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Re: Permit Modification Application for PSD Minor Source Status

Enviva Pellets Northampton, LLC

Garysburg, North Carolina

Northampton County

Permit No.: 10203R05

Facility ID: 6600167

March 29, 2019

Ramboll

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Dear Mr. Willets: T +1 225-408 2691 www.ramboll.com

Enviva submitted an application for a permit modification to reclassify Enviva
Pellets Northampton, LLC (Enviva) as a Prevention of Significant Deterioration (PSD) and hazardous air
pollutant (HAP) minor source on September 28, 2018. Additionally, Enviva submitted an addendum to the
September 2018 application on January 7, 2019. As requested by the North Carolina Department of
Environmental Quality (NC DEQ) Enviva agreed to consolidate the changes proposed with the September
2018 application and January 2019 addendum into a single package. That consolidated application is
enclosed and serves to replace the September 2018 application and January 2019 addendum.
Furthermore, the enclosed replacement application includes minor needed revisions identified during
Enviva's review of the September 2018 application and January 2019 addendum.

Enviva requests that the procedures of 15A NCAC 2Q .0504 be applied to this project allowing issuance of a construction and operating permit under 15A NCAC 2D .0300. As required, three (3) copies of the complete replacement application package are enclosed. The required permit application review fee was included with the initial application submittal.

If you have any questions or require additional information, please contact me at (225) 408-2691 or Kai Simonsen, Air Permit Engineer at Enviva, at (984) 789-3628.

Yours sincerely,

MASZ

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Enclosures: Permit Application including Appendices

Prepared for
Enviva Pellets Northampton, LLC
Northampton County, North Carolina

Prepared By
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Project Number **1690009489**

Date September 2018 (Revised March 2019)

MODIFICATION APPLICATION FOR PSD MINOR SOURCE STATUS

ENVIVA PELLETS NORTHAMPTON, LLC





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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 + NO₂)

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

ACRONYMS AND ABBREVIATIONS (Continued)

PM_{2.5} Particulate Matter Less Than 2.5 Micrometers in Aerodynamic Diameter

PM₁₀ 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

SO₂ 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 Northampton, LLC (Enviva) owns and operates a wood pellet manufacturing plant (referred to herein as "the Northampton plant", "the plant", or "the facility") in Northampton County, North Carolina. The plant currently operates under Air Quality Permit No. 10203R05 issued by the North Carolina Department of Environmental Quality (NCDEQ), Division of Air Quality (DAQ) on March 3, 2017. The plant consists 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.

The Northampton 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 remain above the major source threshold of 25 tpy, and 10 tpy, respectively.

Enviva submitted a modification application on September 28, 2018 and an addendum to that application on January 7, 2019. This application combines the changes proposed in the September 2018 application and January 2019 addendum and serves to replace the initial application. Additionally, this replacement application includes minor required revisions identified during Enviva's review of the September 2018 application and January 2019 addendum.

Enviva requests that the procedures of 15A NCAC 2Q .0504 be utilized for this modification allowing issuance of a construction and operating permit under 15A NCAC 2D .0300. Enviva will thereafter submit a permit application for a Title V Permit Modification within one year after commencement of operations. 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 the significant emission reductions proposed as part of this modification, the Northampton plant's potential emissions will be less than the PSD and HAP major source thresholds, thus, the facility will be classified as a PSD and HAP minor source. The facility will, however, continue to be classified as a major source under the Title V program.

The following summarizes the proposed changes associated with this modification:

- Increase production rate from 535,260 ODT per year to 781,355 ODT per year and increase softwood processed from a maximum of 30% to a maximum of 80% annually;
- Upgrade existing pellet dies with a new 1500 mm prototype;
- Add a chiller, with air to air heat exchanger, to chill air used in the pellet coolers for product quality purposes;
- Install a new direct wood-fired dryer (ES-DRYER-2) equipped with WESP and RTO (CD-WESP-2 and CD-RTO-2);
- Rename the existing dryer from ES-DRYER to ES-DRYER-1 and existing WESP from CD-WESP to CD-WESP-1. Add a regenerative thermal oxidizer (CD-RTO-1) to the existing dryer (ES-DRYER-1) following the existing wet electrostatic precipitator (CD-WESP-1). As such, the existing WESP stack will be replaced with the proposed RTO stack;

- Delete control device CD-DC as this cyclone is used for process material separation and not emission control;
- Remove two existing closed-loop Green Wood Hammermills currently permitted as rechippers (IES-RCHP-1 and IES-RCHP-2) and construct five (5) new closed-loop Green
 Wood Hammermills (ES-GHM-1 through ES-GHM-5) and route the exhaust to the existing
 wet electrostatic precipitator (CD-WESP-1) and proposed RTO (CD-RTO-1). The Green
 Wood Hammermills will also have the ability to be routed and controlled by the CD-WESP2 and CD-RTO-2 when the CD-WESP-1 and CD-RTO-2 are shut down;
- Assign source ID ES-PS-1 and ES-PS-2 to the existing dry hammer mill pre-screeners.
- Add chip reclaim automation by adding up to three truck tippers and a chip stacker reclaimer, and removing most front-end loader usage;
- Add two (2) new dry hammermills (ES-DSHM-1 and ES-DSHM-2) dedicated to dry shavings and route the exhaust to a proposed new wet scrubber (CD-WS-1) and Regenerative Catalytic Oxidizer (RCO) (CD-RCO-1) that can also operate as a Regenerative Thermal Oxidizer (RTO).
- Add source IDs for Dry Shavings Handling and Storage (IES-DRYSHAVE and IES-DRYSHAVE-1), Dry Shaving Reception (ES-DSR) and a proposed Dry Shavings Reception Dust Control Baghouse (CD-DSR-BF);
- Add source IDs for the Dry Shavings Silo (ES-DSS) and associated baghouse (CD-DSS-BF);
- Dry Hammermills (ES-HM-1 through 8) will exhaust through a new wet scrubber (CD-WS-1) and RCO (CD-RCO-1) that can also operate as an RTO to control emissions from the Dry Hammermills (ES-HM-1 through 8) and proposed Dry Shavings Hammermills (ES-DSHM-1 and 2).
- Add an additive silo (IES-ADD) and accompanying baghouse (CD-ADD-BF);
- Route Pellet Cooler exhausts through a new wet scrubber (CD-WS-2) and RCO (CD-RCO-2) that can also operate as an RTO to control emissions;
- Add a Propane Vaporizer (IES-PVAP) for RTOs/RCO;
- Add four (4) double duct burners (IES-DDB-1 through IES-DDB-4), two per dryer line on the exhaust and recirculation ducts, to reduce the risk of moisture condensation.;
- Add dryer and furnace bypass stacks (ES-DRYERBYP-1, ES-DRYERBYP-2, ES-FURNACEBYP-1, ES-FURNACEBYP-2);
- Update dry wood handling from IES-DWH to ES-DWH-1 and add a second dry wood handling emission point ES-DWH-2. Emissions from ES-DWH-1 and ES-DWH-2 will be controlled via two new baghouses CD-DWH-BF-1 and CD-DWH-BF-2 respectively, one for each dryer line, at the post dryer conveyors;
- Add a mobile fuel diesel storage tank (IES-TK-3);
- Change source ID for IES-GN to IES-GN-1 and add a second emergency generator (ES-GN-2) and associated diesel storage tank (IES-TK-4);
- Remove CD-HM-BF-3 as a control device for the Dry Line Feed Conveyor (ES-DLC-1);

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- Replace the TLO Bucket Elevator Belt & Buckets;
- Upgrade/Replace the Pellet Mill Fines Bin Screw and Pellet Screener (ES-FPH) controlled by existing baghouse CD-FPH-BF to accommodate higher throughput;
- Replace the Dryer Furnace Fuel Surge Bin; and
- Replace Green Hammermill Wear Plates and upgrade Green Hammermill hydraulics.

In addition to the changes proposed above, Enviva also proposes the following reconciliations:

- Reconcile log chipper emissions (IES-CHIP-1) into electric powered wood chipper source ID (IES-EPWC) and delete IES-CHIP-1;
- Update the source ID for Green Wood Handling and Storage from IES-GWHS to ES-GWHS, reconcile drop points and material transfers associated with the Green Wood Handling and Storage (ES-GWHS) source ID, and add a new drop point for the dryer furnace fuel bin walking floor;
- Remove sources associated with the bagging system. These include ES-BSC-1 through ES-BSC-3, ES-BSS-1 and ES-BSS-2, and ES-BSB-1, ES-BSB-2, and CD-BS-BF-1 and 2;
- Correct source IDs for the diesel storage tanks from IS-TK-1 and IS-TK-2 to IES-TK-1 and IES-TK-2;
- Correct source ID for dry line hopper from ES-DLH to IES-DLH to reflect updated status as an insignificant activity; and
- Re-name the currently permitted Pellet Fines Bin (ES-PFB-1) and associated bin vent filter (CD-PFB-BV) to Pellet Cooler HP Fines Relay System (ES-PCHP) and baghouse (ES-PCHP-BV);
- Delete source ID IES-FPH as emissions are accounted for under ES-FPH;
- Permit the Bark Hog and Debarker as separate sources (IES-BARK and IES-DEBARK).
 These sources are currently permitted under Green Wood Handling and Storage (ES-GWHS).
- Delete source ID IES-PP as emissions are accounted for under ES-CLR-1 through ES-CLR-6.

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.

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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 CO₂/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 description of the proposed changes to the Northampton plant. An area map and process flow diagram are provided in Appendices A and B, respectively.

2.1 Green Wood Handling and Storage (ES-GWHS)

"Green" (i.e., fresh cut) wood is delivered to the plant via trucks as either pre-chipped wood or unchipped logs from commercial harvesting for on-site chipping. Pre-chipped wood is screened to remove oversize material which goes to the furnace fuel pile. Logs are debarked, chipped, and sized in the, Debarker (IES-DEBARK), Chipper (IES-EWPC) and Green Wood Hammermills (ES-GHM-1 through 5). Chipped wood for drying is conveyed to a chipped wood storage pile and bark is conveyed to a bark fuel storage pile. All transfer points and storage piles are captured by the Green Wood Handling and Storage source. With this application, Enviva proposes to correct the Green Wood Handling and Storage source ID from IES-GWHS to ES-GWHS. Additionally, Enviva proposes to reconcile drop points and material transfers associated with the Green Wood Handling and Storage source ID as well as add a new drop point for the dryer furnace fuel bin walking floor. Enviva also proposes to remove the Debarker and Bark Hog from the Green Wood Handling and Storage emission source and permit these as individual emission sources under IDs IES-DEBARK and IES-BARK, respectively.

2.2 Debarking (IES-DEBARK), Chipping (IES-EWPC), Bark Hog (IES-BARK), and Green Wood Fuel Storage Bin (IES-GWFB)

Logs are debarked by the electric-powered rotary drum Debarker (IES-DEBARK) and then sent to the electric powered green wood chipper (IES-EPWC) to chip the wood to specification and routed to Green Wood Storage Piles. Purchased chips received by three (3) truck dumps are also transferred to Green Wood Storage Piles. Bark from the Debarker is hogged and

purchased bark/fuel chips from one truck dump or walking floor trailers are transferred to the bark pile. Following storage in the Bark Fuel and Chip Storage Piles, the bark is transferred to a blend pile and then transferred via walking floor to a covered conveyor, then to an enclosed Green Wood Fuel Storage Bin (IES-GWFB) where the material is pushed into the furnace.

With this application, Enviva proposes to automate the chip reclaim operations by using up to three (3) truck tippers and a stacker reclaimer, as well as removing most front-end loader usage. Enviva also plans to install a second walking floor next to the existing one associated with a new fuel blend pile for the new dryer line. Additionally, Enviva proposes to delete the IES-CHIP-1 source and incorporate the associated emissions with the IES-EPWC source ID.

2.3 Green Wood Hammermills (ES-GHM-1 through ES-GHM-5)

With this application, Enviva is proposing to remove the currently permitted re-chippers (IES-RCHP-1 and IES-RCHP2) and construct five (5) new closed-loop green wood hammermills (ES-GHM-1 through ES-GHM-5) and route the exhaust to the existing WESP (CD-WESP-1) and to the proposed new RTO (CD-RTO-1). Prior to drying, chips from the Green Wood Storage Piles will be processed in these Green Wood Hammermills to reduce material to the proper size. The Green Wood Hammermills will have the ability to be routed and controlled by the new dryer's WESP (CD-WS-2) and RTO (CD-RTO-2) when the Dryer 1 WESP and RTO are shut down.

2.4 Dryers (ES-DRYER-1 and ES-DRYER-2)

The existing dryer (ES-DRYER) uses direct contact heat provided to the system via a 175.3 million British thermal unit per hour (MMBtu/hr) total heat input furnace that uses bark and wood chips as fuel. Green wood is fed into the dryer where the moisture content is reduced to the desired level and routed to a multiclone separator consisting of three identical cyclones equipped to control the discharge of the rotary dryer system. Emissions from each cyclone are combined into a common duct and are routed to the WESP (CD-WESP-1) for additional particulate, metallic HAP, and hydrogen chloride removal. With this application, Enviva proposes to rename the existing dryer from ES-DRYER to ES-DRYER-1 and rename the existing WESP from CD-WESP to CD-WESP-1.

Additionally, Enviva proposes to equip the existing dryer with a RTO (CD-RTO-1) following the existing WESP (CD-WESP-1). Enviva also proposes to install a new direct contact rotary dryer system (ES-DRYER-2) equipped with a WESP (CD-WESP-2) and RTO (CD-RTO-2) to provide PM, VOC, and HAP emissions control. The new dryer, similar to the existing dryer, will use direct contact heat provided to the system via a 180 MMBtu/hr total heat input furnace that uses bark and fuel chips as fuel.

As the flue gas exits the dryers and begins to cool, wood tar can condense and coat the inner walls of the dryer ducts creating a fire risk. To prevent condensation from occurring and thus reduce the fire risk, each dryer system will include double ducts which will be heated. The duct from the cyclone outlet to the ID fan will be heated by one low-NOx burner with a maximum heat input rating of 1 MMBtu/hr and a second 1 MMBtu/hr low-NOx burner will be used to heat the duct used for exhaust gas recirculation and the WESP. The double duct burners (IES-DDB-1 through IES-DDB-4) will combust natural gas, or propane as back-up, and will exhaust directly to atmosphere.

2.5 Bypass Stacks (ES-DRYERBYP-1, ES-DRYERBYP-2, ES-FURNACEBYP-1, ES-FURNACEBYP-2)

Bypass stacks for each furnace and rotary drum dryer may be used to exhaust hot gases during start-ups (for temperature control) and malfunctions. Specifically, the Furnace Bypass Stacks will be used in the following situations:

- Cold Start-ups: The furnace bypass stacks will be used when the furnace is started up
 from a cold shutdown until the refractory is sufficiently heated and can sustain operations
 at a low level. The bypass stack will then be closed, and the furnace will slowly be
 brought up to a normal operating rate.
- Malfunction: The furnace itself can abort and open the bypass stack in the event of a malfunction. This may occur as a result of a number of different interlocks such as power failure, dryer ID fan failure, etc. As soon as the furnace aborts it will automatically switch to "idle mode" (defined as operation at up to a maximum heat input rate of 5 MMBtu/hr). The fuel feed is significantly reduced, and the heat input rate drops rapidly.
- **Planned Shutdown:** In the event of a planned shutdown the furnace heat input will be decreased, and all remaining fuel will be moved through the system to prevent a fire during the shutdown period. The remaining fuel will be combusted prior to opening the furnace bypass stack.

Conditions under which the Dryer Bypass Stacks will be used are as follows:

- **Malfunction:** The dryer system can abort due to a number of different interlocks such as power failure, equipment failure, or as a result of a furnace abort. If the RTO goes offline as a result of interlock failure the dryer will immediately abort. This can occur for a number of reasons (e.g., temperature out of range, damper failure, power failure, etc.). Dryer abort may also be triggered if a spark is detected.
- Planned Shutdown: During planned shutdowns, as the remaining fuel is combusted by the furnace, the operator will reduce the chip input to the dryer. When only a small amount of chips remains, these will be emptied to clean the dryer drum out. The dryer bypass stack will then be opened, and a purge air fan used to ensure no explosive build-up occurs in the drum. Emissions during this time will be minimal as the furnace and dryer are no longer operating.

Use of the Furnace and Dryer Bypass Stacks for start-up, shutdown, and malfunctions will be limited to 100 hours per year for each dryer line (i.e., 50 hours of furnace bypass at full capacity and 50 hours of dryer bypass at full capacity).

Each furnace may also operate up to 500 hours per year in "idle mode" with emissions routed to the Furnace Bypass Stacks. The purpose of operation in "idle mode" is to maintain the temperature of the fire brick lining the furnaces which may be damaged if it cools too rapidly. Operation in "idle mode" also significantly reduces the amount of time required to restart the dryers.

2.6 Dried Wood Handling (ES-DWH-1 and ES-DWH-2), Dry Shavings Reception and Handling (ES-DSR, IES-DRYSHAVE, IES-DRYSHAVE-1), Dry Hammermills (ES-HM-1 through ES-HM-8), Dry Line Conveyor (ES-DLC-1), Dry Line Hopper (IES-DLH), and Nuisance Dust System (ES-NDS), Dry Shavings Hammermills (ES-DSHM-1 and 2), Dry Shavings Silo (ES-DSS)

Dried materials from the Dryer product recovery cyclones are conveyed to screening operations that remove smaller wood particles which bypass the Dry Hammermills. The Dried Wood Handling emission source consists of a drop point at the post dryer conveyor. Due to updated emission estimates, this source will no longer be considered insignificant and therefore Enviva requests the ID be changed from IES-DWH to ES-DWH-1. Enviva also proposes to add a second Dry Wood Handling source, ES-DWH-2, to account for the drop point from the proposed new Dryer #2 (ES-DRYER-2) to the conveyor.

Pre-screening is accomplished with two (2) existing pre-screeners both of which will be replaced. Oversized wood is diverted to one of eight (8) existing Dry Hammermills (ES-HM-1 through ES-HM-8) for further size reduction prior to pelletization. Each Dry Hammermill includes a product recovery cyclone (CD-HM-CYC-1 through CD-HM-CYC-8) which are routed to one of three (3) baghouses (CD-HM-BF-1 through CD-HM-BF-3) for particulate matter control. With this application, Enviva proposes to route the exhaust from the existing dry hammermill baghouses to the proposed new scrubber (CD-WS-1) and RCO/RTO (CD-RCO-1) to control PM, VOC and HAP emissions.

Smaller particles passing through the screens will bypass these hammermills and be pneumatically conveyed directly to the Dry Hammermill product recovery cyclones. 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. Product from the recovery cyclones is transferred to the hammermills system discharge collection enclosed drag chain conveyor and then to the pellet mill feed silo infeed screw via enclosed drag chain conveyors. The Nuisance Dust System pulls PM from the Dry Hammermill Area and is controlled using the existing hammermill baghouse (CD-HM-BF-3) which will be routed to a proposed new wet scrubber (CD-WS-1) and RCO/RTO (CD-RCO-1).

Purchased dry shavings are used to produce wood pellets in addition to green chips or logs, forgoing the drying process and thus minimizing onsite VOC and HAP emissions. Currently the plant receives dry shavings at the bark truck dump where they are moved to an open dry shavings pile via front end loader or are received via walking floor trailer at the pile. Dry shavings are added to the Dry Line Hopper (IES-DLH) which transfers via Dry Line Feed Conveyor (ES-DLC-1) to the dry hammermill feed conveyor at the point of the hammermill pre-screens. These transfer activities make up the Dry Shaving Material Handling and Storage (IES-DRYSHAVE) emission source. This system will remain in use for feeding reclaimed materials after start-up of the new dry shavings system. With this application, Enviva proposes to remove CD-HM-BF-3 as a control device for the Dry Line Feed Conveyor and identify a drop point from the Dry Line Hopper to the Dry Line Feed Conveyor. Enviva also proposes to rename the Dry Line Hopper source ID from ES-DLH to IES-DLH to reflect its updated status as an insignificant activity.

As part of this application, Enviva is proposing to add a new Dry Shavings Material Handling and Storage source (IES-DRYSHAVE-1) and assign a source ID for the Dry Shavings Reception

(ES-DSR) both of which will be controlled by a proposed new Dry Shavings Reception Dust Control Baghouse (CD-DSR-BF).

Enviva also proposes to add a Dry Shavings Silo (IES-DSS) to store dry shavings used in pellet production, a Dry Shavings Baghouse (CD-DSS-BF) to control PM emissions, and two new Dry Shavings Hammermills (ES-DSHM-1 and ES-DSHM-2). The purchased dry shavings will be unloaded from trucks via a new truck dump into a hopper that feeds material via enclosed conveyors to a bucket elevator that ultimately fills a silo. From the silo, the dry shavings will then be transferred via an enclosed conveyor to the proposed new Dry Shavings Hammermills (ES-DSHM-1 and ES-DSHM-2) for additional processing. Milled dry shavings will be transferred to the pellet mill feed silo. The dry shavings hammermill exhaust will be routed to the new scrubber (CD-WS-1) and RCO/RTO (CD-RCO-1) for control of PM, VOC, and HAP emissions.

2.7 Pellet Mill Feed Silo (ES-PMFS) and Pellet Cooler HP Fines Relay System (ES-PCHP)

With this application, Enviva proposes to re-name the pellet fines bin (ES-PFB-1) and associated bin vent filter (CD-PFB-BV) to Pellet Cooler HP Fines Relay System (ES-PCHP) and associated baghouse (CD-PCHP-BV).

Milled wood from the Dry Hammermill product recovery cyclones are 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 are controlled by a bin vent filter (CD-PMFS-BF).

Fines from Finished Product Handling (ES-FPH) are collected by the Pellet Cooler HP Fines Relay System (ES-PCHP) which is controlled by a baghouse (CD-PCHP-BV). The Pellet Cooler HP Fines Relay System transfers this material to the Pellet Mill Feed Silo (ES-PMFS).

2.8 Additive Handling and Storage (IES-ADD)

With this application, Enviva proposes to add an Additive Silo (IES-ADD) and baghouse (CD-ADD-BF). Additive will be used in the pellet production process to increase the durability of the final product. The additive will be added to milled 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 equipped with a baghouse 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.

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

Dried processed wood is mechanically compacted through twelve (12) presses in the Pellet Press System. 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. Formed pellets are discharged into one of six (6) pellet coolers (ES-CLR-1 thru ES-CLR-6). Chilled cooling air is passed through the pellets.

At this point, the pellets contain a small amount of wood fines, which are swept out with the cooling air and are controlled utilizing six (6) cyclones (CD-CLR-1 thru CD-CLR-6).

As previously discussed, Enviva is proposing to upgrade the pellet press dies to a new design, and delete the source ID IES-PP since the pellet press emissions are accounted for with the Pellet Coolers. Additionally, Enviva proposes to add a new scrubber (CD-WS-2) to collect the Pellet Cooler exhaust prior to routing the exhaust through a proposed new RCO/RTO (CD-RCO-2) to control VOC and HAP emissions leaving the pellet coolers.

2.10 Finished Product Handling (ES-FPH) and Loadout (ES-PL-1, ES-PL-2, ES-PB-1 through ES-PB-12)

Final product is conveyed to pellet load-out bins (ES-PB-1 through ES-PB-12) that will feed pellet truck loadout operations (ES-PL-1 and ES-PL-2). Pellet loadout is accomplished by gravity feed of the pellets through a covered chute to reduce emissions. Emissions from pellet loadout are minimal because dried wood fines will have been removed in the pellet screener and future screener, and a slight negative pressure is maintained in the loadout building as a fire prevention measure to prevent any build-up of dust on surfaces within the building. This slight negative pressure is produced via an induced draft fan that exhausts to the Finished Product Handling baghouse (CD-FPH-BF). This baghouse controls emissions from Finished Product Handling (ES-FPH) and the Pellet Loadout Bins (ES-PB-1 through ES-PB-12). Fine material from loadout operations is transferred to the Pellet Mill Feed Silo (ES-PMFS).

As noted in Section 1, Enviva proposes to delete IES-FPH as emissions are accounted for under ES- FPH.

2.11 Emergency Generators (IES-GN-1 and IES-GN-2), Fire Water Pump Engine (IES-FWP), and Diesel Storage Tanks (IES-TK-1 through IES-TK-4)

The plant has a 350 brake horsepower (bhp) diesel-fired Emergency Generator (IES-GN) for emergency operations and a 300 bhp diesel-fired Fire Water Pump Engine (IES-FWP). Aside from maintenance and readiness testing, the generator and fire water pump engines are only utilized for emergency operations.

With this application, Enviva proposes to change the existing Emergency Generator ID from IES-GN to IES-GN-1 and add a second diesel-fired Emergency Generator (IES-GN-2). The proposed new emergency generator is required to support operation of the proposed new dryer (ES-DRYER-2). In addition, Enviva proposes to re-name tanks from IS-TK-1 and IS-TK-2 to IES-TK-1 and IES-TK-2. Diesel for the existing emergency generator (IES-GN-1) is stored in a tank of up to 2,500 gallons capacity (IES-TK-1) and diesel for the fire water pump engine is stored in a storage tank of up to 500 gallon capacity (IES-TK-2).

With this application, Enviva proposes to add a third diesel storage tank with a capacity of up to 5,000 gallons (IES-TK-3) for distributing diesel fuel to mobile equipment and a fourth diesel storage tank with a capacity of 1,000 gallons (IES-TK-4) for the proposed generator (IES-GN-2).

2.12 Propane Vaporizer (IES-PVAP)

With this application, Enviva proposes to add a propane vaporizer. A direct-fired propane vaporizer (IES-PVAP) will be located on-site to vaporize propane gas for combustion by the RTO burners, RCO burners, and double duct burners (IES-TK-1 through IES-DDB-4).¹ The vaporizer will have a maximum heat input capacity of 1 MMBtu/hr and will combust propane. Propane may be used initially until natural gas service is completed when natural gas will be the primary fuel for all burners and propane may be used as a back-up fuel.

¹ Any activity whose emissions would not violate any applicable emissions standard and whose potential emissions of criteria pollutants before air control devices are each no more than 5 tpy are considered insignificant per 15A NCAC 02Q .0503.

3. POTENTIAL EMISSIONS QUANTIFICATION

The following summarizes the data sources and calculation methodologies used in quantifying potential emissions from the Northampton plant. Detailed potential emissions calculations are provided in Appendix C. Note that Enviva has quantified potential greenhouse gas (GHG) emissions from all applicable emissions sources; however, GHG emission are not discussed in detail below. Please refer to the detailed emission calculations provided in Appendix C for GHG emission estimates.

3.1 Green Wood Handling and Storage (ES-GWHS)

Fugitive PM emissions 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*. Detailed potential emission calculations are included in Appendix C.

3.2 Green Wood Storage Piles and Bark Fuel Storage Piles (ES-GWHS)

Particulate emission factors used to quantify emissions from storage pile wind erosion for the four (4) Green Wood Storage Piles and three (3) 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 DAQ⁵. 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.

3.3 Debarker (IES-DEBARK) and Bark Hog (IES-BARK)

PM emissions occur as a result of log debarking and processing. Potential PM emissions from debarking and the bark hog were quantified based on emission factors from EPA's AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air

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.

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 is minimal due to the high moisture content of green wood (~50%) and the fact that bark is removed in pieces larger than that which can become airborne. A 90% control efficiency was applied for use of water spray. The Bark Hog is also primarily enclosed, and 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.⁷ Detailed potential emission calculations for the debarker and bark hog are included in Appendix C.

The Debarker (IES-DEBARK) and Bark Hog (IES-BARK) are considered insignificant activities per 15A NCAC 02Q .0503 due to potential uncontrolled PM emissions less than 5 tpy.

3.4 Chipper (IES-EPWC)

The chipping process results in emissions of VOC and HAP. VOC and HAP emissions were quantified based on emission factors for log chipping from AP-42 Section 10.6.3, *Medium Density Fiberboard* and AP-42 Section 10.6.4, *Hardboard and Fiberboard*. Detailed emission calculations are included in Appendix C.

The chipper is considered an insignificant activity per 15A NCAC 02Q .0503 due to potential uncontrolled emissions less than 1 lb/hr.

3.5 Green Wood Fuel Storage Bin

Bark is transferred from the fuel storage piles via a walking floor to a covered conveyor and then to the fully enclosed Green Wood Fuel Storage Bin (ES-GWFB). Due to complete enclosure of the Green Wood Fuel Storage Bin (ES-GWFB), emissions from transfer of material into the bin were not specifically quantified.

3.6 Dryers (ES-DRYER-1 and ES-DRYER-2) and Green Wood Hammermills (ES-GHM-1 through ES-GHM-5)

Exhaust from the dryers will be routed to two dedicated WESP/RTO control systems (one for each dryer line) for control of PM, VOC, and HAP. The Green Wood Hammermills will share the existing dryer's WESP/RTO control system for control of PM, VOC, and HAP. The Green Wood Hammermills will have the ability to be routed and controlled by the Dryer #2 WESP and RTO when the Dryer #1 WESP and RTO are shut down. It should be noted that for potential-to-emit emission estimates Green Wood Hammermill emissions are accounted for under the Dryer #1 WESP and RTO. Uncontrolled PM, PM less than 10 microns in diameter (PM10), and PM less than 2.5 microns in diameter (PM2.5) emission factors for green wood combustion were provided by the WESP vendor. Carbon monoxide (CO) emissions generated during green wood combustion are based on data from similar Enviva facilities and information from the NCASI database. Oxides of nitrogen (NOx) emissions are based on stack test results from similar facilities plus a 30% contingency. Potential emissions of sulfur dioxide (SO2) from green wood combustion were calculated based on the heat input of the dryer burners and an

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

emission factor for wood combustion from AP-42, Section 1.6, *Wood Residue Combustion in Boilers*. 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 from green wood combustion were calculated based on emission factors from several data sources including stack testing data from other similar facilities, engineering judgement/process knowledge, and emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*⁸. Detailed potential emission calculations are provided in Appendix C.

Emissions from natural gas and propane combustion by the RTO were calculated based on AP-42 Section 1.4, *Natural Gas Combustion*, AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion*, NC DAQ's Wood Waste Combustion Spreadsheet⁹, and emission factors from the South Coast Air Quality Management District's (SCAQMD) Air Emissions Reporting (AER) Tool. Detailed emission calculations are included in Appendix C.

3.6.1 Dryer Bypass (Full Capacity)

Bypass stacks following each furnace and rotary drum dryer will be used to exhaust hot gases during start-up (for temperature control), shutdown, and malfunctions. Potential emissions associated with dryer bypass were calculated based on stack testing data from comparable Enviva facilities with the exception of condensable PM and SO_2 emissions which were calculated based on emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*. Emissions were based on the full capacity of the furnaces and 50 hours per year per dryer. Detailed potential emission calculations are included in Appendix C.

