordinator
NC DENR, Division of Air Quality
Raleigh Regional Office
3800 Barrett Drive, Raleigh, NC 27609
E-mail: charles.mceachern@ncdenr.gov
Phone: (919)791-4276
FAX: (919)881-2261
DAQ Web Site: www.ncair.org

DIVISION OF AIR QUALITY
May 8, 2014

MEMORANDUM

TO: Kevin Godwin, Environmental Engineer, RCO
Jenny Sheppard, Environmental Engineer, RCO
Permit Coordinator, RRO

FROM: Tom Anderson, Meteorologist II, AQAB

THROUGH: Mark Cuilla, Supervisor, Air Quality Analysis Branch (AQAB)

SUBJECT: Review of Revised Toxics Modeling Analysis – Enviva Pellets Northampton, LLC
Facility ID: 6600167
Garysburg, NC Northampton County

I have reviewed the dispersion modeling analysis, received April 22, 2014, for the Enviva Pellets facility located in Northampton County, NC. The company is requesting a construction permit to install an eighth dry hammermill in addition to submitting their initial Title V application. These actions trigger modeling requirements to evaluate those toxics whose rates are expected to exceed the levels outlined in 15A NCAC 2Q .0700. The modeling adequately demonstrates compliance, on a source-by-source basis, for all toxics modeled.

Ten toxics were evaluated facility wide in the modeling. Emission rates and stack parameters used in the modeling are provided in the attached tables.

AERMOD using the latest available years (2008-2012) of meteorological data from Rocky Mount/Wilson (surface) and Newport (upper air) was used to evaluate impacts in both simple and elevated terrain. Direction-specific building dimensions, determined using EPA's BPIP program (95086), were used as input to the model for building wake effect determination. Receptors were placed around the facility's property line at 25-meter intervals and extended outward to a distance of approximately 2 kilometers at 100 meter spacing. The following table shows the maximum impact for each toxic:

...table on following page...

TABLE 4-2. MODELED SOURCE PARAMETERS

Model ID	Stack Height (m)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
EP1	28.66	352.59	7.58	3.05
EP2	14.78	310.93	0.01	1.62
EP3	14.78	310.93	0.01	1.62
EP4	14.78	310.93	0.01	1.62
EP7	12.19	333.15	17.70	0.76
EP8	12.19	333.15	17.70	0.76
EP9	12.19	333.15	17.70	0.76
EP10	12.19	333.15	17.70	0.76
EP11	12.19	333.15	17.70	0.76
EP12	12.19	333.15	17.70	0.76
EP14	1.77	766.48	78.30	0.10
EP15	3.05	803.15	0.01	0.13

TABLE 4-3. MODELED EMISSION RATES

Model ID	Modeled Emission Rates (g/s)									
	ARSENIC	BAP	CADMIUM	CL	FCRM	HXCLPDXN	HCL	MERCURY	NICKEL	VNYLCHLR
EP1	3.52E-05	5.74E-05	6.57E-06	1.75E-02	1.85E-01	3.53E-05	4.20E-02	7.73E-05	7.29E-04	3.98E-04
EP2	-	-	-	-	3.09E-02	-	-	-	-	-
EP3	-	-	-	-	3.09E-02	-	-	-	-	-
EP4	-	-	-	-	2.06E-02	-	-	-	-	-
EP7	-	-	-	-	1.99E-03	-	-	-	-	-
EP8	-	-	-	-	1.99E-03	-	-	-	-	-
EP9	-	-	-	-	1.99E-03	-	-	-	-	-
EP10	-	-	-	-	1.99E-03	-	-	-	-	-
EP11	-	-	-	-	1.99E-03	-	-	-	-	-
EP12	-	-	-	-	1.99E-03	-	-	-	-	-
EP14	-	5.80E-08	-	-	3.64E-04	-	-	-	-	-
EP15	-	4.97E-08	-	-	3.12E-04	-	-	-	-	-

Zoning Consistency Determination

Facility Name	Enviva Pellets Northampton, LLC
Facility Street Address	874 Lebanon Church Road
Facility City	Gaston
Description of Process	Wood pellet manufacturing facility
SIC Code/NAICS	SIC – 2499 ; NAICS - 321999
Facility Contact	Joe Harrell
Phone Number	(252) 209-6032
Mailing Address	142 N.C. Route 561 East
Mailing City, State Zip	Ahoskie, NC 27910

Based on the information given above:

☑ I have received a copy of the air permit application (draft or final) AND...

☐ There are no applicable zoning and subdivision ordinances for this facility at this time

☑ The proposed operation IS consistent with applicable zoning and subdivision ordinances

☐ The proposed operation IS NOT consistent with applicable zoning and subdivision ordinances
(please include a copy of the rules in the package sent to the air quality office)

☐ The determination is pending further information and can not be made at this time

☐ Other: _____

Agency	NORTHAMPTON PLANNING & ZONING DEPT
Name of Designated Official	WILLIAM E. FLYNN, JR.
Title of Designated Official	PLANNING & ZONING DIRECTOR
Signature	William E. Flynn Jr
Date	4/28/14

Please forward to the mailing address listed above and the air quality office
at the appropriate address as checked on the back of this form.

Courtesy of the Small Business Assistance Program
toll free at 1-877-623-6748 or on the web at www.envhelp.org/sb

All PSD and Title V Applications

X Attn: Dr. Donald van der Vaart, PE
DAQ – Permitting Section
1641 Mail Service Center
Raleigh, NC 27699-1641

Local Programs

☐ Attn: David Brigman
Western NC Regional Air Quality Agency
49 Mount Carmel Road
Asheville, NC 28806
(828) 250-6777

☐ Attn: Donald R. Willard
Mecklenburg County Air Quality
700 N. Tryon Street, Suite 205
Charlotte, NC 28202-2236
(704) 336-5500

☐ Attn: Robert R. Fulp
Forsyth County
Environmental Affairs Department
537 N. Spruce Street
Winston-Salem, NC 27101-1362
(336) 703-2440

Division of Air Quality Regional Offices

☐ Attn: Paul Muller
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(910) 796-7215

☐ Attn: Margaret Love, PE
Winston-Salem Regional Office
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Winston-Salem, NC 27107
(336) 771-5000

1 Copley Parkway | Suite 310 | Morrisville, NC 27560 | P (919) 462-9693 | F (919) 462-9694
trinityconsultants.com

Trinity Consultants

April 21, 2014

Mr. Mark Cuilla
Acting Chief, Air Permits Section
North Carolina Division of Air Quality
217 West Jones Street
Raleigh, NC 27603

Re: Construction Permit Application and Initial Title V Application
Enviva Pellets Northampton, LLC
Garysburg, NC

Dear Mr. Cuilla:

On behalf of Enviva Pellets Northampton, LLC (Enviva), please find attached six copies of a combined Initial Title V and Construction application for a pellet manufacturing facility located near Garysburg, NC. We are submitting six copies of the application, with three copies to comply with the construction permit application requirements and three copies to comply with the Title V application requirements. Thus, Enviva is requesting that DAQ process the attached as two applications – a construction application for an 8th hammermill and the initial Title V application for the site. The applications are identical, but Enviva needs a construction permit to be issued as soon as possible such that it can proceed with construction of the 8th hammermill as referenced in the application. The application fee requirements and zoning requirements are addressed in the application.

The enclosed application addresses the state SIP requirements and the state only air toxic requirements and air dispersion modeling has been conducted to meet the air toxic regulations. The attached application provides information that the facility is minor for PSD and is minor for HAPs under CAA Section 112(g). This application was developed in accordance with the current DAQ pre-construction regulations and other DAQ pre-construction application guidance.

If you have any questions regarding this application, please feel free to contact me at (919) 462-9693.

Sincerely,

Dale Overcash, P.E.
Principal Consultant

Cc: Mr. Michael Doniger, Enviva
Mr. Joe Harrell, Enviva
Mr. Alan McConnell, Kilpatrick Townsend

ENVIVA PELLETS NORTHAMPTON, LLC
NORTHAMPTON COUNTY, NORTH CAROLINA

INITIAL TITLE V PERMIT APPLICATION AND CONSTRUCTION PERMIT APPLICATION

Prepared By:

TRINITY CONSULTANTS

One Copley Parkway, Suite 310
Morrisville, North Carolina 27560
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Fax: 919.462.9694
trinityconsultants.com

April 2014

Project 143401.0049

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

1. INTRODUCTION

Enviva manufactures wood pellets for use as a renewable fuel for energy generation and industrial customers. Enviva's customers use wood pellets in place of coal, significantly reducing emissions of pollutants such as carbon dioxide, mercury, arsenic and lead. The company is dedicated to improving the environmental profile of energy generation while promoting sustainable forestry in the southeastern United States. Enviva holds certifications from the Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI) and the Programme for the Endorsement of Forest Certifications (PEFC). Enviva requires that all suppliers adhere to state-developed "Best Management Practices" (BMPs) in their activities to protect water quality and sensitive ecosystems. In addition, Enviva is implementing an industry leading "track and trace" system to further ensure that all fiber resources come from responsible harvests. We pay particular attention to: land use change, use and effectiveness of BMPs, wetlands, biodiversity and certification status. All of this combined ensures that Enviva's forestry activities contribute to healthy forests both today and in the future.

This application has been developed for two reasons, to request a construction permit for an eighth dry hammermill and to submit the initial Title V application. Thus, included in this application are three copies of the application for the construction permit component and three copies for the Title V application component. Enviva requests a construction permit be issued for the eight hammermill as soon as possible. In accordance with the "two-step" Title V application option under 15A NCAC 2Q .0504, Enviva Pellets Northampton, LLC (Enviva) is submitting a Title V application within one year of commencement of operation of the facility. Operation of the facility commenced on April 22, 2013.

1.1. REGULATORY APPLICABILITY

This application contains regulatory applicability information for SIP, NSPS, NESHAP, and state only regulations. The forms have been developed with the general facility forms followed by source specific forms.

Both the current operating permit and the tabular summary provided after Form E3 identify all Title V applicable requirements. Please note that the 40 CFR Part 64 Compliance Assurance Monitoring (CAM) Regulations apply to the particulate matter and associated pollution control system for the rotary wood dryer; however, because post-control emissions are less than the major source threshold of 100 tpy, the CAM Plan is not required until Title V permit renewal.

Air quality modeling analyses for certain toxic air pollutants (TAPs) are required in accordance with relevant North Carolina Division of Air Quality's (NC DAQ's) regulations. The facility was previously modeled for TAPs from the dryer, emergency generator and fire pump. However, some of the same TAPs are emitted from the hammermills and the pellet coolers. Therefore, the modeling for air toxics (or TAPs) has been updated as a part of this application submittal and is included in Section 4.0

1.2. UPDATED EMISSION CALCULATIONS AND REQUEST TO CONSTRUCT EIGHTH HAMMERMILL

Based on testing from other facilities, there have shown to be VOCs, HAPs, and TAPs in downstream processes such as the hammermills and pellet coolers. Therefore, Enviva has updated the potential emissions in Appendix B to account for these downstream emissions. The information in this

application also reflects an increase of the annual production from 475,000 to 537,625 oven dried tons per year.

In addition to updating the calculations, Enviva is also requesting the addition of an eighth hammermill. Enviva request the addition of the eight hammermill be completed as a construction application and issued before the Title V permit.

1.3. APPLICATION ORGANIZATION

Six copies of the application are being submitted to DAQ, three for the construction permit and three for the initial Title V application. Since a permit fee was submitted with the initial application, a fee is not required for the initial Title V application. However, since Enviva is also including in this application a request to construct an eight hammermill, Enviva has included the appropriate $904 fee for construction application.

This application contains the following information:

- Section 1 provides an introduction,
- Section 2 provides a project description and discusses air emissions,
- Section 3 discusses regulatory applicability,
- Section 4 summarizes the air dispersion modeling analysis,
- Appendix A contains air permit application forms,
- Appendix B presents air emissions calculations,
- Appendix C contains TAP modeling support,
- Appendix D contains the electronic modeling files, and
- Appendix E contains the zoning consistency determination.

2. PROCESS DESCRIPTION AND AIR EMISSIONS

The Northampton wood pellets plant is designed to produce up to 537,625 oven-dried tons (ODT) per year of wood pellets typically consisting of pressed hardwoods, but could contain up to 10% softwoods on a 12-month rolling total basis. This section discusses the Northampton Plant's pelletizing process and associated air emissions for the existing plant, which consists of the following:

- Green wood handling and sizing operations;
- Green wood fuel storage bin;
- Log debarker;
- Log bark hog;
- Log chipper;
- Two (2) rechippers also referred to as green wood hammermills;
- Eight (8) dry wood hammermills controlled by eight cyclones and three fabric filtration systems;
- Hammermill area emissions controlled by a hammermill fabric filter;
- A pellet mill feed silo controlled by bin vent filter;
- Twelve (12) wood pellet presses and six (6) pellet coolers controlled via cyclones;
- One 175.3 MMBtu/hr green wood direct-fired dryer system with pollution control equipment consisting of a three simple cyclones and wet electrostatic precipitator (WESP) for particulate matter abatement,
- Finished product storage and loading controlled by a fabric filter;
- Pellet fines bin controlled via a bin vent filter;
- Dried wood handling operations;
- Two (2) diesel storage tanks;
- Emergency electric generator; and
- Fire water pump.

Detailed air emissions calculations are presented for each source discussed in this section in Appendix B. A process flow diagram is presented in Figure 2-1.

Figure 2-1. Process Flow Diagram

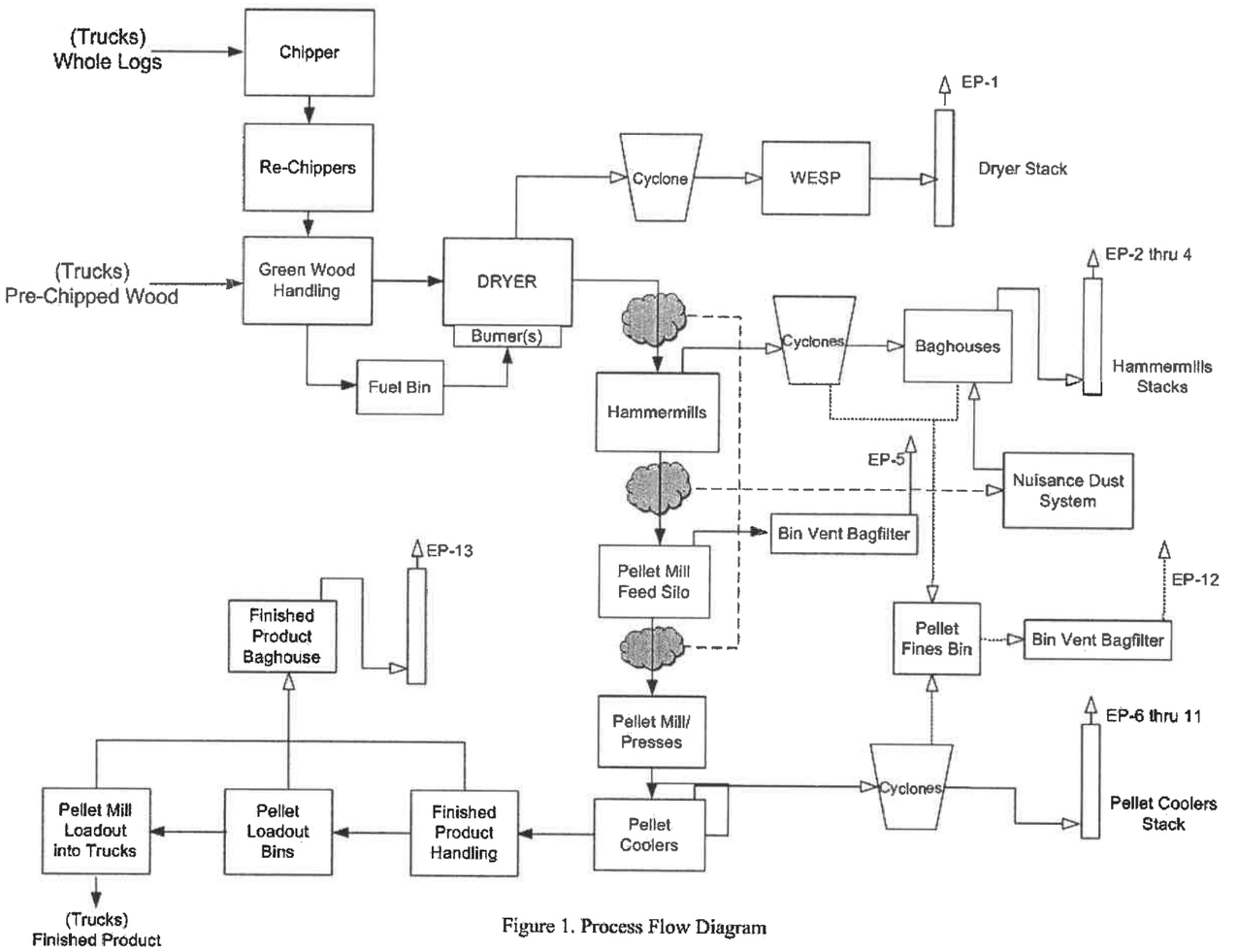

Figure 1. Process Flow Diagram

2.1. GREEN WOOD HANDLING AND SIZING, FUEL STORAGE BIN, AND STORAGE PILES

"Green" (i.e., wet) wood will be delivered to the facility via trucks as either pre-chipped wood or unchipped low grade wood fiber, tops, limbs, and logs from commercial thinning for on-site chipping. Pre-chipped wood will be screened and oversized chips will undergo additional chipping. Unchipped wood will be debarked and chipped to specification for drying in the on-site electric-powered debarker (IES-DEBARK-1), chipper (ES-CHIP-1), and two green wood hammermills/ rechippers (ES-RCHP-1, ES-RCHP-2) as required. Chipped wood for drying is conveyed to a chipped wood storage pile while bark is conveyed to a bark fuel storage pile (IES-GWFB).

Green wood and bark contains a high moisture content approaching 50 percent by weight. Therefore, green wood handling and sizing, fuel storage bin, and storage piles have negligible emissions and are included on the insignificant activities list. Representative drop point emission calculations using AP-42 Section 13.2.3 for Aggregate Handling are attached in Appendix B for green wood handling and sizing to demonstrate that these emissions are negligible.

Fugitive particulate emissions from chipped wood storage piles are quantified in Appendix B. Emission factors are developed based on surface area of the piles in accordance with U.S. EPA guidance for active storage pile fugitive emissions.[1] These factors provide estimates of PM emissions due to wind erosion at the surface of each storage pile based on the annual frequency of high wind speeds (> 12 mph).

In addition to particulate matter emissions, volatile organic compounds are also emitted from the storage pile. Emission factors are obtained from a National Council for Air and Stream Improvement (NCASI) document provided by SC DHEC for the calculation of fugitive VOC emissions from woody biomass storage piles. Emission factors ranged from 1.6 to 3.6 lb VOC as carbon/acre-day. Enviva chose to employ the maximum emission factor to be conservative. Emission factors are provided in pounds of carbon per surface area of the pile. Detailed calculations are included in Appendix B.

2.2. DEBARKING, CHIPPING, GREEN WOOD HAMMERMILLING, AND BARK HOG

Bark is removed from unchipped wood prior to chipping in rotary drum debarkers. There are no current AP-42 emission factors or other emission factors available for debarkers, and visual observation of these units in operation at other Enviva plants indicate that emissions are negligible due to the high moisture content of bark and the wind break provided by the drums.

Emission estimates for the chipper and bark hog are based on limited emission factors available for wood chipping. As shown in the attached emissions calculations (Appendix B), VOC emissions from these sources are calculated using emission factors from AP-42 Section 10.6.3 emission factors for hardwood chipping emissions. Methanol emissions are also calculated using factors from AP-42 Sections 10.6.3 and 10.6.4. Particulate matter (PM) emissions will be negligible from the green wood chipper (ES-CHIP-1) because the exhaust is directed downward towards the ground.

---

[1] U.S. EPA *Control of Open Fugitive Dust Sources*, Research Triangle Park, North Carolina, EPA-450/3-88-008. September 1988.

VOC emission estimates for the rechippers (ES-RCHP-1 and 2) are based on AP-42 Section 10.6.2 emission factors. Particulate emissions are assumed to be small due to the inherently high moisture content of the wood. Any PM emissions would be fugitive and are routed downward to the ground.

2.3. WOOD DRYER (ES-DRYER)

Green wood is conveyed to a single rotary dryer system. Direct contact heat is provided to the system via a 175.3 MMBtu/hr total heat input burner system using bark and wood chips as fuel. Air emissions are controlled by three identical simple cyclones to capture bulk particulate matter. Emissions from each of the cyclones are combined into a common duct and are routed to the wet electrostatic precipitator (WESP) for additional particulate, metallic HAP, and hydrogen chloride removal.

Criteria pollutant emissions are calculated using a combination of AP-42 emission factors, Enviva Northampton October 2013 stack testing results, and specifications from the dryer system vendor. The reader should refer to detailed footnotes in Appendix B for details of the origin of each emission factor.

HAP and TAP emissions are calculated from combustion of wood in the dryer using AP-42 Section 1.6 and control of metallic HAP emissions via the WESP. In addition to HAP and TAP emissions from combustion of wood in the dryer, HAPs and TAPs are also released during the drying of wood. Emission factors for green, direct wood-fired softwood are obtained from AP-42 Section 10.6.2. To account for hardwood HAP and TAP emissions, factors are conservatively calculated by taking the AP-42 HAP factors for 100% hardwood, and multiplying by the ratio of the total listed VOC emission factors for hardwood and softwood (0.24 / 4.7).

2.4. DRIED AND SIZED WOOD HANDLING (IES-DWH)

Dried materials are transferred from the dryer via conveyors to screening operations that remove smaller size wood particles prior to transfer into hammermills for further size reduction prior to pelletization. Smaller particles passing through the screens are diverted to the hammermill discharge conveyor, while oversized wood is diverted to the hammermills. Dust generated from transfer operations around the screening operation is diverted to the hammermill area filtration system, which is described in the following subsection. There are several other transfer points comprising an insignificant emission source designated as "IES-DWH", dried and sized wood handling. IES-DWH is located between the dryer and hammermills, and are completely enclosed with no emissions.

2.5. HAMMERMILLS (ES-HM-1 THROUGH 8)

Prior to pellitization, dried materials are reduced to the appropriate size needed for pelletization using eight hammermills operating in parallel. A conveyor system receives the ground wood from the hammermills and sends it to the pellet mill feed silo.

Particulate emissions from each of the eight hammermills are controlled using cyclones, which are subsequently controlled by fabric filters. The first three cyclones are directed to hammermill filter HM-BF1. The second three cyclones are directed to hammermill filter HM-BF2. The last two cyclones are directed to hammermill filter HM-BF-3. Appendix B summarizes the emissions from each hammermill bagfilter system. Particulate matter emissions from each bagfilter are calculated using a manufacturer guaranteed grain loading factor for the wood particulates and the maximum nominal stack flow rate.

VOC, HAP, and TAP emissions are calculated using Enviva Northampton September 2013 stack testing results as shown in Appendix B.

2.6. HAMMERMILL AREA EMISSIONS/ NUISANCE DUST SYSTEM (ES-NDS)

An induced draft fan is used to transfer dust generated from a number of enclosed transfer/handling sources around the hammermill to one of the three hammermill bagfilters (CD-HM-BF3). The sources controlled by this bagfilter include, but are not limited to, the following:

- Emissions from the seventh and eight hammermill;
- Hammermills infeed and distribution transfer;
- Pellet cooler transfer (particulate emissions from pellet cooler cyclones large enough to drop out of entrainment) & pellet screening;
- Hammermill pre-screen feeder emissions; and
- Pellet screen fines cyclone.

Emissions from this bagfilter are calculated assuming a manufacturer guaranteed grain loading factor for the wood particulates and the maximum nominal stack flow rate.

2.7. PELLET MILL FEED SILO (ES-PMFS) AND PELLET MILL FINES BIN (ES-PFB)

Sized wood from the hammermills is transported on a set of conveyors to the pellet mill feed silo prior to pelletization. Particulate emissions from the pellet mill feed silo bin vent filter are calculated assuming a manufacturer guaranteed grain loading factor and the maximum nominal stack flow rate.

Fine pellet material from the hammermill pollution control system and screening operation is collected in the pellet fines bin which is controlled by a bin vent baghouse. Particulate emissions from the baghouse are calculated assuming a manufacturer guaranteed grain loading factor and the maximum nominal stack flow rate.

2.8. PELLET PRESS SYSTEM PELLET COOLERS (ES-CLR-1 THROUGH 6)

Dried ground wood is mechanically compacted in the presence of water in twelve presses in the Pellet Press System. Exhaust from the Pellet Press and Pellet Coolers are vented through the cooler aspiration cyclones and then to the atmosphere, as shown in Appendix B. No chemical binding agents are required for pelletization.

Formed pellets are discharged into one of six pellet coolers. Cooling air is passed through the pellets. At this point, the pellets contain a small amount of wood fines, which are swept out with the cooling air and are controlled utilizing six cyclones operating in parallel prior to discharge to the atmosphere.

Particulate matter emissions from each cyclone are calculated assuming a maximum grain loading factor for the wood particulates and the maximum nominal stack flow rate. VOC, HAP, and TAP emissions are calculated like the hammermills using Enviva Northampton September 2013 stack test data. Please see Appendix B for a detailed discussion.

2.9. FINISHED PRODUCT HANDLING AND LOADOUT

Final product is conveyed to pellet truck loadout bins that feed two pellet truck loadout operations (ES-PL-1, -2). Emissions from the Pellet Loadout Bins are controlled by a bagfilter. Pellet Loadout is accomplished by gravity feed of the pellets through a covered chute to reduce emissions. Emissions to the atmosphere from conveyance from the Pellet Loadout Bins are minimal because dried wood fines have been removed in the pellet screener, and a slight negative pressure is maintained in the loadout building as a fire prevention measure to prevent any buildup of dust on surfaces within the building. Slight negative pressure is produced via an induced draft fan that exhausts to the same bagfilter (CD-FPH) that controls minor dust emissions from loading of the Pellet Loadout Bins.

Particulate emissions from finished product handling and loadout are calculated assuming a manufacturer guaranteed grain loading factor and the maximum nominal stack flow rate for the bagfilter.

2.10. EMERGENCY GENERATOR, FIRE WATER PUMP, AND FUEL OIL STORAGE TANKS

The plant will utilize a 250 brake horsepower emergency generator for emergency operations and a 250 brake horsepower fire water pump engine. All engines will combust diesel fuel. Aside from maintenance and readiness testing, the generator and fire water pump engines will only be utilized for emergency operations. Diesel for the emergency generator will be stored in a storage tank of up to 2,500 gallons capacity and diesel for the fire water pump will be stored in a storage tank of up to 1,000 gallons capacity. Emissions from all fuel oil storage tanks are insignificant and these units are categorically exempt from construction permitting requirements.

3. REGULATORY APPLICABILITY ANALYSIS

This section summarizes the applicability and requirements of key federal and state regulations.

3.1. FEDERAL REGULATIONS

3.1.1. Prevention of Significant Deterioration (PSD), 40 CFR Part 51.166

North Carolina implements the federal PSD requirements of 40 CFR 51.166 under North Carolina Regulation 15A NCAC 2D .0530. Under the PSD regulations, a major stationary source for PSD is defined as any source in one of the 28 named source categories with the potential to emit 100 tpy or more of any regulated pollutant, or any source not in one of the 28 named source categories with the potential to emit 250 tpy or more of any regulated pollutant other that GHGs.[2] Neither wood pellet production nor operation of associated combustion sources qualifies the facility for classification in one of the 28 listed source categories.

Federal PSD requirements for GHGs have been implemented in North Carolina under 15A NCAC 2D .0544, which essentially adopts the U.S. EPA's "GHG Tailoring Rule." The GHG Tailoring Rule establishes emission rates triggering PSD review for GHGs with the major source threshold being 100,000 tpy of CO_2 equivalent (CO_2e) and a significant emission rate of 75,000 tpy CO_2e. As shown in Appendix B, Table B-1 the proposed project does not trigger PSD review for CO_{2e}, since the biomass deferral rule is still in effect in North Carolina.

As shown in Appendix B, Table B-1 the Northampton facility is minor for all pollutants.

3.1.2. Title V Operating Permit Program, 40 CFR Part 70

40 CFR Part 70 establishes the federal Title V operating permit program. North Carolina has incorporated the provisions of this federal program in its Title V operating permit program under 15A NCAC 2Q .0500. The major source thresholds with respect to the North Carolina Title V operating permit program regulations are 10 tons per year of a single HAP, 25 tpy of any combination of HAP, 100 tpy of certain other regulated pollutants, and 100,000 tons of GHGs per year (expressed as CO_{2e}).

