Amended
application
8/4/16

Enviva Pellets Northampton LLC
874 Lebanon Church Road
Garysburg, NC 27381

+1 (252) 541 2631
fax (252) 541 2632

www.envivabiomass.com

December 20, 2016

Via FedEx
Overnight Delivery

Ms. Yukiko Puram
NCDEQ-DAQ
Air Permitting Section
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: Additional Information Request for Permit Application Submitted August 9, 2016
(Application ID No. 6600167.14B)
Enviva Pellets Northampton, LLC
Garysburg, North Carolina

Ms. Puram:

Enviva Pellets Northampton, LLC (Enviva) would like to provide the requested information that was requested on November 29, 2016. Please find Enviva's response below:

1. Please submit additional documents to support the control efficiencies for the cyclones CD-DC, CD-HM-CYC 1 through 8, and CD-CLR 1 through 6.
    a. For the CD-DC, the 98.5% refers to the cyclone and WESP's combined control efficiencies. In Form C4 for Dryer, the manufacturer is listed Lundberg E-Tube 115719, which is the WESP manufacturer.
    b. For CD-HM-CYC 1 through 8, the control efficiency document is attached. The ES-HM 1 through 8 cyclones are in series with a process ending bag filter equipment, Aircon 16 RAB 412-10. The control efficiency of the cyclones is not included in the emission calculations.
    c. For CD-CYC- 1 through 6, the control efficiency document is attached.
2. Please update Table B-1 of your application to include emissions from missing emission sources. The sources that are missing from the table are: ES-DLB, ES-DLC-1, ES-BCS-2, ES-BCS-3, ES-BSB-1, and ES-BSB-2.
    a. For ES-DLB, ES-DLC-1, ES-BSC-2, ES-BSC-3, ES-BSB-1, and ES-BSB-2, are represented in the emission calculations for ES-DWH in Table B-~~14~~ 13.
    b. All of the emission sources listed above are fugitive emissions from handling dry wood.
    c. From NCDEQ request for more information letter, ES-BCS-2 and ES-BCS-3 were incorrectly named. They are ES-BSC-2 and ES-BSC-3 in the application, which are included in the ES-DWH emissions calculations.

3. There are inconsistent source ID numbers throughout the application, with ES-DLH, Dry Line Hopper and ES-DLB, Dry Line Feed Bin are the same source. ES-PFB-1, Pellet Fines Bin and ES-FB are the same source.
   a. Attached are the edited forms and tables that will list ES-DLB, Dry Line Bin and ES-PFB-1, Pellet Fines Bin.

If you have any questions or require additional information, please contact me at 252-370-3181.

Sincerely,

Joe Harrell
Corporate EHS Manager

cc: Royal Smith, Enviva Executive VP-Operations

B-4

TABLE ~~B-12~~ 6

BAGFILTER AND CYCLONE EMISSIONS
ENVIVA PELLETS NORTHAMPTON

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 $PM_{2.5}$	Emissions PM (lb/hr)	Emissions PM (tpy)	Emissions PM_{10}[3] (lb/hr)	Emissions PM_{10}[3] (tpy)	Emissions $PM_{2.5}$[3] (lb/hr)	Emissions $PM_{2.5}$[3] (tpy)
Hammermills 1-3	ES-HM-1 through 3	CD-HM-BF-1	45000	0.004	8,760	100%	100%	1.54	6.76	1.54	6.76	1.54	6.76
Hammermills 4-6	ES-HM-4 through 6	CD-HM-BF-2	45000	0.004	8,760	100%	100%	1.54	6.76	1.54	6.76	1.54	6.76
Hammermills 7, 8, NDS	ES-HM-7 and 8, ES-NDS, DLC	CD-HM-BF-3	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-1	CD-PFB-BV-1	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 Handing	ES-FPH, ES-PL1,2, ES-PB1-12	CD-FPH-BV	35,500	0.004	8,760	91%	55%	1.22	5.33	1.11	4.85	0.67	2.93
Finished Product Bagging Screens	ES-BSC-1, ES-BSS-1	CD-BS-BF-1	45,000	0.01	8,760	91%	55%	3.86	16.89	3.51	15.37	2.12	9.29
Finished Product Bagging Screens	ES-BSC-1, ES-BSS-2	CD-BS-BF-2	45,000	0.01	8,760	91%	55%	3.86	16.89	3.51	15.37	2.12	9.29
							TOTAL	**22.56**	**98.83**	**20.97**	**91.84**	**14.59**	**63.89**

HM 6?

Note:

[1] Filter, Vent, and Cyclone inlet flow rate (cfm) provided by design engineering firm (Mid-South Engineering Co.). The exit flowrate was conservataively assumed to be the same as the inlet flowrate.

[2] Pollutant loading 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.

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

Source Description	Unit ID	CO (tpy)	NOx (tpy)	TSP (tpy)	PM-10 (tpy)	PM-2.5 (tpy)	SO2 (tpy)	Total VOC (tpy)	$CO_{2e\ biomass\ deferral}$ (tpy)	CO_{2e} (tpy)
Dryer System	ES-DRYER	60.95	125.50	29.84	29.84	29.84	19.20	209.88	3,341.43	162,118.83
Emergency Generator	ES-EG	0.50	0.58	0.03	0.03	0.03	0.0010	0.0015	93.35	93.35
Fire Water Pump	ES-FWP	0.43	0.49	0.02	0.02	0.02	0.0008	0.0013	80.02	80.02
Hammermills/Nuisance Dust System	ES-HM-1 thru 8/ ES-NDS (see note)	-	-	20.27	20.27	20.27	-	24.71	-	-
Pellet Mill Feed Silo	ES-PMFS	-	-	0.38	0.38	0.38	-	-	-	-
Pellet Fines Bin	ES-PFB-1	-	-	0.54	0.54	0.54	-	-	-	-
Pellet Presses and Coolers	ES-CLR1 thru -6	-	-	38.52	35.05	21.19	-	142.86	-	-
Finished Product Handling & Loadout	ES-FPH, PL1,2 PB1-12	-	-	5.33	4.85	2.93	-	-	-	-
Finished Product Bagging Screening	ES-BSC-1, ES-BSS-1, 2	-	-	33.79	30.75	18.58	-	-	-	-
Dried Wood Handling	ES-DWH (see note), ES-PP	-	-	0.12	0.06	0.01	-	-	-	-
Diesel Storage Tanks	TK1 & TK2	-	-	-	-	-	-	9.10E-04	-	-
	Total PSD Emissions	**61.88**	**126.57**	**128.84**	**121.79**	**93.79**	**19.20**	**377.46**	**3,514.80**	**162,292.20**
Fugitive (Non-PSD Sources)										
Bark-Hog	ES-BARK	-	-	-	-	-	-	0.30	-	-
Chipping	ES-EPWC	-	-	-	-	-	-	1.25	-	-
Green Hammermills	ES-RCHIP - 1 and 2	-	-	-	-	-	-	1.25	-	-
Green Wood Handling	ES-GWH S	-	-	0.03	0.01	0.00	-	-	-	-
Green Wood Piles	ES-GWSP1 GWH S ?	-	-	2.65	1.33	0.20	-	2.93	-	-
	Total Facility Emissions:	**61.88**	**126.57**	**131.52**	**123.13**	**93.99**	**19.20**	**382.89**	**3,514.80**	**162,292.20**

Note: DWH (Dried wood handling) includes several miscellaneous dried wood transfer sources as detailed in Table B-14 (including ES-DLB, ES-BSC-1, ES-BSC-2, ES-BSB-1, and ES-BSB-2).
Note: NDS represents the Nuisance Dust System source which includes the transfer of materials from the Dry Line Conveyor (ES-DLC-1).

TABLE B-14
DRIED WOOD HANDLING DROP POINTEMISSIONS
ENVIVA PELLETS NORTHAMPTON

Annual Dryer Output Throughput (ODT/yr)	537,625
Maxium Dry Line Annual Throughput (ODT/yr)	87,600
Dryer Throughput Plus Dry-line Throughput (ODT/yr)	625,225
Amount of Fines Diverted from Hammermills	15.0%
Annual Hammermill Throughput (ODT/yr)	531,441
Pellet Press Throughput (ODT/yr)	625,225
Max Dryer Short-Term Throughput (ODT/hr)	71.710
Dry-line Feed Throughput (ODT/hr)	10.000
Max Hammermill and Pellet Press Throughput (ODT/hr)	81.710
Max Bagging System Throughput (ODT/hr)	60.000
Dryer Output Moisture Content:	17%
Pellet Mill Output Moisture Content:	7%

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] (tph)	Annual (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	86.40	647,741	3.1E-03	1.2E-02	1.5E-03	5.5E-03	2.2E-04	8.3E-04
DP2	ES-DWH	Pre-screen Feeder Fines Overs to Hammermills Infeed and Distribution	Enclosed	Reduction to 2 mph mean wind speed	14.77	112,992	5.3E-04	2.0E-03	2.5E-04	9.6E-04	3.8E-05	1.5E-04
DP3	ES-DWH	Hammermills Cyclone Diverter Gates to Hammermills System Discharge Collection Conveyor Belt	Enclosed	Reduction to 2 mph mean wind speed	83.68	640,291	3.0E-03	1.2E-02	1.4E-03	5.4E-03	2.2E-04	8.2E-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	98.45	753,283	3.5E-03	1.4E-02	1.7E-03	6.4E-03	2.5E-04	9.7E-04
DP5	ES-DWH	Drop Point for Dry Line Transfer from Dry Line Bin to Dry Line Conveyor DLH ~~DLB~~	Enclosed	Reduction to 2 mph mean wind speed	12.05	105,542	4.3E-04	1.9E-03	2.0E-04	9.0E-04	3.1E-05	1.4E-04
DP6	ES-PP	Drop Emissions from Pellet Presses to Pellet Press Collection Conveyors	Enclosed	Reduction to 2 mph mean wind speed	87.86	672,285	1.1E-02	4.2E-02	5.2E-03	2.0E-02	7.8E-04	3.0E-03
DP7	ES-DWH	Drop Emissions from Bagging System Conveyors to Bagging System Bins	Enclosed	Reduction to 2 mph mean wind speed	64.52	625,225	8.0E-03	3.9E-02	3.8E-03	1.8E-02	5.8E-04	2.8E-03
						TOTAL	**3.0E-02**	**1.2E-01**	**1.4E-02**	**5.7E-02**	**2.1E-03**	**8.7E-03**

BSB1.2, BSC2.3

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	
	Dryer Exit	Pellet Press Exit
M = material moisture content (%)	17	7
E for PM (lb/ton) =	3.6E-05	1.2E-04
E for PM_{10} (lb/ton) =	1.7E-05	5.9E-05
E for $PM_{2.5}$ (lb/ton) =	2.6E-06	8.9E-06

$$E = k(0.0032)\left(\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\right) \text{ lb/ton}$$

$$= 0.35(0.0032)\frac{\left(\frac{2.0}{5}\right)^{1.3}}{\left(\frac{17}{2}\right)^{1.4}} = 0.0000702 \text{ lb/ton}$$

$$0.00112 \quad \frac{0.3039}{20.}$$

$$\times \text{~~1.03~~} 12.05 \frac{\text{ton}}{\text{hr}} = 0.41 \text{ lb/hr}$$

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: Dry Line Bin	EMISSION SOURCE ID NO: ES-DLB
	CONTROL DEVICE ID NO(S): N/A- Fugitive
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A - Fugitive

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Dried wood materials are transferred to Dry Line Conveyor (ES-DLC).

DLB →

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	10 tph	

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

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 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: Dry Line Feed Conveyor	EMISSION SOURCE ID NO: IES-DLC
	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):

Dried wood materials are transferred from the dry line feed ~~hopper~~ Bin (ES-DLB) to the exisiting hammermill pre-screens in-feed conveyor.

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: 2014	OPERATION DATE: 2014	DATE MANUFACTURED: 2014
MANUFACTURER / MODEL NO.: Enviva Built	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 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: Dry Line ~~Hopper~~ Bin	EMISSION SOURCE ID NO: ES-DLB
	CONTROL DEVICE ID NO(S): N/A
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A - Fugitive

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Dried wood materials aretransferred to the Dry Line Conveyor (ES-DLC).

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: 2014	OPERATION DATE: 2014	DATE MANUFACTURED: 2014
MANUFACTURER / MODEL NO.: Enviva Built	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

OPERATION, INSTALLATION, & MAINTENANCE MANUAL

for

Aircon HE (High-Efficiency)

Pellet Cooler Cyclone Units

Aircon Corporation
P.O. Box 80446
2873 Chelsea Avenue
Memphis, TN 38108-0446
Telephone: (901) 452-0230
FAX: (901) 452-0264

TABLE of CONTENTS

OPERATING PRINCIPLE

A. Dust-laden air enters the cyclone at the inlet section. Typically, it is directly from the pellet cooler.

B. As air is collected in the body section of the unit, the weight of this rotating mass of air begins to drop into the cone section. The deceleration of particles striking the inside surface of the cone section causes the heavier particulate matter to drop from the air stream into the cone discharge. Hence, the cone section contributes most to the action of mechanical separation inside the cyclone.

C. The swirl of air in this cone section creates a low pressure area in the center area of the cyclone body. Consequently, the lighter (cleaner) air in the center of this vortex rises into the tube and into the plenum section.

D. A smaller cone called a "vortex cone" or "vortex breaker" sits directly under the bottom of the main cone. Its purpose is to lower the final discharge of the cyclone below the profile of the vortex, so that material can be allowed to flow out of the unit without being pulled back up into the unit.

E. A pressure drop occurs as air swirls through the unit. Every rotation of air within the unit requires energy to cause it to constantly change direction. The average amount of pressure drop through the cyclone will typically range from 5 inches to 7 inches [water gage]. Given different air velocities and temperatures, a chart in the Appendix is available for more precise estimates.

F. There is a practical upper and lower design limit to the capacity of any cyclone unit or cyclone set. The best range is based on an inlet velocity of between 3,500 and 4,000 feet per minute. However, the upper range can be extended to 4,300 feet per minute without any measurable loss of efficiency.

EFFICIENCY

The efficiency of any cyclone is nearly proportional to the mean size of suspended particles entering the unit. Because an Aircon pellet cooler cyclone has a relatively large height-to-width ratio, it is the most efficient type of mechanical separator used in the feed industry.

According to an EPA publication AP-42, a high-efficiency pellet cooler cyclone of this type will emit a maximum of *0.15 lbs. of PM-10 particulate per one ton of material entering the pellet cooler.* {Source: EPA publication AP-42, Chapter 9 (for the food and agricultural industries), at their website: http://www.epa.gov/ttn/chief/ap42/ch09/final/c9s0909-1.pdf, page 24.}

For example, a 60-ton per hour counter-flow pellet cooler system will have the following *maximum* emissions rate:

$$\frac{60 \text{ process tons}}{\text{hr}} \times \frac{0.15 \text{ lbs emissions}}{\text{process ton}} = 9 \text{ lbs/hr}$$

The chart in the Appendix can help determine the capture percent efficiency of a correctly sized pellet cooler cyclone for any one particular size of dust. A correctly sized cyclone typically will be sized for an inlet velocity of between 3,500 and 4,300 (actual) feet per minute.

The new EPA emission standard concerning manganese and chromium (40 CFR Part 63, Subpart DDDDDDD) states that air pollution control equipment must achieve 95% or greater (by weight) reduction in particulate matter (PM_{10}) emissions. This efficiency is guaranteed by Aircon provided that the cyclones are adequately sized for the system. The ideal range design inlet range for any HE cyclone is from 3,500 to 4,000 fpm. However, a system can be adequately sized and still allow air velocity to be as high 4,300 feet per minute.

The lower recommended range for a cyclone of 3,500 feet per minute is based on maintenance concerns and not necessarily on emission concerns. If the velocity in a cyclone inlet falls below 3,500 fpm, there may be buildup of material in the inlet duct. However, this will not adversely affect emissions at the point of the cyclone. Nevertheless, it is possible that the lack of adequate ventilation on the pellet cooler exhaust may allow the unvented emissions to show up somewhere else in the process.

OPERATING INSTRUCTIONS

RECEIVING

Depending upon the request of the installer, the cyclone may be shipped in several sections. Therefore, a quick inspection should be performed on each section for damage that may have occurred in transit. Also, both the quantity and quality of any parts that may have been shipped loosely should be checked. Boxes containing these parts should be inspected for signs of improper handling that may have caused damage. Any missing or damaged parts should be noted with the shipper before accepting the shipment. Aircon is not responsible for any damage that occurs during shipping. The purchaser should bring all damage claims against the carrier.

INSPECTION

Upon accepting the shipment a closer inspection of the cyclone is necessary. Care should be taken to thoroughly inspect each section of the cyclone for dents or cracks. Aircon should be notified of any inconsistencies between the unit and any certified drawings containing Aircon specifications. No changes should be made without the consent of Aircon.

INSTALLATION

Most pellet cooler cyclones are installed inside a mill. The available space will determine how the cyclones and related ductwork are installed.

START-UP CHECKLIST

A. Unit body sections, supports, and compressed air piping secured with all bolts adequately tightened.

B. Any unused optional or auxiliary NPT connections plugged and sealed airtight.

C. Clean-out door secured.

D. Any access doors in place and properly secured.

E. At the conclusion of an operating period, turn off the process equipment and other related process equipment twenty (20) minutes before the system fan. This routine will allow the system to be purged after each use. Remember to discharge all related auxiliary equipment, such as the screw conveyor and rotary airlock.

TROUBLESHOOTING

A. **Observation**: Visible dust leakage (not steam)

Problem: Fan oversized, too much airflow, or damper open too much.

B. **Observation**: Flow rate of air through system too low

Problem: System blower or fan (fan undersized; fan running backwards; fan belt slippage)

System blockage (blockage in duct leading up to filter)

RECOMMENDED MAINTENANCE

INSPECTION

Daily

A. Check exhaust from the system fan to make sure there are no visible dust emissions.
B. Check solid discharge from the cyclones.
C. Check to see if there if there is any visible water (condensate) leaking from the ductwork.
D. Check system fan amperage draw, calculated brake horsepower, and compare to estimated brake horsepower.

Quarterly (every three months)

A. Remove any access doors (if equipped with them) to observe if there is any dust accumulation in the plenum.
B. Do a thorough examination of the cyclones and ductwork to see if there are any air leaks, rust, or corrosion. In some cases, insulation may need to be removed to check affected areas.