3.6.2 Furnace Bypass (Full Capacity)

Potential emissions of CO, NO_X , SO_2 , PM, VOC, and HAP for furnace bypass conditions were calculated based on emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*. Filterable PM emissions were calculated based on stack testing data from a comparable Enviva plant. Emissions were based on the full capacity of the furnaces and 50 hours per year per furnace. Detailed potential emission calculations are included in Appendix C.

3.6.3 Furnace Bypass (Idle Mode)

Each furnace will operate up to 500 hours per year in "idle mode", which is defined as operation up to a maximum heat input rate of 5 MMBtu/hr. During this time, emissions will exhaust out of the furnace bypass stacks. Potential emissions of CO, NO_X, SO₂, PM, VOC, and HAP were calculated based on emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*. Detailed potential emission calculations are included in Appendix C.

⁸ USEPA AP-42 Section 1.6, Wood Residue Combustion in Boilers (09/03).

⁹ NCDAQ Wood Waste Combustion Spreadsheet for a wood stoker boiler. Available online at: https://files.nc.gov/ncdeg/Air%20Quality/permits/files/WWC rev K 20170308.xlsx.

3.6.4 Double Duct Burners (IES-DDB-1 through IES-DDB-4) and Propane Vaporizer (IES-PVAP)

Emissions from natural gas and propane combustion by the double duct burners (IES-DDB-1 through IES-DDB-4) and propane vaporizer (IES-PVAP) were calculated based on AP-42 Section 1.4, *Natural Gas Combustion*, AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion*, NC DAQ's Wood Waste Combustion Spreadsheet, and emission factors from the South Coast Air Quality Management District's (SCAQMD) Air Emissions Reporting (AER) Tool. Detailed emission calculations are included in Appendix C.

Per 15A NCAC 02Q .0503, the double duct burners (IES-DDB-1 through IES-DDB-4) and propane vaporizer (IES-PVAP) are considered insignificant activities because potential uncontrolled emissions are less than 5 tpy.

3.7 Dried Wood Handling (ES-DWH)

As previously described in Section 2, Dried Wood Handling (ES-DWH-1 and ES-DWH-2) will include conveyor transfer points located after each dryer. Emissions from these transfers will be routed through either baghouse CD-DWH-BF-1 or CD-DWH-BF-2 (one on each dryer line) at the post dryer conveyors. Particulate emissions from the baghouse were calculated based on the exhaust flow rate and exit grain loading. Detailed potential emission calculations are provided in Appendix C.

3.8 Dry Shavings Handling (IES-DRYSHAVE), Dry Line Feed Conveyor (ES-DLC-1) and Dry Line Hopper (IES-DLH)

Particulate emissions will occur during unloading of dry shavings walking floor trucks to the dry shavings pile (IES-DRYSHAVE). Potential emissions were calculated based on AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles*. A front end loader fills the Dry Line Hopper (IES-DLH) which feeds the Dry Line Feed Conveyor (ES-DLC-1) to introduce pre-dried wood into the process prior to the hammermills.

Emissions from the Dry Line Hopper (IES-DLH) and Dry Line Feed Conveyor (ES-DLC-1) were calculated using equation 1 in AP-42 Section 13.2.4. Per 15A NCAC 02Q .0503, the Dry Line Hopper will be re-classified as an insignificant activity due to emissions below 5 tpy. Detailed potential emissions calculations can be found in Appendix C.

3.9 Dry Shavings Reception, Handling, and Silo (ES-DSR, IES-DRYSHAVE-1, and ES-DSS)

Particulate emissions will occur during unloading of dry shavings from existing and new dry shavings truck dump (IES-DRYSHAVE and IES-DRYSHAVE-1). Potential emissions from dry shavings storage piles and dry shavings transfer activities associated with IES-DRYSHAVE were calculated based on AP-42, Section 13.2.4, Aggregate Handling and Storage Piles.¹⁰

The Dry Shavings Reception Dust Control Baghouse (CD-DSR-BF) controls particulate emissions from the receiving area, from IES-DRYSHAVE, and from Dry Shavings Reception (ES-DSR). Particulate emissions from the baghouse were calculated based on the exhaust

¹⁰ USEPA AP-42 Section 13.2.4, Aggregate Handling and Storage Piles (11/06).

flow rate and exit grain loading. Dry shavings will be transferred into the new dry shavings silo (ES-DSS) via an enclosed conveyor and bucket elevator. Particulate emissions from the baghouse on the dry shavings silo (CD-DSS-BF) were calculated based on the exhaust flow rate and exit grain loading. Detailed potential emission calculations are provided in Appendix C.

Per 15A NCAC 02Q .0503, Dry Shavings Handling (IES-DRYSHAVE-1) is considered an insignificant activity because potential uncontrolled PM emissions are less than 5 tpy.

3.10 Dry Hammermills (ES-HM-1 through 8) and Dry Shavings Hammermills (ES-DSHM-1 and ES-DSHM-2)

The Dry Hammermills generate PM, VOC, and HAP emissions during the process of reducing wood chips to the required size. PM emissions from the existing Dry Hammermill cyclones (CD-HM-CYC-1 through 8) are controlled using baghouses (CD-HM-BF-1 through CD-HM-BF-3). 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 summarizes the potential PM emissions from each Dry Hammermill baghouse.

The Dry Hammermill and Dry Shavings Hammermill exhaust will be routed to the proposed new scrubber (CD-WS-1) and RCO/RTO (CD-RCO-1) for HAP and VOC control. Detailed calculations are provided in Appendix C for the Dry Hammermills and Dry Shavings Hammermills.

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

As previously described in Section 2, fine pellet material will be conveyed from finished product handling to the Pellet Cooler High Pressure Fines Relay System, controlled by a baghouse (CD-PCHP-BV). 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.

3.12 Pellet Mill Feed Silo (ES-PMFS)

The Pellet Mill Feed Silo is equipped with a bin vent filter (CD-PMFS-BV) to control PM emissions associated with silo loading and unloading operations. PM emissions are 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.

3.13 Additive Handling and Storage (IES-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-BF). PM emissions from the baghouse were calculated based on an exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Detailed potential emissions calculations are provided in Appendix C.

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

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

Pellet Press System and Pellet Cooler (ES-CLR-1 through 6) operations will generate PM, HAP, and VOC emissions during the forming and cooling of wood pellets. The Pellet Mills and Coolers are equipped with six (6) simple cyclones (CD-CLR-1 through CD-CLR-6) and will be routed to a proposed new wet scrubber (CD-WS-2) for PM control and then through the proposed RCO/RTO (CD-RCO-2) for VOC and HAP control. 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 scrubber. Refer to Appendix C for detailed potential PM emissions calculations.

Uncontrolled VOC and HAP emissions at the outlet of the Pellet Cooler wet scrubber (CD-WS-2) were quantified based on stack testing data from comparable Enviva plants and/or engineering judgement/process knowledge, including any appropriate contingency. This includes emissions from both the Pellet Mills and the Pellet Coolers. Controlled emissions were conservatively based on a 95% control efficiency for the RCO/RTO based on vendor data. Detailed calculations are provided in Appendix C.

3.15 Pellet Loadout Bins (ES-PB-1 through ES-PB-12), Pellet Mill Loadout (ES-PL-1 and ES-PL-2), and Finished Product Handling (ES-FPH)

PM emissions result from the transfer of finished product to the Pellet Loadout Bins. PM emissions from transfers associated with Finished Product Handling, Pellet Mill Loadout, and the Pellet Loadout Bins are controlled by a baghouse (CD-FPH-BF). 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.

3.16 Emergency Generator (IES-GN-1 and ES-GN-2) and Fire Water Pump Engine (IES-FWP)

Operation of the Emergency Generator and Fire Water Pump generates emissions of criteria pollutants and HAP. Potential PM, NOx, VOC, and CO emissions from operation of the Emergency Generators and Fire Water Pump Engine were calculated based on emission factors from NSPS Subpart IIII (or 40 CFR 89 where applicable) and the maximum horsepower rating of the engines. Potential SO₂ 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 SO₂ air emissions. Potential VOC and HAP emissions were quantified based on emission factors from AP-42 Section 3.3, *Stationary Internal Combustion Engines*. Annual potential emissions were conservatively calculated based on 500 hours per year.

¹¹ Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(b) as required by NSPS Subpart IIII.

¹² USEPA AP-42 Section 3.3, Stationary Internal Combustion Engines (10/96).

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

3.17 Diesel Storage Tanks (IES-TK-1 through IES-TK-4)

The storage of diesel in on-site storage tanks generates emissions of VOC. VOC emissions from the four (4) 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 for detailed potential emission calculations.

3.18 Haul Roads

Fugitive PM emissions occur as a result of trucks and employee vehicles traveling on paved and unpaved roads on the Northampton plant property. Emission factors for paved roads were calculated based on Equation 2 from AP-42 Section 13.2.1, *Paved Roads*¹³ using the mean silt loading for quarries (8.2 g/m²) and 120 days with rainfall greater than 0.01 inch based on Figure 13.2.1-2. Emission factors for unpaved roads were calculated based on Equation 1a from AP-42 Section 13.2.2, *Unpaved Roads*¹⁴ using a surface material silt content (8.4%) and 120 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. This control efficiency is based on data from the *Air Pollution Engineering Manual* of the Air and Waste Management Association. Refer to Appendix C for detailed potential emissions calculations.

¹³ USEPA AP-42 Section 13.2.1, Paved Roads (01/11).

¹⁴ USEPA AP-42 Section 13.2.2, *Unpaved Roads* (01/11).

4. STATE AND FEDERAL PERMITTING APPLICABILITY

The Enviva Northampton 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 Northampton 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"¹⁵ 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 Northampton plant is in Northampton County which is classified as attainment or unclassifiable for all criteria pollutants. ¹⁶ The Northampton 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. Enviva is submitting this permit application to authorize construction 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 Northampton 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 minor source. A comparison of the currently permitted PTE to the proposed PTE after incorporating the changes proposed in this application is provided in Table 4.1.

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¹⁵ The following are "criteria pollutants" under current NSR regulations: CO, nitrogen dioxide, SO₂, PM₁₀, PM_{2.5}, ozone (VOCs and NO_x), and lead.

^{16 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)	CO₂e (tpy)	Total HAPs (tpy)
Proposed PTE ¹	182.73	242.21	148.97	118.75	83.75	39.52	129.68	399,490.52	21.71
Previous PTE	61.88	126.57	128.84	121.79	93.79	19.20	456.40	162,292.20	37.82
Change in PTE	+120.85	+115.64	+20.13	-3.04	-10.04	+20.32	-326.72	+237,198.3	-16.11

^{1.} Proposed PTE (excluding fugitive emission sources) from Appendix C, Tables 2 and 3.

4.1.2 Title V Operating Permit Program

The federal Title V Operating Permit program is promulgated in 40 CFR Part 70 and is implemented in North Carolina via 15A NCAC 2Q .0500. The Northampton plant is and will remain 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. Currently, the plant is considered a major source of HAP due to total HAP emissions exceeding the major source thresholds of 25 tpy. However, the emission reductions proposed as part of this modification will result in a net decrease in HAP emissions. After the project is completed, the Northampton plant will be a minor source of HAP.

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 Northampton 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 Generators and Fire Water Pump Engine are subject to NSPS Subpart IIII.

5.1.2 40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

NSPS Subpart Dc applies to owners or operators of steam generating units for which construction, modification, or reconstruction is commenced after June 9, 1989 and that have a maximum design heat input of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. The proposed Propane Vaporizer and double duct burners each have a maximum heat input of 1 MMBtu/hr and are not steam generating units; therefore, NSPS Subpart Dc does not apply.

5.1.3 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

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 350 bhp Emergency Generator 1, 671 bhp Emergency Generator 2, and 300 bhp Fire Water Pump Engine at the Northampton plant will be subject to NSPS Subpart IIII.

Under NSPS Subpart IIII, owners and operators of emergency generators manufactured in calendar year 2007 or later with a maximum engine power greater than or equal to 50 hp are required to comply with the emission limits in §60.4205(b). These limits are as follow: 0.20 grams per kilowatt (g/kW) for PM, 3.5 g/kW for CO, and 6.4 g/kW for oxides of nitrogen (NOx) plus nonmethane hydrocarbons (NMHC).

For the new Emergency Generator 2, Enviva will purchase an engine certified to meet the referenced emission limits in accordance with §60.4211(c) and will comply with the applicable emission limits by operating the emergency generator as instructed in the manufacturer's operating manual in accordance with §60.4211(a). The engine will be equipped with a non-

resettable hour meter in accordance with §60.4209(a). Emergency and readiness testing of the unit is limited to 100 hours per year.

The emergency generator will be required to comply with the fuel requirements in §80.510(b), as required in §60.4207(b), which limits sulfur to a maximum of 15 parts per million by weight (ppmw) and a cetane index of at least 40 or a maximum aromatic content of 35 volume percent.

5.2 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAP) regulate HAP emissions and apply 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 Northampton plant will be a minor source of HAP due to facility-wide total HAP emissions being below 25 tpy, and maximum individual HAP emissions below 10 tpy. Please refer to emission calculations provided in Appendix C.

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 Northampton plant has sources subject to Subpart ZZZZ of this part and thus, Subpart A also applies 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). 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 Northampton plant will not be subject to 112(g) since they will be a minor source of HAP.

5.2.3 40 CFR 63 Subpart DDDD – NESHAP for Plywood and Composite Wood Products

Subpart DDDD regulates HAP emissions from plywood and composite wood products (PCWP) manufacturing facilities located at major sources of HAPs. A PCWP manufacturing facility is defined in §63.2292 as one that manufactures plywood and/or composite wood products by bonding wood material or agricultural fiber to form a panel, engineered wood product, or other product defined in §63.2292. Further, an engineered wood product is defined as a product made with wood elements that are bound together with resin, such as laminated strand lumber and glue-laminated beams. The wood pellets that will be manufactured at the Northampton plant will not meet the definition for any of the PCWP products defined in §63.2292 as being subject to Subpart DDDD. Specifically, the wood pellets are not an engineered wood product, as they will not be bound together with resin or other chemical

agent. Further, the Northampton facility will not be a major source of HAPs following the changes proposed. As such, this regulation does not apply.

5.2.4 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 Northampton plant's Emergency Generators 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 or reconstructed CI engines with ratings less than or equal to 500 bhp located at an area source of HAP, including the plant's 350 bhp Emergency Generator 1,671 bhp Emergency Generator 2, and 300 bhp Fire Water Pump Engine, are only subject to the requirement to comply with the applicable provisions of NSPS Subpart IIII, per §63.6590(c)(1), and no further requirements apply under Subpart ZZZZ.

5.2.5 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 an enclosed device using a controlled flame, and the unit's primary purpose is to transfer heat <u>indirectly</u> to a process material (liquid, gas, or solid) or to a heat transfer material (e.g., glycol or a mixture of glycol and water) for use in a process unit, instead of generating steam. The Northampton plant's dryers will each be heated by a wood-fired furnace burner system; however, the furnace burner systems will provide <u>direct</u> heating of the wood chips, not indirect. As such, Subpart DDDDD does not apply to the wood-fired furnace burner systems.

As previously discussed, a Propane Vaporizer will be used to convert liquid propane to a gas for combustion by the RTO burners, RCO burners, and burners for the dryer double ducts. The vaporizer will be used to heat liquid propane which is a fuel and not a process material or heat transfer material. As such, the Propane Vaporizer is not a process heater and Subpart DDDDD does not apply.

Burners will be used to heat the dryer double ducts; however, these burners will provide direct heating of the ducts. As such, Subpart DDDDD does not apply.

5.3 Compliance Assurance Monitoring

Compliance Assurance Monitoring (CAM) under 40 CFR Part 64 applies 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]).¹⁷ 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.¹⁸

The Dryers (ES-DRYER-1 and ES-DRYER-2) and five (5) Green Wood Hammermills (ES-GHM-1 through ES-GHM-5) are each subject to a PM emission limit under 15A NCAC 02D .0515 and will utilize a WESP (CD-WESP-1 and CD-WESP-2) to meet this limit. However, combined, the Dryers and Green Wood Hammermills post-controlled PM emissions are below the major source threshold. The exhaust from both the Dryers and Green Wood Hammermills will be controlled by RTOs (CD-RTO-1 and CD-RTO-2) 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. There is no other applicable VOC limit for the Dryers 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 Dryers and Green Wood Hammermills with the initial Title V permit renewal application.

The Pellet Coolers (ES-CLR-1 through ES-CLR-6) are also subject to a PM emission limit under 15A NCAC 02D .0515 and will utilize six (6) individual high efficiency cyclones to meet this limit. Post-controlled PM emissions will be below the major source threshold. A scrubber (CD-WS-1) and RCO/RTO (CD-RCO-1) will be installed to control VOC from the Pellet Mills and Pellet Coolers; however, the RCO/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. There is no other applicable VOC limit for the Pellet Coolers. As such, 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 ES-CLR-6) with the initial Title V permit renewal application.

All other emission units at the Northampton 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 Chemical Accident Prevention Provisions

The Chemical Accident Prevention Provisions, promulgated in 40 CFR Part 68, provide requirements for the development of risk management plans (RMP) for regulated substances. Applicability of RMP requirements is based on the types and amounts of chemicals stored at a facility. Propane, which is a regulated substance under Subpart F of this rule, will be stored at the Northampton facility to be used as a fuel for the RTO burners, RCO burners, and dryer system double duct burners. Per §68.126, substances used as a fuel or held for sale as a fuel at a retail facility are excluded from all provisions; therefore, an RMP is not required for the Northampton facility.

¹⁷ §64.5(a)

^{18 §64.5(}b)

5.5 North Carolina Administrative Code

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

5.5.1 15A NCAC 02D .0504 Particulates from Wood Burning Indirect Heat Exchangers

15A NCAC 02D .0504 provides PM emission limits for <u>indirect</u> 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 Dryers will each be heated by a wood-fired furnace burner system; however, the furnace burner systems provide <u>direct</u> heating of the wood chips, not indirect. As such, this regulation does not apply.

5.5.2 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 30 tons per hour (tph), and $E = 55 \times P^{0.11}$ -40 for process rates greater than or equal to 30 tph. All emissions from PM sources at the Northampton plant will either be negligible or controlled by cyclones, baghouses, a scrubber, or a WESP, and thus, will comply with this requirement. The process weight limit for each emission point is summarized in Table 5-1 below.

Table 5-1. Process Weight Limits for Northampton Emission Points							
Emission Point ID	Source Description	Control Device	Process Weight Input Rate (tph)	Allowable Emission Rate (lb/hr)			
ES-DRYER-1	One (1) 175.3 MMBtu/hr Wood-fired Direct	CD-WESP-1; CD-RTO-1	138	54.6			
ES-DRYER-2	One (1) 180 MMBtu/hr Wood-fired Direct	CD-WESP-2; CD-RTO-2	158	56.0			
ES-DWH-1	Dried Wood Handling	CD-DWH-BF- 1	78	48.8			
ES-DWH-2	Dried Wood Handling	CD-DWH-BF- 2	89	50.1			
ES-GWHS	Green Wood Handling and Storage	N/A	400	66.3			
IES-DLH	Dry Line Hopper	N/A	185	57.7			

	T	T		
ES-DLC-1	Dry Line Feed Conveyor	N/A	185	57.7
IES- Dry Shavings DRYSHAVE Handling and Storag		N/A	154	55.7
ES-DSHM-1 and ES- DSHM-2	Dry Shavings Hammermills	CD-HM-BF-1 through 3; CD-WS-1; CD-RCO-1	30	39.7
IES-EPWC	Electric Powered Green Wood Chipper	N/A	239	60.4
ES-GHM-1 through ES- GHM-5	Green Hammermills 1 through 5	CD-WESP-1; CD-RTO-1; CD-WESP-2; CD-RTO-2	299	63.0
IES-BARK	Bark Hog	N/A	63	46.8
IES-DEBARK	Debarker	N/A	210	59.0
ES-HM-1 through ES- HM-8	Dry Hammermills 1 through 8	CD-HM-CYC- 1 through CD-HM-CYC- 8; CD-HM-BF-1 through CD-HM-BF-3; CD-WS-1; CD-RCO-1	152	55.6
IES-DSS	Dry Shaving Silo	CD-DSS-BF	30	39.7
ES-DSR; IES- DRYSHAVE-1	Dry Shavings Reception; Dry Shavings Material Handling	CD-DSR-BF	30	39.7
ES-PS-1 and ES-PS-2	Dry Hammermill Pre- screeners 1 and 2	N/A	185	57.7
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	152	55.6
ES-CLR-1 through ES- CLR-6	Pellet Press and Coolers 1 through 6	CD-CLR-1 through CD-CLR-6; CD-WS-1; CD-RCO-1	152	55.6
ES-PCHP	Pellet Cooler HP Fines Relay System	CD-PCHP-BF	10	19.0

IES-ADD	Additive Handling and Storage	CD-ADD-BF	20	30.5
ES-FPH; ES- PB-1 through ES-PB-12; ES-PL-1 and ES-PL-2	Finished Product Handling; Twelve pellet loadout bins; Pellet mill load-out 1 and 2	CD-FPH-BF	152	55.6

5.5.3 15A NCAC 02D .0516 Sulfur Dioxide Emissions from Combustion Sources

Emissions of SO_2 from combustion sources may not exceed 2.3 pounds of SO_2 per MMBtu input. The Emergency Generators (IES-GN-1 and IES-GN-2) and Fire Water Pump (IES-FWP) will use ultra-low sulfur diesel, the Dryer furnace burner systems will combust bark and wood chips, and the RTOs and RCO will utilize natural gas or propane, each of which contain low amounts of sulfur and will result in SO_2 emissions below the limit of 2.3 lb/MMBtu.

5.5.4 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.

5.5.5 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 a violation or the 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. Based on the relatively low emissions from fugitive dust sources, Enviva does not believe a fugitive dust control plan is necessary.

5.5.6 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. Per NCAC 02Q .0706, the facility shall submit an application that complies with 15A NCAC 02 D .1100(1) if the modification results in a net increase in emissions or ambient concentration as determined in 15A NCAC 02D .1106 and 15A NCAC 02Q .0709 of any toxic air pollutant that the facility was emitting before the modification; or (2) emissions of any toxic air

pollutant that the facility was not emitting before the modification if such emissions exceed the levels set forth in 15A NCAC 02Q .0711. Air Toxics Modeling was performed for this facility and is discussed in section 6 below.

6. TOXICS MODELING ANALYSIS

A TAP permit application is required to include an evaluation of TAP emissions from a facility's sources, excluding exempt sources listed under 15A NCAC 02Q .0702(a)(18). 15A NCAC 02D .1100 outlines the procedures that must be followed if a TAP permit and associated modeling is required under 15A NCAC 02Q .0700. Modeling was most recently completed for the Northampton plant in September 2018. The modeled concentrations for eleven (11) of the thirteen (13) TAP were less than 1% of their respective Acceptable Ambient Level (AAL). The worst-case TAP was benzene, with a maximum modeled concentration that was 21.6% of its AAL. Although several changes are being proposed (e.g., addition of a separate wet scrubber and RCO to control the Pellet Mills/Pellet Coolers) to the facility since the September 2018 modeling analysis was completed, given the magnitude of the previous modeled concentrations it is not anticipated that these design changes will significantly impact results. As such, revised modeling was not conducted. The following sections outline the data sources, methodologies, and results from the September 2018 modeling analysis.

6.1 State Requirements

Dispersion modeling was conducted for each TAP with post-project facility-wide potential emissions in excess of its respective Toxic Permitting Emission Rate (TPER). The analysis was conducted consistent with the following state and federal guidance documents:

- NC DAQ's Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina (May 2018);
- North Carolina's PSD Modeling Guidance (January 6, 2012);
- EPA's Guideline on Air Quality Models 40 CFR 51, Appendix W (Revised, January 17, 2017), herein referred to as Appendix W;¹⁹ and
- EPA's AERMOD Implementation Guide (Revised April 17, 2018).

6.2 Acceptable Ambient Levels

Enviva conducted air dispersion modeling for 13 TAPs with emissions in excess of the TPER thresholds in 15A NCAC 02Q .0711 to demonstrate compliance with the Acceptable Ambient Levels (AALs) in 15A NCAC 02D. The AALs are in place to ensure that emissions from a facility do not adversely affect human health. A comparison of facility-wide potential emissions to the TPERs is provided in Table 6-1 below.

Modeling for each TAP was conducted for the most recent year of meteorological data available (2017) and maximum concentrations were compared to the AALs.

¹⁹ Appendix W was revised on December 17, 2016 (Federal Register Vol. 82, No. 10); however, on January 26, 2017 the effective date of the final rule was delayed until March 21, 2017 (Federal Register Vol. 82, No. 16). On March 20, 2017 the effective date of the final rule was further delayed to May 22, 2017 (Federal Register Vol. 82, No. 52), upon which it became effective.

Table 6-1. Comparison to Toxic Air Pollutant Permitting Emission Rates

Dellutant	Potential Emissions			TPER (2Q .0711)			Modeling	
Pollutant	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	Required?	
1,3-Butadiene			0.09			11.0	No	
Acetaldehyde	24.1			6.8			Yes	
Acrolein	16.1			0.020			Yes	
Ammonia	0.26			0.68			No	
Arsenic			5.7			0.053	Yes	
Benzene			884			8.1	Yes	
Benzo(a)pyrene			0.34			2.2	No	
Beryllium			0.28			0.28	Yes	
Cadmium			1.89			0.37	Yes	
Carbon Tetrachloride			5.0			460	No	
Chlorine	0.26	6.3		0.23	0.79		Yes	
Chlorobenzene		0.2637			46		No	
Chloroform			2.0			290	No	
Chromic acid (Chromium VI)		0.0048			0.013		No	
Di(2-ethylhexyl)phthalate (DEHP)		3.76x10 ⁻⁴			0.63		No	
Ethylene dichloride (1,2-dichloroethane)			3.2			260	No	
Formaldehyde	20.7			0.040			Yes	
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8			1.31x10 ⁻⁶			5.10x10 ⁻³	No	
n-Hexane	0.148			23			No	
Hydrogen chloride (hydrochloric acid)	6.33			0.18			Yes	
Manganese & Compounds		12.79			0.63		Yes	
Mercury, vapor		0.03			0.013		Yes	
Methyl chloroform (1,1,1 trichloroethane)	1.03x10 ⁻²	0.248		64.0	250		No	
Methyl ethyl ketone	4.50x10 ⁻⁵	0.001		22.4	78.0		No	
Xylene	1.50x10 ⁻³	0.036		16.4	57.0		No	
Methylene chloride	1.39x10 ⁻³		21.1	0.39		1,600	No	
Nickel		0.268			0.13		Yes	
Pentachlorophenol	1.70x10 ⁻⁵	4.08x10 ⁻⁴		0.0064	0.063		No	
Perchloroethylene (tetrachloroethylene)			4.2			13,000	No	
Phenol	8.4			0.24			Yes	
Polychlorinated biphenyls			9.07x10 ⁻⁴			5.6	No	
Styrene	0.016			2.7			No	
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-			9.57x10 ⁻⁷			2.00x10 ⁻⁴	No	
Toluene	0.002	0.06		14.4	98.0		No	
Trichloroethylene			3.3			4,000	No	
Trichlorofluoromethane (CFC 111)	3.41x10 ⁻⁴			140		ŕ	No	
Vinyl chloride			2.0			26.0	No	

6.3 Model Selection

Enviva utilized the latest version of the AERMOD model (Version 18081). AERMOD is the EPAapproved air dispersion model for near-field (within 50 km) modeling analyses. AERMOD was run using default regulatory options.

6.4 Receptor Grid and Elevation Data

A resolution of 25 meters was used for receptors along the ambient boundary and a nested Cartesian grid extending approximately 10 km from the center of the plant was modeled using the following resolutions:

- 100-meter resolution extending approximately 500 m from the property boundary; and
- 500-meter resolution between approximately 500 m and approximately 10 km from the property boundary.

Modeled concentrations were reviewed to ensure that the maximum concentration was captured with 100 m resolution.

Receptor elevations, in addition to source and building elevations, were determined using the AERMAP terrain pre-processor. Hill height parameters required by AERMOD are also calculated by AERMAP. Elevations were based on 1/3 arc-second National Elevation Dataset (NED) from the U.S. Geological Survey (USGS). AERMAP input and output files and a copy of the NED file are provided in Appendix E.

6.5 Meteorological Data

Enviva utilized AERMOD-ready meteorological data processed by NC DAQ for the Rocky Mount National Weather Service (NWS) surface station (ID: 93759) and upper air data from the Newport NWS Station (ID: 93768) for the period 2012-2016.²⁰ The meteorological data were processed by NC DAQ using version 18081 of AERMET. The base elevation for the Rocky Mount surface station was set to 48.8 m.²¹ The meteorological data files are provided in Appendix E for reference.

6.6 Modeled Sources and Release Parameters

As previously described in Section 2, there are several different operating scenarios for the Northampton plant dryers and furnaces. Normal operation was modeled to assess compliance with the AALs as it results in the maximum annual potential emissions. Use of the dryer and furnace bypass stacks occurs intermittently, and the frequency and duration are minimized to the extent possible, as previously described in Section 2.5.

Table 6-2 presents a summary of the modeled sources and associated release parameters. The emergency generator and fire water pump are subject to 40 CFR 63 Subpart ZZZZ and

²⁰ https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/modeling-meteorology/meteorological-data

²¹ https://files.nc.gov/ncdeg/Air%20Quality/permits/mets/ProfileBaseElevations 2018.pdf

are therefore exempt from toxics permitting requirements per 15A NCAC 02Q .0702(a)(27)(B). These sources were excluded from the modeling analysis.

Modeled emission rates are consistent with the emission rates provided in the potential emissions calculations in Appendix C. A figure showing the modeled layout is provided in Appendix F.

6.6.1 Point Sources

Each modeled source has a defined stack and was thus represented as a point source. The duct burner stacks will have rain caps and were modeled using the POINTCAP option in accordance with the *AERMOD Implementation Guide*. Modeled stack parameters are summarized in Table 6-2 below.