The site is a major Title V source for criteria pollutants as shown in Appendix B, Table B-1. The biomass deferral rule is still in effect as of the submittal of this application. The site is an area source for HAPs (minor). The purpose of this application is to request a Title V permit, which is being submitted within one year after commencement of operation date of, April 22nd, 2013.

3.1.3. New Source Performance Standards, 40 CFR Part 60 (15A NCAC 2D .0524 New Source Performance Standards)

New Source Performance Standards (NSPS), located in 40 CFR Part 60 and implemented in North Carolina Regulation 15A NCAC 2D .0524, require certain categories of new, modified, or reconstructed sources to control emissions to specified levels. Three potentially applicable NSPS are addressed below.

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[2] 40 CFR §52.21(b)(1)(i)

Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, unless specifically excluded.

3.1.3.1. NSPS Subpart IIII

NSPS Subpart IIII applies to owners or operators of compression ignition (CI) internal combustion engines (ICE) manufactured after April 1, 2006 that are not fire pump engines, and fire pump engines manufactured after July 1, 2006. As noted in Section 2, the plant will have a 250 hp emergency generator and a 250 hp emergency fire pump. The emergency generator and fire pump are subject to the provisions of NSPS Subpart IIII.

Under NSPS Subpart IIII, owners and operators of emergency generators manufactured in CY 2007 or later with a maximum engine power greater than or equal to 50 hp are required to comply with the emission limits referenced in 40 CFR §60.4205(b). These limits are as follows: 0.20 g/kW for PM, 3.5 g/kW for CO, and 4 g/kW for NO_x + nonmethane hydrocarbons (NMHC).

Enviva complies with the emission limits by operating the emergency generator and fire water pump as instructed in the manufacturer's operating manual in accordance with 40 CFR §60.4211(a), and purchasing an engine certified to meet the referenced emission limits in accordance with 40 CFR §60.4211(c). The engine is also equipped with a non-resettable hour meter in accordance with 40 CFR §60.4209(a). Emergency and readiness testing of the unit will be limited to 100 hours per year.

In accordance with NSPS Subpart IIII, owners and operators of fire pump engines manufactured after July 1, 2006 must comply with the emission limits in Table 4 of NSPS Subpart IIII, which are organized based on the size of the unit. These limits are as follows: 0.20 g/kW for PM, 3.5 g/kW for CO, and 4 g/kW for NO_x + nonmethane hydrocarbons (NMHC).

Enviva complies with these emission limits by operating the fire pump as instructed in the manufacturer's operating manual in accordance with 40 CFR §60.4211(a), and purchasing an engine certified to meet the referenced emission limits in accordance with 40 CFR §60.4211(b). The engine is equipped with a non-resettable hour meter in accordance with 40 CFR §60.4209(a). Emergency and readiness testing of the unit will be limited to 100 hours per year.

Both the emergency generator and fire pump comply with the fuel requirements in 40 CFR §60.4175.3, which limit sulfur to a maximum of 15 ppmw and a cetane index of at least 40.

3.1.3.2. NSPS Subpart Kb

NSPS Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels*, regulates storage vessels with a capacity greater than 75 cubic meters (m^3) (19,813 gallons) that are used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984.[3]

Diesel fuel oil storage tank capacities are well below the NSPS Subpart Kb storage capacity threshold of 19,813 gallons. Thus, Subpart Kb is not application to any emission source for process heat at the Enviva Northampton facility.

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[3] 40 CFR 60.110b(a)

3.1.3.3. NSPS Subpart Db

The plant will utilizes direct fired drying of chipped wood and, therefore, does not trigger the NSPS Subpart Db (Industrial-Commercial-Institutional Steam Generating Units) regulations.

3.1.4. National Emission Standards for Hazardous Air Pollutants for Regulated Source Categories, 40 CFR Part 63 (15A NCAC 2D .1111 Maximum Achievable Control Technology)

National Emission Standards for Hazardous Air Pollutants (NESHAP) are listed in 40 CFR Part 63 and implemented via North Carolina regulation 15A NCAC 2D .1111. One potentially applicable NESHAP is addressed below.

3.1.4.1. 40 CFR Part 63 Subpart ZZZZ

40 CFR 63 Subpart ZZZZ applies to reciprocating internal combustion engines (RICE) located at a major or area source of HAP emissions. Emergency stationary RICE are defined in 40 CFR 63.6675 as any stationary RICE that operates in an emergency situation. These situations include engines used for power generation when power from the local utility is interrupted, or when engines are used to pump water in the case of fire or flood.

The emergency generator and the emergency fire pump at the site are classified as emergency stationary RICE under the NESHAP and will comply with the requirements listed under this subpart by complying with NSPS IIII, 63.6590(c).

3.2. NORTH CAROLINA REGULATIONS

For the sources that are included for review in this application package, the North Carolina State Implementation Plan (SIP) rules and regulations have been evaluated for applicability. Applicable rules are identified below.

3.2.1. 15A NCAC 02D .0515 Particulates from Miscellaneous Industrial Processes

Particulate emissions from all emissions sources subject to permitting, including the wood pellet dryer are regulated under 15A NCAC 2D .0515. This regulation limits the particulate emissions based on process throughput using the equation $E = 4.10 \times P^{0.67}$, for process rates (P) less than 30 tons per hour (ton/hr) and $E=55 \times P^{0.11}-40$ for process rates greater than 30 tons per hour.

All emissions from particulate matter sources at the proposed facility are either negligible or well-controlled. The most significant emission unit at the site, the process dryer operating a 71.71 ODT/hr, has an emission limit of 48 lb/hr. Maximum emissions from the dryer are approximately 5.7 lb/hr, well below the standard.

3.2.2. 15A NCAC 02D .0516 Sulfur Dioxide Emissions from Combustion Sources

Under this regulation, emissions of sulfur dioxide from combustion sources cannot exceed 2.3 pounds of sulfur dioxide per million Btu input. Wood is fired in the dryer and low sulfur diesel is combusted in the two emergency engines, resulting in operation well below regulatory limits.

3.2.3. 15A NCAC 02D .0521 Control of Visible Emissions

Under this regulation, for sources manufactured after July 1, 1971, visible emissions cannot be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent opacity under the following conditions:

- No six-minute period exceeds 87 percent opacity,
- No more than one six-minute period exceeds 20 percent opacity in any hour, and
- No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

This rule applies to all processes that may have a visible emission, including the dryer, other particulate matter emissions sources controlled by cyclone and/or baghouse, and the diesel-fired engines. Compliance will be achieved for all sources.

3.2.4. 15A NCAC 02Q .0700 Toxic Air Pollutant Procedures

This regulation requires that certain new and modified sources of toxic air pollutants with emissions exceeding specified de minimis values apply for an air toxics permit. Facility-wide emissions of several compounds emitted from the site exceed the permitting de minimis level. A comparison of emissions to de minimis values are summarized in Appendix B, Table B-3. Air dispersion modeling results for compounds triggering permitting is discussed in Section 4 of this application.

3.2.5. 15A NCAC 2D .1100 - Control of Toxic Air Pollutant Emissions

A toxic air pollutant (TAP) permit application shall include an evaluation of the TAP emissions from facility sources, excluding exempt sources listed under 15A NCAC 2Q .0702(a)(18). This regulation outlines the procedures that must be followed if modeling is required under 15A NCAC 2Q .0700. Air dispersion modeling results for compounds triggering permitting is discussed in Section 4 of this application.

4. STATE AIR TOXICS MODELING REQUIREMENTS

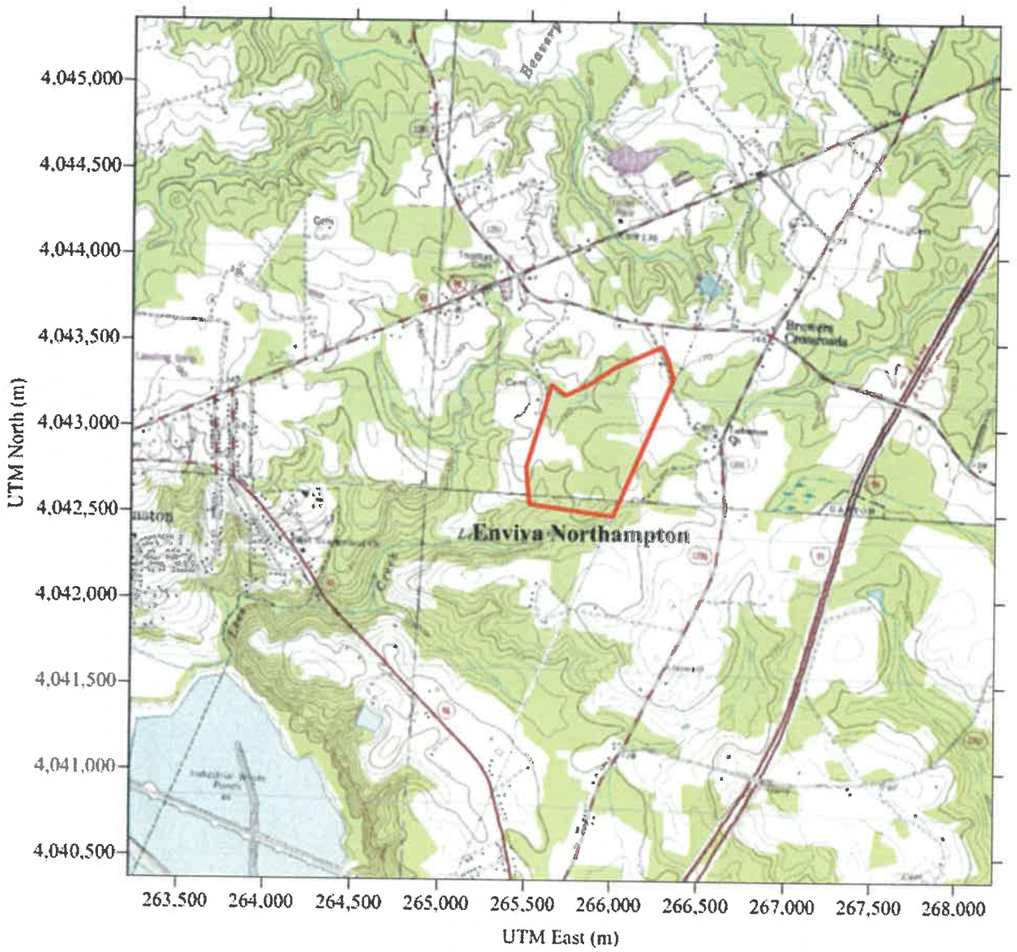
This section presents the methodology and results of the TAP air dispersion modeling conducted for the Enviva Pellets Northampton, LLC (Enviva) plant which is located near Garysburg, NC (Northampton Plant). The modeling methodology used to demonstrate compliance with the NC toxic air pollutant (TAP) acceptable ambient levels (AAL) conforms to the *Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina* (February 2014). In lieu of a modeling protocol a protocol checklist is provided in Appendix C.

4.1. FACILITY LOCATION AND DESCRIPTION

Enviva operates a wood pellets manufacturing plant in Northampton County, near Garysburg, NC. The Northampton plant consists of a wood drying system along with various material handling and emergency equipment.

Figure 4-1 provides a map of the area surrounding the Northampton property. The approximate central Universal Transverse Mercator (UTM) coordinates of the facility are 265.7 kilometers (km) east and 4,042.9 km north in Zone 18 (NAD 83). A signed survey of the property is included in Appendix C.

FIGURE 4-1. TOPOGRAPHIC MAP OF THE ENVIVA NORTHAMPTON AREA



For modeling purposes, the appropriate urban/rural land use classification for the area was determined using the Auer technique, which is recommended in the *Guideline on Air Quality Models.* In accordance with this technique, the area within a 3-km radius of the facility was identified on US Geological Survey (USGS) topographic maps (and was delineated by land use type. More than 50 percent of the surrounding land use can be classified as undeveloped rural (i.e., Auer's A4 classification), therefore the area is classified as rural.

Potential emissions of several compounds regulated under 15A NCAC 2Q .0700 (NC Air Toxics) exceed their toxics permitting emission rates (TPER) and this air dispersion modeling evaluation has been conducted to demonstrate compliance with all applicable AAL.

4.2. MODEL SELECTION

The latest version (13350) of the AERMOD modeling system was used to estimate maximum ground-level concentrations in all Class II Area analyses conducted for this application. AERMOD is a refined, steady-state, multiple source, Gaussian dispersion model and was promulgated in December 2005 as the preferred model for use by industrial sources in this type of air quality analysis.[4] The AERMOD model has the Plume Rise Modeling Enhancements (PRIME) incorporated in the regulatory version, so the direction-specific building downwash dimensions used as inputs are determined by the Building Profile Input Program, PRIME version (BPIP PRIME), version 04274.[5] BPIP PRIME is designed to incorporate the concepts and procedures expressed in the GEP Technical Support document, the Building Downwash Guidance document, and other related documents, while incorporating the PRIME enhancements to improve prediction of ambient impacts in building cavities and wake regions.[6]

The AERMOD modeling system is composed of three modular components: AERMAP, the terrain preprocessor; AERMET, the meteorological preprocessor; and AERMOD, the control module and modeling processor. AERMAP is the terrain pre-processor that is used to import terrain elevations for selected model objects and to generate the receptor hill height scale data that are used by AERMOD to drive advanced terrain processing algorithms. National Elevation Dataset (NED) data available from the United States Geological Survey (USGS) were utilized to interpolate surveyed elevations onto user specified receptor grids and buildings and sources in the absence of more accurate site-specific (i.e., site surveys, GPS analyses, etc.) elevation data.

AERMET generates a separate surface file and vertical profile file to pass meteorological observations and turbulence parameters to AERMOD. AERMET meteorological data are refined for a particular analysis based on the choice of micrometeorological parameters that are linked to the land use and land cover (LULC) around the meteorological site shown to be representative of the application site.

Enviva used the most recent versions of AERMOD and AERMAP (version 11103) to estimate ambient impacts from the modeled sources in the Class II area. Per NCDAQ guidelines, AERMOD will be run using all regulatory default options.

4.3. SOURCE DESCRIPTION

Table 4-1 presents a table of the modeled sources and their locations at the Northampton plant. All locations are expressed in UTM Zone 18 (NAD83) coordinates.

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[4] 40 CFR Part 51, Appendix W–*Guideline on Air Quality Models*, Appendix A.1– AMS/EPA Regulatory Model (AERMOD).
[5] Earth Tech, Inc., *Addendum to the ISC3 User's Guide, The PRIME Plume Rise and Building Downwash Model*, Concord, MA.
[6] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised)*, Research Triangle Park, North Carolina, EPA 450/4-80-023R, June 1985.

TABLE 4-1. MODELED SOURCE LOCATIONS

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
EP1	Wet ESP Stack	266,018.7	4,042,780.2	48.91
EP2	Hammermill Filter #1	266,040.7	4,042,879.0	49.02
EP3	Hammermill Filter #2	266,040.9	4,042,883.2	49.05
EP4	Hammermill Filter #3	266,041.3	4,042,893.2	49.13
EP7	Pellet Cooler #1 Aspiration Stack	266,109.2	4,042,965.1	50.36
EP8	Pellet Cooler #2 Aspiration Stack	266,104.2	4,042,965.3	50.32
EP9	Pellet Cooler #3 Aspiration Stack	266,099.3	4,042,965.5	50.29
EP10	Pellet Cooler #4 Aspiration Stack	266,093.0	4,042,965.8	50.24
EP11	Pellet Cooler #5 Aspiration Stack	266,087.3	4,042,966.0	50.20
EP12	Pellet Cooler #6 Aspiration Stack	266,082.3	4,042,966.2	50.15
EP14	Emergency Generator	266,061.4	4,042,777.6	48.75
EP15	Diesel Fire Pump	266,054.2	4,043,084.1	46.90

Tables 4-2 and 4-3 present the stack parameters and emission rates input to the model for each of the sources. The hammermill baghouse (EP2-4) and firewater pump (EP15) discharges are oriented horizontally and thus, per NCDAQ guidance, were modeled with an exit velocity of 0.01 m/s. All other emission points at the site are unobstructed, vertical releases.

TABLE 4-2. MODELED SOURCE PARAMETERS

Model ID	Stack Height (m)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
EP1	28.66	352.59	7.58	3.05
EP2	14.78	310.93	0.01	1.62
EP3	14.78	310.93	0.01	1.62
EP4	14.78	310.93	0.01	1.62
EP7	12.19	333.15	17.70	0.76
EP8	12.19	333.15	17.70	0.76
EP9	12.19	333.15	17.70	0.76
EP10	12.19	333.15	17.70	0.76
EP11	12.19	333.15	17.70	0.76
EP12	12.19	333.15	17.70	0.76
EP14	1.77	766.48	78.30	0.10
EP15	3.05	803.15	0.01	0.13

TABLE 4-3. MODELED EMISSION RATES

Model ID	Modeled Emission Rates (g/s)									
	ARSENIC	BAP	CADMIUM	CL	FORM	HXCLPDXN	HCL	MERCURY	NICKEL	VNYLCHLR
EP1	3.52E-05	5.74E-05	6.57E-06	1.75E-02	1.85E-01	3.53E-05	4.20E-02	7.73E-05	7.29E-04	3.98E-04
EP2	-	-	-	-	3.09E-02	-	-	-	-	-
EP3	-	-	-	-	3.09E-02	-	-	-	-	-
EP4	-	-	-	-	2.06E-02	-	-	-	-	-
EP7	-	-	-	-	1.99E-03	-	-	-	-	-
EP8	-	-	-	-	1.99E-03	-	-	-	-	-
EP9	-	-	-	-	1.99E-03	-	-	-	-	-
EP10	-	-	-	-	1.99E-03	-	-	-	-	-
EP11	-	-	-	-	1.99E-03	-	-	-	-	-
EP12	-	-	-	-	1.99E-03	-	-	-	-	-
EP14	-	5.80E-08	-	-	3.64E-04	-	-	-	-	-
EP15	-	4.97E-08	-	-	3.12E-04	-	-	-	-	-

4.4. METEOROLOGICAL DATA

The AERMOD modeling results were based on sequential hourly surface observations from Rocky Mount/Wilson, NC and upper air data from Newport, NC. These stations are recommended by NCDAQ for modeling facilities located in Northampton County. The base elevation for the surface station is 46 m.[7]

The five (5) most recent years of meteorological data (2008-2012) were downloaded from NCDAQ's website and input to AERMOD.[8] As shown in Section 4.7, TAP model impacts, with the exception of formaldehyde were less than 50% of the AAL, so only the most recent year (2012) was evaluated. The formaldehyde analysis utilized all 5 years in a single, concatenated file.

4.5. MODELED RECEPTORS

The receptors included in the modeling analysis consisted of property line receptors, spaced 25 meters (m) apart, and Cartesian receptor points spaced every 100 m, extending out 2.5 kilometers (km) from the center of the facility. There are no public right-of-ways (e.g. roads, railways) traversing the property line, so the same receptor grid was modeled for the one-hour (1-hr) and annual TAP analyses. The impacts were reviewed to ensure that the maximum impacts were captured within the 100 m spaced grid. Figure 4-2 shows the receptors included in the modeling analysis.

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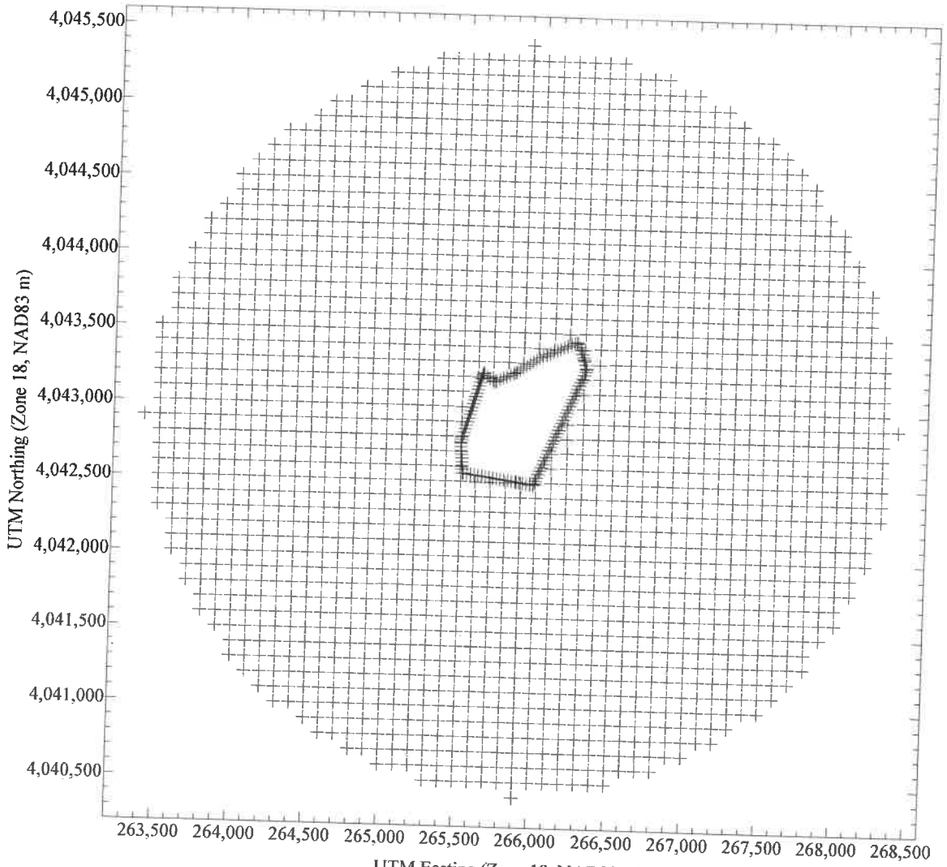
[7] http://www.ncair.org/permits/mets/ProfileBaseElevations.pdf
[8] http://www.ncair.org/permits/mets/metdata.shtml

FIGURE 4-2. MODELED RECEPTOR GRID



The AERMOD model is capable of handling both simple and complex terrain. Through the use of the AERMOD terrain preprocessor (AERMAP), AERMOD incorporates not only the receptor heights, but also an effective height (hill height scale) that represents the significant terrain features surrounding a given receptor that could lead to plume recirculation and other terrain interaction.[9]

Receptor terrain elevations input to the model were interpolated from National Elevation Database (NED) data obtained from the USGS. NED data consist of arrays of regularly spaced elevations. The array elevations are at a resolution of 1 arcsecond (approximately 30 m intervals) and were interpolated using the latest version of AERMAP (version 11103) to determine elevations at the defined receptor intervals. The data obtained from the NED files were checked for completeness and spot-checked for accuracy against elevations on corresponding USGS 1:24,000 scale topographical quadrangle maps. AERMAP was also used to establish the base elevation of all Enviva structures and emission sources.

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9 US EPA. *Users Guide for the AERMOD Terrain Preprocessor (AERMAP)*, EPA-454/B-03-003, Research Triangle Park, NC.

4.6. BUILDING DOWNWASH

AERMOD incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithms. Direction specific building parameters required by AERMOD are calculated using the BPIP-PRIME preprocessor (version 04274).

EPA has promulgated stack height regulations that restrict the use of stack heights in excess of "Good Engineering Practice" (GEP) in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP height is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. The minimum stack height not subject to the effects of downwash, called the GEP stack height, is defined by the following formula:

$H_{GEP} = H + 1.5L$, where:

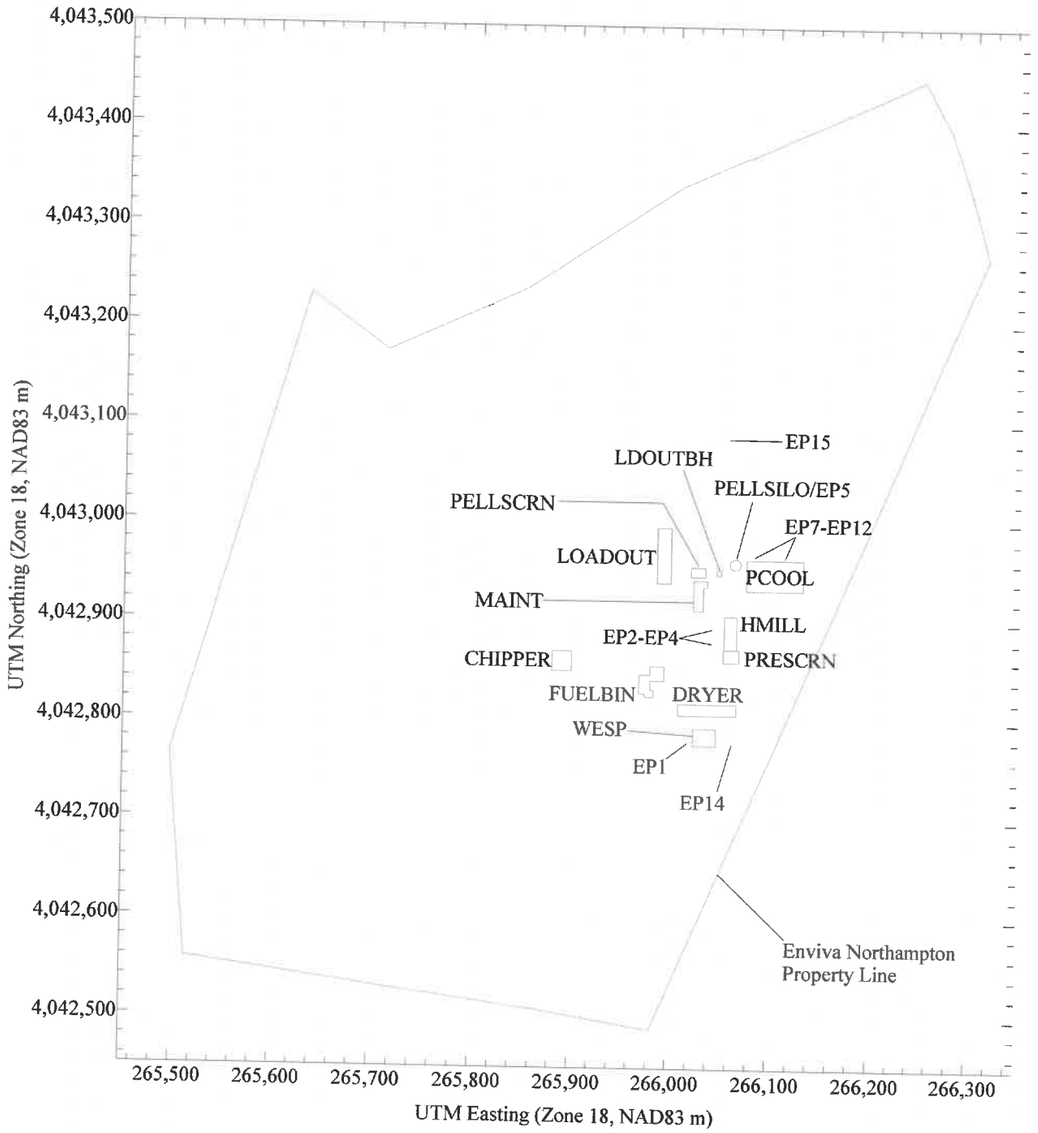
H_{GEP} = minimum GEP stack height,
H = structure height, and
L = lesser dimension of the structure (height or projected width).

This equation is limited to stacks located within 5L of a structure. Stacks located at a distance greater than 5L are not subject to the wake effects of the structure. The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis are determined using BPIP. In general, the lowest GEP stack height for any source is 65 meters by default.[10] None of the proposed emission units at the Northampton will exceed GEP height.

Figure 4-3 presents a site layout for the facility that shows the source and building arrangement as modeled.

[10] 40 CFR §51.100(ii)

FIGURE 4-3. ENVIVA NORTHAMPTON MODELED SITE LAYOUT



4.7. TAP MODELING RESULTS

Table 4-4 presents the results for the state toxics modeling that was performed for the proposed Enviva Sampson facility. As shown, the project will not cause an exceedance of any pollutant AAL. With the exception of formaldehyde, all modeled TAP had impacts less than 50% of the AAL, and as such, only the most recent meteorological year (2012) was modeled. The formaldehyde results are based on the full five years of meteorological data. Electronic copies of all modeling input and output files are included on the CD-ROM in Appendix D.