SAFETY

Before removing any access doors, please observe the following safety precautions:

A. Turn off the system fan or blower and lock out all electrical disconnects for all associated and auxiliary equipment.

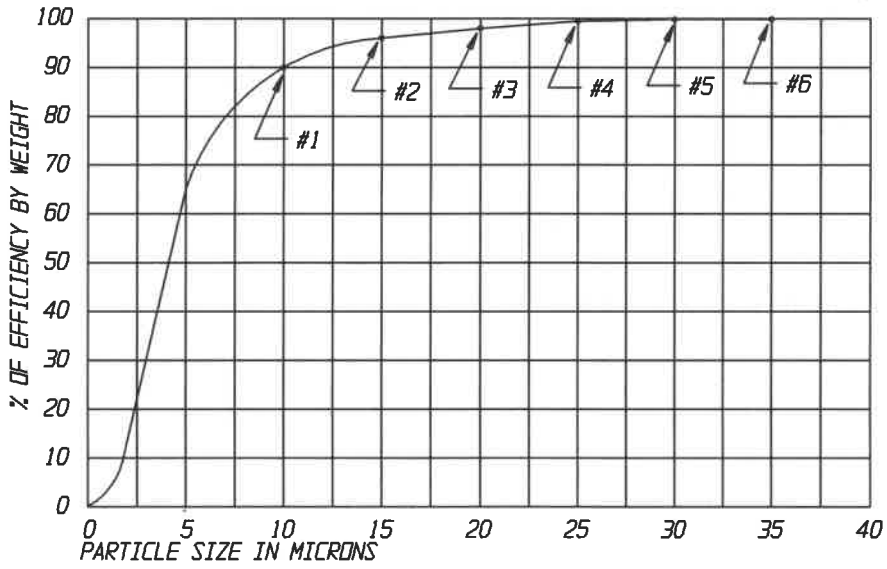
B. Depending upon the size of the access door, two operators may be required to remove it. Access doors are to be removed completely.

C. Do not enter a cyclone without a confined space permit or without observing required safety protocol at the site.

Aircon CORPORATION
P.O. BOX 8446
MEMPHIS, TENNESSEE 38108
(901) 452-0230

EFFICIENCY CHART FOR HIGH EFFICIENCY CYCLONES

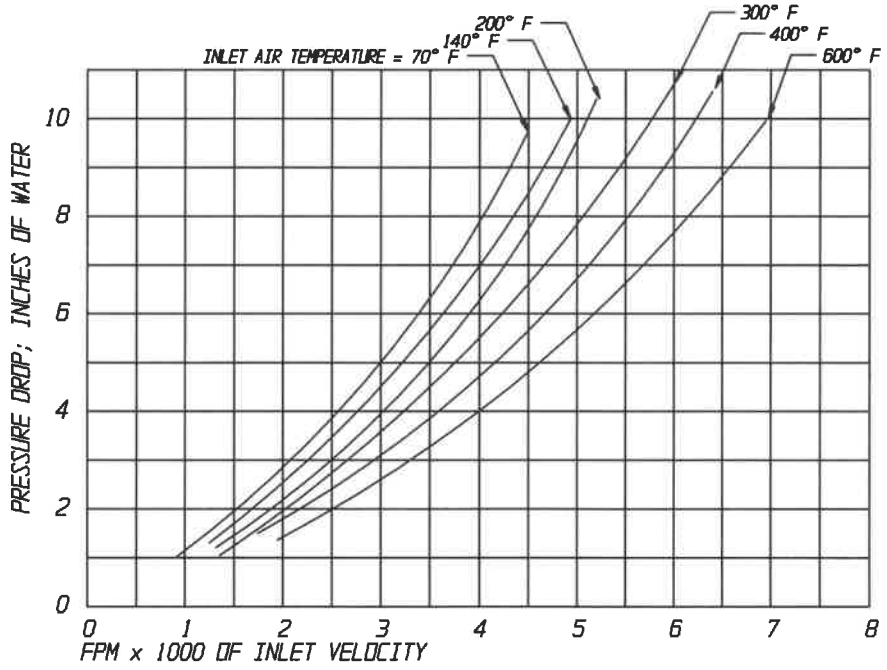
EFFICIENCY CHART



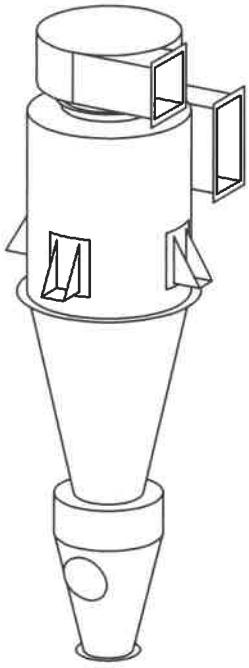
POINTS # : EFFICIENCY @ MICRON (SIZE OF PARTICLE)

#1 90% @ 10
#2 96% @ 15
#3 98% @ 20
#4 99.5% @ 25
#5 99.85% @ 30
#6 99.9% @ 35

PRESSURE DROP CHART

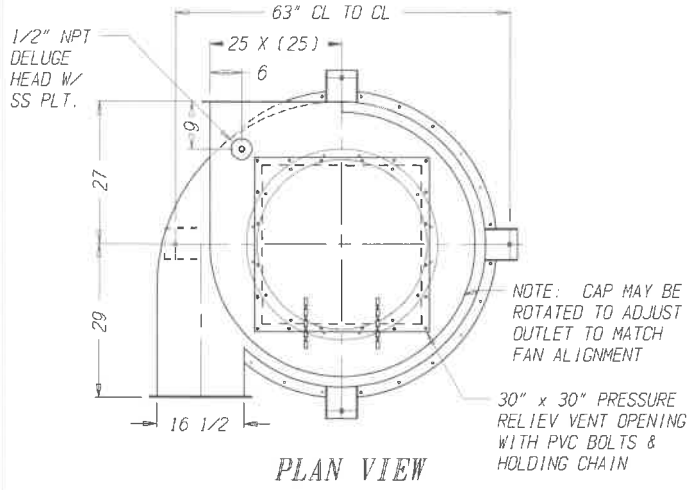


AIRCON MODEL

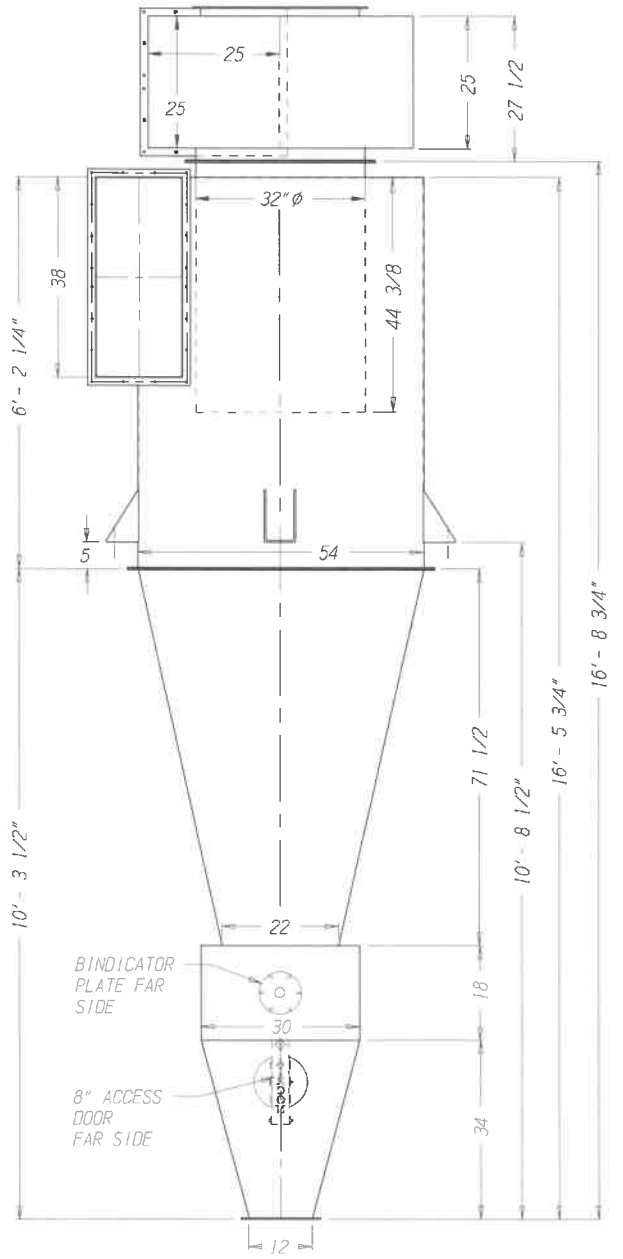


COLLECTOR

SUITABLE IMPLEMENTATION OF AIRCON H-STYLE COLLECTORS CAN ACHIEVE UP TO 99.9% COLLECTOR EFFICIENCY ON PARTICLES GREATER THAN 34 MICRONS. PARTICLES SMALLER THAN 34 MICRONS CAN BE COLLECTED WITH EFFICIENCIES RANGING FROM 90% TO 99.85%.



PLAN VIEW



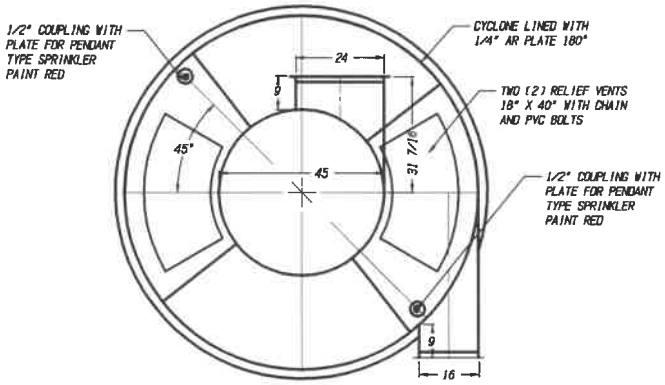
ELEVATION VIEW

NO.	REVISION - DESCRIPTION	DATE	BY
A	Corrected top view to shop exp vent	12/13/12	JT

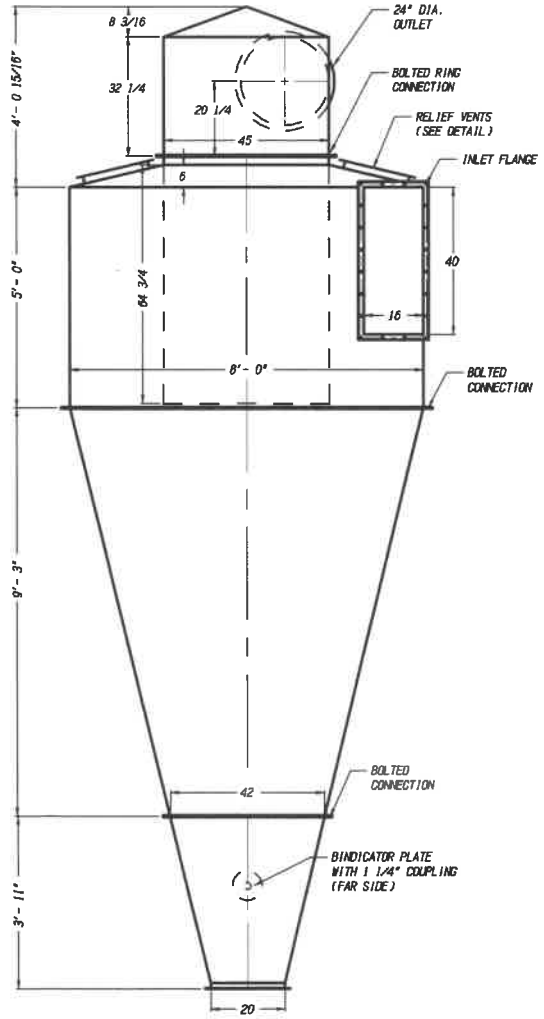
Aircon CORPORATION
P.O. BOX 80446
MEMPHIS, TN 38108-0446
PHONE: (901) 452-0230
FAX: (901) 452-0264
E-MAIL: doronp@aircon-corporation.com

DRAWN: dp/jt
SCALE: 3/16" = 1'- 0"
DATE: 12/12/12
PROJ. NO.: 2012-5620
DWG. NO.: 5620-HE54

1HE-54 COLLECTOR UNIT



PLAN VIEW



ELEVATION VIEW

NOTE: 1) TWO (2) SPRINKLER TAPS DELUGE PER CYCLONE 1/2" FULL COUPLING WITH PLATE AND PENDANT SPRINKLER (DO NOT USE UPRIGHT) PAINT RED

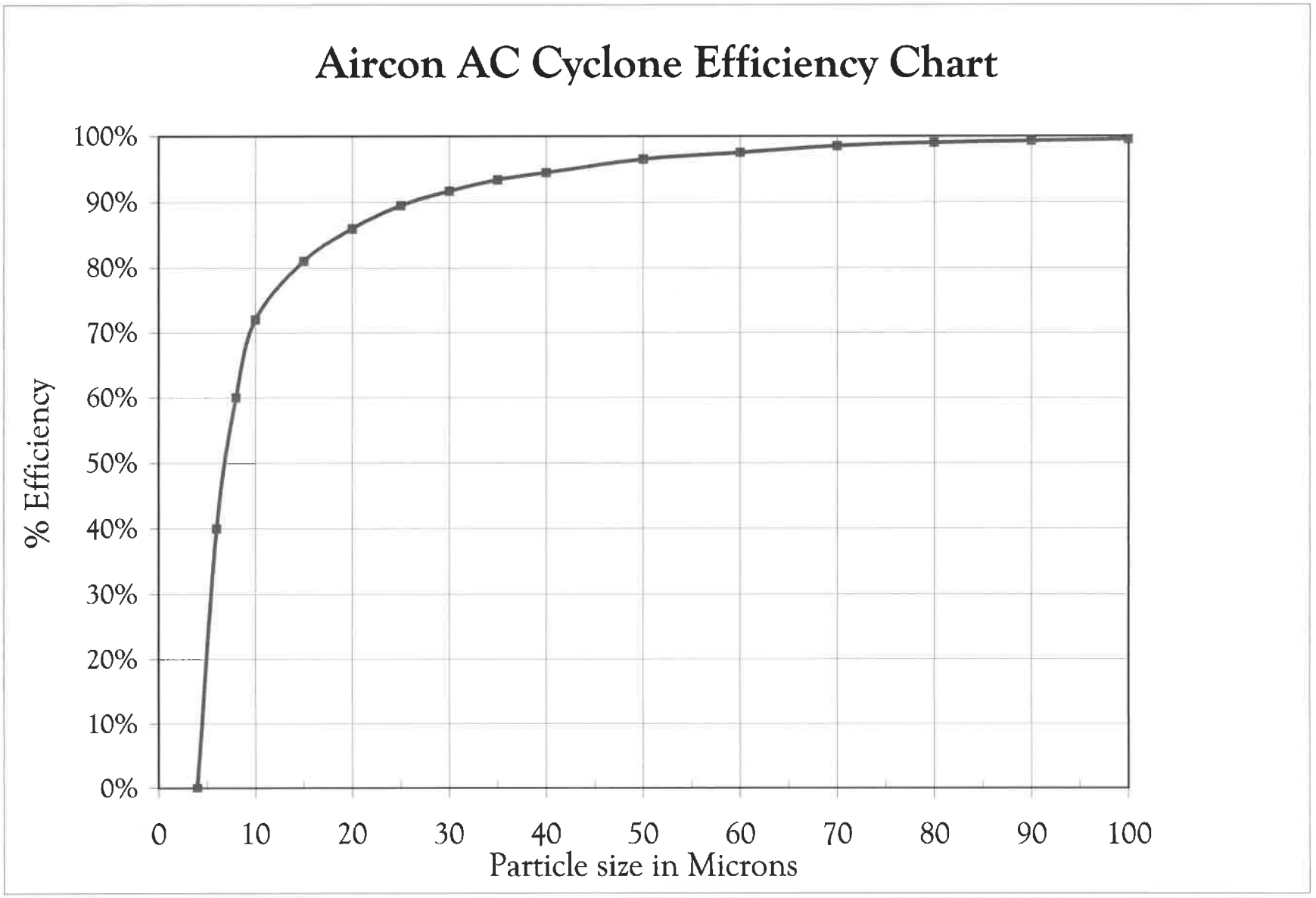
NO.	REVISION - DESCRIPTION	DATE	BY

Aircon CORPORATION
P.O. BOX 80446
MEMPHIS, TN 38108-0446
PHONE:(901) 452-0230
FAX: (901) 452-0264
E-MAIL : johna@aircon-corporation.com

DRAWN	dp/jt
APPROVED	
SCALE	1/2" = 1'-0"
DATE	12/12/12
PROJ.NO.	2612-5620
DWG.NO.	AC96-overall

AC96 CYCLONE

Aircon AC Cyclone Efficiency Chart



Puram, Yukiko

From: Joe Harrell <joe.harrell@envivabiomass.com>
Sent: Friday, June 30, 2017 3:44 PM
To: Puram, Yukiko
Cc: Voelker, Joseph; Wike, Will; Christopher Seifert; Michael H Carbon
Subject: RE: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Yuki,

Thanks for preparing the summary of our recent discussions I found it very helpful. As a follow-up to your questions please find the below responses and associated attachment for your review.

Best regards,
Joe

Joe Harrell
Corporate EHS Manager

Enviva Pellets Ahoskie, LLC
142 NC Route 561 East
Ahoskie, NC 27910 USA
www.envivabiomass.com
+1 (252) 209 6032 x(2202)
cell (252) 370 3181
fax (252) 364 3428
joe.harrell @envivabiomass.com

From: Puram, Yukiko [mailto:yuki.puram@ncdenr.gov]
Sent: Tuesday, June 13, 2017 9:33 AM
To: Joe Harrell <joe.harrell@envivabiomass.com>
Cc: Voelker, Joseph <joseph.voelker@ncdenr.gov>; Wike, Will <will.wike@ncdenr.gov>; Christopher Seifert <Christopher.Seifert@envivabiomass.com>
Subject: RE: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Joe,

Do you think three weeks be sufficient? How about by July 5th?

Yuki

Yuki Puram
Environmental Engineer
Division of Air Quality
North Carolina Department of Environmental Quality

919 707 8470 office
yuki.puram@ncdenr.gov

217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699

Nothing Compares

From: Joe Harrell [mailto:joe.harrell@envivabiomass.com]
Sent: Tuesday, June 13, 2017 9:29 AM
To: Puram, Yukiko <yuki.puram@ncdenr.gov>
Cc: Voelker, Joseph <joseph.voelker@ncdenr.gov>; Wike, Will <will.wike@ncdenr.gov>; Christopher Seifert <Christopher.Seifert@envivabiomass.com>
Subject: RE: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Yuki,
When will you need this by? I'm speaking with my support team on Friday, so we can address your comments and questions below.