Table 6-2. Summary of Modeled Source Parameters

Model ID	Source Type	UTM Easting ¹ (m)	UTM Northing ¹ (m)	Stack Height (m)	Exhaust Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
RTO1	POINT	266,018.70	4,042,780.20	28.66	352.59	7.58	3.05
RTO2	POINT	266,023.34	4,042,695.01	28.61	388.71	23.88	1.63
RCO	POINT	266,025.18	4,042,863.93	27.43	362.04	15.15	2.34
DWH	POINT	266,054.30	4,042,862.43	18.31	Ambient	5.63	0.40
PVAP	POINT	266,036.30	4,042,727.09	3.05	449.82	18.11	0.15
DB1	POINTCAP	266,032.87	4,042,801.89	3.05	449.82	18.11	0.15
DB2	POINTCAP	266,044.72	4,042,829.62	3.05	449.82	18.11	0.15
DB3	POINTCAP	266,016.15	4,042,742.63	3.05	449.82	18.11	0.15
DB4	POINTCAP	266,026.31	4,042,746.65	3.05	449.82	18.11	0.15
DB5	POINTCAP	266,070.76	4,042,919.37	3.05	449.82	18.11	0.15
DB6	POINTCAP	266,071.60	4,042,864.76	3.05	449.82	18.11	0.15
DB7	POINTCAP	266,031.39	4,042,855.66	3.05	449.82	18.11	0.15
DB8	POINTCAP	266,004.72	4,042,858.41	3.05	449.82	18.11	0.15

^{1.} Coordinates reflect NAD83, UTM Zone 18.

6.7 GEP Stack Height Analysis

EPA has promulgated regulations that limit the maximum stack height that may be used in a modeling analysis to no more than Good Engineering Practice (GEP) stack height. The purpose of this requirement is to prevent the use of excessively tall stacks to reduce the modeled concentrations of a pollutant. GEP stack height is impacted by the heights of nearby structures. In general, the minimum value for GEP stack height is 65 meters. The stack

²² EPA. AERMOD Implementation Guide. Revised April 17, 2018.

heights for all sources at the Northampton plant are less than 65 meters and were thus modeled using actual stack heights.

6.8 Building Downwash

The AERMOD model incorporates Plume Rise Modeling Enhancements (PRIME) to account for downwash. The direction-specific building downwash dimensions used as inputs were determined by the latest version (04274) of the Building Profile Input Program, PRIME (BPIP PRIME.) BPIP PRIME uses building downwash algorithms incorporated into AERMOD to account for the plume dispersion effects of the aerodynamic wakes and eddies produced by buildings and structures. On-site structures at the Northampton plant were evaluated for downwash effects on each modeled point source. BPIP input and output files are included in Appendix E.

6.9 Modeling Results

As shown in Table 6-3 below, modeled concentrations for each of the 13 TAPs are less than 50% of the AAL based on 2017 meteorological data. As such, the Northampton plant will not cause an exceedance of the AAL for any TAP and no further modeling is required. AERMOD input and output files are provided in Appendix E.

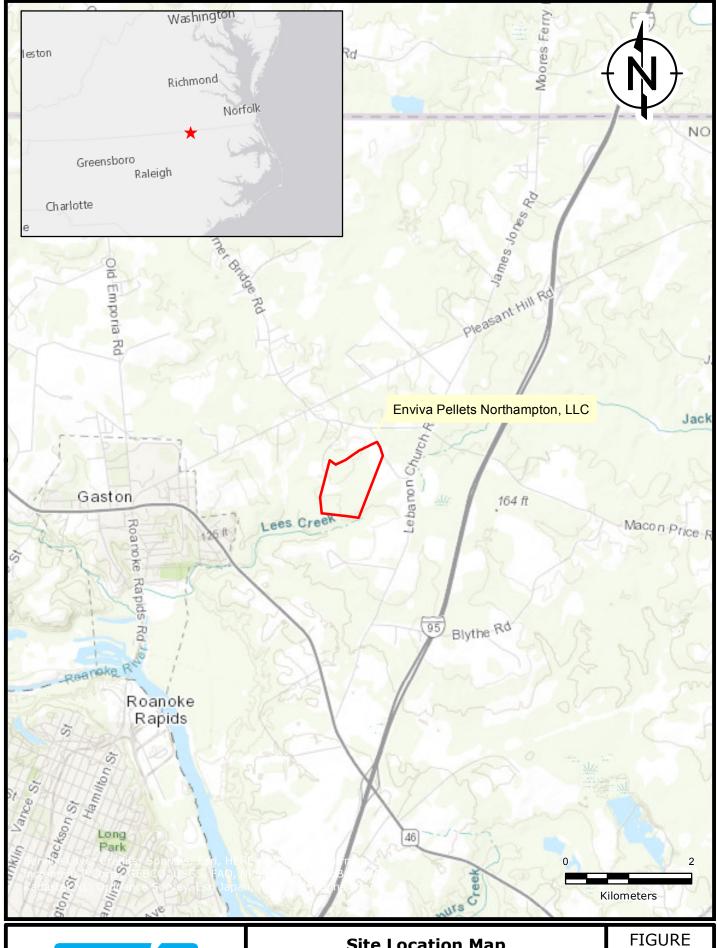
Table 6-3. Comparison of Maximum Modeled Concentrations from 2017 to the AALs

Pollutant	Averaging Period	UTM Easting ¹ (m)	UTM Northing ¹ (m)	Modeled Concentration (µg/m³)	AAL (μg/m³)	Percent of AAL (%)
Acetaldehyde	1-hour	266167.00	4042616.00	0.60	27,000	0.002%
Acrolein	1-hour	265,879.90	4,043,255.60	0.49	80	0.62%
Arsenic	Annual	266,220.00	4,043,046.20	2.00E-05	2.10E-03	0.95%
Benzene	Annual	266,102.70	4,042,770.10	0.030	0.12	21.6%
Beryllium ²	Annual	266,220.00	4,043,046.20	1.03E-06	4.10E-03	0.025%
Cadmium Metal	Annual	266,102.70	4,042,770.10	3.00E-05	5.50E-03	0.55%
Chlavina	1-hour	266,267.00	4,042,516.00	0.23	900	0.025%
Chlorine	24-hour	265,865.30	4,042,508.50	0.09	37.5	0.23%
Formaldehyde	1-hour	266,092.90	4,042,747.00	13.8	150	9.22%
Hydrochloric acid	1-hour	266,267.00	4,042,516.00	0.55	700	0.078%
Manganese	24-hour	265,865.30	4,042,508.50	0.012	31	0.040%
Mercury	24-hour	265,865.30	4,042,508.50	5.00E-05	0.6	0.008%
Nickel	24-hour	265,865.30	4,042,508.50	4.40E-04	6	0.007%
Phenol	1-hour	265,879.90	4,043,255.60	0.25	950	0.026%

^{1.} Coordinates reflect NAD83, UTM Zone 18.

^{2.} Concentrations in the AERMOD output files are in units of nanograms per cubic meter.

APPENDIX A AREA MAP



RAMBOLL

DRAFTED BY: ARJ DATE: 9/11/2018

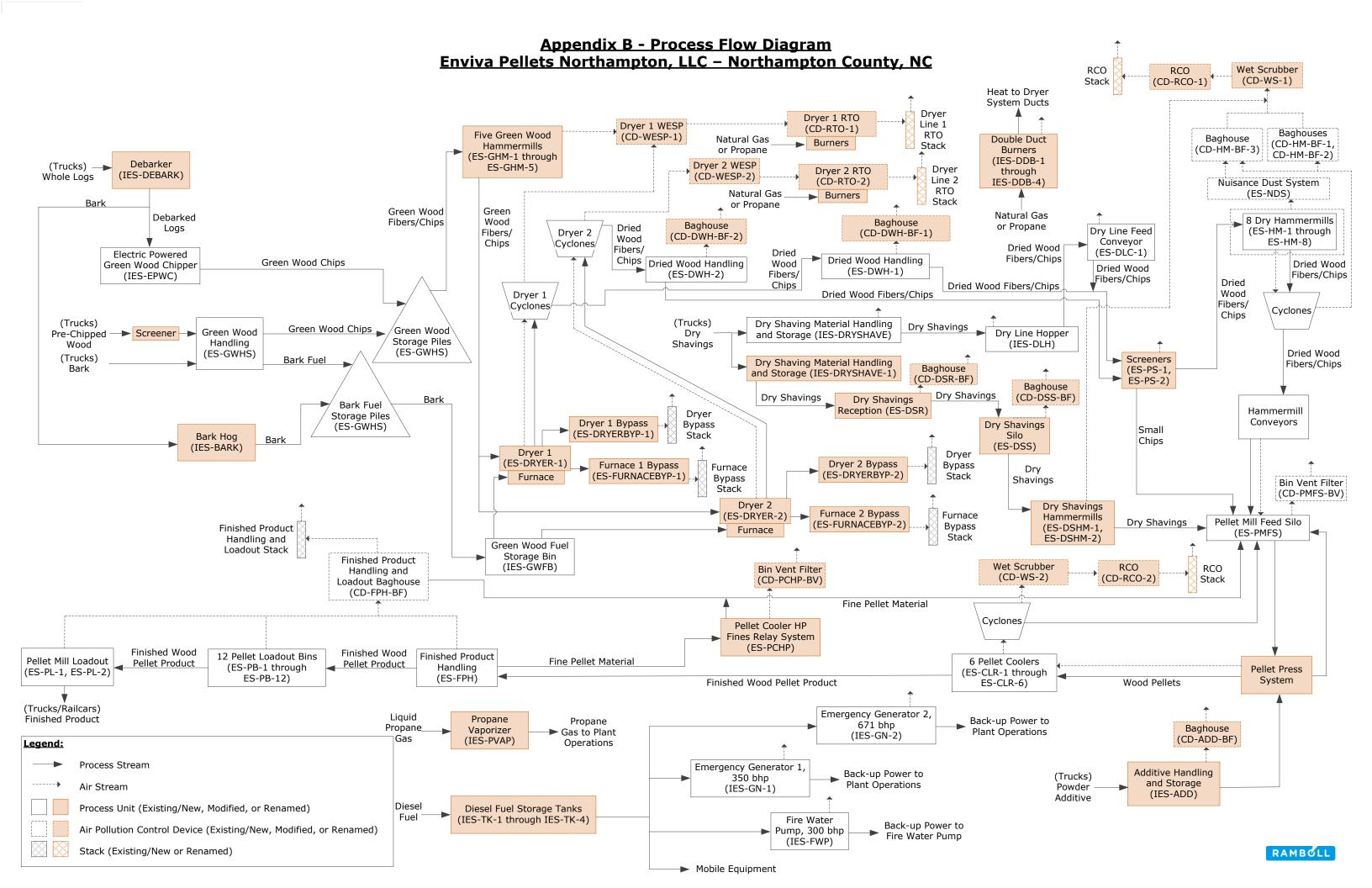
Site Location Map

Enviva Pellets Northampton, LLC Garysburg, Northampton County, North Carolina

1

PROJECT: 1690009489

APPENDIX B PROCESS FLOW DIAGRAM



APPENDIX C POTENTIAL EMISSIONS CALCULATIONS

Table 1 Facility-wide Criteria and CO2e Emissions Summary **Enviva Pellets Northampton, LLC**

Emission Unit ID	Source Description	Control Device ID	Control Device Description	CO (tpy)	NOx (tpy)	TSP (tpy)	PM-10 (tpy)	PM-2.5 (tpy)	SO2 (tpy)	Total VOC (tpy)	CO _{2e} (tpy)
ES-GHM-1 through ES-GHM-5	Green Hammermills 1 through 5	CD WECD 1. CD DTO 1	WECD, DTO								
ES-DRYER-1 ¹	Dryer #1	CD-WESP-1; CD-RTO-1	WESP; RTO	156.44	194.96	66.58	66.58	66.58	38.91	28.93	365,608.88
ES-DRYER-2 ¹	Dryer #2	CD-WESP-2; CD-RTO-2	WESP; RTO	1							
ES-DRYERBYP-1	Dryer #1 Bypass			0.54	0.66	1.52	1.52	1.52	0.11	0.35	918.37
ES- FURNACEBYP-1	Furnace #1 Bypass			3.38	1.24	3.25	3.17	3.09	0.14	0.10	1,180.31
IES-DDB-1 and -2	Dryer #1 Double Duct Burners			0.72	0.62	0.07	0.07	0.07	0.01	0.10	1,219.07
ES-DRYERBYP-2	Dryer #2 Bypass			0.54	0.66	1.56	1.56	1.56	0.11	0.35	942.99
ES- FURNACEBYP-2	Furnace #2 Bypass			3.45	1.27	3.32	3.24	3.16	0.13	0.10	1,204.93
	Dryer #2 Double Duct Burners			0.72	0.62	0.07	0.07	0.07	0.01	0.10	1,219.07
IES-PVAP	Propane Vaporizer			0.36	0.62	0.03	0.03	0.03	0.003	0.05	609.53
	Dry Hammermills 1 through 8; Nuisance Dust System	CD-HM-CYC-1 through CD- HM-CYC-8; CD-HM-BF-1 through CD-HM-BF-3; CD-WS-1; CD-RCO-1	Cyclones; Baghouses; Wet Scrubber; RCO	7.60	14.88	20.93	20.93	1.00	0.05	18.32	12,841.84
ES-DSHM-1 and ES-DSHM-2	Dry Shavings Hammermills 1 and 2	CD-WS-1; CD-RCO-1	Wet Scrubber; RCO			2.01	2.01	2.01			·
ES-CLR-1 through ES-CLR-6	Pellet Coolers 1 through 6	CD-CLR-1 through CD-CLR-6; CD-WS-2; CD-RCO-2	Simple Cyclones; Wet Duct Scrubber; RCO	7.91	23.16	39.18	10.71	1.89	0.05	28.53	13,367.45
ES-DWH-1 ⁴	Dried Wood Handling-1	CD-DWH-BF-1	Baghouse			0.38	0.38	0.38	÷	48.53	
ES-DWH-2 ⁴	Dried Wood Handling-2	CD-DWH-BF-2	Baghouse			0.38	0.38	0.38	-	40.33	
ES-PS-1 and -2	Dry Hammermill Prescreeners 1 and 2					0.30	0.16	0.02			
ES-PCHP	Pellet Cooler HP Fines Relay System	CD-PCHP-BV	Baghouse			0.54	0.54	0.54			
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	Baghouse			0.38	0.38	0.38			
ES-PB-1 through ES-PB-12;	Finished Product Handling; Twelve pellet loadout bins; Pellet mill load-out 1 and 2	CD-FPH-BF	Baghouse			5.33	4.85	0.09			
	Additive Handling and Storage	CD-ADD-BF	Baghouse			3.31E-03	3.31E-03	3.31E-03			
	Dry Line Hopper					0.15	0.07	0.01			
	Dry Line Feed Conveyor					0.15	0.07	0.01			
	Dry Shaving Material Handling and Storage					0.77	0.38	0.06		0.19	
	Dry Shaving Silo	CD-DSS-BF	Baghouse			0.54	0.54	0.54			
	Dry Shavings Reception;										
	Dry Shaving Material Handling	CD-DSR-BF	Baghouse			0.38	0.38	0.38			
	Green Wood Handling and Storage					16.32	8.35	1.22		8.30	
	Electric Powered Green Wood Chipper									1.95	
	Bark Hog					0.47	0.26			0.59	
	Debarker					1.56	0.86				
	Green Wood Fuel Bin										
	Emergency Generator 1			0.50	0.58	0.03	0.03	0.03	0.001	0.002	100.21
	Emergency Generator 2			0.14	2.46	0.01	0.03	0.01	0.002	1.68	191.98
	Fire Water Pump			0.43	0.49	0.02	0.02	0.02	0.001	0.001	85.90
	Diesel Storage Tank for Emergency Generator #1									5.75E-04	
IES-TK-2	Diosal Starage Tank for Eiro Water Street									1.60E-04	
	Diesel Storage Tank for Fire Water Pump Mobile Fuel Diesel Storage Tank									3.33E-03	
	Diesel Storage Tank for Emergency										
IES-TK-4	Generator #2									5.75E-04	
	Haul Road Emissions					43.31	11.41	0.923			
			Total Emissions:	182.73	242.21	209.53	138.95	85.96	39.52	138.17	399,490.52
			tal Excluding Fugitives ³ :	182.73	242.21	148.97	118.75	83.75	39.52	129.68	399,490.52
		PSD	Major Source Threshold:	250	250	250	250	250	250	250	
lotes:			Major Source?	No	No	No	No	No	No	No	

- Notes:

 1 Each dryer line is routed to a separate RTO (CD-RTO-1 and CD-RTO-2). Although dryer line 1 and dryer line 2 are capable of processing up to 537,625 ODT/yr and 620,000 ODT/yr, respectively, the combined throughput of both dryers will not exceed 781,255 ODT/yr. In order to provide Enviva with the flexibility to use either dryer line up to its individual capacity, the total emissions from the two RTO's are based on the total facility throughput and are calculated as follows:

 Where individual dryer emissions were calculated based on throughput (i.e. Ib/ODT), the total emissions are conservatively set equal to the sum of the emissions from the two dryer lines plus - Where individual dryer emissions were calculated based on fuel use (i.e. lb/MMBtu or lb/MMscf) or hourly test/vendor data (i.e., lb/hr), the total emissions are conservatively set equal to the sum of the emissions from the two dryer lines plus the emissions from the green hammermills assuming both dryer lines operate 8,760 hrs/yr.
- 2. Bark is transferred from the raw wood chip storage pile by walking floor to covered conveyors which transfer the material into the fully enclosed Green Wood Fuel Storage 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.
 4. As Total VOC emissions are based on throughput, the calculated VOC emissions represent the total emissions from Dried Wood Handling 1 and 2 (ES-DWH-1 and ES-DWH-2).
- 5. Emissions from the Nuisance Dust System (ES-NDS) are routed to the inlet of CD-HM-BF-3.



Table 2
Facility-Wide HAP Emissions Summary
Enviva Pellets Northampton, LLC

		CD-RTO-1	ES-DRYER	ES-	IES-DDB-1	ES-DRYER	ES-	IES-DDB-3				ES-DWH-1							
	HAP	and	BYP-1	FURNACE	and -2	BYP-2	FURNACE	and -4	IES-PVAP	CD-RCO-1	CD-RCO-2	and -2	IES-GN-1	IES-GN-2	IES-FWP	IES-EPWC	IES-BARK	Total	Major
Description	l liar	CD-RTO-2 ¹ (tpy)	(tpy)	BYP-1 (tpy)	(tpy)	(tpy)	BYP-2 (tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	Source?
Acetaldehyde	V	1.73E+00	3.02E-01	4.67E-03	1.31E-07	3.46E-01	4.77E-03	1.31E-07	-	1.66E-01	4.92E-01	-	4.70E-04	2.96E-05	4.03E-04	-	-	3.04E+00	No
Acrolein	Ÿ	1.23E+00	1.97E-01	2.25E-02	1.55E-07	2.26E-01	2.30E-02	1.55E-07	_	2.09E-01	9.75E-01	_	5.67E-05	9.25E-06	4.86E-05	_	_	2.88E+00	No
Formaldehyde	Ϋ́	1.87E+00	2.57E-01	2.48E-02	1.31E-02	2.95E-01	2.53E-02	1.31E-02	6.57E-03	2.90E-01	2.50E-01	3.28E-01	7.23E-04	9.26E-05	6.20E-04	-	-	3.37E+00	No
Methanol	Y	1.39E+00	1.88E-01	-	-	2.15E-01	-	-	-	1.61E-01	4.14E-01	7.62E-01	-	-	-	3.91E-01	1.17E-01	3.64E+00	No
Phenol	Υ	6.07E-01	1.03E-01	2.87E-04	-	1.18E-01	2.93E-04	-	-	6.36E-02	4.92E-01	-	-	-	-	-	-	1.39E+00	No
Propionaldehyde	Υ	3.88E-01	6.90E-02	3.44E-04	-	7.90E-02	3.51E-04	-	-	2.82E-01	2.85E-01	-	-	-	-	-	1	1.10E+00	No
Acetophenone	Υ	1.24E-07	1.40E-08	1.80E-08	-	1.44E-08	1.84E-08	-	-	-	-	-	-	-	-	-	-	1.89E-07	No
Ammonia	N	8.79E-01	-	-	2.75E-02	-	-	2.75E-02	-	2.69E-01	2.69E-01	-	-	-	-	-	-	1.47E+00	No
Antimony and compounds	Υ	8.91E-04	3.46E-05	4.45E-05	-	3.56E-05	4.54E-05	-	-	-	-	-	-	-	-	-	-	1.05E-03	No
Arsenic	Y	2.54E-03	9.64E-05	1.24E-04	1.72E-06	9.90E-05	1.27E-04	1.72E-06	-	1.68E-05	1.68E-05	-	-	-	-	-	-	3.02E-03	No
Benzene	Y	3.62E-01	-		6.22E-03	-	-	6.22E-03	3.11E-03	6.10E-02	6.10E-02	-	5.71E-04	9.11E-04	4.90E-04	-	-	5.02E-01	No
Benzo(a)pyrene	Y	1.01E-04	1.14E-05	1.46E-05	1.03E-08	1.17E-05	1.50E-05	1.03E-08	-	1.01E-07	1.01E-07	-	2.39E-05	3.02E-07	9.87E-08	-	-	1.79E-04	No
Beryllium	Y	1.27E-04	4.82E-06	6.20E-06	1.03E-07	4.95E-06	6.33E-06	1.03E-07		1.01E-06	1.01E-06	-	-	-	-	-	-	1.52E-04	No
1,3-Butadiene	Y	7.655.04	1 005 05	-	- 0.455.06	- 1 055 05	- 2 265 25	- 0.455.06	-	- 0 205 25	- 0 265 25	-	2.39E-05	-	2.05E-05	-	-	4.45E-05	No
Cadmium Carbon tatrachlarida	Y	7.65E-04	1.80E-05	2.31E-05	9.45E-06	1.85E-05	2.36E-05	9.45E-06	-	9.26E-05	9.26E-05	-	-	-	- -	-	-	1.05E-03	No
Carbon tetrachloride	Y	1.75E-03	1.97E-04	2.53E-04	-	2.03E-04	2.59E-04	-	-	-	-	-	-	-	-	-	-	2.66E-03	No
Chlorine Chlorehenzene	Y	1.23E+00 1.28E-03	3.46E-03 1.45E-04	4.45E-03 1.86E-04	-	3.56E-03 1.49E-04	4.54E-03 1.90E-04	-	-	-	-	-	-	-	-	-	-	1.25E+00 1.95E-03	No No
Chlorobenzene Chloroform	Ϋ́	1.28E-03 1.09E-03		1.00E-U4	-		1.900-04	-	-	-		-	-	-	-	<u>-</u>	<u>-</u>	1.95E-03 1.09E-03	No
Chloroform Chromium VI	Y V	7.80E-04	-		1.20E-05	-	<u>-</u>	1.20E-05	-	1.18E-04	1.18E-04	-	-	-	-		<u>-</u>	1.09E-03 1.04E-03	No
Chromium-Other compounds	T V	1.97E-03	7.67E-05	1.18E-04	1.20L-03	7.88E-05	1.21E-04	1.20L-03		1.10L-04	1.10L-04	 			<u> </u>			2.37E-03	No
Cobalt compounds	V	7.33E-04	2.85E-05	3.66E-05	_	2.93E-05	3.74E-05	-	_	7.07E-06	7.07E-06	-	_	-				8.79E-04	No
Dichlorobenzene		3.30E-04	2.03L-03	5.00L-05 -	1.03E-05	2.93L-03	- -	1.03E-05	_	1.01E-04	1.01E-04	-	_	-	_	_		5.52E-04	No
Dichloroethane, 1,2-	Ÿ	1.13E-03	1.27E-04	1.63E-04	-	1.31E-04	1.67E-04	-	_	-	-	_	_	_	_	_	_	1.72E-03	No
Dichloropropane, 1,2-	Ÿ	1.28E-03	1.45E-04	1.86E-04	_	1.49E-04	1.90E-04	_	_	_	_	_	_	_	_	_	_	1.95E-03	No
Dinitrophenol, 2,4-	Ý	7.00E-06	7.89E-07	1.01E-06	_	8.10E-07	1.04E-06	_	_	_	_	-	_	_	-	_	_	1.07E-05	No
Di(2-ethylhexyl)phthalate	Ý	1.83E-06	2.06E-07	2.06E-07	-	2.12E-07	2.70E-07	_	-	-	-	-	-	-	-	-	-	2.72E-06	No
Ethyl benzene	Y	1.21E-03	1.36E-04	1.75E-04	-	1.40E-04	1.78E-04	-	-	-	-	-	-	-	-	-	-	1.83E-03	No
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	N	6.96E-10	-	_	-	-	_	-	-	-	-	-	-	-	-	-	-	6.96E-10	No
Hexane	Υ	4.95E-01	-	_	1.55E-02	-	-	1.55E-02	-	1.51E-01	1.51E-01	-	-	_	-	_	_	8.29E-01	No
Indeno(1,2,3-cd)pyrene	Y	4.95E-07	-	-	1.55E-08	-	-	1.55E-08	-	1.51E-07	1.51E-07	-	-	-	-	-	-	8.29E-07	No
Hydrochloric acid	Υ	2.96E+00	8.33E-02	1.07E-01	-	8.55E-02	1.09E-01	-	-	-	-	-	-	-	-	-	-	3.34E+00	No
Lead	Υ	5.55E-03	-	-	4.29E-06	-	-	4.29E-06	-	4.21E-05	4.21E-05	-	-	-	-	-	-	5.65E-03	No
Manganese	Υ	1.81E-01	7.01E-03	9.01E-03	3.26E-06	7.20E-03	7.20E-03	3.26E-06	-	3.20E-05	3.20E-05	-	-	-	-	-	-	2.11E-01	No
Mercury	Y	4.66E-04	1.53E-05	1.97E-05	2.23E-06	1.58E-05	2.01E-05	2.23E-06	-	2.19E-05	2.19E-05	-	-	-	-	-	-	5.86E-04	No
Methyl bromide	Y	5.84E-04	6.57E-05	8.45E-05	-	6.75E-05	8.63E-05	-	-	-	-	-	-	-	-	-	-	8.88E-04	No
Methyl chloride	Y		1.01E-04	1.30E-04	-	1.04E-04	1.32E-04	-	-	-	-	-	-	-	-	-	-	1.36E-03	
Methyl ethyl ketone	N	2.10E-04	-	-		-	-		-		-	-	-	-	-	-	-	2.10E-04	No
3-Methylchloranthrene	Y	4.95E-07	-	-	1.55E-08	-	-	1.55E-08	-	1.51E-07	1.51E-0/	-	-	-	-	-	-	8.29E-07	
Methylene chloride	Y	1.13E-02	- 4 255 04			- 4 275 04			-	-		-	-	- 1 525 04	-	-	-	1.13E-02	
Naphthalene Night-l	Y	3.95E-03	4.25E-04	5.46E-04	5.24E-06	4.37E-04	5.58E-04	5.24E-06	-	5.13E-05	5.13E-05	-	-	1.53E-04	-	-	-	6.18E-03	4
Nickel	Y	4.30E-03	1.45E-04	1.86E-04	1.80E-05		1.90E-04	1.80E-05	-	1.77E-04	1.77E-04	-	-	-	-	-	-	5.36E-03	No No
Nitrophenol, 4-	Y	4.28E-06	4.82E-07	6.20E-07	-	4.95E-07	6.33E-07	-	-	-	-	-	-	-	-	-	-	6.51E-06	No No
Pentachlorophenol	Y	1.98E-06 1.48E-03	2.24E-07 1.67E-04	2.87E-07 2.14E-04	-	2.30E-07 1.71E-04	2.93E-07 2.19E-04	-	-	-	<u>-</u>	-	-	-	-	<u>-</u>		3.02E-06 2.25E-03	No No
Perchloroethylene Phosphorus metal, yellow or white	Y	3.05E-03	1.67E-04 1.18E-04	2.14E-04 1.52E-04	-	1.71E-04 1.22E-04	2.19E-04 1.55E-04	-	-	-	<u>-</u> -	-	-	-	-		<u> </u>	3.59E-03	No No
Priosphorus metal, yellow or white Polychlorinated biphenyls	Y	3.17E-07	3.57E-08	4.59E-08	_	3.67E-08	4.69E-08	-		-	<u> </u>	-		-	-	_	<u>-</u>	4.82E-07	No
Polycyclic Organic Matter	Y	1.61E-02	5.48E-04	7.04E-04		5.63E-04	7.19E-04	3.50E-04	1.75E-04		3.43E-03	-	1.03E-04	2.49E-04	8.82E-05	_		2.68E-02	No
Selenium compounds	Y	3.23E-04	1.23E-05	1.58E-05	2.06E-07	1.26E-05	1.61E-05	2.06E-07	1./3L-04 -	2.02E-06	2.02E-06	-	1.03L-04 -	2.49L-04 -	- 0.02L-03			3.84E-04	No
Styrene	Ÿ	7.39E-02	1.23L-03	1.36L-03	2.00L-07	1.20L-03	1.01L-03	2.00L-07	-	2.02L-00	2.02L-00 -	-	_	-	_	_		7.39E-02	No
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	Y	3.35E-10	3.77E-11	4.84E-11	_	3.87E-11	4.95E-11		_	_	_	_	_	_	_	_	_	5.09E-10	No
Toluene	Ϋ́	2.10E-03	-	- +.O+L 11	2.92E-05	-	- 4.55L 11	2.92E-05	-	2.86E-04	2.86E-04	-	2.51E-04	3.30E-04		_	_	3.53E-03	
Trichloroethane, 1,1,1-	Ϋ́	1.21E-03	1.36E-04	1.75E-04	-	1.40E-04	1.78E-04	-	-	-	-	-	-	-	-	-	-	1.83E-03	No
Trichloroethylene	Ϋ́	1.17E-03	1.31E-04	1.31E-04	-	1.35E-04	1.73E-04	-	-	-	-	-	-	-	-	-	-	1.74E-03	
Trichlorofluoromethane	N	1.60E-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.60E-03	
Trichlorophenol, 2,4,6-	Ϋ́	8.56E-07	9.64E-08	1.24E-07	-	9.90E-08	1.27E-07	-		-	-	-	-	-	-	-	-	1.30E-06	
Vinyl chloride	Y	7.00E-04	7.89E-05	1.01E-04	-	8.10E-05	1.04E-04	-	-	-	-	-	-	-	-	-	-	1.07E-03	No
Xylene	Υ Υ	9.73E-04	-	-	-	-	-	-	-	-	-	-	1.75E-04	2.26E-04	1.50E-04			1.52E-03	No
TOTAL HAP	1	12.57	1.21	0.18	0.04	1.38	0.18	0.04	0.01	1.39	3.12	1.09	2.37F-03	1.85E-03		0.39	0.12	21.71	No

Notes:

1. Each dryer line is routed to a separate RTO (CD-RTO-1 and CD-RTO-2). Although dryer line 1 and dryer line 2 are capable of processing up to 537,625 ODT/yr and 620,000 ODT/yr, respectively, the combined throughput of both dryers will not exceed 781,255 ODT/yr. In order to provide Enviva with the flexibility to use either dryer line up to its individual capacity, the total emissions from the two RTO's are based on the total facility throughput and are calculated as follows:

- Where individual dryer emissions were calculated based on throughput (i.e. lb/ODT), the total emissions are estimated based on the total throughput of 781,255 ODT/yr, plus the emissions from the green hammermills.

