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ENVIRONMENT
& HEALTH

Received
MAY 14 2018
Air Permits Section

Mr. William Willets, PE
Chief, Permitting Section, Division of Air Quality
NC Department of Environmental Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: Permit Modification for Classification as a PSD Minor Source
Enviva Pellets Hamlet, LLC
Hamlet, North Carolina
Richmond County
Permit No.: 10365R02
Facility ID: 7700096

Dear Mr. Willets:

Date May 9, 2018

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Enclosed please find a North Carolina Department of Environment Quality (NC DEQ) permit application package for a permit modification to classify the Enviva Pellets Hamlet, LLC (Enviva) (NC DEQ Facility ID #7700096) in Richmond County as a Prevention of Significant Determination (PSD) minor source.

Enviva was initially permitted to construct a wood pellets manufacturing plant (referred to herein as "the Hamlet plant" or "the facility") under the authorization of PSD Permit No. 10365R00 issued by the North Carolina Department of Environment and Natural Resources (DENR), now the NC Department of Environmental Quality (NCDEQ), Division of Air Quality (DAQ) on March 29, 2016.[1] The plant is currently permitted to produce up to 537,625 oven-dried tons (ODT) per year of wood pellets utilizing up to 75% softwood on a 12-month rolling basis. Enviva has initiated onsite construction of the Hamlet plant but has not yet completed construction activities.

Enviva is submitting this permit modification application to reflect planned changes for the Hamlet plant since the submittal of the original construction permit application. These changes are being implemented to meet new customer softwood percentage and production rate demands and to incorporate significant emission reduction efforts to minimize emissions impacts associated with the project. Because of these changes, the Hamlet plant's potential emissions for all criteria pollutants will be less

[1] Permit Nos. 10365R01 and 10365R02 were subsequently issued on April 7, 2017 and June 8, 2017, respectively.

than the PSD major source thresholds of 250 tpy and, thus, the facility will be classified as a PSD synthetic minor source. The facility will, however, continue to be classified as a major source under the Title V and hazardous air pollutant (HAP) programs. Therefore, this application is being submitted to modify the existing PSD permit to incorporate the proposed construction changes and to reclassify the permit as a PSD Synthetic Minor facility.

In addition to these physical design changes to the proposed construction, Enviva is proposing several updates to the previous PSD permit as part of this application.

As required, three (3) copies of the complete permit application package and an application processing fees in an amount of $947 are enclosed. In addition, Enviva has submitted the required zoning determination documents to both the City of Hamlet and Richmond County departments.

Thank you for your prompt attention to this matter. If you have any questions regarding this request, please contact me at (225) 408-2691 or Kai Simonsen, Air Permit Engineer at Enviva, at (984) 789-3628.

Yours sincerely,

Michael Carbon
Managing Principal
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Enclosures: Permit Application including Appendices

Prepared for
Enviva Pellets Hamlet, LLC
Richmond County, North Carolina

Prepared By
Ramboll US Corporation
Research Triangle Park, North Carolina

Project Number
1690006061

Date
May 2018

APPLICATION FOR PERMIT MODIFICATION FOR CLASSIFICATION AS A PSD MINOR SOURCE

ENVIVA PELLETS HAMLET, LLC

RAMBOLL

CONTENTS

APPENDIX

ACRONYMS AND ABBREVIATIONS

AAL	Acceptable Ambient Level
AP-42	Compilation of Air Pollutant Emission Factors
bhp	brake horsepower
BMP	Best Management Practice
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CI	Compression Ignition
CO	Carbon Monoxide
DAQ	Division of Air Quality
DENR	Department of Environment and Natural Resources
FSC	Forest Stewardship Council
HAP	Hazardous Air Pollutant
hp	horsepower
ICE	Internal Combustion Engine
lb	Pound
MACT	Maximum Achievable Control Technology
MMBtu	Million British thermal units
NAAQS	National Ambient Air Quality Standards
NCAC	North Carolina Administrative Code
NCASI	National Council for Air and Stream Improvement
NCDEQ	North Carolina Department of Environmental Quality
NESHAP	National Emission Standards for Hazardous Air Pollutants
NNSR	Nonattainment New Source Review
NO_x	Nitrogen Oxides ($NO + NO_2$)
NSPS	New Source Performance Standards
NSR	New Source Review
NWS	National Weather Service
ODT	Oven Dried Tons
PEFC	Programme for the Endorsement of Forest Certifications
PM	Particulate Matter

$PM_{2.5}$	Particulate Matter Less Than 2.5 Micrometers in Aerodynamic Diameter
PM_{10}	Particulate Matter Less Than 10 Micrometers in Aerodynamic Diameter
PSD	Prevention of Significant Deterioration
PSEU	Pollutant Specific Emission Unit
RICE	Reciprocating Internal Combustion Engine
RCO	Regenerative Catalytic Oxidizer
RTO	Regenerative Thermal Oxidizer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SFI	Sustainable Forestry Initiative
TAP	Toxic Air Pollutant
TCO	Thermal Catalytic Oxidizer
tph	tons per hour
tpy	tons per year
EPA	US Environmental Protection Agency
VOC	Volatile Organic Compounds
WESP	Wet Electrostatic Precipitator

1. INTRODUCTION

Enviva Pellets Hamlet, LLC (Enviva) was initially permitted to construct a wood pellets manufacturing plant (referred to herein as "the Hamlet plant" or "the facility") in Richmond County, North Carolina under the authorization of Prevention of Significant Deterioration (PSD) Permit No. 10365R00 issued by the North Carolina Department of Environment and Natural Resources (DENR), now the NC Department of Environmental Quality (NCDEQ), Division of Air Quality (DAQ) on March 29, 2016.[1] The plant is currently permitted to produce up to 537,625 oven-dried tons (ODT) per year of wood pellets utilizing up to 75% softwood on a 12-month rolling basis. The plant will consist of the following processes: Log Chipper, Bark Hog, Green Wood Hammermills, Rotary Dryer, Dry Hammermills, Pellet Presses and Coolers, Product Loadout operations and other ancillary activities. Enviva has initiated onsite construction activities on the Hamlet plant but has not yet completed construction activities.

The Hamlet plant is currently permitted as a major source with respect to the Title V and New Source Review (NSR) permitting programs, because potential facility-wide emissions of one or more criteria pollutants were estimated to exceed the major source thresholds of 100 tons per year (tpy) and 250 tpy, respectively. Additionally, the plant is permitted as a major source of hazardous air pollutants (HAP) due to potential total HAP emissions and maximum individual HAP emissions estimated to exceed the major source threshold of 25 tpy, and 10 tpy, respectively.

Enviva is submitting this permit modification application to reflect planned changes for the Hamlet plant since the submittal of the original construction permit application. These changes are being implemented to meet new customer softwood percentage and production rate demands and to incorporate significant emission reduction efforts to minimize emissions impacts associated with the project. Because of these changes, the Hamlet plant's potential emissions for all criteria pollutants will be less than the PSD major source thresholds of 250 tpy and, thus, the facility will be classified as a PSD synthetic minor source. The facility will, however, continue to be classified as a major source under the Title V and HAP programs. Therefore, this application is being submitted to modify the existing PSD permit to incorporate the proposed changes and to reclassify the permit as a PSD Synthetic Minor facility.

The following summarizes the proposed physical changes and changes in the method of operation associated with the new plant design:

- Increase production rate from 537,625 ODT per year to 625,011 ODT per year by upgrading pellet dies with a new prototype while increasing the amount of softwood processed from a maximum of 75% to a maximum of 85%;
- Incorporate a permit condition that allows Enviva to operate either up to 625,011 ODT/yr at 85% softwood or at a higher production rate if the softwood percentage is lower such that the total facility-wide annual emissions stay below the potential to emit (PTE) emissions set forth in this application;
- Add a regenerative thermal oxidizer (CD-RTO-1) following the currently permitted Dryer wet electrostatic precipitator (CD-WESP) for volatile organic compound (VOC), HAP and particulate matter (PM) emissions control;

[1] Permit Nos. 10365R01 and 10365R02 were subsequently issued on April 7, 2017 and June 8, 2017, respectively.

- Install a third Green Wood Hammermill;
- Remove the Green Wood Hammermill cyclones from the permit and recirculate the exhaust to either the inlet of the Dryer furnace or directly to the WESP/RTO system (CD-WESP/CD-RTO-1) to reduce VOC, HAP and PM emissions;
- Following the six (6) Pellet Cooler product recovery cyclones, install either six (6) baghouses (CD-CLR-BH1 through 6) or one wet scrubber (CD-WSB) to reduce PM emissions;
- Add a regenerative catalytic oxidizer (CD-RCO), which can operate in thermal mode (as an RTO) for backup during catalyst cleaning, to control combined emissions of VOC, HAP and PM from the Pellet Coolers and Pellet Mills;
- Decrease the amount of wood that can bypass the Dry Hammermills from 25% to 15%;
- Incorporate construction of a baghouse (CD-HMC-BH) installed to control fugitive emissions that escape from the Hammermill Collection Conveyor (ES-HMC);
- Add an emission point for the Pellet Cooler Low Pressure (LP) Fines Relay System (ES-PCLP) and add a corresponding baghouse (CD-PCLP-BH);
- Remove the hammermill area (ES-HMA) emission point which will no longer be an emission point;
- Rename the Pellet Fines Bin (ES-PFB) and associated baghouse (CD-PFB-BV) as the Pellet Cooler High Pressure (HP) Fines Relay System (ES-PCHP) and associated baghouse (CD-PCHP-BH), respectively;
- Rename the Pellet Sampling Transfer Bin (ES-PSTB) to the Pellet Dust Collection Transfer Bin (ES-PDCTB);
- Change the number of Pellet Loadout Bins (ES-PB-1 to 8) from eight (8) to (2) bins (ES-PB-1 and 2);
- Remove the truck loadout station (ES-PL-1 to 3) emissions point because pellets will be loaded into closed top hopper rail cars that are entirely enclosed; and
- Add Additive Handling and Storage (ES-ADD) and associated baghouse (CD-ADD-BH) to for storage of a powder additive to be added during pelletizing.

In addition to these physical design changes, Enviva is proposing the following reconciliations to the previous PSD permit as part of this application:

- Update site emissions to reflect planned insignificant activities including:
    - Adding two storage piles for a total of four Green Wood Storage Piles (IES-GWSP-1 through 4);
    - Adding Bark Fuel Storage Piles (IES-BFSP-1 and 2);
    - Reclassifying the Chipper (IES-CHIP-1) and Bark Hog (IES-BARKHOG) as insignificant activities instead of as permitted equipment (previously, ES-CHIP-1 and ES-BARKHOG, respectively); and
    - Adding Dry Shavings Handling (IES-DRYSHAVE) and storage silo to allow the facility to process dry shavings which will not require drying.

- Update HAP emission factors to reflect new testing data from other similar facilities.
- Bin vent filter (CD-BV) and bagfilter (CD-BF) descriptions have been changed to baghouse (CD-BH) to more accurately reflect planned control equipment to be utilized at the Hamlet plant. In addition, some control device nomenclature was updated to reference the equipment it controls to be consistent with nomenclature used for the other units in Enviva's permit (e.g. CD-DC-BF-3 is relabeled as CD-PDCTB-BH, and CD-DC-BV1 and CD-DC-BV2 are relabeled CD-DWH-BH1 and CD-DWH-BH2).
- Update the emergency generator rating to a proposed rating of 671 brake horsepower (bhp) instead of the proposed 536 bhp unit referenced in the initial PSD application.
- Update the Fire Pump Engine rating from 250 bhp to 131 bhp.
- Cyclones on the Dry Hammermills (ES-HM-1 to 8) and Dryer (ES-DRYER) will not be used as air pollution control devices but rather are used for product recovery. Therefore, CD-HM-CYC-1 through 8 and CD-DC1 through 4 for the ES-HM-1 through 8 and ES-DRYER, respectively, should be removed from the control device description in Section 1 of the Hamlet plant's permit.

A description of the process is provided in Section 2 and methodologies used to quantify potential emissions are summarized in Section 3. Section 4 describes the applicability of federal and state permitting programs. Section 5 includes a detailed applicability analysis of both federal and state regulations. Finally, the completed air permit application forms are included in Appendix D.

2. PROCESS DESCRIPTION

Enviva manufactures wood pellets for use as a renewable fuel for energy generation and industrial customers. Enviva's customers use wood pellets in place of coal, significantly reducing emissions of pollutants such as lifecycle CO_2/greenhouse gases, mercury, arsenic and lead. The company is dedicated to improving the environmental profile of energy generation while promoting sustainable forestry in the southeastern United States. Enviva holds certifications from the Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), Programme for the Endorsement of Forest Certification (PEFC), and Sustainable Biomass Program (SBP). Enviva requires that all suppliers adhere to state-developed "Best Management Practices" (BMPs) in their activities to protect water quality and sensitive ecosystems. In addition, Enviva is implementing an industry leading "track and trace" system to further ensure that all fiber resources come from responsible harvests. Enviva pays particular attention to: land use change, use and effectiveness of BMPs, wetlands, biodiversity, and certification status. All of this combined ensures that Enviva's forestry activities contribute to healthy forests both today and in the future. A detailed description of Enviva's Responsible Wood Supply Program can be found at: http://www.envivabiomass.com/sustainability/wood-sourcing/responsible-wood-supply-program/

The following sections provide a process description of proposed operations at the Hamlet plant. An area map and process flow diagram are provided in Appendices A and B, respectively.

2.1 Green Wood Handling and Storage

"Green" (i.e., wet) wood will be delivered to the plant via trucks as either pre-chipped wood or unchipped logs from commercial harvesting for on-site chipping. Purchased chips and bark will be unloaded from trucks into hoppers that feed conveyors (IES-GWH) that transfer the material to Green Wood Storage Piles (IES-GWSP-1 through 4) or to Bark Fuel Storage Piles (IES-BFSP-1 and 2). Conveyors transferring green wood chips will be enclosed.

Purchased chips will be screened prior to transfer to the Green Wood Storage Piles.

2.2 Debarking, Chipping, Bark Hog, and Bark Fuel Storage Piles and Bin

Logs will be debarked by the electric-powered rotary drum Debarker (IES-DEBARK-1) and then sent to the Chipper (IES-CHIP-1) to chip the wood to specification for drying. Bark from the Debarker and purchased bark/chips will be transferred to the Bark Hog (IES-BARKHOG) via conveyor for further processing.

Material processed by the Bark Hog will be transferred to the Bark Fuel Storage Piles (IES-BFSP-1 and 2) via conveyor. The primary Bark Fuel Storage Pile (IES-BFSP-1) will be located under a covered structure. The secondary Bark Fuel Storage Pile (IES-BFSP-2) will serve as overflow storage as needed. Following storage in the Bark Fuel Storage Piles (IES-BFSP-1 and 2), the bark will be transferred via a walking floor to a covered conveyor to a fully enclosed Bark Fuel Bin (IES-BFB) where the material will be pushed into the furnace.

2.3 Green Wood Hammermills

Chipped wood used in pellet production will be further processed in the Green Wood Hammermills (ES-GHM-1, 2, and 3) to reduce material to the proper size. The facility is currently permitted to install two Green Wood Hammermills (ES-GHM-1 and 2) each with its

own cyclone control device (CD-GHM-CYC1 and CD-GHM-CYC2). Enviva is now proposing to install three Green Wood Hammermills total, to remove the cyclones from the design, and to directly route the vent streams to either the inlet of the Dryer furnace (which is ultimately routed to WESP/RTO control system) or directly into the WESP/RTO control system (CD-WESP/CD-RTO-1) to control PM, VOC, and HAP emissions.

2.4 Dryer

Green wood will be conveyed to a single pass rotary Dryer system (ES-DRYER). Direct contact heat will be provided to the system via a 250.4 million British thermal unit per hour (MMBtu/hr) total heat input furnace that uses bark and wood chips as fuel. Green wood will be fed into the Dryer where the moisture content will be reduced to the desired level and routed to four (4) identical product recovery cyclones operating in parallel, which will capture dried wood for further processing. Emissions from the Dryer cyclones will be combined into a common duct which will include the proposed vent from the Green Hammermills (ES-GHM-1 through 3) and routed to a WESP (CD-WESP) for additional particulate, metallic HAP, and hydrogen chloride removal. As part of this application, Enviva is proposing to install a natural gas-fired RTO (CD-RTO-1) following the WESP to provide further PM, VOC, and HAP emissions control.

2.5 Dried Wood Handling

Dried materials from the Dryer product recovery cyclones will be conveyed to screening operations that remove smaller wood particles. Oversized wood will be diverted to the Dry Hammermills (ES-HM-1 through 8) for further size reduction prior to pelletization, each of which will be followed by a product recovery cyclone that is controlled by a baghouse. Smaller particles passing through the screens will bypass these hammermills and be pneumatically conveyed directly to the product recovery cyclones for the Dry Hammermills. Enviva estimates that approximately 15% of the total material leaving the Dryer will bypass the Dry Hammermills and be sent directly to the pelletizing operations. It should be noted that the current permit basis assumes 25% will bypass the Dry Hammermills.

There will be several other conveyor transfer points located between the Dryer and Dry Hammermills comprising the Dried Wood Handling (ES-DWH) emission source. These transfer points will be completely enclosed with only two (2) emission points that will be controlled by individual baghouses (CD-DWH-BH1 and 2).

As part of this application, Enviva is proposing to use purchased dry shavings to produce wood pellets in addition to green chips or logs, forgoing the drying process and thus lowering VOC and HAP emissions. The purchased dry shavings will be unloaded from trucks into a hopper that feeds material via enclosed conveyors to a bucket elevator that ultimately fills a silo. Each of these material transfer points will be entirely enclosed except for truck unloading (IES-DRYSHAVE). From the silo, the dry shavings will then be transferred via an enclosed screw conveyor to the Dry Hammermills for additional processing.

2.6 Dry Hammermills

Prior to pelletization, dried wood is reduced to the appropriate size using eight (8) Dry Hammermills operating in parallel (ES-HM-1 through ES-HM-8). Each Dry Hammermill will include a product recovery cyclone for capturing additional dried wood for further processing. Particulate emissions from each of the Dry Hammermills will be controlled using individual baghouses (CD-HM-BH1 through 8).

2.7 Hammermill Conveyors

The Hammermill Conveyors (ES-HMC) will transport material from the product recovery cyclones associated with the Dry Hammermills (ES-HM-1 through 8) to the pelletizing process. Emissions from the Hammermill Conveyors will be captured and controlled by the Hammermill Conveyor baghouse (CD-HMC-BH).

2.8 Pellet Mill Feed Silo

Sized wood from the Dry Hammermill product recovery cyclones will be transported by a set of conveyors to the Pellet Mill Feed Silo (ES-PMFS) prior to pelletization. Particulate emissions from the Pellet Mill Feed Silo will be controlled by a baghouse (CD-PMFS-BH).

2.9 Additive Handling and Storage

Additive will be used in the pellet production process to increase the durability of the final product. The additive will be added to sized wood from the Pellet Mill Feed Silo discharge screw conveyor prior to transfer to the Pellet Presses. The additive contains no hazardous chemicals or VOCs.

Bulk additive material will be delivered by truck and pneumatically unloaded into a storage silo (ES-ADD) equipped with a baghouse (CD-ADD-BH) to control emissions from air displaced during the loading of additive material to the silo. The additive will then be conveyed via screw conveyor from the storage silo to the milled fiber conveyor which transfers milled wood to the Pellet Presses.

2.10 Pellet Press System and Pellet Coolers

Dried processed wood will be mechanically compacted through pellet press dies. Exhaust from the Pellet Press System and Pellet Press conveyors will be vented through the Pellet Cooler aspiration material recovery cyclones and pollutant controls as described below, and then to the atmosphere. No resin or other chemical binding agents are needed for pelletization. As discussed in Section 1, Enviva is proposing to increase the permitted production rate from 537,625 ODT per year to 625,011 ODT per year by upgrading the design of the pellet dies to use a new prototype.

Formed pellets will be discharged into one of six (6) Pellet Coolers (ES-PCLR-1 through ES-PCLR-6) where cooling air will be passed through the pellets. At this point, the pellets will contain a small amount of wood fines which will be swept out with the cooling air and controlled utilizing either six (6) baghouses (CD-CLR-BH1 through 6), one on each cooler, or a single wet scrubber (CD-WSB). The exhaust from the baghouses or scrubber will then be sent to a natural gas-fired RCO (CD-RCO) for control of VOC, HAP, and PM. The RCO will also be able to operate in thermal mode during catalyst cleaning.

An aspiration system will be used to recirculate air for the pellet coolers. Emissions from the Pellet Cooler LP Fines Relay System (ES-PCLP) will be controlled by a baghouse (CD-PCLP-BH). A second aspiration system, referred to as the Pellet Cooler HP Fines Relay System (ES-PCHP), will pull collected fines from the Pellet Cooler screens and from the Pellet Cooler LP Fines Relay System baghouse to the associated baghouse (CD-PCHP-BH). From the collection system, the fines will be reintroduced to the Pellet Presses for re-use in the process.

The final product, wood pellets, will be transferred from the Pellet Coolers to the rail loadout operation via a conveyor that will be controlled by the Pellet Dust Collection Transfer Bin (ES-PDCTB) baghouse (CD-PDCTB-BH).

2.11 Finished Product Handling and Loadout

Final product will be conveyed to two storage bins (ES-PB-1 and ES-PB-2) that will feed a rail loadout station. At the rail loadout station, pellets will be gravity fed into closed top rail cars. Atmospheric emissions from pellet loadout will be minimal because dried wood fines will have been removed in the pellet screener, and a slight negative pressure will be maintained in the loadout building as a fire prevention measure to prevent any buildup of dust on surfaces within the building. This slight negative pressure will be produced via an induced draft fan that will exhaust to the Finished Product Handling baghouse (CD-FPH-BH). This baghouse will control emissions from Finished Product Handling (ES-FPH) and the two (2) Pellet Loadout Bins (ES-PB-1 to ES-PB-2). Rail car loading will be entirely enclosed because material will be loaded into closed top hopper cars.

2.12 Emergency Generator, Fire Water Pump Engine, and Diesel Storage Tanks

The plant will have a 671 brake horsepower (bhp) diesel-fired Emergency Generator (IES-GN) for emergency operations and a 131 bhp diesel-fired Fire Water Pump Engine (IES-FWP). Aside from maintenance and readiness testing, the generator and fire water pump engines will only be utilized for emergency operations.

Diesel for the emergency generator will be stored in a tank of up to 1,000 gallons capacity (IES-TK-1) and diesel for the fire water pump engine will be stored in a storage tank of up to 185 gallons capacity (IES-TK-2). The plant will also have a third diesel storage tank with a capacity of up to 5,000 gallons (IES-TK-3) for distributing diesel fuel to mobile equipment.