Thank you,
Joe

enviva

Joe Harrell
Corporate EHS Manager

Enviva Pellets Ahoskie, LLC
142 NC Route 561 East
Ahoskie, NC 27910 USA
www.envivabiomass.com
+1 (252) 209 6032 x(2202)
cell (252) 370 3181
fax (252) 364 3428
joe.harrell @envivabiomass.com

From: Puram, Yukiko [mailto:yuki.puram@ncdenr.gov]
Sent: Monday, June 12, 2017 2:43 PM
To: Joe Harrell <joe.harrell@envivabiomass.com>
Cc: Voelker, Joseph <joseph.voelker@ncdenr.gov>; Wike, Will <will.wike@ncdenr.gov>
Subject: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Joe,

So here's a summary of what we discussed...

Based on the stack test conducted on October 3, 2013, the dryer was controlled by the WESP with 1000 amp of secondary current and 62 kV of secondary voltage. Even though the margin of compliance from the stack test result was pretty large (3.07 lb/hr for the 48.0 lb/hr limit), I'm not sure how you can demonstrate the compliance with the 2D .0515 standard at 200 amp and 20kV, which is drastically different than what it was tested. I don't think you can use the emission factor from the stack test (3.07 lb/hr) unless you operate the WESP with the same parameters.

Enviva has performed a detailed review of the October 3, 2013 stack test results and vendor performance specifications of the WESP and have concluded that the emissions from the dryer comply with the process weight rate rule particulate matter (PM) emissions limit of 2D .0515 without use of the WESP. Therefore, CAM does not apply and the proposed operating parameters above are not required. Please see below for a detailed discussion of the emissions review and documentation of CAM applicability.

Based on the vender's letter dated on May 10, 2017, the proposed minimum voltage was 20kV. The equation that was used for the calculation was based on the input rate of 54.91 lb/hrI am a little concerned about this input rate as the before control emission rate was never tested during the stack testing. The permit application indicated that the before control emission rate was 150 lb/hr, which is not consistent with the vendor's letter. The equation that the vender used to calculate the PM emissions from the WESP is clearly dependent of the input rate. Therefore, I cannot approve to use the vender's calculation unless I can confirm the validity of the input rate.

Based on the October 3, 2013 stack test results and vendor performance specifications for WESP control efficiency, the inlet PM emission rate to the WESP during the test is calculated to be 35.47 lb/hr. Therefore, as stated above, CAM does not apply and the WESP is not required to comply with the 2D.0515 standard. Please see below for a detailed discussion of the emissions review and documentation of CAM applicability.

Another issue that I'm concerned is the applicability of CAM. The following are the three criteria to be subject to CAM:

1. be subject to an emission limitation or standard, and
2. use a control device to achieve compliance, and
3. have potential pre-control emissions that exceed 100 tpy.

It's pretty clear that the dryer satisfies the first two conditions. It appears to me that the dryer also meets the third criteria. Based on the application, the befor e control emission rate was 150 lb/hr, which is equivalent to 657 tpy. If we use the input rate indicated on vender's letter (54.92 lb/hr), it would be 236 tpy. Either way, the pre-control emissions exceeds 100 tpy. Therefore, the dryer is subject to CAM.

As discussed above, Enviva reviewed the October 3, 2013 stack test results and vendor specifications of WESP control efficiency to determine the WESP inlet PM emission rate (uncontrolled dryer emission rate). The October 3, 2013 stack test resulted in an outlet WESP PM emission rate of 3.07 lb/hr. Based on the vendor specifications of the WESP and actual flow rate measured during the test (109,700 acfm) the control efficiency corresponding to the test was 91.35%. The resulting uncontrolled dryer PM emission rate during the test was calculated to be 35.47 lb/hr.

As stated by Lundberg in the May 10, 2017 letter, WESP control efficiency is based on WESP collection area, effective migration velocity, and actual gas flow rate. Page 2 of the attached document includes the control efficiency of the WESP based on the vendor's calculation.

Enviva also evaluated potential uncontrolled PM emissions from the dryer at the maximum design throughput rate of 71.71 odt/hr. The process throughput during the October 3, 2013 stack test was 60 odt/hr. The resulting uncontrolled dryer PM emission factor is 0.59 lb/odt (35.47 lb/hr divided by 60 odt/hr). This factor multiplied by the maximum design throughput rate of 71.71 odt/hr results in an uncontrolled dryer PM emission rate of 42.40 lb/hr, which is less than the PM limit calculated in accordance with 2D .0515. Therefore, condition 2 above is not met and the dryer is not subject to

CAM. Page 1 of the attached document includes the process throughput information, PM emission limit, and potential PM emissions.

We then need to determine if the WESP is considered to be a large PSEU. If the potential post control **PM10** emission is larger than 100 tpy, the WESP will be a large PSEU. Even though the stack test from 2013 shows PM emission factor was 1.54 lb/hr, which is equivalent of 6.74 tpy, this emission factor is not relevant unless you want to operate the WESP at the same parameters used at the stack test. If we use the emission rate of 42 lb/hr at 20 kV from the vender's letter, the emission would be about 42.00 lb/hr, which is equivalent to 183.96 tpy, and would make it as a large PSEU.

As documented above and in the attached, CAM is not applicable.

The difference between small and large PSEU is the deadline for submitting a CAM plan. If the WESP is a small PSEU, we can wait to for the next. If it's large, we have to address CAM for this permit.

It is up to you which minimum voltage and current you want to use, but it will also affect CAM depending on how you operate the WESP. Based on the information I have (and I don't have), I think we need to include a test requirement on the permit. I think we need to test for emissions at 20 kV and 200 amp to show the compliance. We need to measure the before and after the control so that we know the control efficiency of the WESP (this was on the permit when the testing was conducted, but they did not test for the efficiency for some reason.) Also, we need to incorporate CAM at this time as I think this would be considered as a large PSEU. For more information regarding CAM, please review this page:
https://ncdenr.s3.amazonaws.com/s3fs-public/Air%20Quality/enf/cam/CAM_Overview.pdf

As documented above and in the attached, CAM is not applicable. Enviva does not believe testing of the WESP inlet and outlet for control efficiency is warranted. As stated above and in the May 10, 2017 letter provided by Lundberg, WESP control efficiency is dependent on WESP collection area, effective migration velocity, and gas flow rate. The WESP collection area is fixed, effective migration velocity is proportional to the secondary voltage, and gas flow rate was measured during the October 3, 2013 stack test. Therefore, all values required to calculate WESP control efficiency are known and WESP inlet testing should not be required.

Please fill out this Form E6 to submit a CAM plan.
https://ncdenr.s3.amazonaws.com/s3fs-public/Air%20Quality/permits/files/2016_Permit_Application_Forms/E6.pdf

If you have further questions, please let me know.

Thanks.
Yuki Puram

Yuki Puram
Environmental Engineer
Division of Air Quality
North Carolina Department of Environmental Quality

919 707 8470 office
yuki.puram@ncdenr.gov

217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699

Nothing Compares

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

Disclaimer

Disclaimer

The information contained in this communication from the sender is confidential. It is intended solely for use by the recipient and others authorized to receive it. If you are not the recipient, you are hereby notified that any disclosure, copying, distribution or taking action in relation of the contents of this information is strictly prohibited and may be unlawful.

This email has been scanned for viruses and malware, and may have been automatically archived by **Mimecast Ltd**, an innovator in Software as a Service (SaaS) for business. Providing a **safer** and **more useful** place for your human generated data. Specializing in; Security, archiving and compliance. To find out more Click Here.

Puram, Yukiko

From: Joe Harrell <joe.harrell@envivabiomass.com>
Sent: Tuesday, July 11, 2017 7:47 AM
To: Puram, Yukiko
Cc: Willets, William; Voelker, Joseph; Christopher Seifert; Roland Burnett; Heath Lucy
Subject: RE: Enviva Northampton First Time Title V Permit

Hi Yuki,

We agree with the department that stack test needs to be performed, which will be a condition of the Title V air permit.

Thank you,
Joe

Joe Harrell
Corporate EHS Manager

Enviva Pellets Ahoskie, LLC
142 NC Route 561 East
Ahoskie, NC 27910 USA
www.envivabiomass.com
+1 (252) 209 6032 x(2202)
cell (252) 370 3181
fax (252) 364 3428
joe.harrell @envivabiomass.com

From: Puram, Yukiko [mailto:yuki.puram@ncdenr.gov]
Sent: Friday, July 07, 2017 2:29 PM
To: Joe Harrell <joe.harrell@envivabiomass.com>
Cc: Willets, William <william.willets@ncdenr.gov>; Voelker, Joseph <joseph.voelker@ncdenr.gov>
Subject: Enviva Northampton First Time Title V Permit

Hi Joe,

Hope you had a great 4th of July!

I've discussed the issues that were raised in the draft Enviva Northampton First Time Title V permit with my supervisors. We came to a conclusion that it is necessary to request a stack test in order to establish the WESP operation parameters. Since this is a First Time Title V permit, it is critical to ensure your operation is in compliance with all the applicable regulations. Although theoretical calculations are useful designing pollution controls, they do not demonstrate compliance with actual emissions. The only way to ensure compliance is through a stack test in this case.

Unfortunately, the stack test that was conducted in October 2013 does not represent Enviva Northampton's current operation since the voltage of the WESP during the testing was much higher than your typical operations. Other than

the stack test, we don't have any emission data we can rely on at the voltage that you are requesting. Therefore, I am going to insert a performance test requirement in the permit. I recommend testing the emissions with various operation scenarios in order to have flexibility in the WESP operations. Some examples of alternative scenarios could be operating with one or two fields only or operating at different voltage/current values. The more you can demonstrate compliance in different ways, the more flexibility we can give with operation parameters. In addition, these data can be used for other Enviva facilities. I believe additional stack test data would be beneficial to your facilities in order to maximize the control efficiency.

You stated that Enviva Northapmton is not subject to CAM because the dryer emissions will be able to meet the 02D .0515 PM emissions standard without a control. However, you still need to demonstrate the inapplicability of CAM through a stack test. In addition to the 02D .0515 standard, you also need to show that the dryer can meet the opacity standard without a control in order to avoid the CAM applicability. Otherwise, DAQ will assume the WESP is subject to CAM. After you conduct a stack test to measure the outlet with certain WESP parameters, we can then determine whether the WESP is either large or small PSEU. If it's a small PSEU (post control emissions are less than 100 tpy), then we can address CAM during the next permit cycle. If it's a large PSEU, then the permit needs to be modified to include CAM.

I hope this explained why we need to include a stack test condition in the permit. I will send you a copy of the draft as soon as I update it. If you need further questions or concerns, please contact me or William Willets at 919-707-8726.

Thank you. Have a great weekend.

Yuki

Yuki Puram
Environmental Engineer
Division of Air Quality
North Carolina Department of Environmental Quality

919 707 8470 office
yuki.puram@ncdenr.gov

217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699

enviva
Enviva Pellets Northampton LLC
874 Lebanon Church Road
Garysburg, NC 27831

+1 (252) 541 2631
fax (252) 541 2632

www.envivabiomass.com

June 30, 2017

Will Wike
NCDEQ-DAQ-Compliance Officer
Raleigh Regional Office
217 West Jones St.
Raleigh, NC 27603

RE: Request for Extension of Deadline for Emission Testing, Enviva Pellets Northampton, LLC (Permit #10386R05)

Dear Mr. Wike:

Enviva Pellets Northampton (the "Facility") filed a request to process up to 45% softwood through the dry hammermill (ES-HM-1 through 8) dated December 21, 2016. DAQ approved the request with emission testing in 180 days, which the facility received on January 19, 2017. In the last six months the facility has been unable to process above 20% pine through the system and meet our customer's requirements. At this time, we request to perform emissions testing, when we achieve 45% softwood instead of being subject to a specific due date, because at this time we are unsure when we will achieve 45% softwood. I've attached the facility 12 month rolling average for your review.

Once we achieve the 45% softwood content through the dry hammermills the facility will submit an emissions testing protocol immediately. When the emission testing protocol has been approved by NCDEQ-DAQ, the facility will perform emissions testing to establish VOC emission factors for the dry hammermills at the 45% softwood content.

Please contact me if you have any questions regarding this matter, and thank you for your consideration of this request.

Sincerely,

Joe Harrell

Environmental, Health, and Safety Manager

Cc: Chris Seifert, EHS Director
Yukiko Puram, NCDEQ-DAQ, air permit section

			Dryer				% SW	Dryer	DHM VOC	Cooler	Total VOC -		CO Rolling			Log HW	Log HW		Log HW	
Month-YR	Total SW BDT	Dry Shavings BDT	SW BDT Dryer Only	HW BDT Dry Only	BDT Total	Total BDT Dryer only	Dryer as month	VOC Monthly Tons	Monthly Tons	VOC Monthly Tons	Rolling 12m Tons	CO Tons	12m Tons	Dryer MC ≥ 19%	Dryer MC Roll 12m	Purchased	MC %	Log SW Purchased	MC %	Log HW/SW %
Jul-15	7908.17	3,003.19	4905.02	40956.19	48864.36	45861.21	11%	18	2	11	369	5	62	20.50	19.38	32200.00	44.00	11726.00	44.00	26.69%
Aug-15	8934.27	3,572.70	5361.57	43042.49	51976.76	48404.06	11%	19	2	12	369	6	62	20.51	19.45	34544.00	44.00	13899.00	44.00	28.69%
Sep-15	6726.04	1,669.81	5056.23	43980.57	50706.61	49036.80	10%	19	2	12	370	6	62	19.33	19.47	51398.00	44.00	11964.00	44.00	18.88%
Oct-15	4736.43	909.09	3827.34	36367.38	41103.81	40194.72	10%	16	2	9	364	5	61	18.58	19.44	54396.00	44.00	6078.00	44.00	10.05%
Nov-15	6397.68	1,551.59	4846.09	40802.52	47200.20	45648.61	11%	18	2	11	362	5	61	17.80	19.39	36953.00	44.00	2707.00	44.00	6.83%
Dec-15	6339.93	2088.56	4251.37	44557.31	50897.24	48808.68	9%	19	2	12	366	6	62	17.80	19.34	36184.00	44.00	3464.00	44.00	8.74%
Jan-16	7101.75	2545.43	4556.32	40976.73	48078.48	45533.05	10%	18	2	11	370	5	63	17.05	19.19	50050.41	44.00	7801.20	44.00	13.48%
Feb-16	6420.19	3121.70	4298.49	41204.86	47625.05	45503.35	9%	18	2	11	373	5	63	16.65	18.99	54741.50	44.00	6829.70	44.00	11.09%
Mar-16	7115.15	3241.62	3873.53	48173.64	55288.79	52047.17	7%	20	3	13	378	6	64	17.78	18.85	71705.65	44.00	9599.77	44.00	11.81%
Apr-16	7705.79	2777.36	4928.43	41152.56	48858.35	46080.99	11%	18	2	11	377	5	64	18.56	18.77	43241.70	44.00	1230.70	44.00	2.77%
May-16	7619.55	3927.69	3691.86	42487.07	50106.62	46178.93	8%	18	2	11	379	6	65	20.02	18.77	42388.00	44.00	77.90	44.00	0.17%
Jun-16	10180.60	3278.05	6902.55	37885.92	48067.52	44789.47	15%	17	2	11	380	5	65	20.80	18.78	44637.00	44.00	3098.00	44.00	6.49%
Jul-16	10367.60	3850.89	6516.71	37901.05	48268.65	44417.76	15%	17	2	11	379	5	65	20.40	18.77	35766.20	44.00	7734.00	44.00	17.78%
Aug-16	14677.00	4402.77	10274.23	38396.30	53073.30	48670.53	21%	19	2	12	380	6	65	21.09	18.82	39381.20	44.00	19342.70	44.00	32.94%
Sep-16	7110.68	1577.36	5533.32	38127.62	45238.30	43660.94	13%	17	2	10	376	5	64	20.75	18.94	33869.00	44.00	6394.40	44.00	15.88%
Oct-16	6731.59	2774.12	3957.47	40974.66	47706.25	44932.13	9%	18	2	11	380	5	65	20.60	19.11	43932.77	44.00	4018.77	44.00	8.38%
Nov-16	7501.18	1552.67	5848.51	44784.03	52285.21	50632.54	12%	20	2	12	383	6	66	19.69	19.27	45335.95	44.00	10618.68	44.00	18.98%
Dec-16	5423.27	1490.10	3933.17	41889.10	47312.37	45822.27	9%	18	2	11	381	5	65	18.83	19.35	43600.40	44.00	4594.70	44.00	9.53%
Jan-17	5253.38	1728.95	3524.43	43510.08	48763.46	47034.51	7%	18	2	11	382	5	65	19.61	19.57	49232.70	44.00	4183.00	44.00	7.83%
Feb-17	3414.54	800.25	2614.29	40885.75	44300.29	43500.04	6%	17	2	10	380	5	65	19.17	19.78	43385.60	44.00	1344.00	44.00	3.00%
Mar-17	3672.89	2105.52	1567.37	42889.24	46562.13	44456.61	4%	17	2	11	374	5	64	19.45	19.91	52307.10	44.00	15.70	44.00	0.03%
Apr-17	9788.58	1715.35	8073.23	35428.19	45216.77	43501.42	19%	17	2	10	372	5	63	20.90	20.11	30991.80	44.00	10490.00	44.00	25.29%
May-17	11425.69	2572.10	8853.59	32284.18	43709.87	41137.77	22%	16	2	10	369	5	63	21.30	20.22	35765.70	44.00	22022.70	44.00	38.11%
Jun-17																				
12 months	95,547.00	27,948.13	67,598.87	474,957.12	570,504.12	542,555.99														
17 months	131,509.43	42,561.93	88,947.50	688,951.98	820,461.41	777,899.48										548,649.78	44.00	81,335.52	44.1	14.10

Dryer SW% Rolling 12 Month Avg.	12.46%	Dryer SW% Rolling 17 Month Avg.	11.43%
DHM/Press SW% Rolling 12 Month Avg.	16.75%	DHM/Press SW% Rolling 17 Month Avg.	16.09%

Official Start Date: April 22, 2013

Total VOC Limit 463 tpy

Emission Factors

10% Pine

~~lb/ODT VOC: Dryer 0.72 October 18, 2013 stack test results~~

lb/ODT CO: Dryer 0.23 October 18, 2013 stack test results

30% Pine

lb/ODT VOC: Dryer 0.781 Ahoskie Stack Test June 2014, used in the above calculations

lb/ODT VOC: DHM 0.093 Ahoskie Stack Test June 2014, used in the above calculations

45% Pine

lb/ODT VOC: DHM 0.167 45% softwood content through the DHMs as of January 19, 2017, not used in the above calculations, will use once achieve above 30% softwood content

lb/ODT VOC: CLR 0.457 Ahoskie Stack Test June 2014, used in the above calculations

Puram, Yukiko

From: Joe Harrell <joe.harrell@envivabiomass.com>
Sent: Friday, June 30, 2017 3:44 PM
To: Puram, Yukiko
Cc: Voelker, Joseph; Wike, Will; Christopher Seifert; Michael H Carbon
Subject: RE: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Yuki,

Thanks for preparing the summary of our recent discussions I found it very helpful. As a follow-up to your questions please find the below responses and associated attachment for your review.