- Where individual dryer emissions were calculated based on fuel use (i.e. lb/MMBtu or lb/MMscf) or hourly test/vendor data (i.e., lb/hr), the total emissions are conservatively set equal to the sum of the emissions from the two dryer lines plus the emissions from the green hammermills assuming both dryer lines operate 8,760 hrs/yr.

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Table 3a Potential Criteria Emissons Dryer #1 (ES-DRYER-1, CD-WESP-1, CD-RTO-1) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Dried Wood Throughput ¹	781,255 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	71.71 ODT/hr
Burner Heat Input	175.3 MMBtu/hr
Percent Hardwood	20.0%
Percent Softwood	80.0%
Annual Operation	8,760 hr/yr
Annual Heat Input	1,535,628 MMBtu/yr
Number of RTO Burners	4
RTO Burner Rating	8 MMBtu/hr
RTO Control Efficiency	97.50%

Potential Criteria Emissions

Pollutant	Biomass	Units	Emission Factor	Uncon Emiss		Controlled Emissions	
Tonatant	Emission Factor	Oilles	Source	Max (lb/hr)	Annual (tpy)	Max (lb/hr)	Annual (tpy)
CO	0.4	lb/ODT	Note 2			28.68	156.3
NO_X	22.23	lb/hr	Note 2			22.23	97.4
PM/PM ₁₀ /PM _{2.5} (Filterable + Condensable)	7.6	lb/hr	Note 4			7.60	33.3
SO ₂	0.025	lb/MMBtu	AP-42, Section 1.6 ³			4.38	19.2
Total VOC (as propane)	2.64	lb/ODT	Note 5	189.31	1031.3	4.73	25.8

- Annual dried wood throughput is based on total facility production. Although dryer line 1 and dryer line 2 are capable of processing up to 537,625 ODT/yr and 620,000 ODT/yr, respectively, the combined throughput of both dryers will not exceed 781,255 ODT/yr. In order to to provide Enviva with the flexibility to use either dryer line up to its individual capacity, the total emissions from the two dryer lines are based on the total facility throughput and calculated as follows:
- Where individual dryer emissions are calculated based on throughput (i.e. lb/ODT), the total emissions are estimated based on the total throughput of 781,255 ODT/yr.
- Where individual dryer emissions are calculated based on fuel use (i.e. lb/MMBtu or lb/MMscf) or hourly test/vendor data (i.e., lb/hr), the total emissions are conservatively set equal to the sum of the emissions from the two dryer lines assuming both dryer lines operate 8,760 hrs/yr.
- Dryer line 1 described as 175.3 MMBtu/hr = 155.3 MMBtu/hr from the grate and 2 additional 10 MMBtu/hr dust burners permitted but not added.
- 2 CO emissions based on data from similar Enviva facilities and information from NCASI database.
- NOx emissions based on stack test results from similar Enviva facility plus 30% contingency.
- ³ No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Enviva has conservatively calculated SO₂ emissions based upon the heat input of the dryer burners using an emission factor for wood combustion from AP-42, Section 1.6.
- ⁴ Particulate emission factor is based on data from similar Enviva facilities.
- ⁵ VOC emission factor based on source test data for similar pellet manufacturing facilities and represents uncontrolled emissions.



Table 3b

Potential VOC Emissons

Green Hammermills (ES-GHM-1 through ES-GHM-5, CD-WESP-1, CD-RTO-1 or CD-WESP-2, CD-RTO-2) **Enviva Pellets Northampton, LLC**

Calculation Basis

Hourly Throughput ¹	150.0 ODT/hr
Annual Throughput	781,255 ODT/yr
Hours of Operation	8,760 hr/yr
RTO Control Efficiency	97.50%

Potential VOC Emissions

Pollutant	CAS No.	НАР	NC TAP	voc	Emission Factor ²	Potential Emissions ³		
					(lb/ODT)	Max (lb/hr)	Annual (tpy)	
Acetaldehyde	75-07-0	Y	Υ	Y	8.4E-03	0.032	0.082	
Acrolein	107-02-8	Y	Υ	Y	1.6E-02	0.059	0.15	
Formaldehyde	50-00-0	Y	Υ	Y	4.8E-03	0.018	0.047	
Methanol	67-56-1	Y	N	Y	3.7E-02	0.140	0.36	
Phenol	108-95-2	Y	Υ	Y	4.6E-03	0.017	0.045	
Propionaldehyde	123-38-6	Υ	N	Υ	1.2E-03	0.005	0.012	
				Total T	AP Emissions	0.125	0.326	
	0.27	0.70						
Total VOC (as propane)		N/A	N/A	Y	0.32	1.21	3.15	

Notes:

- $^{
 m 1.}$ The max hourly throughput is based on the maximum capacity for the 2 existing green hammermills ratioed up to reflect 3 additional hammermills (i.e. 119.4 tph * 5/2).
- ^{2.} Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.
- ^{3.} The emissions from the green hammermills will primarily be controlled by the RTO on the existing dryer line (CD-RTO-1). During periods when the existing dryer line is down, the emissions from the green hammermills will be controlled by the RTO on the new dryer line (CD-RTO-2).

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents 0.018 MMBtu/lb Uncontrolled VOC emissions 126 tons/yr Uncontrolled VOC emissions 48 lb/hr 4,666 MMBtu/yr Heat input of uncontrolled VOC emissions Heat input of uncontrolled VOC emissions 0.9 MMBtu/hr

	Emission		Potential Emissions				
Pollutant	Factor	Units	Max (lb/hr)	Annual (tpv)			
CO	8.2E-02	lb/MMBtu ¹	0.07	0.19			
NO_X	9.8E-02	lb/MMBtu ¹	0.09	0.23			

Notes:

^{1.} CO and NO_x emission factors are from AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98 for small boilers.

Abbreviations:

CAS - chemical abstract service HAP - hazardous air pollutant

hr - hour lb - pound

NC - North Carolina ODT - oven dried tons RTO - Regenerative Thermal Oxidizer

TAP - toxic air pollutant tpy - tons per year

VOC - volatile organic compound

yr - year

Table 3c Potential HAP and TAP Emissions Dryer #1 (ES-DRYER-1, CD-WESP-1, CD-RTO-1) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Dried Wood Throughput ¹⁰	781,255 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	71.71 ODT/hr
Burner Heat Input	175.3 MMBtu/hr
Percent Hardwood	20.0%
Percent Softwood	80.0%
Annual Operation	8,760 hr/yr
Annual Heat Input	1,535,628 MMBtu/yr
Number of RTO Burners	4
RTO Burner Rating	8 MMBtu/hr
RTO Control Efficiency	97.50%

Potential HAP and TAP Emissions

Potential HAP and TAP Emissions					I		Potential	Emissions
Pollutant	НАР	NC TAP	voc	Emission Factor	Units	Footnote	Max	Annual
				Factor			(lb/hr)	(tpv)
Dryer Burner - Biomass Source		ı	1		1	1		
Acetaldehyde	Y	Y	Y	1.7E-01	lb/ODT	1	0.30	1.64
Acrolein	Y	Y	Υ	1.1E-01	lb/ODT	1	0.20	1.07
Formaldehyde	Y	Y	Υ	1.4E-01	lb/ODT	1	0.26	1.40
Methanol	Y	N	Υ	1.0E-01	lb/ODT	1	0.19	1.02
Phenol	Y	Y	Υ	5.8E-02	lb/ODT	1	0.10	0.56
Propionaldehyde	Y	N	Y	3.9E-02	lb/ODT	1	0.07	0.38
Acetophenone	Y	N	Υ	3.2E-09	lb/MMBtu	2,3	1.4E-08	6.1E-08
Antimony and compounds	Y	N	N	7.9E-06	lb/MMBtu	2,4	1.0E-04	4.4E-04
Arsenic	Y	Y	N	2.2E-05	lb/MMBtu	2,4	2.8E-04	1.2E-03
Benzene	Y	Y	Υ	4.2E-03	lb/MMBtu	2,3	1.8E-02	8.1E-02
Benzo(a)pyrene	Y	Y	Υ	2.6E-06	lb/MMBtu	2,3	1.1E-05	5.0E-05
Beryllium	Y	Y	N	1.1E-06	lb/MMBtu	2,4	1.4E-05	6.1E-05
Cadmium	Y	Y	N	4.1E-06	lb/MMBtu	2,4	5.2E-05	2.3E-04
Carbon tetrachloride	Y	Y	Y	4.5E-05	lb/MMBtu	2,3	2.0E-04	8.6E-04
Chlorine	Y	Y	N	7.9E-04	lb/MMBtu	2,9	1.4E-01	6.1E-01
Chlorobenzene	Y	Y	Υ	3.3E-05	lb/MMBtu	2,3	1.4E-04	6.3E-04
Chloroform	Y	Y	Υ	2.8E-05	lb/MMBtu	2,3	1.2E-04	5.4E-04
Chromium VI	_5	Y	N	3.5E-06	lb/MMBtu	2,4,5	4.4E-05	1.9E-04
Chromium-Other compounds	Y	N	N	1.8E-05	lb/MMBtu	2,4	2.2E-04	9.7E-04
Cobalt compounds	Y	N	N	6.5E-06	lb/MMBtu	2,4	8.3E-05	3.6E-04
Dichloroethane, 1,2-	Y	Y	Y	2.9E-05	lb/MMBtu	2,3	1.3E-04	5.6E-04
Dichloropropane, 1,2-	Y	N	Υ	3.3E-05	lb/MMBtu	2,3	1.4E-04	6.3E-04
Dinitrophenol, 2,4-	Y	N	Υ	1.8E-07	lb/MMBtu	2,3	7.9E-07	3.5E-06
Di(2-ethylhexyl)phthalate	Y	Y	Υ	4.7E-08	lb/MMBtu	2,3	2.1E-07	9.0E-07
Ethyl benzene	Y	N	Y	3.1E-05	lb/MMBtu	2,3	1.4E-04	6.0E-04
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	N	Y	Υ	1.8E-11	lb/MMBtu	2,3	7.8E-11	3.4E-10
Hydrochloric acid	Y	Y	N	1.9E-02	lb/MMBtu	2,6	3.3E-01	1.5E+00
Lead	Y	N	N	4.8E-05	lb/MMBtu	2,4	6.1E-04	2.7E-03
Manganese	Y	Y	N	1.6E-03	lb/MMBtu	2,4	2.0E-02	8.9E-02
Mercury	Y	Y	N	3.5E-06	lb/MMBtu	2,4	4.4E-05	1.9E-04
Methyl bromide	Y	N	Υ	1.5E-05	lb/MMBtu	2,3	6.6E-05	2.9E-04
Methyl chloride	Y	N	Y	2.3E-05	lb/MMBtu	2,3	1.0E-04	4.4E-04
Methyl ethyl ketone	N	Y	Y	5.4E-06	lb/MMBtu	2,3	2.4E-05	1.0E-04
Methylene chloride	Y	Y	Y	2.9E-04	lb/MMBtu	2,3	1.3E-03	5.6E-03
Naphthalene	Y	N	Y	9.7E-05	lb/MMBtu	2,3	4.3E-04	1.9E-03
Nickel	Y	Y	N	3.3E-05	lb/MMBtu	2,4	4.2E-04	1.8E-03
Nitrophenol, 4-	Y	N	Y	1.1E-07	lb/MMBtu	2,3	4.8E-07	2.1E-06
Pentachlorophenol	Y	Y	N	5.1E-08	lb/MMBtu	2	2.2E-07	9.8E-07
Perchloroethylene	Y	Y	N	3.8E-05	lb/MMBtu	2	1.7E-04	7.3E-04
Phosphorus metal, yellow or white	Y	N	N	2.7E-05	lb/MMBtu	2,4	3.4E-04	1.5E-03
Polychlorinated biphenyls	Y	Y	Υ	8.2E-09	lb/MMBtu	2,3	3.6E-08	1.6E-07
Polycyclic Organic Matter	Y	N	N	1.3E-04	lb/MMBtu	2	5.5E-04	2.4E-03
Selenium compounds	Y	N	N	2.8E-06	lb/MMBtu	2,4	3.6E-05	1.6E-04
Styrene	Y	Y	Υ	1.9E-03	lb/MMBtu	2,3	8.3E-03	3.6E-02
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	Y	Y	Υ	8.6E-12	lb/MMBtu	2,3	3.8E-11	1.7E-10
Toluene	Y	Y	Υ	3.0E-05	lb/MMBtu	2,3	1.3E-04	5.8E-04
Trichloroethane, 1,1,1-	Y	Y	N	3.1E-05	lb/MMBtu	2	1.4E-04	6.0E-04
Trichloroethylene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	1.3E-04	5.8E-04
Trichlorofluoromethane	N	Y	Y	4.1E-05	lb/MMBtu	2,3	1.8E-04	7.9E-04
Trichlorophenol, 2,4,6-	Y	N	Y	2.2E-08	lb/MMBtu	2,3	9.6E-08	4.2E-07
Vinyl chloride	Y	Y	Y	1.8E-05	lb/MMBtu	2,3	7.9E-05	3.5E-04
Xylene	Y	Υ	Υ	2.5E-05	lb/MMBtu	2,3	1.1E-04	4.8E-04
				otal HAP Emiss	•	-	1.64	8.38
<u> </u>			7	otal TAP Emiss	sions (related	to biomacc)	1.38	6.97



Table 3c Potential HAP and TAP Emissions Dryer #1 (ES-DRYER-1, CD-WESP-1, CD-RTO-1) Enviva Pellets Northampton, LLC

				Emission			Potential	Emissions
Pollutant	HAP	NC TAP	voc	Factor	Units	Footnote	Max	Annual
RTO - Natural Gas/Propane Source	I	<u> </u>	<u> </u>	<u> </u>		<u> </u>	(lb/hr)	(tpv)
2-Methylnaphthalene	Υ	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	1.0E-01	4.4E-01
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	7.1E-04	lb/MMBtu	8	2.3E-02	1.0E-01
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	1.5E-03	lb/MMBtu	8	4.8E-02	2.1E-01
Hexane	Y	Y	Y	1.8	lb/MMscf	7	5.6E-02	2.5E-01
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	1.0E-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
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	1.3E-03	5.6E-03
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 compounds	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
Toluene	1		•	issions (relate	· · · · · · · · · · · · · · · · · · ·	,		0.56
				issions (related				0.56

Notes:

- 1. Emission factor derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.
- ^{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 97.5% for the RTO is applied to all VOC hazardous and toxic pollutants.
- ^{4.} The control efficiency of the wet electrostatic precipitator (WESP) for filterable particulate matter is applied to all metal hazardous and toxic pollutants from the dryer and duct burners. Actual design filterable efficiency is estimated to 96.4%, but 92.75% is assumed for toxics permitting.
- WESP Control Efficiency for metal HAP 92.8
- ^{5.} Chromium VI is a subset of chromium 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.

WESP HCI Control Efficiency 90.00%

- ^{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. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.
- 8. The RTO burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.
- $^{9.}$ It was assumed that chlorine is not oxidized in the RTO.
- Annual dried wood throughput is based on total facility production. Although dryer line 1 and dryer line 2 are capable of processing up to 537,625 ODT/yr and 620,000 ODT/yr, respectively, the combined throughput of both dryers will not exceed 781,255 ODT/yr. In order to to provide Enviva with the flexibility to use either dryer line up to its individual capacity, the total emissions from the two dryer lines are based on the total facility throughput and calculated as follows:
 - Where individual dryer emissions are calculated based on throughput (i.e. lb/ODT), the total emissions are estimated based on the total throughput of 781,255 ODT/yr.
 - Where individual dryer emissions are calculated based on fuel use (i.e. lb/MMBtu or lb/MMscf), the total emissions are conservatively set equal to the sum of the emissions from the two dryer lines assuming both dryer lines operate 8,760 hrs/yr.



Table 3c Potential HAP and TAP Emissions Dryer #1 (ES-DRYER-1, CD-WESP-1, CD-RTO-1) Enviva Pellets Northampton, LLC

Abbreviations:

CAS - chemical abstract service

CH₄ - methane

CO - carbon monoxide

CO2 - carbon dioxide

CO₂e - 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

N₂O - nitrous oxide

ODT - oven dried tons

PM - particulate matter

 $\ensuremath{\text{PM}_{10}}\xspace$ - 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 3d

Potential Emissions

Dryer #1 Bypass (ES-DRYERBYP-1) (Full Capacity)¹ Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput ¹	71.71 ODT/hr
Hourly Heat Input Capacity	175.3 MMBtu/hr
Annual Heat Input Capacity	8,765 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	1 4000		Max (lb/hr)	Annual (tpv)	
СО	21.4	lb/hr ²	21.4	0.54	
NO_X	26.3	lb/hr ²	26.3	0.66	
SO₂	0.025	lb/MMBtu ³	4.38	0.110	
voc	14.0	lb/hr ²	14.0	0.35	
PM/PM ₁₀ /PM _{2.5} Condensable	0.017	lb/MMBtu ⁴	2.98	0.075	
PM/PM ₁₀ /PM _{2.5} Filterable	0.33	lb/MMBtu⁵	57.8	1.45	
Total PM/PM ₁₀ /PM _{2.5}	-	•	60.8	1.52	

Notes:

During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line. As the feed to the dryer is typically stopped during shutdown and malfunction events, the hourly throughput is equal to the annual average of the dryer feed rate.

 2 CO, NO_X, and VOC emission rates based on data from a comparable Enviva facility.



^{3.} No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Enviva has conservatively calculated SO₂ emissions based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

^{4.} Emission factor for condensable PM based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

 $^{^{5.}}$ Uncontrolled filterable PM emission factor is based on testing at a comparable Enviva facility.

Table 3d Potential Emissions Dryer #1 Bypass (ES-DRYERBYP-1) (Full Capacity)¹ Enviva Pellets Northampton, LLC

Potential HAP Emissions per Dryer Line

	Emission		F	Potential Emissions ¹	
Pollutant	Factor	Units	Footnote	Max	Annual
				(lb/hr)	(tpv)
Acetaldehyde	0.168	lb/ODT	2	12.1	0.30
Acrolein	0.110	lb/ODT	2	7.89	0.197
Formaldehyde	0.144	lb/ODT	2	10.29	0.26
Methanol	0.105	lb/ODT	2	7.52	0.19
Phenol	0.058	lb/ODT	2	4.13	0.10
Propionaldehyde	0.039	lb/ODT	2	2.76	0.069
Acetophenone	3.2E-09	lb/MMBtu	3	5.61E-07	1.40E-08
Antimony and compounds	7.9E-06	lb/MMBtu	3	1.38E-03	3.46E-05
Arsenic	2.2E-05	lb/MMBtu	3	3.86E-03	9.64E-05
Benzo(a)pyrene	2.6E-06	lb/MMBtu	3	4.56E-04	1.14E-05
Beryllium	1.1E-06	lb/MMBtu	3	1.93E-04	4.82E-06
Cadmium	4.1E-06	lb/MMBtu	3	7.19E-04	1.80E-05
Carbon tetrachloride	4.5E-05	lb/MMBtu	3	7.89E-03	1.97E-04
Chlorine	7.9E-04	lb/MMBtu	3	1.38E-01	3.46E-03
Chlorobenzene	3.3E-05	lb/MMBtu	3	5.78E-03	1.45E-04
Chromium-Other compounds	1.8E-05	lb/MMBtu	3	3.07E-03	7.67E-05
Cobalt compounds	6.5E-06	lb/MMBtu	3	1.14E-03	2.85E-05
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	3	3.16E-05	7.89E-07
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	3	8.24E-06	2.06E-07
Ethyl benzene	3.1E-05	lb/MMBtu	3	5.43E-03	1.36E-04
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	3	5.08E-03	1.27E-04
Hydrochloric acid	1.9E-02	lb/MMBtu	3	3.33E+00	8.33E-02
Lead	4.8E-05	lb/MMBtu	3	8.41E-03	2.10E-04
Manganese	1.6E-03	lb/MMBtu	3	2.80E-01	7.01E-03
Mercury	3.5E-06	lb/MMBtu	3	6.14E-04	1.53E-05
Methyl bromide	1.5E-05	lb/MMBtu	3	2.63E-03	6.57E-05
Methyl chloride	2.3E-05	lb/MMBtu	3	4.03E-03	1.01E-04
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	3	5.43E-03	1.36E-04
Naphthalene	9.7E-05	lb/MMBtu	3	1.70E-02	4.25E-04
Nickel	3.3E-05	lb/MMBtu	3	5.78E-03	1.45E-04
Nitrophenol, 4-	1.1E-07	lb/MMBtu	3	1.93E-05	4.82E-07
Pentachlorophenol	5.1E-08	lb/MMBtu	3	8.94E-06	2.24E-07
Perchloroethylene	3.8E-05	lb/MMBtu	3	6.66E-03	1.67E-04
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	3	4.73E-03	1.18E-04
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	3	1.43E-06	3.57E-08
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	3	2.19E-02	5.48E-04
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	3	5.78E-03	1.45E-04
Selenium compounds	2.8E-06	lb/MMBtu	3	4.91E-04	1.23E-05
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	3	1.51E-09	3.77E-11
Trichloroethylene	3.0E-05	lb/MMBtu	3	5.26E-03	1.31E-04
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	3	3.86E-06	9.64E-08
Vinyl chloride	1.8E-05	lb/MMBtu	3	3.16E-03	7.89E-05
		Total HAP	Emissions	48.5	1.21

Notes:

- 1. During dryer bypass emissions are not controlled by the WESP and RTO; however, combustion in the furnace still results in a reduction in organic HAP emission rates
- ^{2.} Organic HAP emissions rates were derived based on stack testing data from other similar Enviva plants and/or engineering judgement.
- ^{3.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 Wood Residue Combustion in Boilers, 09/03.

Abbreviations:

CH₄ - methane ODT - oven dried tons
CO - carbon monoxide PM - particulate matter

CO2 - carbon dioxide PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns CO_2 e - carbon dioxide equivalent $PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less

HAP - hazardous air pollutant RTO - regenerative thermal oxidizer

 $\begin{array}{ccc} \text{hr - hour} & & \text{SO}_2\text{ - sulfur dioxide} \\ \text{kg - kilogram} & & \text{tpy - tons per year} \end{array}$

Ib - poundVOC - volatile organic compoundMMBtu - Million British thermal unitsWESP - wet electrostatic precipitator

Reference:

N₂O - nitrous oxide

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 3e **Potential Emissions**

Dryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Full Capacity)¹ **Enviva Pellets Northampton, LLC**

Calculation Basis

Hourly Heat Input Capacity	175.3 MMBtu/hr
Annual Heat Input Capacity	8,765 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potentia	l Emissions
	. 4000		Max (lb/hr)	Annual (tpy)
СО	0.60	lb/MMBtu ²	105.2	2.63
NO_X	0.22	lb/MMBtu ²	38.57	0.96
SO ₂	0.025	lb/MMBtu ²	4.38	0.110
VOC	0.017	lb/MMBtu ²	2.98	0.075
Total PM/PM ₁₀ /PM _{2.5}	0.58	lb/MMBtu ²	101.1	2.53

- 1. During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line.

 2. CO, NO_X, SO₂, PM, and VOC emission rates based on AP-42, Chapter 1.6 Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet wood-
- fired boilers. VOC emission factor excludes formal dehyde.



Table 3e

Potential Emissions

Dryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Full Capacity)¹ Enviva Pellets Northampton, LLC

Potential HAP Emissions per Dryer Line

Pollutant	Emission	Units	Footnote	Potential Emissions		
Pollutant	Factor	Units	rootnote	Max	Annual	
				(lb/hr)	(tpv)	
Acetaldehyde	8.30E-04	lb/MMBtu	1	1.45E-01	3.64E-03	
Acrolein	4.00E-03	lb/MMBtu	1	7.01E-01	1.75E-02	
Formaldehyde	4.40E-03	lb/MMBtu	1	7.71E-01	1.93E-02	
Phenol	5.10E-05	lb/MMBtu	1	8.94E-03	2.24E-04	
Propionaldehyde	6.10E-05	lb/MMBtu	1	1.07E-02	2.67E-04	
Acetophenone	3.2E-09	lb/MMBtu	1	5.61E-07	1.40E-08	
Antimony and compounds	7.9E-06	lb/MMBtu	1	1.38E-03	3.46E-05	
Arsenic	2.2E-05	lb/MMBtu	1	3.86E-03	9.64E-05	
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	4.56E-04	1.14E-05	
Beryllium	1.1E-06	lb/MMBtu	1	1.93E-04	4.82E-06	
Cadmium	4.1E-06	lb/MMBtu	1	7.19E-04	1.80E-05	
Carbon tetrachloride	4.5E-05	lb/MMBtu	1	7.89E-03	1.97E-04	
Chlorine	7.9E-04	lb/MMBtu	1	1.38E-01	3.46E-03	
Chlorobenzene	3.3E-05	lb/MMBtu	1	5.78E-03	1.45E-04	
Chromium-Other compounds	2.1E-05	lb/MMBtu	1	3.68E-03	9.20E-05	
Cobalt compounds	6.5E-06	lb/MMBtu	1	1.14E-03	2.85E-05	
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	3.16E-05	7.89E-07	
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	8.24E-06	2.06E-07	
Ethyl benzene	3.1E-05	lb/MMBtu	1	5.43E-03	1.36E-04	
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	5.08E-03	1.27E-04	
Hydrochloric acid	1.9E-02	lb/MMBtu	1	3.33E+00	8.33E-02	
Lead	4.8E-05	lb/MMBtu	1	8.41E-03	2.10E-04	
Manganese	1.6E-03	lb/MMBtu	1	2.80E-01	7.01E-03	
Mercury	3.5E-06	lb/MMBtu	1	6.14E-04	1.53E-05	
Methyl bromide	1.5E-05	lb/MMBtu	1	2.63E-03	6.57E-05	
Methyl chloride	2.3E-05	lb/MMBtu	1	4.03E-03	1.01E-04	
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	5.43E-03	1.36E-04	
Naphthalene	9.7E-05	lb/MMBtu	1	1.70E-02	4.25E-04	
Nickel	3.3E-05	lb/MMBtu	1	5.78E-03	1.45E-04	
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	1.93E-05	4.82E-07	
Pentachlorophenol	5.1E-08	lb/MMBtu	1	8.94E-06	2.24E-07	
Perchloroethylene	3.8E-05	lb/MMBtu	1	6.66E-03	1.67E-04	
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	4.73E-03	1.18E-04	
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	1.43E-06	3.57E-08	
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	2.19E-02	5.48E-04	
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	5.78E-03	1.45E-04	
Selenium compounds	2.8E-06	lb/MMBtu	1	4.91E-04	1.23E-05	
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	1.51E-09	3.77E-11	
Trichloroethylene	3.0E-05	lb/MMBtu	1	5.26E-03	1.31E-04	
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	3.86E-06	9.64E-08	
Vinyl chloride	1.8E-05	lb/MMBtu	1	3.16E-03	7.89E-05	
	HAP Emissions		mbustion)	5.51	0.14	

Notes:

1. Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations: CH₄ - methane

CO - carbon monoxide
CO2 - carbon dioxide
CO2e - carbon dioxide equivalent
HAP - hazardous air pollutant

hr - hour lb - pound

MMBtu - Million British thermal units

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

SO₂ - sulfur dioxide

tpy - tons per year VOC - volatile organic compound

yr - year

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 3f Potential Emissions

Dryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Idle Mode)¹ Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Heat Input Capacity	5 MMBtu/hr
Annual Heat Input Capacity	2,500 MMBtu/yr
Hours of Operation ¹	500 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	ructor		Max (lb/hr)	Annual (tpv)	
СО	0.60	lb/MMBtu ²	3.00	0.75	
NO_X	0.22	lb/MMBtu ²	1.10	0.28	
SO ₂	0.025	lb/MMBtu ²	0.13	0.031	
VOC	0.017	lb/MMBtu ²	0.085	0.021	
Total PM	0.58	lb/MMBtu ²	2.89	0.72	
Total PM ₁₀	0.52	lb/MMBtu ²	2.59	0.65	
Total PM _{2.5}	0.45	lb/MMBtu ²	2.24	0.56	



^{1.} As part of this submittal Enviva is requesting a limit of 500 hours per year of "idle mode" for each furnace.

^{2.} CO, NO_X, SO₂, PM, PM₁₀, PM_{2.5}, and VOC emission rates based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet wood-fired boilers. PM₁₀ and PM_{2.5} factors equal to the sum of the filterable and condensible factors from Table 1.6-1. VOC emission factor excludes formaldehyde.