3. POTENTIAL EMISSIONS QUANTIFICATION

The following summarizes the data sources and calculation methodologies used in quantifying potential emissions from the Hamlet plant. Detailed potential emissions calculations are provided in Appendix C.

3.1 Green Wood Handling (IES-GWH)

Fugitive PM emissions will result from unloading purchased chips and bark from trucks into hoppers and transfer of these materials to storage piles via conveyors. Fugitive PM emissions from chip and bark transfer operations were calculated based on AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles*.[2] Chip conveyors are completely enclosed; therefore, emissions were only quantified for the final drop points (i.e., from conveyor to pile). Bark conveyors will not be enclosed; however, due to the large size of this material any fugitive PM emissions occurring along the conveyor itself will be negligible. As such, emissions were only quantified for the final drop points (i.e., from conveyor to pile). Detailed potential emission calculations are included in Appendix C, Table 13.

Green wood and bark contain a high moisture content approaching 50 percent water by weight. Therefore, Green Wood Handling will have insignificant PM emissions. Per 15A NCAC 02Q .0503, Green Wood Handling (IES-GWH) is an insignificant activity, because potential uncontrolled PM emissions are less than 5 tpy.

3.2 Green Wood Storage Piles (IES-GWSP-1 through 4) and Bark Fuel Storage Piles (IES-BFSP-1 and 2)

Particulate emission factors used to quantify emissions from storage pile wind erosion for the four (4) Green Wood Storage Piles and two (2) Bark Fuel Storage Piles were calculated based on USEPA's *Control of Open Fugitive Dust Sources*.[3] The number of days with rainfall greater than 0.01 inch was obtained from AP-42 Section 13.2.2, *Unpaved Roads*[4], and the percentage of time that wind speed exceeds 12 miles per hour (mph) was determined based on the AERMOD-ready meteorological dataset for the Maxton National Weather Service (NWS) Station provided by DAQ[5]. The mean silt content of 8.4% for unpaved roads at lumber mills from AP-42 Section 13.2.2 was conservatively applied in the absence of site-specific data. The exposed surface area of the pile was calculated based on worst-case pile dimensions.

VOC emissions from storage piles were quantified based on the exposed surface area of the pile and emission factors from the National Council for Air and Stream Improvement (NCASI). NCASI emission factors range from 1.6 to 3.6 pounds (lb) VOC as carbon/acre-day; however, emissions were conservatively based on the maximum emission factor. Detailed potential emission calculations are included in Appendix C, Table 14.

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[2] USEPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (11/06).

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

[4] USEPA AP-42 Section 13.2.2, *Unpaved Roads* (11/06).

[5] Data provided via email to Aubrey Jones (Ramboll) by Matthew Porter (NC DAQ) on July 27, 2017.

Per 15A NCAC 02Q .0503, the Green Wood Storage Piles (IES-GWSP-1 through 4) and the Bark Fuel Storage Piles (IES-BFSP-1 and 2) are insignificant activities based on potential uncontrolled PM and VOC emissions each less than 5 tpy.

3.3 Debarker (IES-DEBARK-1)

PM emissions will occur as a result of log debarking. Potential PM emissions from debarking were quantified based on emission factors from EPA's *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants* for Source Classification Code (SCC) 3-07-008-01 (Log Debarking).[6] All PM was assumed to be larger than 2.5 microns in diameter. PM emissions from debarking will be minimal due to the high moisture content of green wood (~50%) and the fact that the debarking drum will be enclosed, except for the two ends where logs enter and material exits after debarking. A 90% control efficiency was applied for partial enclosure. Detailed potential emission calculations are included in Appendix C, Table 18.

The Debarker is considered an insignificant activity per 15A NCAC 02Q .0503 due to potential uncontrolled PM emissions less than 5 tpy.

3.4 Bark Hog (IES-BARKHOG)

Processing of bark by the Bark Hog will result in emissions of PM, VOC, and methanol. Particulate emission factors were not available in for this specific operation; therefore, potential PM emissions were quantified based on emission factors from EPA's *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants* for log debarking (SCC 3-07-008-01).[7] The Bark Hog is primarily enclosed and thus has minimal PM emissions. A 90% control efficiency was applied for partial enclosure. VOC and methanol emissions were quantified based on emission factors for log chipping from AP-42 Section 10.6.3, *Medium Density Fiberboard*.[8] Detailed potential emission calculations are included in Appendix C, Table 12.

The Bark Hog is considered an insignificant activity per 15A NCAC 02Q .0503 due to potential uncontrolled emissions less than 5 tpy.

3.5 Chipper (IES-CHIP-1)

The Chipper will be located inside of a building; therefore, PM emissions will be negligible and were not quantified. The chipping process will also result in emissions of VOC and methanol. VOC and methanol emissions were quantified based on emission factors for log chipping from AP-42 Section 10.6.3, *Medium Density Fiberboard*.[9] Detailed emission calculations are included in Appendix C, Table 11.

The Chipper is considered an insignificant activity per 15A NCAC 02Q .0503 due to potential uncontrolled emissions less than 5 tpy.

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[6] USEPA. Office of Air Quality Planning and Standards. *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants.* EPA 450/4-90-003. March 1990.

[7] Ibid.

[8] USEPA AP-42 Section 10.6.3, *Medium Density Fiberboard Manufacturing* (08/02).

[9] Ibid.

3.6 Bark Fuel Bin (IES-BFB)

Bark will be transferred from the Bark Fuel Storage Piles via a walking floor to a covered conveyor and then to the fully enclosed Bark Fuel Bin (IES-BFB). Due to complete enclosure of the Bark Fuel Bin, emissions from transfer of material into the bin were not explicitly quantified. Per 15A NCAC 02Q .0503, the Bark Fuel Bin is an insignificant activity due to potential uncontrolled PM emissions less than 5 tpy.[10]

3.7 Dryer (ES-DRYER) and Green Wood Hammermills (ES-GHM-1 through 3)

Exhaust from the Dryer and Green Wood Hammermills will be routed to a WESP/RTO control system for control of PM, VOC, and HAP. As shown in Appendix C, Table 4, potential emissions of PM, PM less than 10 microns in diameter (PM_{10}), PM less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide (CO) and oxides of nitrogen (NO_x), including NO_x and CO emissions generated during thermal oxidation, are based on guaranteed pound per hour (lb/hr) emission rates provided by the RTO vendor. Potential emissions of sulfur dioxide (SO_2) were calculated based on an emission factor from AP-42 Section 10.6.2, *Particle Board Manufacturing*.[11] VOC emissions were calculated using an emission factor derived from stack testing conducted at Enviva and other similar wood pellet manufacturing facilities.

HAP and toxics air pollutant (TAP) emissions were calculated based on emission factors from several data sources including stack testing data from other similar facilities, emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*[12], and NC DAQ's Wood Waste Combustion Spreadsheet[13]. HAP emissions from natural gas combustion by the RTO burners were calculated based on AP-42 Section 1.4, *Natural Gas Combustion*.[14]

Combustion of wood by the Dryer furnace and natural gas by the RTO burners will also result in emissions of GHG. The emissions were quantified based on emission factors from AP-42, Section 10.6.1 for a rotary dryer with an RTO control device. Enviva has conservatively calculated the CO_2 emissions using the higher hardwood emission factor because the dryer at the Hamlet facility will use a combination of hardwood and softwood.

3.8 Dried Wood Handling (ES-DWH)

As previously described in Section 2, ES-DWH will include conveyor transfer points located between the Dryer and Dry Hammermills with emissions controlled by two (2) baghouses (CD-DWH-BH-1 and 2). PM emissions from these baghouses were calculated based on manufacturer guaranteed exit grain loading rates and the maximum nominal exhaust flow rate of the baghouses. Detailed potential emissions calculations are provided in Appendix C, Table 5.

Additionally, the dried material may continue to emit VOC and HAP as it is transferred between the Dryer and Dry Hammermills due to the elevated temperature of the material.

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[10] Due to complete enclosure of the Bark Fuel Bin, emissions were not quantified.

[11] USEPA AP-42 Section 10.6.2, *Particle Board Manufacturing* (6/02).

[12] USEPA AP-42 Section 1.6, *Wood Residue Combustion in Boilers* (09/03).

[13] NCDAQ Wood Waste Combustion Spreadsheet for a wood stoker boiler. Available online at: https://files.nc.gov/ncdeq/Air%20Quality/permits/files/WWC_rev_K_20170308.xlsx.

[14] USEPA AP-42 Section 1.4, *Natural Gas Combustion* (07/98).

Potential VOC and HAP emissions were calculated based on NCASI dry wood handling emission factors.[15] Potential emissions calculations are provided in Appendix C, Table 8.

3.9 Dry Shavings Handling (IES-DRYSHAVE)

Particulate emissions will occur during unloading of dry shavings from trucks and may also occur because of air displaced during silo loading. Potential emissions were calculated based on AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles*.[16] Dry shavings will be transferred into the new dry shavings silo via an enclosed bucket elevator. Because the actual transfer will be enclosed within the silo, a 90% control efficiency was applied for this material transfer point. Detailed potential emission calculations are provided in Appendix C, Table 17.

Per 15A NCAC 02Q .0503, Dry Shavings Handling (IES-DRYSHAVE) is considered an insignificant activity because potential uncontrolled PM emissions are less than 5 tpy.

3.10 Dry Hammermills (ES-HM-1 through 8)

The Dry Hammermills will generate PM, VOC, and HAP emissions during the process of reducing wood chips to the required size. PM emissions from the Dry Hammermills will be controlled using individual baghouses (CD-HM-BH-1 through 8). Particulate emissions from each baghouse were calculated using a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Appendix C, Table 5 summarizes the potential PM emissions from each Dry Hammermill baghouse.

VOC and HAP emissions were calculated based on stack testing data from comparable Enviva facilities as shown in Appendix C, Table 6.

3.11 Pellet Cooler HP Fines Relay System (ES-PCHP) and Pellet Cooler LP Fines Relay System (ES-PCLP)

As previously described in Section 2, an induced draft fan will be used to transfer dust generated from a number of enclosed transfer/handling sources around the Dry Hammermill Area to the Pellet Cooler HP Fines Relay System, controlled by a baghouse (CD-PCHP-BH). PM emissions from this baghouse, which will control emissions from ES-PCHP, were calculated based on a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Potential emission calculations are provided in Appendix C, Table 5. A second baghouse (CD-PCLP-BH) will control emissions from Pellet Cooler LP Fines Relay System (ES-PCLP) and PM emissions were calculated based on a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse.

3.12 Dry Hammermill Conveying System (ES-HMC)

Fugitive PM emissions that escape the Hammermill Collection Conveyor will be controlled by a baghouse (CD-HMC-BH). PM emissions from this baghouse were calculated based on a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Potential emission calculations are provided in Appendix C, Table 5.

3.13 Pellet Mill Feed Silo (ES-PMFS)

The Pellet Mill Feed Silo will be equipped with a baghouse (CD-PMFS-BH) to control PM emissions associated with silo loading and unloading operations. PM emissions are calculated

[15] NCASI VOC Dry Wood handling factor based oriented-strand board operations.

[16] USEPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (11/06).

based on a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Potential emission calculations are provided in Appendix C, Table 5.

3.14 Additive Handling and Storage (ES-ADD)

An additive will be used in the pellet production process to increase the durability of the final product. Material will be pneumatically conveyed from the delivery trucks to the storage silo equipped with a baghouse (CD-ADD-BH). PM emissions from the baghouse were calculated based on an assumed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Detailed potential emissions calculations are provided in Appendix C, Table 5.

3.15 Pellet Press System and Pellet Coolers (ES-CLR-1 through 6)

Pellet Press and Pellet Cooler operations will generate PM, HAP, and VOC emissions during the forming and cooling of wood pellets. The Pellet Mill and Coolers will be equipped with either six (6) baghouses (CD-CLR-BH1 through 6) or a single wet scrubber (CD-WSB) for PM control, followed by an RCO (CD-RCO) for VOC and HAP control from the exhaust of the scrubber. The oxidizer will operate in thermal mode as an RTO during catalyst cleaning. PM emissions from the Pellet Press System (Pellet Mills) and Pellet Coolers were calculated based on a maximum exit grain loading rate and the maximum nominal exhaust flow rate for the proposed baghouses. If Enviva installs a wet scrubber in place of the six baghouses, the PM emissions are expected to be less than or equal to those estimated assuming the baghouses. Thus, PM emissions represented in this application are assumed to be the maximum PTE for the Pellet Mill and Coolers. Refer to Appendix C, Table 5 for detailed potential PM emissions calculations.

Uncontrolled VOC and HAP emissions at the outlet of the Pellet Cooler baghouses (CD-CLR-BH1 through 6) or wet scrubber (CD-WSB) were quantified based on stack testing data from comparable Enviva plants. This includes emissions from both the Pellet Mills and the Pellet Coolers. Controlled emissions were estimated based on a 95% control efficiency for the RCO. Operation in thermal mode will achieve the same control efficiency and will have no impact on the calculated emissions. NO_x and CO emissions resulting from thermal oxidation were calculated using AP-42 Section 1.4, *Natural Gas Combustion*[17], and the maximum high heating value of the anticipated VOC constituents. Detailed calculations are provided in Appendix C, Table 7.

Emissions of criteria pollutants, HAP, and TAP from natural gas combustion by the RCO burners were estimated using emission factors from AP-42 Section 1.4. Potential GHG emissions from natural gas combustion were quantified based on emission factors from Subpart C of 40 CFR Part 98. Emissions were converted to carbon dioxide equivalent (CO_2e) based on Global Warming Potentials from Subpart A of 40 CFR 98.

3.16 Pellet Dust Collection Transfer Bin (ES-PDCTB)

PM emissions will occur during transfer of wood pellets into the Pellet Dust Collection Transfer Bin. Particulate emissions from the baghouse that controls the Pellet Dust Collection Transfer Bin (CD-PDCTB-BH) were calculated assuming a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Refer to Appendix C, Table 5 for detailed potential emission calculations.

[17] uSEPA AP-42 Section 1.4, *Natural Gas Combustion* (07/98).

3.17 Pellet Loadout Bins (ES-PB-1 through 2) and Finished Product Handling (ES-FPH)

PM emissions result from the transfer of finished product to the Pellet Loadout Bins. No emissions are anticipated for the transfer of pellets from the bins to rail cars because wood pellets will be loaded into closed top rail cars that are entirely enclosed. PM emissions from Finished Product Handling and the two (2) Pellet Loadout Bins will be controlled by a baghouse (CD-FPH-BH). Potential PM emissions from the baghouse were calculated based on a maximum exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Detailed potential emissions calculations are provided in Appendix C, Table 5.

3.18 Emergency Generator (IES-GN) and Fire Water Pump Engine (IES-FWP)

Operation of the Emergency Generator and Fire Water Pump will generate emissions of criteria pollutants, HAP, and GHG. Potential PM, NO_X, VOC, and CO emissions from operation of the Emergency Generator and Fire Water Pump Engine were calculated based on emission factors from their respective manufacturer specification sheets and the maximum horsepower rating of the engines. VOC emissions were calculated based on the manufacturer's emission factor for hydrocarbons. Potential SO_2 emissions were calculated based on the fuel sulfur restriction in NSPS Subpart IIII, and by assuming that all the sulfur present in the diesel fuel becomes SO_2 air emissions.[18] Potential HAP emissions were quantified based on emission factors from AP-42 Section 3.3, *Stationary Internal Combustion Engines*.[19] Annual potential emissions were conservatively calculated based on 500 hours per year.

Combustion of diesel fuel by the engines will also result in emissions of GHG. Potential GHG emissions from each engine were quantified based on emission factors from Subpart C of 40 CFR Part 98. Emissions were converted to CO_2e based on Global Warming Potentials from Subpart A of 40 CFR 98.

The Emergency Generator and Fire Water Pump Engine are considered insignificant activities pursuant to 15A NCAC 02Q .0503. Refer to Appendix C, Tables 9 and 10 for detailed potential emission calculations.

3.19 Diesel Storage Tanks (IES-TK-1 through 3)

The storage of diesel in on-site storage tanks will generate emissions of VOC. VOC emissions from the three (3) Diesel Storage Tanks were calculated using EPA's TANKS 4.0 software based on actual tank characteristics (e.g., orientation, dimensions, etc.) and potential annual throughput. VOC emissions from the storage tanks are below 5 tpy and thus, per 15A NCAC 02Q .0503 they are listed as insignificant sources in the permit. Refer to Appendix C, Table 16 for detailed potential emission calculations.

3.20 Paved Roads

Fugitive PM emissions will occur as a result of trucks and employee vehicles traveling on paved roads on the Hamlet plant property. Emission factors were calculated based on Equation 2 from AP-42 Section 13.2.1, *Paved Roads*[20] using the mean silt loading for quarries (8.2 g/m^2) and 110 days with rainfall greater than 0.01 inch based on Figure 13.2.1-2. A 90% control efficiency was applied for water/dust suppression activities followed

[18] Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(b) as required by NSPS Subpart IIII.

[19] USEPA AP-42 Section 3.3, *Stationary Internal Combustion Engines* (10/96).

[20] USEPA AP-42 Section 13.2.1, *Paved Roads* (01/11).

by sweeping. This control efficiency is based on data from the *Air Pollution Engineering Manual* of the Air and Waste Management Association. Refer to Appendix C, Table 15 for detailed potential emissions calculations.

4. STATE AND FEDERAL PERMITTING APPLICABILITY

The Enviva Hamlet plant is potentially subject to numerous federal and state air quality permitting requirements. The following sections summarize the applicability of these requirements.

4.1 Federal Permitting Programs

The federal NSR permitting program includes requirements for construction of new sources, and modifications to existing sources, while the Title V Operating Permit Program includes requirements for operation of Title V major sources. The following sections discuss the applicability of these requirements to the Hamlet plant.

4.1.1 New Source Review

NSR is a federal pre-construction permitting program that applies to certain major stationary sources. The federal NSR permitting program is implemented in North Carolina pursuant to 15A NCAC 2D .0530 and 15A NCAC 2D .0531. The primary purpose of NSR is to support the attainment and maintenance of ambient air quality standards across the country. There are two distinct permitting programs under NSR. The particular program that applies depends on the ambient air quality in the geographic area in which the source is located. The two programs are nonattainment NSR (NNSR) (15A NCAC 2D .0531) and PSD (15A NCAC 2D .0530). Because NNSR and PSD requirements are pollutant-specific, a stationary source can be subject to NNSR requirements for one or more regulated NSR pollutants and to PSD requirements for the remaining regulated NSR pollutants.

NNSR permitting requirements apply to an existing stationary source located in an area where concentrations of a "criteria pollutant"[21] exceed the National Ambient Air Quality Standard (NAAQS) for that pollutant. PSD permitting requirements apply to stationary sources located in an area where concentrations of criteria pollutants do not exceed a NAAQS.

The Hamlet plant is located in Richmond County which is classified as attainment or unclassifiable for all criteria pollutants.[22] The Hamlet plant is currently permitted as a PSD major source because facility-wide potential emissions of one or more criteria pollutants have previously been estimated to exceed the major source threshold of 250 tpy. However, Enviva is submitting this application to incorporate recent design changes to the facility that will limit the Hamlet plant's potential emissions to less than the major source threshold of 250 tpy for all PSD-regulated pollutants (see Appendix C, Table 2). As a result, the facility will be classified as a synthetic minor source for PSD. A comparison of the current permitted PTE to the proposed PTE incorporating the changes proposed in this application is provided in Table 4.1.

[21] The following are "criteria pollutants" under current NSR regulations: CO, nitrogen dioxide, SO_2, PM_{10}, $PM_{2.5}$, ozone (VOCs and NO_X), and lead.

[22] 40 CFR 81.334

Table 4.1. Change In Potential to Emit

Emissions Scenario	CO (tpy)	NO_x (tpy)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	VOC (tpy)	CO_2e (tpy)	Total HAPs (tpy)
Proposed PTE[1]	231	236	71	60	37	28	241	264,666	34
Previous PTE[2]	231	220	178	101	58	27	606	229,961	83
Change in PTE	**0.3**	**16**	**-107**	**-41**	**-21**	**0.1**	**-365**	**34,705**	**-49**

[1.] Proposed PTE (excluding fugitive emission sources) from Appendix C, Tables 2 and 3.

[2.] Previous PTE from the January 20, 2015 PSD modification application for the facility.

In order to provide the plant with operational flexibility while still achieving this reduction in emissions, Enviva requests that a permit condition be added to the permit that allows Enviva to process either up to 625,011 ODT/yr at 85% softwood or to process a higher annual throughput with a lower softwood percentage such that the total facility-wide annual emissions stay below the proposed VOC PTE of 246 tpy listed in Table 4.1.

The CO and NO_x emissions at the facility are predominately from the Dryer, and the proposed RTO and RCO, and are independent of softwood percentage. As discussed in Section 3 and the associated Appendix C emission tables, these potential emissions are based on a maximum emission rate over 8,760 hrs/yr and thus, the CO and NO_x emissions would not exceed the PTE listed in Table 4.1 with an increase in throughput at a lower softwood content.

4.1.2 Title V Operating Permit Program

The federal Title V Operating Permit program is promulgated in 40 CFR 70 and is implemented in North Carolina via 15A NCAC 2Q .0500. The Hamlet plant is a major source with respect to the Title V Operating Permit Program, because facility-wide emissions of one or more criteria pollutants exceed the major source threshold of 100 tpy. Additionally, the plant is considered a major source of HAP due to total HAP emissions and maximum individual HAP emissions exceeding the major source thresholds of 25 tpy and 10 tpy, respectively. The proposed permit modifications will not change this status. Enviva will submit an application for an initial Title V operating permit within one year of commencing source operations pursuant to 15A NCAC 02Q .0507(a).

4.2 North Carolina Permitting Program

In addition to the Title V permitting requirements in 15 NCAC 02Q .0500, specific requirements for permitting of construction and operation of new and modified sources are included in 15A NCAC 02Q .0300, in accordance with North Carolina's State Implementation Plan (SIP). The proposed changes are subject to the permitting procedures under 15A NCAC 02Q .0300, and the required application forms are included as Appendix D.

5. REGULATORY APPLICABILITY

The Hamlet plant will be subject to federal and state air quality regulations. The following addresses all potentially applicable regulations.

5.1 New Source Performance Standards

New Source Performance Standards (NSPS) apply to new and modified sources and require sources to control emissions in accordance with standards set forth at 40 CFR Part 60. NSPS standards in 40 CFR Part 60 have been incorporated by reference in 15A NCAC 02D .0524.

5.1.1 40 CFR 60 Subpart A – General Provisions

All sources subject to a NSPS are subject to the general requirements under Subpart A unless excluded by the source-specific subpart. Subpart A includes requirements for initial notification, performance testing, recordkeeping, monitoring, and reporting. Subpart A is applicable because the Emergency Generator and Fire Water Pump Engine are subject to NSPS Subpart IIII.