Best regards,
Joe

Joe Harrell
Corporate EHS Manager

Enviva Pellets Ahoskie, LLC
142 NC Route 561 East
Ahoskie, NC 27910 USA
www.envivabiomass.com
+1 (252) 209 6032 x(2202)
cell (252) 370 3181
fax (252) 364 3428
joe.harrell @envivabiomass.com

From: Puram, Yukiko [mailto:yuki.puram@ncdenr.gov]
Sent: Tuesday, June 13, 2017 9:33 AM
To: Joe Harrell <joe.harrell@envivabiomass.com>
Cc: Voelker, Joseph <joseph.voelker@ncdenr.gov>; Wike, Will <will.wike@ncdenr.gov>; Christopher Seifert <Christopher.Seifert@envivabiomass.com>
Subject: RE: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Joe,

Do you think three weeks be sufficient? How about by July 5th?

Yuki

Yuki Puram
Environmental Engineer
Division of Air Quality
North Carolina Department of Environmental Quality

919 707 8470 office
yuki.puram@ncdenr.gov

217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699

Nothing Compares

From: Joe Harrell [mailto:joe.harrell@envivabiomass.com]
Sent: Tuesday, June 13, 2017 9:29 AM
To: Puram, Yukiko <yuki.puram@ncdenr.gov>
Cc: Voelker, Joseph <joseph.voelker@ncdenr.gov>; Wike, Will <will.wike@ncdenr.gov>; Christopher Seifert <Christopher.Seifert@envivabiomass.com>
Subject: RE: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Yuki,
When will you need this by? I'm speaking with my support team on Friday, so we can address your comments and questions below.

Thank you,
Joe

enviva

Joe Harrell
Corporate EHS Manager

Enviva Pellets Ahoskie, LLC
142 NC Route 561 East
Ahoskie, NC 27910 USA
www.envivabiomass.com
+1 (252) 209 6032 x(2202)
cell (252) 370 3181
fax (252) 364 3428
joe.harrell @envivabiomass.com

From: Puram, Yukiko [mailto:yuki.puram@ncdenr.gov]
Sent: Monday, June 12, 2017 2:43 PM
To: Joe Harrell <joe.harrell@envivabiomass.com>
Cc: Voelker, Joseph <joseph.voelker@ncdenr.gov>; Wike, Will <will.wike@ncdenr.gov>
Subject: Enviva Northampton WESP and Compliance Assurance Monitoring (CAM) Plan

Hi Joe,

So here's a summary of what we discussed...

Based on the stack test conducted on October 3, 2013, the dryer was controlled by the WESP with 1000 amp of secondary current and 62 kV of secondary voltage. Even though the margin of compliance from the stack test result was pretty large (3.07 lb/hr for the 48.0 lb/hr limit), I'm not sure how you can demonstrate the compliance with the 2D .0515 standard at 200 amp and 20kV, which is drastically different than what it was tested. I don't think you can use the emission factor from the stack test (3.07 lb/hr) unless you operate the WESP with the same parameters.

Enviva has performed a detailed review of the October 3, 2013 stack test results and vendor performance specifications of the WESP and have concluded that the emissions from the dryer comply with the process weight rate rule particulate matter (PM) emissions limit of 2D .0515 without use of the WESP. Therefore, CAM does not apply and the proposed operating parameters above are not required. Please see below for a detailed discussion of the emissions review and documentation of CAM applicability.

Based on the vender's letter dated on May 10, 2017, the proposed minimum voltage was 20kV. The equation that was used for the calculation was based on the input rate of 54.91 lb/hrI am a little concerned about this input rate as the before control emission rate was never tested during the stack testing. The permit application indicated that the before control emission rate was 150 lb/hr, which is not consistent with the vendor's letter. The equation that the vender used to calculate the PM emissions from the WESP is clearly dependent of the input rate. Therefore, I cannot approve to use the vender's calculation unless I can confirm the validity of the input rate.

Based on the October 3, 2013 stack test results and vendor performance specifications for WESP control efficiency, the inlet PM emission rate to the WESP during the test is calculated to be 35.47 lb/hr. Therefore, as stated above, CAM does not apply and the WESP is not required to comply with the 2D.0515 standard. Please see below for a detailed discussion of the emissions review and documentation of CAM applicability.

Another issue that I'm concerned is the applicability of CAM. The following are the three criteria to be subject to CAM:

1. be subject to an emission limitation or standard, and
2. use a control device to achieve compliance, and
3. have potential pre-control emissions that exceed 100 tpy.

It's pretty clear that the dryer satisfies the first two conditions. It appears to me that the dryer also meets the third criteria. Based on the application, the befor e control emission rate was 150 lb/hr, which is equivalent to 657 tpy. If we use the input rate indicated on vender's letter (54.92 lb/hr), it would be 236 tpy. Either way, the pre-control emissions exceeds 100 tpy. Therefore, the dryer is subject to CAM.

As discussed above, Enviva reviewed the October 3, 2013 stack test results and vendor specifications of WESP control efficiency to determine the WESP inlet PM emission rate (uncontrolled dryer emission rate). The October 3, 2013 stack test resulted in an outlet WESP PM emission rate of 3.07 lb/hr. Based on the vendor specifications of the WESP and actual flow rate measured during the test (109,700 acfm) the control efficiency corresponding to the test was 91.35%. The resulting uncontrolled dryer PM emission rate during the test was calculated to be 35.47 lb/hr.

As stated by Lundberg in the May 10, 2017 letter, WESP control efficiency is based on WESP collection area, effective migration velocity, and actual gas flow rate. Page 2 of the attached document includes the control efficiency of the WESP based on the vendor's calculation.

Enviva also evaluated potential uncontrolled PM emissions from the dryer at the maximum design throughput rate of 71.71 odt/hr. The process throughput during the October 3, 2013 stack test was 60 odt/hr. The resulting uncontrolled dryer PM emission factor is 0.59 lb/odt (35.47 lb/hr divided by 60 odt/hr). This factor multiplied by the maximum design throughput rate of 71.71 odt/hr results in an uncontrolled dryer PM emission rate of 42.40 lb/hr, which is less than the PM limit calculated in accordance with 2D .0515. Therefore, condition 2 above is not met and the dryer is not subject to

CAM. Page 1 of the attached document includes the process throughput information, PM emission limit, and potential PM emissions.

We then need to determine if the WESP is considered to be a large PSEU. If the potential post control **PM10** emission is larger than 100 tpy, the WESP will be a large PSEU. Even though the stack test from 2013 shows PM emission factor was 1.54 lb/hr, which is equivalent of 6.74 tpy, this emission factor is not relevant unless you want to operate the WESP at the same parameters used at the stack test. If we use the emission rate of 42 lb/hr at 20 kV from the vender's letter, the emission would be about 42.00 lb/hr, which is equivalent to 183.96 tpy, and would make it as a large PSEU.

As documented above and in the attached, CAM is not applicable.

The difference between small and large PSEU is the deadline for submitting a CAM plan. If the WESP is a small PSEU, we can wait to for the next. If it's large, we have to address CAM for this permit.

It is up to you which minimum voltage and current you want to use, but it will also affect CAM depending on how you operate the WESP. Based on the information I have (and I don't have), I think we need to include a test requirement on the permit. I think we need to test for emissions at 20 kV and 200 amp to show the compliance. We need to measure the before and after the control so that we know the control efficiency of the WESP (this was on the permit when the testing was conducted, but they did not test for the efficiency for some reason.) Also, we need to incorporate CAM at this time as I think this would be considered as a large PSEU. For more information regarding CAM, please review this page:
https://ncdenr.s3.amazonaws.com/s3fs-public/Air%20Quality/enf/cam/CAM_Overview.pdf

As documented above and in the attached, CAM is not applicable. Enviva does not believe testing of the WESP inlet and outlet for control efficiency is warranted. As stated above and in the May 10, 2017 letter provided by Lundberg, WESP control efficiency is dependent on WESP collection area, effective migration velocity, and gas flow rate. The WESP collection area is fixed, effective migration velocity is proportional to the secondary voltage, and gas flow rate was measured during the October 3, 2013 stack test. Therefore, all values required to calculate WESP control efficiency are known and WESP inlet testing should not be required.

Please fill out this Form E6 to submit a CAM plan.
https://ncdenr.s3.amazonaws.com/s3fs-public/Air%20Quality/permits/files/2016_Permit_Application_Forms/E6.pdf

If you have further questions, please let me know.

Thanks.
Yuki Puram

Yuki Puram
Environmental Engineer
Division of Air Quality
North Carolina Department of Environmental Quality

919 707 8470 office
yuki.puram@ncdenr.gov

217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699

Enviva Northampton Dryer Particulate Matter Emissions Estimate

Process Information [1]		
Dryer Throughput	71.71	ODT/hr
Moisture Content	17%	
Wet Process Weight	83.90	tons/hr

15A NCAC 02D .0515		
Particulate Limit: [2]	49.53	lb/hr

October 2013 Test Data		
WESP Outlet PM Emissions Rate	3.07	lb/hr
Secondary Voltage	63.5	kV
WESP Efficiency [3]	91.35	%
Uncontrolled PM Emission Rate	35.47	lb/hr
Dryer Throughput	60	ODT/hr
Uncontrolled PM Emissions per ODT	0.59	lb/ODT

Uncontrolled Emissions @ Maximum Dryer Throughput [4]	42.40	lb/hr
Uncontrolled Emissions Less Than Applicable Limit?	Y	Y/N

Notes:

[1] Dryer throughput represents the design maximum process rate of oven dried tons (ODT) per hour. Moisture content represents the average outlet moisture content of dried wood. Wet process weight is based on the maximum process rate of 71.71 ODT/hr and the average outlet moisture content.

[2] Particulate Limit is based on the process weight rate equation from 15A NCAC 02D.0515.

[3] WESP efficiency during the October 2013 based on vendor efficiency calculations.

[4] Uncontrolled emissions at the maximum dryer throughput is calculated by multiplying the October 2013 uncontrolled PM emission factor of 0.59 lb/ODT and the maximum dryer throughput of 71.71 ODT/hr.

ENVIVA NORTHAMPTON WESP CONTROL EFFICIENCY

EMV (ft/min)	Voltage (kV)	Penetration	Outlet Rate (lb/hr)	Inlet Rate (lb/hr)	Flow (acfm)	Area (ft^2)	Control Efficiency (%)
15.5	67	0.066	2.33	35.47	109,700	19,278	93.44
15.1	66	0.071	2.52	35.47	109,700	19,278	92.90
14.6	65	0.077	2.73	35.47	109,700	19,278	92.31
14.2	64	0.083	2.95	35.47	109,700	19,278	91.68
13.9	63.5	0.087	3.07	35.47	109,700	19,278	91.35
13.7	63	0.090	3.19	35.47	109,700	19,278	91.00
12.8	61	0.105	3.74	35.47	109,700	19,278	89.45
12	59	0.121	4.31	35.47	109,700	19,278	87.86
11.2	57	0.140	4.96	35.47	109,700	19,278	86.03
10.4	55	0.161	5.70	35.47	109,700	19,278	83.92
9.7	53	0.182	6.45	35.47	109,700	19,278	81.82
9	51	0.206	7.29	35.47	109,700	19,278	79.44
8.3	49	0.233	8.25	35.47	109,700	19,278	76.74
7.6	47	0.263	9.33	35.47	109,700	19,278	73.70
7	45	0.292	10.37	35.47	109,700	19,278	70.77
6.4	43	0.325	11.52	35.47	109,700	19,278	67.52
5.8	41	0.361	12.80	35.47	109,700	19,278	63.91
5.2	39	0.401	14.22	35.47	109,700	19,278	59.90
4.7	37	0.438	15.53	35.47	109,700	19,278	56.22
4.2	35	0.478	16.96	35.47	109,700	19,278	52.20
3.8	33	0.513	18.19	35.47	109,700	19,278	48.72
3.3	31	0.560	19.86	35.47	109,700	19,278	44.01
2.9	29	0.601	21.31	35.47	109,700	19,278	39.93
2.5	27	0.644	22.86	35.47	109,700	19,278	35.55
2.2	25	0.679	24.10	35.47	109,700	19,278	32.06
1.8	23	0.729	25.85	35.47	109,700	19,278	27.12
1.5	21	0.768	27.25	35.47	109,700	19,278	23.17
1.2	19	0.810	28.73	35.47	109,700	19,278	19.01
1	17	0.839	29.76	35.47	109,700	19,278	16.12
0.8	15	0.869	30.82	35.47	109,700	19,278	13.12
0.6	13	0.900	31.92	35.47	109,700	19,278	10.01
0.4	11	0.932	33.07	35.47	109,700	19,278	6.79
0.3	9	0.949	33.65	35.47	109,700	19,278	5.14
0.2	7	0.965	34.25	35.47	109,700	19,278	3.45
0.1	5	0.983	34.86	35.47	109,700	19,278	1.74

Control Efficiency calculated using LUNDBERG's equation. $E = 1\text{-}e^{-(Aw/Q)}$

A = Collecting Area (ft^2)

Q = Gas Flow Rate (acfm) = 109,700 acfm as measured during October 2013 Stack Test

w = effective migration velocity (ft/min), as provided by LUNDBERG in letter dated 5/10/2017

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

Disclaimer

Disclaimer

The information contained in this communication from the sender is confidential. It is intended solely for use by the recipient and others authorized to receive it. If you are not the recipient, you are hereby notified that any disclosure, copying, distribution or taking action in relation of the contents of this information is strictly prohibited and may be unlawful.

This email has been scanned for viruses and malware, and may have been automatically archived by **Mimecast Ltd**, an innovator in Software as a Service (SaaS) for business. Providing a **safer** and **more useful** place for your human generated data. Specializing in; Security, archiving and compliance. To find out more Click Here.

Enviva Northampton Dryer Particulate Matter Emissions Estimate

Process Information [1]		
Dryer Throughput	71.71	ODT/hr
Moisture Content	17%	
Wet Process Weight	83.90	tons/hr

15A NCAC 02D .0515		
Particulate Limit: [2]	49.53	lb/hr

October 2013 Test Data		
WESP Outlet PM Emissions Rate	3.07	lb/hr
Secondary Voltage	63.5	kV
WESP Efficiency [3]	91.35	%
Uncontrolled PM Emission Rate	35.47	lb/hr
Dryer Throughput	60	ODT/hr
Uncontrolled PM Emissions per ODT	0.59	lb/ODT

Uncontrolled Emissions @ Maximum Dryer Throughput [4]	42.40	lb/hr
Uncontrolled Emissions Less Than Applicable Limit?	Y	Y/N

Notes:

[1] Dryer throughput represents the design maximum process rate of oven dried tons (ODT) per hour. Moisture content represents the average outlet moisture content of dried wood. Wet process weight is based on the maximum process rate of 71.71 ODT/hr and the average outlet moisture content.

[2] Particulate Limit is based on the process weight rate equation from 15A NCAC 02D.0515.

[3] WESP efficiency during the October 2013 based on vendor efficiency calculations.

[4] Uncontrolled emissions at the maximum dryer throughput is calculated by multiplying the October 2013 uncontrolled PM emission factor of 0.59 lb/ODT and the maximum dryer throughput of 71.71 ODT/hr.

$$35.47\ \text{lb/hr} \times \frac{8760\ \text{hr}}{\text{yr}} \times \frac{\text{Ton}}{2000\ \text{lb}} = 155.36\ \text{TPY}$$

ENVIVA NORTHAMPTON WESP CONTROL EFFICIENCY

EMV (ft/min)	Voltage (kV)	Penetration	Outlet Rate (lb/hr)	Inlet Rate (lb/hr)	Flow (acfm)	Area (ft^2)	Control Efficiency (%)
15.5	67	0.066	2.33	35.47	109,700	19,278	93.44
15.1	66	0.071	2.52	35.47	109,700	19,278	92.90
14.6	65	0.077	2.73	35.47	109,700	19,278	92.31
14.2	64	0.083	2.95	35.47	109,700	19,278	91.68
13.9	63.5	0.087	3.07	35.47	109,700	19,278	91.35
13.7	63	0.090	3.19	35.47	109,700	19,278	91.00
12.8	61	0.105	3.74	35.47	109,700	19,278	89.45
12	59	0.121	4.31	35.47	109,700	19,278	87.86
11.2	57	0.140	4.96	35.47	109,700	19,278	86.03
10.4	55	0.161	5.70	35.47	109,700	19,278	83.92
9.7	53	0.182	6.45	35.47	109,700	19,278	81.82
9	51	0.206	7.29	35.47	109,700	19,278	79.44
8.3	49	0.233	8.25	35.47	109,700	19,278	76.74
7.6	47	0.263	9.33	35.47	109,700	19,278	73.70
7	45	0.292	10.37	35.47	109,700	19,278	70.77
6.4	43	0.325	11.52	35.47	109,700	19,278	67.52
5.8	41	0.361	12.80	35.47	109,700	19,278	63.91
5.2	39	0.401	14.22	35.47	109,700	19,278	59.90
4.7	37	0.438	15.53	35.47	109,700	19,278	56.22
4.2	35	0.478	16.96	35.47	109,700	19,278	52.20
3.8	33	0.513	18.19	35.47	109,700	19,278	48.72
3.3	31	0.560	19.86	35.47	109,700	19,278	44.01
2.9	29	0.601	21.31	35.47	109,700	19,278	39.93
2.5	27	0.644	22.86	35.47	109,700	19,278	35.55
2.2	25	0.679	24.10	35.47	109,700	19,278	32.06
1.8	23	0.729	25.85	35.47	109,700	19,278	27.12
1.5	21	0.768	27.25	35.47	109,700	19,278	23.17
1.2	19	0.810	28.73	35.47	109,700	19,278	19.01
1	17	0.839	29.76	35.47	109,700	19,278	16.12
0.8	15	0.869	30.82	35.47	109,700	19,278	13.12
0.6	13	0.900	31.92	35.47	109,700	19,278	10.01
0.4	11	0.932	33.07	35.47	109,700	19,278	6.79
0.3	9	0.949	33.65	35.47	109,700	19,278	5.14
0.2	7	0.965	34.25	35.47	109,700	19,278	3.45
0.1	5	0.983	34.86	35.47	109,700	19,278	1.74

Control Efficiency calculated using LUNDBERG's equation. $E = 1\text{-}e^{-(Aw/Q)}$