Table 3f Potential Emissions

Dryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Idle Mode)¹ Enviva Pellets Northampton, LLC

Potential HAP Emissions per Dryer Line

	Emission	1	_	Potential E	missions
Pollutant	Factor	Units	Footnote	Max (lb/hr)	Annual
Acetaldehyde	8.30E-04	lb/MMBtu	1	4.15E-03	(tpv) 1.04E-03
Acrolein	4.00E-03	lb/MMBtu	1	2.00E-02	5.00E-03
Formaldehyde	4.40E-03	lb/MMBtu	1	2.20E-02	5.50E-03
Phenol	5.10E-05	lb/MMBtu	1	2.55E-04	6.38E-05
Propionaldehyde	6.10E-05	lb/MMBtu	1	3.05E-04	7.63E-05
Acetophenone	3.2E-09	lb/MMBtu	1	1.60E-08	4.00E-09
Antimony and compounds	7.9E-06	lb/MMBtu	1	3.95E-05	9.88E-06
Arsenic	2.2E-05	lb/MMBtu	1	1.10E-04	2.75E-05
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	1.30E-05	3.25E-06
Beryllium	1.1E-06	lb/MMBtu	1	5.50E-06	1.38E-06
Cadmium	4.1E-06	lb/MMBtu	1	2.05E-05	5.13E-06
Carbon tetrachloride	4.1E-06 4.5E-05	Ib/MMBtu		2.25E-04	5.63E-05
	7.9E-04	lb/MMBtu	1 1	3.95E-03	9.88E-04
Chlorine Chlorobenzene					
	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05
Chromium-Other compounds	2.1E-05	lb/MMBtu	1	1.05E-04	2.63E-05
Cobalt compounds	6.5E-06	lb/MMBtu	1	3.25E-05	8.13E-06
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	9.00E-07	2.25E-07
Bis(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	2.35E-07	5.88E-08
Ethyl benzene	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-0
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	1.45E-04	3.63E-0
Hydrochloric acid	1.9E-02	lb/MMBtu	1	9.50E-02	2.38E-02
Lead	4.8E-05	lb/MMBtu	1	2.40E-04	6.00E-0
Manganese	1.6E-03	lb/MMBtu	1	8.00E-03	2.00E-03
Mercury	3.5E-06	lb/MMBtu	1	1.75E-05	4.38E-0
Methyl bromide	1.5E-05	lb/MMBtu	1	7.50E-05	1.88E-0
Methyl chloride	2.3E-05	lb/MMBtu	1	1.15E-04	2.88E-0
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-0
Naphthalene	9.7E-05	lb/MMBtu	1	4.85E-04	1.21E-04
Nickel	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-0
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	5.50E-07	1.38E-0
Pentachlorophenol	5.1E-08	lb/MMBtu	1	2.55E-07	6.38E-08
Perchloroethylene	3.8E-05	lb/MMBtu	1	1.90E-04	4.75E-0
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	1.35E-04	3.38E-0
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	4.08E-08	1.02E-0
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	6.25E-04	1.56E-0
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-0
Selenium compounds	2.8E-06	lb/MMBtu	1	1.40E-05	3.50E-0
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	4.30E-11	1.08E-1
Trichloroethene	3.0E-05	lb/MMBtu	1	1.50E-04	3.75E-0
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	1.10E-07	2.75E-0
Vinyl chloride	1.8E-05	lb/MMBtu	1	9.00E-05	2.25E-0
	IAP Emissions				0.039

Notes:

1. Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations:

 ${
m CH_4}$ - methane ${
m N_2O}$ - nitrous oxide ${
m CO}$ - carbon monoxide ${
m ODT}$ - oven dried tons ${
m CO2}$ - carbon dioxide ${
m PM}$ - particulate matter

 CO_2e - carbon dioxide equivalent 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

 $\begin{array}{ccc} \text{hr - hour} & \text{SO}_2\text{ - sulfur dioxide} \\ \text{kg - kilogram} & \text{tpy - tons per year} \end{array}$

lb - pound VOC - volatile organic compound

 \mbox{MMBtu} - Million British thermal units $$\mbox{yr}$ - year $\mbox{NO}_{\mbox{X}}$ - nitrogen oxides

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 3g

Potential Emissions

Dryer #1 Double Duct Burners (IES-DDB-1 and -2) Enviva Pellets Northampton, LLC

Duct Burner Inputs

Duct Burner Rating	1 MMBtu/hr
Number of Duct Burners	2
Annual Operation	8,760 hr/yr

Potential Criteria Pollutant Emissions:

Potential Criteria Pollutant Emissions - Natural Gas Combustion

Pollutant	Emission	lluite.	Emission	Potential Emissions	
Pollutant	Factor	Units	Factor Source	Max (lb/hr)	Annual (tpv)
СО	84.0	lb/MMscf	Note 1	0.16	0.72
NO_X	50.0	lb/MMscf	Note 2	0.10	0.43
SO ₂	0.60	lb/MMscf	Note 1	0.0012	0.005
VOC	5.50	lb/MMscf	Note 1	0.01	0.05
PM/PM ₁₀ /PM _{2.5} Condensable	5.70	lb/MMscf	Note 1	0.01	0.05
PM/PM ₁₀ /PM _{2.5} Filterable	1.90	lb/MMscf	Note 1	0.004	0.02
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.065

Potential Criteria Pollutant Emissions - Propane Combustion

Pollutant	Emission	Emission Unite	Emission	Potential Emissions	
Poliutant	Factor ³ Units	Factor Source	Max (lb/hr)	Annual (tpv)	
CO	7.50	lb/Mgal	Note 3	0.16	0.72
NO_X	6.50	lb/Mgal	Note 4	0.14	0.62
SO ₂	0.054	lb/Mgal	Note 3,5	0.001	0.005
VOC	1.00	lb/Mgal	Note 3	0.02	0.10
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	Note 3	0.01	0.05
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	Note 3	0.004	0.02
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.067

- ^{1.} Emission factors for natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, 07/98. Natural gas heating value of 1,020 Btu/scf assumed per AP-42.
- ^{2.} Emission factors for NO_X assume burners are low NO_X burners, per email from Kai Simonsen (Enviva) on August 8, 2018.
- ^{3.} Emission factors for propane combustion obtained from AP-42 Section 1.5 Liquefied Petroleum Gas Combustion, 07/08. Propane heating value of 91.5 MMBtu/Mgal assumed per AP-42.
- 4 . AP-42 Section 1.5 does not include an emission factor for low NO_X burners. Per AP-42 Section 1.4, low NO_X burners reduce NO_X emissions by accomplishing combustion in stages, reducing NO_X emissions 40 to 85% relative to uncontrolled emission levels. A conservative control efficiency of 50% was applied to the uncontrolled NO_X emission factor from AP-42 Section 1.5. This reduction is consistent with the magnitude of reduction between the uncontrolled and low NO_X emission factors in AP-42 Section 1.4.



^{5.} SO₂ emissions are based on an assumed fuel sulfur content of 0.54 grains/100 ft³ per *A National Methodology and Emission Inventory for Residential Fuel Combustion* .

Table 3g Potential Emissions

Dryer #1 Double Duct Burners (IES-DDB-1 and -2) Enviva Pellets Northampton, LLC

Potential HAP and TAP Emissions

				Emission		Footnote	Potential Emissions		
Pollutant	НАР	NC TAP	VOC	Factor	Units		Max (lb/hr)	Annual (tpv)	
Duct Burners - Natural Gas/Propane Sc	ource								
2-Methylnaphthalene	Y	N	Y	2.4E-05	lb/MMscf	1	4.7E-08	2.1E-07	
3-Methylchloranthrene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	lb/MMscf	1	3.1E-08	1.4E-07	
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	1	3.0E-08	1.3E-07	
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	1	3.5E-08	1.5E-07	
Ammonia	N	Y	N	3.2	lb/MMscf	1	6.3E-03	2.7E-02	
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	1	4.7E-09	2.1E-08	
Arsenic	Y	Y	N	2.0E-04	lb/MMscf	1	3.9E-07	1.7E-06	
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	2	1.4E-03	6.2E-03	
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08	
Benzo(b)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08	
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	1	2.4E-08	1.0E-07	
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	1	2.2E-06	9.4E-06	
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	1	2.7E-06	1.2E-05	
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Cobalt	Y	N	N	8.4E-05	lb/MMscf	1	1.6E-07	7.2E-07	
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08	
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	1	2.4E-06	1.0E-05	
Fluoranthene	Υ	N	Y	3.0E-06	lb/MMscf	1	5.9E-09	2.6E-08	
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	1	5.5E-09	2.4E-08	
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	2	3.0E-03	1.3E-02	
Hexane	Y	Y	Y	1.8	lb/MMscf	1	3.5E-03	1.5E-02	
Indeno(1,2,3-cd)pyrene	Υ	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Lead	Υ	N	N	5.0E-04	lb/MMscf	1	9.8E-07	4.3E-06	
Manganese	Y	Y	N	3.8E-04	lb/MMscf	1	7.5E-07	3.3E-06	
Mercury	Y	Y	N	2.6E-04	lb/MMscf	1	5.1E-07	2.2E-06	
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	1	1.2E-06	5.2E-06	
Nickel	Υ	Y	N	2.1E-03	lb/MMscf	1	4.1E-06	1.8E-05	
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	8.0E-05	3.5E-04	
Phenanthrene	Y	N	Y	1.7E-05	lb/MMscf	1	3.3E-08	1.5E-07	
Pyrene	Y	N	Y	5.0E-06	lb/MMscf	1	9.8E-09	4.3E-08	
Selenium compounds	Y	N	N	2.4E-05	lb/MMscf	1	4.7E-08	2.1E-07	
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	1	6.7E-06	2.9E-05	
	•	Т	otal HAP Em	issions (relate	d to natural q	as/propane)	0.008	0.035	
				issions (relate	_		0.01	0.056	



Table 3g

Potential Emissions

Dryer #1 Double Duct Burners (IES-DDB-1 and -2)

Enviva Pellets Northampton, LLC

Notes:

^{1.} 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. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

^{2.} The duct burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Abbreviations:

CAS - chemical abstract service

CH₄ - methane

CO - carbon monoxide

CO2 - carbon dioxide

CO₂e - 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

N₂O - nitrous oxide

ODT - oven dried tons

PM - particulate matter

PM₁₀ - 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

SO₂ - sulfur dioxide

TAP - toxic air pollutant

tpy - tons per year

VOC - volatile organic compound

WESP - wet electrostatic precipitator

yr - year



Table 4a Potential Criteria Emissons Dryer #2 (ES-DRYER-2, CD-WESP-2, CD-RTO-2) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Dried Wood Throughput ¹	781,255 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	82.10 ODT/hr
Burner Heat Input	180.0 MMBtu/hr
Percent Hardwood	20.0%
Percent Softwood	80.0%
Annual Operation	8,760 hr/yr
Annual Heat Input	1,576,800 MMBtu/yr
Number of RTO Burners	4
RTO Burner Rating	8 MMBtu/hr
RTO Control Efficiency	97.50%

Potential Criteria Emissions

Dellutent	Biomass	Haita	Emission Factor Source	Uncontrolled Emissions		Controlled Emissions	
Pollutant	Emission Factor	Units	Emission Factor Source	Max (lb/hr)	Annual (tpy)	Max (lb/hr)	Annual (tpy)
СО	0.4	lb/ODT	Note 2			32.84	156.3
NO_X	22.23	lb/hr	Note 2			22.23	97.4
PM/PM ₁₀ /PM _{2.5} (Filterable + Condensable)	7.6	lb/hr	Note 4			7.60	33.3
SO ₂	0.025	lb/MMBtu	AP-42, Section 1.6 ³			4.50	19.7
Total VOC (as propane)	2.640	lb/ODT	Note 5	216.74	1031.3	5.42	25.8

- Annual dried wood throughput is based on total facility production. Although dryer line 1 and dryer line 2 are capable of processing up to 537,625 ODT/yr and 620,000 ODT/yr, respectively, the combined throughput of both dryers will not exceed 781,255 ODT/yr. In order to to provide Enviva with the flexibility to use either dryer line up to its individual capacity, the total emissions from the two dryer lines are based on the total facility throughput and calculated as follows:
- Where individual dryer emissions are calculated based on throughput (i.e. lb/ODT), the total emissions are estimated based on the total throughput of 781,255 ODT/yr.
- Where individual dryer emissions are calculated based on fuel use (i.e. lb/MMBtu or lb/MMscf) or hourly test/vendor data (i.e., lb/hr), the total emissions are conservatively set equal to the sum of the emissions from the two dryer lines assuming both dryer lines operate 8,760 hrs/yr.
- Dryer line 1 described as 175.3 MMBtu/hr = 155.3 MMBtu/hr from the grate and 2 additional 10 MMBtu/hr dust burners permitted but not added.
- ² CO emissions based on data from similar Enviva facilities and information from NCASI database.
- NOx emissions based on stack test results from similar Enviva facility plus 30% contingency.
- 3 No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Enviva has conservatively calculated SO₂ emissions based upon the heat input of the dryer burners using an emission factor for wood combustion from AP-42, Section 1.6.
- ⁴ Particulate emission factor is based on data from similar Enviva facilities.
- ⁵ VOC emission factor based on source test data for similar pellet manufacturing facilities and represents uncontrolled emissions.



Table 4b Potential HAP and TAP Emissions Dryer #2 (ES-DRYER-2, CD-WESP-2, CD-RTO-2) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Dried Wood Throughput ¹	781,255 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	82.10 ODT/hr
Burner Heat Input	180.0 MMBtu/hr
Percent Hardwood	20.0%
Percent Softwood	80.0%
Annual Operation	8,760 hr/yr
Annual Heat Input	1,576,800 MMBtu/yr
Number of RTO Burners	4
RTO Burner Rating	8 MMBtu/hr
RTO Control Efficiency	97.50%

Pollutant	НАР	NC TAP	voc	Emission Factor	Units	Footnote	Potential Max (lb/hr)	Emissions Annual
Biomass Source		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	(ID/Nr)	(tpv)
Acetaldehyde	Υ	Y	Y	1.7E-01	lb/ODT	1	0.35	1.64
Acrolein	Y	Y	Y	1.1E-01	Ib/ODT	1	0.23	1.07
Formaldehyde	Y	Y	Y	1.4E-01	Ib/ODT	1	0.29	1.40
Methanol	Y	N	Y	1.0E-01	Ib/ODT	1	0.22	1.02
Phenol	Y	Y	Y	5.8E-02	Ib/ODT	1	0.12	0.56
Propionaldehyde	Y	N	Y	3.9E-02	Ib/ODT	1	0.08	0.38
Acetophenone	Y	N	Y	3.2E-02	Ib/MMBtu	2,3	1.4E-08	6.3E-08
Antimony and compounds	Y	N	N	7.9E-06	Ib/MMBtu	2,4	1.4E-08 1.0E-04	4.5E-04
Arsenic	Y	Y	N	2.2E-05	Ib/MMBtu	2,4	2.9E-04	1.3E-03
Benzene	Y	Y	Y	4.2E-03	Ib/MMBtu	2,3	1.9E-02	8.3E-02
Benzo(a)pyrene	Y	Y	Y	2.6E-06	Ib/MMBtu	2,3	1.9E-02 1.2E-05	5.1E-05
Beryllium	Y	Y	N N	1.1E-06	Ib/MMBtu	2,3	1.4E-05	6.3E-05
Cadmium	Y	Y	N	4.1E-06	Ib/MMBtu		5.4E-05	2.3E-04
Carbon tetrachloride	Y	Y	Y	4.1E-06 4.5E-05	Ib/MMBtu	2,4 2,3	2.0E-04	8.9E-04
Carbon tetrachioride Chlorine	Y	Y	N N	7.9E-04	Ib/MMBtu	2,3	1.4E-01	6.2E-01
Chlorobenzene	Y	Y	Y	7.9E-04 3.3E-05	Ib/MMBtu	2,9	1.4E-01 1.5E-04	6.2E-01 6.5E-04
Chloroform	Y	Y	Y	2.8E-05	Ib/MMBtu	2,3	1.3E-04 1.3E-04	5.5E-04
Chromium VI		Y	N N	3.5E-06	Ib/MMBtu		4.6E-05	
	Y	N	N N	1.8E-05	Ib/MMBtu	2,4,5	2.3E-04	2.0E-04 1.0E-03
Chromium-Other compounds	Y	N	N N	6.5E-06	,	2,4	8.5E-05	3.7E-04
Cobalt compounds	Y		Y		lb/MMBtu lb/MMBtu	2,4		
Dichloroethane, 1,2-	Y	Y		2.9E-05		2,3	1.3E-04	5.7E-04
Dichloropropane, 1,2-		N	Y	3.3E-05	Ib/MMBtu	2,3	1.5E-04	6.5E-04
Dinitrophenol, 2,4-	Y	N	Y	1.8E-07	Ib/MMBtu	2,3	8.1E-07	3.5E-06
Di(2-ethylhexyl)phthalate Ethyl benzene	Y	Y	Y	4.7E-08	lb/MMBtu	2,3	2.1E-07	9.3E-07
,		N		3.1E-05	Ib/MMBtu	2,3	1.4E-04	6.1E-04
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	N	Y	Y	1.8E-11	Ib/MMBtu	2,3	8.1E-11	3.5E-10
Hydrochloric acid	Y	Y	N	1.9E-02	Ib/MMBtu	2,6	3.4E-01	1.5E+00
Lead		N	N	4.8E-05	Ib/MMBtu	2,4	6.3E-04	2.7E-03
Manganese	Y	Y	N	1.6E-03	Ib/MMBtu	2,4	2.1E-02	9.1E-02
Mercury			N	3.5E-06	Ib/MMBtu	2,4	4.6E-05	2.0E-04
Methyl bromide	Y	N	Y	1.5E-05	lb/MMBtu	2,3	6.8E-05	3.0E-04
Methyl chloride	Y	N	Y	2.3E-05	Ib/MMBtu	2,3	1.0E-04	4.5E-04
Methyl ethyl ketone	N	Y	Y	5.4E-06	lb/MMBtu	2,3	2.4E-05	1.1E-04
Methylene chloride	Y	Y	Y	2.9E-04	Ib/MMBtu	2,3	1.3E-03	5.7E-03
Naphthalene	Y	N	Y	9.7E-05	Ib/MMBtu	2,3	4.4E-04	1.9E-03
Nickel	Y	Y	N	3.3E-05	Ib/MMBtu	2,4	4.3E-04	1.9E-03
Nitrophenol, 4-	Y	N	Y	1.1E-07	lb/MMBtu	2,3	5.0E-07	2.2E-06
Pentachlorophenol	Y	Y	N	5.1E-08	lb/MMBtu	2	2.3E-07	1.0E-06
Perchloroethylene	Y	Y	N	3.8E-05	lb/MMBtu	2	1.7E-04	7.5E-04
Phosphorus metal, yellow or white	Y	N	N	2.7E-05	lb/MMBtu	2,4	3.5E-04	1.5E-03
Polychlorinated biphenyls	Y	Y	Y	8.2E-09	lb/MMBtu	2,3	3.7E-08	1.6E-07
Polycyclic Organic Matter	Y	N	N	1.3E-04	lb/MMBtu	2	5.6E-04	2.5E-03
Selenium compounds	Y	N	N	2.8E-06	lb/MMBtu	2,4	3.7E-05	1.6E-04
Styrene	Y	Y	Y	1.9E-03	lb/MMBtu	2,3	8.6E-03	3.7E-02
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	Y	Y	Y	8.6E-12	lb/MMBtu	2,3	3.9E-11	1.7E-10
Toluene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	1.4E-04	5.9E-04
Trichloroethane, 1,1,1-	Y	Y	N	3.1E-05	lb/MMBtu	2	1.4E-04	6.1E-04
Trichloroethylene	Y	Y	Υ	3.0E-05	lb/MMBtu	2,3	1.4E-04	5.9E-04
Trichlorofluoromethane	N	Υ	Υ	4.1E-05	lb/MMBtu	2,3	1.8E-04	8.1E-04
Trichlorophenol, 2,4,6-	Y	N	Υ	2.2E-08	lb/MMBtu	2,3	9.9E-08	4.3E-07
Vinyl chloride	Y	Y	Y	1.8E-05	lb/MMBtu	2,3	8.1E-05	3.5E-04
Xylene	Y	Υ	Y	2.5E-05	lb/MMBtu	2,3	1.1E-04	4.9E-04
			T	otal HAP Emiss	sions (related	to biomass)	1.82	8.44
			7	otal TAP Emiss	sions (related	to biomass)	1.52	7.03



Table 4b Potential HAP and TAP Emissions Dryer #2 (ES-DRYER-2, CD-WESP-2, CD-RTO-2) Enviva Pellets Northampton, LLC

				Emission			Potential Emissions		
Pollutant	HAP	NC TAP	voc	Factor	Units	Footnote	Max	Annual	
							(lb/hr)	(tpy)	
RTO - Natural Gas/Propane Source	1	1	1	•	1	1			
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	Υ	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	Υ	N	Υ	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07	
Acetaldehyde	Y	Y	Υ	1.5E-05	lb/MMscf	7	4.8E-07	2.1E-06	
Acrolein	Υ	Y	Υ	1.8E-05	lb/MMscf	7	5.6E-07	2.5E-06	
Ammonia	N	Υ	N	3.2	lb/MMscf	7	1.0E-01	4.4E-01	
Anthracene	Y	N	Υ	2.4E-06	lb/MMscf	7	7.5E-08	3.3E-07	
Arsenic	Υ	Y	N	2.0E-04	lb/MMscf	7	6.3E-06	2.7E-05	
Benz(a)anthracene	Υ	N	Υ	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07	
Benzene	Y	N	Υ	7.1E-04	lb/MMBtu	8	2.3E-02	1.0E-01	
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	Υ	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	Υ	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07	
Dichlorobenzene	Y	Y	Υ	1.2E-03	lb/MMscf	7	3.8E-05	1.6E-04	
Fluoranthene	Y	N	Υ	3.0E-06	lb/MMscf	7	9.4E-08	4.1E-07	
Fluorene	Y	N	Υ	2.8E-06	lb/MMscf	7	8.8E-08	3.8E-07	
Formaldehyde	Y	Y	Υ	1.5E-03	lb/MMBtu	8	4.8E-02	2.1E-01	
Hexane	Y	Y	Υ	1.8	lb/MMscf	7	5.6E-02	2.5E-01	
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	
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	1.3E-03	5.6E-03	
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 compounds	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	
	<u> </u>			issions (relate				0.56	
				issions (relate				0.46	

Notes:

- ^{1.} Emission factor derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.
- 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 97.5% for the RTO is applied to all VOC hazardous and toxic pollutants
- ^{4.} The control efficiency of the wet electrostatic precipitator (WESP) for filterable particulate matter is applied to all metal hazardous and toxic pollutants from the dryer and duct burners. Actual design filterable efficiency is estimated to 96.4%, but 92.75% is assumed for toxics permitting.

 WESP Control Efficiency for metal HAP

 92.8%
- 5. Chromium VI is a subset of chromium 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.

WESP HCI Control Efficiency 90.00%

- ^{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. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.
- 8. The RTO burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.
- $^{\rm 9.}$ It was assumed that chlorine is not oxidized in the RTO.
- Annual dried wood throughput is based on total facility production. Although dryer line 1 and dryer line 2 are capable of processing up to 537,625 ODT/yr and 620,000 ODT/yr, respectively, the combined throughput of both dryers will not exceed 781,255 ODT/yr. In order to to provide Enviva with the flexibility to use either dryer line up to its individual capacity, the total emissions from the two dryer lines are based on the total facility throughput and calculated as follows:
- Where individual dryer emissions are calculated based on throughput (i.e. lb/ODT), the total emissions are estimated based on the total throughput of 781,255 ODT/yr.
- Where individual dryer emissions are calculated based on fuel use (i.e. lb/MMBtu or lb/MMscf), the total emissions are conservatively set equal to the sum of the emissions from the two dryer lines assuming both dryer lines operate 8,760 hrs/yr.



Table 4b Potential HAP and TAP Emissions Dryer #2 (ES-DRYER-2, CD-WESP-2, CD-RTO-2) Enviva Pellets Northampton, LLC

Abbreviations:

CAS - chemical abstract service

CH₄ - methane

CO - carbon monoxide

CO2 - carbon dioxide

 ${\rm CO_2e}$ - 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

N₂O - nitrous oxide

ODT - oven dried tons

PM - particulate matter

 $\mathrm{PM}_{\mathrm{10}}\,\text{-}$ 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

SO₂ - sulfur dioxide

TAP - toxic air pollutant

tpy - tons per year

VOC - volatile organic compound WESP - wet electrostatic precipitator

yr - year

Table 4c

Potential Emissions

Dryer #2 Bypass (ES-DRYERBYP-2) (Full Capacity)¹ Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput	82.10 ODT/hr
Hourly Heat Input Capacity	180 MMBtu/hr
Annual Heat Input Capacity	9,000 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	ractoi		Max (lb/hr)	Annual (tpy)	
СО	21.4	lb/hr ²	21.4	0.54	
NO_X	26.3	lb/hr ²	26.3	0.66	
SO ₂	0.025	lb/MMBtu ³	4.50	0.113	
VOC	14.0	lb/hr ²	14.0	0.35	
PM/PM ₁₀ /PM _{2.5} Condensable	0.017	lb/MMBtu ⁴	3.06	0.077	
PM/PM ₁₀ /PM _{2.5} Filterable	0.33	lb/MMBtu ⁵	59.4	1.49	
Total PM/PM ₁₀ /PM _{2.5}			62.5	1.56	

- ^{1.} During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line. As the feed to the dryer is typically stopped during shutdown and malfunction events, the hourly throughput is equal to the annual average of the dryer feed rate.
- $^{\rm 2.}$ CO, NO $_{\rm X}$, and VOC emission rates based on data from a comparable Enviva facility.
- $^{3.}$ No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Enviva has conservatively calculated SO₂ emissions based on AP-42, Section 1.6 Wood Residue Combustion in Boilers, 09/03.
- ^{4.} Emission factor for condensable PM based on AP-42, Section 1.6 Wood Residue Combustion in Boilers, 09/03.
- ^{5.} Uncontrolled filterable PM emission factor is based on testing at a comparable Enviva facility.



Table 4c

Potential Emissions

Dryer #2 Bypass (ES-DRYERBYP-2) (Full Capacity)¹ **Enviva Pellets Northampton, LLC**

Potential HAP Emissions per Dryer Line

Dall days	Emission	Emission		Potential Emissions ¹		
Pollutant	Factor	Units	Footnote	Max	Annual	
				(lb/hr)	(tpv)	
Acetaldehyde	0.168	lb/ODT	2	13.8	0.35	
Acrolein	0.110	lb/ODT	2	9.03	0.23	
Formaldehyde	0.144	lb/ODT	2	11.78	0.29	
Methanol	0.105	lb/ODT	2	8.61	0.22	
Phenol	0.058	lb/ODT	2	4.73	0.12	
Propionaldehyde	0.039	lb/ODT	2	3.16	0.079	
Acetophenone	3.2E-09	lb/MMBtu	3	5.76E-07	1.44E-08	
Antimony and compounds	7.9E-06	lb/MMBtu	3	1.42E-03	3.56E-05	
Arsenic	2.2E-05	lb/MMBtu	3	3.96E-03	9.90E-05	
Benzo(a)pyrene	2.6E-06	lb/MMBtu	3	4.68E-04	1.17E-05	
Beryllium	1.1E-06	lb/MMBtu	3	1.98E-04	4.95E-06	
Cadmium	4.1E-06	lb/MMBtu	3	7.38E-04	1.85E-05	
Carbon tetrachloride	4.5E-05	lb/MMBtu	3	8.10E-03	2.03E-04	
Chlorine	7.9E-04	lb/MMBtu	3	1.42E-01	3.56E-03	
Chlorobenzene	3.3E-05	lb/MMBtu	3	5.94E-03	1.49E-04	
Chromium-Other compounds	1.8E-05	lb/MMBtu	3	3.15E-03	7.88E-05	
Cobalt compounds	6.5E-06	lb/MMBtu	3	1.17E-03	2.93E-05	
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	3	3.24E-05	8.10E-07	
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	3	8.46E-06	2.12E-07	
Ethyl benzene	3.1E-05	lb/MMBtu	3	5.58E-03	1.40E-04	
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	3	5.22E-03	1.31E-04	
Hydrochloric acid	1.9E-02	lb/MMBtu	3	3.42E+00	8.55E-02	
Lead	4.8E-05	lb/MMBtu	3	8.64E-03	2.16E-04	
Manganese	1.6E-03	lb/MMBtu	3	2.88E-01	7.20E-03	
Mercury	3.5E-06	lb/MMBtu	3	6.30E-04	1.58E-05	
Methyl bromide	1.5E-05	lb/MMBtu	3	2.70E-03	6.75E-05	
Methyl chloride	2.3E-05	lb/MMBtu	3	4.14E-03	1.04E-04	
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	3	5.58E-03	1.40E-04	
Naphthalene	9.7E-05	lb/MMBtu	3	1.75E-02	4.37E-04	
Nickel	3.3E-05	lb/MMBtu	3	5.94E-03	1.49E-04	
Nitrophenol, 4-	1.1E-07	lb/MMBtu	3	1.98E-05	4.95E-07	
Pentachlorophenol	5.1E-08	lb/MMBtu	3	9.18E-06	2.30E-07	
Perchloroethylene	3.8E-05	lb/MMBtu	3	6.84E-03	1.71E-04	
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	3	4.86E-03	1.22E-04	
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	3	1.47E-06	3.67E-08	
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	3	2.25E-02	5.63E-04	
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	3	5.94E-03	1.49E-04	
Selenium compounds	2.8E-06	lb/MMBtu	3	5.04E-04	1.26E-05	
Tetrachlorodibenzo-p-dioxin,	8.6E-12	lb/MMBtu	3	1.55E-09	3.87E-11	
2,3,7,8-		,				
Trichloroethylene	3.0E-05	lb/MMBtu	3	5.40E-03	1.35E-04	
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	3	3.96E-06	9.90E-08	
Vinyl chloride	1.8E-05	lb/MMBtu	3	3.24E-03	8.10E-05	
		Total HA	P Emissions	55.12	1.38	

Notes:

- 1. During dryer bypass emissions are not controlled by the WESP and RTO; however, combustion in the furnace still results in a reduction in organic HAP
- ^{2.} Organic HAP emissions rates were derived based on stack testing data from other similar Enviva plants and/or engineering judgement.
- ³ Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 Wood Residue Combustion in Boilers, 09/03.

Abbreviations:

CH₄ - methane ODT - oven dried tons CO - carbon monoxide PM - particulate matter

 ${\rm PM}_{10}$ - particulate matter with an aerodynamic diameter less than 10 microns CO2 - carbon dioxide CO_2e - carbon dioxide equivalent $\ensuremath{\text{PM}}_{2.5}\xspace$ - particulate matter with an aerodynamic diameter of 2.5 microns or less

HAP - hazardous air pollutant RTO - regenerative thermal oxidizer

hr - hour SO₂ - sulfur dioxide kg - kilogram lb - pound

tpy - tons per year VOC - volatile organic compound MMBtu - Million British thermal units WESP - wet electrostatic precipitator

 NO_X - nitrogen oxides yr - year

 N_2O - nitrous oxide

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 4d **Potential Emissions**

Dryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Full Capacity)¹ **Enviva Pellets Northampton, LLC**

Calculation Basis

Hourly Heat Input Capacity	180 MMBtu/hr
Annual Heat Input Capacity	9,000 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

rotelitial Criteria rollutalit alla Git	eeiiiiouse das Eii	iissioiis pei i	Jiyei Lille		
Pollutant	Emission Factor	Units	Potential Emissions		
	ractor		Max (lb/hr)	Annual (tpy)	
СО	0.60	lb/MMBtu ²	108.0	2.70	
NO_X	0.22	lb/MMBtu ²	39.60	0.99	
SO ₂	0.025	lb/MMBtu ²	4.50	0.113	
VOC	0.017	lb/MMBtu ²	3.06	0.077	
Total PM/PM ₁₀ /PM _{2.5}	0.58	lb/MMBtu ²	103.9	2.60	

Notes:

During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line.

2. CO, NO_X, SO₂, PM, and VOC emission rates based on AP-42, Chapter 1.6 - Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet wood-

fired boilers. VOC emission factor excludes formaldehyde.