TABLE 4-4. TAP MODELING RESULTS

Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time (YYMMDDHH)	Maximum Concentration ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% of AAL (%)
Arsenic	Annual	266,220.00	4,043,046.20	2012	1.00E-05	2.30E-04	4.35%
Benzo(a)pyrene	Annual	266,220.00	4,043,046.20	2012	2.00E-05	3.30E-02	0.06%
Cadmium*	Annual	266,220.00	4,043,046.20	2012	2.20E-06	5.50E-03	0.04%
Chlorine	1-Hour 24-Hour	265,872.30 265,939.30	4,042,507.50 4,042,496.30	12111814 12102724	1.79E-01 7.54E-02	900 37.5	0.02% 0.20%
Formaldehyde	1-hour	266,171.10	4,042,931.10	10083106	114.32	150	76.21%
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	Annual	266,220.00	4,043,046.20	2012	1.00E-05	7.60E-05	13.16%
Hydrogen chloride (hydrochloric acid)	1-Hour	265,872.30	4,042,507.50	12111814	0.43	700	0.06%
Mercury	24-Hour	265,939.30	4,042,496.30	12102724	3.30E-04	0.6	0.06%
Nickel	24-Hour	265,939.30	4,042,496.30	12102724	3.15E-03	6	0.05%
Vinyl chloride	Annual	266,220.00	4,043,046.20	2012	1.30E-04	0.38	0.03%

* Modeled impacts in the AERMOD output file are shown in nanograms per cubic meter in order to capture enough significant figures.

Facility Forms

FORM A1

FACILITY (General Information)

REVISED 11/01/02 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — A1

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

☑ Local Zoning Consistency Determination (if required) ☑ Facility Reduction & Recycling Survey Form (Form A4) ☑ Application Fee
☑ Responsible Official/Authorized Contact Signature ☑ Appropriate Number of Copies of Application ☑ P.E. Seal (if required)

GENERAL INFORMATION

Legal Corporate/Owner Name: **Enviva Pellets Northampton, LLC**	
Site Name: **Enviva Pellets Northampton, LLC**	
Site Address (911 Address) Line 1: **874 Lebanon Church Road**	
Site Address Line 2:	
City: **Garysburg**	State: **North Carolina**
Zip Code: **27866**	County: **Northampton**

CONTACT INFORMATION

Permit/Technical Contact:	***Facility/Inspection Contact:***
Name/Title: **Joe Harrell**	Name/Title: **Heath Lucy**
Mailing Address Line 1: **142 N.C. Route 561 East**	Mailing Address Line 1: **Same as Site Address**
Mailing Address Line 2:	Mailing Address Line 2:
City: **Ahoskie** State: **NC** Zip Code: **27910**	City: State: Zip Code:
Phone No. (area code) **(252) 209-6032** Fax No. (area code)	Phone No. (area code) **(910) 318-2743** Fax No. (area code)
Email Addres **Joe.Harrell@envivabiomass.com**	Email Address: [redacted]
Responsible Official/Authorized Contact:	***Invoice Contact:***
Name/Title: **Michael Doniger, Director Plant Operations**	Name/Title: **Same as permit/technical contact**
Mailing Address Line 1: **7200 Wisconsin Avenue**	Mailing Address Line 1:
Mailing Address Line 2: **Suite 1000**	Mailing Address Line 2:
City: **Bethesda** State: **MD** Zip Code: **20814**	City: State: Zip Code:
Phone No. (area code) **804 929 8418** Fax No. (area code)	Phone No. (area code) Fax No. (area code)
Email Addres **Pete.Najera@envivabiomass.com**	Email Address:

APPLICATION IS BEING MADE FOR

☐ New Non-permitted Facility/Greenfield ☑ Modification of Facility (permitted) ☐ Renewal with Modification
☐ Renewal (TV Only)

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

☐ General ☐ Small ☐ Prohibitory Small ☐ Synthetic Minor ☑ Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s): **Facility ID No. : 6600167**
Wood pellet manufacturing facility

Primary SIC/NAICS Code: **2499 (Wood Products, Not Elsewhere Classified)**	Current/Previous Air Permit No. **10203R02** Expiration Date **2/28/2017**
Facility Coordinates: Latitude: **256,700 UTM E**	Longitude: **4,042,900 UTM N**
Does this application contain confidential data? ☐ YES	☑ NO

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: **Dale Overcash**	Firm Name: **Trinity Consultants, Inc.**
Mailing Address Line 1: **One Copley Parkway**	Mailing Address Line 2: **Suite 310**
City: **Morrisville** State: **North Carolina**	Zip Code: **27560** County: **Wake**
Phone No. **(919) 462-9693** Fax No. **(919) 462-9694**	Email Address: [redacted]

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed) **Michael Doniger**	Title: **Director Plant Operations**
X Signature(Blue Ink):	Date: 4/16/2014

Attach Additional Sheets As Necessary

Received
APR 22 2014
Air Permits Section

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 04/10/07

NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate

A2

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
ES-CHIP-1	Log Chipping	N/A	N/A
ES-RCHP-1 and 2	Rechippers	N/A	N/A
ES-DRYER	Green Wood Direct-Fired Dryer System	CD-DC	Three (3) Simple Cyclones
		CD-WESP	Wet Electrostatic Precipitator
ES-HM-1, through 8	Eight (8) Hammermills	CD-HM-CYC-1 CD-HM-BF1	Simple Cyclone, Bagfilter
		CD-HM-CYC-2 CD-HM-BF1	Simple Cyclone, Bagfilter
		CD-HM-CYC-3 CD-HM-BF1	Simple Cyclone, Bagfilter
		CD-HM-CYC-4 CD-HM-BF2	Simple Cyclone, Bagfilter
		CD-HM-CYC-5 CD-HM-BF2	Simple Cyclone, Bagfilter
		CD-HM-CYC-6 CD-HM-BF2	Simple Cyclone, Bagfilter
		CD-HM-CYC-7 CD-HM-BF3	Simple Cyclone, Bagfilter
		CD-HM-CYC-8 CD-HM-BF3	Simple Cyclone, Bagfilter
ES-NDS	Nuisance Dust System	CD-HMA-BF3	Bagfilter
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	Bin Vent Baghouse
ES-CLR-1 through 6	Six (6) Pellet Coolers	CD-CLR-1 through 6	Six (6) Pellet Cooler Cyclones
ES-PFB	Pellet Fines Bin	CD-PFB-BF	Bin Vent Baghouse
ES-FPH	Finished Product Handling	CD-FPH-BF	Finished Product Handling Bagfilter
ES-PB	Pellet Loadout Bins		
ES-PL	Pellet Mill Loadout 1 and 2		
ES-GN	Emergency Generator (350 bhp)	N/A	N/A
ES-FWP	Fire Water Pump (300 bhp)	N/A	N/A
Existing Permitted Equipment To Be MODIFIED By This Application			
Equipment To Be DELETED By This Application			
ES-CHIP-2	Portable Chipper	N/A	N/A

112(r) APPLICABILITY INFORMATION

A 3

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? Yes / X No

If No, please specify in detail how your facility avoided applicability: _____

If your facility is Subject to 112(r), please complete the following:

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?
Yes ☐ No ☐ Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?
Yes ☐ No ☐ If yes, please specify: _____

Attach Additional Sheets As Necessary

FORM A4

SURVEY OF AIR EMISSIONS AND FACILITY - WIDE REDUCTION & RECYCLING ACTIVITIES

DATE: Does facility have an environmental mangement system in place? ( ) YES (X) NO If so, is facility ISO 14000 Certified? ( ) YES (X) NO

Facility Name:	Enviva Pellets Northampton, LLC		Permit Number:	10203R02	
Facility ID:	N/A [to be	County: Northampton	Environmental Contact:	Joe Harrell	
Mailing Address Line 1:	874 Lebanon Church Road		Phone No. ( )	(252) 209-6032	Fax No. ( )
Mailing Address Line 2:			Zip Code:	27866	County: Northampton
City:	Garysburg	State: North Carolina	Email Address:	Joe.Harrell@envivabiomass.com	

AIR EMISSIONS SOURCE REDUCTIONS

Any Air Emissions Source Reductions in the past year? ( ) YES (X) NO

Source Description and ID	Air Pollutant	Enter Code for Emission Reduction Option (See Codes)	Date Reduction Option Implemented (mo/yr)	Quantity Emitted from prior annual report to DAQ (lb/yr)	Quantity Emitted from current annual report to DAQ (lb/yr)	Has reduction activity been discontinued? If so, when was it discontinued? (mo/yr)	Addition detail about source
N/A							

Comments:

FACILITY - WIDE REDUCTIONS & RECYCLING ACTIVITIES

Any Reductions or Recycling Activities in the past year? ( ) YES (X) NO

Source Description or Activity	Pollutant or Recycled or Reduced Materials	Enter Code for Emission Reduction Option (See Codes)	Date Reduction Option Implemented (mo/yr)	Quantity Emitted from prior annual report	Quantity Emitted from current annual report	Has reduction activity been discontinued? If so, when was it discontinued? (mo/yr)	Addition detail about source
N/A							

Comments:

The requested information above shall be used for fulfilling the requirements of North Carolina General Statute 143-215.108(g). The permit holder shall submit to the Department a written description of current and projected plans to reduce the emissions of air pollutants by source reduction or recycling. The written description shall accompany any application for a new permit, modification of an existing permit and for each annual air quality permit fee payment. Source reduction is defined as reducing the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal. If no activity has taken place since the previous report, simply indicate so by checking the no box in that section. Once completed, this form should be submitted along with your fee payment. Examples are listed on the first line of each section of the form for your benefit.

REVISED 1/07

Attach Additional Sheets As Necessary

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — D1

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

AIR POLLUTANT EMITTED	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix B		
PARTICULATE MATTER < 10 MICRONS (PM_{10})			
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)			
SULFUR DIOXIDE (SO2)			
NITROGEN OXIDES (NOx)			
CARBON MONOXIDE (CO)			
VOLATILE ORGANIC COMPOUNDS (VOC)			
LEAD			
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr
		See Emission Calculations in Appendix B		

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Modeling Required ? Yes	No	
		See Emission Calculations in Appendix B					

COMMENTS:

Attach Additional Sheets As Necessary

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

REVISED: 12/01/01 NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate D4

ACTIVITIES EXEMPTED PER 2Q .0102 OR INSIGNIFICANT ACTIVITIES PER 2Q .0503 FOR TITLE V SOURCES		
DESCRIPTION OF EMISSION SOURCE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY
1. Green Wood Handling and Sizing Operations IES-GWHS	N/A	15A NCAC 02Q .0102 (c)(2)(E) -low emissions, see Appendix B
2. Dried Wood Handling and Sizing Operations IES-DWHS	N/A	15A NCAC 02Q .0102 (c)(2)(E) -negligible emissions, enclosed
3. Emergency Generator Diesel Fuel Storage Tank TK-1	Up to 2,500 gallons	15A NCAC 02Q .0102 (c)(1)(D)
4. Firewater Pump Diesel Fuel Storage Tank TK-2	Up to 500 gallons	15A NCAC 02Q .0102 (c)(1)(D)
5. Green Wood Storage Piles IES-GWSP1 and IES-GWSP2	N/A	15A NCAC 02Q .0102 (c)(2)(E) -low emissions, see Appendix B
6. Debarker IES-DEBARK-1	N/A	15A NCAC 02Q .0102 (c)(2)(E) -negligible emissions
7. Green Wood Fuel Bin IES-GWFB	13.93 ODT/hr	15A NCAC 02Q .0102 (c)(2)(E) -no quantifiable emissions
8.		
9.		
10.		

Attach Additional Sheets As Necessary

FORM D
TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED: 12/01/01 **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** D5

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A	**SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B) -** SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.
B	**SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY) -** PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE.
C	**CONTROL DEVICE ANALYSIS (FORM C) -** PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.
D	**PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY) -** SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.
E	**PROFESSIONAL ENGINEERING SEAL -** PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY). *I, M. Dale Overcash, attest that this application for Enviva Pellets Northampton, LLC has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.* **(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)** NAME: M. Dale Overcash DATE: 4/21/14 COMPANY: Trinity Consultants of North Carolina P.C. ADDRESS: One Copley Parkway, Suite 310 Morrisville, NC 27560 TELEPHONE: (919) 462-9693 SIGNATURE: PAGES CERTIFIED: Entire Application **(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)** PLACE NORTH CAROLINA SEAL HERE 

Attach Additional Sheets As Necessary

FORM E1

TITLE V GENERAL INFORMATION

REVISED: 12/01/01 — **Division of Air Quality - Application for Air Permit to Construct/Operate** — E1

IF YOUR FACILITY IS CLASSIFIED AS "MAJOR" FOR TITLE V YOU MUST COMPLETE THIS FORM AND ALL OTHER REQUIRED "E" FORMS (E2 THROUGH E5 AS APPLICABLE)

Indicate here if your facility is subject to Title V by: **X Emissions** ☐ Other

If subject to Title V by other, check or specify: ☐ NSPS ☐ NESHAPS (MACT) ☐ TITLE IV

Other, specify:

If you are or will be subject to any maximum achievable control technology standards (MACT) issued pursuant to section 112(d) of the Clean Air Act, specify below:

EMISSION SOURCE ID	***EMISSION SOURCE DESCRIPTION***	***MACT***
ES-EG, ES-FWP	Emergency Generator and Firepump	Subpart ZZZZ
ES-DRYER	Green Wood Direct-Fired Dryer Syst	40 CFR 63 Subpart B, [112(g)]

List any additional regulation which are requested to be included in the shield and provide a detailed explanation as to why the shield should be granted:

REGULATION	***EMISSION SOURCE (Include ID)***	***EXPLANATION***

Comments:

Attach Additional Sheets As Necessary

FORM E2

EMISSION SOURCE APPLICABLE REGULATION LISTING

REVISED 12/01/01

Division of Air Quality - Application for Air Permit to Construct/Operate **E2**

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	OPERATING SCENARIO INDICATE PRIMARY (P) OR ALTERNATIVE (A)	POLLUTANT	APPLICABLE REGULATION
See attached table following Form E3 for a summary of regulatory requirements and associated compliance requirements				

Attach Additional Sheets As Necessary

FORM E3
EMISSION SOURCE COMPLIANCE METHOD

REVISED 12/01/01 — NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate — E3

Emission Source ID NO. **See attached table following Form E3 for a summary of regulatory requirements and associated compliance requirements**

Regulated Pollutant _____

Applicable Regulation

Alternative Operating Scenario (AOS) NO:

ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS

MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? ◊ Yes ◊ No

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? ◊ Yes ◊ No

Describe Monitoring Device Type:

Describe Monitoring Location:

Other Monitoring Methods (Describe In Detail):

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording:

Frequency of recordkeeping (How often is data recorded?):

REPORTING REQUIREMENTS

Generally describe what is being reported:

Frequency: ◊ MONTHLY ◊ QUARTERL ◊ EVERY 6 MONTHS

OTHER (DESCRIBE):

TESTING

Specify proposed reference test method:

Specify reference test method rule and citation:

Specify testing frequency:

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary

Summary of Title V Applicable Regulations and Compliance Demonstration Procedures
Enviva Pellets Northampton, LLC

Emission Source Description and ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordkeeping	Reporting
Wood-fired Dryer System (ES-DRYER)	PM/ PM10/PM2.5	15A NCAC 2D .0515	Cyclones + WESP	PM emissions shall be controlled by a an ESP. To assure compliance, daily verification of power and rapper operations are functioning. Monthly visual inspection of the ductwork and material collection units. Every 24 months internal inspection of the structural integrity	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation	Any maintenance performed on the scrubber within 30 days of a written request by DAQ. Semi-annual progress report and annual compliance certification
Nuisance Dust System (ES-NDS) Coarse Hammermills (ES-HM-1 through 8) Pellet Mill Feed Silo (ID No. ES-PMFS) Pellet Fines Bin (ES-PFB) Finished Product Handling (ES-FPH)			Fabric Filter	Inspections and maintenance, including monthly inspection of ductwork and annual internal inspection of bagfilter integrity	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation	Semi-annual progress report and annual compliance certification
Pellet Presses & Coolers (ES-CLR-1 through 6)			Cyclones	Inspections and maintenance, including monthly inspection of ductwork and annual internal inspection of cyclone	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation	Semi-annual progress report and annual compliance certification
Wood-fired Dryer System (ES-DRYER)	SO2	15A NCAC 2D .0516	WESP	None required because inherently low sulfur content of wood fuel achieves compliance		
Emergency Generator (ID No. ES-EG) and Fire Water Pump (ID No. ES-FWP)	SO2	15A NCAC 2D .0516	N/A	None required because inherently low sulfur content of fuel achieves compliance		
Wood-fired Dryer System (ES-DRYER) Nuisance Dust System (ES-NDS) Coarse Hammermills (ES-HM-1 through 7) Pellet Mill Feed Silo (ID No. ES-PMFS) Pellet Fines Bin (ES-PFB) Finished Product Handling (ES-FPH) Pellet Presses & Coolers (ES-CLR-1 through 6)	Opacity	15A NCAC 2D. 0521	Cyclones + WESP Fabric Filter Cyclones	Monthly visible observation for "normal." If above normal, correct action or Method 9 observation required	Written or electronic log of date/time/result of each observation, results of each non-compliant observation and actions taken to correct, and results of the corrective action	Semi-annual progress report and annual compliance certification
Emergency Generator (ID No. ES-EG) Fire Water Pump (ID No. ES-FWP)	Opacity	15A NCAC 2D. 0521	N/A	N/A	N/A	N/A
Emergency Generator (ID No. ES-EG) Fire Water Pump (ID No. ES-FWP)	PM, CO, NOx, NMHC, SO2	40 CFR Part 60 Subpart IIII	N/A	All requirements as outlined in the regulation, including the following: use certified emergency engines, operate according to manufacturers procedures, use fuel oil with fuel content of no more than 15 ppmw sulfur and cetane index of at least 40, install non-resettable hours meter.	Maintain records of engine certification, fuel certifications and hours/year of operation of each engine	Annual Compliance Certification
Emergency Generator (ID No. ES-EG) Fire Water Pump (ID No. ES-FWP)	HAPs	40 CFR Part 63 Subpart ZZZZ	N/A	Comply with the NSPS requirements above and no other requirements apply	Comply with the NSPS requirements above and no other requirements apply	Annual Compliance Certification

FORM E4
EMISSION SOURCE COMPLIANCE SCHEDULE

Revised 12/01/01

NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate

E4

COMPLIANCE STATUS WITH RESPECT TO ALL APPLICABLE REQUIREMENTS

Will each emission source at your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements?

X Yes No **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

Will your facility be in compliance with all applicable requirements taking effect during the term of the permit and meet such requirements on a timely basis?

X Yes No **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

If this application is for a modification of existing emissions source(s), is each emission source currently in compliance with all applicable requirements?

X Yes No **If NO**, complete **A** through **F** below for each requirement for which compliance is not achieved.

A. Emission Source Description (Include ID NO.) _____

B. Identify applicable requirement for which compliance is not achieved:

_____

C. Narrative description of how compliance will be achieved with this applicable requirements:

_____

D. Detailed Schedule of Compliance:

Step(s)	Date Expected

E. Frequency for submittal of progress reports (6 month minimum):

_____

F. Starting date of submittal of progress reports: _____

Attach Additional Sheets As Necessary

FORM E5

TITLE V COMPLIANCE CERTIFICATION (Required)

Revised 01/01/07

NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate

E5

In accordance with the provisions of Title 15A NCAC 2Q .0520 and .0515(b)(4) the responsible company official of:

SITE NAME: Enviva Pellets Northampton, LLC

SITE ADDRESS: 874 Lebanon Church Road

CITY, NC : Garysburg, NC

COUNTY: Northampton

PERMIT NUMBER : N/A

CERTIFIES THAT(Check the appropriate statement(s):

[X] The facility is in compliance with all applicable requirements

[ ] In accordance with the provisions of Title 15A NCAC 2Q .0515(b)(4) the responsible company official certifies that the proposed minor modification meets the criteria for using the procedures set out in 2Q .0515 and requests that these procedures be used to process the permit application.

[ ] The facility is not currently in compliance with all applicable requirements
If this box is checked, you must also complete form E4 "Emission Source Compliance Schedule"

The undersigned certifies under the penalty of law, that all information and statements provided in the application, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

Signature of responsible company official (REQUIRED, USE BLUE INK) Date: 4/16/2014

Michael Doniger, Director of Operations
Name, Title of responsible company official (Type or print)

Attach Additional Sheets As Necessary

Source Specific Forms - Chipper

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** — **B**

EMISSION SOURCE DESCRIPTION: **Chipper**	EMISSION SOURCE ID NO: **ES-EPWC**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **N/A**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips are screened and oversized chips will undergo additional chipping as required.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1) ☐ Woodworking (Form B4) ☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2) ☐ Coating/finishing/printing (Form B5) ☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3) ☐ Storage silos/bins (Form B6) ■ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.: **CEM 112" 15KN SUS Pellet Proce**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%** SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B9**

EMISSION SOURCE DESCRIPTION: **Chipper**	EMISSION SOURCE ID NO: **ES-EPWC**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **N/A**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips are screened and oversized chips will undergo additional chipping as required.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
TYPE	UNITS		
Green Wood	**ODT**	**71.71**	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: **N/A**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): **N/A**
MAX. CAPACITY HOURLY FUEL USE: **N/A**	REQUESTED CAPACITY ANNUAL FUEL USE: **N/A**

COMMENTS:

Attach Additional Sheets as Necessary

Source Specific Forms - Green Wood Hammermills

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B

EMISSION SOURCE DESCRIPTION: **Rechippers/ Green Wood Hammermills**	EMISSION SOURCE ID NO: ES-RCHP-1, 2
	CONTROL DEVICE ID NO(S): N/A
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips are screened and oversized chips will undergo additional chipping as required.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1) ☐ Woodworking (Form B4) ☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2) ☐ Coating/finishing/printing (Form B5) ☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3) ☐ Storage silos/bins (Form B6) ■ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: 4/22/2013	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.: Williams #490	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25%	MAR-MAY 25% JUN-AUG 25%	SEP-NOV 25%
EXPECTED ANNUAL HOURS OF OPERATION 8,760	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: <20	% OPACITY

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix B						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 — **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** — **B9**

EMISSION SOURCE DESCRIPTION: **Green Wood Hammermills**	EMISSION SOURCE ID NO: **ES-RCHP-1, 2**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-6**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips are screened and oversized chips will undergo additional chipping as required.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Green Wood	**ODT**	**71.71**	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	(BATCHES/YR):
REQUESTED LIMITATION (BATCHES / HOUR):	
FUEL USED: **N/A**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): **N/A**
MAX. CAPACITY HOURLY FUEL USE: **N/A**	REQUESTED CAPACITY ANNUAL FUEL USE: **N/A**

COMMENTS:

Attach Additional Sheets as Necessary

Source Specific Forms - Dryer Source

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** — B

EMISSION SOURCE DESCRIPTION: **Green Wood Direct-Fired Dryer System**	EMISSION SOURCE ID NO: **ES-DRYER**
OPERATING SCENARIO **1** OF **1**	CONTROL DEVICE ID NO(S): **CD-DC, CD-WESP**
	EMISSION POINT (STACK) ID NO(S): **EP-1**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Green wood is conveyed to a rotary dryer system. Direct contact heat is provided to the system via a 175.3 mmBtu/hr burner system. Air emissions are controlled by cyclones for bulk particulate removal and additional particulate is removed utilitizing a wet electrostatic precipitator (WESP) operating after the cyclones.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ■ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manufact. of chemicals/coatings/inks (Form B7)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ☐ Storage silos/bins (Form B6)
- ☐ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:	
MANUFACTURER / MODEL NO.: **Buettner 5X26R**		EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%**	SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY		

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO_2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
	See Emission Calculations in Appendix B						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
	See Emission Calculations in Appendix B			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B1

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B1

EMISSION SOURCE DESCRIPTION: **Green Wood Direct-Fired Dryer System**

EMISSION SOURCE ID NO: **ES-DRYER**

CONTROL DEVICE ID NO(S): **CD-DC, CD-WESP**

EMISSION POINT (STACK) ID NO(S): **EP-1**

OPERATING SCENARIO: 1 OF 1

DESCRIBE USE: (●) PROCESS HEAT ( ) SPACE HEAT ( ) ELECTRICAL GENERATION

(●) CONTINUOUS USE ( ) STAND BY/EMERGENCY ( ) OTHER (DESCRIBE):

HEATING MECHANISM: ( ) INDIRECT (●) DIRECT

MAX. FIRING RATE (MMBTU/HOUR): **175.3**

WOOD-FIRED BURNER

WOOD TYPE: ( ) BARK (●) WOOD/BARK ( ) WET WOOD ( ) DRY WOOD ( ) OTHER (DESCRIBE):

PERCENT MOISTURE OF FUEL: 20 to 50%

( ) UNCONTROLLED ( ) CONTROLLED WITH FLYASH REINJECTION (●) CONTROLLED W/O REINJECTION

FUEL FEED METHOD:

HEAT TRANSFER MEDIA: ( ) STEAM (●) AIR ( ) OTHER

METHOD OF TUBE CLEANING: **N/A**

COAL-FIRED BURNER

TYPE OF BOILER — IF OTHER DESCRIBE:

PULVERIZED	OVERFEED STOKER	UNDERFEED STOKER	SPREADER STOKER	FLUIDIZED BED
[ ] WET BED	( ) UNCONTROLLED	( ) UNCONTROLLED	( ) UNCONTROLLED	( ) CIRCULATING
[ ] DRY BED	( ) CONTROLLED	( ) CONTROLLED	( ) FLYASH REINJECTION	( ) RECIRCULATING
			( ) NO FLYASH REINJECTION	

METHOD OF LOADING: ( ) CYCLONE ( ) HANDFIRED ( ) TRAVELING GRATE ( ) OTHER (DESCRIBE):

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

OIL/GAS-FIRED BURNER

TYPE OF BOILER: [ ] UTILITY [ ] INDUSTRIAL [ ] COMMERCIAL [ ] RESIDENTIAL

TYPE OF FIRING: [ ] NORMAL [ ] TANGENTIAL [ ] LOW NOX BURNERS [ ] NO LOW NOX BURNER

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

OTHER FUEL-FIRED BURNER

TYPE OF FUEL: PERCENT MOISTURE:

TYPE OF BOILER: [ ] UTILITY [ ] INDUSTRIAL [ ] COMMERCIAL [ ] RESIDENTIAL

TYPE OF FIRING: TYPE OF CONTROL (IF ANY): FUEL FEED METHOD:

METHOD OF TUBE CLEANING: CLEANING SCHEDULE:

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Bark/Wet Wood	**ton**	**20.8**	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)
Bark/Wet Wood	**Nominal 4,200 BTU/lb**	**0.011**	

SAMPLING PORTS, COMPLIANT WITH EPA METHOD 1 WILL BE INSTALLED ON THE STACKS: (●) YES ( ) NO

COMMENTS:

Attach Additional Sheets As Necessary

FORM C4
CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C4

CONTROL DEVICE ID NO: **CD-DC**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-DRYER**
EMISSION POINT (STACK) ID NO(S): **EP-1**	POSITION IN SERIES OF CONTROLS NO. **1** OF **2** UNITS
MANUFACTURE **Lundberg E-Tube 115719**	MODEL NO:
DATE MANUFACTURED:	PROPOSED OPERATION DATE:
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE:
1 OF 1	P.E. SEAL REQUIRED (PER 2Q .0112)? ○ YES ○ NO

DESCRIBE CONTROL SYSTEM :
Three identical simple cyclones are equipped to the discharge of the rotary dryer system to capture bulk PM emissions. Emissions from each the cyclones are combined into a common duct and are routed to the WESP. The parameters presented here are per each cyclone:

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANT(S) COLLECTED:	PM	PM_{10}	$PM_{2.5}$	
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	98.5 %	98.5 %	98.5 %	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):				

PRESSURE DROP (IN. H_2O): MIN MAX **6.0"** WARNING ALARM? ○ YES ○ NO

INLET TEMPERATURE (°F): MIN MAX **Nominal 400**	OUTLET TEMPERATURE (°F): MIN MAX **Nominal 400**
INLET AIR FLOW RATE (ACFM): **117,000**	BULK PARTICLE DENSITY (LB/FT³): **3.43E-05**
POLLUTANT LOADING RATE (GR/FT³ **0.24**	

SETTLING CHAMBER	CYCLONE			MULTICYCLONE
LENGTH (INCHES):	INLET VELOCITY (FT/SEC):	95	○ CIRCULAR ○ RECTANGLE	NO. TUBES:
WIDTH (INCHES):	*DIMENSIONS (INCHES) See instructions*		*IF WET SPRAY UTILIZED*	DIAMETER OF TUBES:
HEIGHT (INCHES):	H:	Dd:	LIQUID USED:	HOPPER ASPIRATION SYSTEM?
VELOCITY (FT/SEC.):	W:	Lb: 156"	FLOW RATE (GPM):	○ YES ○ **NO**
NO. TRAYS:	De: 79"	Lc: 312"	MAKE UP RATE (GPM):	LOUVERS?
NO. BAFFLES:	D: 156"	S:		○ YES ○ **NO**
	TYPE OF CYCLONE ○ CONVENTIONAL		○ HIGH EFFICIENCY ○ OTHER	

DESCRIBE MAINTENANCE PROCEDURES:
Periodic inspection of mechanical integrity during plant outages as specified by manufacturer

PARTICLE SIZE DISTRIBUTION		
SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	**Unknown**	
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

DESCRIBE INCOMING AIR STREAM:
The flue gas from the dryer will be split and distributed through a set of three cyclones before entering the WESP. After the cyclones, the gas stream will be combined into a single duct and directed to the WESP inlet point.