A = Collecting Area (ft^2)

Q = Gas Flow Rate (acfm) = 109,700 acfm as measured during October 2013 Stack Test

w = effective migration velocity (ft/min), as provided by LUNDBERG in letter dated 5/10/2017

Enviva Northampton Wet ESP Performance Model for 0.1 grains/scfd

EMV (ft/min)	Voltage (kV)	Penetration (fraction)	Outlet Rate (lb/h)	Inlet Rate (lb/h)	Flow (acfm)	Area (ft^2)
15.5	67	0.066	3.62	54.9	109,700	19,278
15.0	66	0.072	3.93	54.9	109,700	19,278
14.6	65	0.078	4.25	54.9	109,700	19,278
14.1	64	0.084	4.60	54.9	109,700	19,278
13.7	63	0.091	4.97	54.9	109,700	19,278
13.2	62	0.098	5.36	54.9	109,700	19,278
12.8	61	0.105	5.77	54.9	109,700	19,278
12.4	60	0.113	6.21	54.9	109,700	19,278
12.0	59	0.122	6.67	54.9	109,700	19,278
11.6	58	0.131	7.16	54.9	109,700	19,278
11.2	57	0.140	7.68	54.9	109,700	19,278
10.8	56	0.150	8.22	54.9	109,700	19,278
10.4	55	0.160	8.79	54.9	109,700	19,278
10.0	54	0.171	9.39	54.9	109,700	19,278
9.7	53	0.183	10.02	54.9	109,700	19,278
9.3	52	0.195	10.68	54.9	109,700	19,278
9.0	51	0.207	11.36	54.9	109,700	19,278
8.6	50	0.220	12.08	54.9	109,700	19,278
8.3	49	0.234	12.83	54.9	109,700	19,278
7.9	48	0.248	13.60	54.9	109,700	19,278
7.6	47	0.263	14.41	54.9	109,700	19,278
7.3	46	0.278	15.24	54.9	109,700	19,278
7.0	45	0.294	16.10	54.9	109,700	19,278
6.7	44	0.310	16.99	54.9	109,700	19,278
6.4	43	0.327	17.91	54.9	109,700	19,278
6.1	42	0.344	18.86	54.9	109,700	19,278
5.8	41	0.362	19.83	54.9	109,700	19,278
5.5	40	0.380	20.83	54.9	109,700	19,278
5.2	39	0.398	21.85	54.9	109,700	19,278
5.0	38	0.417	22.89	54.9	109,700	19,278
4.7	37	0.437	23.95	54.9	109,700	19,278
4.5	36	0.456	25.03	54.9	109,700	19,278
4.2	35	0.476	26.13	54.9	109,700	19,278
4.0	34	0.497	27.25	54.9	109,700	19,278
3.8	33	0.517	28.38	54.9	109,700	19,278
3.5	32	0.538	29.51	54.9	109,700	19,278
3.3	31	0.559	30.66	54.9	109,700	19,278
3.1	30	0.580	31.81	54.9	109,700	19,278
2.9	29	0.601	32.97	54.9	109,700	19,278
2.7	28	0.622	34.13	54.9	109,700	19,278

2.5	27	0.643	35.28	54.9	109,700	19,278
2.3	26	0.664	36.43	54.9	109,700	19,278
2.2	25	0.685	37.57	54.9	109,700	19,278
2.0	24	0.706	38.71	54.9	109,700	19,278
1.8	23	0.726	39.82	54.9	109,700	19,278
1.7	22	0.746	40.92	54.9	109,700	19,278
1.5	21	0.766	42.00	54.9	109,700	19,278
1.4	20	0.785	43.06	54.9	109,700	19,278
1.2	19	0.804	44.08	54.9	109,700	19,278
1.1	18	0.822	45.08	54.9	109,700	19,278
1.0	17	0.840	46.05	54.9	109,700	19,278
0.9	16	0.856	46.98	54.9	109,700	19,278
0.8	15	0.873	47.87	54.9	109,700	19,278
0.7	14	0.888	48.71	54.9	109,700	19,278
0.6	13	0.903	49.52	54.9	109,700	19,278

Based on Deutsch Equation; $\ln P = -A\omega/Q$ where A = Collection area of ESP, Q = flow through ESP, P=Penetration (1-efficiency) and ω is the effective migration velocity (EMV)

48.71 lb/h

71.71 ODT/hr

$E = 55 \times 71.71^{0.11} - 40 = 48.00$ lb/hr

LUNDBERG

13201 Bel-Red Road
Bellevue, Washington 98005
tel: 425.283.5070
fax: 425.283.5081

May 10, 2017

Attention: Mr. Joe Harrell
Corporate EHS Manager

Subject: Use of Secondary Voltage (kV) as an Indicator of Wet Electrostatic Precipitator (WESP) Performance

Enviva Pellets Ahoskie, LLC
142 NC Route 561 East
Ahoskie, NC 27910 USA

Dear Mr. Harrell:

Thank you for your inquiry regarding the use of secondary voltage (kV) as an indicator of the performance of WESPs manufactured by our company and installed at Enviva's Northampton, North Carolina pellet facility. As we have discussed, the most important factor in precipitator performance is the electrostatic field strength (kV/inch). This value is maximized when secondary voltage is maximized.

In short, the efficiency of a wet precipitator is defined by the following equation:

$$E = 1 - e^{-(A\omega/Q)}$$

Where:

E = Efficiency
A = Collecting Area (ft^2)
Q = Gas Flow Rate (actual ft^3/min)
ω = effective migration velocity (ft/min)

(Stated alternatively

$$P = e^{-(A\omega/Q)}$$

or

$$\ln P = -A\omega/Q$$

Where:

P = Penetration = 1- Efficiency)

To increase WESP performance, the options are to either increase A, increase W, or decrease Q. Obviously, the WESP collecting area (A) and gas flow rate (Q) are constants in the Northampton WESP application. Therefore, the only option is to increase the migration velocity (W).

The migration velocity is directly proportional to the charging field strength times the collecting field strength. In effect, this means that the migration velocity is proportional to the secondary voltage, squared. Thus, the secondary voltage of the WESP is clearly the best option as a parametric monitoring data point to indicate performance.

Our review of emissions test data from the subject plant shows that the Lundberg Model 567 WESP in operation at Northampton is operating within the expected design parameters for the airflow and other conditions observed. Based on this, we have developed the table below to describe WESP total grid average control efficiency over a range of secondary kV in the Northampton application. (Note: The WESP inlet concentration used in the table below is assumed to be 0.10 grains/scfd.)

Enviva Northampton Wet ESP Performance Model

EMV (ft/min)	Voltage (kV)	Penetration (fraction)	Outlet Rate (lb/h)	Inlet Rate (lb/h)	Flow (acfm)	Area (ft^2)
15.5	67	0.066	3.62	54.9	109,700	19,278
14.6	65	0.078	4.25	54.9	109,700	19,278
13.7	63	0.091	4.97	54.9	109,700	19,278
12.8	61	0.105	5.77	54.9	109,700	19,278
12.0	59	0.122	6.67	54.9	109,700	19,278
11.2	57	0.140	7.68	54.9	109,700	19,278
10.4	55	0.160	8.79	54.9	109,700	19,278
9.7	53	0.183	10.02	54.9	109,700	19,278
9.0	51	0.207	11.36	54.9	109,700	19,278
8.3	49	0.234	12.83	54.9	109,700	19,278
7.6	47	0.263	14.41	54.9	109,700	19,278
7.0	45	0.294	16.10	54.9	109,700	19,278
6.4	43	0.327	17.91	54.9	109,700	19,278
5.8	41	0.362	19.83	54.9	109,700	19,278
5.2	39	0.398	21.85	54.9	109,700	19,278
4.7	37	0.437	23.95	54.9	109,700	19,278
4.2	35	0.476	26.13	54.9	109,700	19,278
3.8	33	0.517	28.38	54.9	109,700	19,278
3.3	31	0.559	30.66	54.9	109,700	19,278
2.9	29	0.601	32.97	54.9	109,700	19,278
2.5	27	0.643	35.28	54.9	109,700	19,278
2.2	25	0.685	37.57	54.9	109,700	19,278
1.8	23	0.726	39.82	54.9	109,700	19,278
1.5	21	0.766	42.00	54.9	109,700	19,278
1.2	19	0.804	44.08	54.9	109,700	19,278
1.0	17	0.840	46.05	54.9	109,700	19,278
0.8	15	0.873	47.87	54.9	109,700	19,278
0.6	13	0.903	49.52	54.9	109,700	19,278
0.4	11	0.929	50.98	54.9	109,700	19,278
0.3	9	0.952	52.23	54.9	109,700	19,278
0.2	7	0.971	53.25	54.9	109,700	19,278
0.1	5	0.985	54.03	54.9	109,700	19,278

From this table Enviva can infer the WESP outlet emission rate at a given total average of all grids at a kV value.

Thank you for contacting Lundberg regarding this important matter. If you have any questions or comments regarding this matter please do not hesitate to contact me at (425) 283-5070.

Sincerely,

V

Steve A. Jaasund, P.E.

Manager, Geoenergy Products

Lundberg

20 KV // 200 amp. // ~~total~~ grid

average of 3 grid.

B.3 WET ELECTROSTATIC PRECIPITATORS[1,2,7,8,22,23]

B.3.1. Background

A wet electrostatic precipitator (WESP) typically is used to control PM emissions in exhaust gas streams containing sticky, condensible hydrocarbon pollutants, or where the potential for explosion is high. A WESP may be used to control a variety of emission points and pollutants, such as wood chip dryers; sulfuric acid mist; coke oven off-gas; blast furnaces; detarring operations; basic oxygen furnaces; cupolas; and aluminum potlines. In the wood products industry, WESPs often are used in combination with wet scrubbers or regenerative thermal oxidizers (RTOs) to control both PM and gaseous emissions. The general operating principles and components of ESPs and the specific features of dry ESPs are discussed in section B.2; this section focuses on the components and operation of WESPs that differ from those of dry ESPs.

The two primary differences between dry ESP and WESP design are the use of a prequench and the collector plate cleaning method. Unlike dry ESPs, WESP control systems typically incorporate a prequench (water spray) to cool and saturate the gases prior to entering the electrical fields. As PM accumulates on the collector plates of a WESP, the plates are cleaned by a continuous or intermittent film or spray of water. Major differences in the types of WESPs available include: the shape of the collector; orientation of the gas stream (vertical or horizontal); use of preconditioning water sprays; and whether the entire ESP is operated wet. Configurations include circular plate, concentric plate, tubular, and flat plate WESPs.

In circular-plate WESPs, the circular plates are irrigated continuously; this provides the electrical ground for attracting the particles and also removes them from the plates. Concentric-plate WESPs have an integral, tangential prescrubbing inlet chamber, followed by a vertical wetted-wall concentric ring ESP chamber. The discharge electrode system is made of expanded metal, with corona points on a mesh background.

Tube-type WESPs typically have vertical collecting pipes; electrodes are typically in the form of discs placed along the axis of each tube. The particles are charged by the high-intensity electric field, and, as they travel farther down the tube, they are forced to the tube walls by the electrostatic field. The tube walls remain wet because the fine mist entrained in the saturated gas is also collected on the tube surfaces and flows down along the tube walls. Flushing is performed periodically to clean the tube surfaces. The water is collected in a settling tank, and this water is used to quench the gaseous stream prior to its entering the WESP.

In rectangular plate WESPs (horizontal flow), water sprays precondition the incoming gas and provide some initial PM removal. Because the water sprays are located over the top of the electrostatic fields, collection plates are also continuously irrigated. The collected water and PM flow downward into a sloped trough. The last section of this type of WESP is sometimes operated dry to remove entrained water droplets from the gas stream.

The conditioning of the incoming gas stream and continual washing of the internal components with water eliminate re-entrainment problems common to dry ESPs. Efficiency is affected by particle size, gas flow rate, and gas temperature. Common problems with WESPs include: poor gas flow; high gas flow; poor water flow; low voltage; low current; and high dissolved solids in the flush or prequench water. Other common mechanical-type problems include: poor alignment of electrodes; bowed or distorted collecting plates; full or overflowing hoppers; plugged water sprays; corrosion of electrodes; and air inleakage.

B.3.2 Indicators of WESP Performance

The primary indicators of WESP performance are opacity, secondary corona power, secondary voltage, and secondary current. Other indicators of WESP performance are the spark rate, primary current, primary voltage, inlet gas temperature, gas flow rate, inlet water flow rate, solids content of flush water (when recycled water is used), and field operation. section B-2 describes each of these indicators with the exception of the inlet water flow rate and the flush water solids content, which are described below. For some systems, mist may be entrained in the exhaust gas. In such cases, opacity measurements would be misleading. Table B-3 lists these indicators and illustrates potential monitoring options for WESPs.

Inlet water flow rate. Because WESPs use water to clean collector plates, the water flow rate is an indicator that the cleaning mechanism is operating properly. If flow rates decrease, sections of the WESP may not be as effective. As a result, PM collection rates would decrease as material built up on the collectors. In addition, low flow rates increase the likelihood of ineffective spraying and distribution of water, as well as nozzle plugging.

Flush water solids content. When recycled water is used, the solids content of the water increases with each recycling. If the solids content becomes excessive, the effectiveness of the cleaning mechanism is reduced. Increased solids content also can lead to plugging of spray nozzles.

B.3.3. Illustrations

The following illustrations present examples of compliance assurance monitoring for WESPs:

3a: Monitoring secondary current, secondary voltage, spark rate, and inlet water flow rate.

3b: Monitoring secondary current, secondary voltage, inlet water flow rate, and flush water solids content.

B.3.4 Bibliography

TABLE B-3. SUMMARY OF PERFORMANCE INDICATORS FOR WESPs

Parameter	Performance indication	Approach No.	1	2	3	4	5	6
		Illustration No.	3a	3b				
		Example CAM Submittals					A9a	A9b
		Comment		✔	✔	✔		
Primary Indicators of Performance								
Opacity	Increased opacity or VE denotes performance degradation. COMS, opacity observations, or visible/no visible emissions. If mist is entrained in exhaust gas or a condensed plume is present, opacity measurements may be misleading.				X			
Secondary corona power	Performance usually increases as power input increases; indicates work done by WESP to remove PM. Product of voltage and current; can help identify any fields that are not operating.		a	a		a		
Secondary current	Partial indicator of power consumption; too low indicates malfunction. Can help identify any fields that are not operating properly.		X	X		X		
Secondary voltage	Partial indicator of power consumption; too low indicates problem such as grounded electrodes. Can help identify any fields that are not operating properly.		X	X	X	X	X	X
Other Performance Indicators								
Inlet water flow rate	Indicates cleaning mechanism is working properly; if low, can indicate plugging. As an alternative to water flow, the water pressure can be monitored.		X	X	X	X		
Flush water solids content	High solids may cause plugging, reduce collection efficiency. Applies to systems that use recycled water.			X				
Inlet/outlet gas temperature	Indicates water sprays and prequench (if applicable) are working. Also, temperature affects resistivity of particulate.				X			X

Comments:
- Approach No. 2 also corresponds to 40 CFR 60, subpart PPP (Wool Fiberglass).
- Approach No. 3 includes monitoring the voltage to indicate that the WESP is collecting particulate, VE as an indicator of PM emissions, water flow to indicate PM being removed, and outlet temperature to indicate sufficient water.

[a] Monitoring both secondary current and voltage is essentially the same as monitoring secondary corona power. Monitoring of corona power is not appropriate for WESPs with a large number of fields.

No Part 63 rules refer to WESP.

CAM ILLUSTRATION
No. 3a. WET ELECTROSTATIC PRECIPITATOR FOR PM

1. APPLICABILITY

1.1 Control Technology: Wet electrostatic precipitator (WESP) [010, 011, 012]
1.2 Pollutants
Primary: Particulate matter (PM)
Other:
1.3 Process/Emission units: Wood products dryers

2. MONITORING APPROACH DESCRIPTION

2.1 Parameters to be Monitored: Secondary current, secondary voltage, and inlet water flow rate.
2.2 Rationale for Monitoring Approach
- Secondary current: Current is generally constant and low; increase or drop in current indicates a malfunction. The current directly affects collection efficiency.
- Secondary voltage: Voltage is maintained at high level; drop in voltage indicates a malfunction. When the voltage drops, less particulate is charged and collected. The voltage directly affects collection efficiency.
- Inlet water flow rate: Indicates sufficient water flow for proper removal of particulate from the collection plates.

2.3 Monitoring Location
- Secondary current and secondary voltage: Measure after each transformer/rectifier set.
- Inlet water flow rate: Water line.

2.4 Analytical Devices
- Secondary current: Ammeter.
- Secondary voltage: Voltmeter.
- Inlet water flow rate: Liquid flow meter or other device for liquid flow; see section 4 for more information on specific types of instruments.

2.5 Data Acquisition and Measurement System Operation
- Frequency of measurement: Hourly, or continuously by strip chart or data acquisition system.
- Reporting units:
  - Current: Amps.
  - Voltage: Volts.
  - Inlet water flow rate: Gallons per minute (gpm) or cubic feet per minute (ft^3/min)
- Recording process: Operators log data manually, or recorded automatically on strip chart or data acquisition system.

2.6 Data Requirements
- Baseline secondary current, secondary voltage, and inlet water flow rate measurements concurrent with emission test.

- Historical plant records on secondary current, secondary voltage, and inlet water flow rate measurements.

2.7 Specific QA/QC Procedures: Calibrate, maintain, and operate instrumentation using procedures that take into account manufacturer's specifications.

2.8 References: 7, 8, 9, 13.

3. COMMENTS

3.1 Data Collection Frequency: For large emission units, a measurement frequency of once per hour would not be adequate; collection of four or more data points each hour is required. (See Section 3.3.1.2.)

CAM ILLUSTRATION
No. 3b. WET ELECTROSTATIC PRECIPITATOR FOR PM

1. APPLICABILITY

1.1 Control Technology: Wet electrostatic precipitator (WESP) [010, 011, 012]
1.2 Pollutants
Primary: Particulate matter (PM)
Other:
1.3 Process/Emission units: Insulation manufacturing, dryers

2. MONITORING APPROACH DESCRIPTION

2.1 Parameters to be Monitored: Secondary voltage and current, inlet water flow rate, and solids content of flush water.
2.2 Rationale for Monitoring Approach
- Secondary current:
- Secondary voltage: Low voltage or current indicates a problem in the WESP.
- Inlet water flow rate: Indicates sufficient water flow for proper removal of particulate from the collection plates.
- Flush water solids content: High solids content of recycled water reduces the efficiency of cleaning.

2.3 Monitoring Location
- Secondary current and secondary voltage: Measure after each transformer/rectifier set.
- Inlet water flow rate: Measure at inlet water inlet line or pump discharge.
- Flush water solids content: Measure at inlet line or recycle water tank.