Table 4d Potential Emissions

Dryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Full Capacity)¹ Enviva Pellets Northampton, LLC

Potential HAP Emissions per Dryer Line

D. II.	Emission			Potential E	missions
Pollutant	Factor	Units	Footnote	Max (lb/hr)	Annual
Acetaldehyde	8.30E-04	lb/MMBtu	1	1.49E-01	(tpv) 3.74E-03
Acrolein	4.00E-03	lb/MMBtu	1	7.20E-01	1.80E-02
Formaldehyde	4.40E-03	lb/MMBtu	1	7.92E-01	1.98E-02
Phenol	5.10E-05	lb/MMBtu	1	9.18E-03	2.30E-04
Propionaldehyde	6.10E-05	lb/MMBtu	1	1.10E-02	2.75E-04
Acetophenone	3.2E-09	lb/MMBtu	1	5.76E-07	1.44E-08
Antimony and compounds	7.9E-06	lb/MMBtu	1	1.42E-03	3.56E-05
Arsenic	2.2E-05	lb/MMBtu	1	3.96E-03	9.90E-05
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	4.68E-04	1.17E-05
Beryllium	1.1E-06	lb/MMBtu	1	1.98E-04	4.95E-06
Cadmium	4.1E-06	lb/MMBtu	1	7.38E-04	1.85E-05
Carbon tetrachloride	4.5E-05	lb/MMBtu	1	8.10E-03	2.03E-04
Chlorine	7.9E-04	lb/MMBtu	1	1.42E-01	3.56E-03
Chlorobenzene	3.3E-05	lb/MMBtu	1	5.94E-03	1.49E-04
Chromium-Other compounds	2.1E-05	lb/MMBtu	1	3.78E-03	9.45E-05
Cobalt compounds	6.5E-06	lb/MMBtu	1	1.17E-03	2.93E-05
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	3.24E-05	8.10E-07
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	8.46E-06	2.12E-07
Ethyl benzene	3.1E-05	lb/MMBtu	1	5.58E-03	1.40E-04
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	5.22E-03	1.31E-04
Hydrochloric acid	1.9E-02	lb/MMBtu	1	3.42E+00	8.55E-02
Lead	4.8E-05	lb/MMBtu	1	8.64E-03	2.16E-04
Manganese	1.6E-03	lb/MMBtu	1	2.88E-01	7.20E-03
Mercury	3.5E-06	lb/MMBtu	1	6.30E-04	1.58E-05
Methyl bromide	1.5E-05	lb/MMBtu	1	2.70E-03	6.75E-05
Methyl chloride	2.3E-05	lb/MMBtu	1	4.14E-03	1.04E-04
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	5.58E-03	1.40E-04
Naphthalene	9.7E-05	lb/MMBtu	1	1.75E-02	4.37E-04
Nickel	3.3E-05	lb/MMBtu	1	5.94E-03	1.49E-04
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	1.98E-05	4.95E-07
Pentachlorophenol	5.1E-08	lb/MMBtu	1	9.18E-06	2.30E-07
Perchloroethylene	3.8E-05	lb/MMBtu	1	6.84E-03	1.71E-04
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	4.86E-03	1.22E-04
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	1.47E-06	3.67E-08
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	2.25E-02	5.63E-04
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	5.94E-03	1.49E-04
Selenium compounds	2.8E-06	lb/MMBtu	1	5.04E-04	1.26E-05
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	1.55E-09	3.87E-11
Trichloroethylene	3.0E-05	lb/MMBtu	1	5.40E-03	1.35E-04
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	3.96E-06	9.90E-08
Vinyl chloride	1.8E-05	lb/MMBtu	1	3.24E-03	8.10E-05
Total H	AP Emissions	(Biomass Co	mbustion)	5.66	0.14

Notes:

Abbreviations: CH₄ - methane

 $\begin{array}{lll} \text{CH}_4 \text{ - methane} & & \text{N}_2\text{O} \text{ - nitrous oxide} \\ \text{CO} \text{ - carbon monoxide} & & \text{ODT} \text{ - oven dried tons} \\ \text{CO2} \text{ - carbon dioxide} & & \text{PM} \text{ - particulate matter} \\ \end{array}$

 CO_2e - carbon dioxide equivalent 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

 $\begin{array}{lll} \text{hr - hour} & & \text{SO}_2 \text{ - sulfur dioxide} \\ \text{lb - pound} & & \text{tpy - tons per year} \\ \text{MMBtu - Million British thermal units} & & \text{VOC - volatile organic compound} \end{array}$

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



^{1.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Table 4e

Potential Emissions

Dryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Idle Mode)¹ **Enviva Pellets Northampton, LLC**

Calculation Basis

Hourly Heat Input Capacity	5 MMBtu/hr
Annual Heat Input Capacity	2,500 MMBtu/yr
Hours of Operation ¹	500 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	Factor		Max (lb/hr)	Annual (tpy)	
CO	0.60	lb/MMBtu ²	3.00	0.75	
NO_X	0.22	lb/MMBtu ²	1.10	0.28	
SO₂	0.025	lb/MMBtu ²	0.13	0.031	
VOC	0.017	lb/MMBtu ²	0.085	0.021	
Total PM	0.58	lb/MMBtu ²	2.89	0.72	
Total PM ₁₀	0.52	lb/MMBtu ²	2.59	0.65	
Total PM _{2.5}	0.45	lb/MMBtu ²	2.24	0.56	

- 1. As part of this submittal Enviva is requesting a limit of 500 hours per year of "idle mode" for each furnace.
 2. CO, NO_x, SO₂, PM₁₀, PM_{2.5}, and VOC emission rates based on AP-42, Section 1.6 Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet woodfired boilers. PM_{10} and $PM_{2.5}$ factors equal to the sum of the filterable and condensible factors from Table 1.6-1. VOC emission factor excludes formaldehyde.



Table 4e

Potential Emissions

Dryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Idle Mode)¹ **Enviva Pellets Northampton, LLC**

Potential HAP Emissions per Dryer Line

	Emission			Potential Emissions		
Pollutant	Factor	Units	Footnote	Max (lb/hr)	Annual (tpy)	
Acetaldehyde	8.30E-04	lb/MMBtu	1	4.15E-03	1.04E-03	
Acrolein	4.00E-03	lb/MMBtu	1	2.00E-02	5.00E-03	
Formaldehyde	4.40E-03	lb/MMBtu	1	2.20E-02	5.50E-03	
Phenol	5.10E-05	lb/MMBtu	1	2.55E-04	6.38E-05	
Propionaldehyde	6.10E-05	lb/MMBtu	1	3.05E-04	7.63E-05	
Acetophenone	3.2E-09	lb/MMBtu	1	1.60E-08	4.00E-09	
Antimony and compounds	7.9E-06	lb/MMBtu	1	3.95E-05	9.88E-06	
Arsenic	2.2E-05	lb/MMBtu	1	1.10E-04	2.75E-05	
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	1.30E-05	3.25E-06	
Beryllium	1.1E-06	lb/MMBtu	1	5.50E-06	1.38E-06	
Cadmium	4.1E-06	lb/MMBtu	1	2.05E-05	5.13E-06	
Carbon tetrachloride	4.5E-05	lb/MMBtu	1	2.25E-04	5.63E-05	
Chlorine	7.9E-04	lb/MMBtu	1	3.95E-03	9.88E-04	
Chlorobenzene	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05	
Chromium-Other compounds	2.1E-05	lb/MMBtu	1	1.05E-04	2.63E-05	
Cobalt compounds	6.5E-06	lb/MMBtu	1	3.25E-05	8.13E-06	
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	9.00E-07	2.25E-07	
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	2.35E-07	5.88E-08	
Ethyl benzene	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-05	
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	1.45E-04	3.63E-05	
Hydrochloric acid	1.9E-02	lb/MMBtu	1	9.50E-02	2.38E-02	
Lead	4.8E-05	lb/MMBtu	1	2.40E-04	6.00E-05	
Manganese	1.6E-03	lb/MMBtu	1	8.00E-03	2.00E-03	
Mercury	3.5E-06	lb/MMBtu	1	1.75E-05	4.38E-06	
Methyl bromide	1.5E-05	lb/MMBtu	1	7.50E-05	1.88E-05	
Methyl chloride	2.3E-05	lb/MMBtu	1	1.15E-04	2.88E-05	
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-05	
Naphthalene	9.7E-05	lb/MMBtu	1	4.85E-04	1.21E-04	
Nickel	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05	
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	5.50E-07	1.38E-07	
Pentachlorophenol	5.1E-08	lb/MMBtu	1	2.55E-07	6.38E-08	
Perchloroethylene	3.8E-05	lb/MMBtu	1	1.90E-04	4.75E-05	
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	1.35E-04	3.38E-05	
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	4.08E-08	1.02E-08	
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	6.25E-04	1.56E-04	
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05	
Selenium compounds	2.8E-06	lb/MMBtu	1	1.40E-05	3.50E-06	
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	4.30E-11	1.08E-11	
Trichloroethylene	3.0E-05	lb/MMBtu	1	1.50E-04	3.75E-05	
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	1.10E-07	2.75E-08	
Vinyl chloride	1.8E-05	lb/MMBtu	1	9.00E-05	2.75E-05 2.25E-05	
,	HAP Emissions			9.00E-05 0.16	0.039	

Notes:

^{1.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations:

CH₄ - methane N₂O - nitrous oxide CO - carbon monoxide ODT - oven dried tons CO2 - carbon dioxide PM - particulate matter

CO₂e - carbon dioxide equivalent $\ensuremath{\text{PM}_{10}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns $\mbox{PM}_{\mbox{\scriptsize 2.5}}\mbox{ - particulate matter with an aerodynamic diameter of 2.5 microns or less$ HAP - hazardous air pollutant

yr - year

hr - hour SO₂ - sulfur dioxide kg - kilogram tpy - tons per year lb - pound VOC - volatile organic compound MMBtu - Million British thermal units

 NO_X - nitrogen oxides

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 4f

Potential Emissions

Dryer #2 Double Duct Burners (IES-DDB-3 and -4) Enviva Pellets Northampton, LLC

Duct Burner Inputs

Duct Burner Rating	1 MMBtu/hr
Number of Duct Burners	2
Annual Operation	8,760 hr/yr

Potential Criteria Pollutant Emissions:

Potential Criteria Pollutant Emissions - Natural Gas Combustion

Pollutant	Emission Factor	Units	Emission Factor Source	Potential Emissions		
				Max (lb/hr)	Annual (tpv)	
СО	84.0	lb/MMscf	Note 1	0.16	0.72	
NO_X	50.0	lb/MMscf	Note 2	0.10	0.43	
SO ₂	0.60	lb/MMscf	Note 1	0.0012	0.005	
voc	5.50	lb/MMscf	Note 1	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} Condensable	5.70	lb/MMscf	Note 1	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} Filterable	1.90	lb/MMscf	Note 1	0.004	0.02	
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.065	

Potential Criteria Pollutant Emissions - Propane Combustion

Pollutant	Emission Factor	Units	Emission Factor Source	Potential Emissions		
				Max (lb/hr)	Annual (tpv)	
СО	7.50	lb/Mgal	Note 3	0.16	0.72	
NO_{χ}	6.50	lb/Mgal	Note 4	0.14	0.62	
SO ₂	0.054	lb/Mgal	Note 3,5	0.001	0.005	
VOC	1.00	lb/Mgal	Note 3	0.02	0.10	
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	Note 3	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	Note 3	0.004	0.02	
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.067	

- ^{1.} Emission factors for natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, 07/98. Natural gas heating value of 1,020 Btu/scf assumed per AP-42.
- ^{2.} Emission factors for NO_X assume burners are low NO_X burners, per email from Kai Simonsen (Enviva) on August 8, 2018.
- ^{3.} Emission factors for propane combustion obtained from AP-42 Section 1.5 Liquefied Petroleum Gas Combustion, 07/08. Propane heating value of 91.5 MMBtu/Mgal assumed per AP-42.
- 4 · AP-42 Section 1.5 does not include an emission factor for low NO_X burners. Per AP-42 Section 1.4, low NO_X burners reduce NO_X emissions by accomplishing combustion in stages, reducing NO_X emissions 40 to 85% relative to uncontrolled emission levels. A conservative control efficiency of 50% was applied to the uncontrolled NO_X emission factor from AP-42 Section 1.5. This reduction is consistent with the magnitude of reduction between the uncontrolled and low NO_X emission factors in AP-42 Section 1.4.



 $^{^{5.}}$ SO₂ emissions are based on an assumed fuel sulfur content of 0.54 grains/100 ft³ per *A National Methodology and Emission Inventory for Residential Fuel Combustion* .

Table 4f Potential Emissions Dryer #2 Double Duct Burners (IES-DDB-3 and -4) Enviva Pellets Northampton, LLC

Potential HAP and TAP Emissions

				Emission			Potential Emissions	
Pollutant	HAP	NC TAP	voc	Factor	Units	Footnote	Max	Annual
Duct Burners - Natural Gas/Propane So	ource	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	(lb/hr)	(tpv)
2-Methylnaphthalene	Y	N	Υ	2.4E-05	lb/MMscf	1	4.7E-08	2.1E-07
3-Methylchloranthrene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	lb/MMscf	1	3.1E-08	1.4E-07
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	1	3.0E-08	1.3E-07
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	1	3.5E-08	1.5E-07
Ammonia	N	Y	N	3.2	lb/MMscf	1	6.3E-03	2.7E-02
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	1	4.7E-09	2.1E-08
Arsenic	Y	Y	N	2.0E-04	lb/MMscf	1	3.9E-07	1.7E-06
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	2	1.4E-03	6.2E-03
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08
Benzo(b)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	1	2.4E-08	1.0E-07
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	1	2.2E-06	9.4E-06
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	1	2.7E-06	1.2E-05
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
Cobalt	Y	N	N	8.4E-05	lb/MMscf	1	1.6E-07	7.2E-07
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	1	2.4E-06	1.0E-05
Fluoranthene	Y	N	Y	3.0E-06	lb/MMscf	1	5.9E-09	2.6E-08
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	1	5.5E-09	2.4E-08
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	2	3.0E-03	1.3E-02
Hexane	Y	Y	Y	1.8	lb/MMscf	1	3.5E-03	1.5E-02
Indeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08
Lead	Y	N	N	5.0E-04	lb/MMscf	1	9.8E-07	4.3E-06
Manganese	Y	Y	N	3.8E-04	lb/MMscf	1	7.5E-07	3.3E-06
Mercury	Y	Y	N	2.6E-04	lb/MMscf	1	5.1E-07	2.2E-06
Naphthalene	Y	N	Υ	6.1E-04	lb/MMscf	1	1.2E-06	5.2E-06
Nickel	Y	Y	N	2.1E-03	lb/MMscf	1	4.1E-06	1.8E-05
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	8.0E-05	3.5E-04
Phenanthrene	Y	N	Υ	1.7E-05	lb/MMscf	1	3.3E-08	1.5E-07
Pyrene	Y	N	Υ	5.0E-06	lb/MMscf	1	9.8E-09	4.3E-08
Selenium compounds	Y	N	N N	2.4E-05	lb/MMscf	1	4.7E-08	2.1E-07
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	1	6.7E-06	2.9E-05
	<u> </u>	1		issions (relate		l .	0.008	0.035
				issions (relate			0.01	0.056

Table 4f

Potential Emissions

Dryer #2 Double Duct Burners (IES-DDB-3 and -4) Enviva Pellets Northampton, LLC

Notes:

- 1. 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. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.
- 2. The duct burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Abbreviations:

CAS - chemical abstract service

CH₄ - methane

CO - carbon monoxide

CO2 - carbon dioxide

CO₂e - 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

N₂O - nitrous oxide

ODT - oven dried tons

PM - particulate matter

 $\ensuremath{\text{PM}_{\text{10}}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns

 $\ensuremath{\text{PM}_{2.5}}\xspace$ - particulate matter with an aerodynamic diameter of 2.5 microns or less

RTO - regenerative thermal oxidizer

SO₂ - sulfur dioxide

TAP - toxic air pollutant

tpy - tons per year

VOC - volatile organic compound

WESP - wet electrostatic precipitator

yr - year



Table 5 Potential Emissions Propane Vaporizer (IES-PVAP) Enviva Pellets Northampton, LLC

Calculation Basis

Heat Content ¹	91.5 MMBtu/10 ³ gal propane
Hours of Operation	8,760 hr/yr
Vaporizer Heat Input ²	1.00 MMBtu/hr

Notes:

- 1. Propane heat content from AP-42 Section 1.5 Liquefied Petroleum Gas Production, 7/08, Table 1.5-1, footnote a.
- ² Heat input based on information provided by Enviva in August 2018.

Potential Criteria Pollutant Emissions

	Emission		Potential Emissions		
Pollutant	Factor ¹	Units	Max (lb/hr)	Annual (tpy)	
СО	7.5	lb/10 ³ gal	0.08	0.36	
NO_X	13.0	lb/10 ³ gal	0.14	0.62	
SO ₂ ²	0.05	lb/10 ³ gal	0.001	0.003	
тос	1.0	lb/10 ³ gal	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} ³	0.70	lb/10 ³ gal	0.01	0.03	

<u>Notes:</u>

- 1. Emission factors obtained from AP 42 1.5, Liquefied Petroleum Gas Production, 10/96, Table 1.5-1.
- ^{2.} AP 42 1.5, Liquefied Petroleum Gas Production, 10/96, Table 1.5-1 provides an SO₂ emission factor of 0.10S, where S equals the sulfur content of the fuel. The national sulfur fuel content for LPG of 0.54 grains/100 ft³ as assigned by EPA was used (Source: A National Methodology and Emission Inventory for Residential Fuel Combustion)
- ^{3.} All particulate matter was conservatively assumed to be less than 2.5 microns in size.

Potential HAP Emissions

Pollutant	CAS No.	Emission Factor ¹	Potential Emissions				
Pollutant	CAS NO.	(lb/MMBtu)	Max (lb/hr)	Annual (tpv)			
Benzene	71-43-2	7.1E-04	7.10E-04	3.11E-03			
Formaldehyde	50-00-0	1.5E-03	1.50E-03	6.57E-03			
PAHs		4.0E-05	4.0E-05	1.75E-04			
Total HAP Emissions 0.002 0.010							

Notes:

Abbreviations:

Btu - British thermal unit MW - megawatt

CAS - chemical abstract service MMBtu - Million British thermal units

 ${
m CH_4}$ - methane ${
m NO_X}$ - nitrogen oxides ${
m CO}$ - carbon monoxide ${
m N_2O}$ - nitrous oxide ${
m CO2}$ - carbon dioxide ${
m ODT}$ - oven dried tons

CO₂e - carbon dioxide equivalent PAH - polycyclic aromatic hydrocarbon

g - gram PM - particulate matter

gal - gallon PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns HAP - hazardous air pollutant $PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less

hp - horsepower POM - polycyclic organic matter

 $\begin{array}{ll} \text{hr - hour} & \text{SO}_2 \text{ - sulfur dioxide} \\ \text{kg - kilogram} & \text{tpy - tons per year} \end{array}$

kW - kilowatt VOC - volatile organic compound

lb - pound yr - year

References:

Advanced Environmental Interface, Inc. (1998). General Permits for Emergency Engines. INSIGHTS, 98-2, 3.

AP-42 Chapter 3.3, Stationary Internal Combustion Engines, 10/96.



^{1.} Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Table 6a

Potential Emissions at Outlet of RCO-1 Stack (CD-RCO-1) Dry Hammermills (ES-HM-1 through ES-HM-8)

Enviva Pellets Northampton, LLC

Calculation Basis

Total Plant Throughput	781,255	ODT/yr
% of Total Throughput to the Hammermills	85%	
Hours of Operation	8760	hr/yr

Hammermills Annual Throughput	664,067	ODT/yr
Hammermills Hourly Throughput	144	ODT/hr
Number of Burners	2	burners
RCO/RTO Burner Rating	9.8	MMBtu/hr
Control Efficiency ¹	95.0%	

Potential VOC and HAP Emissions

Pollutant	CAS No. HAP		NC TAP		Emission Factor ²	Potential Emissions	
		НАР		VOC	(lb/ODT)	Max (lb/hr)	Annual (tpy)
Acetaldehyde	75-07-0	Υ	Y	Y	0.0073	0.05	0.12
Acrolein	107-02-8	Υ	Υ	Y	0.0092	0.07	0.15
Formaldehyde	50-00-0	Υ	Υ	Y	0.0071	0.05	0.12
Methanol	67-56-1	Υ	N	Υ	0.0071	0.05	0.12
Phenol	108-95-2	Υ	Y	Y	0.0028	0.02	0.05
Propionaldehyde	123-38-6	Υ	N	Υ	0.0124	0.09	0.21
				Total H	AP Emissions	0.33	0.76
				Total T	AP Emissions	0.19	0.44
Total VOC (as propane)				Y	0.77	5.51	12.70

Notes:

- 1. Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.
- ^{2.} A 95.0% control efficiency is applied to the potential emissions for the RCO.

Emissions from the pellet mills and pellet coolers will be controlled by 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 when operating in thermal mode.

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents1.8E-02 MMBtu/lbUncontrolled VOC emissions254 tons/yrUncontrolled VOC emissions110 lb/hrHeat input of uncontrolled VOC emissions9,396 MMBtu/yrHeat input of uncontrolled VOC emissions2 MMBtu/hr

	Emission		Potential Emissions		
Pollutant	Factor ¹	Units	Max (lb/hr)	Annual (tpy)	
СО	8.2E-02	lb/MMBtu	0.17	0.39	
NO_X	9.8E-02	lb/MMBtu	0.20	0.46	

Table 6a

Potential Emissions at Outlet of RCO-1 Stack (CD-RCO-1) Dry Hammermills (ES-HM-1 through ES-HM-8)

Enviva Pellets Northampton, LLC

Natural Gas Combustion Potential Criteria Pollutant Emissions

	Emission		Potential Emissions		
Pollutant	Factor ¹	Units	Max	Annual	
			(lb/hr)	(tpy)	
СО	8.2E-02	lb/MMBtu	1.61	7.07	
NO_X	3.25	lb/hr ³	3.25	14.25	
SO ₂	5.9E-04	lb/MMBtu	0.01	0.05	
VOC	5.4E-03	lb/MMBtu	0.11	0.46	
Total PM	7.5E-03	lb/MMBtu	0.15	0.64	
Total PM ₁₀	7.5E-03	lb/MMBtu	0.15	0.64	
Total PM _{2.5}	7.5E-03	lb/MMBtu	0.15	0.64	

Potential Criteria Pollutant Emissions - Propane Combustion

	Emission		Potential Emissions		
Pollutant	Factor ²	Units	Max (lb/hr)	Annual (tpy)	
со	7.50	lb/Mgal	1.61	7.04	
NO_X	3.25	lb/hr ³	3.25	14.25	
SO ₂	0.054	lb/Mgal	0.01	0.05	
VOC	1.00	lb/Mgal	0.21	0.94	
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	0.11	0.47	
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	0.04	0.19	
Total PM/PM ₁₀ /PM _{2.5}	0.15	0.66			

Natural Gas Combustion Potential HAP and TAP Emissions

		Emission			Potential Emissions			
Pollutant	HAP	NC TAP	VOC	Factor	Units	Footnote	Max	Annual
				Factor	ractor		(lb/hr)	(tpy)
latural Gas Source								
-Methylnaphthalene	Y	N	Υ	2.4E-05	lb/MMscf	4	4.6E-07	2.0E-06
3-Methylchloranthrene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	lb/MMscf	4	3.1E-07	1.3E-06
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	4	2.9E-07	1.3E-06
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	4	3.5E-07	1.5E-06
Ammonia	N	Y	N	3.2	lb/MMscf	4	6.1E-02	2.7E-01
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	4	4.6E-08	2.0E-07
Arsenic	Y	Y	N	2.0E-04	lb/MMscf	4	3.8E-06	1.7E-05
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	5	1.4E-02	6.1E-02
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-07
Benzo(b)fluoranthene	Ϋ́	Ň	Ϋ́	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-07
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	4	2.3E-07	1.0E-06
Cadmium	Ϋ́	Y	N	1.1E-03	lb/MMscf	4	2.1E-05	9.3E-05
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	4	2.7E-05	1.2E-04
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Cobalt Compounds	Ϋ́	N	N	8.4E-05	lb/MMscf	4	1.6E-06	7.1E-06
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-07
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	4	2.3E-05	1.0E-04
luoranthene	Y	N	Y	3.0E-06	lb/MMscf	4	5.8E-08	2.5E-07
luorene	Ϋ́	N	Y	2.8E-06	lb/MMscf	4	5.4E-08	2.4E-07
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	5	2.9E-02	1.3E-01
lexane	Y	Y	Y	1.8	lb/MMscf	4	3.5E-02	1.5E-01
ndeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
ead	Ϋ́	N	N	5.0E-04	lb/MMscf	4	9.6E-06	4.2E-05
Manganese	Y	Y	N	3.8E-04	lb/MMscf	4	7.3E-06	3.2E-05
Mercury	Y	Y	N	2.6E-04	lb/MMscf	4	5.0E-06	2.2E-05
Naphthalene	Ϋ́	N	Y	6.1E-04	lb/MMscf	4	1.2E-05	5.1E-05
Vickel	Y	Y	N	2.1E-03	lb/MMscf	4	4.0E-05	1.8E-04
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	5	7.8E-04	3.4E-03
Phenanthrene	Y	N	Y	1.7E-05	lb/MMscf	4	3.3E-07	1.4E-06
Pyrene	Y	N	Y	5.0E-06	lb/MMscf	4	9.6E-08	4.2E-07
Selenium compounds	Y	N	N .	2.4E-05	lb/MMscf	4	4.6E-07	2.0E-06
oluene	Y	Y	Y	3.4E-03	lb/MMscf	4	6.5E-05	2.9E-04
0140110		<u> </u>				combustion)		0.35

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 patural gas per AP-42 Section 1.4
- Emission factors for propane combustion obtained from AP-42 Section 1.5 Liquefied Petroleum Gas Combustion, 07/08.
- $^{\mbox{\scriptsize 3.}}$ Emission factor for NOx based on Vendor Guarantee.
- 4. 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.
- 5. The RCO burner can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.



Table 6a

Potential Emissions at Outlet of RCO-1 Stack (CD-RCO-1)

Dry Hammermills (ES-HM-1 through ES-HM-8) Enviva Pellets Northampton, LLC

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 6b

Potential Emissions at Outlet of RCO-1 Stack (CD-RCO-1) Dry Shavings Hammermills (ES-DSHM-1 and -2)

Enviva Pellets Northampton, LLC

Calculation Basis

Hammermills Hourly Throughput	28	ODT/hr
Hammermills Annual Throughput	245,000	ODT/yr
RCO Control Efficiency ¹	95.0%	
Wet Scrubber PM Control Efficiency	99.9%	

Potential PM, VOC, and HAP Emissions

Pollutant	Pollutant CAS No. HAP NC TAP	a.p	NG TAB	voc	Emission Factor ²	Potential Emissions	
Pollutant		VOC	(lb/ODT)	Max (lb/hr)	Annual (tpy)		
Acetaldehyde	75-07-0	Y	Y	Y	0.0073	0.010	0.04
Acrolein	107-02-8	Y	Υ	Υ	0.0092	0.013	0.06
Formaldehyde	50-00-0	Υ	Y	Υ	0.0071	0.010	0.04
Methanol	67-56-1	Υ	N	Υ	0.0071	0.010	0.04
Phenol	108-95-2	Y	Y	Υ	0.0028	0.004	0.02
Propionaldehyde	123-38-6	Y	N	Υ	0.0124	0.017	0.08
				Total H	AP Emissions	0.06	0.28
				Total T	AP Emissions	0.04	0.16
Total VOC (as propane)				Y	0.765	1.07	4.69
PM/PM ₁₀ /PM _{2.5}					16.44	0.46	2.01

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents 1.8E-02 MMBtu/lb Uncontrolled VOC emissions 94 tons/yr Uncontrolled VOC emissions 21 lb/hr Heat input of uncontrolled VOC emissions 3,467 MMBtu/yr Heat input of uncontrolled VOC emissions 0.40 MMBtu/hr

	Emission		Potential Emissions				
Pollutant	Factor ³	Units	Max (lb/hr)	Annual (tpy)			
со	8.2E-02	lb/MMBtu	0.03	0.14			
NO_X	9.8E-02	lb/MMBtu	0.04	0.17			

- 1. Exhaust from the two drying shavings hammermills will be routed to the wet scrubber and RCO at the pellet building, which control PM and VOC/HAP emissions with a 99.9% and 95.0% control efficiency, respectively.
- 2 Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.
- 3. All particulate matter was conservatively assumed to be less than 2.5 microns in size.
- 4. CO and NOx emission factors are from AP-42, Fifth Edition, Volume 1, Chapter 1.4 Natural Gas Combustion, 07/98 for small boilers.

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 Emissions at Outlet of RCO-2 Stack (CD-RCO-2) Pellet Coolers (ES-CLR-1 through ES-CLR-6) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Throughput	781,255 ODT/yr
Hourly Throughput	144 ODT/hr
Hours of Operation	8,760 hr/yr
Number of Burners	2 burners
RCO/RTO Burner Rating	9.8 MMBtu/hr
RCO/RTO Control Efficiency	95.0%

Pellet Cooler and Pellet Mill Potential Process VOC and HAP Emissions

Pollutant	CAS No.	NC TAP	voc	Emission Factor ¹	Emissions at RCO Outlet ²			
	dahda	(lb/ODT)	Max (lb/hr)	Annual (tpy)				
Acetaldehyde	75-07-0	Y	Υ	0.025	0.181	0.49		
Acrolein	107-02-8	Υ	Υ	0.050	0.36	0.97		
Formaldehyde	50-00-0	Y	Υ	0.006	0.04	0.12		
Methanol	67-56-1	N	Υ	0.021	0.15	0.41		
Phenol	108-95-2	Υ	Υ	0.025	0.18	0.49		
Propionaldehyde	123-38-6	N	Υ	0.015	0.105	0.29		
			Total	HAP Emissions	1.02	2.78		
	0.77	2.08						
Total VOC (as propane)			Υ	1.4	10.17	27.60		

Notes:

- ^{1.} Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.
- ^{2.} A 95.0% control efficiency is applied to the potential emissions for the RCO.

Emissions from the pellet mills and pellet coolers will be controlled by 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 when operating in thermal mode.