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:
None

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

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

FORM C2

CONTROL DEVICE (Electrostatic Precipitator)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **C2**

CONTROL DEVICE ID NO: **CD-WESP**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO: **ES-DRYER**
EMISSION POINT (STACK) ID NO(S): **EP-1**	POSITION IN SERIES OF CONTROLS: NO. **2** OF **2** UNITS
MANUFACTURER: **Lundberg E-Tube 115719**	MODEL NO. **Lundberg E-Tube 115719**
MANUFACTURE DATE:	PROPOSED OPERATION DATE: **TBD**
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE: **TBD**
____ OF ____	P.E. SEAL REQUIRED (PER 2Q .0112)? ◉ YES ○ NO
EQUIPMENT SPECIFICATIONS	GAS DISTRIBUTION GRIDS: ◉ YES ○ NO
TYPE: ◉ WET ○ DRY	◉ SINGLE-STAGE ○ TWO-STAGE
TOTAL COLLECTION PLATE AREA (FT^2): **29,904**	NO. FIELDS **2** NO. COLLECTOR PLATE PER FIELD: **567 tubes**
COLLECTOR PLATES SIZE (FT): LENGTH: WIDTH:	SPACING BETWEEN COLLECTOR PLATES (INCHES): **12" hextube**
TOTAL DISCHARGE ELECTRODE LENGTH(FT): **19"-0"**	GAS VISCOSITY (POISE): **2.054E-04 Poise**
NUMBER OF DISCHARGE ELECTRODES: **567**	NUMBER OF COLLECTING ELECTRODE RAPPERS: **none**
MAXIMUM INLET AIR FLOW RATE (ACFM): **117,000**	PARTICLE MIGRATION VELOCITY (FT/SEC): **0.234**
MINIMUM GAS TREATMENT TIME (SEC): **2.3**	BULK PARTICLE DENSITY (LB/FT^3): **45 lb/cu. ft.**
FIELD STRENGTH (VOLTS) CHARGING: **83 kVA** COLLECTING: **N/A**	CORONA POWER (WATTS/1000 CFM): **4000**
ELECTRICAL USAGE (kw/HOUR): **141.5**	
CLEANING PROCEDURES: ○ RAPPING ○ PLATE VIBRATING ◉ WASHING ○ OTHER	
OPERATING PARAMETERS PRESSURE DROP (IN. H20): MIN **2"** MAX **2"**	WARNING ALARM? ○ YES ○ NO
RESISTIVITY OF POLLUTANT (OHM-CM): **N/A**	GAS CONDITIONING: ○ YES ◉ NO TYPE OF AGENT (IF YES):
INLET GAS TEMPERATURE (°F): **240 °F nominal**	OUTLET GAS TEMPERATURE (°F): **180 °F nominal**
VOLUME OF GAS HANDLED (ACFM): **117,000**	INLET MOISTURE PERCENT: MIN **40%** MAX **50%**
POWER REQUIREMENTS	IS AN ENERGY MANAGEMENT SYSTEM USED? ○ YES ○ NO

FIELD NO.	*NO. OF SETS*	*CHARGING*	*EACH TRANSFORMER (kVA)*	*EACH RECTIFIER Kv Ave/Peak Ma Dc*
1	1		118	83 / 1265
2	1		118	83 / 1265

POLLUTANT(S) COLLECTED:	$PM / PM_{10} / PM_{2.5}$			
BEFORE CONTROL EMISSION RATE (LB/HR):	150.00			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE STARTUP PROCEDURES:
See attached

DESCRIBE MAINTENANCE PROCEDURES:
See attached

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:
NOAH

DESCRIBE ANY MONITORING DEVICES, GAUGES, OR TEST PORTS AS ATTACHMENTS:
PLC

ATTACH A DIAGRAM OF THE TOP VIEW OF THE ESP WITH DIMENSIONS (include at a minimum the plate spacing and wire spacing and indicate the electrode type), AND THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

Attach Additional Sheets As Necessary

Source Specific Forms - Hammermills & Hammermill Area

ES-HM-1 THUR 7

ES-HM-8 ADD

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B

EMISSION SOURCE DESCRIPTION: **Eight (8) Hammermills**	EMISSION SOURCE ID NO: **ES-HM-1 thru 8**
	CONTROL DEVICE ID NO(S): **CD-HM-CYC-1 through 8** / **CD-HM-BF1 through 3**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-2**

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Dried materials are reduced to the appropriate size needed for pelletization using eight hammermills.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1) ☐ Woodworking (Form B4) ☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2) ☐ Coating/finishing/printing (Form B5) ☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3) ☐ Storage silos/bins (Form B6) ■ Other (Form B9)

START CONSTRUCTION DATE: | OPERATION DATE: **4/22/2013** | DATE MANUFACTURED:
MANUFACTURER / MODEL NO.: **Bliss Hammermill ERD-44** | EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): | NESHAP (SUBPART?): | MACT (SUBPART?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760** | VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B9

EMISSION SOURCE DESCRIPTION: Eight (8) Hammermills	EMISSION SOURCE ID NO: ES-HM-1 thru 8
	CONTROL DEVICE ID NO(S): CD-HM-CYC-1 through 8
OPERATING SCENARIO: 1 OF 1	CD-HM-BF1 through 3
	EMISSION POINT (STACK) ID NO(S): EP-2 through 4

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Dried materials are reduced to the appropriate size needed for pelletization using eight hammermills.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Dried Wood	ODT	71.71	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C4
CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C4

CONTROL DEVICE ID NO: **CD-HM-CYC-1 thru -8**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-HM-1 through-8**
EMISSION POINT (STACK) ID NO(S): **EP-2**	POSITION IN SERIES OF CONTROLS NO. **1** OF **2** UNITS
MANUFACTURER: **Aircon AC-96**	MODEL NO: **AC-96**
DATE MANUFACTURED:	PROPOSED OPERATION DATE: **1Q2014**
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION I **TBD**
1 OF **1**	P.E. SEAL REQUIRED (PER 2Q .0112)? (YES) ○ NO

DESCRIBE CONTROL SYSTEM :
One cyclone is equipped for each hammermill to capture bulk PM emissions. The emissions from the cyclone are then routed to one of three bagfilters.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANT(S) COLLECTED:				
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
CAPTURE EFFICIENCY:	98.0%	98.0%	98.0%	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN MAX **6.0"** WARNING ALARM? ○ YES ○ NO	
INLET TEMPERATURE (°F): MIN **MAX** **Ambient**	OUTLET TEMPERATURE (°F): MIN MAX **Ambient**
INLET AIR FLOW RATE (ACFM): **15,000 each cyclone**	BULK PARTICLE DENSITY (LB/FT^3): **1.43E-03**
POLLUTANT LOADING RATE (GR/FT^3): **10 gr/cf inlet**	

SETTLING CHAMBER	CYCLONE			MULTICYCLONE
LENGTH (INCHES):	INLET VELOCITY (FT/SEC): **114.65**		● CIRCULAR ○ RECTANGLE	NO. TUBES:
WIDTH (INCHES):	*DIMENSIONS (INCHES) See instructions*		*IF WET SPRAY UTILIZED*	DIAMETER OF TUBES:
HEIGHT (INCHES):	H: **60**	Dd: **20**	LIQUID USED:	HOPPER ASPIRATION SYSTEM?
VELOCITY (FT/SEC.):	W: **32.25**	Lb: **60**	FLOW RATE (GPM):	○ YES ○ NO
NO. TRAYS:	De: **45**	Lc: **120**	MAKE UP RATE (GPM):	LOUVERS?
NO. BAFFLES:	D: **96**	S: **64.75**		○ YES ○ NO
	TYPE OF CYCLONE: ● CONVENTIONAL		○ HIGH EFFICIENCY	○ OTHER

DESCRIBE MAINTENANCE PROCEDURES:
Periodic inspection of mechanical integrity during plant outages as specified by manufacturer

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE INCOMING AIR STREAM:
The material will be pulled through the cyclone under negative pressure. The cyclone will separate the material from the air stream and the air will discharge to an associated bag filter prior to being discharge to atmosphere via a discharge stack common to all fitlers in this area.

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:
None

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

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: CD-HM-BF-1 and 2	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-HM-1 through 6
EMISSION POINT (STACK) ID NO(S): EP-2	POSITION IN SERIES OF CONTROLS NO. 2 OF 2 UNITS
MANUFACTURER: Aircon	MODEL NO: Aircon 16 RAB 412-10
DATE MANUFACTURED:	PROPOSED OPERATION DATE: 1Q2014
OPERATING SCENARIO: 1 OF 1	PROPOSED START CONSTRUCTION DATE: TBD
	P.E. SEAL REQUIRED (PER 2Q .0112)? ◉ YES ○ NO

DESCRIBE CONTROL SYSTEM:
Three (3) bagfilters will be utilized for emission control on eight hammermill cyclones. HMs 1 - 3 vent through bagfilter 1, HMs 4-6 vent through bagfilter 2 and the 7 and 8 cyclones will be routed routed to the third bagfilter along with hammermill area emissions.

POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
CAPTURE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN: MAX: 6"	GAUGE? ◉ YES ○ NO	WARNING ALARM? ◉ YES ○ NO	
BULK PARTICLE DENSITY (LB/FT^3): 1.43E-05	INLET TEMPERATURE (°F): 120		
POLLUTANT LOADING RATE: 0.1 gr/cf inlet	○ LB/HR ◉ GR/FT^3	OUTLET TEMPERATURE (°F): 100	
INLET AIR FLOW RATE (ACFM): 45,000		FILTER MAX OPERATING TEMP. (°F): N/A	
NO. OF COMPARTMENTS: 1	NO. OF BAGS PER COMPARTMENT: 412	LENGTH OF BAG (IN.): 144	
DIAMETER OF BAG (IN.): 5.75	DRAFT: ○ INDUCED/NEG. ◉ FORCED/POS	FILTER SURFACE AREA (FT^2): 6,250	
AIR TO CLOTH RATIO: 7.20	FILTER MATERIAL: Polyester or equivalent	○ WOVEN ◉ FELTED	

DESCRIBE CLEANING PROCEDURES:
- ○ AIR PULSE
- ◉ REVERSE FLOW
- ○ MECHANICAL/SHAKER
- ○ OTHER
- ○ SONIC
- ○ SIMPLE BAG COLLAPSE
- ○ RING BAG COLLAPSE

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particles. Larger particles will have been removed by the upstream cyclone.

METHOD FOR DETERMINING WHEN TO CLEAN:
◉ AUTOMATIC ○ TIMED ○ MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
○ ALARM ◉ INTERNAL INSPECTION ○ VISIBLE EMISSION ○ OTHER

SPECIAL CONDITIONS: None
○ MOISTURE BLINDING ○ CHEMICAL RESISTIVITY ○ OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: **Per manufacturer recommendations**

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

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: CD-HM-BF-3	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-HM-7, HM-8, and ES-NDS
EMISSION POINT (STACK) ID NO(S): EP-2	POSITION IN SERIES OF CONTROLS NO. 2 OF 2 UNITS
MANUFACTURER: Aircon	MODEL NO: 16 RAB 412-10
DATE MANUFACTURED:	PROPOSED OPERATION DATE: 1Q2014
OPERATING SCENARIO: 1 OF 1	PROPOSED START CONSTRUCTION DATE: TBD
	P.E. SEAL REQUIRED (PER 2Q .0112)? ◉ YES ○ NO

DESCRIBE CONTROL SYSTEM:
Three (3) bagfilters will be utilized for emission control on seven of the hammermill cyclones. HMs 1 - 3 vent through bagfilter 1, HMs 4-6 vent through bagfilter 2 and the 7 and 8 cyclones will be routed routed to the third bagfilter along with hammermill area emissions.

POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
CAPTURE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN: MAX: 6" GAUGE? ◉ YES ○ NO WARNING ALARM? ◉ YES ○ NO

BULK PARTICLE DENSITY (LB/FT³):	1.43E-05	INLET TEMPERATURE (°F):	120
POLLUTANT LOADING RATE:	0.1 gr/cf inlet ○ LB/HR ◉ GR/FT³	OUTLET TEMPERATURE (°F):	100
INLET AIR FLOW RATE (ACFM):	45,000	FILTER MAX OPERATING TEMP. (°F):	N/A
NO. OF COMPARTMENTS:	1	NO. OF BAGS PER COMPARTMENT:	412
DIAMETER OF BAG (IN.):	5.75	DRAFT: ○ INDUCED/NEG. ◉ FORCED/POS	
AIR TO CLOTH RATIO:	7.20	FILTER MATERIAL: Polyester or equivalent	
LENGTH OF BAG (IN.):	144		
FILTER SURFACE AREA (FT²):	6,250		
		○ WOVEN ◉ FELTED	

DESCRIBE CLEANING PROCEDURES:
- ○ AIR PULSE
- ◉ REVERSE FLOW
- ○ MECHANICAL/SHAKER
- ○ OTHER
- ○ SONIC
- ○ SIMPLE BAG COLLAPSE
- ○ RING BAG COLLAPSE

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particles. Larger particles will have been removed by the upstream cyclone. The filters will discharge to a common stack. This stack will also accept the discharge air flow from a third bag filter (CD-HMA-BF) (located in this area.)

METHOD FOR DETERMINING WHEN TO CLEAN:
◉ AUTOMATIC ○ TIMED ○ MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
○ ALARM ◉ INTERNAL INSPECTION ○ VISIBLE EMISSION ○ OTHER

SPECIAL CONDITIONS: None
○ MOISTURE BLINDING ○ CHEMICAL RESISTIVITY ○ OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: **Per manufacturer recommendations**

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

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B

EMISSION SOURCE DESCRIPTION: **Nuisance Dust System/ Hammermill Area**	EMISSION SOURCE ID NO: **ES-NDS**
	CONTROL DEVICE ID NO(S): **CD-HM-BF-3**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-2**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Hammermill area dust from the hammermill and screening operations will be vented to the hammermill bagfilter No. 3 (CD-HM-BF-3) to control particulate matter emissions.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1) ☐ Woodworking (Form B4) ☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2) ☐ Coating/finishing/printing (Form B5) ☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3) ☐ Storage silos/bins (Form B6) ■ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%** SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B9**

EMISSION SOURCE DESCRIPTION: **Nuisance Dust System/ Hamermill Area**	EMISSION SOURCE ID NO: **ES-NDS**
	CONTROL DEVICE ID NO(S): **CD-HM-BF3**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-2**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Hammermill area dust from the hammermill and screening operations will be vented to the hammermill bagfilter No. 3 (CD-HM-BF-3) to control particulate matter emissions.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Dried Wood	**ODT**	**71.71**	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):	(BATCHES/YR):
REQUESTED LIMITATION (BATCHES / HOUR):	
FUEL USED: **N/A**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): **N/A**
MAX. CAPACITY HOURLY FUEL USE: **N/A**	REQUESTED CAPACITY ANNUAL FUEL USE: **N/A**

COMMENTS:

Attach Additional Sheets as Necessary

Source Specific Forms - Pellet Presses & Coolers

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B

EMISSION SOURCE DESCRIPTION: **Pellet Coolers**	EMISSION SOURCE ID NO: **ES-CLR-1 through 6**
OPERATING SCENARIO **1** OF **1**	CONTROL DEVICE ID NO(S): **CD-CLR-1 through 6**
	EMISSION POINT (STACK) ID NO(S): **EP-10 through 15**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Six (6) Pellet Coolers follow the pellet presses to cool the newly formed pellets down to an acceptable storage temperature.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manufact. of chemicals/coatings/inks (Form B7)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ☐ Storage silos/bins (Form B6)
- ■ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:	
MANUFACTURER / MODEL NO.: **Kahl Press 60-1250**		EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%**	SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY		

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix B						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B9**

EMISSION SOURCE DESCRIPTION: **Pellet Coolers**	EMISSION SOURCE ID NO: **ES-CLR1 through 6**
	CONTROL DEVICE ID NO(S): **CD-CLR-1 through 6**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-10 through 15**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Six (6) Pellet Coolers follow the pellet presses to cool the newly formed pellets down to an acceptable storage temperature.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS TYPE	UNITS	MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
Dried Wood	**ODT**	**76.07**	

MATERIALS ENTERING PROCESS - BATCH OPERATION TYPE	UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	(BATCHES/YR):
REQUESTED LIMITATION (BATCHES / HOUR):	
FUEL USED: **N/A**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): **N/A**
MAX. CAPACITY HOURLY FUEL USE: **N/A**	REQUESTED CAPACITY ANNUAL FUEL USE: **N/A**

COMMENTS:

Attach Additional Sheets as Necessary

FORM C4
CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C4

CONTROL DEVICE ID NO: **CD-CLR-1 through 6**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-CLR1 through 6**
EMISSION POINT (STACK) ID NO(S): **EP-10 through 15**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
MANUFACTURER: **Aircon HE54**	MODEL NO: Aircon HE54
DATE MANUFACTURED:	PROPOSED OPERATION DATE: 4/22/2013
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE:
1 OF 1	P.E. SEAL REQUIRED (PER 2Q .0112)? ◉ YES ○ NO

DESCRIBE CONTROL SYSTEM:
Six (6) identical high efficiency cyclones are to be used to capture bulk PM emissions from six (6) pellet coolers. Each cooler vents to one dedicated cyclone. The cyclones will operate under negative pressure.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANT(S) COLLECTED:	PM	PM_{10}	$PM_{2.5}$	
BEFORE CONTROL EMISSION RATE (LB/HR):	See Emissions Calculations in Appendix B			
CAPTURE EFFICIENCY:	90+ %	90+ %	90+ %	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See Emissions Calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN MAX **6.0"**	WARNING ALARM? ○ YES ○ NO
INLET TEMPERATURE (°F): MIN **MAX** **Ambient**	OUTLET TEMPERATURE (°F): MIN MAX **Ambient**
INLET AIR FLOW RATE (ACFM): **21,000 each**	BULK PARTICLE DENSITY (LB/FT^3): **2.86E-05**
POLLUTANT LOADING RATE (GR/FT^3): **0.2**	

SETTLING CHAMBER	CYCLONE			MULTICYCLONE
LENGTH (INCHES):	INLET VELOCITY (FT/SEC): **94.75**		○ CIRCULAR ○ RECTANGLE	NO. TUBES:
WIDTH (INCHES):	*DIMENSIONS (INCHES) See instructions*		*IF WET SPRAY UTILIZED*	DIAMETER OF TUBES:
HEIGHT (INCHES):	H: **38**	Dd: **22**	LIQUID USED:	HOPPER ASPIRATION SYSTEM?
VELOCITY (FT/SEC.):	W: **25**	Lb: **74.25**	FLOW RATE (GPM):	○ YES ○ NO
NO. TRAYS:	De: **32**	Lc: **84.5**	MAKE UP RATE (GPM):	LOUVERS?
NO. BAFFLES:	D: **54**	S: **44.38**		○ YES ○ NO
	TYPE OF CYCLONE: ○ CONVENTIONAL		◉ HIGH EFFICIENCY	○ OTHER

DESCRIBE MAINTENANCE PROCEDURES:
Periodic inspection of mechanical integrity during plant outages as specified by manufacturer

DESCRIBE INCOMING AIR STREAM:
The cyclones used for particulate capture the pellet coolers will be ducted to a discharge stack. The stack will be common to all cooler aspiration systems.

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:
None

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

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

Source Specific Forms - Pellet Mill Feed Silo

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **Pellet Mill Feed Silo**	EMISSION SOURCE ID NO: **ES-PMFS**
OPERATING SCENARIO **1** OF **1**	CONTROL DEVICE ID NO(S): **CD-PMFS-BV**
	EMISSION POINT (STACK) ID NO(S): **EP-3**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
A pellet press silo stores dried ground wood prior to transport to the pellet presses.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B5)	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	■ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.: **Laidig 533**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%** SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B6**

EMISSION SOURCE DESCRIPTION: **Pellet Mill Feed Silo**	EMISSION SOURCE ID NO: **ES-PMFS**
	CONTROL DEVICE ID NO(S): **CD-PMFS-BV**
OPERATING SCENARIO: ____ OF ____	EMISSION POINT(STACK) ID NO(S): **EP-3**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

A pellet press silo stores dried ground wood prior to transport to the pellet presses.

MATERIAL STORED: — DENSITY OF MATERIAL (LB/FT3): **40**

CAPACITY	CUBIC FEET:			TONS:		
DIMENSIONS (FEET)	HEIGHT:	DIAMETER:	***(OR)***	LENGTH:	WIDTH:	HEIGHT:
ANNUAL PRODUCT THROUGHPUT (TONS)	ACTUAL:			MAXIMUM DESIGN CAPACITY:		

PNEUMATICALLY FILLED	MECHANICALLY FILLED		FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	MOTOR HP:	☐ RAILCAR
☐ COMPRESSOR	☑ BELT CONVEYOR		☐ TRUCK
☐ OTHER:	☐ BUCKET ELEVATOR		☐ STORAGE PILE
	☐ OTHER:		☑ OTHER: **Conveyor**

NO. FILL TUBES:

MAXIMUM ACFM:

MATERIAL IS FILLED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **105**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **105**

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: **CD-PMFS-BV** | CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-PMFS**

EMISSION POINT (STACK) ID NO(S): **EP-3** | POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS

MANUFACTURER: **Aircon BV25-6** | MODEL NO: Aircon BV25-6

DATE MANUFACTURED: | PROPOSED OPERATION DATE: 4/22/2013

OPERATING SCENARIO: | PROPOSED START CONSTRUCTION DATE:

1 OF **1** | P.E. SEAL REQUIRED (PER 2Q .0112)? ◉ YES ○ NO

DESCRIBE CONTROL SYSTEM:
A bin vent filter is used to create a slight negative pressure on the Pellet Mill Feed Silo. The bin vent collects dust from the air volume present in the silo. The bin vent is sized to offset the air displacement created by the material feed to the silo.

POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN: MAX: 4" GAUGE? ◉ YES ○ NO WARNING ALARM? ◉ YES ○ NO

BULK PARTICLE DENSITY (LB/FT^3): **1.43E-06** | INLET TEMPERATURE (°F): **Ambient**

POLLUTANT LOADING RATE: **0.1** ○ LB/HR ◉ GR/FT^3 | OUTLET TEMPERATURE (°F): **Ambient**

INLET AIR FLOW RATE (ACFM): | FILTER MAX OPERATING TEMP. (°F): **N/A**

NO. OF COMPARTMENTS: **1** | NO. OF BAGS PER COMPARTMENT: **1** | LENGTH OF BAG (IN.): **120**

DIAMETER OF BAG (IN.): **5.875** | DRAFT: ◉ INDUCED/NEG. ○ FORCED/POS | FILTER SURFACE AREA (FT^2): **377**

AIR TO CLOTH RATIO: **6** | FILTER MATERIAL: ○ WOVEN ◉ FELTED

DESCRIBE CLEANING PROCEDURES:
- ◉ **AIR PULSE**
- ○ REVERSE FLOW
- ○ MECHANICAL/SHAKER
- ○ OTHER
- ○ SONIC
- ○ SIMPLE BAG COLLAPSE
- ○ RING BAG COLLAPSE

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particulate emissions

METHOD FOR DETERMINING WHEN TO CLEAN:
○ AUTOMATIC ◉ **TIMED** ○ MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
○ ALARM ◉ INTERNAL INSPECTION ○ VISIBLE EMISSION ○ **OTHER**

SPECIAL CONDITIONS: **None**
○ MOISTURE BLINDING ○ CHEMICAL RESISTIVITY ○ OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: **Per manufacturer recommendations**

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

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

Source Specific Forms - Pellet Fines Bin

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** — B

EMISSION SOURCE DESCRIPTION: **Pellet Fines Bin**	EMISSION SOURCE ID NO: **ES-PFB**
	CONTROL DEVICE ID NO(S): **CD-PFB-BV**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-7**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Fine pellet material from hammermill pollution control system and screening operation is collected in the pellet fines bin which is controlled by a bin vent filter.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manufact. of chemicals/coatings/inks (Form B7)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ■ Storage silos/bins (Form B6)
- ☐ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.: **Aircon**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%** SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B6**

EMISSION SOURCE DESCRIPTION: **Pellet Fines Bin**	EMISSION SOURCE ID NO: **ES-PFB**
	CONTROL DEVICE ID NO(S): **CD-PFB-BV**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **EP-7**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Fine pellet material from hammermill pollution control system and screening operation is collected in the pellet fines bin which is controlled by a bin vent filter.

MATERIAL STORED: **Fine pellet material**			DENSITY OF MATERIAL (LB/FT3): **40**		
CAPACITY	CUBIC FEET: **2200**		TONS:		
DIMENSIONS (FEET)	HEIGHT:	DIAMETER: **12** ***(OR)***	LENGTH:	WIDTH:	HEIGHT:
ANNUAL PRODUCT THROUGHPUT (TONS)	ACTUAL:		MAXIMUM DESIGN CAPACITY: **6 tph**		

PNEUMATICALLY FILLED	MECHANICALLY FILLED		FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	MOTOR HP:	☐ RAILCAR
☐ COMPRESSOR	☑ BELT CONVEYOR		☐ TRUCK
☐ OTHER:	☐ BUCKET ELEVATOR		☐ STORAGE PILE
	☐ OTHER:		☑ OTHER: **Conveyor**

NO. FILL TUBES:

MAXIMUM ACFM:

MATERIAL IS FILLED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** — C1

CONTROL DEVICE ID NO: **CD-PFB-BV**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-PFB**
EMISSION POINT (STACK) ID NO(S): **EP-7**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1 UNITS**
MANUFACTURER: **Aircon**	MODEL NO: **36-6**
DATE MANUFACTURED:	PROPOSED OPERATION DATE: **4/22/2013**
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE:
1 OF **1**	P.E. SEAL REQUIRED (PER 2Q .0112)? (•) YES ( ) NO

DESCRIBE CONTROL SYSTEM:
A bin vent baghouse collects dust from when wood enters or exits the silo and displaces air.

POLLUTANT(S) COLLECTED:	PM	PM_{10}	$PM_{2.5}$	
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
CAPTURE EFFICIENCY:	~99 %	~99 %	~99 %	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN: **TBD** MAX: **TBD** GAUGE? (•) YES ( ) NO WARNING ALARM? (•) YES ( ) NO

BULK PARTICLE DENSITY (LB/FT^3): **1.43E-05**	INLET TEMPERATURE (°F): **Ambient**
POLLUTANT LOADING RATE: **0.1** ( ) LB/HR (•) GR/FT^3	OUTLET TEMPERATURE (°F): **Ambient**
INLET AIR FLOW RATE (ACFM): **3,600**	FILTER MAX OPERATING TEMP. (°F): **N/A**

NO. OF COMPARTMENT: **TBD**	NO. OF BAGS PER COMPARTMENT: **TBD**	LENGTH OF BAG (IN.): **TBD**
DIAMETER OF BAG (IN.):	DRAFT: (•) INDUCED/NEG. ( ) FORCED/POS.	FILTER SURFACE AREA (FT^2): **325**
AIR TO CLOTH RATIO: **11.08**	FILTER MATERIAL:	( ) WOVEN ( ) FELTED

DESCRIBE CLEANING PROCEDURES:
( ) AIR PULSE ( ) SONIC
( ) REVERSE FLOW ( ) SIMPLE BAG COLLAPSE
( ) MECHANICAL/SHAKER ( ) RING BAG COLLAPSE
(•) OTHER

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particles

PARTICLE SIZE DISTRIBUTION

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

METHOD FOR DETERMINING WHEN TO CLEAN:
(•) AUTOMATIC ( ) TIMED ( ) MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
( ) ALARM (•) INTERNAL INSPECTION ( ) VISIBLE EMISSION ( ) OTHER

SPECIAL CONDITIONS:
( ) MOISTURE BLINDING ( ) CHEMICAL RESISTIVITY ( ) OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES:
Per manufacturer recommendations or common industry practices.