5.1.2 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII applies to owners or operators of compression ignition (CI) internal combustion engines (ICE) manufactured after April 1, 2006 that are not fire pump engines, and fire pump engines manufactured after July 1, 2006. The 671 bhp Emergency Generator and 131 bhp Fire Water Pump Engine at the Hamlet plant will be subject to NSPS Subpart IIII. The Subpart IIII requirements were previously incorporated into the facility's permit. Under this application, the maximum rating of the Emergency Generator and Fire Pump Engine have been updated to reflect planned construction. Thus, the applicable requirements under Subpart IIII for the fire water pump will change.

5.2 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAP) regulate HAP emissions and are applicable to certain major and area sources of HAP. NESHAP can be found in 40 CFR Part 63 and have been incorporated by reference in 15A NCAC 02D .1111. As previously discussed, the Hamlet plant will be a major source of HAP due to facility-wide total HAP emissions exceeding 25 tpy and maximum individual HAP emissions exceeding 10 tpy.

5.2.1 40 CFR 63 Subpart A – General Provisions

All sources subject to a NESHAP are subject to the general requirements under Subpart A unless excluded by the source-specific subpart. Subpart A includes requirements for initial notification, performance testing, recordkeeping, monitoring, and reporting. The Hamlet plant has sources subject to Subparts B and ZZZZ of this part and thus, Subpart A is also applicable to these sources.

5.2.2 40 CFR 63 Subpart B – Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Section 112(g)

Clean Air Act (CAA) Section 112(g)(2)(B) requires that a new or reconstructed stationary source that does not belong to a regulated "source category" for which a NESHAP has been promulgated must control emissions to levels that reflect "maximum achievable control technology" (MACT). Because Wood Pellet Manufacturing Plants are not a regulated source category under 40 CFR 63, the Hamlet plant was subject to 112(g) and underwent a case-

by-case MACT analysis pursuant to 40 CFR 63 Subpart B as part of the initial PSD construction permitting process. NC DAQ concluded that case-by-case MACT was use of a low HAP-emitting design for the Dryer (ES-DRYER) without the addition of add-on controls, and that the Hamlet plant was not subject to numeric HAP emission limits under Section 112(g).[23] Furthermore, while not required under case-by-case MACT, the plant is subject to other requirements that have the ancillary benefit of reducing HAP emissions such as a limitation on softwood to reduce VOC emissions. We also note that previous BACT requirements include a limitation on PM from the Dryer achieved through use of a WESP, that provides control of metallic and inorganic HAP emissions resulting from wood combustion in the furnace. Although BACT will no longer be applicable since the plant will now be a synthetic minor source with respect to PSD, Enviva is still proposing to install and operate the WESP.

5.2.2.1 Applicability of Section 112(g) to the Proposed Project

Enviva has initiated construction activities at the Hamlet plant but has not yet completed construction. The proposed permit modifications outlined in this application include changes to the wood pellet manufacturing process that will decrease total potential HAP emissions by approximately 126 tpy. As provided in §63.40(b), a case-by-case MACT evaluation is only required prior to the construction or reconstruction of a major source of HAP emissions.

The regulation defines "construct a major source" as the fabrication, erection, or installation of a **new greenfield site** emitting greater than the HAP major source thresholds, or of a new process or production unit at an existing site, provided the new process or production unit in and of itself emits above the HAP major source thresholds.[24] The rule further defines process or production unit as "any collection of structures and/or equipment that processes, assembles, applies, or otherwise uses material inputs to produce or store an intermediate or final product [bold emphasis added]."[25]

Since Enviva has already commenced construction of the Hamlet plant under the currently effective PSD permit, the proposed project does not constitute construction of a greenfield site as defined in §63.41.

Furthermore, the proposed changes to the plant design do not constitute reconstruction of a major source. Per §63.41, reconstruction is defined as the replacement of components at an existing process or production unit such that the fixed capital cost of the new components exceeds 50% of that which would be required to construct a comparable new process or production unit. The "process or production unit" at the Hamlet plant is the collection of all equipment used to manufacture the wood pellet product. The fixed capital costs associated with the proposed project are significantly less than 50% of the fixed capital costs that would be required to construct a comparable new wood pellet manufacturing facility. As such, the project also does not constitute reconstruction of the process or production unit.

Based on this review, Enviva has concluded that the proposed project does not trigger a requirement to perform a new case-by-case MACT evaluation under Section 112(g), as the project does not constitute construction of a major source or reconstruction of the process or production unit.

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[23] Air Quality Permit No. 10365R02, Section 2.1.A, Condition 4

[24] §63.41

[25] Ibid.

5.2.2.2 Impact of the Proposed Project on Existing Case-by-Case MACT

As part of the proposed project, Enviva is requesting an increase in the maximum amount of softwood that can be used from 75% up to a maximum of 85%. However, Enviva is also proposing to install an RTO to follow the WESP for the Dryer exhaust which will significantly reduce emissions of VOC and organic HAP. In addition, the exhaust stream from the Green Wood Hammermills (ES-GHM-1 to 3) will be routed to either the inlet of the Dryer furnace or directly to the WESP/RTO system (CD-WESP/CD-RTO-1), which will control VOC and organic HAP emissions from the Green Wood Hammermills. Furthermore, Enviva is proposing to install an RCO (with RTO backup) to control VOC and organic HAP emissions from the twelve (12) Pellet Mills and six (6) Pellet Coolers (ES-CLR-1 through 6). With the installation of the RTO and RCO, Enviva will surpass the level of control required under the original case-by-case MACT determination for the Hamlet plant and believes the intent of the original case-by-case MACT determination continues to be satisfied after completion of the proposed project.

Other sources of organic HAP emissions at the plant include the following: Log Chipper (IES-CHIP-1), the Bark Hog (IES-BARKHOG), Dried Wood Handling (ES-DWH), and eight (8) Dry Hammermills (ES-HM-1 through 8) as well as the Emergency Generator (IES-GEN) and Fire Water Pump (IES-FWP). For these sources, MACT was determined to be good process design and maintenance of equipment in accordance with manufacturer specifications and/or standard industry practices. Enviva is not requesting any modifications to the existing MACT determinations for these process sources.

5.2.3 40 CFR 63 Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines

Subpart ZZZZ applies to reciprocating internal combustion engines (RICE) located at a major or area source of HAP emissions. Emergency stationary RICE are defined in §63.6675 as any stationary RICE that operates in an emergency situation. These situations include engines used for power generation when a normal power source is interrupted, or when engines are used to pump water in the case of fire or flood. The Hamlet plant's Emergency Generator and emergency Fire Water Pump Engine will both be classified as emergency RICE under Subpart ZZZZ. Further, the engines will both be classified as new sources, as they will be constructed after June 12, 2006.

New and reconstructed emergency power engines with ratings of more than 500 bhp located at a major source of HAP emissions, including the plant's Emergency Generator, are subject to limited requirements under Subpart ZZZZ, in accordance with §63.6590(b)(1)(i). New or reconstructed CI engines with ratings less than or equal to 500 bhp located at a major source of HAP, including the plant's Fire Water Pump Engine, are only subject to the requirement to comply with the applicable provisions of NSPS Subpart IIII, per §63.6590(c)(7), and no further requirements apply under Subpart ZZZZ. The applicable requirements of this regulation have previously been incorporated into the facility's current permit and will not be impacted by the proposed permit changes.

5.2.4 40 CFR 63 Subpart DDDDD – NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

Subpart DDDDD, also referred to as the Boiler MACT, provides emission standards for boilers and process heaters located at major sources of HAP emissions. The rule defines a process heater in §63.7575 as a device with the primary purpose of transferring heat indirectly to a

process material or to a heat transfer material for use in a process unit. The Hamlet plant's Dryer will be heated by a wood-fired furnace burner system; however, the furnace burner system will provide direct heating of the wood chips, not indirect. As such, Subpart DDDDD does not apply.

5.3 Compliance Assurance Monitoring

Compliance Assurance Monitoring (CAM) under 40 CFR 64 is applicable to emission units located at a Title V major source that use a control device to achieve compliance with an emission limit and whose pre-controlled emissions exceed the major source thresholds. A CAM plan is required to be submitted with the initial Title V operating permit application for emission units whose post-controlled emissions exceed the major source thresholds (i.e., large pollutant-specific emission units [PSEU]).[26] For emission units with post-controlled emissions below the major source thresholds, a CAM plan must be submitted with the first Title V permit renewal application.[27]

The Dryer (ES-DRYER) and three (3) Green Wood Hammermills (ES-GHM-1 to 3) are each subject to a PM emission limit under 15A NCAC 02D .0515 and will utilize a WESP (CD-WESP) to meet this limit. However, combined, the Dryer and Green Wood Hammermill post-controlled PM emissions are below the major source threshold. The exhaust from both the Dryer and Green Wood Hammermills will be controlled by an RTO following the WESP; however, the RTO will not be installed to meet a specific emission limit but rather to reduce the plant's potential VOC emissions below the PSD major source threshold. Since the Hamlet plant will now be a synthetic minor PSD source, the current BACT limits will no longer be applicable and there is no other applicable VOC limit for the Dryer or Green Wood Hammermills. As such, a CAM plan is not required for VOC. A CAM plan for PM is required to be submitted for the Dryer and Green Wood Hammermills with the initial Title V permit renewal application.

The Pellet Coolers (ES-CLR-1 through 6) are also subject to a PM emission limit under 15A NCAC 02D .0515 and will utilize either six (6) individual baghouses or a wet scrubber to meet this limit. Post-controlled PM emissions will be below the major source threshold. An RCO (with RTO backup) will be installed to control VOC from the Pellet Mills and Pellet Coolers to reduce the facility-wide VOC PTE below the PSD major source threshold. Since the current VOC BACT limit will no longer be applicable and there is no other applicable VOC limit, a CAM plan is not required for VOC. A CAM plan for PM will be submitted for the Pellet Press System and Pellet Coolers (ES-CLR-1 through 6) with the initial Title V permit application.

All other emission units at the Hamlet plant have pre-controlled emissions below the major source threshold and/or do not use a control device as defined in §64.1. For those with control devices, the post-controlled emissions are below the major source threshold and thus, if CAM is applicable, it will not need to be addressed until the first Title V permit renewal application.

5.4 North Carolina Administrative Code

The Hamlet plant sources will be subject to regulations contained within 15A NCAC 02D and 02Q. Potentially applicable regulations are addressed in the following sections.

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[26] §64.5(a)

[27] §64.5(b)

5.4.1 15A NCAC 02D .0504 Particulates from Wood Burning Indirect Heat Exchangers

15A NCAC 02D .0504 provides PM emission limits for indirect heat exchangers combusting wood. An indirect heat exchanger is defined as equipment used for the alteration of the temperature of one fluid by the use of another fluid in which the two fluids are not mixed. The Dryer will be heated by a wood-fired furnace burner system; however, the furnace burner system provides direct heating of the wood chips, not indirect. As such, this regulation does not apply.

5.4.2 15A NCAC 02D .0515 Particulates from Miscellaneous Industrial Processes

PM emissions from all emission sources subject to permitting are regulated under 15A NCAC 02D .0515. This regulation limits particulate emissions based on process throughput using the equation $E = 4.10 \times P^{0.67}$, for process rates (P) less than or equal to 30 tons per hour (tph) and $E=55 \times P^{0.11}-40$ for process rates greater than 30 tph.

All emissions from PM sources at the Hamlet plant will either be negligible or controlled by cyclones, baghouses, a scrubber, or the WESP, and thus, are expected to comply with this requirement.

5.4.3 15A NCAC 02D .0516 Sulfur Dioxide Emissions from Combustion Sources

Emissions of SO_2 from combustion sources cannot exceed 2.3 pounds of SO_2 per MMBtu input. The Emergency Generator and Fire Water Pump will use ultra-low sulfur diesel, the Dryer furnace burner system will combust bark and wood chips, and the RTO and RCO will utilize natural gas, each of which contain low amounts of sulfur and will result in SO_2 emissions well below the limit of 2.3 lb/MMBtu.

5.4.4 15A NCAC 02D .0521 Control of Visible Emissions

For sources manufactured after July 1, 1971, visible emissions cannot exceed 20 percent opacity when averaged over a six-minute period except under the following conditions:

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

This rule applies to all processes at the facility that may have visible emissions.

5.4.5 15A NCAC 02D .0540 Particulate from Fugitive Dust Emission Sources

15A NCAC 02D .0540 requires a fugitive dust control plan be prepared if ambient monitoring or air dispersion modeling show violation or a potential for a violation of a PM NAAQS, or if NC DAQ observes excess fugitive dust emissions from the facility beyond the property boundary for six (6) minutes in any one hour using EPA Method 22. Previous dispersion modeling for the Hamlet plant did not show a violation or the potential for a violation of the PM_{10} or $PM_{2.5}$ NAAQS. As such, a fugitive dust control plan is not required at this time.

5.4.6 15A NCAC 02D .1100 Control of Toxic Air Pollutant Emissions

15A NCAC 02D .1100 outlines the procedures that must be followed if a TAP permit and associated modeling are required under 15A NCAC 02Q .0700. Under 15A NCAC 02Q .0704(d), a TAP permit application is required to include an evaluation of the TAP emissions from a facility's sources, excluding exempt sources listed in Rule .0702 of this Section.

15A NCAC 02Q .0702(a)(27)(B) exempts affected sources under 40 CFR Part 63. Case-by-Case MACT, required under Clean Air Act (CAA) Section 112(g)(2)(B), is carried out in Subpart B of 40 CFR 63; therefore, all sources subject to Case-by-Case MACT under Subpart B of 40 CFR 63 are exempt from the requirement to obtain a permit to emit air toxics under 15A NCAC 02Q .0702(a)(27)(B). All sources of TAP emissions at the Hamlet plant are either subject a source-specific NESHAP under 40 CFR 63 (i.e., Emergency Generator and Fire Pump Engine) or have previously undergone case-by-case MACT as required under 40 CFR 63 Subpart B. The proposed changes do not trigger a re-assessment of the previous case-by-case MACT determination, as discussed in Section 5.2.2. As such, a TAP permit and associated TAP evaluation and TAP modeling are not required.

Although not required, a TAP modeling analysis was performed as part of the permitting effort in January 2015 and the results demonstrated that the facility would not exceed any TAP ambient air standards. As part of this permit modification Enviva is proposing to reduce total TAP emissions from 31.6 tpy to 20.5 tpy. As such, Enviva believes additional TAP modeling is not warrantied.

5.4.7 15A NCAC 02Q .0700 Toxic Air Pollutant Procedures

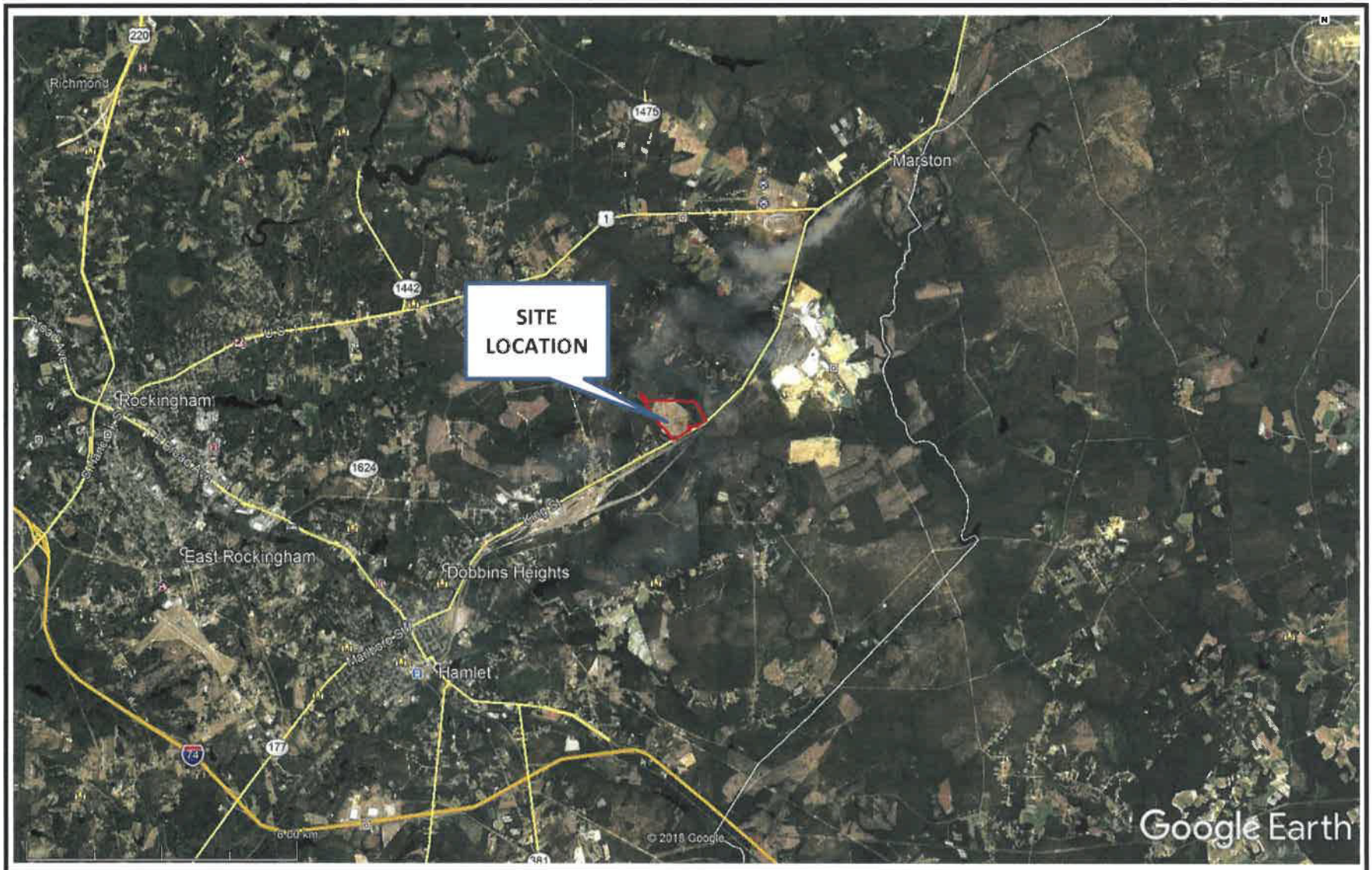
As discussed in the previous section, total potential HAP emissions are significantly lower than estimated in the previous permit application. In addition, per 15A NCAC 02Q .0702(a)(27)(B), sources subject to 40 CFR 63 are exempt from the requirements to obtain a permit for TAP emissions.

(a) A permit to emit toxic air pollutants shall not be required under this Section for:...

(27)(B) an affected source under 40 CFR 63, as amended

Because the Enviva Hamlet plant is subject to NESHAP Part 63, Subpart B, which covers CAA 112(g) §63.40-§63.44 case-by-case MACT for the Hamlet plant, and Subpart ZZZZ which covers the Emergency Generator and Fire Water Pump Engine, all sources are exempt from air toxics review.

APPENDIX A
AREA MAP



RAMBOLL

DRAFTED BY: FXP | DATE: MARCH 2018

SITE LOCATION MAP

ENVIVA HAM, LLC

HAMLET, NORTH CAROLINA

FIGURE
1

1690006061

APPENDIX B
PROCESS FLOW DIAGRAM

APPENDIX C
POTENTIAL EMISSIONS CALCULATIONS

Table 1
Calculation Inputs
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Operational Data	
Green Hammermills, Dryers, Pellet Coolers	
Short-Term Throughput (ODT/hr)	80
Annual Throughput (ODT/yr)	625,011
Hours of Operation (hr/yr)	8,760
Softwood Composition	85%
Dry Hammermills	
Short-Term Throughput (ODT/hr)	68
Annual Throughput (ODT/yr)[1]	531,259
Hours of Operation (hr/yr)	8,760
Softwood Composition	85%

Notes:
1. 85% of raw material is processed by the dry hammermills.

Table 2
Summary of Facility-wide Potential Emissions
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Emission Unit ID	Source Description	Control Device ID	Control Device Description	CO (tpy)	NO_x (tpy)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	VOC (tpy)	CO_2e (tpy)
IES-CHIP-1	Log Chipping	--	--	--	--	--	--	--	--	1.6	--
IES-BARKHOG	Bark Hog	--	--	--	--	0.23	0.13	--	--	0.28	--
ES-DRYER	250.4 MMBtu/hr Wood-fired Direct Heat Drying System	CD-WESP CD-RTO-1	WESP; RTO	219	219	33	33	33	27	39	243,754
ES-GHM-1 through 3	Three (3) Green Wood Hammermills										
ES-HM-1 through 8	Eight (8) Dry Hammermills	CD-HM-BH1 through 8	Eight (8) baghouses	--	--	18	18	0.31	--	135	--
ES-HMC	Hammermill Collection Conveyor	CD-HMC-BH	One (1) baghouse			0.23	0.23	0.23	--	--	--
ES-PCHP	Pellet Cooler HP Fines Relay System	CD-PCHP-BH	One (1) baghouse	--	--	0.075	0.075	0.075	--	--	--
ES-PCLP	Pellet Cooler LP Fines Relay System	CD-PCLP-BH	One (1) baghouse	--	--	0.47	0.47	0.47	--	--	
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BH	One (1) baghouse	--	--	0.37	0.37	0.37	--	--	--
ES-CLR-1 through 6[1]	Six (6) Pellet Coolers	CD-CLR-1 through 6 (or CD-WSB) CD-RCO	Six (6) baghouses (one on each cooler) or wet scrubber; RCO	12	15	15	4.6	1.5	0.082	24	20,683
ES-DCTB	Pellet Dust Collection Transfer Bin	CD-PDCTB-BH	One (1) baghouse	--	--	0.45	0.45	0.45	--	--	--
ES-FPH	Finished Product Handling	CD-FPH-BH	One (1) baghouse	--	--	1.3	1.2	0.022	--	--	--
ES-PB-1 and 2	Two (2) Pellet Loadout Bins										
ES-DWH	Dried Wood Handling Operations	CD-DWH-BH1 and 2	Two (2) baghouses	--	--	0.30	0.30	0.30	--	39	--
ES-ADD	Additive Handling and Storage	CD-ADD-BH	One (1) baghouse	--	--	0.15	0.15	0.15	--	--	--
IES-GWH	Green Wood Handling Operations	--	--	--	--	0.077	0.036	0.0055	--	--	--
IES-TK-1	1,000 gallon Diesel Storage Tank	--	--	--	--	--	--	--	--	0.00058	--
IES-TK-2	185 gallon Diesel Storage Tank	--	--	--	--	--	--	--	--	0.00015	--
IES-TK-3	5,000 gallon Diesel Storage Tank	--	--	--	--	--	--	--	--	0.0033	--
IES-GWSP-1 through 4	Green Wood Storage Piles	--	--	--	--	13	6.7	1.0	--	5.9	--
IES-BFSP-1 and 2	Bark Fuel Storage Piles	--	--	--	--	0.56	0.28	0.042	--	0.29	--
IES-DRYSHAVE	Dry Shaving Material Handling	--	--	--	--	0.054	0.025	0.0039	--	--	--
IES DEBARK-1	Debarker	--	--	--	--	1.1	0.59	--	--	--	--
IES-BFB[2]	Bark Fuel Bin	--	--	--	--	--	--	--	--	--	--
IES-GN	500 kW Diesel-fired Emergency Generator	--	--	0.14	2.5	0.0078	0.0078	0.0078	0.00066	1.7	179
IES-FWP	250 hp Diesel-fired Fire Water Pump			0.07	0.18	0.009	0.009	0.009	0.00048	0.01	50
--	Paved Roads	--	--	--	--	16	3.2	0.78	--	--	--
			Total Emissions:	**231**	**236**	**100**	**70**	**39**	**28**	**248**	**264,666**
			Total Excluding Fugitives[3]:	**231**	**236**	**71**	**60**	**37**	**28**	**241**	**264,666**
			PSD Major Source Threshold:	**250**	**250**	**250**	**250**	**250**	**250**	**250**	—

Notes:

1. The pellet coolers will be equipped with either six (6) baghouses (one on each cooler) or a single wet scrubber for PM control. The emissions are expected to be the same whether the scrubber or baghouses are installed. In addition, the pellet coolers will be equipped with an RCO for VOC control that will operate primarily in catalytic mode with thermal (RTO) mode as a backup. The RTO and RCO modes have the same control efficiency so there will be no impact on emissions during thermal mode usage.
2. Bark is transferred from the primary Bark Fuel Storage Pile by walking floor to covered conveyors which transfer the bark into the fully enclosed Bark Fuel Bin. There are no emissions expected from transfer of material into the bin.
3. Fugitive emissions are not included in comparison against the major source threshold because the facility is not on the list of 28 source categories in 40 CFR 52.21.