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents1.8E-02 MMBtu/lbUncontrolled VOC emissions552 tons/yrUncontrolled VOC emissions203 lb/hrHeat input of uncontrolled VOC emissions20,417 MMBtu/yrHeat input of uncontrolled VOC emissions4 MMBtu/hr

	Emission		Potential Emissions					
Pollutant	Factor ¹	Units	Max (lb/hr)	Annual (tpy)				
СО	8.2E-02	lb/MMBtu	0.31	0.84				
NO_{x}	9.8E-02	lb/MMBtu	0.37	1.00				

Natural Gas Combustion Potential Criteria Pollutant Emissions

	Emission		Potential	Emissions
Pollutant	Factor ¹	Units	Max	Annual
	1 40001		(lb/hr)	(tpy)
СО	8.2E-02	lb/MMBtu	1.61	7.07
NO_X	5.06	lb/hr ³	5.06	22.16
SO ₂	5.9E-04	lb/MMBtu	1.2E-02	0.05
VOC	5.4E-03	lb/MMBtu	0.11	0.46
Total PM	7.5E-03	lb/MMBtu	0.15	0.64
Total PM ₁₀	7.5E-03	lb/MMBtu	0.15	0.64
Total PM _{2.5}	7.5E-03	lb/MMBtu	0.15	0.64

Potential Criteria Pollutant Emissions - Propane Combustion

Totellal criteria i ollatalit Elli	solono i ropane	Combastion					
Pollutant	Emission	11-2-2-	Potential Emissions				
	Factor ²	Units	Max (lb/hr)	Annual (tpy)			
CO	7.50	lb/Mgal	1.61	7.04			
NO_X	5.06	lb/hr ³	5.06	22.16			
SO ₂	0.054	lb/Mgal	0.01	0.05			
VOC	1.00	lb/Mgal	0.21	0.94			
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	0.11	0.47			
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	0.04	0.19			
Total PM/PM ₁₀ /PM _{2.5}			0.15	0.66			



Table 7

Potential Emissions at Outlet of RCO-2 Stack (CD-RCO-2) Pellet Coolers (ES-CLR-1 through ES-CLR-6) Enviva Pellets Northampton, LLC

Natural Gas Combustion Potential HAP and TAP Emissions

				Fusianian			Pote	
Pollutant	HAP	NC TAP	VOC	Emission	Units	Footnote		sions
				Factor			Max (lb/hr)	Annua (tpy)
Natural Gas Source	<u> </u>	<u> </u>		<u> </u>	<u> </u>		(10/111)	(tpy)
2-Methylnaphthalene	I v	l N	٧	2.4E-05	lb/MMscf	4	4.6E-07	2.0E-0
3-Methylchloranthrene	Y	N		1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
7,12-Dimethylbenz(a)anthracene	† ' _Y	N	Y	1.6E-05	lb/MMscf	4	3.1E-07	1.3E-0
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
Acenaphthylene	† 'v	N		1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
Acetaldehyde	† 'v	Y	Y	1.5E-05	lb/MMscf	4	2.9E-07	1.3E-0
Acrolein	† ' _Y	Y	Y	1.8E-05	lb/MMscf	4	3.5E-07	1.51E-0
Ammonia	i i	Y	N I	3.2	lb/MMscf	4	6.15E-02	2.69E-0
Anthracene	Y	N N	Y	2.4E-06	lb/MMscf	4	4.6E-08	2.0E-0
Arsenic	Y	Y	N I	2.0E-04	lb/MMscf	4	3.8E-06	1.7E-0
	Y	N N	Y					
Benz(a)anthracene	Y		Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
Benzene	'	N	•	7.1E-04	lb/MMBtu	5	1.4E-02	6.1E-0
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-0
Benzo(b)fluoranthene	<u> </u>	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-0
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
Beryllium	Υ	Υ	N	1.2E-05	lb/MMscf	4	2.3E-07	1.0E-0
Cadmium	Y	Υ	N	1.1E-03	lb/MMscf	4	2.1E-05	9.3E-0
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	4	2.7E-05	1.2E-0
Chrysene	Υ	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
Cobalt Compounds	Υ	N	N	8.4E-05	lb/MMscf	4	1.6E-06	7.1E-0
Dibenzo(a,h)anthracene	Υ	N	Υ	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-0
Dichlorobenzene	Υ	Υ	Υ	1.2E-03	lb/MMscf	4	2.3E-05	1.0E-0
Fluoranthene	Υ	N	Υ	3.0E-06	lb/MMscf	4	5.8E-08	2.5E-0
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	4	5.4E-08	2.4E-0
Formaldehyde	Υ	Υ	Y	1.5E-03	lb/MMBtu	5	2.9E-02	1.3E-0
Hexane	Υ	Υ	Υ	1.8	lb/MMscf	4	3.5E-02	1.51E-0
Indeno(1,2,3-cd)pyrene	Υ	N	Υ	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-0
_ead	Ϋ́	N	N	5.0E-04	lb/MMscf	4	9.6E-06	4.2E-0
Manganese	Ý	Y	N	3.8E-04	lb/MMscf	4	7.3E-06	3.2E-0
Mercury	Y	Y	N	2.6E-04	lb/MMscf	4	5.0E-06	2.2E-0
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	4	1.2E-05	5.1E-0
Nickel	† '	Y	N '	2.1E-03	lb/MMscf	4	4.0E-05	1.8E-0
Polycyclic Organic Matter	Y	N N	N N	4.0E-05	lb/MMBtu	5	7.8E-04	3.4E-0
Phenanthrene	Y	N N	Y	1.7E-05	lb/MMscf	4	3.3E-07	1.4E-0
	Y		<u>т</u> Ү		Ib/MMscf		9.6E-08	4.2E-0
Pyrene Solonium compounds	Y	N		5.0E-06		4		
Selenium compounds	<u> </u>	N	N Y	2.4E-05	lb/MMscf	4	4.6E-07	2.0E-0
Toluene	Y	Υ	Y	3.4E-03	lb/MMscf	4	6.5E-05	2.9E-0
				AP Emissions (1 AP Emissions (1			0.079 0.13	0.35 0.55

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 propane combustion obtained from AP-42 Section 1.5 Liquefied Petroleum Gas Combustion, 07/08.
- 3. Emission factor for NOx based on Vendor Guarantee.
- ^{4.} 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.
- ^{5.} The RCO burner can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

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

vr - vear

yr - year



Table 8

Potential VOC and HAP Emissions Dried Wood Handling 1 and 2 (ES-DWH-1 and ES-DWH-2) Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput ¹	154 ODT/hr
Annual Throughput ¹	781,255 ODT/yr

Potential Criteria Pollutant Emissions

5	Emission Factor	Potential Emissions ⁴					
Pollutant	(lb/ODT)	Max (lb/hr)	Annual (tpv)				
Formaldehyde ²	8.4E-04	0.129	0.33				
Methanol ²	2.0E-03	0.30	0.76				
Tot	tal HAP Emissions	0.43	1.09				
VOC as carbon ²	0.10	15.6	39.5				
VOC as propane ³	0.12	19.1	48.5				

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.
- ^{4.} As emissions are based on throughput, the calculated emissions represent the total emissions from Dried Wood Handling 1 and 2 (ES-DWH-1 and ES-DWH-2).

Abbreviations:

hr - hour

lb - pound

ODT - oven dried tons

tpy - tons per year

VOC - volatile organic compound

yr - year



Table 9 Potential PM Emissions from Baghouses/Cyclones Enviva Pellets Northampton, LLC

				Exhaust	Exit Grain	Annual	Particulate	Speciation			Potential	Emissions		
Emission Unit ID	Source Description	Control Device	Control Device	Flow Rate ¹	Loading ²	Operation	Particulate	Speciation	Р	М	PI	M ₁₀	PI	M _{2.5}
Limssion onic 15	, and a second part of	ID	Description	(cfm)	(gr/cf)	(hours)	PM ₁₀ (% of PM)	PM _{2.5} (% of PM)	Max (lb/hr)	Annual (tpy)	Max (lb/hr)	Annual (tpy)	Max (lb/hr)	Annual (tpy)
ES-HM-1 through 3	Dry Hammermills 1 through 3	CD-HM-BF-1; CD-WS-1	One (1) existing baghouse and one (1) new wet scrubber ^{3,4}	45,000	0.004	8760	100%	1.7%	1.54	6.76	1.54	6.76	0.03	0.11
ES-HM-4 through 6	Dry Hammermills 4 through 6	CD-HM-BF-2; CD-WS-1	One (1) existing baghouse and one (1) new wet scrubber ^{3,4}	45,000	0.004	8760	100%	1.7%	1.54	6.76	1.54	6.76	0.03	0.11
ES-HM-7 and 8; ES-NDS	Dry Hammermills 7 through 8; Nuisance Dust System	CD-HM-BF-3; CD-WS-1	One (1) existing baghouse and one (1) new wet scrubber ^{3,4}	45,000	0.004	8760	100%	1.7%	1.54	6.76	1.54	6.76	0.03	0.11
ES-PCHP	Pellet Cooler HP Fines Relay System	CD-PCHP-BV	One (1) baghouse ⁵	3,600	0.004	8760	100%	100%	0.12	0.54	0.12	0.54	0.12	0.54
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	One (1) baghouse ⁵	2,500	0.004	8760	100%	100%	0.09	0.38	0.09	0.38	0.09	0.38
ES-CLR-1	Pellet Cooler	CD-CLR-1; CD-WS-2	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-2	Pellet Cooler	CD-CLR-2; CD-WS-2	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-3	Pellet Cooler	CD-CLR-3; CD-WS-2	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-4	Pellet Cooler	CD-CLR-4; CD-WS-2	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-5	Pellet Cooler	CD-CLR-5; CD-WS-2	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-6	Pellet Cooler	CD-CLR-6; CD-WS-2	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-DWH-1	Dried Wood Handling-1	CD-DWH-BF-1	One (1) baghouse ⁵	2,500	0.004	8760	100%	100%	0.09	0.38	0.09	0.38	0.09	0.38
ES-DWH-2	Dried Wood Handling-2	CD-DWH-BF-2	One (1) baghouse ⁵	2,500	0.004	8760	100%	100%	0.09	0.38	0.09	0.38	0.09	0.38
ES-DSR; IES-DRYSHAVE-1	Dry Shavings Reception; Dry Shaving Material Handling	CD-DSR-BF	One (1) baghouse ⁵	2,500	0.004	8760	100%	100%	0.09	0.38	0.09	0.38	0.09	0.38
ES-FPH; ES-PB-1 through 12; ES-PL-1 and -2	Finished Product Handling; Twelve pellet loadout bins; Pellet mill load-out 1 and 2	CD-FPH-BF	One (1) baghouse ^{4,7}	35,500	0.004	8760	91%	2%	1.22	5.33	1.11	4.85	0.02	0.09
ES-DSS	Dry Shavings Silo	CD-DSS-BF	One (1) baghouse ⁵	3,600	0.004	8760	100%	100%	0.12	0.54	0.12	0.54	1.2E-01	0.54
IES-ADD	Additive Handling and Storage	CD-ADD-BF	One (1) baghouse ⁵	1,652	0.004	117	100%	100%	0.057	0.00	0.057	0.003	0.057	0.003

Notes:

- 1. Filter, Vent, and Cyclone inlet flow rate (cfm) provided by design engineering firm (Mid-South Engineering Co.). The exit flowrate was conservataively assumed to be the same as the inlet flowrate.
- 2. Pollutant loading provided by Aircon. For Pellet Coolers, pollutant loading based on data from other Enviva facilities reflecting addition of either a WESP or baghouse.
- 3. No speciation data is available for PM₁₀. Therefore, it is conservatively assumed to be equal to total PM.
- $^{4\cdot}$ Dry Hammermills and finished product handling PM_{2.5} speciation based on April 2014 Enviva Southampton PM_{2.5} speciation tests.
- $^{5.}$ No speciation data is available for $PM_{10}/PM_{2.5}$. Therefore, it is conservatively assumed to be equal to total PM.
- $^{6.}$ Pellet cooler $\mathrm{PM}_{10}/\mathrm{PM}_{2.5}$ speciation based on data for similar Enviva facility.
- ^{7.} Finished product handling PM₁₀ speciation based on AP-42 factors for wet wood combustion (Section 1.6) controlled by a mechanical separator. Since the particle size of

lb - pound

particulate matter from a pellet cooler is anticipated to be larger than flyash, this factor is believed to be a conservative indicator of speciation.

Abbreviations:

hr - hour

cf - cubic feet cfm - cubic feet per minute

ES - Emission Sources
IES - Insignificant Emission Source
gr - grain

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 10a **Potential Emissions from Material Handling Enviva Pellets Northampton, LLC**

Source	Transfer Activity ¹	Control	Control Description	Number of Drop Points	Material Moisture Content	PM Emission Factor ²	PM ₁₀ Emission Factor ²	PM _{2.5} Emission Factor ²	Throughnut		Potential PM Emissions		Potential PM ₁₀ Emissions			al PM _{2.5} sions
					(%)	(lb/ton)	(lb/ton)	(lb/ton)	(tph)	(tpy)	Max (lb/hr)	Annual (tpv)	Max (lb/hr)	Annual (tpv)	Max (lb/hr)	Annual (tpv)
	Material feed conveyance system to dryer burner fuel storage bin			5	48%	3.7E-05	1.8E-05	2.7E-06	30	252,692	5.6E-03	2.4E-02	2.7E-03	1.1E-02	4.0E-04	1.7E-03
	Material feed conveyance system to raw wood chip storage pile			1	48%	3.7E-05	1.8E-05	2.7E-06	400	1,502,414	1.5E-02	2.8E-02	7.1E-03	1.3E-02	1.1E-03	2.0E-03
ES-GWHS	Material feed conveyance system to dryer burner			0	45%	4.1E-05	1.9E-05	2.9E-06	30	545,455	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Material feed conveyance system to rotary drum wood dryer			0	48%	3.7E-05	1.8E-05	2.7E-06	300	1,652,655	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Material feed conveyance system to fuel storage piles			3	45%	4.1E-05	1.9E-05	2.9E-06	30	238,909	3.7E-03	1.5E-02	1.7E-03	6.9E-03	2.6E-04	1.0E-03
IES-DLH	Drop point for dry shavings to dry line hopper			1	17%	1.6E-04	7.6E-05	1.1E-05	185.3	1,882,542	3.0E-02	1.5E-01	1.4E-02	7.1E-02	2.1E-03	1.1E-02
ES-DLC-1	Drop point for dry line hopper to dry line feed conveyor			1	17%	1.6E-04	7.6E-05	1.1E-05	185.3	1,882,542	3.0E-02	1.5E-01	1.4E-02	7.1E-02	2.1E-03	1.1E-02
TEC DRYCHAVE	Existing dry shaving walking floor truck dump			1	8.0%	4.6E-04	2.2E-04	3.3E-05	48.0	219,000	2.2E-02	5.0E-02	1.0E-02	2.4E-02	1.6E-03	3.6E-03
IES-DRYSHAVE	Existing dry shaving loader			2	8.0%	4.6E-04	2.2E-04	3.3E-05	153.8	750,000	1.4E-01	3.4E-01	6.7E-02	1.6E-01	1.0E-02	2.5E-02
ES-PS-1 and 2	Drop points from the dry line feed conveyor to the Dry Hammermill Pre-screeners			2	17.0%	1.6E-04	7.6E-05	1.1E-05	185.3	1,882,542	5.9E-02	3.0E-01	2.8E-02	1.4E-01	4.2E-03	2.2E-02
									Total	Emissions:	2.47E-01	7.62E-01	1.17E-01	3.60E-01	1.77E-02	5.46E-02

Notes:1. These dry wood handling emissions are representative of the fugitive emissions at the site.

^{2.} Emission factor calculation based on formula from AP-42, Section 13.2.4 - Aggregate Handling and Storage Piles, Equation 1, (11/06).

where: E = emission factor (lb/ton)

> k = particle size multiplier (dimensionless) for PM0.74 k = particle size multiplier (dimensionless) for PM₁₀0.35 k = particle size multiplier (dimensionless) for PM_{2.5}0.053 6.3 U = mean wind speed (mph)

^{3.} Throughputs represent dry weight of materials, calculated based on listed material moisture contents. Throughput for dry shaving material handling is based on comparable Enviva facilities.

Abbreviations:

hr - hour lb - pound

PM - particulate matter

PM₁₀ - 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 10b **Potential Emissions from Wood Storage Pile Wind Erosion Enviva Pellets Northampton, LLC**

Source	Description	PM Emission Factor ¹ VOC Emission Fac		n Factor ²	Pile Width/ Diamter	Pile Length	Pile Height	Outer Surface Area of Pile ³			Potential PM ₁₀ Emissions		Potential PM _{2.5} Emissions		Potential VOC Emissions as propane ⁴		
	2 333. (4 113.)	(lb/day/acre)	(lb/hr/ft²)	(lb/day/acre)		(ft)	(ft)	(ft)	(ft²)	Max (lb/hr)	Annual (tpy)	Max (lb/hr)	Annual (tpy)	Max (lb/hr)	Annual (tpy)	Max (lb/hr)	Annual (tpy)
IES-DRYSHAVE	Dry Shaving Storage Pile	8.6	8.2E-06	3.6	3.4E-06	100		25	10,537	0.09	0.4	0.04	0.2	0.007	0.03	0.04	0.2
	Green Wood Storage Pile No. 1	8.6	8.2E-06	3.6	3.4E-06	155		72	30,907	0.25	1.1	0.13	0.6	0.019	0.08	0.13	0.6
	Green Wood Storage Pile No. 2	8.6	8.2E-06	3.6	3.4E-06	350	400	25	213,000	1.75	7.7	0.88	3.8	0.131	0.58	0.89	3.9
	Green Wood Storage Pile No. 3	8.6	8.2E-06	3.6	3.4E-06	150	150	25	45,000	0.37	1.6	0.19	0.8	0.028	0.12	0.19	0.8
IES-GWHS	Green Wood Storage Pile No. 4	8.6	8.2E-06	3.6	3.4E-06	200	200	25	72,000	0.59	2.6	0.30	1.3	0.044	0.19	0.30	1.3
	Bark Fuel Storage Pile No. 1	8.6	8.2E-06	3.6	3.4E-06	150	150	25	45,000	0.37	1.62	0.185	0.81	2.8E-02	0.122	0.189	0.83
	Bark Fuel Storage Pile No. 2	8.6	8.2E-06	3.6	3.4E-06	100	200	25	42,000	0.345	1.513	0.173	0.757	2.6E-02	1.1E-01	0.176	0.773
	Bark Fuel Storage Pile No. 3	8.6	8.2E-06	3.6	3.4E-06	50		25	3,332	0.027	0.120	0.014	0.060	2.1E-03	9.0E-03	0.014	0.061
								T	otal Emissions:	3.80	16.64	1.90	8.32	0.28	1.25	1.94	8.50

Notes:

where:

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.

$$E = 1.7 \left(\frac{s}{1.5}\right) \left(\frac{(365-p)}{235}\right) \left(\frac{f}{15}\right) (lb/day/acre)$$

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) (%): Based on meteorological data averaged for 2012-2016 for Maxton, NC National Weather Service (NWS) Station

> PM₁₀/TSP ratio: 50% PM₁₀ 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} 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. $PM_{2.5}/TSP$ ratio: 7.5%

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. As Enviva has engineering data that shows VOC emissions from greenwood storage piles are less than the low end of the factors listed, Enviva chose to employ the minimum emission factor from the NCASI dosument for purposes of conservatism.

3. The surface area for rectangular piles is calculated as [2*H*L+2*W*H+L*W] + 20% to consider the sloping pile edges. Pile dimensions were provided by Enviva.

The surface area for circular piles is calculated as $[\Pi^*R^*(R^2+H^2)^{0.5}] + 20\%$ to consider the sloping pile edges. Diameter and height were provided by Enviva.

^{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 ft² - square feet

lb - pound mph - miles per hour

NC - North Carolina

NCASI - National Council for Air and Stream Improvement, Inc.

NWS - National Weather Service

 ${\rm PM}_{10}$ - 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

VOC - volatile organic compound



Table 11 Potential Emissions Electric Powered Green Wood Chipper (IES-EPWC) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Throughput of Chipper	781,255	tons/year (dry wood) ¹
Short Term Throughput	119.40	tons/hr (dry wood) ¹
Approximate Moisture Content	50%	of total weight

	Emission Factor		Emissions	
Pollutant			Max (lb/hr)	Annual (tpy)
THC as Carbon ²	0.0041 lb/ODT		0.49	1.60
VOC as propane ³	0.0050 lb/ODT		0.60	1.95
Methanol ²	0.0010	lb/ODT	0.12	0.39

Notes:

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

² Emission factor obtained from available emissions factors for 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.

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

Table 12 Potential Emissions Bark Hog (IES-BARK) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Throughput of Bark Hog	234,377 tons/year (dry wood) ¹
Short-term Throughput of Bark Hog	31.50 tons/hr (dry wood) ¹
Approximate Moisture Content	50% of total weight

			Emis	sions
Pollutant	Emissio	on Factor	Max (lb/hr)	Annual (tpy)
THC as Carbon ²	0.0041	lb/ODT	0.13	0.48
VOC as propane ³	0.0050	lb/ODT	0.16	0.59
PM ⁴	0.02	lb/ton	0.13	0.47
PM ₁₀ ⁴	0.011	lb/ton	0.07	0.26
Methanol ²	0.0010	lb/ODT	0.03	0.12

Notes:

- ¹ The annual throughput used for the bark hog is 30% of the annual throughput of the facility. The short-term throughput is 15% of maximum hourly capacity of the debarker.
- 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, Tables 7 and 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.
- ⁴ 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).

Table 13 Potential Emissions Debarker (IES-DEBARK) Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput ¹	210 ton/hr
Annual Throughput ¹	781,255 ton/yr
Approximate Moisture Content	50% of total weight

Potential Criteria Pollutant Emissions

6	Dellutant	Emission Factor	Potential Emissions	
Source	Pollutant Fa (lb)		Max (lb/hr)	Annual (tpy)
IES-DEBARK	TSP ²	2.0E-02	0.84	1.56
ILS-DEDAKK	PM_{10}^{2}	1.1E-02	0.46	0.86

Notes:

- ^{1.} The annual throughput used for the debarker is equal to the annual throughput of the dryers. The short-term throughput is based upon the maximum capacity of the debarker.
- ^{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 use of water spray and the bark hog being partially enclosed (assumed 90% control).

Abbreviations:

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



Table 14 Potential Emissions Emergency Generators (IES-GN-1 and IES-GN-2) and Fire Water Pump (IES-FWP) Enviva Pellets Northampton, LLC

Emergency Generator 1 - Emissions (IES-GN-1)

Equipment and Fuel Characteristics

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

Criteria Pollutant Emissions

				Emis	Emissions	
Pollutant	Category	Emission Factor	Units	Max	Annual	
				lb/hr	tpy	
TSP	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02	
PM ₁₀	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02	
PM _{2.5}	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02	
NO _x	PSD	8.82E-03	lb/kW-hr (5)	2.30	5.75E-01	
SO ₂	PSD	15	ppmw (3)	3.81E-03	9.52E-04	
CO	PSD	7.72E-03	lb/kW-hr (2)	2.01	5.03E-01	
VOC (NMHC)	PSD	2.51E-03	lb/MMBtu (4)	6.15E-03	1.54E-03	

Hazardous Air Pollutant Emissions

				Emissions	
Pollutant	Category	Emission Factor	Units	Max	Annual
				lb/hr	tpy
Acetaldehyde	HAP	5.37E-06	lb/hp-hr (4)	1.88E-03	4.70E-04
Acrolein	HAP	6.48E-07	lb/hp-hr (4)	2.27E-04	5.67E-05
Benzene	HAP	6.53E-06	lb/hp-hr (4)	2.29E-03	5.71E-04
Benzo(a)pyrene ⁶	HAP	1.32E-09	lb/hp-hr (4)	4.61E-07	1.15E-07
1,3-Butadiene	HAP	2.74E-07	lb/hp-hr (4)	9.58E-05	2.39E-05
Formaldehyde	HAP	8.26E-06	lb/hp-hr (4)	2.89E-03	7.23E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	4.12E-04	1.03E-04
Toluene	HAP	2.86E-06	lb/hp-hr (4)	1.00E-03	2.51E-04
Xylenes	HAP	2.00E-06	lb/hp-hr (4)	6.98E-04	1.75E-04
		Highest	HAP (Formaldehyde)	2.89E-03	7.23E-04
			Total HAPs	9.49E-03	2.37E-03

Notes:

- ¹ NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.
- ² Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2009 construction.
- ³ Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.
- ⁴ Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.



⁵ Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx.

⁶ Benzo(a)pyrene is included as a HAP in Total PAH.

Table 14 **Potential Emissions Emergency Generators (IES-GN-1 and IES-GN-2) and Fire Water Pump (IES-FWP) Enviva Pellets Northampton, LLC**

Emergency Generator 2 - Emissions (IES-GN-2)

Equipment and Fuel Characteristics

Engine Output	500 kW
Engine Power	671 hp (brake)
Hours of Operation	500 hr/yr ¹
Heating Value of Diesel	19,300 Btu/lb
Power Conversion	7,000 Btu/hr/hp

Criteria Pollutant Emissions

				Emis	sions
Pollutant	Category	Emission Factor	Units	Max	Annual
				lb/hr	tpy
PM	PSD	0.021	g/hp-hr (2)	0.03	7.8E-03
PM ₁₀	PSD	0.021	g/hp-hr (2)	0.03	7.8E-03
PM _{2.5}	PSD	0.021	g/hp-hr (2)	0.03	7.8E-03
NO_x	PSD	6.65	g/hp-hr (2)	9.83	2.46
SO ₂	PSD	15.0	ppmw (3)	7.3E-03	1.8E-03
CO	PSD	0.39	g/hp-hr (2)	0.58	0.14
VOC (NMHC)	PSD	0.01	lb/hp-hr (2)	6.71	1.68

Hazardous Air Pollutant Emissions

				Emissions	
Pollutant	Category	Emission Factor	Units	Max	Annual
				lb/hr	tpy
Acetaldehyde	HAP	2.52E-05	lb/MMTbu (4)	1.18E-04	2.96E-05
Acrolein	HAP	7.88E-06	lb/MMTbu (4)	3.70E-05	9.25E-06
Benzene	HAP	7.76E-04	lb/MMTbu (4)	3.64E-03	9.11E-04
Benzo(a)pyrene ⁵	HAP	2.57E-07	lb/MMTbu (4)	1.21E-06	3.02E-07
Formaldehyde	HAP	7.89E-05	lb/MMTbu (4)	3.70E-04	9.26E-05
Naphthalene ⁵	HAP	1.30E-04	lb/MMTbu (4)	6.10E-04	1.53E-04
Total PAH (POM)	HAP	2.12E-04	lb/MMTbu (4)	9.95E-04	2.49E-04
Toluene	HAP	2.81E-04	lb/MMTbu (4)	1.32E-03	3.30E-04
Xylenes	HAP	1.93E-04	lb/MMTbu (4)	9.06E-04	2.26E-04
		<u> </u>	Highest HAP (Benzene)	3.64E-03	9.11E-04
			Total HAPs	7.39E-03	1.85E-03

1 NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

Emission factors for Particulate Matter (TSP/PM10/PM2.5), Nitrous Oxide (NOx), 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 factor obtained from AP-42 Section 3.4, Tables 3.4-3 Table 3.4-4. ⁵ Benzo(a)pyrene and naphthalene are included as HAPs in Total PAH.



Table 14 Potential Emissions Emergency Generators (IES-GN-1 and IES-GN-2) and Fire Water Pump (IES-FWP) Enviva Pellets Northampton, LLC

Firewater Pump Emissions (IES-FWP)

Equipment and Fuel Characteristics

Engine Output	0.22 MW
Engine Power	300 hp
Hours of Operation	500 hr/yr ¹
Heating Value of Diesel	19,300 Btu/lb
Power Conversion	7,000 Btu/hr/hp

Criteria Pollutant Emissions

				Emis	sions
Pollutant	Category	Emission Factor	Units	Max	Annual
				lb/hr	tpy
TSP	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
PM ₁₀	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
PM _{2.5}	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
NO_x	PSD	8.82E-03	lb/kW-hr (5)	1.97	4.93E-01
SO ₂	PSD	15	ppmw (3)	3.26E-03	8.16E-04
CO	PSD	7.72E-03	lb/kW-hr (2)	1.73	4.32E-01
VOC (NMHC)	PSD	2.51E-03	lb/MMBtu (4)	5.27E-03	1.32E-03

Hazardous Air Pollutant Emissions

				Emis	sions
Pollutant	Category	Emission Factor	Units	Max	Annual
				lb/hr	tpy
Acetaldehyde	HAP	5.37E-06	lb/hp-hr (4)	1.61E-03	4.03E-04
Acrolein	HAP	6.48E-07	lb/hp-hr (4)	1.94E-04	4.86E-05
Benzene	HAP	6.53E-06	lb/hp-hr (4)	1.96E-03	4.90E-04
Benzo(a)pyrene ⁶	HAP	1.32E-09	lb/hp-hr (4)	3.95E-07	9.87E-08
1,3-Butadiene	HAP	2.74E-07	lb/hp-hr (4)	8.21E-05	2.05E-05
Formaldehyde	HAP	8.26E-06	lb/hp-hr (4)	2.48E-03	6.20E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	3.53E-04	8.82E-05
Toluene	HAP	2.86E-06	lb/hp-hr (4)	8.59E-04	2.15E-04
Xylenes	HAP	2.00E-06	lb/hp-hr (4)	5.99E-04	1.50E-04
	2.48E-03	6.20E-04			
	_	_	Total HAPs	8.13E-03	2.03E-03

Notes:

- NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.
- ² Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2009 construction.
- ³ Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.
- ⁴ Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.
- ⁵ Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx.
- ⁶ Benzo(a)pyrene is included as a HAP in Total PAH.



Table 15 Potential Emissions Diesel Storage Tanks (IES-TK-1 through IES-TK-4) Enviva Pellets Northampton, LLC

	Description	Design	Working	Tank Dim	ensions ⁵		_			
Source ID		Volume ¹	Volume ²	Diameter	Height/ Length	Orientation	Throughput ³ Turnovers		VOC Emissions⁴	
		(gal)	(gal)	(ft)	(ft)		(gal/yr)		(lb/hr)	(tpy)
IES-TK-1	Emergency Generator #1 Fuel Storage Tank ²	2,500	1,250	6.0	12	Horizontal	8,803	7.0	1.3E-04	5.8E-04
IES-TK-2	Fire Pump Fuel Storage Tank ²	500	250	3.0	10.0	Horizontal	7,554	30.2	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
IES-TK-4	Emergency Generator #2 Fuel Storage Tank ²	1,000	500	5.3	6.0	Horizontal	15,958	31.9	1.3E-04	5.8E-04
Total Emissions: 1										4.6E-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, IES-TK-2, and IES-TK-4 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 16a

Haul Road Emissions

Potential Fugitive PM Emissions from Paved Roads

Enviva Pellets Northampton, LLC

Vehicle Activity	Distance Traveled per	Trips Per	Daily	Events Per Year	Empty Truck Weight	Loaded Truck Weight	Average Truck Weight	Annual VMT	PM Emission Factor ²	PM ₁₀ Emission Factor ²	PM _{2.5} Emission Factor ²	Potenti Emissi		Potentia Emiss		Potentia Emiss	_=.5
	Roundtrip ¹	Day		(days)	(lb)	(lb)	(ton)		(lb/VMT)	(lb/VMT)	(lb/VMT)	(lb/day)	(tpy)	(lb/day)	(tpy)	(lb/day)	(tpy)
Bark Delivery - Dumper	2,800	11	6	365	41,000	81,000	30.5	2,134	2.24	0.45	0.11	1.31	0.24	0.26	0.05	0.06	0.01
Bark Delivery - Self Unload	3,730	11	8	365	41,000	81,000	30.5	2,842	2.24	0.45	0.11	1.74	0.32	0.35	0.06	0.09	0.02
Log Delivery to Crane Storage Area	2,800	93	49	365	40,400	85,400	31.5	18,004	2.31	0.46	0.11	11.39	2.08	2.28	0.42	0.56	0.10
Log Delivery to Log Storage Area	2,800	93	49	365	40,400	85,400	31.5	18,004	2.31	0.46	0.11	11.39	2.08	2.28	0.42	0.56	0.10
Purchased Chip Delivery	2,800	114	61	365	41,000	91,000	33.0	22,095	2.42	0.48	0.12	14.68	2.68	2.94	0.54	0.72	0.13
Additive Delivery	2,000	0.26	0.1	365	41,000	91,000	33.0	36	2.42	0.48	0.12	0.02	0.00	0.00	0.00	0.00	0.00
Pellet Truck Delivery to Pellet Loadout Area (Normal Operations)	3,730	86	61	365	41,000	91,000	33.0	22,182	2.42	0.48	0.12	14.73	2.69	2.95	0.54	0.72	0.13
Dry Shavings	3,730	32	23	365	41,000	77,000	29.5	8,251	2.16	0.43	0.11	4.89	0.89	0.98	0.18	0.24	0.04
Contractor Vehicle	2,000	18	7	365	4,000	4,000	2.0	2,462	0.14	0.03	0.01	0.09	0.02	0.02	0.00	0.00	0.00
Employee Car Parking	2,000	68	26	365	4,000	4,000	2.0	9,470	0.14	0.03	6.8E-03	0.36	0.07	0.07	0.01	0.02	0.00
	_								_	Total	Emissions:	60.60	11.06	12.12	2.21	2.97	0.54

Notes:

Distance traveled per round trip and daily trip counts were provided by Enviva.