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

Attach Additional Sheets As Necessary

Specific Forms - Final Product Handling

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

B

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate

EMISSION SOURCE DESCRIPTION: **Finished Product Handling/ Pellet Loadout Bins / Pellet Loadout**	EMISSION SOURCE ID NO: **ES-FPH, ES-PB, ES-PL1 and 2**
OPERATING SCENARIO **1** OF **1**	CONTROL DEVICE ID NO(S): **CD-FPH-BF**
	EMISSION POINT (STACK) ID NO(S): **EP-8**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Pelletized product is conveyed to pellet loadout bins that feed two pellet loadout operations (ES-PL-1, -2). Emissions from the Pellet Loadout Bins are controlled by a bagfilter. Pellet Loadout is accomplished by gravity feed of the pellets into trucks through a covered shoot that automatically telescopes upward during the loadout process to maintain constant contact with product as it is loaded to prevent emissions. Although emissions to the atmosphere from conveyance from the storage bins are minimal because of dried wood fines have been removed in the pellet coolers, a slight negative pressure is maintained in the loadout building a fire prevention measure to prevent any buildup of dust on surfaces within the building. The slight negative pressure is produced via an induced draft fan that exhausts to the same bagfilter that controls minor dust emissions from loading of the pellet press silo. Trucks are covered immediately after loading.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1) ☐ Woodworking (Form B4) ☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2) ☐ Coating/finishing/printing (Form B5) ☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3) ■ Storage silos/bins (Form B6) ■ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:	
MANUFACTURER / MODEL NO.:	**Agra 1200 Pellet Storage**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESHAP (SUBPART?):	MACT (SUBPART?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%**	SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY		

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B9**

EMISSION SOURCE DESCRIPTION: **Finished Product Handling**	EMISSION SOURCE ID NO: **ES-FPH**
	CONTROL DEVICE ID NO(S): **CD-FPH-BF**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-8**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Collection of transfer points, pellet screening operations, and pellet conveying.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Dried Wood	**ODT**	**74.94**	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):		
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):	
FUEL USED: **N/A**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):	**N/A**
MAX. CAPACITY HOURLY FUEL USE: **N/A**	REQUESTED CAPACITY ANNUAL FUEL USE:	**N/A**

COMMENTS:

Attach Additional Sheets as Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B6**

EMISSION SOURCE DESCRIPTION: **Pellet Loadout Bins**	EMISSION SOURCE ID NO: **ES-PB**
	CONTROL DEVICE ID NO(S): **CD-FPH-BF**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **EP-8**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Pellet loadout bins are used to store pellets for shipping. Pellets are then loaded from the bins into trucks/train in either of the two pellet loadout areas.

MATERIAL STORED: **Pellet Product**				DENSITY OF MATERIAL (LB/FT3): **40**		
CAPACITY	CUBIC FEET:			TONS:		
DIMENSIONS (FEET)	HEIGHT:	DIAMETER: **12**	***(OR)***	LENGTH:	WIDTH:	HEIGHT:
ANNUAL PRODUCT THROUGHPUT (TONS)	ACTUAL:			MAXIMUM DESIGN CAPACITY:	**71.19 ODT/hr**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED		FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	MOTOR HP:	☐ RAILCAR
☐ COMPRESSOR	☑ BELT CONVEYOR		☐ TRUCK
☐ OTHER:	☐ BUCKET ELEVATOR		☐ STORAGE PILE
	☐ OTHER:		☑ OTHER: **Conveyor**

NO. FILL TUBES:

MAXIMUM ACFM: **750 each**

MATERIAL IS FILLED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):

COMMENTS:

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B9

EMISSION SOURCE DESCRIPTION: **Pellet Loadout 1 and 2**	EMISSION SOURCE ID NO: **ES-PL-1 and PL-2**
	CONTROL DEVICE ID NO(S): **CD-FPH-BF**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-8**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Final product is loaded into trucks in either of the two (2) pellet loadout areas.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN CAPACITY (ODT)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
TYPE	UNITS		
Dried Wood	**ODT**	**70.83**	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
TYPE	UNITS		

MAXIMUM DESIGN (BATCHES / HOUR):			
REQUESTED LIMITATION (BATCHES / HOUR):		(BATCHES/YR):	
FUEL USED: **N/A**		TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):	**N/A**
MAX. CAPACITY HOURLY FUEL USE:	**N/A**	REQUESTED CAPACITY ANNUAL FUEL USE:	**N/A**

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: CD-FBH-BF	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-FPH, ES-PB-1 through 12, ES-PL1 and 2
EMISSION POINT (STACK) ID NO(S): EP-8	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
MANUFACTURER: Aircon	MODEL NO: Aircon 13.5 RAW 268-10
DATE MANUFACTURED:	PROPOSED OPERATION DATE: 4/22/2013
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE:
1 OF 1	P.E. SEAL REQUIRED (PER 2Q .0112)? ◉ YES ○ NO

DESCRIBE CONTROL SYSTEM:

This bagfilter will be utilized to control particulate form the finished product handling pellet conveyers and screens, as well as the pellet load out operation consisting of loading finished product from the bins into the trucks.

POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
CAPTURE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN: MAX: 6"	GAUGE? ◉ YES ○ NO	WARNING ALARM? ◉ YES ○ NO	
BULK PARTICLE DENSITY (LB/FT^3): 1.43E-05	INLET TEMPERATURE (°F): 120		
POLLUTANT LOADING RATE: 0.10 ○ LB/HR ◉ GR/FT^3	OUTLET TEMPERATURE (°F): 100		
INLET AIR FLOW RATE (ACFM): 35,500	FILTER MAX OPERATING TEMP. (°F): N/A		
NO. OF COMPARTMENTS: 1	NO. OF BAGS PER COMPARTMENT:	LENGTH OF BAG (IN.): 144	
DIAMETER OF BAG (IN.): 5.75	DRAFT: ○ INDUCED/NEG. ◉ FORCED/POS	FILTER SURFACE AREA (FT^2): 4,842	
AIR TO CLOTH RATIO: 7.30	FILTER MATERIAL: Polyester or equivalent	○ WOVEN ◉ FELTED	

DESCRIBE CLEANING PROCEDURES:

- ◉ AIR PULSE
- ◉ REVERSE FLOW
- ○ MECHANICAL/SHAKER
- ○ OTHER
- ○ SONIC
- ○ SIMPLE BAG COLLAPSE
- ○ RING BAG COLLAPSE

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE INCOMING AIR STREAM:

The air stream will contain wood dust particles.

METHOD FOR DETERMINING WHEN TO CLEAN:
◉ AUTOMATIC ○ TIMED ○ MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
○ ALARM ◉ INTERNAL INSPECTION ○ VISIBLE EMISSION ○ OTHER

SPECIAL CONDITIONS: None
○ MOISTURE BLINDING ○ CHEMICAL RESISTIVITY ○ OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: **Per manufacturer recommendations**

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

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

Source Specific Forms - Emergency Generator & Fire pump

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B

EMISSION SOURCE DESCRIPTION: **Emergency Generator (350 bhp)**	EMISSION SOURCE ID NO: **ES-EG**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-4**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Diesel-fired internal combustion generator to provide power in the case of an emergency.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ■ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manufact. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☐ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE: **4/22/2013**	DATE MANUFACTURED:	
MANUFACTURER / MODEL NO.: **Generac SD200**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR		
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): **IIII**	NESHAP (SUBPART?):	MACT (SUBPART?): **ZZZZ**	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%**	SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **500**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY		

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
	See Emission Calculations in Appendix B						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
	See Emission Calculations in Appendix B			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATORS)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B2

EMISSION SOURCE DESCRIPTION: **Emergency Generator**

EMISSION SOURCE ID NO: **ES-GN**
CONTROL DEVICE ID NO(S): **N/A**
EMISSION POINT (STACK) ID NO(S): **EP-4**

OPERATING SCENARIO: 1 OF 1

CHECK ALL THAT APPLY ☑ EMERGENCY ☐ SPACE HEAT ☐ ELECTRICAL GENERATION ☐ PEAK SHAVER ☐ OTHER (DESCRIBE):

GENERATOR OUTPUT (KW):
ANTICIPATED ACTUAL HOURS OF OPERATION AS PEAK SHAVER (HRS/YR):
ENGINE OUTPUT (HP):

TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 HP ☐ DIESEL ENGINE GREATER THAN 600 HP (complete below) ☐ DUAL FUEL ENGINE ☐ OTHER (DESCRIBE):

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN (N/A)
EMISSION REDUCTION MODIFICATIONS ☐ INJECTION TIMING RETARD ☐ PREIGNITION CHAMBER COMBUSTION ☐ OTHER

OR ☐ STATIONARY GAS TURBINE (complete below)

FUEL: ☐ NATURAL GAS ☐ OIL ☐ OTHER (DESCRIBE):
CYCLE: ☐ COGENERATION ☐ SIMPLE ☐ REGENERATIVE ☐ COMBINED
CONTROLS: ☐ WATER-STEAM INJECTION ☐ UNCONTROLLED ☐ LEAN-PREMIX

☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

ENGINE TYPE: ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE ☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE):
CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): ☐ NONSELECTIVE CATALYTIC REDUCTION ☐ SELECTIVE CATALYTIC REDUCTION ☐ CLEAN BURN AND PRECOMBUSTION CHAMBER ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
No. 2 Fuel Oil	**gal**	**6.55**	**6.55**

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
No. 2 Fuel Oil	**19,300**	**lb**	**<15 ppmw**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

DESCRIBE METHODS TO MINIMIZE VISIBLE EMISSIONS DURING IDLING, OR LOW LOAD OPERATIONS:
Periodic equipment maintenance will minimize opacity by following manufacturers specification or common industry practices.

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — B

EMISSION SOURCE DESCRIPTION: **Fire Water Pump (300 bhp)**	EMISSION SOURCE ID NO: **ES-FWP**
OPERATING SCENARIO **1** OF **1**	CONTROL DEVICE ID NO(S): **N/A**
	EMISSION POINT (STACK) ID NO(S): **EP-5**

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Diesel-fired internal combustion pump to provide water in the case of a fire emergency.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manufact. of chemicals/coatings/inks (Form B7)
- ■ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ☐ Storage silos/bins (Form B6)
- ☐ Other (Form B9)

START CONSTRUCTION DATE:	OPERATION DATE:
DATE MANUFACTURED: **2012**	
MANUFACTURER / MODEL NO.: **Clarke/John Deere PE6068L220451**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?): **IIII**	NESHAP (SUBPART?): MACT (SUBPART?): **ZZZZ**
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **100**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (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
	See Emission Calculations in Appendix B						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
	See Emission Calculations in Appendix B			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATORS)

REVISED 12/01/01 — **NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate** — **B2**

EMISSION SOURCE DESCRIPTION: **Fire Water Pump**	EMISSION SOURCE ID NO: **ES-FWP**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-5**

CHECK ALL THAT APPLY ☝ EMERGENCY ☝ SPACE HEAT ☝ ELECTRICAL GENERATION ☝ PEAK SHAVER ☝ OTHER (DESCRIBE):

GENERATOR OUTPUT (KW): | ANTICIPATED ACTUAL HOURS OF OPERATION AS PEAK SHAVER (HRS/YR):

ENGINE OUTPUT (HP):

TYPE ICE: ☝ GASOLINE ENGINE ☝ DIESEL ENGINE UP TO 600 HP ☝ DIESEL ENGINE GREATER THAN 600 HP ☝ DUAL FUEL ENGINE ☝ OTHER (DESCRIBE): (complete below)

ENGINE TYPE ☝ RICH BURN ☝ LEAN BURN (N/A)

EMISSION REDUCTION MODIFICATIONS ☝ INJECTION TIMING RETARD ☝ PREIGNITION CHAMBER COMBUSTION ☝ OTHER

OR ☝ STATIONARY GAS TURBINE (complete below)

FUEL: ☝ NATURAL GAS ☝ OIL ☝ OTHER (DESCRIBE):

CYCLE: ☝ COGENERATION ☝ SIMPLE ☝ REGENERATIVE ☝ COMBINED

CONTROLS: ☝ WATER-STEAM INJECTION ☝ UNCONTROLLED ☝ LEAN-PREMIX

☝ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

ENGINE TYPE: ☝ 2-CYCLE LEAN BURN ☝ 4-CYCLE LEAN ☝ TURBINE ☝ 4-CYCLE RICH BURN ☝ OTHER (DESCRIBE):

CONTROLS: ☝ COMBUSTION MODIFICATIONS (DESCRIBE): ☝ NONSELECTIVE CATALYTIC REDUCTION ☝ SELECTIVE CATALYTIC REDUCTION ☝ CLEAN BURN AND PRECOMBUSTION CHAMBER ☝ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
No. 2 Fuel Oil	**gal**	**6.55**	**6.55**

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
No. 2 Fuel Oil	**19,300**	**lb**	**<15 ppmw**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

DESCRIBE METHODS TO MINIMIZE VISIBLE EMISSIONS DURING IDLING, OR LOW LOAD OPERATIONS:

Periodic equipment maintenance will minimize opacity by following manufacturers specification or common industry practices.

COMMENTS:

Attach Additional Sheets As Necessary

APPENDIX B - EMISSIONS CALCULATIONS

TABLE B-1
FACILITY-WIDE CRITERIA POLLUTANT SUMMARY
ENVIVA PELLETS NORTHAMPTON, LLC

Source Description	Unit ID	CO (tpy)	NOx (tpy)	TSP (tpy)	PM-10 (tpy)	PM-2.5 (tpy)	SO2 (tpy)	Total VOC (tpy)	CO_{2e} biomass defferal (tpy)	CO_{2e} (tpy)
Dryer System	ES-DRYER	60.95	125.50	22.12	22.12	22.12	19.20	189.78	3,341.43	162,118.83
Emergency Generator	ES-EG	0.50	0.58	0.03	0.03	0.03	0.0003	0.0006	93.35	93.35
Fire Water Pump	ES-FWP	0.43	0.49	0.02	0.02	0.02	0.0003	0.0005	80.02	80.02
Hammermills/ Nuisance Dust System	ES-HM-1 thru 8/ ES-NDS	-	-	20.27	20.27	20.27	-	20.45	-	-
Pellet Mill Feed Silo	ES-PMFS	-	-	0.38	0.38	0.38	-	-	-	-
Pellet Mill Fines Bin	ES-PFB	-	-	0.54	0.54	0.54	-	-	-	-
Pellet Presses and Coolers	ES-CLR1 thru -6	-	-	38.52	35.05	21.19	-	17.96	-	-
Log Debarking/Chipping	ES-CHIP-1	-	-	-	-	-	-	0.73	-	-
Rechipping	ES-RCHP-1, -2	-	-	-	-	-	-	1.44	-	-
Finished Product Handling/ Pellet Loadout Bins/ Pellet Loadout Areas	ES-FPH/ ES-PL1 & 2/ ES-PB-1 thru 12	-	-	5.33	4.85	2.93	-	-	-	-
Green Wood Handling				0.016	0.007	0.0011				
Green Wood Piles				2.65	1.33	0.20		2.93		
Dried Wood Handling				0.07	0.03	0.00				
Diesel Storage Tanks	TK1 & TK2	-	-	-	-	-	-	3.79E-03	-	-
	Total Emissions	**61.88**	**126.57**	**89.95**	**84.63**	**67.69**	**19.20**	**233.30**	**3,514.80**	**162,292.20**

ADD MINOR

3.27 TPY

20.87 TPY
13.52 TPY
6.75 TPY ⇒ 1.54 lb/Hr

INCREASE FROM 8TA'

TABLE B-2
FACILITYWIDE HAP EMISSIONS SUMMARY
ENVIVA PELLETS NORTHAMPTON, LLC

Description	ES-DRYER (tpy)	ES-HM1 thru 7 (tpy)	ES-CLR1 thru 6 (tpy)	ES-EG (tpy)	ES-FWP (tpy)	ES-CHIP-1 (tpy)	ES-RCHP-1, -2 (tpy)	Total (tpy)
1,3-Butadiene	-	-	-	2.39E-05	2.05E-05	-	-	4.45E-05
Acetaldehyde	2.94E+00	0.00E+00	0.00E+00	4.70E-04	4.03E-04	-	-	2.94E+00
Acetophenone	2.46E-06	-	-	-	-	-	-	2.46E-06
Acrolein	0.00E+00	0.00E+00	0.00E+00	5.67E-05	4.86E-05	-	-	1.05E-04
Antimony & Compounds	4.40E-04	-	-	-	-	-	-	4.40E-04
Arsenic & Compounds	1.22E-03	-	-	-	-	-	-	1.22E-03
Benzene	-	-	-	5.71E-04	4.90E-04	-	-	1.06E-03
Beryllium metal (un-reacted) (Also include in BEC)	6.12E-05	-	-	-	-	-	-	6.12E-05
Cadmium Metal (elemental un-reacted) –(Add w/CDC)	2.28E-04	-	-	-	-	-	-	2.28E-04
Carbon tetrachloride	3.46E-02	-	-	-	-	-	-	3.46E-02
Chlorine	6.07E-01	-	-	-	-	-	-	6.07E-01
Chlorobenzene	2.53E-02	-	-	-	-	-	-	2.53E-02
Chromium–Other compds (add w/chrom acid to get CRC)	9.74E-04	-	-	-	-	-	-	9.74E-04
Cobalt compounds	3.62E-04	-	-	-	-	-	-	3.62E-04
Chloroform	-	-	-	-	-	-	-	0.00E+00
Cumene	-	-	-	-	-	-	-	0.00E+00
Dinitrophenol, 2,4-	1.38E-04	-	-	-	-	-	-	1.38E-04
Di(2-ethylhexyl)phthalate (DEHP)	3.61E-05	-	-	-	-	-	-	3.61E-05
Ethyl benzene	2.38E-02	-	-	-	-	-	-	2.38E-02
Ethylene dichloride (1,2-dichloroethane)	2.23E-02	-	-	-	-	-	-	2.23E-02
Formaldehyde	5.49E+00	2.45E+00	3.55E-01	7.23E-04	6.20E-04	-	-	8.30E+00
Hydrogen chloride (hydrochloric acid)	1.46E+00	-	-	-	-	-	-	1.46E+00
Lead and Lead compounds	2.67E-03	-	-	-	-	-	-	2.67E-03
m-,p-Xylene	-	-	-	1.75E-04	1.50E-04	-	-	3.24E-04
Manganese & compounds	8.91E-02	-	-	-	-	-	-	8.91E-02
Mercury, vapor (Include in Mercury&Compds)	2.69E-03	-	-	-	-	-	-	2.69E-03
Methanol	4.32E+00	1.48E+00	7.09E-01	-	-	0.16	0.29	6.95E+00
Methyl bromide (bromomethane)	1.15E-02	-	-	-	-	-	-	1.15E-02
Methyl chloride (chloromethane)	1.77E-02	-	-	-	-	-	-	1.77E-02
Methyl chloroform (1,1,1 trichloroethane)	2.38E-02	-	-	-	-	-	-	2.38E-02
Methyl isobutyl ketone	-	-	-	-	-	-	-	0.00E+00
Methylene chloride	-	-	-	-	-	-	-	0.00E+00
Naphthalene	7.45E-02	-	-	-	-	-	-	7.45E-02
Nickel metal (Component of Nickel & Compounds)	2.53E-02	-	-	-	-	-	-	2.53E-02
Nitrophenol, 4-	8.45E-05	-	-	-	-	-	-	8.45E-05
o-Xylene	-	-	-	-	-	-	-	0.00E+00
Pentachlorophenol	3.92E-05	-	-	-	-	-	-	3.92E-05
Perchloroethylene (tetrachloroethylene)	2.92E-02	-	-	-	-	-	-	2.92E-02
Phenol	0.00E+00	0.00E+00	0.00E+00	-	-	-	-	0.00E+00
Phosphorus Metal, Yellow or White	2.07E-02	-	-	-	-	-	-	2.07E-02
Polychlorinated biphenyls	6.26E-06	-	-	-	-	-	-	6.26E-06
Propionaldehyde	5.10E-01	0.00E+00	0.00E+00	-	-	-	-	5.10E-01
Propylene dichloride (1,2 dichloropropane)	2.53E-02	-	-	-	-	-	-	2.53E-02
Selenium compounds	2.15E-03	-	-	-	-	-	-	2.15E-03
Styrene	-	-	-	-	-	-	-	0.00E+00
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	6.60E-09	-	-	-	-	-	-	6.60E-09
Toluene	-	-	-	2.51E-04	2.15E-04	-	-	4.65E-04
Total PAH (POM)	9.60E-02	-	-	1.03E-04	8.82E-05	-	-	9.62E-02
Trichloroethylene	2.30E-02	-	-	-	-	-	-	2.30E-02
Trichlorophenol, 2,4,6-	1.69E-05	-	-	-	-	-	-	1.69E-05
Vinyl chloride	1.38E-02	-	-	-	-	-	-	1.38E-02
TOTAL HAP	**15.89**	**3.93**	**1.06**	**0.002**	**0.002**	**0.16**	**0.29**	**21.34**

TABLE B-3
DETERMINATION OF POLLUTANTS SUBJECT TO AIR TOXICS PERMITTING
ENVIVA PELLETS NORTHAMPTON, LLC

TAP Emissions

Description		Dryer			Hammermills			Pellet Coolers			Emergency Generator			Fire Water Pump			Total		
Pollutant	CAS Number	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)
1,3-Butadiene	106-99-0	-	-	-	-	-	-	-	-	-	0.0001	0.0023	0.0479	0.0001	0.0020	0.0411	1.78E-04	4.27E-03	8.90E-02
Acetaldehyde	75-07-0	7.85E-01	18.840	5,885.28	-	-	-	-	-	-	0.0019	0.0451	0.9396	0.0016	0.0387	0.8054	7.88E-01	1.89E+01	5.89E+03
Acrolein	107-02-8	-	-	-	-	-	-	-	-	-	0.0002	0.0054	0.1133	0.0002	0.0047	0.0971	4.21E-04	1.01E-02	2.10E-01
Arsenic		2.80E-04	0.007	2.45	-	-	-	-	-	-							2.80E-04	6.71E-03	2.45E+00
Benzene	71-43-2	-	-	-	-	-	-	-	-	-	0.0023	0.0549	1.1429	0.0020	0.0470	0.9797	4.25E-03	1.02E-01	2.12E+00
Benzo(a)pyrene	50-32-8	4.56E-04	0.011	3.99	-	-	-	-	-	-	0.0000	0.0000	0.0002	0.0000	0.0000	0.0002	4.57E-04	1.10E-02	3.99E+00
Beryllium metal (un-reacted) (Also include in BEC)		1.40E-05	0.000	0.12	-	-	-	-	-	-							1.40E-05	3.36E-04	1.22E-01
Cadmium Metal (elemental un-reacted) –(Add w/CDC)		5.21E-05	0.001	0.46	-	-	-	-	-	-							5.21E-05	1.25E-03	4.56E-01
Carbon Tetrachloride		7.89E-03	0.189	69.10	-	-	-	-	-	-							7.89E-03	1.89E-01	6.91E+01
Chlorine		1.38E-01	3.324	1,213.15	-	-	-	-	-	-							1.38E-01	3.32E+00	1.21E+03
Chlorobenzene		5.78E-03	0.139	50.68	-	-	-	-	-	-							5.78E-03	1.39E-01	5.07E+01
Chloroform	67-66-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromic acid (Chromium VI)	7738-94-5	4.45E-05	0.001	0.39	-	-	-	-	-	-							4.45E-05	1.07E-03	3.90E-01
Di(2-ethylhexyl)phthalate (DEHP)		8.24E-06	0.000	0.07	-	-	-	-	-	-							8.24E-06	1.98E-04	7.22E-02
Ethylene dichloride (1,2-dichloroethane)		5.08E-03	0.122	44.53	-	-	-	-	-	-							5.08E-03	1.22E-01	4.45E+01
Formaldehyde	50-00-0	1.47E+00	35.168	10,985.85	0.65	15.69	4,902.36	0.09	2.27	709.04	0.0029	0.0694	1.4455	0.0025	0.0595	1.2390	2.22E+00	5.33E+01	1.66E+04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8		2.80E-04	0.007	2.46	-	-	-	-	-	-							2.80E-04	6.73E-03	2.46E+00
Hydrogen chloride (hydrochloric acid)		3.33E-01	7.994	2,917.69	-	-	-	-	-	-							3.33E-01	7.99E+00	2.92E+03
Manganese & compounds		2.03E-02	0.488	178.13	-	-	-	-	-	-							2.03E-02	4.88E-01	1.78E+02
Mercury, vapor (Include in Mercury&Compds)		6.14E-04	0.015	5.37	-	-	-	-	-	-							6.14E-04	1.47E-02	5.37E+00
Methyl chloroform (1,1,1 trichloroethane)		5.43E-03	0.130	47.60	-	-	-	-	-	-							5.43E-03	1.30E-01	4.76E+01
Methyl ethyl ketone		9.47E-04	0.023	8.29	-	-	-	-	-	-							9.47E-04	2.27E-02	8.29E+00
m-,p-Xylene	1330-20-7	-	-	-	-	-	-	-	-	-	0.0007	0.0168	0.3491	0.0006	0.0144	0.2993	1.30E-03	3.11E-02	6.48E-01
Methyl isobutyl ketone	108-10-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	75-09-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel metal (Component of Nickel & Compounds)		5.78E-03	0.139	50.68	-	-	-	-	-	-							5.78E-03	1.39E-01	5.07E+01
Pentachlorophenol		8.94E-06	0.000	0.08	-	-	-	-	-	-							8.94E-06	2.15E-04	7.83E-02
Perchloroethylene (tetrachloroethylene)		6.66E-03	0.160	58.35	-	-	-	-	-	-							6.66E-03	1.60E-01	5.84E+01
Phenol	108-95-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated biphenyls		1.43E-06	0.000	0.01	-	-	-	-	-	-							1.43E-06	3.43E-05	1.25E-02
Styrene	100-42-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-		1.51E-09	0.000	0.00	-	-	-	-	-	-							1.51E-09	3.62E-08	1.32E-05
Toluene	108-88-3	-	-	-	-	-	-	-	-	-	0.0010	0.0240	0.5610	0.0009	0.0206	0.4295	1.86E-03	4.47E-02	9.30E-01
Trichloroethylene		5.26E-03	0.126	46.07	-	-	-	-	-	-							5.26E-03	1.26E-01	4.61E+01
Trichlorofluoromethane (CFC 111)		7.19E-03	0.172	62.96	-	-	-	-	-	-							7.19E-03	1.72E-01	6.30E+01
Vinyl chloride		3.16E-03	0.076	27.64	-	-	-	-	-	-							3.16E-03	7.57E-02	2.76E+01

TPER Comparison Table

Pollutant	CAS Number	Total			TPER (2Q .0711)			Modeling Required?
		(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	
1,3-Butadiene	106-99-0			8.90E-02			1.10E+01	No
Acetaldehyde	75-07-0	7.88E-01			6.80E+00			No
Acrolein	107-02-8	4.21E-04			2.00E-02			No
Arsenic				2.45E+00			1.60E-02	Yes
Benzene	71-43-2			2.12E+00			8.10E+00	No
Benzo(a)pyrene	50-32-8			3.99E+00			2.20E+00	Yes
Beryllium				1.22E-01			2.80E-01	No
Cadmium				4.56E-01			3.70E-01	Yes
Carbon Tetrachloride				6.91E+01			4.60E+02	No
Chlorine		1.38E-01	3.32E+00		2.30E-01	7.90E-01		Yes
Chlorobenzene			1.39E-01			4.60E+01		No
Chloroform	67-66-3			0.00E+00			2.90E+02	No
Chromic acid (Chromium VI)	7738-94-5		1.07E-03			1.30E-02		No
Di(2-ethylhexyl)phthalate (DEHP)			1.98E-04			6.30E-01		No
Ethylene dichloride (1,2-dichloroethane)				4.45E+01			2.60E+02	No
Formaldehyde	50-00-0	2.22E+00			4.00E-02			Yes
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8				2.46E+00			5.10E-03	Yes
Hydrogen chloride (hydrochloric acid)		3.33E-01			1.80E-01			Yes
Manganese & compounds			4.88E-01			6.30E-01		No
Mercury, vapor (Include in Mercury&Compds)			1.47E-02			1.30E-02		Yes
Methyl chloroform (1,1,1 trichloroethane)		5.43E-03	1.30E-01		6.40E+01	2.50E+02		No
Methyl ethyl ketone		9.47E-04	2.27E-02		2.24E+01	7.80E+01		No
Xylene	1330-20-7	1.30E-03	3.11E-02		1.64E+01	5.70E+01		No
Methyl isobutyl ketone	108-10-1	0.00E+00	0.00E+00		7.60E+00	5.20E+01		No
Methylene chloride	75-09-2	0.00E+00		0.00E+00	3.90E-01		1.60E+03	No
Nickel metal (Component of Nickel & Compounds)			1.39E-01			1.30E-01		Yes
Pentachlorophenol		8.94E-06	2.15E-04		6.40E-03	6.30E-02		No
Perchloroethylene (tetrachloroethylene)				5.84E+01			1.30E+04	No
Phenol	108-95-2	0.00E+00			2.40E-01			No
Polychlorinated biphenyls				1.25E-02			5.60E+00	No
Styrene	100-42-5	0.00E+00			2.70E+00			No
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-				1.32E-05			2.00E-04	No
Toluene	108-88-3	1.86E-03	4.47E-02		1.44E+01	9.80E+01		No
Trichloroethylene				4.61E+01			4.00E+03	No
Trichlorofluoromethane (CFC 111)		7.19E-03			1.40E+02			No
Vinyl chloride				2.76E+01			2.60E+01	Yes

TABLE B-4
ROTARY DRYER -CRITERIA POLLUTANT EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Dryer Inputs

Dryer Throughput (@ Dryer Exit)	**575,000**	tons/year @ 6.5% moisture
Annual Dried Wood Throughput of Dryer	**537,625**	ODT/year
Max. Hourly Dried Wood Throughput of Dryer	71.71	ODT/hr
Burner Heat Input	175.3	MMBtu/hr
Percent Hardwood	90%	
Percent Softwood	10%	
Potential Operation	8,760	hr/yr

Do we want to increase production

ODT/hr increase as well?