Abbreviations:

ES - Emission Source
IES - Insignificant Emission Source
CO - carbon monoxide
CO_2e - carbon dioxide equivalent
NO_x - nitrogen oxides
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
RTO - Regenerative Thermal Oxidizer
SO_2 - sulfur dioxide
tpy - tons per year
VOC - volatile organic compounds
WESP - Wet Electrostatic Precipitator

Table 3
Summary of Facility-wide HAP Emissions
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Pollutant	CD-RTO-1[1] (tpy)	ES-HM-1 through 3 (tpy)	CD-RCO[2] (tpy)	ES-DWH	IES-GN (tpy)	IES-FWP (tpy)	IES-BARKHOG (tpy)	IES-CHIP-1 (tpy)	Total HAP (tpy)
Acetaldehyde	1.8	2.4	0.13	--	9.0E-04	1.8E-04	--	--	4.3
Acetophenone	1.8E-07	--	--	--	--	--	--	--	1.8E-07
Acrolein	1.0	2.9	0.79	--	1.1E-04	2.1E-05	--	--	4.7
Antimony and compounds	6.3E-04	--	--	--	--	--	--	--	6.3E-04
Arsenic and compounds	1.8E-03	--	2.7E-05	--	--	--	--	--	1.8E-03
Benzene	0.23	--	2.9E-04	--	1.1E-03	2.1E-04	--	--	0.23
Benzo(a)pyrene	1.4E-04	--	1.6E-07	--	2.2E-07	4.3E-08	--	--	1.4E-04
Beryllium metal	8.9E-05	--	1.6E-06	--	--	--	--	--	9.1E-05
Butadiene, 1,3-	--	--	--	--	4.6E-05	9.0E-06	--	--	5.5E-05
Cadmium Metal	4.8E-04	--	1.5E-04	--	--	--	--	--	6.3E-04
Carbon tetrachloride	2.5E-03	--	--	--	--	--	--	--	2.5E-03
Chlorine	0.87	--	--	--	--	--	--	--	0.87
Chlorobenzene	1.8E-03	--	--	--	--	--	--	--	1.8E-03
Chloroform	1.5E-03	--	--	--	--	--	--	--	1.5E-03
Chromium VI	4.7E-04	--	1.9E-04	--	--	--	--	--	6.6E-04
Chromium-Other compounds	1.4E-03	--	--	--	--	--	--	--	1.4E-03
Cobalt compounds	5.3E-04	--	1.2E-05	--	--	--	--	--	5.4E-04
Dichlorobenzene	1.6E-04	--	1.6E-04	--	--	--	--	--	3.3E-04
Dichloroethane, 1,2-	1.6E-03	--	--	--	--	--		--	1.6E-03
Dichloropropane, 1,2-	1.8E-03	--	--	--	--	--	--	--	1.8E-03
Dinitrophenol, 2,4-	9.9E-06	--	--	--	--	--	--	--	9.9E-06
Di(2-ethylhexyl)phthalate	2.6E-06	--	--	--	--	--	--	--	2.6E-06
Ethyl benzene	1.7E-03	--	--	--	--	--	--	--	1.7E-03
Formaldehyde	0.94	2.1	0.50	0.26	1.4E-03	2.7E-04	--	--	3.8
Hexane	0.25	--	0.25	--	--	--	--	--	0.49
Hydrochloric acid	2.1	--	--	--	--	--	--	--	2.1
Lead and lead compounds	3.9E-03	--	6.9E-05	--	--	--	--	--	4.0E-03
Manganese and compounds	0.13	--	5.2E-05	--	--	--	--	--	0.127
Mercury, vapor	3.1E-04	--	3.6E-05	--	--	--	--	--	3.5E-04
Methanol	2.1	1.4	3.8	0.61	--	--	5.7E-02	0.31	8.2
Methyl bromide	8.2E-04	--	--	--	--	--		--	8.2E-04
Methyl chloride	1.3E-03	--	--	--	--	--	--	--	1.3E-03
Methylene chloride	1.6E-02	--	--	--	--	--	--	--	1.6E-02
Naphthalene	5.4E-03	--	8.4E-05	--	1.0E-04	1.9E-05	--	--	5.6E-03
Nickel metal	2.9E-03	--	2.9E-04	--	--	--	--	--	3.2E-03
Nitrophenol, 4-	6.0E-06	--	--	--	--	--	--	--	6.0E-06
Pentachlorophenol	5.6E-05	--	--	--	--	--	--	--	5.6E-05
Perchloroethylene	4.2E-02	--	--	--	--	--	--	--	0.042
Phenol	1.3	1.1	0.39	--	--		--	--	2.8
Phosphorus metal, yellow or white	2.1E-03	--	--	--	--	--	--	--	2.1E-03
Polychlorinated biphenyls	4.5E-07	--	--	--	--	--	--	--	4.5E-07
Propionaldehyde	0.45	5.0	0.17	--	--	--	--	--	5.6
Selenium compounds	2.3E-04	--	3.3E-06	--	--	--	--	--	2.3E-04
Styrene	0.10	--	--	--	--	--	--	--	0.10
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	4.7E-10	--	--	--	--	--	--	--	4.7E-10
Toluene	2.1E-03	--	4.7E-04	--	4.0E-04	9.4E-05	--	--	3.2E-03
Total PAH (POM)	0.14	--	9.6E-05	--	2.0E-04	3.9E-05	--	--	0.14
Trichloroethane, 1,1,1-	3.4E-02	--	--	--	--	--	--	--	3.4E-02
Trichloroethylene	1.6E-03	--	--	--	--	--	--	--	1.6E-03
Trichlorophenol, 2,4,6-	1.2E-06	--	--	--	--	--	--	--	1.2E-06
Vinyl chloride	9.9E-04	--	--	--	--	--	--	--	9.9E-04
Xylene	1.4E-03	--	--	--	3.3E-04	6.5E-05	--	--	1.8E-03
Total HAP Emissions[3] (tpy)	**11**	**15**	**6.0**	**0.87**	**4.5E-03**	**8.9E-04**	**0.06**	**3.1E-01**	**34**
Maximum Individual HAP (tpy)	**Hydrochloric acid**	**Propionaldehyde**	**Methanol**	**Methanol**	**Formaldehyde**	**Formaldehyde**	**Methanol**	**Methanol**	**Methanol**
Maximum Individual HAP Emissions (tpy)	**2.1**	**5.0**	**3.8**	**0.61**	**1.4E-03**	**2.7E-04**	**0.06**	**3.1E-01**	**8.2**

Notes:

1. Includes emissions at outlet of RTO-1 stack as well as the HAP combustion emissions resulting from NG by the RTO-1 burners. RTO-1 controls emissions from the dryer (ES-DRYER) and green hammermills (ES-GHM-1 through 3).
2. Includes emissions at outlet of RCO stack as well as the HAP combustion emissions resulting from NG by the RCO burners. RCO controls emissions from the pellet coolers and pellet mill (ES-CLR-1 through 6). The pellet coolers will be equipped with an RCO that will operate primarily in catalytic mode with thermal (RTO) mode as a backup. The RTO and RCO modes have the same control efficiency so there will be no impact on emissions during thermal mode usage.
3. Because benzo(a)pyrene and naphthalene emissions were presented individually and as components of total PAH emissions, the total HAP emissions presented here do not match the sum of all pollutant emissions to avoid double counting benzo(a)pyrene and naphthalene emissions.

Abbreviations:

HAP - hazardous air pollutant
RCO - regenerative catalytic oxidizer
RTO - regenerative thermal oxidizer
tpy - tons per year

Table 4
Potential Emissions at Outlet of RTO-1 Stack
ES-DRYER and ES-GHM-1 through 3
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Hourly Throughput	80 ODT/hr
Annual Throughput	625,011 ODT/yr
Hourly Heat Input Capacity	250.4 MMBtu/hr
Annual Heat Input Capacity	2,193,504 MMBtu/yr
Hours of Operation	8,760 hr/yr
Number of RTO Burners	4 burners
RTO Burner Rating	8 MMBtu/hr
RTO Control Efficiency	95%

Potential Criteria Pollutant and Greenhouse Gas Emissions

Pollutant	Controlled Emission Factor	Units	Emissions at RTO-1 Outlet[1]	
			(lb/hr)	(tpy)
CO	50	lb/hr[2]	50	219
NO_x	50	lb/hr[2]	50	219
SO_2	0.025	lb/MMBtu[3]	6.3	27
VOC	0.12	lb/ODT[4]	10	39
$PM/PM_{10}/PM_{2.5}$ (Filterable + Condensable)	7.6	lb/hr[2]	7.6	33
CO_2	780	lb/ODT[5]	62,400	243,754

Notes:

1. Exhaust from the dryer (ES-DRYER) and green hammermills (ES-GHM-1 through 3) are routed to a WESP and then RTO for control of VOC, HAP, and particulates.
2. Emission rate based on data provided by RTO vendor (Lundberg) and include thermal emissions from the use of the RTO.
3. No emission factor is provided in AP-42, Section 10.6.2 for SO_2 for rotary dryers. Enviva has conservatively calculated SO_2 emissions based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.
4. VOC emission factor based on source test results from similar Enviva facilities.
5. Emission factor for CO_2 from AP-42, Section 10.6.1 for rotary dryer with RTO control device. Enviva has conservatively calculated the CO_2 emissions using the hardwood emission factor because the dryer at Hamlet uses a combination of hardwood and softwood and the hardwood emission factor is greater than the softwood emission factor.

Table 4
Potential Emissions at Outlet of RTO-1 Stack
ES-DRYER and ES-GHM-1 through 3
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Potential HAP and TAP Emissions

Pollutant	HAP	NC TAP	VOC	Emission Factor	Units	Footnote	Potential Emissions	
							(lb/hr)	(tpy)
Biomass Source								
Acetaldehyde	Y	Y	Y	5.7E-03	lb/ODT	1	0.46	1.8
Acrolein	Y	Y	Y	3.2E-03	lb/ODT	1	0.26	1.0
Formaldehyde	Y	Y	Y	3.0E-03	lb/ODT	1	0.24	0.92
Methanol	Y	N	Y	6.6E-03	lb/ODT	1	0.53	2.1
Phenol	Y	Y	Y	4.1E-03	lb/ODT	1	0.33	1.3
Propionaldehyde	Y	N	Y	1.4E-03	lb/ODT	1	0.12	0.45
Acetophenone	Y	N	Y	3.2E-09	lb/MMBtu	1	4.0E-08	1.8E-07
Antimony and compounds	Y	N	N	7.9E-06	lb/MMBtu	2,4	1.4E-04	6.3E-04
Arsenic	Y	Y	N	2.2E-05	lb/MMBtu	2,4	4.0E-04	1.7E-03
Benzene	Y	Y	Y	4.2E-03	lb/MMBtu	2,3	5.3E-02	0.23
Benzo(a)pyrene	Y	Y	Y	2.6E-06	lb/MMBtu	2,3	3.3E-05	1.4E-04
Beryllium	Y	Y	N	1.1E-06	lb/MMBtu	2,4	2.0E-05	8.7E-05
Cadmium	Y	Y	N	4.1E-06	lb/MMBtu	2,4	7.4E-05	3.3E-04
Carbon tetrachloride	Y	Y	Y	4.5E-05	lb/MMBtu	2,3	5.6E-04	2.5E-03
Chlorine	Y	Y	N	7.9E-04	lb/MMBtu	2	0.20	0.87
Chlorobenzene	Y	Y	Y	3.3E-05	lb/MMBtu	2,3	4.1E-04	1.8E-03
Chloroform	Y	Y	Y	2.8E-05	lb/MMBtu	2,3	3.5E-04	1.5E-03
Chromium VI	-[3]	Y	N	3.5E-06	lb/MMBtu	2,4,5	6.4E-05	2.8E-04
Chromium-Other compounds	Y	N	N	1.8E-05	lb/MMBtu	2,4	3.2E-04	1.4E-03
Cobalt compounds	Y	N	N	6.5E-06	lb/MMBtu	2,4	1.2E-04	5.2E-04
Dichloroethane, 1,2-	Y	Y	Y	2.9E-05	lb/MMBtu	2,3	3.6E-04	1.6E-03
Dichloropropane, 1,2-	Y	N	Y	3.3E-05	lb/MMBtu	2,3	4.1E-04	1.8E-03
Dinitrophenol, 2,4-	Y	N	Y	1.8E-07	lb/MMBtu	2,3	2.3E-06	9.9E-06
Di(2-ethylhexyl)phthalate	Y	Y	Y	4.7E-08	lb/MMBtu	2,3	5.9E-07	2.6E-06
Ethyl benzene	Y	N	Y	3.1E-05	lb/MMBtu	2,3	3.9E-04	1.7E-03
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	N	Y	Y	1.8E-11	lb/MMBtu	2,3	2.2E-10	9.8E-10
Hydrochloric acid	Y	Y	N	1.9E-02	lb/MMBtu	2,6	0.48	2.1
Lead and lead compounds	Y	N	N	4.8E-05	lb/MMBtu	2,4	8.7E-04	3.8E-03
Manganese and compounds	Y	Y	N	1.6E-03	lb/MMBtu	2,4	2.9E-02	0.13
Mercury, vapor	Y	Y	N	3.5E-06	lb/MMBtu	2,4	6.4E-05	2.8E-04
Methyl bromide	Y	N	Y	1.5E-05	lb/MMBtu	2,3	1.9E-04	8.2E-04
Methyl chloride	Y	N	Y	2.3E-05	lb/MMBtu	2,3	2.9E-04	1.3E-03
Methyl ethyl ketone	N	Y	Y	5.4E-06	lb/MMBtu	2,3	6.8E-05	3.0E-04
Methylene chloride	Y	Y	Y	2.9E-04	lb/MMBtu	2,3	3.6E-03	1.6E-02
Naphthalene	Y	N	Y	9.7E-05	lb/MMBtu	2,3	1.2E-03	5.3E-03
Nickel metal	Y	Y	N	3.3E-05	lb/MMBtu	2,4	6.0E-04	2.6E-03
Nitrophenol, 4-	Y	N	Y	1.1E-07	lb/MMBtu	2,3	1.4E-06	6.0E-06
Pentachlorophenol	Y	Y	N	5.1E-08	lb/MMBtu	2	1.3E-05	5.6E-05
Perchloroethylene	Y	Y	N	3.8E-05	lb/MMBtu	2	9.5E-03	4.2E-02
Phosphorus metal, yellow or white	Y	N	N	2.7E-05	lb/MMBtu	2,4	4.9E-04	2.1E-03
Polychlorinated biphenyls	Y	Y	Y	8.2E-09	lb/MMBtu	2,3	1.0E-07	4.5E-07
Polycyclic Organic Matter	Y	N	N	1.3E-04	lb/MMBtu	2	3.1E-02	0.14
Selenium compounds	Y	N	N	2.8E-06	lb/MMBtu	2,4	5.1E-05	2.2E-04
Styrene	Y	Y	Y	1.9E-03	lb/MMBtu	2,3	2.4E-02	0.10
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	Y	Y	Y	8.6E-12	lb/MMBtu	2,3	1.1E-10	4.7E-10
Toluene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	3.8E-04	1.6E-03
Trichloroethane, 1,1,1-	Y	Y	N	3.1E-05	lb/MMBtu	2	7.8E-03	3.4E-02
Trichloroethylene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	3.8E-04	1.6E-03
Trichlorofluoromethane	N	Y	Y	4.1E-05	lb/MMBtu	2,3	5.1E-04	2.2E-03
Trichlorophenol, 2,4,6-	Y	N	Y	2.2E-08	lb/MMBtu	2,3	2.8E-07	1.2E-06
Vinyl chloride	Y	Y	Y	1.8E-05	lb/MMBtu	2,3	2.3E-04	9.9E-04
Xylene	Y	Y	Y	2.5E-05	lb/MMBtu	2,3	3.1E-04	1.4E-03
					Total HAP Emissions (related to biomass)		**2.8**	**11.2**
					Total TAP Emissions (related to biomass)		**2.1**	**8.5**

Table 4
Potential Emissions at Outlet of RTO-1 Stack
ES-DRYER and ES-GHM-1 through 3
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Pollutant	HAP	NC TAP	VOC	Emission Factor	Units	Footnote	Potential Emissions	
							(lb/hr)	(tpy)
Natural Gas Source								
2-Methylnaphthalene	Y	N	Y	2.4E-05	lb/MMscf	7	7.5E-07	3.3E-06
3-Methylchloranthrene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	lb/MMscf	7	5.0E-07	2.2E-06
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	7	4.8E-07	2.1E-06
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	7	5.6E-07	2.5E-06
Ammonia	N	Y	N	3.2	lb/MMscf	7	0.10	0.44
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	7	7.5E-08	3.3E-07
Arsenic	Y	Y	N	2.0E-04	lb/MMscf	7	6.3E-06	2.7E-05
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Benzene	Y	N	Y	2.1E-03	lb/MMscf	7	6.6E-05	2.9E-04
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Benzo(b)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	7	3.8E-07	1.6E-06
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	7	3.5E-05	1.5E-04
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	7	4.4E-05	1.9E-04
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Cobalt	Y	N	N	8.4E-05	lb/MMscf	7	2.6E-06	1.2E-05
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	7	3.8E-05	1.6E-04
Fluoranthene	Y	N	Y	3.0E-06	lb/MMscf	7	9.4E-08	4.1E-07
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	7	8.8E-08	3.8E-07
Formaldehyde	Y	Y	Y	7.5E-02	lb/MMscf	7	2.4E-03	1.0E-02
Hexane	Y	Y	Y	1.8	lb/MMscf	7	5.6E-02	0.25
Indeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Lead	Y	N	N	5.0E-04	lb/MMscf	7	1.6E-05	6.9E-05
Manganese	Y	Y	N	3.8E-04	lb/MMscf	7	1.2E-05	5.2E-05
Mercury	Y	Y	N	2.6E-04	lb/MMscf	7	8.2E-06	3.6E-05
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	7	1.9E-05	8.4E-05
Nickel	Y	Y	N	2.1E-03	lb/MMscf	7	6.6E-05	2.9E-04
Phenanthrene	Y	N	Y	1.7E-05	lb/MMscf	7	5.3E-07	2.3E-06
Pyrene	Y	N	Y	5.0E-06	lb/MMscf	7	1.6E-07	6.9E-07
Selenium	Y	N	N	2.4E-05	lb/MMscf	7	7.5E-07	3.3E-06
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	7	1.1E-04	4.7E-04
				Total HAP Emissions (related to natural gas)			**0.059**	**0.26**
				Total TAP Emissions (related to natural gas)			**0.16**	**0.70**

Notes:

1. Emission factor derived based on stack testing data from comparable Enviva facilities.
2. Emission factors (criteria and HAP/TAP) for wood combustion in a stoker boiler from NCDAQ Wood Waste Combustion Spreadsheet/AP-42, Fifth Edition, Volume 1, Chapter 1.6 - Wood Residue Combustion in Boilers, 09/03.
3. The control efficiency of 95% for the RTO is applied to all VOC hazardous and toxic pollutants for those emission factors that are not derived from Enviva stack test data.
4. The control efficiency of the wet electrostatic precipitator (WESP) for filterable particulate matter is applied to all metal hazardous and toxic pollutants. Actual design filterable efficiency is estimated to 96.4%, but 92.75% is assumed for toxics permitting.
5. Chromium VI is a subset of chrome compounds, which is accounted for separately as a HAP. As such, Chromium VI is only calculated as a TAP.
6. The WESP employs a caustic solution in its operation in which hydrochloric acid will have high water solubility. This caustic solution will neutralize the acid and effectively control it by 90%, per conversation on October 18, 2011 with Steven A. Jaasund, P.E. of Lundberg Associates, a manufacturer of WESPs.
7. Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98 for small boilers. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

Abbreviations:

CAS - chemical abstract service
CH_4 - methane
CO - carbon monoxide
CO2 - carbon dioxide
CO_2e - carbon dioxide equivalent
HAP - hazardous air pollutant
hr - hour
kg - kilogram
lb - pound
MMBtu - Million British thermal units
NC - North Carolina
NO_X - nitrogen oxides
N_2O - nitrous oxide
ODT - oven dried tons
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
RTO - regenerative thermal oxidizer
SO_2 - sulfur dioxide
TAP - toxic air pollutant
tpy - tons per year
VOC - volatile organic compound
WESP - wet electrostatic precipitator
yr - year