2.4 Analytical Devices:
- Secondary current: Ammeter.
- Secondary voltage: Voltmeter.
- Inlet water flow rate: Liquid flow meter or other device for liquid flow; see section 4 for more information on specific types of instruments.
- Flush water solids content: Manual sampling of water.

2.5 Data Acquisition and Measurement System Operation
- Frequency of measurement: Hourly, or continuously on strip chart or data acquisition system; flush water solids, weekly.
- Reporting units:
  - Current: Amps.
  - Voltage: Volts.
  - Inlet water flow rate: Gallons per minute (gpm) or cubic feet per minute (ft^3/min).
  - Flush water solids content: Percent solids.
- Recording process: Operators log data manually, or recorded automatically on strip chart or data acquisition system.

2.6 Data Requirements
- Baseline secondary current, secondary voltage, inlet water flow rate, and solids content measurements concurrent with emission test.
- Historical plant records on secondary current, secondary voltage, inlet water flow rate, and solids content measurements.

2.7 Specific QA/QC Procedures: Calibrate, maintain, and operate instrumentation using procedures that take into account manufacturer's specifications.

2.8 References: 7, 8, 9, 11, 13.

3. COMMENTS

3.1 Data Collection Frequency: For large emission units, a measurement frequency of once per hour would not be adequate; collection of four or more data points each hour is required. (See Section 3.3.1.2.)

enviva
Enviva Pellets Northampton LLC
874 Lebanon Church Road
Garysburg, NC 27381

+1 (252) 541 2631
fax (252) 541 2632

www.envivabiomass.com

August 4, 2016

Via FedEx
Overnight Delivery

Ms. Yukiko Puram
NCDENR-DAQ
Air Permitting Section
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: Enviva Pellets Northampton, LLC
Title V Air Permit Application Amendment

Ms. Puram:

Enviva Pellets Northampton, LLC (Enviva) submitted a Title V Air Permit Application for its Northampton, NC wood pellet manufacturing facility in April 2014. In May 2015, Enviva subsequently submitted a State Operating Permit Application requesting physical modifications to the facility and an increase in the allowable VOC emissions at the facility. This permit modification request was approved by the NCDEQ Division of Air Quality (DAQ) and a revised Operating Permit No. 10203R04 was issued on October 12, 2015.

Enviva is submitting attached, amendments to its Title V Air Permit Application to include the changes made in Permit 10203R04. Included attached are copies of the Air Permit Forms for all existing and proposed units at the facility (Appendix A), a copy of the facility-wide emissions calculations representing the revised operating scenarios from the May 2015 State Operating Permit Application (Appendix B), and a process flow diagram reflecting the new equipment configuration (Appendix C).

As part of the May 2015 State Operating Permit Application, Enviva requested a facility-wide VOC emissions limit of 456.4 tons per year. The emissions calculated as detailed in Appendix B represent the maximum potential VOC emissions from the facility at the maximum throughput capacities and a softwood content of 30%. As shown in Appendix B, the facility-wide emissions at 30% softwood are well below the permitted maximum of 456.4 tons per year. As detailed in the May 2015 State Operating Permit Application, Enviva proposes the potential use of even higher softwood content provided that appropriate emission factors are derived and approved by DAQ, as detailed in Section 2.1, Condition 4.c of the newly issued Air Permit 10203R04.

North Carolina Air Toxics Air Dispersion Modeling was initially submitted as part of the April 2014 Title V Air Permit Application and updated modeling for two pollutants was submitted in May 2015. There are no additional changes to the existing air dispersion modeling and therefore, the modeling demonstrations are not reproduced in this Title V Air Permit Amendment Application.

If you have any questions or require additional information, please contact Michael Deyo at 804-937-0377 or Joe Harrell at 252-370-3181.

Sincerely,

Steven Steigerwald
Corporate EHS Director

cc: Royal Smith, Enviva
Joe Harrell, Enviva
Michael Deyo, Deyo and Associates, LLC

APPENDIX A

Enviva Pellets Northampton, LLC

Amended North Carolina DAQ Title V

Air Permit Application Forms

Received
AUG 0 9 2016
Air Permits Section

FORM A1

FACILITY (General Information)

REVISED 05/25/12 — 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 ☐ 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, Corporate Environmental Health & Safety Manager	Name/Title: Heath Lucy, Environmental Health & Safety Manager
Mailing Address Line 1: 142 N.C. Route 561 East	Mailing Address Line 1: 874 Lebanon Church Road
Mailing Address Line 2:	Mailing Address Line 2:
City: Ahoskie State: NC Zip Code: 27910	City: Garysburg State: NC Zip Code: 27866
Phone No. (area code) 252-209-6032 Fax No. (area code) N/A	Phone No. (area code) (910) 318-2743 Fax No. (area code)
Email Address: Joe.Harrell@envivabiomass.com	Email Address: heath.lucy@envivabiomass.com
Responsible Official/Authorized Contact:	***Invoice Contact:***
Name/Title: Royal Smith, Vice President 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) (240) 482-3770 Fax No. (area code)	Phone No. (area code) Fax No. (area code)
Email Address: royal.smith@envivabiomass.com	Email Address:

APPLICATION IS BEING MADE FOR

☐ New Non-permitted Facility/Greenfield ☑ Modification of Facility (permitted) ☐ Renewal with Modification
Renewal (TV Only) ☑ AMENDMENT TO INITIAL TITLE V APPLICATION

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. 10203R04 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 ☑ ***If yes, please contact the DAQ Regional Office prior to submitting this application.*** (See Instructions)

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: Michael Deyo	Firm Name: Deyo & Associates, LLC
Mailing Address Line 1: 12325 Morning Creek Rd.	Mailing Address Line 2:
City: Glen Allen State: VA	Zip Code: 23059 County: Henrico
Phone No. (area code) (804) 937-0377 Fax No. (area code) (804) 441-8272	Email Address: mtdeyo@aol.com

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): Royal Smith	Title: Vice President, Operations
X Signature(Blue Ink):	Date: 8/4/16

Attach Additional Sheets As Necessary

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)			
	N/A - Title V Permit Application Update to Incorporate Facility Modifications Included in Enviva's May 2015		
	State Operating Permit Application, as Approved in Operating Permit No. 10203R04.		
Existing Permitted Equipment To Be MODIFIED By This Application			
	N/A - Title V Permit Application Update to Incorporate Facility Modifications Included in Enviva's May 2015		
	State Operating Permit Application, as Approved in Operating Permit No. 10203R04.		
Equipment To Be DELETED By This Application			

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 / (No)

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

Enviva Pellets Northampton, LLC will not handle any of the substances subject to 112(r)

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:	10203R04		
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.

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 Emissions 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 Emissions 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 Emissions Calculations in Appendix B				

COMMENTS:

Attach Additional Sheets As Necessary

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

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.	Dry Line Hopper (ES-DLH)	10 ODT/hr	15A NCAC 02Q .0102 (c)(2)(E) - negligible emissions,
9.	Dry Line Conveyor (ES-DLC-1)	10 ODT/hr	15A NCAC 02Q .0102 (c)(2)(E) - negligible emissions,
10.	Bagging System Conveying (ES-BSC-2, ES-BSC-3, ES-BSB-1 and ES-BSB-2)	60 tph (ES-BSC-2), 30 tph (ES-BSC-3, ES-BSB-1, ES-BSB-2)	15A NCAC 02Q .0102 (c)(2)(E) - negligible emissions,

Attach Additional Sheets As Necessary

FORM D

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

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, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.

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.

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, J. Rusty Field, 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: J. Rusty Field
DATE: 7-25-2016
COMPANY: ONE Environmental Group
ADDRESS: 1508 Willow Lawn Drive, Suite 200, Richmond, VA 23230
TELEPHONE: 804-303-8784
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: ☝ 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*
IES-GN	Emergency Generator	Part 63, Subpart ZZZZ
IES-FWP	Emergency Fire Water Pump Generator	Part 63, Subpart ZZZZ

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*
40 CFR Part DDDD	ES-Dryer	Facility is not defined as a "Plywood and Composite Wood Products (PCWP) Manufacturing Facility" as Defined at 40 CFR Part 63.2292.

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 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 ☐ QUARTERI ☐ 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

FORM E4

EMISSION SOURCE COMPLIANCE SCHEDULE

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?

☝ 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?

☝ 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?

☝ 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)

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 27866

COUNTY: Northampton

PERMIT NUMBER : 10203R04

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.

_____ **Date:** _____

Signature of responsible company official (REQUIRED, USE BLUE INK)

Royal Smith, Vice President of Operations

Name, Title of responsible company official (Type or print)

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: **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)
- ☐ 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: **2013**	DATE MANUFACTURED:	
MANUFACTURER / MODEL NO.: **CEM 112" 15KN SUS Pellet Proces**		PECTED 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
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

Not included in the permit

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	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Green Wood	ODT	71.71	

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

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 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: **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 (SO_2)							
NITROGEN OXIDES (NO_x)							
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	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION (UNIT/HR)
Green Wood	**ODT**	**71.71**	

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

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 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
	CONTROL DEVICE ID NO(S): CD-DC; CD-WESP
OPERATING SCENARIO 1 OF 1	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 utilizing a wet electrostatic precipitator (WESP) operating after the cyclone.

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: 2012	OPERATION DATE: 2013	DATE MANUFACTURED: 2012
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 (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 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
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-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): 125

WOOD-FIRED BURNER

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

PERCENT MOISTURE OF FUEL: ~50%

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

FUEL FEED METHOD: Air Swept Fuel Feeders	HEAT TRANSFER MEDIA: ( ) STEAM (●) AIR ( ) OTHER
METHOD OF TUBE CLEANING: Scraping of Burner Floor	CLEANING SCHEDULE: Annual scraping of burner floor

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	21	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)
Wet Wood	Nominal 4200 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: **2013**
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:

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/FT^3):	**3.43E-05**
POLLUTANT LOADING RATE (GR/FT^3	**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

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.

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.

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: 2013
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

Note: Gas conditioning represents evaporative cooling.

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

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Dried materials are reduced to the approporitate size needed for pelletization using eight dry wood 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: 2012	OPERATION DATE: 2013	DATE MANUFACTURED: 2012
MANUFACTURER / MODEL NO.: Bliss, Model 44-60	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
	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 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) dry wood hammermills	EMISSION SOURCE ID NO: ES-HM-1 through 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 through 4

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

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood	ODT	81.71	

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

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: **2013**
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE: **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

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.

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

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: 2013
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE: TBD
1 OF 1	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, NDS, DLC
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: 2013
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE: TBD
1 OF 1	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.

	PM	PM-10	PM-2.5	
POLLUTANT(S) COLLECTED:				
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 (GRAIN)[1]	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. 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	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 and dry line conveyor transfer 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: 2013	OPERATION DATE: 2013	DATE MANUFACTURED: 2012
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
	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 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/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 DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Hammermill area dust from the hammermill and screening operations and dry line conveyor transfer 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	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood	ODT	81.71	

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

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 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
	CONTROL DEVICE ID NO(S): CD-CLR-C1 through 6
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-10 through 15

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Six 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: 2012	OPERATION DATE: 2013	DATE MANUFACTURED: 2012
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
	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 Emissions 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 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-CLR 1 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 pellet coolers follow the pellet presses to cool the newly formed pellets down to an acceptable storage temperature.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Wood Pellets	ODT	81.71	

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

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-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: **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:				
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.

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: **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: **Pellet Mill Feed Material**				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		RAILCAR
COMPRESSOR	BELT CONVEYOR (circled)	MOTOR HP:	TRUCK
OTHER:	BUCKET ELEVATOR		STORAGE PILE
	OTHER:		OTHER: (circled) **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:	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 ( ) SONIC
( ) REVERSE FLOW ( ) SIMPLE BAG COLLAPSE
( ) MECHANICAL/SHAKER ( ) RING BAG COLLAPSE
( ) OTHER

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

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	Unknown	
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: 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: **Pellet Fines Bin**	EMISSION SOURCE ID NO: **ES-PFB**
OPERATING SCENARIO **1** OF **1**	CONTROL DEVICE ID NO(S): **CD-PFB-BV**
	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: **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:	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

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: **Finished Product Handling/ Pellet Loadout Bins / Pellet Loadout**	EMISSION SOURCE ID NO: **ES-FPH, ES-PB1-12, ES-PL1 and 2**
	CONTROL DEVICE ID NO(S): **CD-FPH-BF**
OPERATING SCENARIO **1** OF **1**	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: **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	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood	**ODT**	**81.71**	

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

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-PB1-12**
	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: **81.71 ODT/hr**		

PNEUMATICALLY FILLED	MECHANICALLY FILLED		FILLED FROM
BLOWER	SCREW CONVEYOR		RAILCAR
COMPRESSOR	BELT CONVEYOR	MOTOR HP:	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	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (ODT)	LIMITATION (UNIT/HR)
Dried Wood	**ODT**	**81.71**	

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

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: 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.

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)
- ☐ 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: **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-EG**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-4**

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) | ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL ☐ OTHER (DESCRIBE): _____

CYCLE: ☐ COGENERATION ☐ SIMPLE ☐ REGENERATIVE ☐ COMBINED

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

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 DETAILTHE 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: **2013**	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 (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 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

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: Dry Line Hopper	EMISSION SOURCE ID NO: ES-DLH — DLB?
	CONTROL DEVICE ID NO(S): N/A
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A - Fugitive

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Dried wood materials aretransferred to the Dry Line Conveyor (ES-DLC).

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: 2014	OPERATION DATE: 2014	DATE MANUFACTURED: 2014
MANUFACTURER / MODEL NO.: Enviva Built	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				

achments: (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)

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

EMISSION SOURCE DESCRIPTION: Dry Line Hopper	EMISSION SOURCE ID NO: ES-DLH — DLB ?
	CONTROL DEVICE ID NO(S): N/A- Fugitive
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A - Fugitive

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Dried wood materials are transferred to Dry Line Conveyor (ES-DLC).

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	10 tph	

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

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 B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: Dry Line Feed Conveyor	EMISSION SOURCE ID NO: ~~ES~~-DLC
	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):
Dried wood materials are transferred from the dry line feed hopper (ES-DLH) to the exisiting hammermill pre-screens in-feed conveyor.

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: 2014	OPERATION DATE: 2014	DATE MANUFACTURED: 2014
MANUFACTURER / MODEL NO.: Enviva Built	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				

.tachments: (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)

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

EMISSION SOURCE DESCRIPTION: Dry Line Feed Conveyor	EMISSION SOURCE ID NO: ES-DLC
	CONTROL DEVICE ID NO(S): CD-HM-BF-3
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-2

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Dried wood materials are transferred from the dry line feed bin (ES-DLB) to the exisiting hammermill pre-screens in-feed conveyor.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	10 toh	

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

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 B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: Bagging System Screening (includes conveyor and two screeners)	EMISSION SOURCE ID NO: ES-BSC-1, BSS1, BSS2
	CONTROL DEVICE ID NO(S): DC-BS-BF-1, DC-BS-BF-2
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-16, EP-17

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Finished product material is transferred using Bagging System Conveyor 1 (ES-BSC-1) into screens ES-BSS-1 and ES-BSS-2.

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: 2015	OPERATION DATE: 2015	DATE MANUFACTURED: 2016
MANUFACTURER / MODEL NO.: Pending	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 ($PM_{2.5}$)							
ULFUR DIOXIDE (SO2)							
ITROGEN 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)

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

EMISSION SOURCE DESCRIPTION: Bagging System Conveyor	EMISSION SOURCE ID NO: ES-BSC-1
	CONTROL DEVICE ID NO(S): DC-BS-BF-1, DC-BS--BF-2
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-16, EP-17

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Finished product material (pellets) are transferred from the finished product bin onto Bagging System Screeners 1 and 2 (ES-BSS-1, ES-BSS-2).

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	60 tn/hr	

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

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 B9

EMISSION SOURCE (OTHER)

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

EMISSION SOURCE DESCRIPTION: Bagging System Screen 1	EMISSION SOURCE ID NO: ES-BSS1
	CONTROL DEVICE ID NO(S): DC-BS-BF-1
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-16

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Finished product material (pellets) are transferred from conveyor ES-BSC-1 onto screen ES-BSS-1. The screened material is then transferred to bagging system conveyor ES-BSC-2.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	30 tn/hr	

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

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)

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

CONTROL DEVICE ID NO: DC-BS-BF-1	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-BSC-1; ES-BSS-1
EMISSION POINT (STACK) ID NO(S): EP-16	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
MANUFACTURER: TBD	MODEL NO: TBD
DATE MANUFACTURED: 2015	PROPOSED OPERATION DATE: 2016
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE: 2015
1 OF 1	P.E. SEAL REQUIRED (PER 2Q .0112)? (YES) ○ NO

DESCRIBE CONTROL SYSTEM:

A fabric filter dust collector is used to collect dust from the Pellet Bagging System Conveyor 1 and Screen 1.

POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
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: 6" GAUGE? (YES) ○ NO WARNING ALARM? ○ (YES) ○ NO

BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE (°F): MIN MAX Ambient
POLLUTANT LOADING RATE: 0.01 ○ LB/HR (○ GR/FT^3)	OUTLET TEMPERATURE (°F): MIN MAX Ambient
INLET AIR FLOW RATE (ACFM): 45000	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): 6250
AIR TO CLOTH RATIO: 6:1	FILTER MATERIAL: Polyester or Equivalent	○ WOVEN ○ (FELTED)

DESCRIBE CLEANING PROCEDURES:

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

DESCRIBE INCOMING AIR STREAM:

The air stream will contain wood dust particulate emissions.

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: 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

FORM B9

EMISSION SOURCE (OTHER)

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

EMISSION SOURCE DESCRIPTION: Bagging System Screen 2	EMISSION SOURCE ID NO: ES-BSS-2
	CONTROL DEVICE ID NO(S): DC-BS-BF-2
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-17

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Finished product material (pellets) are transferred from conveyor ES-BSC-1 onto screen ES-BSS-2. The screened material is then transferred to bagging system conveyor ES-BSC-2.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	30 tn/hr	

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

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)

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

CONTROL DEVICE ID NO: DC-BS-BF-2	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-BSC-1; ES-BSS-2
EMISSION POINT (STACK) ID NO(S): EP-17	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
MANUFACTURER: TBD	MODEL NO: TBD
DATE MANUFACTURED: 2015	PROPOSED OPERATION DATE: 2016
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE: 2015
1 OF 1	P.E. SEAL REQUIRED (PER 2Q .0112)? (YES) ☐ NO

DESCRIBE CONTROL SYSTEM:

A fabric filter dust collector is used to collect dust from the Pellet Bagging System Conveyor 1 and Screen 2.