Criteria Pollutant Calculations:

Pollutant	Biomass Emission Factor (lb/ODT)	Units	Emission Factor Source	Total Potential Emissions (lb/hr)	Total Potential Emissions (tpy)
CO	0.23	lb/ODT	Calculated from NOR October 18, 2013 Stack Test [2]	16.26	60.9
NO_X	0.47	lb/ODT	Calculated from NOR October 18, 2013 Stack Test [2]	33.48	125.5
$PM/PM_{10}/PM_{2.5}$ Condensible Fraction	0.017	lb/MMBtu	AP-42, Section 1.6 [3]	1.22	5.3
TSP (Filterable)	0.062	lb/ODT	Calculated from Guaranteed WESP Specifications [1]	4.48	16.8
Total TSP (Filterable + Condensible)				5.70	22.1
PM_{10} (Filterable)	0.062	lb/ODT	TSP=PM10=PM2.5	4.48	16.8
Total PM_{10} (Filterable + Condensible)				5.70	22.1
$PM_{2.5}$ (Filterable)	0.062	lb/ODT	TSP=PM10=PM2.5	4.48	16.8
Total $PM_{2.5}$ (Filterable + Condensible)				5.70	22.1
SO_2	0.025	lb/MMBtu	AP-42, Section 1.6 [3]	4.38	19.2
VOC as alpha-pinene	0.67	lb/ODT	Calculated from NOR October 18, 2013 Stack Test [2]	48.33	181.2
Total VOC	0.71	lb/ODT	Derived from NOR October 18, 2013 Stack Test and OTM 26 [2]	50.63	189.8
Lead	0.00	N/A	N/A	0.00	0.0

Note:

[1] Filterable PM/PM_{10} emission factors were provided by the dryer system vendor. The $PM_{2.5}$ filterable emission factor is assumed to be the same as PM and PM_{10}.

[2] CO, NOx, and VOC emission factors are calculated from the Northampton October 2013 stack test.

[3] No emission factor is provided in AP-42, Section 10.6.2 for SO_2 for rotary dryers. Enviva has conservatively calculated SO2 emissions based upon the heat input of the dryer burners using an emission factor for wood combustion from AP-42, Section 1.6.

TABLE B-5
ROTARY DRYER -HAP AND TAP WOOD COMBUSTION EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Calculation Inputs:

Annual Composition and Throughput

Throughput ODT/yr	537,625
Hardwood Composition	90%
Softwood Composition	10%

Short Term Composition and Throughput

ODT/hr	71.71
Hardwood Composition	90%
Softwood Composition	10%

Emission Calculations:

Pollutant	CAS Number	HAP (Yes/No)	NC TAP (Yes/No)	VOC (Yes/No)	Emission Factor Comparison: AP-42 Calculated Direct wood-fired, hardwood factors		AP-42 Green, Direct wood-fired softwood factors		Weighted Emission Factor			Potential Emissions [3]	
					Emission Factor (lb/ODT)	Reference	Emission Factor (lb/ODT)	Reference	Short-term EF (lb/ODT)	Anual EF (lb/ODT)	EF Source	(lb/hr)	(tpy)
Acetaldehyde	75-07-0	Yes	Yes	Yes	3.83E-03	[2]	7.50E-02	[1]	1.09E-02	1.09E-02	AP-42	7.85E-01	2.94E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.00E+00	[4]	0.00E+00	[4]	0.00E+00	0.00E+00	AP-42	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	7.15E-03	[2]	1.40E-01	[1]	2.04E-02	2.04E-02	AP-42	1.47E+00	5.49E+00
Methanol	67-56-1	Yes	No	Yes	5.62E-03	[2]	1.10E-01	[1]	1.61E-02	1.61E-02	AP-42	1.15E+00	4.32E+00
Phenol	108-95-2	Yes	Yes	Yes	0.00E+00	[4]	0.00E+00	[4]	0.00E+00	0.00E+00	AP-42	0.00E+00	0.00E+00
Propionaldehyde	123-38-6	Yes	No	Yes	6.64E-04	[2]	1.30E-02	[1]	1.90E-03	1.90E-03	AP-42	1.36E-01	5.10E-01
											Total HAPs	**3.54**	**13.26**

Notes:

[1] HAP & TAP emission factors for "Rotary Dryer, green, direct wood-fired, (inlet moisture content >50%, dry basis) softwood were obtained from AP-42, Section 10.6.2, Table 10.6.2-3.

[2] To account for hardwood emissions since no HAP/TAP emission factors are given for direct hardwood-fired, factors were conservatively calculated by multiplying AP-42 Section 10.6.2-3 HAP factors for green, direct softwood fired by the ratio of the VOC emission factors for hardwood to softwood drying (0.24/4.7).

[3] Short-term emissions were calculated based upon a worst-case scenario of 25% softwood firing on an hourly basis.
Annual emissions were calculated based on the Annual average % Hardwood and Softwood Composition of 90% hardwood to 10% softwood.

[4] Through testing at other Enviva facilities Acrolein and Phenol are typically not evident in the emissions stream.

TABLE B-6
ROTARY DRYER - HAP AND TAP WOOD COMBUSTION EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Calculation Inputs:

Heat Input (MMBtu/hr)	175.30
Operating Schedule (hrs/yr)	8,760
Heat Input (MMBtu/yr)	1,535,628
WESP Metal HAP Control Efficiency[2]	92.75%
HCl Control Efficiency[3]	90.00%

HAP & TAP Emission Calculations:

Pollutant	Pollutant Type	Emission Factors			Emissions							
		Biomass			Biomass		Maximum Uncontrolled Total			Maximum Controlled Total		
		lb/mmBtu Uncontrolled	lb/mmBtu Controlled	Ref.	lb/hr Uncontrolled	lb/hr Controlled	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
Acetophenone	HAP	3.20E-09	3.20E-09	1	5.61E-07	5.61E-07	5.61E-07	4.91E-03	2.46E-06	5.61E-07	4.91E-03	2.46E-06
Antimony & Compounds	HAP	7.90E-06	5.73E-07	1, 2	1.38E-03	1.00E-04	1.38E-03	1.21E+01	6.07E-03	1.00E-04	8.80E-01	4.40E-04
Arsenic	TAP/HAP	2.20E-05	1.60E-06	1, 2	3.86E-03	2.80E-04	3.86E-03	3.38E+01	1.69E-02	2.80E-04	2.45E+00	1.22E-03
Benzo(a)pyrene	TAP/HAP	2.60E-06	2.60E-06	1	4.56E-04	4.56E-04	4.56E-04	3.99E+00	2.00E-03	4.56E-04	3.99E+00	2.00E-03
Beryllium metal (un-reacted) (Also include in BEC)	TAP/HAP	1.10E-06	7.98E-08	1, 2	1.93E-04	1.40E-05	1.93E-04	1.69E+00	8.45E-04	1.40E-05	1.22E-01	6.12E-05
Cadmium Metal (elemental un-reacted) –(Add w/CDC)	TAP/HAP	4.10E-06	2.97E-07	1, 2	7.19E-04	5.21E-05	7.19E-04	6.30E+00	3.15E-03	5.21E-05	4.56E-01	2.28E-04
Carbon tetrachloride	TAP/HAP	4.50E-05	4.50E-05	1	7.89E-03	7.89E-03	7.89E-03	6.91E+01	3.46E-02	7.89E-03	6.91E+01	3.46E-02
Chlorine	TAP/HAP	7.90E-04	7.90E-04	1	1.38E-01	1.38E-01	1.38E-01	1.21E+03	6.07E-01	1.38E-01	1.21E+03	6.07E-01
Chlorobenzene	TAP/HAP	3.30E-05	3.30E-05	1	5.78E-03	5.78E-03	5.78E-03	5.07E+01	2.53E-02	5.78E-03	5.07E+01	2.53E-02
Chromic acid (Chromium VI)	TAP[4]	3.50E-06	2.54E-07	1, 2	6.14E-04	4.45E-05	6.14E-04	5.37E+00	2.69E-03	4.45E-05	3.90E-01	1.95E-04
Chromium–Other compds (add w/chrom acid to get CRC)	HAP	1.75E-05	1.27E-06	1, 2	3.07E-03	2.22E-04	3.07E-03	2.69E+01	1.34E-02	2.22E-04	1.95E+00	9.74E-04
Cobalt compounds	HAP	6.50E-06	4.71E-07	1, 2	1.14E-03	8.26E-05	1.14E-03	9.98E+00	4.99E-03	8.26E-05	7.24E-01	3.62E-04
Dinitrophenol, 2,4-	HAP	1.80E-07	1.80E-07	1	3.16E-05	3.16E-05	3.16E-05	2.76E-01	1.38E-04	3.16E-05	2.76E-01	1.38E-04
Di(2-ethylhexyl)phthalate (DEHP)	TAP/HAP	4.70E-08	4.70E-08	1	8.24E-06	8.24E-06	8.24E-06	7.22E-02	3.61E-05	8.24E-06	7.22E-02	3.61E-05
Ethyl benzene	HAP	3.10E-05	3.10E-05	1	5.43E-03	5.43E-03	5.43E-03	4.76E+01	2.38E-02	5.43E-03	4.76E+01	2.38E-02
Ethylene dichloride (1,2-dichloroethane)	TAP/HAP	2.90E-05	2.90E-05	1	5.08E-03	5.08E-03	5.08E-03	4.45E+01	2.23E-02	5.08E-03	4.45E+01	2.23E-02
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	TAP	1.60E-06	1.60E-06	1	2.80E-04	2.80E-04	2.80E-04	2.46E+00	1.23E-03	2.80E-04	2.46E+00	1.23E-03
Hydrogen chloride (hydrochloric acid)	TAP/HAP	1.90E-02	1.90E-03	1, 3	3.33E+00	3.33E-01	3.33E+00	2.92E+04	1.46E+01	3.33E-01	2.92E+03	1.46E+00
Lead and Lead compounds	HAP	4.80E-05	3.48E-06	1, 2	8.41E-03	6.10E-04	8.41E-03	7.37E+01	3.69E-02	6.10E-04	5.34E+00	2.67E-03
Manganese & compounds	TAP/HAP	1.60E-03	1.16E-04	1, 2	2.80E-01	2.03E-02	2.80E-01	2.46E+03	1.23E+00	2.03E-02	1.78E+02	8.91E-02
Mercury, vapor (Include in Mercury&Compds)	TAP/HAP	3.50E-06	2.54E-07	1, 2	6.14E-04	4.45E-05	6.14E-04	5.37E+00	2.69E-03	6.14E-04	5.37E+00	2.69E-03
Methyl bromide (bromomethane)	HAP	1.50E-05	1.50E-05	1	2.63E-03	2.63E-03	2.63E-03	2.30E+01	1.15E-02	2.63E-03	2.30E+01	1.15E-02
Methyl chloride (chloromethane)	HAP	2.30E-05	2.30E-05	1	4.03E-03	4.03E-03	4.03E-03	3.53E+01	1.77E-02	4.03E-03	3.53E+01	1.77E-02
Methyl chloroform (1,1,1 trichloroethane)	TAP/HAP	3.10E-05	3.10E-05	1	5.43E-03	5.43E-03	5.43E-03	4.76E+01	2.38E-02	5.43E-03	4.76E+01	2.38E-02
Methyl ethyl ketone	TAP	5.40E-06	5.40E-06	1	9.47E-04	9.47E-04	9.47E-04	8.29E+00	4.15E-03	9.47E-04	8.29E+00	4.15E-03
Naphthalene	HAP	9.70E-05	9.70E-05	1	1.70E-02	1.70E-02	1.70E-02	1.49E+02	7.45E-02	1.70E-02	1.49E+02	7.45E-02
Nickel metal (Component of Nickel & Compounds)	TAP/HAP	3.30E-05	2.39E-06	1, 2	5.78E-03	4.19E-04	5.78E-03	5.07E+01	2.53E-02	5.78E-03	5.07E+01	2.53E-02
Nitrophenol, 4-	HAP	1.10E-07	1.10E-07	1	1.93E-05	1.93E-05	1.93E-05	1.69E-01	8.45E-05	1.93E-05	1.69E-01	8.45E-05
Pentachlorophenol	TAP/HAP	5.10E-08	5.10E-08	1	8.94E-06	8.94E-06	8.94E-06	7.83E-02	3.92E-05	8.94E-06	7.83E-02	3.92E-05
Perchloroethylene (tetrachloroethylene)	TAP/HAP	3.80E-05	3.80E-05	1	6.66E-03	6.66E-03	6.66E-03	5.84E+01	2.92E-02	6.66E-03	5.84E+01	2.92E-02
Phosphorus Metal, Yellow or White	HAP	2.70E-05	1.96E-06	1, 2	4.73E-03	3.43E-04	4.73E-03	4.15E+01	2.07E-02	4.73E-03	4.15E+01	2.07E-02
Polychlorinated biphenyls	TAP/HAP	8.15E-09	8.15E-09	1	1.43E-06	1.43E-06	1.43E-06	1.25E-02	6.26E-06	1.43E-06	1.25E-02	6.26E-06
Polycyclic Organic Matter	HAP	1.25E-04	1.25E-04	1	2.19E-02	2.19E-02	2.19E-02	1.92E+02	9.60E-02	2.19E-02	1.92E+02	9.60E-02
Propylene dichloride (1,2 dichloropropane)	HAP	3.30E-05	3.30E-05	1	5.78E-03	5.78E-03	5.78E-03	5.07E+01	2.53E-02	5.78E-03	5.07E+01	2.53E-02
Selenium compounds	HAP	2.80E-06	2.03E-07	1, 2	4.91E-04	3.56E-05	4.91E-04	4.30E+00	2.15E-03	4.91E-04	4.30E+00	2.15E-03
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	TAP/HAP	8.60E-12	8.60E-12	1	1.51E-09	1.51E-09	1.51E-09	1.32E-05	6.60E-09	1.51E-09	1.32E-05	6.60E-09
Trichloroethylene	TAP/HAP	3.00E-05	3.00E-05	1	5.26E-03	5.26E-03	5.26E-03	4.61E+01	2.30E-02	5.26E-03	4.61E+01	2.30E-02
Trichlorofluoromethane (CFC 111)	TAP	4.10E-05	4.10E-05	1	7.19E-03	7.19E-03	7.19E-03	6.30E+01	3.15E-02	7.19E-03	6.30E+01	3.15E-02
Trichlorophenol, 2,4,6-	HAP	2.20E-08	2.20E-08	1	3.86E-06	3.86E-06	3.86E-06	3.38E-02	1.69E-05	3.86E-06	3.38E-02	1.69E-05
Vinyl chloride	TAP/HAP	1.80E-05	1.80E-05	1	3.16E-03	3.16E-03	3.16E-03	2.76E+01	1.38E-02	3.16E-03	2.76E+01	1.38E-02
Total HAPs					**3.88E+00**	**5.91E-01**	**3.88E+00**	**3.40E+04**	**16.98**	**6.01E-01**	**5.27E+03**	**2.63**

[1] Uncontrolled and controlled emission factors (criteria and HAP/TAP) for wood combustion in a stoker boiler from NCDAQ Wood waste Combustion Spreadsheet/AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 1.6, 9/03

[2] The control efficiency of the wet electrostatic precipitator (WESP) for filterable particulate matter (88.9%) is applied to all metal hazardous and toxic pollutants.

[3] The WESP employs a caustic solution in its operation in which hydrochloric acid will have high water solubility. This caustic solution will neutralize the acid and effectively control it by 90%, per conversation on 10/18/2011 with Steven A. Jaasund, P.E. of Lundberg Associates, a manufacturer of WESPs.

[4] Chromic acid is a subset of chrome compounds, which is accounted for seperately as a HAP. As such, chromic acid is only calculated as a TAP.

TABLE B-7
HAMMERMILLS - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Calculation Inputs:

Total Plant Throughput ODT/yr	537,625
% of Total Throughput to the Hammermills	53%

via NOR test for Dry Hammermill pre-screener bypass

Annual Composition and Throughput

Hammermills Throughput ODT/yr	286,554
Hardwood Composition	90%
Softwood Composition	10%

Short Term Composition and Throughput

ODT/hr	38.22

Emission Calculations:

Pollutant	CAS Number	HAP (Yes/No)	NC TAP (Yes/No)	VOC (Yes/No)	Emission Factor Comparison: Stack Tests		Weighted Emission Factor			Potential Emissions	
					Emission Factor (lb/ODT)	Reference	Short-term EF (lb/ODT)	Annual EF (lb/ODT)	EF Source	(lb/hr)	(tpy)
VOC as alpha-pinene	N/A	N/A	N/A	N/A	0.12	[2]	0.12	0.12	stack test	4.52	16.93
Total VOC	N/A	N/A	N/A	N/A	0.14	[2]	0.14	0.14	stack test	5.46	20.45
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.00E+00	[3]	0.0000	0.0000	stack test	0.00E+00	0.00E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.00E+00	[3]	0.0000	0.0000	stack test	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	1.71E-02	[3]	0.0171	0.0171	stack test	6.54E-01	2.45E+00
Methanol	67-56-1	Yes	No	Yes	1.03E-02	[3]	0.0103	0.0103	stack test	3.95E-01	1.48E+00
Phenol	108-95-2	Yes	Yes	Yes	0.00E+00	[3]	0.0000	0.0000	stack test	0.00E+00	0.00E+00
Propionaldehyde	123-38-6	Yes	No	Yes	0.00E+00	[3]	0.0000	0.0000	stack test	0.00E+00	0.00E+00
									Total VOC	**5.46**	**20.45**
									Total HAPs	**1.05**	**3.93**

Notes:

[1] Annual emissions were calculated based on the Annual average % Hardwood and Softwood Composition of 90% hardwood to 10% softwood.

[2] VOC emissions from Enviva Northampton September 2013 Engineering Tests with a mixture of 6% softwood. VOC calculated on an alpha-pinene basis, and total VOC was derived using OTM 26.

[3] HAP emissions from Enviva Northampton September 2013 Stack Testing with a throughput of 6% softwood.

TABLE B-8
PELLET PRESSES AND COOLERS - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Calculation Inputs:

Annual Composition and Throughput

Throughput ODT/yr	537,625
Hardwood Composition	90%
Softwood Composition	10%

Short Term Composition and Throughput

ODT/hr	71.71

Emission Calculations:

Pollutant	CAS Number	HAP (Yes/No)	NC TAP (Yes/No)	VOC (Yes/No)	Emission Factor Comparison – Stack Tests		Selected Emission Factor			Potential Emissions	
					Emission Factor (lb/ODT)	Reference	Short-term EF (lb/ODT)	Annual EF (lb/ODT)	EF Source	(lb/hr)	(tpy)
VOC as alpha-pinene	N/A	N/A	N/A	N/A	0.03	[2]	0.03	0.03	stack test	2.30	8.63
Total VOC	N/A	N/A	N/A	N/A	0.07	[2]	0.07	0.07	stack test	4.79	17.96
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.00E+00	[3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.00E+00	[3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	1.32E-03	[3]	1.32E-03	1.32E-03	stack test	9.46E-02	3.55E-01
Methanol	67-56-1	Yes	No	Yes	2.64E-03	[3]	2.64E-03	2.64E-03	stack test	1.89E-01	7.09E-01
Phenol	108-95-2	Yes	Yes	Yes	0.00E+00	[3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Propionaldehyde	123-38-6	Yes	No	Yes	0.00E+00	[3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
									Total VOC	**4.79**	**17.96**
									Total HAPs	**0.28**	**1.06**

Notes:

[1] Annual emissions were calculated based on the Annual average % Hardwood and Softwood Composition of 90% hardwood to 10% softwood.

[2] VOC emissions from Enviva Northampton September 2013 Engineering Tests with a mixture of 6% softwood. VOC calculated on an alpha-pinene basis, and total VOC was derived using OTM 26.

[3] HAP emissions from Enviva Northampton September 2013 Stack Testing with a throughput of 6% softwood.

TABLE B-9
ELECTRIC POWERED CHIPPER EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Annual Throughput of Chipper	314,090	tons/year (dry wood)[1]
Dryer Throughput	71.71	tons/hr (dry wood)[1]
Chipper Only processes 50% of dryer throughput	35.86	tons/hr Other 50% comes in chip form
Maximum Annual Operation	8,760	hours

Pollutant	Emission Factors (lb/dry wood tons)	Emissions[6]	
		(lb/hr)	(tpy)
THC as Carbon[2]	0.0041	2.940E-01	0.64
THC as alpha-Pinene[3]	0.0047	**3.337E-01**	0.73
PM[4]	N/A	**N/A**	**N/A**
Methanol[2]	0.0010	**7.171E-02**	0.16

[1] It is assumed that the wood received at the facility has a nominal water content of 50%.
The annual throughput used for the chipper is 50% of the annual throughput of the dryer; while the short-term throughput is based upon the maximum hourly throughput of the dryer.

[2] Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Table 7 and Section 10.6.4, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.

[3] The THC/VOC makeup of wood is primarily composed of terpenes $(C_5H_8)_n$ [where n = 2, 3, or 4 typically] but to convert from carbon to the equivalent weight in THC/VOC, the assumption was that alpha-pinene (AP) would be the representative THC/VOC (molecular weight = 136.2 lb/lb-mol).
The following equation shows the conversion:
*lb VOC/ODT = lb C/ODT * (136.2 lb/mol AP / 12 lb/mol C) * (1 mol AP / 10 mol C)*

[4] PM emission factor is not applicable as the chipper emissions are routed downward to the ground.

TABLE B-10
HAMMERMILLS - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Annual Throughput of Each Rechipper	575,000	tons/year (dry wood)[1]
Short-term Throughput of Each Rechipper	70.83	tons/hr (dry wood)[1]
Maximum Annual Operation	8,760	hours

Pollutant	Emission Factors (lb/dry wood tons)	Emissions[5]	
		(lb/hr)	(tpy)
THC as Carbon[2]	0.0041	2.904E-01	1.27
THC as alpha-Pinene[3]	0.0047	**3.296E-01**	**1.44**
PM[4]	N/A	**N/A**	**N/A**
Methanol[2]	0.0010	**7.083E-02**	**0.29**

[1] It is assumed that the wood received at the facility has a nominal water content of 50%.
The annual throughput used for the rechippers are the same as the annual throughput of the dryer; while the short-term throughput is based upon the maximum hourly throughput of the dryer.

[2] Emission factor obtained from available emissions factors for rechippers in AP-42 Section 10.6.3, Table 7 and Section 10.6.4, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.

[3] The THC/VOC makeup of wood is primarily composed of terpenes $(C_5H_8)_n$ [where n = 2, 3, or 4 typically] but to convert from carbon to the equivalent weight in THC/VOC, the assumption was that alpha-pinene (AP) would be the representative THC/VOC (molecular weight = 136.2 lb/lb-mol).
The following equation shows the conversion:
*lb VOC/ODT = lb C/ODT * (136.2 lb/mol AP / 12 lb/mol C) * (1 mol AP / 10 mol C)*

[4] PM emission factor is not applicable as rechipper emissions are routed downward to the ground.

[5] Short term emissions were based upon the max short term capacity of the rechippers. Emissions are representative of the total combined emissions for both rechippers.

TABLE B-11
BAGFILTER AND CYCLONE EMISSIONS
ENVIVA PELLETS NORTHAMPTON, LLC

Emission Unit	Emission Source ID	Filter. Vent -or- Cyclone ID	Flowrate[1] (cfm)	Pollutant Loading[2] (gr/cf)	Annual Operation (hours)	% PM that is PM_{10}	% PM that is $PM_{2.5}$	Potential Emissions PM (lb/hr)	PM (tpy)	PM_{10}[3] (lb/hr)	PM_{10}[3] (tpy)	$PM_{2.5}$[3] (lb/hr)	$PM_{2.5}$[3] (tpy)
Hammermills Bagfilter 1	ES-HM-1 through 3	CD-HM-BF1	45,000	0.004	8,760	100%	100%	1.54	6.76	1.54	6.76	1.54	6.76
Hammermills Bagfilter 2	ES-HM-4 through 6	CD-HM-BF2	45,000	0.004	8,760	100%	100%	1.54	6.76	1.54	6.76	1.54	6.76
Hammermills Bagfilter 3	ES-HM-7 and 8; ES-NDS	CD-HM-BF3	45,000	0.004	8,760	100%	100%	1.54	6.76	1.54	6.76	1.54	6.76
Pellet Mill Feed Silo Bin Vent Filter	ES-PMFS	CD-PMFS-BV	2,500	0.004	8,760	100%	100%	0.09	0.38	0.09	0.38	0.09	0.38
Pellet Mill Fines Bin Bin Vent Filter	ES-PFB	CD-PFB-BV	3,600	0.004	8,760	100%	100%	0.12	0.54	0.12	0.54	0.12	0.54
Pellet Coolers Cyclone 1	ES-CLR-1	CD-CLR-1	17,100	0.01	8,760	91%	55%	1.47	6.42	1.33	5.84	0.81	3.53
Pellet Coolers Cyclone 2	ES-CLR-2	CD-CLR-2	17,100	0.01	8,760	91%	55%	1.47	6.42	1.33	5.84	0.81	3.53
Pellet Coolers Cyclone 3	ES-CLR-3	CD-CLR-3	17,100	0.01	8,760	91%	55%	1.47	6.42	1.33	5.84	0.81	3.53
Pellet Coolers Cyclone 4	ES-CLR-4	CD-CLR-4	17,100	0.01	8,760	91%	55%	1.47	6.42	1.33	5.84	0.81	3.53
Pellet Coolers Cyclone 5	ES-CLR-5	CD-CLR-5	17,100	0.01	8,760	91%	55%	1.47	6.42	1.33	5.84	0.81	3.53
Pellet Coolers Cyclone 6	ES-CLR-6	CD-CLR-6	17,100	0.01	8,760	91%	55%	1.47	6.42	1.33	5.84	0.81	3.53
Finished Product Handling Bagfilter	ES-FPH, ES-PL1 & 2, ES-PB-1 thru 12	CD-FPH-BF	35,500	0.004	8,760	91%	55%	1.22	5.33	1.11	4.85	0.67	2.93
							TOTAL	14.85	65.04	13.95	61.09	10.34	45.31

Note:

[1] Filter, Vent, and Cyclone inlet flow rate (cfm) provided by design engineering firm (Mid-South Engineering Co.). The exit flowrate was conservatively assumed to be the same as the inlet flowrate.

[2] Pollutant Loading (gr/cf) provided by Aircon.

[3] Pellet cooler cyclone and finished product handling bagfilter speciation based on AP-42 factors for wet wood combustion (Section 1.6) controlled by a mechanical separator. Since the particle size of particle size of particulate matter from a pellet cooler is anticipated to be larger than flyash, this factor is believed to be a conservative indicator of speciation.

Firewater Pump Emissions (ES-FWP)

Equipment and Fuel Characteristics

Engine Output	0.22	MW
Engine Power	300	hp
Hours of Operation	500	hr/yr[1]
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	2,545	Btu/hr/hp

Criteria Pollutant Emissions

Pollutant	Category	Emission Factor	Units	Potential Emissions	
				lb/hr	tpy
TSP	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
PM_{10}	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
$PM_{2.5}$	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
NO_x	PSD	8.82E-03	lb/kW-hr (5)	1.97	4.93E-01
SO_2	PSD	15	ppmw (3)	1.19E-03	2.97E-04
CO	PSD	7.72E-03	lb/kW-hr (2)	1.73	4.32E-01
VOC (NMHC)	PSD	2.51E-03	lb/MMBtu (4)	1.92E-03	4.79E-04
Toxic/Hazardous Air Pollutant Emissions					
Acetaldehyde	HAP/TAP	5.37E-06	lb/hp-hr (4)	1.61E-03	4.03E-04
Acrolein	HAP/TAP	6.48E-07	lb/hp-hr (4)	1.94E-04	4.86E-05
Benzene	HAP/TAP	6.53E-06	lb/hp-hr (4)	1.96E-03	4.90E-04
Benzo(a)pyrene[6]	HAP/TAP	1.32E-09	lb/hp-hr (4)	3.95E-07	9.87E-08
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	8.21E-05	2.05E-05
Formaldehyde	HAP/TAP	8.26E-06	lb/hp-hr (4)	2.48E-03	6.20E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	3.53E-04	8.82E-05
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	8.59E-04	2.15E-04
m-,p-Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	5.99E-04	1.50E-04
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr (4)	2.48E-03	6.20E-04
Total HAPs				8.13E-03	2.03E-03

Note:

[1] NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

[2] Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2009 construction.