Table 5
Summary of Potential Emissions from Baghouses
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Emission Unit ID	Source Description	Control Device ID	Control Device Description	Exhaust Flow Rate[1]	Exit Grain Loading	Particulate Speciation		Potential Emissions					
								PM		PM_{10}		$PM_{2.5}$	
				(cfm)	(gr/cf)	PM_{10} (% of PM)	$PM_{2.5}$ (% of PM)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
ES-HM-1	Dry Hammermill	CD-HM-BH1	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HM-2	Dry Hammermill	CD-HM-BH2	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HM-3	Dry Hammermill	CD-HM-BH3	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HM-4	Dry Hammermill	CD-HM-BH4	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HM-5	Dry Hammermill	CD-HM-BH5	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HM-6	Dry Hammermill	CD-HM-BH6	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HM-7	Dry Hammermill	CD-HM-BH7	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HM-8	Dry Hammermill	CD-HM-BH8	One (1) baghouse[2, 3]	15,000	0.004	100%	1.7%	0.51	2.3	0.51	2.3	8.7E-03	0.038
ES-HMC	Hammermill Collection Conveyor	CD-HMC-BH	One (1) baghouse[2, 4]	1,500	0.004	100%	100%	0.051	0.23	0.051	0.23	0.051	0.23
ES-PCHP	Pellet Cooler HP Fines Relay System	CD-PCHP-BH	One (1) baghouse[2, 4]	500	0.004	100%	100%	0.017	0.075	0.017	0.075	0.017	0.075
ES-PCLP	Pellet Cooler LP Fines Relay System	CD-PCLP-BH	One (1) baghouse[2, 4]	3,102	0.004	100%	100%	0.11	0.47	0.11	0.47	0.11	0.47
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BH	One (1) baghouse[2, 4]	2,444	0.004	100%	100%	0.084	0.37	0.084	0.37	0.084	0.37
ES-CLR-1	Pellet Cooler	CD-CLR-BH1	One (1) baghouse[5]	15,000	0.004	26.1%	3.2%	0.51	2.3	0.13	0.59	0.016	0.072
ES-CLR-2	Pellet Cooler	CD-CLR-BH2	One (1) baghouse[5]	15,000	0.004	26.1%	3.2%	0.51	2.3	0.13	0.59	0.016	0.072
ES-CLR-3	Pellet Cooler	CD-CLR-BH3	One (1) baghouse[5]	15,000	0.004	26.1%	3.2%	0.51	2.3	0.13	0.59	0.016	0.072
ES-CLR-4	Pellet Cooler	CD-CLR-BH4	One (1) baghouse[5]	15,000	0.004	26.1%	3.2%	0.51	2.3	0.13	0.59	0.016	0.072
ES-CLR-5	Pellet Cooler	CD-CLR-BH5	One (1) baghouse[5]	15,000	0.004	26.1%	3.2%	0.51	2.3	0.13	0.59	0.016	0.072
ES-CLR-6	Pellet Cooler	CD-CLR-BH6	One (1) baghouse[5]	15,000	0.004	26.1%	3.2%	0.51	2.3	0.13	0.59	0.016	0.072
ES-PDCTB	Pellet Dust Collection Transfer Bin	CD-PDCTB-BH	One (1) baghouse[2, 4]	3,000	0.004	100%	100%	0.10	0.45	0.10	0.45	0.10	0.45
ES-FPH	Finished Product Handling	CD-FPH-BH	One (1) baghouse[2, 6]	8,500	0.004	91%	1.7%	0.29	1.3	0.27	1.2	5.0E-03	0.022
ES-PB-1 and 2	Two (2) Pellet Loadout Bins												
ES-DWH	Dried Wood Handling Operations (conveyors)	CD-DWH-BH1	One (1) baghouse[2, 3]	1,000	0.004	100%	100%	0.034	0.15	0.034	0.15	0.034	0.15
		CD-DWH-BH2	One (1) baghouse[2, 4]	1,000	0.004	100%	100%	0.034	0.15	0.034	0.15	0.034	0.15
ES-ADD	Additive Handling and Storage	CD-ADD-BH	One (1) baghouse[2, 4]	1,000	0.004	100%	100%	0.034	0.15	0.034	0.15	0.034	0.15

Notes:

1. Control device flow rate (cfm) based on updated emission point data provided by Enviva on 3/16/18.
2. No speciation data is available for PM_{10}. Therefore, it is conservatively assumed to be equal to total PM.
3. Dry Hammermills and finished product handling $PM_{2.5}$ speciation based on April 2014 Enviva Southampton $PM_{2.5}$ speciation tests.
4. No speciation data is available for $PM_{2.5}$. Therefore, it is conservatively assumed to be equal to total PM.
5. Exit flow rate provided by Enviva. Exit grain loading assumed to be the same as for other baghouses at the facility. A single wet scrubber may be used in place of the six (6) baghouses for PM control. The emissions are expected to be the same whether the scrubber or baghouses are installed. Baghouse or scrubber emissions will exhaust through CD-RCD.
6. Finished product handling $PM_{2.5}$ speciation based on emission factors for wet wood combustion controlled by a mechanical separator from AP 42, Section 1.6 Wood Residue Combustion in Boilers, 09/03. Because the particle size of particulate matter from finished product handling is anticipated to be larger than flyash, this factor is believed to be a conservative indicator of speciation.

Abbreviations:

cf - cubic feet
cfm - cubic feet per minute
ES - Emission Sources
IES - Insignificant Emission Source
gr - grain
hr - hour
lb - pound
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
tpy - tons per year

Table 6
Dry Hammermill Potential VOC and HAP Emissions
ES-HM-1 through 8
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Hourly Throughput	68 ODT/hr
Annual Throughput	531,259 ODT/yr
Hours of Operation	8,760 hr/yr

Potential VOC and HAP Emissions

Pollutant	CAS No.	NC TAP	VOC	Emission Factor[1]	Potential Emissions	
				(lb/ODT)	(lb/hr)	(tpy)
Acetaldehyde	75-07-0	Y	Y	0.0091	0.62	2.4
Acrolein	107-02-8	Y	Y	0.011	0.73	2.9
Formaldehyde	50-00-0	Y	Y	0.0080	0.55	2.1
Methanol	67-56-1	N	Y	0.0052	0.35	1.4
Phenol	108-95-2	Y	Y	0.0041	0.28	1.1
Propionaldehyde	123-38-6	N	Y	0.019	1.3	5.0
			Total HAP Emissions		**3.8**	**15**
			Total TAP Emissions		**2.2**	**8.5**
Total VOC	--	--	Y	0.51	35	135

Notes:
[1] Emission factors are based on stack testing data from comparable Enviva facilities.

Abbreviations:

CAS - chemical abstract service
HAP - hazardous air pollutant
hr - hour
lb - pound
NC - North Carolina
ODT - oven dried tons
TAP - toxic air pollutant
tpy - tons per year
VOC - volatile organic compound
yr - year

Table 7
Potential VOC and HAP Emissions at Outlet of RCO Stack
ES-CLR-1 through 6
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Hourly Throughput	80 ODT/hr
Annual Throughput	625,011 ODT/yr
Hours of Operation	8,760 hr/yr
Number of Burners	4 burners
RCO/RTO Burner Rating	8 MMBtu/hr
RCO/RTO Control Efficiency	95%

Pellet Cooler and Pellet Mill Potential Process VOC and HAP Emissions

Pollutant	CAS No.	NC TAP	VOC	Uncontrolled Emission Factor[1]	Emissions at RCO Outlet[2]	
				(lb/ODT)	(lb/hr)	(tpy)
Acetaldehyde	75-07-0	Y	Y	0.0084	0.034	0.13
Acrolein	107-02-8	Y	Y	0.050	0.20	0.79
Formaldehyde	50-00-0	Y	Y	0.031	0.12	0.49
Methanol	67-56-1	N	Y	0.24	0.96	3.8
Phenol	108-95-2	Y	Y	0.025	0.10	0.39
Propionaldehyde	123-38-6	N	Y	0.011	0.043	0.17
				Total HAP Emissions	**1.5**	**5.7**
				Total TAP Emissions	**0.46**	**1.8**
Total VOC	--	--	Y	1.5	6.0	23

Notes:

1. Emission factors were derived based on stack testing data from comparable Enviva facilities.
2. A 95% control efficiency is applied to the potential emissions for the RCO. The pellet coolers will be equipped with an RCO that will operate primarily in catalytic mode with thermal (RTO) mode as a backup. The RTO and RCO modes have the same control efficiency so there will be no impact on emissions during thermal mode usage.

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents	1.8E-02 MMBtu/lb
Uncontrolled VOC emissions	467 tons/yr
Heat input of uncontrolled VOC emissions	17,284 MMBtu/yr

Pollutant	Emission Factor	Units	Potential Emissions	
			(lb/hr)	(tpy)
CO	8.2E-02	lb/MMBtu[1]	0.16	0.71
NO_x	9.8E-02	lb/MMBtu[1]	0.19	0.85

Natural Gas Combustion Potential Criteria Pollutant and Greenhouse Gas Emissions

Pollutant	Emission Factor	Units	Potential Emissions	
			(lb/hr)	(tpy)
CO	8.2E-02	lb/MMBtu[1]	2.6	12
NO_x	9.8E-02	lb/MMBtu[1]	3.1	14
SO_2	5.9E-04	lb/MMBtu[1]	1.9E-02	8.2E-02
VOC	5.4E-03	lb/MMBtu[1]	0.17	0.76
PM	7.5E-03	lb/MMBtu[1]	0.24	1.0
PM_{10}	7.5E-03	lb/MMBtu[1]	0.24	1.0
$PM_{2.5}$	7.5E-03	lb/MMBtu[1]	0.24	1.0
CO_2	66.9	kg/MMBtu[2]	4,718	20,666
CH_4	1.0E-03	kg/MMBtu[2]	7.1E-02	0.31
N_2O	1.0E-04	kg/MMBtu[2]	7.1E-03	3.1E-02
CO_2e			4,722	20,683

Table 7
Potential VOC and HAP Emissions at Outlet of RCO Stack
ES-CLR-1 through 6
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Natural Gas Combustion Potential HAP and TAP Emissions

Pollutant	HAP	NC TAP	VOC	Emission Factor	Units	Footnote	Potential Emissions	
							(lb/hr)	(tpy)
Natural Gas Source								
2-Methylnaphthalene	Y	N	Y	2.4E-05	lb/MMscf	3	7.5E-07	3.3E-06
3-Methylchloranthrene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	lb/MMscf	3	5.0E-07	2.2E-06
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	3	4.8E-07	2.1E-06
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	3	5.6E-07	2.5E-06
Ammonia	N	Y	N	3.2	lb/MMscf	3	0.10	0.44
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	3	7.5E-08	3.3E-07
Arsenic	Y	Y	N	2.0E-04	lb/MMscf	3	6.3E-06	2.7E-05
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
Benzene	Y	N	Y	2.1E-03	lb/MMscf	3	6.6E-05	2.9E-04
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	3	3.8E-08	1.6E-07
Benzo(b)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	3	3.8E-08	1.6E-07
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	3	3.8E-07	1.6E-06
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	3	3.5E-05	1.5E-04
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	3	4.4E-05	1.9E-04
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
Cobalt	Y	N	N	8.4E-05	lb/MMscf	3	2.6E-06	1.2E-05
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	3	3.8E-08	1.6E-07
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	3	3.8E-05	1.6E-04
Fluoranthene	Y	N	Y	3.0E-06	lb/MMscf	3	9.4E-08	4.1E-07
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	3	8.8E-08	3.8E-07
Formaldehyde	Y	Y	Y	7.5E-02	lb/MMscf	3	2.4E-03	1.0E-02
Hexane	Y	Y	Y	1.8	lb/MMscf	3	5.6E-02	0.25
Indeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	3	5.6E-08	2.5E-07
Lead	Y	N	N	5.0E-04	lb/MMscf	3	1.6E-05	6.9E-05
Manganese	Y	Y	N	3.8E-04	lb/MMscf	3	1.2E-05	5.2E-05
Mercury	Y	Y	N	2.6E-04	lb/MMscf	3	8.2E-06	3.6E-05
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	3	1.9E-05	8.4E-05
Nickel	Y	Y	N	2.1E-03	lb/MMscf	3	6.6E-05	2.9E-04
Phenanathrene	Y	N	Y	1.7E-05	lb/MMscf	3	5.3E-07	2.3E-06
Pyrene	Y	N	Y	5.0E-06	lb/MMscf	3	1.6E-07	6.9E-07
Selenium	Y	N	N	2.4E-05	lb/MMscf	3	7.5E-07	3.3E-06
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	3	1.1E-04	4.7E-04
				Total HAP Emissions (natural gas combustion)			**0.059**	**0.26**
				Total TAP Emissions (natural gas combustion)			**0.16**	**0.70**

Notes:

1. Emission factors from AP-42, Section 1.4 - Natural Gas Combustion, 07/98. Emission factors converted from lb/MMscf to lb/MMBtu based on assumed heating value of 1,020 Btu/scf for natural gas per AP-42 Section 1.4.
2. Emission factors for natural gas combustion by the burners obtained from Table C-1 and C-2 of 40 CFR Part 98 and Global Warming Potentials from Table A-1.
3. Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98 for small boilers. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

Abbreviations:

CAS - chemical abstract service
HAP - hazardous air pollutant
hr - hour
lb - pound
NC - North Carolina
ODT - oven dried tons
RCO - regenerative catalytic oxidizer
RTO - regenerative thermal oxidizer
TAP - toxic air pollutant
tpy - tons per year
VOC - volatile organic compound
yr - year

Table 8
Dried Wood Handling Potential Emissions
ES-DWH
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Hourly Throughput[1]	80 ODT/hr
Annual Throughput[1]	625,011 ODT/yr

Potential Criteria Pollutant Emissions

Pollutant	Emission Factor (lb/ODT)	Potential Emissions[1]	
		(lb/hr)	(tpy)
Formaldehyde	8.4E-04	0.067	0.26
Methanol	2.0E-03	0.16	0.61
Total HAP Emissions		**0.22**	**0.87**
VOC as carbon[2]	0.10	8.1	32
VOC as propane[3]	0.12	9.9	39

Notes:

1. Hourly and annual throughputs assumed to be the same as dry hammermill throughput.
2. Emission factors derived from NCASI's Wood Products Database (February 2013) for dry wood handling operations at an OSB mill, mean emission factors. The emission factors were converted from lb/MSF (3/8") to lb/ODT using the typical density and moisture content of an OSB panel.
3. VOC as propane = (1.22 x VOC as carbon) + formaldehyde.

Abbreviations:

hr - hour
lb - pound
ODT - oven dried tons
tpy - tons per year
VOC - volatile organic compound
yr - year

Table 9
Emergency Generator Potential Emissions
IES-GN
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Engine Output	500 kW
Horsepower Rating	671 brake hp
Diesel Heating Value	19,300 Btu/lb
Hours of Operation	500 hr/yr
Conversion factor	2,545 Btu/hr/hp
Hourly Fuel Consumption	31.9 gal/hr[1]
Energy Input	4.37 MMBtu/hr[2]

Notes:
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.

Potential Criteria Pollutant Emissions

Pollutant	Emission Factor	Units	Potential Emissions[1]	
			(lb/hr)	(tpy)
CO[2]	0.39	g/hp-hr	0.58	0.14
NO_x[2]	6.65	g/hp-hr	9.8	2.5
SO_2[3]	15	ppmw	2.7E-03	6.6E-04
VOC[2]	0.01	lb/hp-hr	6.7	1.7
PM[2]	0.021	g/hp-hr	3.1E-02	7.8E-03
PM_{10}[2]	0.021	g/hp-hr	3.1E-02	7.8E-03
$PM_{2.5}$[2]	0.021	g/hp-hr	3.1E-02	7.8E-03
CO_2	74.0	kg/MMBtu[4]	713	178
CH_4	3.0E-03	kg/MMBtu[4]	2.9E-02	7.2E-03
N_2O	6.0E-04	kg/MMBtu[4]	5.8E-03	1.4E-03
CO_2e			715	179

Notes:
1. NSPS allows for only 100 hrs/yr of non-emergency operation of these engines. Potential emissions for the emergency generator are conservatively based on 500 hr/yr.
2. Emission factors for Particulate Matter (TSP/PM_{10}/$PM_{2.5}$), Nitrous Oxide (NO_x), Volatile Organic Matter (VOC), and Carbon Monoxide (CO) obtained from generator's spec sheet. The generator's spec sheet does not include an emission factor for VOC so the hydrocarbon (HC) emission factor was used as a surrogate for VOC.
3. Sulfur content in accordance with Year 2013 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.
4. Emission factors from Table C-1 and C-2 of 40 CFR Part 98 and Global Warming Potentials from Table A-1.

Potential HAP Emissions

Pollutant	CAS No.	NC TAP	VOC	Emission Factor[1]	Potential Emissions[2]	
				(lb/hp-hr)	(lb/hr)	(tpy)
Acetaldehyde	75-07-0	Y	Y	5.37E-06	3.6E-03	9.0E-04
Acrolein	107-02-8	Y	Y	6.48E-07	4.3E-04	1.1E-04
Benzene	71-43-2	Y	Y	6.53E-06	4.4E-03	1.1E-03
Benzo(a)pyrene[3]	50-32-8	Y	Y	1.32E-09	8.8E-07	2.2E-07
1,3-Butadiene	106-99-0	Y	Y	2.74E-07	1.8E-04	4.6E-05
Formaldehyde	50-00-0	Y	Y	8.26E-06	5.5E-03	1.4E-03
Naphthalene[3]	91-20-3	N	Y	5.94E-07	4.0E-04	1.0E-04
Total PAH (POM)	--	N	Y	1.18E-06	7.9E-04	2.0E-04
Toluene	108-88-3	Y	Y	2.86E-06	1.9E-03	4.8E-04
Xylene	1330-20-7	Y	Y	2.00E-06	1.3E-03	3.3E-04
			Total HAP Emissions		**1.8E-02**	**4.5E-03**
			Total TAP Emissions		**1.7E-02**	**4.3E-03**

Notes:
1. Emission factors obtained from AP-42 Section 3.3 - Stationary Internal Combustion Engines, 10/96, Table 3.3-2.
2. NSPS allows for only 100 hrs/yr of non-emergency operation of these engines. Potential emissions for the emergency generator are conservatively based on 500 hr/yr.
3. Benzo(a)pyrene and naphthalene are included as HAPs in Total PAH.

Abbreviations:

Btu - British thermal unit
CAS - chemical abstract service
CH_4 - methane
CO - carbon monoxide
CO2 - carbon dioxide
CO_2e - carbon dioxide equivalent
g - gram
gal - gallon
HAP - hazardous air pollutant
hp - horsepower
hr - hour
kg - kilogram
kW - kilowatt
lb - pound
MW - megawatt
MMBtu - Million British thermal units
NO_x - nitrogen oxides
NC - North Carolina
N_2O - nitrous oxide
ODT - oven dried tons
PAH - polycyclic aromatic hydrocarbon
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
POM - polycyclic organic matter
SO_2 - sulfur dioxide
TAP - toxic air pollutant
tpy - tons per year
VOC - volatile organic compound
yr - year

Table 10
Fire Pump Potential Emissions
IES-FWP
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Engine Output	0.10 MW
Horsepower Rating	131 brake hp
Diesel Density[1]	7.1 lb/gal
Hours of Operation	500 hr/yr
Hourly Fuel Consumption	9 gal/hr[1]
Energy Input	1.23 MMBtu/hr[2]

Notes:
1. Diesel density from AP-42 Section 3.4 - Large Stationary Diesel and All Stationary Dual-fuel Engines, 10/96, Table 3.4-1, footnote a.
2. Energy calculated on a fuel consumption basis, using an energy factor of 0.137 MMBtu/gal.

Potential Criteria Pollutant Emissions

Pollutant	Emission Factor	Units	Potential Emissions[1]	
			(lb/hr)	(tpy)
CO[2]	1.3	g/kW-hr	0.28	7.0E-02
NO_x[2]	3.4	g/kW-hr	0.72	0.18
SO_2[3]	15	ppmw	1.9E-03	4.8E-04
VOC[2]	0.15	g/kW-hr	3.2E-02	8.1E-03
PM[2]	0.17	g/kW-hr	3.7E-02	9.2E-03
PM_{10}[2]	0.17	g/kW-hr	3.7E-02	9.2E-03
$PM_{2.5}$[2]	0.17	g/kW-hr	3.7E-02	9.2E-03
CO_2	74	kg/MMBtu[4]	201	50
CH_4	3.0E-03	kg/MMBtu[4]	8.2E-03	2.0E-03
N_2O	6.0E-04	kg/MMBtu[4]	1.6E-03	4.1E-04
CO_2e			202	50

Notes:
1. NSPS allows for only 100 hrs/yr of non-emergency operation of these engines. Potential emissions for the fire pump are conservatively based on 500 hr/yr.
2. Emissions factors for PM/PM_{10}/$PM_{2.5}$, NO_x, hydrocarbons, and CO obtained from generator's spec sheet.
3. Sulfur content in accordance with Year 2013 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.
4. Emission factors from Table C-1 and C-2 of 40 CFR Part 98 and Global Warming Potentials from Table A-1.

Potential HAP Emissions

Pollutant	CAS No.	NC TAP	VOC	Emission Factor[1]	Potential Emissions[2]	
				(lb/hp-hr)	(lb/hr)	(tpy)
Acetaldehyde	75-07-0	Y	Y	5.4E-06	7.0E-04	1.8E-04
Acrolein	107-02-8	Y	Y	6.5E-07	8.5E-05	2.1E-05
Benzene	71-43-2	Y	Y	6.5E-06	8.6E-04	2.1E-04
Benzo(a)pyrene	50-32-8	Y	Y	1.3E-09	1.7E-07	4.3E-08
1,3-Butadiene	106-99-0	Y	Y	2.7E-07	3.6E-05	9.0E-06
Formaldehyde	50-00-0	Y	Y	8.3E-06	1.1E-03	2.7E-04
Naphthalene	91-20-3	N	Y	5.9E-07	7.8E-05	1.9E-05
Total PAH (POM)[3]	--	N	Y	1.2E-06	1.5E-04	3.9E-05
Toluene	108-88-3	Y	Y	2.9E-06	3.8E-04	9.4E-05
Xylene	1330-20-7	Y	Y	2.0E-06	2.6E-04	6.5E-05
			Total HAP Emissions		**3.6E-03**	**8.9E-04**
			Total TAP Emissions		**3.4E-03**	**8.5E-04**

Notes:
1. Emission factor obtained from NCDAQ Internal Combustion (Small Gasoline and Diesel Engines) Spreadsheet/AP-42 Section 3.3 - Stationary Internal Combustion Engines, 10/96, Table 3.3-2.
2. NSPS allows for only 100 hrs/yr of non-emergency operation of these engines. Potential emissions for the fire pump are conservatively based on 500 hr/yr.
3. The PAH emission factor includes all the PAH compounds listed in AP-42. Emissions for naphthalene and benzo(a)pyrene are also calculated separately. For the purposes of calculating total HAP emissions, the naphthalene and benzo(a)pyrene are not included separately to avoid double counting these emissions.