	PM	PM-10	PM-2.5	
POLLUTANT(S) COLLECTED:				
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
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: 6" GAUGE? (YES) ☐ NO	WARNING ALARM? ☐ YES (NO)
BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE (°F): MIN MAX Ambient
POLLUTANT LOADING RATE: 0.01 ☐ LB/HR (GR/FT^3)	OUTLET TEMPERATURE (°F): MIN MAX Ambient
INLET AIR FLOW RATE (ACFM): 45000	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): 6250
AIR TO CLOTH RATIO: 6:1	FILTER MATERIAL: Polyester or Equivalent	☐ 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 particulate emissions.

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: 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

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: Bagging System Conveying and Feed Bins	EMISSION SOURCE ID NO: ES-BSC-2, BSC-3, BSB-1, and BSB-2
	CONTROL DEVICE ID NO(S): N/A
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A- Fugitive

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Finished product material is transferred to the bagging system bins (ES-BSB-1 and ES-BSB-2) via conveyors ES-BSC-2 and ES-BSC-3. Note that the emissions associated with these units are represented by the drop points from the conveyors to the bins.

EMISSION SOURCE DESCRIPTION: Bagging System Conveying

☐ 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: 2015	OPERATION DATE: 2015	DATE MANUFACTURED: 2016
MANUFACTURER / MODEL NO.: Pending	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: Bagging System Conveyor	EMISSION SOURCE ID NO: ES-BSC-2
	CONTROL DEVICE ID NO(S): N/A
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A - Fugitive

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Finished product material (pellets) is transferred to ES-BSB-1 or ES-BSC-3.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	60 tn/hr	

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

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 B9

EMISSION SOURCE (OTHER)

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

EMISSION SOURCE DESCRIPTION: Bagging System Conveyor	EMISSION SOURCE ID NO: ES-BSC-3
	CONTROL DEVICE ID NO(S): N/A
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): N/A - Fugitive

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Finished product material (pellets) is transferred from ES-BSC-2 to ES-BSB-2.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT	60 tn/hr	

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

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: Bagging System Bin 1	EMISSION SOURCE ID NO: ES-BSB-1
	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):

Finished product material (pellets) are transferred from ES-BSC-2.

MATERIAL STORED: Wood pellets				DENSITY OF MATERIAL (LB/FT3): 40		
CAPACITY	CUBIC FEET: 100			TONS: 2		
DIMENSIONS (FEET)	HEIGHT:	DIAMETER:	***(OR)***	LENGTH: 7-8'	WIDTH: 7-8'	HEIGHT 6-7'
ANNUAL PRODUCT THROUGHPUT (TONS)	ACTUAL:			MAXIMUM DESIGN CAPACITY: 30 tph		

PNEUMATICALLY FILLED	MECHANICALLY FILLED		FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR		☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR (circled)	MOTOR HP:	☐ TRUCK
☐ OTHER:	☐ BUCKET ELEVATOR		☐ STORAGE PILE
	☐ OTHER:		☐ OTHER: (circled) Screen

NO. FILL TUBES:

MAXIMUM ACFM:

MATERIAL IS FILLED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Direct coupled to a duplex net weigh scale.

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 30

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 30

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: Bagging System Bin 2	EMISSION SOURCE ID NO: ES-BSB-2
	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):

Finished product material (pellets) are transferred from ES-BSC-3.

MATERIAL STORED: Wood pellets				DENSITY OF MATERIAL (LB/FT3): 40			
CAPACITY	CUBIC FEET: 100			TONS: 2			
DIMENSIONS (FEET)	HEIGHT:	DIAMETER:	***(OR)***	LENGTH: 7-8'	WIDTH: 7-8'	HEIGHT 6-7'	
ANNUAL PRODUCT THROUGHPUT (TONS)	ACTUAL:			MAXIMUM DESIGN CAPACITY: 30 tph			

PNEUMATICALLY FILLED	**MECHANICALLY FILLED**		**FILLED FROM**
G BLOWER	G SCREW CONVEYOR		G RAILCAR
G COMPRESSOR	G BELT CONVEYOR (circled)	MOTOR HP:	G TRUCK
G OTHER:	G BUCKET ELEVATOR		G STORAGE PILE
	G OTHER:		G OTHER (circled): Screen

NO. FILL TUBES:

MAXIMUM ACFM:

MATERIAL IS FILLED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO? Direct coupled to a duplex net weigh scale.

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): 30

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): 30

COMMENTS:

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) Dry Line Conveyor Bagging System Conveyor (BSC-1) Bagging System Screens (BSS1, BSS2) 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)	Opacity	15A NCAC 2D.0521	Cyclones + WESP	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
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) Bagging System Conveyor (BSC-1) Bagging System Screens (BSS1, BSS2) Bagging System Bins (BSB-1, BSB-2)			Fabric Filter			
Pellet Presses & Coolers (ES-CLR-1 through 6)			Cyclones			
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
Dryer	CO	15A NCAC 2Q.0317/ 15A NCAC 2D.0530	N/A	Monthly CO Emissions Calculations (Calculations of rolling annual emissions)	Rolling Annual VOC Emissions Calculations	Semi-annual summary report and annual compliance certification
Facility-Wide	VOC	15A NCAC 2Q.0317/ 15A NCAC 2D.0530	N/A	Monthly VOC Emissions Calculations (Calculations of rolling annual emissions) Using Factors Appropriate for the Annual Average Softwood Content Used in that 12-month Period (Factors shall be approved by DAQ).	Rolling Annual VOC Emissions Calculations. Emission Factor Approvals from DAQ.	Semi-annual summary report and annual compliance certification
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

APPENDIX B

Enviva Pellets Northampton, LLC

Emissions Calculations

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

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	29.84	29.84	29.84	19.20	209.88	3,341.43	162,118.83
Emergency Generator	ES-EG	0.50	0.58	0.03	0.03	0.03	0.0010	0.0015	93.35	93.35
Fire Water Pump	ES-FWP	0.43	0.49	0.02	0.02	0.02	0.0008	0.0013	80.02	80.02
Hammermills/Nuisance Dust System	ES-HM-1 thru 8/ ES-NDS	-	-	20.27	20.27	20.27	-	24.71	-	-
Pellet Mill Feed Silo	ES-PMFS	-	-	0.38	0.38	0.38	-	-	-	-
Pellet Fines Bin	~~ES-FB~~ PFB-1	-	-	0.54	0.54	0.54	-	-	-	-
Pellet Presses and Coolers	ES-CLR1 thru -6	-	-	38.52	35.05	21.19	-	142.86	-	-
Finished Product Handling & Loadout	ES-FPH, PL1,2 PB1-12	-	-	5.33	4.85	2.93	-	-	-	-
~~Finished Product Bagging Screening~~	~~ES-BSC-1, ES-BSS-1, 2~~	-	-	~~33.79~~	~~30.75~~	~~18.58~~	-	-	-	-
Dried Wood Handling	ES-DWH, ES-PP exempt	-	-	0.12	0.06	0.01	-	-	-	-
Diesel Storage Tanks	TK1 & TK2 - exempt	-	-	-	-	-	-	9.10E-04	-	-
	Total PSD Emissions	**61.88**	**126.57**	**128.84**	**121.79**	**93.79**	**19.20**	**377.46**	**3,514.80**	**162,292.20**
Fugitive (Non-PSD Sources)										
Bark-Hog	ES-BARK	-	-	-	-	-	-	0.30	-	-
Chipping	ES-EPWC	-	-	-	-	-	-	1.25	-	-
Green Hammermills	ES-RCHIP - 1 and 2	-	-	-	-	-	-	1.25	-	-
Green Wood Handling	ES-GWH	-	-	0.03	0.01	0.00	-	-	-	-
Green Wood Piles	ES-GWSP1	-	-	2.65	1.33	0.20	-	2.93	-	-
	Total Facility Emisions:	**61.88**	**126.57**	**131.52**	**123.13**	**93.99**	**19.20**	**382.89**	**3,514.80**	**162,292.20**

ES-DLB
ES-DLC-1
ES-PFB-1 (ES-FB)
BCS-2, 3
BSB-1, 2

TABLE B-2
FACILITYWIDE HAP EMISSIONS SUMMARY
ENVIVA PELLETS NORTHAMPTON

Description	Dryer (tpy)	ES-HM1 thru 8 (tpy)	ES-CLR1 thru 6 (tpy)	ES-EG (tpy)	ES-FWP (tpy)	ES-BARK (tpy)	ES-CHIP-1 (tpy)	ES-RCHIP-1,2 (tpy)	Total (tpy)
1,3-Butadiene	-	-	-	2.39E-05	2.05E-05	-	-	-	4.45E-05
Acetaldehyde	6.77E+00	0.00E+00	0.00E+00	4.70E-04	4.03E-04	-	-	-	6.77E+00
Acrolein	0.00E+00	1.08E+00	0.00E+00	5.67E-05	4.86E-05	-	-	-	1.08E+00
Benzene	-	-	-	5.71E-04	4.90E-04	-	-	-	1.06E-03
Formaldehyde	1.26E+01	0.00E+00	1.11E+00	7.23E-04	6.20E-04	-	-	-	1.37E+01
m-,p-Xylene	-	-	-	1.75E-04	1.50E-04	-	-	-	3.24E-04
Methanol	9.93E+00	9.41E-01	3.58E+00	-	-	0.06	0.27	0.27	1.51E+01
Propionaldehyde	1.17E+00	0.00E+00	0.00E+00	-	-	-	-	-	1.17E+00
Toluene	-	-	-	2.51E-04	2.15E-04	-	-	-	4.65E-04
Total PAH (POM)	0.00E+00	-	-	1.03E-04	8.82E-05	-	-	-	1.91E-04
TOTAL HAP	**30.51**	**2.02**	**4.69**	**0.002**	**0.002**	**0.06**	**0.27**	**0.27**	**37.82**

Coolers.

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

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			0.00E+00									4.79E-02			4.11E-02			8.90E-02
Acetaldehyde	75-07-0	3.34E+00		1.35E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E-03			1.61E-03			3.34E+00		
Acrolein	107-02-8	0.00E+00			3.31E-01	7.94E+00	2.15E+03	0.00E+00	0.00E+00	0.00E+00	2.27E-04			1.94E-04			3.31E-01		
Arsenic				0.00E+00															0.00E+00
Benzene	71-43-2			0.00E+00									1.14E+00			9.80E-01			2.12E+00
Benzo(a)pyrene	50-32-8			0.00E+00									2.30E-04			1.97E-01			4.28E-04
Beryllium metal (un-reacted) (Also include in BEC)				0.00E+00															0.00E+00
Cadmium Metal (elemental un-reacted) - (Add w/CDC)				0.00E+00															0.00E+00
Carbon Tetrachloride				0.00E+00															0.00E+00
Chlorine		0.00E+00	0.00E+00														0.00E+00	0.00E+00	
Chlorobenzene			0.00E+00															0.00E+00	
Chloroform	67-66-3			0.00E+00															0.00E+00
Chromic acid (Chromium VI)	7738-94-5		0.00E+00															0.00E+00	
Di(2-ethylhexyl)phthalate (DEHP)			0.00E+00															0.00E+00	
Ethylene dichloride (1,2-dichloroethane)				0.00E+00															0.00E+00
Formaldehyde	50-00-0	6.52E+00			0.00E+00	0.00E+00	0.00E+00	2.99E-01	6.97E+00	2.22E+03	2.89E-03			2.48E-03			6.52E+00		
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8				0.00E+00															0.00E+00
Hydrogen chloride (hydrochloric acid)		0.00E+00																	
Manganese & compounds			0.00E+00														0.00E+00		
Mercury, vapor (include in Mercury & Cmpds)			0.00E+00															0.00E+00	
Methyl chloroform (1,1,1 trichloroethane)		0.00E+00	0.00E+00															0.00E+00	
Methyl ethyl ketone		0.00E+00	0.00E+00														0.00E+00	0.00E+00	
m-,p-Xylene	1330-20-7	0.00E+00	0.00E+00								6.98E-04	1.68E-02	3.49E-01	5.99E-04	1.44E-02	2.99E-01	1.30E-03	3.11E-02	
Methyl isobutyl ketone	108-10-1	0.00E+00	0.00E+00														0.00E+00	0.00E+00	
Methylene chloride	75-09-2	0.00E+00		0.00E+00													0.00E+00		0.00E+00
Nickel metal (Component of Nickel & Compounds)			0.00E+00															0.00E+00	
Pentachlorophenol		0.00E+00	0.00E+00														0.00E+00	0.00E+00	
Perchloroethylene (tetrachloroethylene)				0.00E+00															0.00E+00
Phenol	108-95-2	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00		
Polychlorinated biphenyls				0.00E+00															0.00E+00
Styrene	100-42-5	0.00E+00																	
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-				0.00E+00													0.00E+00		
Toluene	108-88-3		0.00E+00																0.00E+00
Trichloroethylene				0.00E+00								2.40E-02			2.06E-02			4.47E-02	
Trichlorofluoromethane (CFC 11)		0.00E+00																	0.00E+00
Vinyl chloride				0.00E+00													0.00E+00		
																			0.00E+00

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	3.34E+00			6.80E+00			No
Acrolein	107-02-8	3.31E-01			2.00E-02			Yes
Arsenic				0.00E+00			1.60E-02	No
Benzene	71-43-2			2.12E+00			8.10E+00	No
Benzo(a)pyrene	50-32-8			4.28E-04			2.20E+00	No
Beryllium				0.00E+00			7.80E-01	No
Cadmium				0.00E+00			3.70E-01	No
Carbon Tetrachloride				0.00E+00			4.60E+02	No
Chlorine		0.00E+00	0.00E+00		2.30E-01	7.90E-01		No
Chlorobenzene			0.00E+00			4.60E+01		No
Chloroform	67-66-3			0.00E+00			2.90E+02	No
Chromic acid (Chromium VI)	7738-94-5		0.00E+00			1.30E-02		No
Di(2-ethylhexyl)phthalate (DEHP)			0.00E+00			6.30E-01		No
Ethylene dichloride (1,2-dichloroethane)				0.00E+00			2.60E+02	No
Formaldehyde	50-00-0	6.52E+00			4.90E-02			Yes
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8				0.00E+00			5.10E-03	No
Hydrogen chloride (hydrochloric acid)		0.00E+00			1.80E-01			No
Manganese & compounds			0.00E+00			6.30E-01		No
Mercury, vapor (Include in Mercury & Compds)			0.00E+00			1.30E-02		No
Methyl chloroform (1,1,1 trichloroethane)		0.00E+00	0.00E+00		6.40E+01	2.50E+02		No
Methyl ethyl ketone		0.00E+00	0.00E+00		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)			0.00E+00			1.30E-01		No
Pentachlorophenol		0.00E+00	0.00E+00		6.40E-03	6.30E-02		No
Perchloroethylene (tetrachloroethylene)				0.00E+00			1.30E+04	No
Phenol	108-95-2	0.00E+00			2.40E-01			No
Polychlorinated biphenyls				0.00E+00			5.60E+00	No
Styrene	100-42-5	0.00E+00			2.70E+00			No
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-				0.00E+00			2.00E-04	No
Toluene	108-88-3		4.47E-02			9.80E+01		No
Trichloroethylene				0.00E+00			4.00E+03	No
Trichlorofluoromethane (CFC 11)		0.00E+00			1.40E+02			No
Vinyl chloride				0.00E+00			2.60E+01	No

TABLE B-4
ROTARY DRYER -CRITERIA POLLUTANT EMISSIONS
ENVIVA PELLETS NORTHAMPTON

before control
TSP 150 lb/hr

Dryer Inputs

Dryer Throughput (@ Dryer Exit)	**647,741**	tons/year
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
Long Term Percent Hardwood	70.0%	
Long Term Percent Softwood	30.0%	
Short Term Percent Hardwood	40.0%	
Short Term Percent Softwood	60.0%	
Max Potential Annual Heat Input:	**1535628**	**MMBtu/yr**

Criteria Pollutant Calculations:

Pollutant	Biomass Emission Factor (lb/ODT)	Units	Emission Factor Source	Control Efficiency (%)	Emissions (lb/hr)	Emissions (tpy)
CO	0.23	lb/ODT	Calculated from NOR October 18, 2013 Stack Test [2]	N/A	16.26	60.9
NO_X	0.47	lb/ODT	Calculated from NOR October 18, 2013 Stack Test [2]	N/A	33.48	125.5
$PM/PM_{10}/PM_{2.5}$ Condensible Fraction	0.017	lb/MMBtu	AP-42, Section 1.6 [3]	Included in factor	2.98	13.1
TSP (Filterable)	0.062	lb/ODT	Calculated from Guaranteed WESP Specifications [1]	Included in factor	4.48	16.8
Total TSP (Filterable + Condensible)					7.46	29.8
PM_{10} (Filterable)	0.062	lb/ODT	TSP=PM10=PM2.5	Included in factor	4.48	16.8
Total PM_{10} (Filterable + Condensible)					7.46	29.8
$PM_{2.5}$ (Filterable)	0.062	lb/ODT	TSP=PM10=PM2.5	Included in factor	4.48	16.8
Total $PM_{2.5}$ (Filterable + Condensible)					7.46	29.8
SO_2	0.025	lb/MMBtu	AP-42, Section 1.6 [6]	N/A	4.38	19.2
Uncontrolled Long Term VOC	0.781	lb/ODT	See Note 4	N/A	N/A	209.9
Short Term VOC (as alpha-pinene)	0.781	lb/ODT	See Note 5	N/A	55.99	N/A
Lead	0.00	N/A	N/A	Included in factor	0.00	0.0

Test 10/3/2013

1.52 lb/hr
1.54 lb/hr
3.07 lb/hr
13.47 tpy.

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] Condensible PM Factor obtained from AP-42, Section 1.6, Table 1.6-1.

[4] Long Term VOC Emissions: VOC emission factor obtained from Ahoskie June 2014 stack testing (30% softwood).

[5] Short Term VOC Emissions: VOC emission factor obtained from Ahoskie June 2014 stack testing since Ahoskie VOC emissions were slightly higher than Amory October 2013 Stack Testing

[6] No emission factor is provided in AP-42, Section 1.6 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 1.6-2.