[3] Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.

[4] Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.

[5] Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx.

[6] Benzo(a)pyrene is included as a HAP in Total PAH.

TABLE B-13
DRIED WOOD HANDLING DROP POINT EXAMPLE EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Max Annual Throughput (tons/yr) 575,000
Max Short-Term Throughput (tons/yr) 70.650
Amount of Fines Diverted from Hammermills 46.7% via NOR test for Dry Hammermill pre-screener bypass

ID	Emission Source Group	Description	Control	Control Description	Throughput		Potential Uncontrolled Emissions for PM[3]		Potential Uncontrolled Emissions for PM_{10}[3]		Potential Uncontrolled Emissions for $PM_{2.5}$[3]	
					Max. Hourly[2]	Max. Annual						
					(tph)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
DP1	ES-DWH	Dryer Discharger to Dryer Collection Conveyor Belt	Enclosed	Reduction to 2 mph mean wind speed	70.65	575,000	5.3E-03	2.2E-02	2.5E-03	1.0E-02	3.8E-04	1.6E-03
DP2	ES-DWH	Pre-screen Feeder Fines Overs to Hammermills Infeed and Distribution	Enclosed	Reduction to 2 mph mean wind speed	32.99	268,525	2.5E-03	1.0E-02	1.2E-03	4.8E-03	1.8E-04	7.3E-04
DP3	ES-DWH	Hammermills Cyclone Diverter Gates to Hammermills System Discharge Collection Conveyor Belt	Enclosed	Reduction to 2 mph mean wind speed	37.66	306,475	2.8E-03	1.2E-02	1.3E-03	5.5E-03	2.0E-04	8.3E-04
DP4	ES-DWH	Hammermills System Discharge Collection Conveyor Belt to Pellet Mill Feed Silo Infeed Screw	Enclosed	Reduction to 2 mph mean wind speed	70.65	575,000	5.3E-03	2.2E-02	2.5E-03	1.0E-02	3.8E-04	1.6E-03
						TOTAL	1.6E-02	6.5E-02	7.6E-03	3.1E-02	1.1E-03	4.7E-03

Note:

[1] Fugitive emissions are not included in facility-wide PTE because the Northampton Pellet Mill does not belong to one of the listed 28 source categories.

[2] Max hourly rates based upon maximum calculated throughput rates provided in mass balance provided by Mid-South Engineering Company, June 17, 2011; updated for 13% moisture content on December 29, 2011

[3] Based emission factors calculated per AP-42 Section 13.2.4, September 2006.

where: E = emission factor (lb/ton)
k = particle size multiplier (dimensionless) for PM 0.74
k = particle size multiplier (dimensionless) for PM_{10} 0.35
k = particle size multiplier (dimensionless) for $PM_{2.5}$ 0.053
U = mean wind speed (mph) 2.00
M = material moisture content (%) 10
E for PM (lb/ton) = 7.6E-05
E for PM_{10} (lb/ton) = 3.6E-05
E for $PM_{2.5}$ (lb/ton) = 5.4E-06

TABLE B-14
GREEN WOOD HANDLING DROP POINT EXAMPLE EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

ID	Emission Source Group	Transfer Activity	Type of Operation	Number of Drop Points	PM Particle Size Multiplier (dimensionless)	PM_{10} Particle Size Multiplier (dimensionless)	$PM_{2.5}$ Particle Size Multiplier (dimensionless)	Mean Wind Speed (U) (mph)	Material Moisture Content (M)[1] (%)	PM Emission Factor[2] (lb/ton)	PM_{10} Emission Factor[2] (lb/ton)	$PM_{2.5}$ Emission Factor[2] (lb/ton)	Potential Throughput (tpy)	Potential PM Emissions (tpy)	Potential PM_{10} Emissions (tpy)	Potential $PM_{2.5}$ Emissions (tpy)
GDP1	ES-GWH	Purchased Bark Transfer to Outdoor Storage Area	Batch Drop	1	0.74	0.35	0.053	6.3	48%	3.73E-05	1.76E-05	2.67E-06	13,733	6.48E-05	3.06E-05	4.64E-06
GDP1	ES-GWH	Drop Points via Conveying from Bark Pile to Dryer	Batch Drop	4	0.74	0.35	0.053	6.3	42%	4.44E-05	2.10E-05	3.18E-06	13,733	3.09E-04	1.46E-04	2.21E-05
GDP2	ES-GWH	Transfer Purchased Wood Chips (Wet) to Outdoor Storage	Batch Drop	1	0.74	0.35	0.053	6.3	49%	3.58E-05	1.69E-05	2.57E-06	140,600	6.37E-04	3.01E-04	4.57E-05
GDP2	ES-GWH	Drop Points via Conveying from Chip Pile to Dryer	Batch Drop	5	0.74	0.35	0.053	6.0	41%	4.36E-05	2.06E-05	3.12E-06	530,451	1.46E-02	6.91E-03	1.05E-03
		Total Emissions												**1.56E-02**	**7.39E-03**	**1.12E-03**

1. Average moisture content for logs, bark, and wood chips (wet) based on material balance provided by design engineering firm (Abel-South Engineering).

2. Emission factor calculation based on formula from AP-42, Section 13.2.4 - Aggregate Handling and Storage Piles, Equation 13.2.1, (11/06).

where: E = emission factor (lb/ton)

k = particle size multiplier (dimensionless) for PM	0.74
k = particle size multiplier (dimensionless) for PM_{10}	0.35
k = particle size multiplier (dimensionless) for $PM_{2.5}$	0.053
U = mean wind speed (mph)	6.3

M = material moisture content (%)

3. PM_{10} control efficiency of 74.7% applied for three-sided enclosed structure with 50% porosity per Sierra Research *"Final BACM Technological and Economic Feasibility Analysis"*, report prepared for the San Joaquin Valley Unified Air Pollution Control District (3/03). The control efficiency is assumed equivalent for PM_{10} and $PM_{2.5}$ emissions.

4. These green wood handling emissions are representative of the fugitive emissions at the site. Note there may be multiple drop points for each type but as shown these emissions will be negligible.

TABLE B-15
GREEN WOOD STORAGE PILES FUGITIVE EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Emission Unit ID	Description	TSP Emission Factor [1] (lb/day/acre)	TSP Emission Factor [1] (lb/hr/ft²)	VOC Emission Factor [3] (lb/day/acre)	VOC Emission Factor [3] (lb/hr/ft²)	Width (ft)	Length (ft)	Height (ft)	Outer Surface Area of Storage Pile (ft²)	PM Emissions (lb/hr)	PM Emissions (tpy)	PM_{10} Emissions (lb/hr)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions (lb/hr)	$PM_{2.5}$ Emissions (tpy)	VOC as Carbon Emissions (lb/hr)	VOC as Carbon Emissions (tpy)	VOC as alpha-Pinene Emissions [4] (lb/hr)	VOC as alpha-Pinene Emissions [4] (tpy)
GWSP1	Green Wood Pile No. 1	3.71	3.55E-06	3.60	3.44E-06	100	400	10	60,000	0.213	0.933	0.107	0.467	0.0160	0.070	0.21	0.90	0.24	1.03
GWSP2	Green Wood Pile No. 2	3.71	3.55E-06	3.60	3.44E-06	200	400	10	110,400	0.392	1.717	0.196	0.859	0.0294	0.129	0.38	1.67	0.43	1.90
Total										**0.605**	**2.651**	**0.303**	**1.325**	**0.0454**	**0.199**	**0.59**	**2.57**	**0.67**	**2.93**

1. TSP emission factor based on U.S. EPA *Control of Open Fugitive Dust Sources*. Research Triangle Park, North Carolina, EPA-450/3-88-008. September 1988. Page 4-17.

$$E = 1.7\left(\frac{s}{1.5}\right)\left(\frac{(365-p)}{235}\right)\left(\frac{f}{15}\right)(\text{lb/day/acre})$$

where:

s, silt content of wood chips (%):	4.8	s - silt content(%) for lumber sawmills (minimum), from AP-42 Table 13.2.2-1
p, number of days with rainfall greater than 0.01 inch:	120	Based on AP-42, Section 13.2.2, Figure 13.2.1-2.
f (time that wind exceeds 5.36 m/s - 12 mph) (%):	9.8	Based on meteorological data averaged for 2007-2011 for Northampton, NC.
PM_{10}/TSP ratio:	50%	PM_{10} is assumed to equal 50% of TSP based on U.S. EPA *Control of Open Fugitive Dust Sources*. Research Triangle Park, North Carolina, EPA-450/3-88-008. September 1988.
$PM_{2.5}$/TSP ratio:	7.5%	$PM_{2.5}$ is assumed to equal 7.5 % of TSP U.S. EPA Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors. November 2006.

2. The surface area is calculated as [2*H*L+2*W*H+L*W] + 20% to consider the sloping pile edges. Length and width based on proposed site design with a conservative height.

3. Emission factors obtained from NCASI document provided by SC DHEC for the calculation of fugitive VOC emissions from Douglas Fir wood storage piles. Emission factors ranged from 1.6 to 3.6 lb C/acre-day. Enviva chose to employ the maximum emission factor for purposes of conservatism.

4. Emissions are calculated in tons of carbon per year by the following formula:

*tons C/year = 5 acres * 365 days * 1.6 lb C/acre-day / 2000 lb/ton*

Emission factor converted from as carbon to as alpha-pinene by multiplying by 1.14.

TABLE B-16
TANKS EMISSIONS
ENVIVA PELLET NORTHAMPTON, LLC

Tank ID	Tank Description	Volume[1] (gal)	Tank Dimensions		Orientation	Throughput (gal/yr)	Turnovers	TANKS 4.0 VOC Emissions	
			Diameter (ft)	Height/Length (ft)				(lb/yr)	(tpy)
TK01	Emergency Generator Fuel Oil Tank[2]	2,500	6	12	Vertical	12,000	4.80	0.37	3.57E-03
TK02	Fire Water Pump Fuel Oil Tank[2]	500	3	10	Horizontal	10,300	20.60	0.43	2.15E-04
							TOTAL	**0.80**	**3.79E-03**

Note:

[1] Conservative design specifications.

[2] Throughput based on fuel consumption and 500 hours of operation per year. Fuel consumption data provided by pump engine vendors.

TABLE B-17
POTENTIAL GHG EMISSIONS FROM COMBUSTION SOURCES
ENVIVA PELLET NORTHAMPTON, LLC

Operating Data:

Dryer Heat Input	175.30 MMBtu/hr
Operating Schedule	8,760 hrs/yr
Emergency Generator Output	350 bhp
Operating Schedule	500 hrs/yr
No. 2 Fuel Input	16.7 gal/hr[1]
Energy Input	2.282 MMBtu/hr[2]
Fire Water Pump Output	300 bhp
Operating Schedule	500 hrs/yr
No. 2 Fuel Input	14.3 gal/hr[1]
Energy Input	1.956 MMBtu/hr[2]
Portable Chipper Output	1,300 bhp
Operating Schedule	1,000 hrs/yr
No. 2 Fuel Input	61.9 gal/hr[1]
Energy Input	8.478 MMBtu/hr[2]
Truck TipperOutput	170 bhp
Operating Schedule	1,000 hrs/yr
No. 2 Fuel Input	8.1 gal/hr[1]
Energy Input	1.109 MMBtu/hr[2]

Emission Unit ID	Fuel Type	Emission Factors from Table C-1 (kg/MMBtu)[3]			Tier 1 Emissions (metric tons)				
		CO2	CH4	N2O	CO2	CH4	N2O	Total CO2e biomass deferral[4]	Total CO2e
ES-DRYER	Wood and Wood Residuals	9.38E+01	3.20E-02	4.20E-03	158,777	54	7	3,341	162,119
ES-GN	No. 2 Fuel Oil (Distillate)	7.40E+01	3.00E-03	6.00E-04	93	3.77E-03	7.55E-04	93	93
ES-FWP	No. 2 Fuel Oil (Distillate)	7.40E+01	3.00E-03	6.00E-04	80	3.23E-03	6.47E-04	80	80
ES-CHIP-2	No. 2 Fuel Oil (Distillate)	7.40E+01	3.00E-03	6.00E-04	691	2.80E-02	5.61E-03	693	693
ES-TT	No. 2 Fuel Oil (Distillate)	7.40E+01	3.00E-03	6.00E-04	90	3.67E-03	7.33E-04	91	91

[1] Fuel consumption calculated using a factor of 0.0476 gal/hr-hp. Advanced Environmental Interface, Inc. (1998). General Permits for Emergency Engines. INSIGHTS, 98-2, 3.

[2] Energy calculated on a fuel consumption basis, using an energy factor of 0.137 MMBtu/gal.

[3] Emission factors from Table C-1 and C-2 of GHG Reporting Rule. Emission factors for methane and N2O already multiplied by their respective GWPs of 21 and 310.

[4] As per NC DAQ Biomass Deferral Rule 15A NCAC 02D .0544, CO2 emissions from bioenergy and other biogeneic sources are not applicable towards PSD and Title V permitting. Therefore CO2 emissions form the dryer are not included in the Total CO2e biomass deferral column.

APPENDIX C - TAP MODELING SUPPORT

A.1
North Carolina Modeling Protocol Checklist

The North Carolina Modeling Protocol Checklist may be used in lieu of developing the traditional written modeling plan for North Carolina toxics and criteria pollutant modeling. The protocol checklist is designed to provide the same level of information as requested in a modeling protocol as discussed in Chapter 2 of the *Guideline for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina*. The modeling protocol checklist is submitted with the modeling analysis.

Although most of the information requested in the modeling protocol checklist is self explanatory, additional comments are provided, where applicable, and are discussed in greater detail in the toxics modeling guidelines referenced above. References to sections, tables, figures, appendices, etc., in the protocol checklist are found in the toxics modeling guidelines.

INSTRUCTIONS: The modeling report supporting the compliance demonstration should include most of the information listed below. As appropriate, answer the following questions or indicate by check mark the information provided or action taken is reflected in your report.

FACILITY INFORMATION	
Name: Enviva Pellets Northampton, LLC **Facility ID: 6600167** **Address: 874 Lebanon Church Rd.** **Garysburg, NC 27866**	**Consultant (if applicable): Trinity Consultants** 1 Copley Parkway Suite 310 Morrisville, NC 27560
Contact Name: Joe Harrell	**Contact Name: Jonathan Hill**
Phone Number: 252-209-6032 **Email: joe.harrell@envivabiomass.com**	**Phone Number: 919-462-9693** **Email: jhill@trinityconsultants.com**

GENERAL

Description of New Source or Source / Process Modification: provide a short description of the new or modified source(s) and a brief discussion of how this change affects facility production or process operation.	**X**
Source / Pollutant Identification: provide a table of the affected pollutants, by source, which identifies the source type (point, area, or volume), maximum pollutant emission rates over the applicable averaging period(s), and, for point sources, indicate if the stack is capped or non-vertical (C/N).	**X**
Pollutant Emission Rate Calculations: indicate how the pollutant emission rates were derived (e.g., AP-42, mass balance, etc.) and where applicable, provide the calculations.	**X**
Site / Facility Diagram: provide a diagram or drawing showing the location of all existing and proposed emission sources, buildings or structures, public right-of-ways, and the facility property (toxics) / fence line (criteria pollutants) boundaries. The diagram should also include a scale, true north indicator, and the UTM or latitude/longitude of at least one point.	**X**
Certified Plat or Signed Survey: a certified plat (map) from the County Register of Deeds or a signed survey must be submitted to validate property boundaries modeled.	**SS**
Topographic Map: A topographic map covering approximately 5km around the facility must be submitted. The facility boundaries should be annotated on the map as accurately as possible.	**X**
Cavity Impact Analysis: No cavity analysis is required if using AERMOD. *See Section 4.2*	**NA**

Background Concentrations (criteria pollutant analyses only): Background concentrations must be determined for each pollutant for each averaging period evaluated. The averaged background value used (e.g., high, high-second-high, high-third-high, etc.) is based on the pollutant and averaging period evaluated. The background concentrations are added to the modeled concentrations, which are then compared to the applicable air quality standard to determine compliance.	**NA**
Offsite Source Inventories (criteria pollutant analyses only): Offsite source inventories must be developed and modeled for all pollutants for which onsite sources emissions are modeled in excess of the specific pollutant significant impact levels (SILs) as defined in the PSD New Source Review Workshop Manual. The DAQ AQAB must approve the inventories. An initial working inventory can be requested from the AQAB.	**NA**

SCREEN LEVEL MODELING

Model: The latest version of the AERSCREEN model must be used. The use of other screening models should be approved by NCDAQ prior to submitting the modeling report.	**NA**
Source / Source emission parameters: Provide a table listing the sources modeled and the applicable source emission parameters. See NC Form 3 – Appendix A.	**NA**
Merged Sources: Identify merged sources and show all appropriate calculations. See Section 3.3	**NA**
GEP Analysis: See Section 3.2 and NC Form 1 – Appendix A	**NA**
Terrain: Indicate the terrain modeled: simple (Section 4.4), and complex (Section 4.5 and NC Form 4 – Appendix A). If complex terrain is within 5 kilometers of the facility, complex terrain must be evaluated. Simple terrain must include terrain elevations if any terrain is greater than the stack base of any source modeled. Simple: _____ Complex:_____	NA
Meteorology: Refer to Section 4.1 for AERSCREEN inputs.	**NA**
Receptors: AERSCREEN – use shortest distance to property boundary for each source modeled and use sufficient range to find maximum (See Section 4.1 (i) and (j)). Terrain above stack base must be evaluated.	**NA**
Modeling Results: For each affected pollutant, modeling results should be summarized, converted to the applicable averaging period (See Table 3), and presented in tabular format indicating compliance status with the applicable AAL, SIL, or NAAQS. See NC Form S5 – Appendix A.	**NA**
Modeling Files: Either electronic or hard copies of AERSCREEN output must be submitted.	**NA**

REFINED LEVEL MODELING

Model: The latest version of AERMOD should be used, and may be found at http://www.epa.gov/scram001/dispersion_prefrec.htm. The use of other refined models must be approved by NCDAQ prior to submitting the modeling report.	**AERMOD 13350**
Source / Source emission parameters: Provide a table listing the sources modeled and the applicable source emission parameters. See NC Form 3 - Appendix A.	**X**
GEP Analysis: Use BPIP-Prime with AERMOD.	**X**
Cavity Impact Analysis: No separate cavity analysis is required when using AERMOD as long as receptors are placed in cavity susceptible areas. See Section 4.2 and 5.2.	**NA**
Terrain: Use digital elevation data from the USGS NED database (http://seamless.usgs.gov/index.php). Use of other sources of terrain elevations or the non-regulatory Flat Terrain option will require prior approval from DAQ AQAB.	**X**
Coordinate System: Specify the coordinate system used (e.g., NAD27, NAD83, etc.) to identify the source, building, and receptor locations. Note: Be sure to specify in the AERMAP input file the correct base datum (NADA) to be used for identifying source input data locations. Clearly note in both the protocol checklist and the modeling report which datum was used.	**NAD83**
Receptors: The receptor grid should be of sufficient size and resolution to identify the maximum pollutant impact. See Section 5.3.	**X**

Meteorology: Indicate the AQAB, pre-processed, 5-year data set used in the modeling demonstration: (See Section 5.5 and Appendix B) AERMOD__RWI 2008-2012_____ If processing your own raw meteorology, then pre-approval from AQAB is required. Additional documentation files (e.g. AERMET stage processing files) will also be necessary. For NC toxics, the modeling demonstration requires only the last year of the standard 5 year data set (e.g., 2005) provided the maximum impacts are less than 50% of the applicable AAL(s).	X
Modeling Results: For each affected pollutant and averaging period, modeling results should be summarized and presented in tabular format indicating compliance status with the applicable AAL, SIL or NAAQS. See NC Form R5 - Appendix A.	**X**
Modeling Files: Submit input and output files for AERMOD. Also include BPIP-Prime files, AERMAP files, DEM files, and any AERMET input and output files, including raw meteorological data.	**X**

NOTES

1. THE SURVEYED PROPERTY DELINEATED HEREON IS LOCATED ON NORTHAMPTON COUNTY TAX ASSESSMENT MAP 01-09993 AND IS ZONED LI (LIGHT INDUSTRIAL DISTRICT).

   SETBACKS:
   FRONT: 100 FEET
   REAR: 75 FEET
   SIDE: 25 FEET

2. THE SURVEYED PROPERTY CURRENTLY STANDS IN THE NAME OF ENVIVA PELLETS NORTHAMPTON, LLC AS RECORDED IN DEED BOOK 961 AT PAGE 81 AND MAP BOOK 42 AT PAGE 125 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA.

3. NORTH MERIDIAN INFORMATION AS SHOWN HEREON IS BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH ZONE NAD 83 (94 HARN) AND IS TIED TO NORTHAMPTON COUNTY, NORTH CAROLINA GEODETIC CONTROL NETWORK.

4. THE SURVEYED PROPERTY AS SHOWN HEREON IS SUBJECT TO ALL COVENANTS AND RESTRICTIONS OF RECORD AND THOSE RECORDED HEREWITH. BOWMAN CONSULTING GROUP, LTD. WAS PROVIDED A COMMITMENT FOR TITLE INSURANCE FROM FIDELITY NATIONAL TITLE INSURANCE COMPANY, AND SCHEDULE B – PART II IS ADDRESSED IN THE TITLE COMMITMENT REVIEW.

5. THE SURVEYED PROPERTY SHOWN HEREON IS NOT IN A 100-YEAR FLOODPLAIN. IT LIES IN ZONE "X" (DETERMINED TO BE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SHOWN ON FEMA FLOOD INSURANCE RATE MAP FOR NORTHAMPTON COUNTY, NORTH CAROLINA, COMMUNITY-PANEL NUMBER 3721400000 J, EFFECTIVE DATE FEBRUARY 4, 2009.

6. THE LOCATION OF ALL VISIBLE BUILDINGS, STRUCTURES AND OTHER IMPROVEMENTS SITUATED ON THE SURVEYED PROPERTY, WHICH HAS BEEN CAREFULLY ESTABLISHED BY THE CLASSIFICATION AND SPECIFICATIONS FOR CADASTRAL SURVEYS ARE CORRECTLY SHOWN.

7. ALL EASEMENTS AND RIGHTS-OF-WAY APPARENT FROM A CAREFUL PHYSICAL INSPECTION OF THE SURVEYED PROPERTY, OR AS IDENTIFIED IN SCHEDULE B – PART II OF THE COMMITMENT FOR TITLE ARE CORRECTLY SHOWN UNLESS OTHERWISE NOTED.

8. THERE ARE NO VISIBLE ENCROACHMENTS ON ADJOINING PREMISES, STREETS OR EASEMENTS, BY VISIBLE BUILDINGS, STRUCTURES OR OTHER IMPROVEMENTS, NOR VISIBLE ENCROACHMENTS ON SAID PROPERTY BY VISIBLE STRUCTURES OR OTHER IMPROVEMENTS SITUATED ON ADJOINING PREMISES EXCEPT AS SHOWN.

9. THERE ARE 0 REGULAR PARKING SPACES AND 0 HANDICAP PARKING SPACES ON THE PREMISES.

10. AS OF THE DATE OF THE SURVEY, THERE WAS NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS ON THE SUBJECT PROPERTY.

11. AS OF THE DATE OF THE SURVEY, THERE WAS NO OBSERVED EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

12. PROPERTY LINE AS SHOW ON PLAT "SURVEYED FOR NORTHAMPTON COUNTY MID-ATLANTIC INDUSTRIAL PARK, GASTON TOWNSHIP, NORTHAMPTON COUNTY, NORTH CAROLINA, JULY 22, 2004" PREPARED BY JASPER ELEY LAND SURVEYING AND RECORDED IN PLAT BOOK 37 AT PAGE 42 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA.

TITLE COMMITMENT SCHEDULE B-PART II REVIEW

I FURTHER CERTIFY THAT (I) I HAVE EXAMINED TITLE DOCUMENTS FOR THE PROPERTY HEREIN DESCRIBED PROVIDED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY FOR TITLE NUMBER 38511, EFFECTIVE DATE APRIL 27, 2012 AT 8:00AM AND (II) WITH RESPECT TO THE ITEMS IDENTIFIED IN SCHEDULE B-PART II WITH RESPECT TO THE PROPERTY.

THE FOLLOWING ITEMS OF SCHEDULE B-PART II PERTAIN TO THE PROPERTY BUT ARE EITHER STANDARD TITLE EXCEPTIONS OR NOT SURVEY RELATED ITEMS: EXCEPTION ITEMS 1, 2 AND 5.

EXCEPTION 1: DEFECTS, LIENS, ENCUMBRANCES, ADVERSE CLAIMS OR OTHER MATTERS, IF ANY CREATED, FIRST APPEARING IN THE PUBLIC RECORDS OR ATTACHING SUBSEQUENT TO THE EFFECTIVE DATE HEREOF BUT PRIOR TO THE DATE THE PROPOSED INSURED ACQUIRES FOR VALUE OF RECORD THE ESTATE OR INTEREST OR MORTGAGE THEREON COVERED BY THIS COMMITMENT.

EXCEPTION 2: THE LIEN OF ALL TAXES FOR THE YEAR 2012 AND THEREAFTER, WHICH ARE NOT YET DUE AND PAYABLE.

EXCEPTION 3: BUILDING RESTRICTION LINES, EASEMENTS, AND ANY OTHER MATTERS SHOWN ON MAP OR PLAT (3) RECORDED IN MAP BOOK 14, PAGE 25; MAP BOOK 37, PAGES 41 AND 42; MAP BOOK 42, PAGE 125 AND MAP BOOK 42, PAGE 58.
M.B. 14, PG. 25 IS NOT LOCATED NEAR OR ADJACENT TO SUBJECT PROPERTY
M.B. 37, PGS. 41 & 42 DOES NOT CONTAIN ANY OF THE ABOVE MATTERS
M.B. 42, PG. 125 SHOWS:
- 80' TRANSMISSION LINE EASEMENT – AFFECTS SUBJECT PROPERTY AND IS SHOWN HEREON
- 100' & 150' BUILDING SETBACKS/BUFFERS – AFFECTS SUBJECT PROPERTY AND IS SHOWN HEREON
- 30' SEWER EASEMENT – AFFECTS SUBJECT PROPERTY AND IS SHOWN HEREON
- 20' DRAINAGE EASEMENT – AFFECTS SUBJECT PROPERTY AND IS SHOWN HEREON
- 80' FUTURE PUBLIC ROAD – ADJOINS SUBJECT PROPERTY AND IS SHOWN HEREON
- 20' UTILITY EASEMENT – ADJOINS SUBJECT PROPERTY AND IS SHOWN HEREON

M.B. 42, PG. 58 IS AN ADJACENT PROPERTY AND SHOW:
- OVERHEAD ELECTRIC LINE (TRANSMISSION POWER LINE) FROM SUBJECT PROPERTY ACROSS ADJACENT PROPERTY – DOES NOT AFFECT SUBJECT PROPERTY
- BUILDING SETBACK LINES – DOES NOT AFFECT SUBJECT PROPERTY

(4) EXCEPTION 4: EASEMENT(S) AND RIGHT(S)-OF-WAY FOR ROADS OR PUBLIC/PRIVATE UTILITIES.

EXCEPTION 5: STATUTORY LIENS OF MECHANICS, LABORERS AND MATERIALMEN THAT HAVE PERFORMED OR FURNISHED LABOR, PROFESSIONAL DESIGN OR SURVEYING SERVICES, OR FURNISHED MATERIALS OR RENTAL EQUIPMENT OF WHICH NO NOTICE APPEARS OF RECORD. (NOTE: THIS EXCEPTION WILL BE DELETED ONLY UPON RECEIPT OF DOCUMENTATION SATISFACTORY TO THE COMPANY SATISFYING THE MATERIAL AND LABOR LIENS REQUIREMENT SET OUT IN SCHEDULE B-1 OF THIS COMMITMENT.)

EXCEPTION 6: ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCE AFFECTING THE TITLE THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND.

EXCEPTION 7: DISCREPANCIES, VARIANCES, SHORTAGES OR OVERAGES IN THE ACREAGE OF THE LAND.

EXCEPTION 8: RIGHTS OR CLAIMS OF PARTIES IN POSSESSION AS TENANTS UNDER UNRECORDED LEASES.