Abbreviations:

Btu - British thermal unit
CAS - chemical abstract service
CH_4 - methane
CO - carbon monoxide
CO2 - carbon dioxide
CO_2e - carbon dioxide equivalent
g - gram
gal - gallon
HAP - hazardous air pollutant
hp - horsepower
hr - hour
kg - kilogram
kW - kilowatt
lb - pound
MW - megawatt
MMBtu - Million British thermal units
NO_x - nitrogen oxides
NC - North Carolina
N_2O - nitrous oxide
ODT - oven dried tons
PAH - polycyclic aromatic hydrocarbon
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
POM - polycyclic organic matter
SO_2 - sulfur dioxide
TAP - toxic air pollutant
tpy - tons per year
VOC - volatile organic compound
yr - year

Table 11
Log Chipper Potential Emissions
IES-CHIP-1
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Hourly Throughput[1]	275 ton/hr, wet
	138 ODT/hr
Annual Throughput	625,011 ODT/yr

Potential Criteria Pollutant Emissions

Pollutant	Emission Factor	Potential Emissions[1]	
		(lb/hr)	(tpy)
THC as carbon[2]	4.1E-03 lb/ODT	0.56	1.3
VOC as propane[3]	5.0E-03 lb/ODT	0.69	1.6
Methanol[2]	1.0E-03 lb/ODT	0.14	0.31

Notes:

1. Hourly chipper throughput data provided by Enviva (email from Kai Simonsen dated 12/21/17).

2. Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Medium Density Fiberboard, 08/02, Table 7 and Section 10.6.4, Hardboard and Fiberboard, 10/02, Table 9. Emission factors for THC and methanol are the same across all three tables.

3. Emission factor for VOC as propane is from AP-42, Section 10.6.3., Medium Density Fiberboard, 08/02, Table 7.

Abbreviations:

hr - hour
lb - pound
ODT - oven dried tons
THC - total hydrocarbon
tpy - tons per year
yr - year

Table 12
Bark Hog Potential Emissions
IES-BARKHOG
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Hourly Throughput[1]	50 ton/hr, wet
	25 ODT/hr
Annual Throughput[2]	113,638 ODT/yr
	227,277 ton/yr, wet
Approx. Moisture Content[1]	50% of total weight

Potential Criteria Pollutant Emissions

Pollutant	Emission Factor	Potential Emissions[1]	
		(lb/hr)	(tpy)
THC as carbon[3]	4.1E-03 lb/ODT	0.10	0.23
VOC as propane[4]	5.0E-03 lb/ODT	0.13	0.28
Methanol[3]	1.0E-03 lb/ODT	2.5E-02	5.7E-02
TSP[5]	2.0E-02 lb/ton	0.10	0.23
PM_{10}[5]	1.1E-02 lb/ton	5.5E-02	0.13

Notes:

1. Hourly bark hog throughput data and approximate moisture content provided by Enviva (email from Kai Simonsen dated 12/21/17).
2. Maximum throughput assumes bark hog usage is proportional to the amount of log chipping that occurs for maximum pellet ODT and maximum 75% purchase of green wood from logs.
3. Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Medium Density Fiberboard, 08/02, Table 7 and Section 10.6.4, Hardboard and Fiberboard, 10/02, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.
4. Emission factor for VOC as propane is from AP-42, Section 10.6.3., Medium Density Fiberboard, 08/02, Table 7.
5. Particulate matter emission factors from the USEPA document titled *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants. Source Classification Code 3-07-008-01 (Log Debarking)*. All PM is assumed to be larger than 2.5 microns. PM emissions are assumed to be controlled due to the bark hog being partially enclosed (assumed 90% control).

Abbreviations:

hr - hour
lb - pound
ODT - oven dried tons
THC - total hydrocarbon
tpy - tons per year
yr - year

Table 13
Green Wood Handling
IES-GWH
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Source	Transfer Activity[1]	Number of Drop Points	Material Moisture Content[2]	PM Emission Factor[3]	PM_{10} Emission Factor[3]	$PM_{2.5}$ Emission Factor[3]	Potential Throughput[4]		Potential PM Emissions[5]		Potential PM_{10} Emissions[5]		Potential $PM_{2.5}$ Emissions[5]	
			(%)	(lb/ton)	(lb/ton)	(lb/ton)	(tph)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
ES-GWH	Purchased Bark/Fuel Chips Transfer to Outdoor Storage Area	1	48%	5.0E-05	2.4E-05	3.6E-06	25	81,640	1.2E-03	2.0E-03	5.9E-04	9.6E-04	8.9E-05	1.5E-04
	Purchased Wood Chips to Outdoor Storage Area	4	42%	6.0E-05	2.8E-05	4.3E-06	69	312,505	1.6E-02	3.7E-02	7.8E-03	1.8E-02	1.2E-03	2.7E-03
	Processed Wood Chips to Outdoor Storage Area	2	42%	6.0E-05	2.8E-05	4.3E-06	138	312,505	1.6E-02	1.9E-02	7.8E-03	8.9E-03	1.2E-03	1.3E-03
	Chip Truck Dump to Dumpers	2	42%	6.0E-05	2.8E-05	4.3E-06	69	312,505	8.2E-03	1.9E-02	3.9E-03	8.9E-03	5.9E-04	1.3E-03
								Total Emissions:	**4.2E-02**	**7.7E-02**	**2.0E-02**	**3.6E-02**	**3.0E-03**	**5.5E-03**

Notes:

[1] These green wood handling emissions are representative of the fugitive emissions at the site.

[2] Average moisture content for bark based on material balance provided by design engineering firm (Mid-South Engineering). Moisture content for purchased and process wood chips provided by Enviva on July 12, 2017. Assumed the lower moisture content between pine and hardwood to conservatively estimate PM emissions. (Hardwood 42% moisture; pine 51% (purchased wood chips) and 49% (processed wood chips).

[3] 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)	7.85

[4] Throughputs represent dry weight of materials, calculated based on listed material moisture contents. Hourly purchased bark throughput based on bark hog hourly throughput. Hourly purchased wood chip throughput based on weight of chips delivered to the facility. Hourly processed wood chip throughput based on log chipping hourly throughput.

Abbreviations:

hr - hour
lb - pound
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
tpy - tons per year
yr - year

Table 14
Storage Pile Wind Erosion
IES-GWSP-1 through -4, and IES-BFSP-1 and -2
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Source	Description	PM Emission Factor[1]		VOC Emission Factor[2]		Pile Width	Pile Length	Pile Height	Outer Surface Area of Pile[3]	Potential PM Emissions		Potential PM_{10} Emissions		Potential $PM_{2.5}$ Emissions		Potential VOC Emissions as propane[4]	
		(lb/day/acre)	($lb/hr/ft^2$)	(lb/day/acre)	($lb/hr/ft^2$)	(ft)	(ft)	(ft)	(ft^2)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
IES-GWSP-1	Green Wood Storage Pile No. 1	8.6	8.2E-06	3.6	3.4E-06	100	310	30	66,720	0.55	2.4	0.27	1.2	0.041	0.18	0.28	1.2
IES-GWSP-2	Green Wood Storage Pile No. 2	8.6	8.2E-06	3.6	3.4E-06	100	310	30	66,720	0.55	2.4	0.27	1.2	0.041	0.18	0.28	1.2
IES-GWSP-3	Green Wood Storage Pile No. 3	8.6	8.2E-06	3.6	3.4E-06	220	310	30	120,000	0.99	4.3	0.49	2.2	0.074	0.32	0.50	2.2
IES-GWSP-4	Green Wood Storage Pile No. 4	8.6	8.2E-06	3.6	3.4E-06	220	310	30	120,000	0.99	4.3	0.49	2.2	0.074	0.32	0.50	2.2
IES-BFSP-1	Bark Fuel Storage Pile No. 1	8.6	8.2E-06	3.6	3.4E-06	60	100	15	12,960	0.11	0.47	0.053	0.23	8.0E-03	0.035	0.054	0.24
IES-BFSP-2	Bark Fuel Storage Pile No. 2	8.6	8.2E-06	3.6	3.4E-06	25	25	15	2,550	0.021	0.092	0.010	0.046	1.6E-03	6.9E-03	0.011	0.047
									Total Emissions:	3.2	14	1.5	7.0	0.24	1.1	1.6	7.2

Notes:

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 (%):	8.4	s - silt content (%) for lumber sawmills (mean) from AP-42, Section 13.2.2 - Unpaved Roads, 11/06, Table 13.2.2-1
	p, number of days with rainfall greater than 0.01 inch:	110	Based on AP-42, Section 13.2.2 - Unpaved Roads, 11/06, Figure 13.2.1-2.
	f (time that wind exceeds 5.36 m/s = 12 mph) (%):	12.5	Based on meteorological data averaged for 2012-2016 for Marion, NC National Weather Service (NWS) Station
	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. Emission factors obtained from NCASI document provided by the South Carolina Department of Health and Environmental Control (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.
3. 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 pile design with a conservative height.
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 propane by multiplying by 1.22.

Abbreviations:

EPA - Environmental Protection Agency
ft - feet
ft^2 - square feet
lb - pound
mph - miles per hour
NC - North Carolina
NCASI - National Council for Air and Stream Improvement, Inc.
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
tpy - tons per year
TSP - total suspended particulate
yr - year
VOC - volatile organic compound

Table 15
Potential Fugitive PM Emissions from Paved Roads
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Vehicle Activity	Distance Traveled per Roundtrip[1] (ft)	Trips Per Day[2]	Daily VMT	Events Per Year (days)	Empty Truck Weight (lb)	Loaded Truck Weight (lb)	Average Truck Weight (ton)	Annual VMT	PM Emission Factor[3] (lb/VMT)	PM_{10} Emission Factor[3] (lb/VMT)	$PM_{2.5}$ Emission Factor[3] (lb/VMT)	Potential PM Emissions (lb/day)	(tpy)	Potential PM_{10} Emissions (lb/day)	(tpy)	Potential $PM_{2.5}$ Emissions (lb/day)	(tpy)
Logs Delivery to Crane Storage Area	9,000	47	80	365	40,480	102,540	35.8	29,241	2.7	0.53	0.13	21	3.9	4.2	0.78	1.0	0.19
Logs Delivery to South Log Storage Area	11,700	31	69	365	40,480	102,540	35.8	25,088	2.7	0.53	0.13	18	3.3	3.6	0.67	0.89	0.16
Logs Delivery to North Log Storage Area	8,475	14	23	365	40,480	102,540	35.8	8,261	2.7	0.53	0.13	6.0	1.1	1.2	0.22	0.29	3.4E-02
Chips/Hog Fuel Delivery	8,475	94	151	365	40,960	101,440	35.6	55,071	2.6	0.53	0.13	40	7.3	8.0	1.5	2.0	0.36
Pellet Truck Delivery to Pellet Loadout Area (Truck Back-up)	9,075	60	103	10	40,480	102,540	35.8	1,031	2.7	0.53	0.13	27	0.14	5.5	2.7E-02	1.3	6.7E-03
Pellet Truck Delivery to Pellet Loadout Area (Normal Operations)	900	2	0.34	300	40,480	102,540	35.8	102	2.7	0.53	0.13	9.0E-02	1.4E-02	1.8E-02	2.7E-03	4.4E-03	6.7E-04
Employee Car Parking	2,250	75	32	365	4,000	4,000	2.0	11,665	0.14	0.028	6.9E-03	0.45	8.2E-02	8.9E-02	1.6E-02	2.2E-02	4.0E-03
											Total Emissions:	113	16	23	3.2	5.6	0.75

Notes:

1. Distance traveled per round trip was estimated based on truck route and site layout.
2. Daily trip counts based on original permit application estimation.
3. Emission factors calculated based on Equation 2 from AP-42 Section 13.2.1 - Paved Roads, 01/11.

where:

E = emission factor (lb/ton)		
k = particle size multiplier (dimensionless) for PM	0.011	
k = particle size multiplier (dimensionless) for PM_{10}	0.0022	
k = particle size multiplier (dimensionless) for $PM_{2.5}$	0.00054	
sL = mean road surface silt loading from AP-42 Table 13.2.1-3 for quarries (g/m^2)	8.2	
P = No. days with rainfall greater than 0.01 inch	110	Per AP-42, Section 13.2.1, Figure 13.2.1-2 (Richmond County, NC).

4. Potential emissions calculated from appropriate emission factor times vehicle miles traveled with control efficiency of 90% for water / dust suppression activities followed by sweeping. Per Table 5 in Chapter 4 of the Air Pollution Engineering Manual, Air and Waste Management Association, page 141. Control efficiency (%) = 96-0.263*V, where V is the number of vehicle passes since application of water.

Abbreviations:

ft - feet
hr - hour
lb - pound
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
tpy - tons per year
yr - year
VMT - vehicle miles traveled
VOC - volatile organic compound

Table 16
Diesel Storage Tanks
IES-TK-1 through 3
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Source ID	Description	Design Volume[1]	Working Volume[2]	Tank Dimensions[5]		Orientation	Throughput[3]	Turnovers	VOC Emissions[4]	
				Diameter	Length					
		(gal)	(gal)	(ft)	(ft)		(gal/yr)		(lb/hr)	(tpy)
IES-TK-1	Emergency Generator Fuel Storage Tank[2]	1,000	500	5.3	6	Horizontal	15,958	31.9	1.3E-04	5.8E-04
IES-TK-2	Fire Pump Fuel Storage Tank[2]	185	93	3.3	3.3	Horizontal	4,500	48.6	3.7E-05	1.6E-04
IES-TK-3	Mobile Fuel Diesel Storage Tank	5,000	2,500	6.0	23.7	Horizontal	200,000	80.0	7.6E-04	3.3E-03
								Total Emissions:	**9.3E-04**	**4.1E-03**

Notes:

1. Conservative design specifications.
2. Working volume conservatively assumed to be 50% of tank design volume because tanks will not be full at all times.
3. Throughput for IES-TK-1 and IES-TK-2 based on fuel consumption provided by Enviva and 500 hours of operation per year. Throughput for IES-TK-3 provided by Enviva.
4. Emissions calculated using EPA TANKS 4.0 software. A minimum tank length for the TANKS program of 5 feet was used to estimate the emissions for IES-TK-2.
5. IES-TK-3 length was estimated based on the capacity of the tank and the diameter.

Abbreviations:

EPA - Environmental Protection Agency
ft - feet
gal - gallon
lb - pound
yr - year
VOC - volatile organic compound

Table 17
Dry Shaving Material Handling
IES-DRYSHAVE
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Source	Transfer Activity	Number of Drop Points	Material Moisture Content[1]	PM Emission Factor[2]	PM_{10} Emission Factor[2]	$PM_{2.5}$ Emission Factor[2]	Potential Throughput[3,4]		Potential PM Emissions		Potential PM_{10} Emissions		Potential $PM_{2.5}$ Emissions	
			(%)	(lb/ton)	(lb/ton)	(lb/ton)	(tph)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
IES-DRYSHAVE	Dry Shaving Material Handling - Truck dump to truck dumper	1	10%	4.5E-04	2.1E-04	3.2E-05	25	219,000	1.1E-02	4.9E-02	5.3E-03	2.3E-02	8.0E-04	3.5E-03
	Dry Shaving Material Handling - Bucket elevator to silo[5]	1	10%	4.5E-04	2.1E-04	3.2E-05	25	219,000	1.1E-03	4.9E-03	5.3E-04	2.3E-03	8.0E-05	3.5E-04
								Total Emissions:	**1.2E-02**	**5.4E-02**	**5.8E-03**	**2.5E-02**	**8.8E-04**	**3.9E-03**

Notes:

1. Moisture content for dry shavings based on information provided by Enviva.
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) 7.85

3. Hourly throughput based on a maximum transfer rate of 100 ton/hr of dry shaving material.
4. Annual throughput based on 4 dry shaving deliveries per week and a maximum storage capacity of 1360 tons for the dry shaving material storage silo.
5. Bucket elevator to silo material handling transfer point emissions account for a 90% control efficiency due to the enclosed nature of the silo (San Diego County, 1993).

Abbreviations:

hr - hour
lb - pound
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
tpy - tons per year
yr - year

Reference:

San Diego County. 1993. Cement & Fly Ash Storage Silos. June 7. Available online at: https://www.sandiegocounty.gov/content/dam/sdc/apcd/PDF/Toxics Program/APCD_silo1.pdf.

90% Control efficiency for bucket elevator to silo drop
25 tons/hr, maximum hourly transfer rate
600 tons/day, maximum daily throughput
365 days/year

Table 18
Debarker Potential Emissions
IES-DEBARK-1
Enviva Pellets Hamlet, LLC
Hamlet, Richmond County, North Carolina

Calculation Basis

Hourly Throughput[1]	275 ton/hr
Annual Throughput[1]	1,078,143 ton/yr

Potential Criteria Pollutant Emissions

Source	Pollutant	Emission Factor (lb/ton)	Potential Emissions	
			(lb/hr)	(tpy)
IES-DEBARK-1	TSP[2]	2.0E-02	0.55	1.1
	PM_{10}[2]	1.1E-02	0.30	0.59

Notes:

1. Hourly bark hog throughput data provided by Enviva (email from Kai Simonsen dated 12/21/17). Annual throughput of logs delivered for debarking, as reported for log chipping. Per 12/21/17 email from Enviva, 2 tons of green material is needed for every 1 ODT of pellets, and 1.15 times that amount for purchased logs. At most, Enviva would purchase 75% of the needed logs with the remaining 25% of green material coming from purchased chips.

2. Particulate matter emission factors from the USEPA document titled *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants*. Source Classification Code 3-07-008-01 (Log Debarking). All PM is assumed to be larger than 2.5 microns in diameter. PM emissions are assumed to be controlled due to the debarker being partially enclosed (assumed 90% control).

Abbreviations:

hr - hour
lb - pound
ODT - oven dried tons
tpy - tons per year
yr - year

APPENDIX D
PERMIT APPLICATION FORMS

Received
MAY 14 2018
Air Permits Section

FORM A
GENERAL FACILITY INFORMATION

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

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

- ☑ Local Zoning Consistency Determination (new or modification only)
- ☑ Appropriate Number of Copies of Application
- ☑ Application Fee (if required)
- ☑ Responsible Official/Authorized Contact Signature
- ☑ P.E. Seal (if required)

GENERAL INFORMATION

Legal Corporate/Owner Name:	Enviva Pellets Hamlet, LLC
Site Name:	Enviva Pellets Hamlet, LLC
Site Address (911 Address) Line 1:	1125 North NC Highway 177
Site Address Line 2:	
City: Hamlet	State: North Carolina
Zip Code: 28345	County: Richmond

CONTACT INFORMATION

Responsible Official/Authorized Contact:	*Invoice Contact:*
Name/Title: Steve Reeves, EVP and CFO - Accounting	Name/Title: Joe Harrell, Corporate EHS Manager
Mailing Address Line 1: 7200 Wisconsin Avenue	Mailing Address Line 1: 142 NC Route 561 East
Mailing Address Line 2:	Mailing Address Line 2:
City: Bethesda State: MD Zip Code: 20814	City: Ahoskie State: NC Zip Code: 27910
Primary Phone No.: (240) 482-3787 Fax No.:	Primary Phone No.: (252) 370-3181 Fax No.:
Secondary Phone No.:	Secondary Phone No.:
Email Address: Steve.Reeves@envivabiomass.com	Email Address: Joe.Harrell@envivabiomass.com
Facility/Inspection Contact:	*Permit/Technical Contact:*
Name/Title: Kai Simonsen, Air Permit Engineer	Name/Title: Kai Simonsen, Air Permit Engineer
Mailing Address Line 1: 4242 Six Forks Road, Suite 1050	Mailing Address Line 1: 4242 Six Forks Road, Suite 1050
Mailing Address Line 2:	Mailing Address Line 2:
City: Raleigh State: NC Zip Code: 27609	City: Raleigh State: NC Zip Code: 27609
Primary Phone No.: (919) 428-0289 Fax No.:	Primary Phone No.: (919) 428-0289 Fax No.:
Secondary Phone No.:	Secondary Phone No.:
Email Address: Kai.Simonsen@envivabiomass.com	Email Address: Kai.Simonsen@envivabiomass.com

APPLICATION IS BEING MADE FOR

- ☐ New Non-permitted Facility/Greenfield
- ☑ Modification of Facility (permitted)
- ☐ Renewal Title V
- ☐ Renewal Non-Title V
- ☐ Name Change
- ☐ Ownership Change
- ☐ Administrative Amendment
- ☐ Renewal with Modification

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):
Wood pellet manufacturing facility

Facility ID No. 7700096

Primary SIC/NAICS Code: 2499 [Wood Products, not elsewhere classified]

Current/Previous Air Permit No. 10365R02 Expiration Date: 02/28/2021

Facility Coordinates: Latitude: 34 degrees, 55 minutes, 2.4 seconds Longitude: 79 degrees, 38 minutes, 3.3 seconds

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 Carbon	Firm Name: Ramboll US Corporation
Mailing Address Line 1: 8234 YMCA Plaza Drive	Mailing Address Line 2:
City: Baton Rouge State: LA	Zip Code: 70810 County:
Phone No.: (225) 408-2691 Fax No.:	Email Address: mcarbon@ramboll.com

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): Steve Reeves — Title: EVP and CFO - Accounting

X Signature(Blue Ink): — Date: 3 May 18

Attach Additional Sheets As Necessary

FORM A (continued, page 2 of 2)
GENERAL FACILITY INFORMATION

SECTION AA1 - APPLICATION FOR NON-TITLE V PERMIT RENEWAL

_____ (Company Name) hereby formally requests renewal of Air Permit No. _____

There have been no modifications to the originally permitted facility or the operations therein that would require an air permit since the last permit was issued.

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Clean Air Act? ☐ YES ☐ NO

If yes, have you already submitted a Risk Manage Plan (RMP) to EPA? ☐ YES ☐ NO Date Submitted: _____

Did you attach a current emissions inventory? ☐ YES ☐ NO

If no, did you submit the inventory via AERO or by mail? ☐ Via AERO ☐ Mailed Date Mailed: _____

SECTION AA2- APPLICATION FOR TITLE V PERMIT RENEWAL

In accordance with the provisions of Title 15A 2Q .0513, the responsible official of _____ (Company Name)

hereby formally requests renewal of Air Permit No. _____ (Air Permit No.) and further certifies that:

(1) The current air quality permit identifies and describes all emissions units at the above subject facility, except where such units are exempted under the North Carolina Title V regulations at 15A NCAC 2Q .0500;

(2) The current air quality permit cits all applicable requirements and provides the method or methods for determing compliance with the applicable requirements;

(3) The facility is currently in compliance, and shall continue to comply, with all applicable requiremetns. (Note: As provided under 15A NCAC 2Q .0512 compliance with the conditions of the permit shall be deemed compliance with the applicable requirements specifically identified in the permit);

(4) For applicable requirements that become effective during the term of the renewed permit that the facility shall comply on a timely basis;

(5) The facility shall fulfill applicable enhanced monitoring requirements and submit a compliance certification as required by 40 CFR Part 64.