TABLE B-5
ROTARY DRYER -HAP AND TAP WOOD COMBUSTION EMISSIONS
ENVIVA PELLETS NORTHAMPTON

Calculation Inputs:

Annual Composition and Throughput

Throughput ODT/yr	537,625
Hardwood Composition	70%
Softwood Composition	30%

Short Term Composition and Throughput

ODT/hr	71.71
Hardwood Composition	40%
Softwood Composition	60%

Control Efficiency:	0%

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 – Emission Factor (lb/ODT)	Reference	Emission Factor Comparison: AP-42 Green, Direct wood-fired softwood factors – Emission Factor (lb/ODT)	Reference	Weighted Emission Factor[3] – Short-term EF (lb/ODT)	Anuual EF (lb/ODT)	EF Source	Unonctrolled Emissions (lb/hr)	Unonctrolled Emissions (tpy)	Controlled Emissions (lb/hr)	Controlled Emissions (tpy)
Acetaldehyde	75-07-0	Yes	Yes	Yes	3.83E-03	1,2	7.50E-02	1	4.65E-02	2.52E-02	AP-42	3.34E+00	6.77E+00	3.34E+00	6.77E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.00E+00	1,2,4	0.00E+00	1,4	0.00E+00	0.00E+00	AP-42	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	7.15E-03	1,2	1.40E-01	1	8.69E-02	4.70E-02	AP-42	6.23E+00	1.26E+01	6.23E+00	1.26E+01
Methanol	67-56-1	Yes	No	Yes	5.62E-03	1,2	1.10E-01	1	6.82E-02	3.69E-02	AP-42	4.89E+00	9.93E+00	4.89E+00	9.93E+00
Propionaldehyde	123-38-6	Yes	No	Yes	6.64E-04	1,2	1.30E-02	1	8.07E-03	4.36E-03	AP-42	5.78E-01	1.17E+00	5.78E-01	1.17E+00
											Total HAPs	**15.04**	**30.51**	**15.04**	**30.51**

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 based on worst case processing of 60% softwood.

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

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

Calculation Inputs:

Total Plant Throughput ODT/yr	625,225
% of Total Throughput to the Hammermills	85%

Annual Composition and Throughput

Hammermills Throughput ODT/yr	531,441
Hardwood Composition	70%
Softwood Composition	30%

Short Term Composition and Throughput

ODT/hr	81.71
Hardwood Composition	40%
Softwood Composition	60%

Emission Calculations:

Pollutant	CAS Number	HAP (Yes/No)	NC TAP (Yes/No)	VOC (Yes/No)	Emission Factor – Stack Tests		Emission Factor			Emissions	
					Emission Factor (lb/ODT)	Reference	Short-term EF [3][4] (lb/ODT)	Annual EF [2] (lb/ODT)	EF Source	(lb/hr)	(tpy)
VOC and Alpha Pinene	N/A	N/A	N/A	N/A	0.093	[1]	0.732	0.09	Stack Test	59.84	24.71
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.000	[2]	0.000	0.0000	Stack Test	0.00E+00	0.00E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.004	[2]	0.004	0.0040	Stack Test	3.31E-01	1.08E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	0.000	[2]	0.000	0.0000	Stack Test	0.00E+00	0.00E+00
Methanol	67-56-1	Yes	No	Yes	0.004	[2]	0.004	0.0035	Stack Test	2.89E-01	9.41E-01
Propionaldehyde	123-38-6	Yes	No	Yes	0.000	[2]	0.000	0.0000	Stack Test	0.00E+00	0.00E+00
									Total VOC	**59.84**	**24.71**
									Total HAPs	**0.62**	**2.02**

Notes:

[1] Stack test and Long-term VOC: VOC emission factor obtained from Ahoskie June 2014 stack testing (30% softwood).

[2] Stack test and Long-term HAPs: HAP & TAP emission factors obtained from Enviva Amory facility October 2013 stack testing. Amory stack testing performed at 60% softwood.

[3] Short-term VOCs: VOC emission factors obtained from Amory October 2013 Stack Testing

[4] Short-term HAPs: HAP & TAP emission factors obtained from Enviva Amory facility October 2013 stack testing. Amory stack testing performed at 60% softwood.

TABLE B-8
PELLET PRESSES AND COOLERS - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLETS NORTHAMPTON

Calculation Inputs:

Annual Composition and Throughput

Throughput ODT/yr	625,225
Hardwood Composition	70%
Softwood Composition	30%

Short Term Composition and Throughput

ODT/hr	81.71
Hardwood Composition	40%
Softwood Composition	60%

Emission Calculations:

Pollutant	CAS Number	HAP (Yes/No)	NC TAP (Yes/No)	VOC (Yes/No)	Emission Factor – Stack Tests		Emission Factor			Emissions	
					Emission Factor (lb/ODT)	Reference	Short-term EF [3][4] (lb/ODT)	Annual EF[2] (lb/ODT)	EF Source	(lb/hr)	(tpy)
VOC as alpha-pinene	N/A	N/A	N/A	N/A	4.57E-01	1	1.81E+00	0.46	stack test	147.52	142.86
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.00E+00	2	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.00E+00	2	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	3.55E-03	2	3.55E-03	3.55E-03	stack test	2.90E-01	1.11E+00
Methanol	67-56-1	Yes	No	Yes	1.15E-02	2	1.15E-02	1.15E-02	stack test	9.36E-01	3.58E+00
Propionaldehyde	123-38-6	Yes	No	Yes	0.00E+00	2	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
									Total VOC	**147.52**	**142.86**
									Total HAPs	**1.23**	**4.69**

Notes:

[1] Stack test and Long-term VOC: VOC emission factor obtained from Ahoskie June 2014 stack testing (45% softwood).

[2] Stack test and Long-term HAPs: HAP & TAP emission factors obtained from Enviva Amory facility October 2013 stack testing. Amory stack testing performed at 60% softwood.

[3] Short-term VOCs: VOC emission factor obtained from Amory October 2013 Stack Testing

[4] Short-term HAPs: HAP & TAP emission factors obtained from Enviva Amory facility October 2013 stack testing. Amory stack testing performed at 60% softwood.

TABLE B-9
BARK HOG
ENVIVA PELLETS NORTHAMPTON

Annual Throughput of Bark Hog	129,030	tons/year (dry wood)[1]
Dryer Throughput	71.71	tons/hr (dry wood)[1]

Pollutant	Emission Factors (lb/dry wood tons)	Emissions[6]	
		(lb/hr)	(tpy)
THC as Carbon[2]	0.0041	2.940E-01	0.26
THC as alpha-Pinene[3]	0.0047	**3.337E-01**	0.30
PM[4]	N/A	**N/A**	**N/A**
Methanol[2]	0.0010	**7.171E-02**	0.06

[1] The annual throughput used for the chipper is calculated as 12% of dryer throughput, adjusted for moisture content (wet basis). 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 bark hog emissions are routed downward to the ground.

TABLE B-10
ELECTRIC POWERED CHIPPER (ES-EPWC) - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLETS NORTHAMPTON

Annual Throughput to ES-CHIP-1	1,075,250	tn/yr
Moisture Content:	50%	
Annual Throughput to ES-CHIP-1	537,625	tons/year (dry wood)[1]
Short-term Throughput of Chipper	71.71	tons/hr (dry wood)[1]

Pollutant	Emission Factors (lb/dry wood tons)	Emissions[5]	
		(lb/hr)	(tpy)
THC as Carbon[2]	0.0041	2.940E-01	1.10
THC as alpha-Pinene[3]	0.0047	**3.337E-01**	1.25
PM[4]	N/A	**N/A**	**N/A**
Methanol[2]	0.0010	**7.171E-02**	**0.27**

[1] The hourly and annual throughputs used for the chipper are conservatively assumed to be the same as the annual throughput of the dryer (note that 50% of the dryer throughput normally comes from purchased chips).

[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 chippers. Emissions are representative of the total combined emissions for both rechippers.

TABLE B-11
GREEN HAMMERMILLS (ES-RCHP 1 and 2) - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLETS NORTHAMPTON

Combined Annual Throughput to ES-RCHP-1,2	1,075,250	tn/yr
Moisture Content:	50%	
Annual Throughput to ES-CHP2	537,625	tons/year (dry wood)[1]
Short-term Throughput of Green Hammermill	71.71	tons/hr (dry wood)[1]

Pollutant	Emission Factors (lb/dry wood tons)	Emissions[5]	
		(lb/hr)	(tpy)
THC as Carbon[2]	0.0041	2.940E-01	1.10
THC as alpha-Pinene[3]	0.0047	**3.337E-01**	1.25
PM[4]	N/A	**N/A**	**N/A**
Methanol[2]	0.0010	**7.171E-02**	**0.27**

[1] The hourly and annual throughput used for the hammermills is assumed to be the same as the annual throughput of the dryer. Note that the throughputs listed above are throughputs that are allocated across both hammermills.

[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 chippers. Emissions are representative of the total combined emissions for both rechippers.

TABLE B-12
BAGFILTER AND CYCLONE EMISSIONS
ENVIVA PELLETS NORTHAMPTON

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 $PM_{2.5}$	Emissions PM (lb/hr)	Emissions PM (tpy)	Emissions PM_{10}[3] (lb/hr)	Emissions PM_{10}[3] (tpy)	Emissions $PM_{2.5}$[3] (lb/hr)	Emissions $PM_{2.5}$[3] (tpy)
Hammermills 1-3	ES-HM-1 through 3, DLC	CD-HM-BF-1	45000	0.004	8,760	100%	100%	1.54	6.76	1.54	6.76	1.54	6.76
Hammermills 4-6	ES-HM-4 through 6	CD-HM-BF-2	45000	0.004	8,760	100%	100%	1.54	6.76	1.54	6.76	1.54	6.76
Hammermills 7, 8, NDS	ES-HM-7 and 8, ES-NDS	CD-HM-BF-3	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-FB	CD-FB-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 Handing	ES-FPH, ES-PL1,2, ES-PB1-12	CD-FPH-BV	35,500	0.004	8,760	91%	55%	1.22	5.33	1.11	4.85	0.67	2.93
Finished Product Bagging Screens	ES-BSC-1, ES-BSS-1	CD-BS-BF-1	45,000	0.01	8,760	91%	55%	3.86	16.89	3.51	15.37	2.12	9.29
Finished Product Bagging Screens	ES-BSC-1, ES-BSS-2	CD-BS-BF-2	45,000	0.01	8,760	91%	55%	3.86	16.89	3.51	15.37	2.12	9.29
							TOTAL	22.56	98.83	20.97	91.84	14.59	63.89

Note:

[1] Filter, Vent, and Cyclone inlet flow rate (cfm) provided by design engineering firm (Mid-South Engineering Co.). The exit flowrate was conservataively assumed to be the same as the inlet flowrate.

[2] Pollutant loading 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.

HM 1-6 Process rate $\frac{45000\ \text{gr}}{\text{hr}} \times \frac{0.004\ \text{gr}}{\text{ft}^3} \times \frac{0.00014285714\ \text{lb}}{\text{gr}} \times \frac{60\ \text{min}}{\text{hr}} = 1.5428\ \text{lb/hr} \times 2 = 3.086\ \text{lb/hr}$

TABLE B-13
EMERGENCY GENERATOR AND FIRE PUMP
ENVIVA PELLETS NORTHAMPTON

Emergency Generator Emissions (ES-EG)

Equipment and Fuel Characteristics

Engine Output	0.26	MW
Engine Power	350	hp (brake)
Hours of Operation	500	hr/yr[1]
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	7,000	Btu/hr/hp
Fuel Usage	17.6	gal/hr

Criteria Pollutant Emissions

Pollutant	Category	Emission Factor	Units	Emissions lb/hr	Emissions tpy
TSP	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02
PM_{10}	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02
$PM_{2.5}$	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02
NO_x	PSD	8.82E-03	lb/kW-hr (5)	2.30	5.75E-01
SO_2	PSD	15	ppmw (3)	3.81E-03	9.52E-04
CO	PSD	7.72E-03	lb/kW-hr (2)	2.01	5.03E-01
VOC (NMHC)	PSD	2.51E-03	lb/MMBtu (4)	6.15E-03	1.54E-03
Toxic/Hazardous Air Pollutant Emissions					
Acetaldehyde	HAP/TAP	5.37E-06	lb/hp-hr (4)	1.88E-03	4.70E-04
Acrolein	HAP/TAP	6.48E-07	lb/hp-hr (4)	2.27E-04	5.67E-05
Benzene	HAP/TAP	6.53E-06	lb/hp-hr (4)	2.29E-03	5.71E-04
Benzo(a)pyrene[6]	HAP/TAP	1.32E-09	lb/hp-hr (4)	4.61E-07	1.15E-07
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	9.58E-05	2.39E-05
Formaldehyde	HAP/TAP	8.26E-06	lb/hp-hr (4)	2.89E-03	7.23E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	4.12E-04	1.03E-04
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	1.00E-03	2.51E-04
m-,p-Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	6.98E-04	1.75E-04
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr (4)	2.89E-03	7.23E-04
Total HAPs				9.49E-03	2.37E-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.

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	7,000	Btu/hr/hp
Fuel Usage	15.1	gal/hr

Criteria Pollutant Emissions

Pollutant	Category	Emission Factor	Units	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)	3.26E-03	8.16E-04
CO	PSD	7.72E-03	lb/kW-hr (2)	1.73	4.32E-01
VOC (NMHC)	PSD	2.51E-03	lb/MMBtu (4)	5.27E-03	1.32E-03
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.

IES

TABLE B-14
DRIED WOOD HANDLING DROP POINTEMISSIONS
ENVIVA PELLETS NORTHAMPTON

Annual Dryer Output Throughput (ODT/yr)	537,625
Maxium Dry Line Annual Throughput (ODT/yr)	87,600
Dryer Throughput Plus Dry-line Throughput (ODT/yr)	625,225
Amount of Fines Diverted from Hammermills	15.0%
Annual Hammermill Throughput (ODT/yr)	531,441
Pellet Press Throughput (ODT/yr)	625,225
Max Dryer Short-Term Throughput (ODT/hr)	71.710
Dry-line Feed Throughput (ODT/hr)	10.000
Max Hammermill and Pellet Press Throughput (ODT/hr)	81.710
Max Bagging System Throughput (ODT/hr)	60.000
Dryer Output Moisture Content:	17%
Pellet Mill Output Moisture Content:	7%

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]	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	86.40	647,741	3.1E-03	1.2E-02	1.5E-03	5.5E-03	2.2E-04	8.3E-04
DP2	ES-DWH	Pre-screen Feeder Fines Overs to Hammermills Infeed and Distribution	Enclosed	Reduction to 2 mph mean wind speed	14.77	112,992	5.3E-04	2.0E-03	2.5E-04	9.6E-04	3.8E-05	1.5E-04
DP3	ES-DWH	Hammermills Cyclone Diverter Gates to Hammermills System Discharge Collection Conveyor Belt	Enclosed	Reduction to 2 mph mean wind speed	83.68	640,291	3.0E-03	1.2E-02	1.4E-03	5.4E-03	2.2E-04	8.2E-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	98.45	753,283	3.5E-03	1.4E-02	1.7E-03	6.4E-03	2.5E-04	9.7E-04
DP5	ES-DWH	Drop Point for Dry Line Transfer from Dry Line Hopper to Dry Line Conveyor	Enclosed	Reduction to 2 mph mean wind speed	12.05	105,542	4.3E-04	1.9E-03	2.0E-04	9.0E-04	3.1E-05	1.4E-04
DP6	ES-PP	Drop Emissions from Pellet Presses to Pellet Press Collection Conveyors	Enclosed	Reduction to 2 mph mean wind speed	87.86	672,285	1.1E-02	4.2E-02	5.2E-03	2.0E-02	7.8E-04	3.0E-03
DP7	ES-DWH	Drop Emissions from Bagging System Conveyors to Bagging System Bins	Enclosed	Reduction to 2 mph mean wind speed	64.52	625,225	8.0E-03	3.9E-02	3.8E-03	1.8E-02	5.8E-04	2.8E-03
						TOTAL	**3.0E-02**	**1.2E-01**	**1.4E-02**	**5.7E-02**	**2.1E-03**	**8.7E-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	
	Dryer Exit	Pellet Press Exit
M = material moisture content (%)	17	7
E for PM (lb/ton) =	3.6E-05	1.2E-04
E for PM_{10} (lb/ton) =	1.7E-05	5.9E-05
E for $PM_{2.5}$ (lb/ton) =	2.6E-06	8.9E-06

TABLE B-15
GREEN WOOD HANDLING DROP POINT EXAMPLE EMISSIONS
ENVIVA PELLETS NORTHAMPTON

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)	PM Emissions (tpy)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)
GDP1	ES-GWH	Purchased Bark Transfer to Outdoor Storage Area	Batch Drop	1	0.74	0.35	0.053	6.3	50%	3.52E-05	1.67E-05	2.52E-06	129,030	5.75E-04	2.73E-04	4.11E-05
GDP1	ES-GWH	Drop Points via Conveying from Bark Pile to Dryer	Batch Drop	4	0.74	0.35	0.053	6.3	50%	3.52E-05	1.67E-05	2.52E-06	258,060	4.60E-03	2.18E-03	3.29E-04
GDP2	ES-GWH	Transfer Purchased Wood Chips (Wet) to Outdoor Storage	Batch Drop	1	0.74	0.35	0.053	6.3	50%	3.52E-05	1.67E-05	2.52E-06	537,625	2.39E-03	1.14E-03	1.71E-04
GDP2	ES-GWH	Drop Points via Conveying from Chip Pile to Dryer	Batch Drop	5	0.74	0.35	0.053	6.0	50%	3.31E-05	1.57E-05	2.37E-06	1,075,250	2.25E-02	1.07E-02	1.61E-03
		Total Emissions												**3.01E-02**	**1.43E-02**	**2.15E-03**

1. Average moisture content for logs, bark, and wood chips (wet) based on material balance provided by design engineering firm (Mid-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-16
TANKS EMISSIONS
ENVIVA PELLETS NORTHAMPTON

Tank ID	Tank Description	Volume[1] (gal)	Tank Dimensions		Orientation	Throughput (gal/yr)	Turnovers[3]	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	8,813	3.53	1.51	7.55E-04
TK02	Fire Water Pump Fuel Oil Tank[2]	500	3	10	Horizontal	7,554	15.11	0.31	1.55E-04
							TOTAL	**1.82**	**9.10E-04**

Note:

[1] Conservative design specifications.

[2] Throughput based on fuel consumption based on engine horsepower (BHP), conversion to fuel usage (gal/hr), and engine operating hours.

[3] Tanks Program Calculations are performed with a minimum 1 turnover per year as a conservative measure.

TABLE B-17
POTENTIAL GHG EMISSIONS FROM COMBUSTION SOURCES
ENVIVA PELLETS NORTHAMPTON

Operating Data:

Dryer Heat Input	1535628.00	MMBtu/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]

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-EG	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

[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.

TABLE B-18
GREEN WOOD STORAGE PILES FUGITIVE EMISSIONS
ENVIVA PELLETS AHOSKIE

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.

APPENDIX C

Enviva Pellets Northampton, LLC

Process Flow Diagram

NORTHAMPTON PROCESS MAP