EXCEPTION 9: TIMBER DEED IN FAVOR OF GEORGIA PACIFIC CORPORATION RECORDED IN BOOK 811, PAGE 399. NOT PROVIDED BY TITLE COMPANY

(10) EXCEPTION 10: EASEMENT(S) OR RIGHT(S)-OF-WAY IN FAVOR OF VIRGINIA ELECTRIC AND POWER COMPANY RECORDED IN BOOK 342, PAGE 88; BOOK 401, PAGE 332; BOOK 492, PAGE 67; BOOK 524, PAGE 138; BOOK 570, PAGE 350; BOOK 962, PAGE 919.
D.B. 342, PG. 88 – UNABLE TO DETERMINE LOCATION WITH INFORMATION PROVIDED
D.B. 401, PG. 332 – UNABLE TO DETERMINE LOCATION WITH INFORMATION PROVIDED
D.B. 492, PG. 67 – DOES NOT AFFECT SUBJECT PROPERTY
D.B. 524, PG. 138 – DOES NOT AFFECT SUBJECT PROPERTY
D.B. 570, PG. 350 – DOES NOT AFFECT SUBJECT PROPERTY
D.B. 962, PG. 919 – 30' EASEMENT LOCATED PARALLEL TO THE NORTHERN SIDE OF 80' PROPOSED ROAD. SAID EASEMENT IS SHOWN FROM LEBANON CHURCH ROAD INTO THE SUBJECT PROPERTY BUT DOES NOT DEPICT A TERMINATION POINT AND IS SHOWN HEREON.

EXCEPTION 11: EASEMENT(S) OR RIGHT(S)-OF-WAY IN FAVOR OF CAROLINA TELEPHONE AND TELEGRAPH COMPANY RECORDED IN BOOK 433, PAGE 23.
UNABLE TO DETERMINE LOCATION WITH INFORMATION PROVIDED

EXCEPTION 12: EASEMENT(S) OR RIGHT(S)-OF-WAY IN FAVOR OF STATE HIGHWAY COMMISSION RECORDED IN BOOK 472, PAGE 44.
UNABLE TO DETERMINE LOCATION WITH INFORMATION PROVIDED

EXCEPTION 13: INTENTIONALLY DELETED.

EXCEPTION 14: INTENTIONALLY DELETED.

(15) EXCEPTION 15: COVENANTS, CONDITIONS, RESTRICTIONS, RESERVATIONS, POSSIBILITY AND/OR RIGHT OF REVERTER, AND EASEMENTS CONTAINED IN DEED RECORDED IN BOOK 961, PAGE 81.
D.B. 961, PG. 81 LISTS:
- 20' PERPETUAL, NON-EXCLUSIVE UTILITY EASEMENT AFFECTS ADJACENT PROPERTY AND IS SHOWN HEREON
- 30' SEWER EASEMENT AFFECTS SUBJECT PROPERTY AND IS SHOWN HEREON
- 20' DRAINAGE EASEMENT AFFECTS SUBJECT PROPERTY AND IS SHOWN HEREON

(16) EXCEPTION 16: TERMS AND CONDITIONS OF, AND RIGHTS OF OTHERS IN AND TO THE USE OF THE PROPERTY SUBJECT TO, THE APPURTENANT EASEMENT(S) MORE PARTICULARLY DESCRIBED IN EXHIBIT A AS FURTHER SET FORTH IN BOOK 961, PAGE 86.
80' NON-EXCLUSIVE EASEMENT OF RIGHT-OF-WAY TO BE TERMINATED AND EXPIRE UPON COMPLETION OF 100' PUBLIC RIGHT-OF-WAY (ACCESS ROAD) TO BE CONVEYED TO THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION. AFFECTS ADJACENT PROPERTY AND IS SHOWN HEREON

CURRENT LEGAL DESCRIPTION FROM TITLE COMMITMENT

FEE TRACT:

ALL THAT CERTAIN TRACT OF LAND CONTAINING 120.17 ACRES, MORE OR LESS, AND BEING A PORTION OF THE MID-ATLANTIC INDUSTRIAL PARK PROPERTY, AND BEING LOCATED IN GASTON TOWNSHIP, NORTHAMPTON COUNTY, NORTH CAROLINA, AND BEING BOUNDED NOW OR FORMERLY BY NATURAL BOUNDARIES AND/OR LAND OWNED BY AND/OR IN THE POSSESSION OF PERSONS AS FOLLOWS: ON THE SOUTH BY 510 REPP ONE, L.L.C., C.A. THOMAS ESTATE AND WILLIAM W. GRANT; ON THE WEST BY WILLIAM W. GRANT, SL. NEWSOME AND C.R. CLEMENTS; ON THE NORTH BY J.E. DICKENS, L.E. JOHNSON AND J.T. HARGRAVE; ON THE EAST BY J.T. HARGRAVE AND OTHER LANDS OF NORTHAMPTON COUNTY; SAID TRACT LYING APPROXIMATELY 1,600 FEET WEST OF N.C. STATE ROAD 1200 KNOWN AS LEBANON CHURCH ROAD.

SAID TRACT BEING MORE PARTICULARLY SHOWN ON THAT CERTAIN MAP TITLED, "NON-RESIDENTIAL SUBDIVISION PORTION OF MID-ATLANTIC INDUSTRIAL PARK" PREPARED BY CHARLES W. RUSHTON, REGISTERED SURVEYOR, DATED 16 NOVEMBER 2011, WHICH PLAT RECORDED IN MAP BOOK 42 AT PAGE 125 (THE "PLAT"), PUBLIC RECORDS OF NORTHAMPTON COUNTY, IS BY REFERENCE INCORPORATED HEREIN AS PART OF THIS DESCRIPTION (THE "PROPERTY")

TOGETHER WITH A PERPETUAL, NON-EXCLUSIVE, UTILITY EASEMENT 20 FEET WIDTH INCLUDING THE RIGHT TO CONSTRUCT, MAINTAIN, INSPECT, OPERATE, PROTECT, REPAIR, REPLACE, CHANGE THE SIZE OF, AND/OR REMOVE UTILITIES, INCLUDING, BUT NOT LIMITED TO, WATER AND ELECTRIC, WITH APPURTENANCES, TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS OVER, UNDER, THROUGH AND ACROSS SAID EASEMENT SITUATED IN GASTON TOWNSHIP, NORTHAMPTON COUNTY, NORTH CAROLINA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SAID EASEMENT BEING MORE PARTICULARLY DESCRIBED AS AS 20-FOOT WIDE UTILITY EASEMENT LOCATED ON THE SOUTHERN BOUNDARY OF THE FUTURE "PUBLIC ROAD" SHOWN AND DEPICTED UPON THE PLAT LEADING FROM THE WESTERN RIGHT-OF-WAY BOUNDARY OF N.C. STATE ROAD 1200, LEBANON CHURCH ROAD, TO THE EASTERN BOUNDARY OF THE PROPERTY HEREIN CONVEYED TO PARTY OF THE SECOND PART.

SAVE AND EXCEPT: NORTHAMPTON COUNTY, PARTY OF THE FIRST PART, RESERVES UNTO ITSELF, ITS SUCCESSORS AND ASSIGNS, A PERPETUAL, NON-EXCLUSIVE, SEWER EASEMENT 30 FEET IN WIDTH INCLUDING THE RIGHT TO CONSTRUCT, MAINTAIN, INSPECT, OPERATE, PROTECT, REPAIR, REPLACE, CHANGE THE SIZE OF, AND/OR REMOVE A SEWER LINE AND APPURTENANCES, TOGETHER WITH RIGHT OF INGRESS AND EGRESS OVER, UNDER, THROUGH AND ACROSS SAID EASEMENT, SITUATED IN GASTON TOWNSHIP, NORTHAMPTON COUNTY, NORTH CAROLINA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SAID EASEMENT BEING MORE PARTICULARLY DESCRIBED AS A 30-FOOT SEWER EASEMENT LOCATED ON THE SOUTHERN BOUNDARY ON PROPERTY HEREIN CONVEYED ACCORDING TO THE PLAT, IS BY REFERENCE INCORPORATED HEREIN AS PART OF THIS DESCRIPTION.

SAVE AND EXCEPT ALSO A 20-FOOT WIDE DRAINAGE EASEMENT LOCATED WITHIN THE BOUNDARIES OF THE 30-FOOT WIDE SEWER EASEMENT ON THE SOUTHERN BOUNDARY AND WITHIN THE 80-FOOT WIDE TRANSMISSION LINE RIGHT-OF-WAY ON THE EASTERN BOUNDARY AND THENCE CONTINUING ALONG THE OUTER BOUNDARY OF THE ABOVE DESCRIBED 120.17 ACRE TRACT ON THE NORTH AND WEST BOUNDARIES OF THE PROPERTY ALL IN ACCORDANCE WITH THE PLAT.

APPURTENANT EASEMENT:

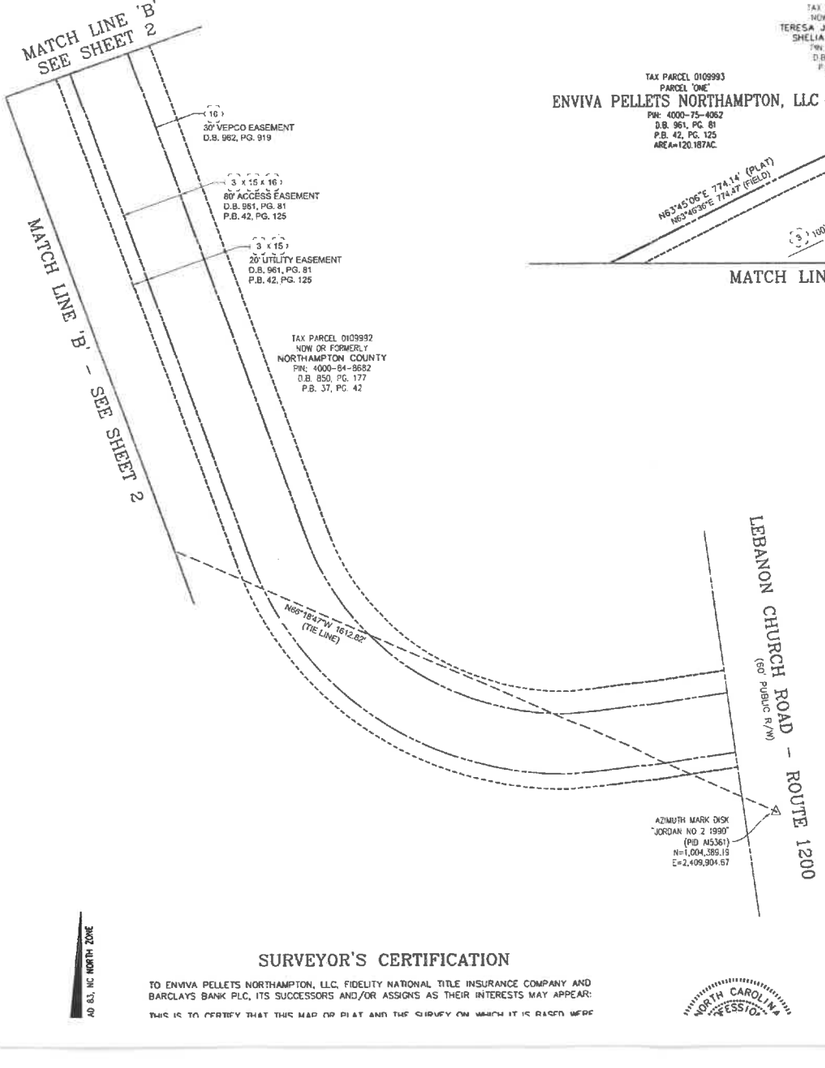
A TEMPORARY 80' FOOT WIDE NON-EXCLUSIVE EASEMENT OF RIGHT-OF-WAY LEADING FROM THE WESTERN RIGHT-OF-WAY OF NORTH CAROLINA STATE ROAD 1200 IN A WESTERLY DIRECTION TO THE EASTERN BOUNDARY OF THE ABOVE-DESCRIBED FEE TRACT, SAID EASEMENT BEING MORE PARTICULARLY SHOWN AND DEPICTED AS "FUTURE PUBLIC ROAD," ACCORDING TO PLAT ENTITLED "NON-RESIDENTIAL SUBDIVISION PORTION OF MID-ATLANTIC INDUSTRIAL PARK" ACCORDING TO A MAP PREPARED BY CHARLES W. RUSHTON, REGISTERED SURVEYOR, DATED 16 NOVEMBER 2011, WHICH PLAT, RECORDED IN MAP BOOK 42 AT PAGE 125, PUBLIC RECORDS OF NORTHAMPTON COUNTY, IS BY REFERENCE INCORPORATED HEREIN AS PART OF THIS DESCRIPTION.

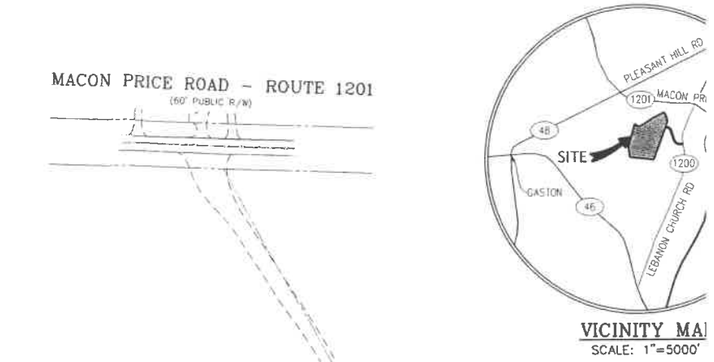
AS SURVEYED METES AND BOUNDS DESCRIPTION

COMMENCING AT A NATIONAL GEODETIC SURVEY MARKER DISK, DESIGNATION "JORDAN NO 2 1990" (PID AI5361), AND TIED TO NAD 83 (2001) HORIZONTAL COORDINATE WITH A NORTHING OF 1,004,389.19 AND A EASTING OF 2,409,904.67. SAID DISK IS LOCATED 13 FEET EAST FROM THE CENTERLINE OF LEBANON CHURCH ROAD, STATE ROUTE 1200, 60 FOOT RIGHT-OF-WAY AND ROUGHLY 43 FEET FROM THE EASTERLY LINE OF THE LANDS OF NORTHAMPTON COUNTY AS RECORDED IN DEED BOOK 850 AT PAGE 177 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA; THENCE DEPARTING SAID DISK AND LEBANON CHURCH ROAD AND CONTINUING THROUGH SAID LANDS OF NORTHAMPTON COUNTY THE FOLLOWING COURSE:
N 66°18'47" W 1612.82 FEET TO AN IRON PIPE FOUND
SAID PIPE BEING THE TRUE POINT OF BEGINNING; THENCE CONTINUING WITH SAID LANDS OF NORTHAMPTON COUNTY THE FOLLOWING (4) COURSES:
S 20°11'28" W 500.79 FEET TO AN IRON PIPE FOUND; THENCE
S 19°59'22" W 450.36 FEET TO AN IRON ROD SET; THENCE
S 20°06'59" W 588.77 FEET TO AN IRON ROD SET; THENCE
S 20°00'00" W 153.31 FEET TO AN IRON PIPE FOUND
SAID PIPE BEING ON THE NORTHERLY LINE OF THE LANDS OF 510 REPP ONE, LLC RECORDED IN DEED BOOK 954 AT PAGE 551 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA; THENCE DEPARTING SAID LANDS OF NORTHAMPTON COUNTY AND CONTINUING WITH SAID LANDS OF 510 REPP ONE, LLC THE FOLLOWING COURSE:
N 82°54'07" W 444.79 FEET TO AN IRON PIPE FOUND
SAID PIPE BEING ON THE NORTHEAST CORNER OF THE LANDS OF C.A. THOMAS ESTATE RECORDED IN DEED BOOK 496 AT PAGE 567 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA; THENCE DEPARTING SAID LANDS OF 510 REPP ONE, LLC AND CONTINUING WITH SAID LANDS OF C.A. THOMAS ESTATE THE FOLLOWING COURSE:
N 83°32'25" W 1180.09 FEET TO AN AXLE FOUND
SAID AXLE BEING ON THE EASTERLY LINE OF THE LANDS OF DAVID M GRANT AND CAROL B. GRANT RECORDED IN DEED BOOK 934 AT PAGE 243; THENCE DEPARTING SAID LANDS OF C.A. THOMAS ESTATE AND CONTINUING WITH SAID LANDS OF DAVID M. GRANT AND CAROL B. GRANT IN PART, THE LANDS OF SARAH L. NEWSOME RECORDED IN DEED BOOK 731, AT PAGE 72 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA AND THE LANDS OF VIRGINIA C. CLEMENTS RECORDED IN DEED BOOK 733 AT PAGE 887 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA THE FOLLOWING (4) COURSES:
N 06°47'36" W 691.23 FEET TO AN IRON PIPE FOUND; THENCE
N 15°08'46" E 730.52 FEET TO AN IRON ROD FOUND; THENCE
N 14°54'52" E 160.09 FEET TO AN IRON ROD FOUND; THENCE
N 15°04'53" E 692.75 FEET TO AN IRON PIPE FOUND
SAID PIPE BEING ON THE SOUTHERLY LINE OF THE LANDS OF TOMMIE A. DICKENS RECORDED IN DEED BOOK 761 AT PAGE 17 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA; THENCE DEPARTING SAID LANDS OF VIRGINIA C. CLEMEMNTS AND CONTINUING WITH SAID LANDS OF TOMMIE A. DICKENS THE FOLLOWING (3) COURSES:
S 54°06'59" E 312.50 FEET TO AN IRON ROD FOUND; THENCE
N 63°55'29" E 484.94 FEET TO AN IRON ROD FOUND; THENCE
N 54°53'13" E 497.77 FEET TO AN IRON PIPE FOUND
SAID PIPE BEING THE SOUTHWEST CORNER OF THE LANDS OF TERESA JOHNSON LONG AND SHELIA JOHNSON WOOD RECORDED IN DEED BOOK 879 AT PAGE 466 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA; THENCE DEPARTING SAID LANDS OF TOMMIE A. DICKENS AND CONTINUING WITH SAID LANDS OF TERESA JOHNSON LONG AND SHELIA JOHNSON WOOD THE FOLLOWING (3) COURSES:
N 54°35'04" E 128.84 FEET TO AN AXLE FOUND; THENCE
N 70°23'46" E 99.36 FEET TO A OAK STUMP FOUND; THENCE
N 63°46'36" E 774.47 FEET TO AN IRON ROD FOUND IN CONCRETE
SAID ROD BEING ON THE WESTERLY LINE OF THE LANDS OF J.T. HARGROVE AND SHIRLEY P. HARGROVE RECORDED IN DEED BOOK 579 AT PAGE 633 AMONG THE LAND RECORDS OF NORTHAMPTON COUNTY, NORTH CAROLINA; THENCE DEPARTING SAID LANDS OF TERESA JOHNSON LONG AND SHELIA JOHNSON WOOD AND CONTINUING WITH SAID LANDS OF J.T. HARGROVE AND SHIRLEY P. HARGROVE THE FOLLOWING (3) COURSES:
S 28°53'01" E 244.94 FEET TO AN IRON ROD FOUND; THENCE
S 16°57'07" E 273.98 FEET TO AN IRON ROD FOUND; THENCE
S 22°37'51" E 111.65 FEET TO AN IRON PIPE FOUND
SAID PIPE BEING ON THE NORTHWEST CORNER OF THE AFORESAID LANDS OF NORTHAMPTON COUNTY; THENCE DEPARTING SAID LANDS OF J.T. HARGROVE AND SHIRLEY P. HARGROVE AND CONTINUING WITH SAID LANDS OF NORTHAMPTON COUNTY THE FOLLOWING (2) COURSES:
S 20°02'13" W 618.03 FEET TO AND IRON PIPE FOUND; THENCE
S 20°07'51" W 446.23 FEET TO THE POINT OF BEGINNING, CONTAINING AN AREA OF 120.187 ACRES, MORE OR LESS.

LEGEND

	SIGN
	LAMP
	POWER POLE
	GUY WIRE
	POST
	RAILROAD SIGNAL
	FLAG
	PEDESTAL
	FIRE HYDRANT
	VALVE
	UTILITY MANHOLE
	BUSH
	TREE
DI	STORM DRAIN INLET
IPF	IRON PIPE FOUND
IRF	IRON ROD FOUND
IRS	IRON ROD SET
CLF	CHAIN LINK FENCE
CONC	CONCRETE
ELEC	ELECTRIC
HW	HEADWALL
P.O.B.	POINT OF BEGINNING
TRANS	TRANSFORMER
	FENCE LINE
	EDGE OF WATER/DITCH
	100' RPA BUFFER
	TREE LINE
	BRUSH LINE
	MECHANICAL EQUIPMENT /CONVEYOR SYSTEM
	EQUIPMENT AREA FOUNDATION
	CONCRETE
	RIP-RAP





VICINITY MA
SCALE: 1"=5000'

SURVEYOR'S CERTIFICATION

TO ENVIVA PELLETS NORTHAMPTON, LLC, FIDELITY NATIONAL TITLE INSURANCE COMPANY AND BARCLAYS BANK PLC, ITS SUCCESSORS AND/OR ASSIGNS AS THEIR INTERESTS MAY APPEAR:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE

NORTH CAROLINA PROFESSIONAL

PLAT SHOWING
ALTA/ACSM LAND TITLE SURVEY
OF
PROPERTY OWNED BY
ENVIVA PELLETS NORTHAMPTON, I
LOCATED ON
TAX PARCEL 01-09993
DEED BOOK 961, PAGE 81
NORTHAMPTON COUNTY, NORTH CAROLINA

SCALE: 1" = 100' DATE: NOV

REVISION

Bowm

APPENDIX D - ELECTRONIC MODELING FILES

Trinity Consultants
One Copley Parkway, Suite 310, Morrisville, North Carolina 27560 U.S.A. ■ (919) 462-9693 ■ Fax (919) 462-9694

April 15, 2014

William Flynn
Planning and Zoning Director
Northampton County Planning and Zoning
102 West Jefferson Street
Jackson, NC 27845

Subject: Air Permit Application Zoning Consistency Determination Request
Enviva Pellets Northampton, LLC

Dear Mr. William Flynn,

This letter is a request for a determination of whether planned installation of an eight hammermill located at Lebanon Church Road in Gaston, NC is consistent with current local zoning requirements. A copy of the air permit application being submitted to the North Carolina Division of Air Quality (NCDAQ) is attached.

Your confirmation of zoning consistency is needed by the NCDAQ prior to issuance of the air quality construction permit. Please complete the attached form and send to the address shown on the form as soon as possible. In the interim, we would appreciate it if you would stamp this cover letter with your department's seal, sign and date next to your seal and return the sealed cover letter via FAX to my attention at (919) 462-9694. This stamp is needed to be considered administratively complete by the NC Division of Air Quality. Should you require additional information to complete your review, please do not hesitate to contact me at (919) 462-9693.

Sincerely,

Gina Hicks

Gina Hicks
Senior Consultant

Attachment

APPENDIX E - ZONING CONSISTENCY DETERMINATION

Zoning Consistency Determination

Facility Name — Enviva Pellets Northampton, LLC

Facility Street Address — 874 Lebanon Church Road

Facility City — Gaston

Description of Process — Wood pellet manufacturing facility

SIC Code/NAICS — SIC – 2499 ; NAICS - 321999

Facility Contact — Joe Harrell

Phone Number — (252) 209-6032

Mailing Address — 142 N.C. Route 561 East

Mailing City, State Zip — Ahoskie, NC 27910

Based on the information given above:

- ☐ I have received a copy of the air permit application (draft or final) AND...
- ☐ There are no applicable zoning and subdivision ordinances for this facility at this time
- ☐ The proposed operation IS consistent with applicable zoning and subdivision ordinances
- ☐ The proposed operation IS NOT consistent with applicable zoning and subdivision ordinances (please include a copy of the rules in the package sent to the air quality office)
- ☐ The determination is pending further information and can not be made at this time
- ☐ Other: _____

Agency _____

Name of Designated Official _____

Title of Designated Official _____

Signature _____

Date _____

Please forward to the mailing address listed above and the air quality office at the appropriate address as checked on the back of this form.

Courtesy of the Small Business Assistance Program
toll free at 1-877-623-6748 or on the web at www.envhelp.org/sb

All PSD and Title V Applications

X Attn: Dr. Donald van der Vaart, PE
DAQ – Permitting Section
1641 Mail Service Center
Raleigh, NC 27699-1641

Local Programs

□ Attn: David Brigman
Western NC Regional Air Quality Agency
49 Mount Carmel Road
Asheville, NC 28806
(828) 250-6777

□ Attn: Donald R. Willard
Mecklenburg County Air Quality
700 N. Tryon Street, Suite 205
Charlotte, NC 28202-2236
(704) 336-5500

□ Attn: Robert R. Fulp
Forsyth County
Environmental Affairs Department
537 N. Spruce Street
Winston-Salem, NC 27101-1362
(336) 703-2440

Division of Air Quality Regional Offices

□ Attn: Paul Muller
Asheville Regional Office
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500

□ Attn: Steven Vozzo
Fayetteville Regional Office
225 Green Street Suite 714
Fayetteville, NC 28301
(910) 433-3300

□ Attn: Ron Slack
Mooresville Regional Office
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

□ Attn: Patrick Butler, PE
Raleigh Regional Office
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200

□ Attn: Robert Fisher
Washington Regional Office
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481

□ Attn: Wayne Cook
Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

□ Attn: Margaret Love, PE
Winston-Salem Regional Office
585 Waughtown Street
Winston-Salem, NC 27107
(336) 771-5000

Courtesy of the Small Business Assistance Program
toll free at 1-877-623-6748 or on the web at www.envhelp.org/sb

DIVISION OF AIR QUALITY
March 20, 2014

MEMORANDUM

To: Patrick Butler, Raleigh Regional Office

From: Shannon M. Vogel, Stationary Source Compliance Branch SMVogel

Subject: Enviva Pellets Northampton LLC
Garysburg, Northampton County, North Carolina
Facility ID 6600167, Permit No. 10203R00
Total Particulate Matter (PM), Volatile Organic Compounds (VOC), Carbon Monoxide (CO), and Nitrogen Oxides (NOx) Emissions Tests of Wood Dryer ES-DRYER
Performed October 3, 2013 by Air Control Techniques, Inc. Tracking No. 2013-166st

SSCB has reviewed the subject report. The test results are acceptable and demonstrate compliance with the applicable emissions standards. Emission Source ID ES-DRYER is a direct heat wood-fired dryer controlled by simple cyclone CD-DC in series with wet electrostatic precipitator CD-WESP. 15A NCAC 2D .0515 *Particulates From Miscellaneous Industrial Processes* and 15A NCAC 2Q .0317 *Avoidance Conditions for 15A NCAC 2D .0530 Prevention of Significant Deterioration* apply to ES-DRYER.

Air Control Techniques, Inc. performed EPA Methods 5/202, 25A and 18, 10 and 7E to determine the total PM, VOC, CO, and NOx emissions, respectively. The test results are acceptable and tabulated below. 15A NCAC 2D .0515 limits total PM based on actual process rate. The VOC and CO emission limits in accordance with 2Q .0317 are stated in permit condition 2.1.A.4.a as 250 tons per 12 month period, each. Permit Condition 2.1.A.4.b requires testing to establish emission factors for VOC and CO emissions to replace the emission factors of 0.95 and 0.81 pounds per oven dried ton (lb/ODT) for VOC and CO, respectively. No emission limits for NOx are included in the permit. The average process rate during testing was 72 tons per hour throughput. The 2D .0515 total PM limit is 48.0 pounds per hour.

Pollutant	Test Results	Emission Limit	Standard	Compliance
Filterable PM	1.54 lb/hr	---	---	---
Condensible PM	1.52 lb/hr	---	---	---
Total PM	3.07 lb/hr	48.0 lb/hr	2D .0515	Yes
VOC as propane[1]	43.3 lb/hr 189.5 ton/12 month	250 ton/12 month[2]	2Q .0317	Yes
	0.724 lb/ODT	0.95 lb/ODT		Yes
CO	13.5 lb/hr 59.0 ton/12 month	250 ton/12 month	2Q .0317	Yes
	0.23 lb/ODT	0.81 lb/ODT		Yes
NOx	27.8 lb/hr 121.9 ton/12 month	---	---	---

1. VOC as propane calculated based on EPA Method 25A minus EPA Method 18 methane results.
2. Ton per 12-month results were calculated based on 8760 hours per year.

Permit Condition 2.1.A.4.d states "The Permittee shall not process more than 10% softwood on an annual basis." Joe Harrell of Enviva reported a hardwood/softwood ratio during testing of 94%/6%. Enviva reported a rate of ~60 oven dried ton pulp per hour (ODT/hr) based on the 17% average moisture content. If you have any questions regarding the results of this review, please contact me at (919) 707-8416 or shannon.vogel@ncdenr.gov. Compliance with the applicable emission standard was demonstrated.

RECD AIR RECORDS UNIT MAR 27 PM

cc: Central Files, Northampton County IBEAM Documents - 6600167