The responsible official (signature on page 1) certifies under the penalty of law that all information and statements provided above, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

SECTION AA3- APPLICATION FOR NAME CHANGE

New Facility Name: _____

Former Facility Name: _____

An official facility name change is requested as described above for the air permit mentioned on page 1 of this form. Complete the other sections if there have been modifications to the originally premitted facility that would requie an air quality permit since the last permit was issued and if ther has been an ownership change associated with this name change.

SECTION AA4- APPLICATION FOR AN OWNERSHIP CHANGE

By this application we hereby request transfer of Air Quality Permit No. _____ from the former owner to the new owner as described below.

The transfer of permit responsibility, coverage and liability shall be effective _____ (immediately or insert date.) The legal ownership of the facility described on page 1 of this form has been or will be transferred on _____ (date). There have been no modifications to the originally permitted facility that would require an air quality permit since the last permit was issued.

Signature of New (Buyer) Responsible Official/Authorized Contact (as typed on page 1):

X Signature (Blue Ink): _____

Date:

New Facility Name:

Former Facility Name:

Signature of Former (Seller) Responsible Official/Authorized Contact:

Name (typed or print):

Title:

X Signature (Blue Ink): _____

Date:

Former Legal Corporate/Owner Name:

In lieu of the seller's signature on this form, a letter may be submitted with the seller's signature indicating the ownership change

SECTION AA5- APPLICATION FOR ADMINISTRATIVE AMENDMENT

Describe the requested administrative amendment here (attach additional documents as necessary):

Attach Additional Sheets As Necessary

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **A2**

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

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
ES-GHM-3	Green Wood Hammermill	CD-WESP	Wet Electrostatic Precipitator
		CD-RTO-1 (new)	Regenerative Thermal Oxidizer
ES-HMC	Hammermill Collection Conveyor	CD-HMC-BH	Baghouse
ES-DWH	Dried Wood Handling Operations	CD-DWH-BH-1 through 2	Baghouses (operating in parallel)
ES-ADD	Additive Handling and Storage	CD-ADD-BH	Baghouse
Existing Permitted Equipment To Be MODIFIED By This Application			
ES-GHM-1 through 2	Two (2) Green Wood Hammermills	CD-WESP	Wet Electrostatic Precipitator
		CD-RTO-1 (new)	Regenerative Thermal Oxidizer
ES-DRYER	Green Wood Direct-Fired Rotary Dryer System	CD-WESP	Wet Electrostatic Precipitator
		CD-RTO-1 (new)	Regenerative Thermal Oxidizer
ES-HM-1 through 8	Eight (8) Dry Hammermills	CD-HM-BH-1 through 8	Baghouses (one per hammermill)
ES-PCHP	Pellet Cooler High Pressure Fines Relay System	CD-PCHP-BH	Baghouse
ES-PCLP	Pellet Cooler Low Pressure Fines Relay System	CD-PCLP-BH	Baghouse
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BH	Baghouse
ES-CLR-1 through 6	Six (6) Pellet Coolers	CD-CLR-1 through 6 or CD-WSB (new)	Baghouses or Wet Scrubber
		CD-RCO (new)	Regenerative Catalytic Oxidizer with thermal mode backup
ES-PDCTB	Pellet Dust Collection Transfer Bin	CD-PDCTB-BH	Baghouse
ES-FPH	Finished Product Handling	CD-FPH-BH	Baghouse
ES-PB-1 through 2	Two (2) Pellet Loadout Bins		
Equipment To Be DELETED By This Application			
ES-PL-1 through 3	Three (3) Pellet Mill Loadouts		
ES-HMA	Hammermill Area		
ES-CHIP-1	Log Chipping (now listed on Form D4 as IES-CHIP-1)		
ES-BARKHOG	Bark Hog (now listed on Form D4 as IES-BARKHOG)		
ES-GN	Emergency Generator (now listed on Form D4 as IES-GN)		
ES-FWP	Fire Water Pump (now listed on Form D4 as IES-FWP)		

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: The Hamlet plant will not store any regulated substances in excess of their threshold quantities, as determined under §68.115.

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: _____

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)

Attach Additional Sheets As Necessary

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | D1

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
AIR POLLUTANT EMITTED	tons/yr	tons/yr	tons/yr
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix C		
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			
GREENHOUSE GASES (GHG) (SHORT TONS)			
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

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

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.

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

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 Operations IES-GWH	Varies	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
2. Bark Hog IES-BARKHOG	25 ODT/hr	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
3. Emergency Generator Diesel Fuel Storage Tank IES-TK1	1,000 gallons	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
4. Firewater Pump Engine Diesel Fuel Storage Tank IES-TK2	185 gallons	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
5. Mobile Sources Diesel Fuel Storage Tank IES-TK3	5,000 gallons	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
6. Green Wood Storage Piles IES-GWSP-1 through 4	N/A	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
7. Bark Fuel Storage Piles IES-BFSP-1 and 2	N/A	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
8. Dry Shaving Material Handling IES-DRYSHAVE	25 tons/hr	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
9. Debarker IES-DEBARK-1	275 tons/hr	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
10. Bark Fuel Bin IES-BFB	N/A	15A NCAC 02Q .0503(8)-negligible emissions, see Appendix C
11. Diesel-Fired Emergency Generator IES-GN	671 bhp	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
12. Diesel-Fired Fire Water Pump IES-FWP	131 bhp	15A NCAC 02Q .0503(8)-low emissions, see Appendix C
13. Log Chipping IES-CHIP-1	138 ODT/hr	15A NCAC 02Q .0503(8)-low emissions, see Appendix C

Attach Additional Sheets As Necessary

FORM D5

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | D5

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

A **SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9)** - 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 INFORMATION 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 and C1 through C9)** - PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.

D **PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.

E **PROFESSIONAL ENGINEERING SEAL** - PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR [illegible] SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, Russell Kemp *attest that this application for* Enviva Pellets Hamlet, 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.*

Received
MAY 14 2018
Air Permits Section

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME:	Russell Kemp, MS, PE
DATE:	04 April 2018
COMPANY:	REUS Engineers, P.C.
ADDRESS:	1600 Parkwood Circle, Suite 310, Atlanta, GA 30339
TELEPHONE:	(678) 388-165[illegible]
SIGNATURE:	
PAGES CERTIFIED:	Forms B, B1, B6, B9, C1, C2, C3, C4
	Appendix C with emission calculations
	Application Narrative

(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 B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Green Wood Hammermills**	EMISSION SOURCE ID NO: **ES-GHM-1, 2, 3**
	CONTROL DEVICE ID NO(S): **CD-WESP, CD-RTO-1**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-1**

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips are processed in the green 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)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: **TBD** — DATE MANUFACTURED: **TBD**

MANUFACTURER / MODEL NO.: **TBD** — EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR

IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?): _____ ☑ NESHAP (SUBPARTS **Supbart B, Section 112(g)**

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
		See Emission Calculations in Appendix C						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
		See Emission Calculations in Appendix C			

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 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: **Green Wood Hammermills**	EMISSION SOURCE ID NO: **ES-GHM-1, 2, 3**
	CONTROL DEVICE ID NO(S): **CD-WESP, CD-RTO-1**
OPERATING SCENARIO: __1_____ OF ___1_____	EMISSION POINT (STACK) ID NO(S): **EP-1**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips are processed in the green wood hammermills.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Green Wood	**ton/hr**	**40**	**N/A**

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 EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Green Wood Direct-Fired Rotary Dryer System**	EMISSION SOURCE ID NO: **ES-DRYER**
	CONTROL DEVICE ID NO(S): **CD-WESP, CD-RTO-1**
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 250.4 MMBtu/hr burner system. Air emissions are controlled utilizing a wet electrostatic precipitator (WESP) for particulate removal. VOC and organic-HAP emissions will be controlled by a regenerative thermal oxidizer (RTO).

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)	☐ Manuf. 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: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **_24__** HR/DAY **_7___** DAY/WK **_52__** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____	☑ NESHAP (SUBPARTS **Subpart B, Section 112(g)**

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
		See Emission Calculations in Appendix C						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
		See Emission Calculations in Appendix C			

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 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **B1**

EMISSION SOURCE DESCRIPTION: **Green Wood Direct-Fired Rotary Dryer System**	EMISSION SOURCE ID NO: **ES-DRYER**
	CONTROL DEVICE ID NO(S): **CD-WESP, CD-RTO-1**
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): **250.4**

WOOD-FIRED BURNER

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

PERCENT MOISTURE OF FUEL: **20 to 50%**

☐ UNCONTROLLED ☐ CONTROLLED WITH FLYASH REINJECTION ☑ CONTROLLED W/O REINJECTION

FUEL FEED METHOD: **N/A** HEAT TRANSFER MEDIA: ☐ STEAM ☑ AIR ☐ OTHER (DESCRIBE) _____

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	

OIL/GAS-FIRED BURNER

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL

TYPE OF FIRING: ☐ NORMAL ☐ TANGENTIAL ☐ LOW NOX BURNERS ☐ NO LOW NOX BURNER

OTHER FUEL-FIRED BURNER

TYPE(S) OF FUEL: _____

TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL

TYPE OF FIRING: _____ TYPE(S) OF CONTROL(S) (IF ANY): _____

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Bark/Wet Wood	**tons**	**40**	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

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

SAMPLING PORTS, COMPLIANT WITH EPA METHOD 1 WILL BE INSTALLED ON THE STACKS ☑ YES ☐ ☐ NO

COMMENTS:

Attach Additional Sheets As Necessary

FORM C2

CONTROL DEVICE (Electrostatic Precipitator)

EVISED 09/22/16 — NCDEQ/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(S): **ES-DRYER and ES-GHM-1 through 3**
EMISSION POINT (STACK) ID NO(S): **EP-1**	POSITION IN SERIES OF CONTROL: NO. **1** OF **2** UNITS
MANUFACTURER: **Lundberg**	MODEL NO. **TBD**
OPERATING SCENARIO:	
OPERATING SCENARIO: ___1___ OF ___1___	P.E. SEAL REQUIRED (PER 2Q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
Emissions from the Dryer and Green Wood Hammermills are initially controlled by the WESP through a common duct for additional PM, metallic HAP, and HCl removal.

EQUIPMENT SPECIFICATIONS	GAS DISTRIBUTION GRIDS: ☑ YES ☐ NO
TYPE: ☑ WET ☐ DRY	☑ SINGLE-STAGE ☑ TWO-STAGE
TOTAL COLLECTION PLATE AREA (FT^2): **TBD**	NO. FIELDS **TBD** NO. COLLECTOR PLATES PER FIELD: **TBD**
COLLECTOR PLATE SIZE (FT): LENGTH: **TBD** WIDTH: **TBD**	SPACING BETWEEN COLLECTOR PLATES (INCHES): **TBD**
TOTAL DISCHARGE ELECTRODE LENGTH (FT): **TBD**	GAS VISCOSITY (POISE): **TBD**
NUMBER OF DISCHARGE ELECTRODES: **TBD**	NUMBER OF COLLECTING ELECTRODE RAPPERS: **TBD**
MAXIMUM INLET AIR FLOW RATE (ACFM): **TBD**	PARTICLE MIGRATION VELOCITY (FT/SEC): **TBD**
MINIMUM GAS TREATMENT TIME (SEC): **TBD**	BULK PARTICLE DENSITY (LB/FT^3): **TBD**
FIELD STRENGTH (VOLTS) CHARGING: COLLECTING: **TBD**	CORONA POWER (WATTS/1000 CFM): **TBD**
ELECTRICAL USAGE (KW/HOUR): TBD	
CLEANING PROCEDURES: ☐ RAPPING ☐ PLATE VIBRATING ☐ WASHING ☐ OTHER _____	
OPERATING PARAMETERS	PRESSURE DROP (IN. H20): MIN MAX — WARNING ALARM? ☐ YES ☐ NO
RESISTIVITY OF POLLUTANT (OHM-CM): **TBD**	GAS CONDITIONING: ☐ YES ☐ NO TYPE OF AGENT (IF YES):
INLET GAS TEMPERATURE (°F): **TBD**	OUTLET GAS TEMPERATURE (°F): **TBD**
VOLUME OF GAS HANDLED (ACFM): **TBD**	INLET MOISTURE PERCENT: **TBD** MIN **TBD** MAX

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

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

PARTICLE SIZE DISTRIBUTION

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

DESCRIBE STARTUP PROCEDURES:
Refer to previous submittal.

DESCRIBE MAINTENANCE PROCEDURES:
Refer to previous submittal.

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM

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

COMMENTS:

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

FORM C3

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | C3

AS REQUIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CAROLINA.

CONTROL DEVICE ID NO: **CD-RTO-1**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-DRYER, ES-GHM-1 through 3**
EMISSION POINT (STACK) ID NO(S): **EP-1**	POSITION IN SERIES OF CONTROLS NO. **2** OF **2** UNITS
MANUFACTURER: **Lundberg**	MODEL NO: **TBD**
OPERATING SCENARIO:	
1 OF **1**	

TYPE ☐ AFTERBURNER ☑ REGENERATIVE THERMAL OXIDATION ☐ RECUPERATIVE THERMAL OXIDATION ☐ CATALYTIC OXIDATION

EXPECTED LIFE OF CATALYST (YRS): **TBD** | METHOD OF DETECTING WHEN CATALYST NEEDS REPLACMENT: **TBD**

CATALYST MASKING AGENT IN AIR STREAM ☐ HALOGEN ☐ SILICONE ☐ PHOSPHOROUS COMPOUND ☐ HEAVY METAL ☐ SULFUR COMPOUND ☑ OTHER (SPECIFY) **TBD** ☐ NONE

TYPE OF CATALYST: **TBD**	CATALYST VOL (FT^3): **TBD**	VELOCITY THROUGH CATALYST (FPS): **TBD**
SCFM THROUGH CATALYST: **TBD**		

DESCRIBE CONTROL SYSTEM, INCLUDING RELATION TO OTHER CONTROL DEVICES AND SOURCES, AND ATTACH DIAGRAM OF SYSTEM:
Emissions leaving the WESP will enter the RTO prior to being emitted to the atmosphere.

POLLUTANT(S) COLLECTED:	**VOC**			
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	**95** %	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR) :	**See calculations in Appendix C**			

PRESSURE DROP (IN. H_2O): MIN MAX **TBD**	OUTLET TEMPERATURE (°F): TBD MIN TBD MAX
INLET TEMPERATURE (°F): MIN MAX **TBD**	RESIDENCE TIME (SECONDS): **TBD**
INLET AIR FLOW RATE (ACFM): **TBD** (SCFM): **TBD**	COMBUSTION TEMPERATURE (°F): **TBD**
COMBUSTION CHAMBER VOLUME (FT^3): **TBD**	INLET MOISTURE CONTENT (%): **TBD**
% EXCESS AIR: **TBD**	CONCENTRATION (ppmv) TBD INLET TBD OUTLET
AUXILIARY FUEL USED: **Natural Gas**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): **32**

DESCRIBE MAINTENANCE PROCEDURES:
TBD

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:
N/A

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Eight (8) Hammermills**	EMISSION SOURCE ID NO: **ES-HM-1 through 8**
	CONTROL DEVICE ID NO(S): **CD-HM-BH-1 through 8**
OPERATING SCENARIO _____1_____ OF _____1_____	EMISSION POINT (STACK) ID NO(S): **EP-2 through 9**

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

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

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. 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: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **_24__** HR/DAY **_7___** DAY/WK **_52__** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____	☑ NESHAP (SUBPART **Subpart B, Section 112(g)**
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
		See Emission Calculations in Appendix C						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
		See Emission Calculations in Appendix C			

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 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: **Eight (8) Hammermills**	EMISSION SOURCE ID NO: **ES-HM-1 through 8**
	CONTROL DEVICE ID NO(S): **CD-HM-BH-1 through 8**
OPERATING SCENARIO: __1_____ OF ____1_____	EMISSION POINT (STACK) ID NO(S): **EP-2 through 9**

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

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood	**ODT**	**68**	

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 09/22/15 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: CD-HM-BH-1 through 8	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-HM-1 through 8
EMISSION POINT (STACK) ID NO(S): EP-2 through 9	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
Eight (8) baghouses are utilized for emission control on the eight dry hammermill cyclones. There are 8 identical dry hammermill baghouse stacks.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANTS 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 AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN:	MAX:TBD	GAUGE? ☑ YES ☐ NO
BULK PARTICLE DENSITY (LB/FT^3): TBD	INLET TEMPERATURE (^oF): TBD	
POLLUTANT LOADING RATE: 0.004 ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (^oF) TBD	
INLET AIR FLOW RATE (ACFM): 15,000 each	FILTER OPERATING TEMP (^oF): N/A	
NO. OF COMPARTMENTS: TBD	NO. OF BAGS PER COMPARTMENT: TBD	LENGTH OF BAG (IN.): TBD
NO. OF CARTRIDGES: TBD	FILTER SURFACE AREA PER CARTRIDGE (FT^2): TBD	DIAMETER OF BAG (IN.): TBD
TOTAL FILTER SURFACE AREA (FT^2): TBD	AIR TO CLOTH RATIO: TBD	

DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE 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 contains wood dust particles. Larger particles are removed by the upstream cyclone for product recovery.

PARTICLE SIZE DISTRIBUTION

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

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

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

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

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

START CONSTRUCTION DATE: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☑ NESHAP (SUBPARTS **Subpart B, Section 112(g)**
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
		See Emission Calculations in Appendix C						

TOXIC AIR POLLUTANT EMSSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
		See Emission Calculations in Appendix C			

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 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

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

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

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood	**ODT**	**80**	

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 C8
CONTROL DEVICE (WET PARTICULATE SCRUBBER)

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **C8**

CONTROL DEVICE ID NO: **CD-WSB**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-CLR1 through 6**
EMISSION POINT ID NO(S): **EP-10**	POSITION IN SERIES OF CONTROLS: NO. **1** OF **2** UNITS
OPERATING SCENARIO:	
___1___ OF ___2___	P.E. SEAL NEEDED (PER 2Q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
Control system for PM is to be determined. One scrubber may be used to capture bulk PM emissions from six (6) pellet coolers. Alternatively, the pellet cooler exhaust may be controlled by six (6) individual baghouses. The exhaust gas will then be passed to CD-RCO.

POLLUTANT(S) COLLECTED:	**PM**	**PM_{10}**	**$PM_{2.5}$**
BEFORE CONTROL EMISSION RATE (LB/HR):			
CAPTURE EFFICIENCY:	%	%	%
CONTROL DEVICE EFFICIENCY:	95 %	95 %	95 %
CORRESPONDING OVERALL EFFICIENCY:	%	%	%
EFFICIENCY DETERMINATION CODE:			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	**See calculations in Appendix C**		

PRESSURE DROP (IN. H_2O): **TBD** MIN **TBD** MAX	
INLET TEMPERATURE (°F): **TBD** MIN **TBD** MAX	OUTLET TEMPERATURE (°F **TBD** MIN **TBD** MAX
INLET AIR FLOW RATE (ACFM): **TBD**	MOISTURE CONTENT : INLET **TBD** % OUTLET **TBD** %
THROAT VELOCITY (FT/SEC): **TBD**	THROAT TYPE: ☐ FIXED ☐ VARIABLE
TYPE OF SYSTEM **TBD**	TYPE OF PACKING USED IF ANY:
ADDITIVE LIQUID SCRUBBING MEDIUM: **TBD**	PERCENT RECIRCULATED: **TBD**
MINIMUM LIQUID INJECTION RATE (GAL/MIN): **TBD**	

MAKE UP RATE (GAL/MIN): **TBD** FOR ADDITIVE (GAL/MIN): **TBD**

DESCRIBE MAINTENANCE PROCEDURES:

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

PARTICLE SIZE DISTRIBUTION

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

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

CONTROL DEVICE ID NO: **CD-CLR-1 through 6**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-CLR-1 through 6**
EMISSION POINT (STACK) ID NO(S): **EP-10**	POSITION IN SERIES OF CONTROLS NO. **1** OF **2** UNITS
OPERATING SCENARIO:	
2 OF **2**	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
Control system for PM is to be determined. Six (6) identical baghouses may be used to capture bulk PM emissions from six (6) pellet coolers. Each cooler would vent to one dedicated baghouse in this scenario. Alternatively, the combined pellet cooler exhaust may be controlled by one scrubber. The exhaust gas will then be passed to CD-RCO.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANTS COLLECTED:				
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN: MAX: **TBD** GAUGE? ☐ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT^3): **TBD**	INLET TEMPERATURE (°F): **TBD**	
POLLUTANT LOADING RATE: **0.004** ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) **TBD**	
INLET AIR FLOW RATE (ACFM): **15,000 per baghouse**	FILTER OPERATING TEMP (°F): **TBD**	
NO. OF COMPARTMENTS: **TBD**	NO. OF BAGS PER COMPARTMENT: **TBD**	LENGTH OF BAG (IN.): **TBD**
NO. OF CARTRIDGES: **TBD**	FILTER SURFACE AREA PER CARTRIDGE (FT^2): **TBD**	DIAMETER OF BAG (IN.): **TBD**
TOTAL FILTER SURFACE AREA (FT^2): **TBD**	AIR TO CLOTH RATIO: **TBD**	
DRAFT TYPE: ☐ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☐ FELTED	

DESCRIBE CLEANING PROCEDURES

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

DESCRIBE INCOMING AIR STREAM:
The baghouses used to capture particulate emissions from the pellet coolers will be ducted to the RCO.

PARTICLE SIZE DISTRIBUTION

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM C3

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | C3

AS REQUIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CAROLINA.

CONTROL DEVICE ID NO: **CD-RCO (new)**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-CLR-1 through 6**
EMISSION POINT (STACK) ID NO(S): **EP-10 (new)**	POSITION IN SERIES OF CONTROLS NO. 2 OF 2 UNITS
MANUFACTURER: **Lundberg**	MODEL NO: **TBD**
OPERATING SCENARIO:	
1 OF 1	

TYPE ☐ AFTERBURNER ☐ REGENERATIVE THERMAL OXIDATION ☐ RECUPERATIVE THERMAL OXIDATION ☑ CATALYTIC OXIDATION

EXPECTED LIFE OF CATALYST (YRS): **TBD** | METHOD OF DETECTING WHEN CATALYST NEEDS REPLACMENT: **TBD**

CATALYST MASKING AGENT IN AIR STREAM ☐ HALOGEN ☐ SILICONE ☐ PHOSPHOROUS COMPOUND ☐ HEAVY METAL ☐ SULFUR COMPOUND ☑ OTHER (SPECIFY) **TBD** ☐ NONE

TYPE OF CATALYST: **TBD** | CATALYST VOL (FT^3): **TBD** | VELOCITY THROUGH CATALYST (FPS): **TBD**

SCFM THROUGH CATALYST: **TBD**

DESCRIBE CONTROL SYSTEM, INCLUDING RELATION TO OTHER CONTROL DEVICES AND SOURCES, AND ATTACH DIAGRAM OF SYSTEM:
Emissions leaving the six (6) baghouses (or wet scrubber) will enter the RCO (with thermal mode backup) prior to being emitted to the atmosphere.

POLLUTANT(S) COLLECTED:	VOC			
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	95 %	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	**See calculations in Appendix C**			

PRESSURE DROP (IN. H_2O): MIN MAX **TBD**	OUTLET TEMPERATURE (^oF): TBD MIN TBD MAX
INLET TEMPERATURE (^oF): MIN MAX **TBD**	RESIDENCE TIME (SECONDS): **TBD**
INLET AIR FLOW RATE (ACFM): **TBD** (SCFM): **TBD**	COMBUSTION TEMPERATURE (^oF): **TBD**
COMBUSTION CHAMBER VOLUME (FT^3): **TBD**	INLET MOISTURE CONTENT (%): **TBD**
% EXCESS AIR: **TBD**	CONCENTRATION (ppmv) TBD INLET TBD OUTLET
AUXILIARY FUEL USED: **Natural Gas**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): **32**

DESCRIBE MAINTENANCE PROCEDURES:
TBD

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:
N/A

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Hammermill Collection Conveyor**	EMISSION SOURCE ID NO: **ES-HMC (new)**
	CONTROL DEVICE ID NO(S): **CD-HMC-BH (new)**
OPERATING SCENARIO ___1___ OF ___1___	EMISSION POINT (STACK) ID NO(S): **EP-11 (new)**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Conveying system for material from the dry hammermills.

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)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **_24__** HR/DAY **_7___** DAY/WK **_52__** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____	☐ NESHAP (SUBPARTS?):_____
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION:	EMISSION SOURCE ID NO: **ES-HMC (new)**
Hammermill Collection Conveyor	CONTROL DEVICE ID NO(S): **CD-HMC-BH (new)**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-11 (new)**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Dust from the dry hammermill collection conveyor is vented to a baghouse (CD-HMC-BH1) 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**	**68**	

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

CONTROL DEVICE ID NO: **CD-HMC-BH (new)**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-HMC (new)**
EMISSION POINT (STACK) ID NO(S): **EP-11 (new)**	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
__1__ OF __1__	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
This baghouse controls particulate from the dry hammermill conveying system.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANTS 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 AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN: MAX: **TBD** GAUGE? ☑ YES ☐ NO	
BULK PARTICLE DENSITY (LB/FT^3): **TBD**	INLET TEMPERATURE (°F): **TBD**
POLLUTANT LOADING RATE: **0.004** ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) **TBD**
INLET AIR FLOW RATE (ACFM): **1,500**	FILTER OPERATING TEMP (°F): **N/A**

NO. OF COMPARTMENTS: **TBD**	NO. OF BAGS PER COMPARTMENT: **TBD**	LENGTH OF BAG (IN.): **TBD**
NO. OF CARTRIDGES: **TBD**	FILTER SURFACE AREA PER CARTRIDGE (FT^2): **TBD**	DIAMETER OF BAG (IN.): **TBD**
TOTAL FILTER SURFACE AREA (FT^2): **TBD**	AIR TO CLOTH RATIO: **TBD**	

DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE 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 contains wood dust particules.

PARTICLE SIZE DISTRIBUTION

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 — NCDEQ/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**
	CONTROL DEVICE ID NO(S): **CD-PMFS-BH**
OPERATING SCENARIO ___1___ OF ___1___	EMISSION POINT (STACK) ID NO(S): **EP-12**

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)	☐ Manuf. 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: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **_24__** HR/DAY **_7___** DAY/WK **_52__** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____	☐ NESHAP (SUBPARTS?):_____

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 — NCDEQ/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-BH**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT(STACK) ID NO(S): **EP-12**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
A pellet mill feed silo stores dried ground wood prior to transport to the pellet presses.

MATERIAL STORED: **Dried ground wood**				DENSITY OF MATERIAL (LB/FT3): **TBD**	
CAPACITY	CUBIC FEET:			TONS: **TBD**	
DIMENSIONS (FEET)	HEIGHT: **70**	DIAMETER: **TBD**	*(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	☐ TRUCK
☐ OTHER:	☐ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☑ OTHER:

NO. FILL TUBES:	
MAXIMUM ACFM:	

MATERIAL IS UNLOADED TO: **Pellet Mill/Presses**

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

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

CONTROL DEVICE ID NO: **CD-PMFS-BH**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-PMFS**
EMISSION POINT (STACK) ID NO(S): **EP-12**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
OPERATING SCENARIO:	
1 OF **1**	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

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

POLLUTANTS 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 AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN: MAX: **TBD** GAUGE? ☑ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT^3): **TBD**	INLET TEMPERATURE (°F): **TBD**	
POLLUTANT LOADING RATE: **0.004** ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) **TBD**	
INLET AIR FLOW RATE (ACFM): **2,444**	FILTER OPERATING TEMP (°F): **N/A**	
NO. OF COMPARTMENTS: **TBD**	NO. OF BAGS PER COMPARTMENT: **TBD**	LENGTH OF BAG (IN.): **TBD**
NO. OF CARTRIDGES: **TBD**	FILTER SURFACE AREA PER CARTRIDGE (FT^2): **TBD**	DIAMETER OF BAG (IN.): **TBD**
TOTAL FILTER SURFACE AREA (FT^2): **TBD**	AIR TO CLOTH RATIO: **TBD**	
DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCEDURES

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

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 contains wood dust particulate emissions.

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Pellet Cooler HP Fines Relay System**	EMISSION SOURCE ID NO: **ES-PCHP**
	CONTROL DEVICE ID NO(S): **CD-PCHP-BH**
OPERATING SCENARIO ___1___ OF ___1___	EMISSION POINT (STACK) ID NO(S): **EP-13**

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

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)	☐ Manuf. 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: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **_24_** HR/DAY **_7___** DAY/WK **_52__** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____	☐ NESHAP (SUBPARTS?):_____
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | **B6**

EMISSION SOURCE DESCRIPTION: **Pellet Cooler HP Fines Relay System**	EMISSION SOURCE ID NO: **ES-PCHP**
	CONTROL DEVICE ID NO(S): **CD-PCHP-BH**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **EP-13**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Fine pellet material from the hammermill pollution control system and screening operation is collected in the pellet cooler high pressure fines relay system which is controlled by a baghouse.

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

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

NO. FILL TUBES: **TBD**

MAXIMUM ACFM: **TBD**

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

CONTROL DEVICE ID NO: CD-PCHP-BH	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-PCHP
EMISSION POINT (STACK) ID NO(S): EP-13	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
The baghouse collects dust from displacement of air that occurs when wood enters or exits the pellet cooler high pressure fines relay system.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANTS COLLECTED:				
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN: MAX: TBD	GAUGE? ☑ YES NO	
BULK PARTICLE DENSITY (LB/FT^3): TBD	INLET TEMPERATURE (°F): TBD	
POLLUTANT LOADING RATE: 0.004 ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) TBD	
INLET AIR FLOW RATE (ACFM): 500	FILTER OPERATING TEMP (°F): N/A	
NO. OF COMPARTMENTS: TBD	NO. OF BAGS PER COMPARTMENT: TBD	LENGTH OF BAG (IN.): TBD
NO. OF CARTRIDGES: TBD	FILTER SURFACE AREA PER CARTRIDGE (FT^2): TBD	DIAMETER OF BAG (IN.): TBD
TOTAL FILTER SURFACE AREA (FT^2): TBD	AIR TO CLOTH RATIO: TBD	
DRAFT TYPE: ☐ INDUCED/NEGATIVE ☑ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCEDURES:

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

DESCRIBE INCOMING AIR STREAM:
The air stream contains wood dust particules. Larger particles are removed by the upstream cyclone.

PARTICLE SIZE DISTRIBUTION

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Pellet Cooler LP Fines Relay System**	EMISSION SOURCE ID NO: **ES-PCLP**
	CONTROL DEVICE ID NO(S): **CD-PCLP-BH**
OPERATING SCENARIO ___1___ OF ___1___	EMISSION POINT (STACK) ID NO(S): **EP-14**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Six (6) Pellet Coolers follow the pellet presses to cool the newly formed pellets down to an acceptable storage temperature. The recirculation for the pellet coolers in the pellet cooler low pressure fines relay system) is controlled by a baghouse.

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)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____	☐ NESHAP (SUBPARTS?):_____
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations In Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate **B9**

EMISSION SOURCE DESCRIPTION: **Pellet Cooler LP Fines Relay System**	EMISSION SOURCE ID NO: **ES-PCLP**
	CONTROL DEVICE ID NO(S): **CD-PCLP-BH**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-14**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Six (6) Pellet Coolers follow the pellet presses to cool the newly formed pellets down to an acceptable storage temperature. The recirculation for the pellet coolers in the pellet cooler low pressure fines relay system is controlled by a baghouse.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Pellet Cooler Exhaust		**3,102 CFM**	

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

CONTROL DEVICE ID NO: CD-PCLP-BH	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-PCLP
EMISSION POINT (STACK) ID NO(S): EP-14	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
The baghouse collects dust from displacement of air that occurs when wood enters or exits the pellet coolers.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANTS 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 AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN: MAX: TBD GAUGE? ☑ YES NO	
BULK PARTICLE DENSITY (LB/FT^3): TBD	INLET TEMPERATURE (°F): TBD
POLLUTANT LOADING RATE: 0.004 ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) TBD
INLET AIR FLOW RATE (ACFM): 3,102	FILTER OPERATING TEMP (°F): N/A

NO. OF COMPARTMENTS: TBD	NO. OF BAGS PER COMPARTMENT: TBD	LENGTH OF BAG (IN.): TBD
NO. OF CARTRIDGES: TBD	FILTER SURFACE AREA PER CARTRIDGE (FT^2): TBD	DIAMETER OF BAG (IN.): TBD
TOTAL FILTER SURFACE AREA (FT^2): TBD	AIR TO CLOTH RATIO: TBD	

DRAFT TYPE: ☐ INDUCED/NEGATIVE ☑ FORCED/POSITIVE FILTER MATERIAL: ☐ WOVEN ☑ FELTED

DESCRIBE CLEANING PROCEDURES:

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

DESCRIBE INCOMING AIR STREAM:
The air stream contains wood dust particules. Larger particles are removed by the upstream cyclone.

PARTICLE SIZE DISTRIBUTION

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Pellet Dust Collection Transfer Bin**	EMISSION SOURCE ID NO: **ES-PDCTB**
	CONTROL DEVICE ID NO(S): **CD-PSTB-BH**
OPERATING SCENARIO ___1___ OF ___1___	EMISSION POINT (STACK) ID NO(S): **EP-15**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Pelletized wood is transferred from the pellet coolers to the truck loadout operations via conveyor. Emissions from this conveyor are controlled by the pellet dust collection transfer bin baghouse.

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)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☐ Other (Form B9)

START CONSTRUCTION DATE: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____	☐ NESHAP (SUBPARTS?):_____

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **B6**

EMISSION SOURCE DESCRIPTION: **Pellet Dust Collection Transfer Bin**	EMISSION SOURCE ID NO: **ES-PDCTB**
	CONTROL DEVICE ID NO(S): **CD-PDCTB-BH**
OPERATING SCENARIO: ___1___ OF ___1___	EMISSION POINT(STACK) ID NO(S): **EP-15**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Pelletized wood is transferred from the pellet coolers to the truck loadout operations via conveyor. Emissions from this conveyor are controlled by the pellet dust collection transfer bin baghouse.

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

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

NO. FILL TUBES: **TBD**

MAXIMUM ACFM: **TBD**

MATERIAL IS UNLOADED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

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

CONTROL DEVICE ID NO: CD-PDCTB-BH	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-PDCTB
EMISSION POINT (STACK) ID NO(S): EP-15	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
A baghouse is used to create a slight negative pressure on the Pellet Dust Collection Transfer Bin. The baghouse collects dust from the air volume present in the bin and is sized to offset the air displacement created by the material feed to the bin.

POLLUTANTS 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 AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP ($IN\ H_2O$): MIN: MAX: TBD GAUGE? ☑ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT^3): TBD	INLET TEMPERATURE (°F): TBD	
POLLUTANT LOADING RATE: 0.004 ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) TBD	
INLET AIR FLOW RATE (ACFM): 3,000	FILTER OPERATING TEMP (°F): N/A	
NO. OF COMPARTMENTS: TBD	NO. OF BAGS PER COMPARTMENT: TBD	LENGTH OF BAG (IN.): TBD
NO. OF CARTRIDGES: TBD	FILTER SURFACE AREA PER CARTRIDGE (FT^2): TBD	DIAMETER OF BAG (IN.): TBD
TOTAL FILTER SURFACE AREA (FT^2): TBD	AIR TO CLOTH RATIO: TBD	
DRAFT TYPE: ☐ INDUCED/NEGATIVE ☑ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCEDURES

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

DESCRIBE INCOMING AIR STREAM:
The air stream contains 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	

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Finished Product Handling/Pellet Loadout Bins**	EMISSION SOURCE ID NO: **ES-FPH, ES-PB-1 and 2**
	CONTROL DEVICE ID NO(S): **CD-FPH-BH**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-16**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Pelletized product is conveyed to one of two pellet loadout bins (ES-PB-1 and 2) that feed enclosed rail cars. Emissions from the pellet loadout bins are controlled by a baghouse.

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)	☐ Manuf. 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: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 NCDEQ/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-BH**
OPERATING SCENARIO: **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-16**

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)
Wood Pellets	**ODT**	**80**	

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 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | **B6**

EMISSION SOURCE DESCRIPTION: **Two (2) Pellet Loadout Bins**	EMISSION SOURCE ID NO: **ES-PB1 and 2**
	CONTROL DEVICE ID NO(S): **CD-FPH-BH**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **EP-16**

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 closed top hopper rail cars.

MATERIAL STORED: **Pellet Product**				DENSITY OF MATERIAL (LB/FT3): **TBD**	
CAPACITY	CUBIC FEET:			TONS:	
DIMENSIONS (FEET)	HEIGHT:	DIAMETER: **TBD**	***(OR)***	LENGTH: WIDTH: HEIGHT:	
ANNUAL PRODUCT THROUGHPUT (TONS)	ACTUAL:			MAXIMUM DESIGN CAPACITY: **80 ODT/hr**	

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

NO. FILL TUBES: **TBD**

MAXIMUM ACFM: **TBD**

MATERIAL IS UNLOADED 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 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: CD-FBH-BH	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-FPH, ES-PB-1 and 2
EMISSION POINT (STACK) ID NO(S): EP-16	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
This baghouse controls particulate from the finished product handling pellet conveyers and screens.

POLLUTANTS 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 AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN: MAX: TBD	GAUGE? ☑ YES ☐ NO	Warning Alarm ☑ Yes	☐ No
BULK PARTICLE DENSITY (LB/FT^3): TBD	INLET TEMPERATURE (°F): TBD		
POLLUTANT LOADING RATE: 0.004 ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) TBD		
INLET AIR FLOW RATE (ACFM): 8,500	FILTER OPERATING TEMP (°F): N/A		
NO. OF COMPARTMENTS: TBD	NO. OF BAGS PER COMPARTMENT: TBD	LENGTH OF BAG (IN.): TBD	
NO. OF CARTRIDGES: TBD	FILTER SURFACE AREA PER CARTRIDGE (FT^2): TBD	DIAMETER OF BAG (IN.): TBD	
TOTAL FILTER SURFACE AREA (FT^2): TBD	AIR TO CLOTH RATIO: TBD		
DRAFT TYPE: ☐ INDUCED/NEGATIVE	☑ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN	☑ FELTED

DESCRIBE CLEANING PROCEDURES:

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

DESCRIBE INCOMING AIR STREAM:
The air stream contains wood dust particules.

PARTICLE SIZE DISTRIBUTION

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

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Dried Wood Handling**	EMISSION SOURCE ID NO: **ES-DWH**
	CONTROL DEVICE ID NO(S): **CD-DWH-BH-1 and 2**
OPERATING SCENARIO ____1____ OF ____1____	EMISSION POINT (STACK) ID NO(S): **EP-17 and 18**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
There are several transfer points comprising emission source ES-DWH that are located between the dryer and dry hammermills. These sources are completely enclosed with only two (2) emission points that are controlled by individual baghouses (CD-DWH-BH-1 and 2).

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)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **_24__** HR/DAY **__7__** DAY/WK **_52__** WK/YR

IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____ ☐ NESHAP (SUBPARTS?):_____

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 | NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate | **B9**

EMISSION SOURCE DESCRIPTION: **Dried Wood Handling**	EMISSION SOURCE ID NO: **ES-DWH**
	CONTROL DEVICE ID NO(S): **CD-DWH-BH-1 and 2**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-17 and 18**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
There are several transfer points comprising emission source ES-DWH that are located between the dryer and dry hammermills. These sources are completely enclosed with only two (2) emission points that are controlled by individual baghouses (CD-DWH-BH-1 and 2).

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood	ODT	80	

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

CONTROL DEVICE ID NO: **CD-DWH-BH-1 and 2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-DWH**
EMISSION POINT (STACK) ID NO(S): **EP-17 & 18**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
OPERATING SCENARIO:	
1 OF **1**	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
Two (2) baghouses are used to create a slight negative pressure on the dried wood handling. The baghouses collects dust from the air volume present in the dried wood handling.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANTS COLLECTED:				
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	**~99.9** %	**~99.9** %	**~99.9** %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	**See calculations in Appendix C**			

PRESSURE DROP (IN H_2O): MIN: MAX: **TBD** GAUGE? ☑ YES NO	
BULK PARTICLE DENSITY (LB/FT^3): **TBD**	INLET TEMPERATURE (°F): **TBD**
POLLUTANT LOADING RATE: **0.004** ☐ LB/HR ☑ GR/FT^3	OUTLET TEMPERATURE (°F) **TBD**
INLET AIR FLOW RATE (ACFM): **1,000**	FILTER OPERATING TEMP (°F): **N/A**

NO. OF COMPARTMENTS: **TBD**	NO. OF BAGS PER COMPARTMENT: **TBD**	LENGTH OF BAG (IN.): **TBD**
NO. OF CARTRIDGES: **TBD**	FILTER SURFACE AREA PER CARTRIDGE (FT^2): **TBD**	DIAMETER OF BAG (IN.): **TBD**
TOTAL FILTER SURFACE AREA (FT^2): **TBD**	AIR TO CLOTH RATIO: **TBD**	

DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE — FILTER MATERIAL: ☐ WOVEN ☑ FELTED

DESCRIBE CLEANING PROCEDURES:

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

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 contains additive dust particles.

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION: **Additive Handling and Storage**	EMISSION SOURCE ID NO: **ES-ADD**
	CONTROL DEVICE ID NO(S): **CD-ADD-BH**
OPERATING SCENARIO ____1____ OF ____1____	EMISSION POINT (STACK) ID NO(S): **EP-19**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Bulk additive material will be delivered by truck and pneumatically unloaded into a storage silo. The additive will then be conveyed via screw conveyor from the storage silo to the milled fiber conveyor which transfers milled wood to the Pellet Presses. Emissions from additive handling are controlled by a baghouse.

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)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: **TBD**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **_24__** HR/DAY **__7__** DAY/WK **_52__** WK/YR

IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____ ☐ NESHAP (SUBPARTS?):_____

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix C**						
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	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A								

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS 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 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **B6**

EMISSION SOURCE DESCRIPTION: **Additive Handling and Storage**	EMISSION SOURCE ID NO: **ES-ADD**
	CONTROL DEVICE ID NO(S): **CD-ADD-BH**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **EP-19**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Bulk additive material will be delivered by truck and pneumatically unloaded into a storage silo. The additive will then be conveyed via screw conveyor from the storage silo to the milled fiber conveyor which transfers milled wood to the Pellet Presses. Emissions from additive handling are controlled by a baghouse.

MATERIAL STORED: **Additive**				DENSITY OF MATERIAL (LB/FT3): **TBD**		
CAPACITY	CUBIC FEET:			TONS:		
DIMENSIONS (FEET)	HEIGHT:	DIAMETER: **TBD**	***(OR)***	LENGTH:	WIDTH:	HEIGHT:
ANNUAL PRODUCT THROUGHPUT (TONS)	ACTUAL:			MAXIMUM DESIGN CAPACITY: **TBD**		

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

NO. FILL TUBES: **TBD**

MAXIMUM ACFM: **TBD**

MATERIAL IS UNLOADED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?
Conveyed via screw conveyor to the milled fiber conveyor which transfers milled wood to the Pellet Presses.

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

CONTROL DEVICE ID NO: CD-ADD-BH	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-ADD
EMISSION POINT (STACK) ID NO(S): EP-19	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
1 OF 1	P.E. SEAL REQUIRED (PER 2q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM:
The silo baghouse will control air displaced by the loaded additive.

	PM	PM_{10}	$PM_{2.5}$	
POLLUTANTS COLLECTED:				
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	99.9 %	99.9 %	99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix C			

PRESSURE DROP (IN H_2O): MIN: MAX: TBD GAUGE? ☑ YES NO	
BULK PARTICLE DENSITY (LB/FT^3): TBD	INLET TEMPERATURE (°F): TBD
POLLUTANT LOADING RATE: 0.004 ☐ LB/HR ☑ LB/FT^3	OUTLET TEMPERATURE (°F): TBD
INLET AIR FLOW RATE (ACFM): 1,000 each	FILTER OPERATING TEMP (°F): N/A

NO. OF COMPARTMENTS: TBD	NO. OF BAGS PER COMPARTMENT: TBD	LENGTH OF BAG (IN.): TBD
NO. OF CARTRIDGES: TBD	FILTER SURFACE AREA PER CARTRIDGE (FT^2): TBD	DIAMETER OF BAG (IN.): TBD
TOTAL FILTER SURFACE AREA (FT^2): TBD	AIR TO CLOTH RATIO: TBD	

DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE — FILTER MATERIAL: ☐ WOVEN ☑ FELTED

DESCRIBE CLEANING PROCEDURES:

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

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 contains wood dust particules.

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

COMMENTS:

Attach Additional Sheets As Necessary

Figure 2. Process Flow Diagram
Enviva Pellets Hamlet, LLC – Richmond County, NC