^{2.} Emission factors calculated based on Equation 2 from AP-42 Section 13.2.1 - Paved Roads, 01/11.

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless) for PM 0.011

k = particle size multiplier (dimensionless) for PM₁₀ 0.0022k = 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 120 Per AP-42, Section 13.2.1, Figure 13.2.1-2 (Northampton County, NC).

Abbreviations:

ft - feet hr - hour

lb - pound

PM - particulate matter

 ${\rm PM}_{10}$ - 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



^{3.} 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.

Table B-16b

Haul Road Emissions

Potential Fugitive PM Emissions from Unpaved Roads Enviva Pellets Northampton, LLC

Vehicle Activity	Distance Traveled per Roundtrip ¹ (ft)	Trips Per Day ¹	Daily VMT	Events Per Year (days)	Empty Truck Weight (lb)	Loaded Truck Weight (lb)	Average Truck Weight (ton)	Annual VMT
Log Delivery to Crane Storage Area	2,000	93	35	365	40,400	85,400	31.5	12,860
Log Delivery to Log Storage Area	2,000	93	35	365	40,400	85,400	31.5	12,860
Purchased Chip Delivery	7,000	114	151	365	41,000	91,000	33.0	55,238
Bark Delivery - Dumper	7,000	11	15	365	41,000	81,000	30.5	5,334
Additive Delivery	500	0.26	0.02	365	41,000	91,000	33.0	9
				-	_		32.4	86,300

Notes:

Emission Calculations Unpaved Roads:

Pollutant	Emeperical Constant (k) ¹ (lb/VMT)	Silt Content (S) ² (%)	Particle Constant a ¹ (-)	Particle Constant b ¹ (-)	Emission Factor ³ (lb/VMT)	Potential Emissions ⁴ (tpy)
РМ	4.9	8.4	0.7	0.45	7.47	32.25
PM ₁₀	1.5	8.4	0.9	0.45	2.13	9.19
PM _{2.5}	0.15	8.4	0.9	0.45	0.21	0.92

Notes:

- ^{1.} Constants (k, a, & b) based on AP-42, Section 13.2.2 (Unpaved Roads), Table 13.2.2-2 for Industrial Roads, November 2006
- ^{2.} Silt loading factor based on AP-42, Section 13.2.2 (Unpaved Roads), Table 13.2.2-1, Lumber Sawmills, November 2006
- $^{3.}$ Emission factors calculated based on Equation 1a from AP-42 Section 13.2.2 Unpaved Roads, 11/06.

Particulate Emission Factor: $E_{ext} = k (s/12)^a x (W/3)^b * (365-P/365)$

 \mathbf{k} = particle size multiplier for particle size range and units of interest

E = size-specific emission factor (lb/VMT)

s = surface material silt content (%)

W = mean vehicle weight (tons)

P=number of days with at least 0.01 in of precipitation during the averaging period =

Per AP-42, Section 13.2.1, Figure 13.2.1-2 (Northampton, VA). = 120

Abbreviations:

ft - feet

hr - hour lb - pound

PM - particulate matter

PM₁₀ - 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

Distance traveled per round trip and daily trip counts were provided by Enviva.

^{4.} Potential emissions calculated from appropriate emission factor times vehicle miles traveled with control efficiency of 90% for water / dust suppression activities.

Table 17 Potential GHG Emissions Facility-wide Enviva Pellets Northampton, LLC

Operating Data:

Operating Data:		
Dryer-1 Heat Input Annual Heat Input	175.3 1,540,294	MMBtu/hr MMBtu/yr
Duct Burner 1 and 2 Heat Input Number of Burners	1 2	MMBtu/hr
Operating Schedule		hrs/yr
Dryer 1 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
Dryer-2 Heat Input Annual Heat Input	180.0 1,576,800	MMBtu/hr MMBtu/yr
Duct Burner 3 and 4 Heat Input Number of Burners Operating Schedule	2	MMBtu/hr hrs/yr
Dryer 2 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
RTO-1 Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 1 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 1 Idle Heat Input Operating Schedule		MMBtu/hr hrs/yr
RTO-2 Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 2 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 2 Idle Heat Input Operating Schedule		MMBtu/hr hrs/yr
RCO-1 Heat Input Operating Schedule	184,558.6 8,760	MMBtu/yr hrs/yr
RCO-2 Heat Input Operating Schedule	192,112.5 8,760	MMBtu/yr hrs/yr
Propane Vaporizer Heat Input Operating Schedule		MMBtu/hr hrs/yr
Emergency Generator 1 Output Operating Schedule Power Conversion Energy Input	500 7,000	bhp hrs/yr Btu/hr/hp MMBtu/hr
Emergency Generator 2 Output Operating Schedule Power Conversion Energy Input	500 7,000	bhp hrs/yr Btu/hr/hp MMBtu/hr
Fire Water Pump Output Operating Schedule Power Conversion Energy Input	500 7,000	bhp hrs/yr Btu/hr/hp MMBtu/hr



Table 17 **Potential GHG Emissions** Facility-wide **Enviva Pellets Northampton, LLC**

Footoolog Hote TD	Ford Tone	Emission Facto	ors from Table C-1	(kg/MMBtu) ^{1, 2}	Tier	1 Emissior	ns (short to	ons)²
Emission Unit ID	Fuel Type	CO ₂	CH₄	N ₂ O	CO ₂	CH₄	N ₂ O	Total CO₂e
ES-DRYER-1	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	159,259.79	306	1,821	161,387
IES-DDB-1 and -2	Propane	62.87	7.50E-02	1.79E-01	1214.16	1.45	3.45	1,219
ES-DRYERBYP-1	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	906.26	1.74	10.37	918
ES-DRYER-2	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	163,034.40	313	1,865	165,212
IES-DDB-3 and -4	Propane	62.87	7.50E-02	1.79E-01	1214.16	1.45	3.45	1,219
ES-DRYERBYP-2	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	930.56	1.79	10.64	943
CD-RTO-1	Propane	62.87	7.50E-02	1.79E-01	19426.62	23.17	55.25	19,505
ES-FURNACEBYP-1	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	906.26	1.74	10.37	918
ES-FURNACEBYP-1 (Idle Mode)	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	258.49	0.50	2.96	262
CD-RTO-2	Propane	62.87	7.50E-02	1.79E-01	19426.62	23.17	55.25	19,505
ES-FURNACEBYP-2	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	930.56	1.79	10.64	943
ES-FURNACEBYP-2 (Idle Mode)	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	258.49	0.50	2.96	262
CD-RCO-1	Propane	62.87	7.50E-02	1.79E-01	12790.20	15.26	36.37	12,842
CD-RCO-2	Propane	62.87	7.50E-02	1.79E-01	13313.70	15.88	37.86	13,367
IES-PVAP	Propane	62.87	7.50E-02	1.79E-01	607.08	0.72	1.73	610
IES-GN-1	No. 2 Fuel Oil (Distillate)	73.96	7.50E-02	1.79E-01	100	1.01E-01	2.41E-01	100
IES-GN-2	No. 2 Fuel Oil (Distillate)	73.96	7.50E-02	1.79E-01	191	1.94E-01	4.63E-01	192
IES-FWP	No. 2 Fuel Oil (Distillate)	73.96	7.50E-02	1.79E-01	86	8.68E-02	2.07E-01	86

¹ Emission factors from Table C-1 and C-2 of GHG Reporting Rule. Emission factors for methane and N₂O already multiplied by their respective GWPs of 25 and 298.
² As per VADEQ guidance, VADEQ has adopted the GHG Biomass Deferral Rule which excludes CO₂ emissions from biomass combustion.



APPENDIX D PERMIT APPLICATION FORMS

FORM A

GENERAL FACILITY INFORMATION

REVISED 09/2	2/16	NCDEQ/Division of A	Air Quality - A	- Application for Air Permit to Construct/Operate
			LL NOT BE	E PROCESSED WITHOUT THE FOLLOWING:
V	Local Zoning Consistency Determine modification only)	nation (new or	v	Appropriate Number of Copies of Application
☑	Responsible Official/Authorized Co	ontact Signature	V	P.E. Seal (if required)
			GENERA	AL INFORMATION
Legal Corpora	ate/Owner Name: Enviva Po	ellets Northampton, LLC		
Site Name:	Enviva Pellets Northampton, LLC			
Site Address (9	911 Address) Line 1: 309 Envir			
Site Address L				
City:	Garysburg			State: NC
Zip Code:	27839			County: Northampton
			CONTAC	CT INFORMATION
Responsible (Official/Authorized Contact:			Invoice Contact:
Name/Title:	Royal Smith, Executive Vice Presi	dent Operations		Name/Title: Joe Harrell, Corporate Environmental Health & Safety Manager
	ss Line 1: 7200 Wisconsin Avenue			Mailing Address Line 1: 142 N.C. Route 561 East
	ss Line 2: Suite 1000			Mailing Address Line 2:
City: Bethes	SV COMPANY	Zip Code:	20814	
Primary Phone	2-94 Selection 2-95 S	Fax No.:	20011	Primary Phone No.: (252) 209-6032 Fax No.:
Secondary Pho		T GATTON		Secondary Phone No.:
	: Royal.Smith@envivabiomass.com	1		Email Address: loe.Harrell@envivabiomass.com
Facility/Inspec				Permit/Technical Contact:
Name/Title:	Heath Lucy, Environmental Healt	rh & Safety Manager		Name/Title: Joe Harrell, Corporate Environmental Health & Safety Manager
10 mm (1 mm)	ss Line 1: 309 Enviva Blvd.	ar a barby Francy		Mailing Address Line 1: 142 N.C. Route 561 East
Mailing Addres				Mailing Address Line 2:
City: Garysh		Zip Code:	27839	
Primary Phone		Fax No.:	27007	City: Ahoskie State: NC Zip Code: 27910
Secondary Pho				Secondary Phone No.:
	: Heath.Lucy@envivabiomass.com			Email Address: Joe.Harrell@envivabiomass.com
			PLICATION	ON IS BEING MADE FOR
□ New N	on-permitted Facility/Greenfield	☑ Modification of Facil	lity (permitted	ed) Renewal Title V Renewal Non-Title V
☐ Name		_		Renewal with Modification
				AFTER APPLICATION (Check Only One)
	General	Small		☐ Prohibitory Small ☐ Synthetic Minor ☑ Title V
		FAC	CILITY (Pla	ant Site) INFORMATION
Describe natur	e of (plant site) operation(s): Wood p		The second secon	
				Facility ID No. 6600167
Primary SIC/N	AICS Code: 2499 (Wood Products, N	Not Elsewhere Classified)		Current/Previous Air Permit No. 10203R05 Expiration Date: February 28, 2025
Facility Coordin	•	Latitude: 36,5025		Longitude: -77.6135
	disation contain —			***If yes, please contact the DAQ Regional Office prior to submitting this
confidential d		YES 🕢 NO		application.*** (See Instructions)
		PERSON O	R FIRM TH	HAT PREPARED APPLICATION
Person Name:	Michael Carbon			Firm Name: Ramboll US Corporation
TOTAL	ss Line 1: 8235 YMCA Plaza Drive			Mailing Address Line 2: Suite 300
City: Baton Ro		State: LA		Zip Code: 70810 County: East Baton Rouge
Phone No.:	(225) 408-2691	Fax No.:		Email Address: mcarbon@ramboll.com
			SPONSIBL	BLE OFFICIAL/AUTHORIZED CONTACT
Name (typed):	Royal Smith			Title: Executive Vice President Operations
X Signature(B	10			Date: 2 / / 2
	LFT	7		3/29/19

Attach Additional Sheets As Necessary

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2 112r APPLICABILITY INFORMATION - A3

	EMISSION SOUR	RCE LISTING:	New, Modified, Previously Unpermitte	d, Replaced, Deleted	
EMISSION SOURCE	EMISSION SOURCE		CONTROL DEVICE		CONTROL DEVICE
ID NO.	DESCRIPTION		ID NO.		DESCRIPTION
	Fauinment To Be A	DDFD By Th	is Application (New, Previously Unper	mitted or Replacement)	
	-	DDLD by III	-		
ES-GHM-1 through ES-GHM-	Five (5) Green Wood Hammermills (new)		CD-WESP-1/ CD-WESP-2(new)	Wet Electrostatic Precipita	
3			CD-RTO-1 (new)/ CD-RTO-2 (new)	Regenerative Thermal Oxio	
ES-DRYER-2	Green Wood Direct-Fired Rotary Dryer System	m (new)	CD-WESP-2 (new)	Wet Electrostatic Precipita	
			CD-RTO-2 (new)	Regenerative Thermal Oxio	dizer
ES-DRYERBYP-1	Dryer #1 Bypass		N/A	N/A	
ES-FURNACEBYP-1	Furnace #1 Bypass		N/A	N/A	
ES-DRYERBYP-2	Dryer #2 Bypass		N/A	N/A	
ES-FURNACEBYP-2	Furnace #2 Bypass		N/A	N/A	
ES-DWH-2	Dry Wood Handling		CD-DWH-BF-2 (new)	Baghouse	
IES-ADD	Additive Handling and Storage (new)		CD-ADD-BF (new)	Baghouse	
EC DOWN 4 LEC DAWN 0	m (0) D (1 : W : 11 ()		CD-WS-1 (new)	Wet Scrubber	
ES-DSHM-1 and ES-DHM-2	Two (2) Dry Shavings Hammermills (new)		CD-RCO-1 (new)	Recuperative Catalytic Oxio	lizer
ES-PS-1 and -2	Dry Hammermill Pre-screeners 1 and 2		N/A	N/A	
IES-DRYSHAVE	Dry Shaving Material Handling and Storage (N/A	N/A	
IES-DRYSHAVE-1	Dry Shaving Material Handling (new)	,	CD-DSR-BF (new)	N/A	
ES-DSR	Dry Shaving Reception (new)		CD-DSR-BF (new)	Baghouse	
ES-DSS	Dry Shavings Silo (new)		CD-DSS-BF (new)	Baghouse	
		ma aitre) (masse)			
IES-TK-3	Mobile Diesel Storage Tank (5,000 gallon cap		N/A	N/A	
IES-TK-4	Diesel Storage Tank for Emergency Generato		N/A	NI / A	
	gallon capacity) (new)		N/A	N/A	
IES-Bark	Bark Hog (renamed/new)		N/A	N/A	
IES-Debark	Debarker (renamed/new)		N/A	N/A	
IES-DDB-1 through IES-DDB	Dryer Line Double Duct Burners (new)				
4	J		N/A	N/A	
IES-PVAP	Liquid Propane Vaporizer (new)		N/A	N/A	
IES-GN-2	Emergency Generator 2(new)		N/A	N/A	
			quipment To Be MODIFIED By This	,	
	Green Wood Direct-Fired Rotary Dryer System		, <u>,</u>	Ī	tou
ES-DRYER	(renamed to ES-DRYER-1)	m (moainea)	CD-WESP (renamed to CD-WESP-1)	Wet Electrostatic Precipita	
	(renamed to ES-DRTER-1)		CD-RTO-1 (new)	Regenerative Thermal Oxio	lizer
			CD-HM-CYC-1 through 8	Cyclones	
ES-HM-1 through 8	Eight (8) Dry Hammermills (modified)		CD-HM-BF-1 through CD-HM-BF-3	Baghouses	
			CD-WS-1 (new)		
			CD-RCO-1 (new)	Recuperative Catalytic Oxid	lizer
			CD-CLR-1 through	Baghouses (one per pellet	cooler)
ES-CLR-1 through	Six (6) Pellet Coolers (modified)		CD-CLR-6	3	
ES-CLR-6	on (o) I ener doorers (mounteu)		CD-WS-2 (new)	Wet Scrubber	
			CD-RCO-2 (new)	Recuperative Catalytic Oxio	lizer
ES-PFB-1	Pellet Fines Bin (renamed to ES-PCHP)		CD-PFB-BV (renamed to CD-PCHP-BV)	Baghouse	
ES-PMFS	Pellet Mill Feed Silo (modified)		CD-PMFS-BV	Baghouse	
ES-FPH	Finished Product Handling (modified)				
ES-PB-1 through					
ES-PB-12	Pellet Loadout Bins (modified)		CD-FPH-BF	Baghouse	
	Tonot Zoudout Zinz (incumou)				
ES-PL-1 and	D-11-41 144 12 (1/6-1)				
ES-PL-2	Pellet Loadout 1 and 2 (modified)				
ES- DLH	Dry line hopper (renamed to IES-DLH)		N/A	N/A	
			CD-HM-BF-3	Baghouse	
			CD-WS-1 (new)	Wet Scrubber	
ES-NDS	Nuisance Dust System		CD-RCO-1 (new)	Recuperative Catalytic Oxid	lizer
ES-DLC-1	Dry Line Feed Conveyor		N/A	N/A	
			CD-DWH-BF-1 (new)	Daghauga	
	Dried Wood Handling (re-named to ES-DWH-	·1 and 2 and	CD-DWH-Br-1 (liew)	Baghouse	
IES-DWH	modified)				
	Two diesel storage tanks (2,500 gallon and 5	On gallon			
IS-TK1 and IS-TK2	capacity) (renamed to IES-TK-1 and IES-TK-2	าบบ ยลมบม			
IES-EPWC		_	N/A	N/A	
	Electric Powered Green Wood Chipper	2)	N/A N/A	N/A N/A	
		2)			
		2)			
IES-GWHS		2)			
	Electric Powered Green Wood Chipper	t to ES-GWHS)	N/A N/A	N/A N/A N/A	
IES-GWHS	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed	t to ES-GWHS)	N/A N/A	N/A N/A	
IES-GWHS IES-GWFB	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin	1 to ES-GWHS)	N/A N/A N/A N/A	N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin	1 to ES-GWHS)	N/A N/A	N/A N/A N/A N/A	
IES-GWHS IES-GWFB	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1)	t to ES-GWHS) Equipment	N/A N/A N/A N/A TO Be DELETED By This Applicatio	N/A N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin	t to ES-GWHS) Equipment	N/A N/A N/A N/A	N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers	2) Ito ES-GWHS) Equipment	N/A N/A N/A TO BE DELETED By This Application N/A	N/A N/A N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping	2) I to ES-GWHS) Equipment	N/A N/A N/A N/A t To Be DELETED By This Applicatio N/A N/A	N/A N/A N/A N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1 IES-PP	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping Pellet Pess System	2) I to ES-GWHS) Equipment	N/A N/A N/A N/A t To Be DELETED By This Application N/A N/A N/A	N/A N/A N/A N/A N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1 IES-PP IES-FPH	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping	2) I to ES-GWHS) Equipment	N/A N/A N/A N/A t To Be DELETED By This Applicatio N/A N/A	N/A N/A N/A N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1 IES-PP IES-FPH ES-BSC-1	Electric Powered Green Wood Chipper Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping Pellet Pess System	2) I to ES-GWHS) Equipment	N/A N/A N/A N/A t To Be DELETED By This Application N/A N/A N/A	N/A N/A N/A N/A N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1 IES-PP IES-FPH ES-BSC-1 ES-BSS-1	Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping Pellet Pess System Finished product handling	2) Ito ES-GWHS) Equipment	N/A N/A N/A TO BE DELETED By This Application N/A N/A N/A N/A N/A	N/A N/A N/A N/A N/A N/A N/A N/A	
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1 IES-PP IES-FPH ES-BSC-1 ES-BSS-1 ES-BSS-2	Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping Pellet Pess System Finished product handling Bagging system conveyor and two bagging sy	2) Ito ES-GWHS) Equipment	N/A N/A N/A TO Be DELETED By This Application N/A N/A N/A N/A N/A CD-BS-BF-1 and 2	N/A N/A N/A N/A N/A N/A N/A N/A	uare feet of filter area each)
IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1 IES-PP IES-FPH ES-BSC-1 ES-BSS-1 ES-BSS-2 ES-BSC-2 and 3	Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping Pellet Pess System Finished product handling	2) Ito ES-GWHS) Equipment	N/A N/A N/A TO BE DELETED By This Application N/A N/A N/A N/A N/A	N/A N/A N/A N/A N/A N/A N/A N/A	uare feet of filter area each)
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IES-GWHS IES-GWFB IES-GN IES-RCHP-1 and IES-RCHIP 2 IES-CHIP-1 IES-PP IES-FPH ES-BSC-1 ES-BSS-1 ES-BSS-2 ES-BSC-2 and 3 ES-BSB-1 ES-BSB-2 Is your facility subject to 40 0 of the second of the sec	Green Wood Handling and Storage (renamed Green Wood Fuel Storage Bin Emergency Generator (renamed to IES-GN-1) Two electric powered wood re-chippers Log Chipping Pellet Pess System Finished product handling Bagging system conveyor and two bagging sy Two bagging system conveyors Two bagging system bins CFR Part 68 "Prevention of Accidental Releases il how your facility avoided applicability: 12(r), please complete the following: smitted a Risk Management Plan (RMP) to EPA	to ES-GWHS) Equipment System screens 112(r) A Pursuant to 40 C al date:	N/A N/A N/A TO BE DELETED By This Application N/A N/A N/A N/A CD-BS-BF-1 and 2 N/A N/A APPLICABILITY INFORMATION of the Federal Clean Air Act? Enviva Pellets Northampton, LLC will not handle subject to Section 112(r) of the Federal Clean Air Act? EFR Part 68.10 or Part 68.150? If submitted, RMP submittal date:	N/A N/A N/A N/A N/A N/A N/A N/A	A 3
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FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16

D1

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate **CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE EXPECTED ACTUAL EMISSIONS** POTENTIAL EMISSIONS POTENTIAL EMISSIONS (BEFORE CONTROLS / (AFTER CONTROLS / (AFTER CONTROLS / LIMITATIONS) LIMITATIONS) LIMITATIONS) AIR POLLUTANT EMITTED tons/yr tons/yr tons/yr PARTICULATE MATTER (PM) See Emission Calculations in Appendix C PARTICULATE MATTER < 10 MICRONS (PM₁₀) PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5}) SULFUR DIOXIDE (SO₂) NITROGEN OXIDES (NOx) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) GREENHOUSE GASES (GHG) (SHORT TONS) OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE **EXPECTED ACTUAL POTENTIAL EMISSIONS EMISSIONS POTENTIAL EMISSIONS** (AFTER CONTROLS / (BEFORE CONTROLS / (AFTER CONTROLS / LIMITATIONS) LIMITATIONS) LIMITATIONS) HAZARDOUS AIR POLLUTANT EMITTED CAS NO tons/yr tons/yi 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:

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

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

D4

INLV	NCDEQ/DIVISION OF All Quality -		·	_
		EMPTED PER 2Q		
	INSIGNIFICANT ACTIVITIES	PER 2Q .0503 FC	JR TITLE V SOURCES	
	DESCRIPTION OF EMISSION SOURCE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY	
1	Negligible emissions IES-Bark	234377 ODT/yr	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
2.	Emergency Generator Diesel Fuel Storage Tank IES-TK-1	2,500 gallons	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
3.	Fire Water Pump Diesel Fuel Storage Tank IES-TK-2	500 gallons	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
4.	Mobile Sources Diesel Fuel Storage Tank IES-TK-3	5,000 gallons	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
5.	Emergency Generator 2 Fuel Storage Tank IES-TK-4	1,000 gallons	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
6.	Debarker IES-Debark	781255 ODT/yr	15A NCAC 02Q .0503(8)-negligible emissions see Appendix C	S,
7.	Green Wood Fuel Bin IES-GWFB	13.93 ODT/hr	15A NCAC 02Q .0503(8)-no quantifiable emissions	
8.	Dry line hopper IES-DLH	10 ODT/hr	15A NCAC 02Q .0503(8)-negligible emissions	S
9.	Dry Shavings Handling IES-DRYSHAVE	Varies	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
10.	Dry Shavings Handling IES-DRYSHAVE-1	Varies	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
11.	Electric Powered Green Wood Chipper IES-EPWC	781255 ODT/yr	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
12.	Additive Handling IES-ADD	2344 ODT/yr	15A NCAC 02Q .0503(8)-negligible emissions see Appendix C	s,
13.	Diesel Fired Emergency Generator (350 brake IES-GN-1	350 bhp	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
14.	Diesel Fired Emergency Generator (671 brake IES-GN-2	671 bhp	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
15.	One fire water pump (300 brake horsepower) IES-FWP	300 bhp	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
16.	Dryer double duct burners IES-DDB-1 through IES-DDB-4	1 MMBtu/hr	15A NCAC 02Q .0503(8)-low emissions, see Appendix C	
17.	Propane Vaporizer IES-PVAP	1 MMBtu/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.
- 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.
- PROFESSIONAL ENGINEERING SEAL PURSUANT TO 15A NCAC 2Q ,0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL,"

 A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES, (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

l, Russell Kemp attest that this application for Enviva Pellets Northampton, LLC

has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed \$10,000 as well as civil penalties up to \$25,000 per violation.

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME:

Russell Kemp, MS, PE

DATE:

27 MARCH 2019

COMPANY:

REUS Engineers, P.C.

ADDRESS:

1600 Parkwood Circle, Suite 310, Atlanta, GA 30339

TELEPHONE:

(678) 388-1654

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

CARO
SEAL
19628

FORM E1

TITLE V GENERAL INFORMATION

REVISED 06/01/16

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

E1

			TITLE V YOU MUST CO	
Indicate here if your facility is subject to Title V		EMISSIONS	E2 THROUGH E5 AS APF	'LICABLE)
If subject to Title V by "OTHER", specify why:		NSPS OTHER (specify)	☐ NESHAP (MACT)	☐ TITLE IV
If you are or will be subject to any maximum at 112(d) of the Clean Air Act, specify below:	chievable control technology standar EMISSION SOUR		int to section	
EMISSION SOURCE ID	DESCRIPTION			MACT
IES-GN-1, IES-GN-2	Emergency Generator 1 and	2	Subpart ZZZZ	
IES-FWP	One fire water pump (300 brake	e horsepower)	Subpart ZZZZ	
List any additional regulation which are reques the shield should be granted: **REGULATION**	EMISSION SOURCE (Ir			EXPLANATION
Comments:				

FORM E2

EMISSION SOURCE APPLICABLE REGULATION LISTING

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate										
EMISSION	EMISSION	OPERATING SCENARIO								
SOURCE		INDICATE PRIMARY (P)		APPLICABLE						
ID NO.	DESCRIPTION	OR ALTERNATIVE (A)	POLLUTANT	REGULATION						
ES 1	Coal/Wood Boiler	P - Coal	PM	NCAC 2D .0503						
		A - Wood	PM	NCAC 2D .0504						
See attached table following Form E3 for a summary of regulatory requirements and associated compliance requirements										

FORM E3

EMISSION SOURCE COMPLIANCE METHOD

E3 REVISED 09/22/16 NCDEQ/Division Of Air Quality - Application for Air Permit to Construct/Operate Regulated Pollutant Emission Source ID NO. Applicable Regulation Alternative Operating Scenario (AOS) NO: ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS MONITORING REQUIREMENTS Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? YES NO NO Describe Monitoring Device Type: Describe Monitoring Location: Other Monitoring Methods (Describe In Detail): CAM applicability and, if applicable, submission of CAM plans, will be addressed as part of future Title V operating permit applications. Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average): RECORDKEEPING REQUIREMENTS Data (Parameter) being recording: Frequency of recordkeeping (How often is data recorded?): **REPORTING REQUIREMENTS** Generally describe what is being reported: Frequency: MONTHLY QUARTERLY EVERY 6 MONTHS OTHER (DESCRIBE): **TESTING** Specify proposed reference test method: Specify reference test method rule and citation: Specify testing frequency: NOTE - Proposed test method subject to approval and possible change during the test protocol process

Summary of Regulatory Requirements and Associated Compliance Requirements Enviva Pellets Northampton, LLC

Emission Source Description	ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordkeeping	Reporting
		PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515				
Wood-fired Dryers & Green Wood Hammermills ES-DRYER-1, ES-1 2 & ES-GHM-1 GHM-5		SO ₂	15A NCAC 02D .0516	RTO	None required because inherently low sulfur content of wood fuel achieves compliance.		
		Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non-compliant observation and actions taken to correct, and results of corrective action.	N/A
Dry Hammermills E	ES-HM-1 to ES-HM-8	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	RCO			
		Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non-compliant observation and actions taken to correct, and results of corrective action.	N/A
Pellet Mill Feed Silo	ES-PMFS	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	Paghausa	Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
		Opacity	Baghouse 15A NCAC 02D .0521	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non-compliant observation and actions taken to correct, and results of corrective action.	N/A	

Summary of Regulatory Requirements and Associated Compliance Requirements Enviva Pellets Northampton, LLC

Emission Source Description	ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordkeeping	Reporting
	ES-FPH,	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515		Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
Finished Product Handling ES-PB-1 to ES-PB-1 ES-PL-2		Opacity	15A NCAC 02D .0521	Dagnouse	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each noncompliant observation and actions taken to correct, and results of corrective action.	N/A
Pellet Coolers	ES-CLR-1 to ES-CLR-6	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	RCO			
		Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each noncompliant observation and actions taken to correct, and results of corrective action.	N/A
Pellet Cooler HP Fines Relay System	ES-PCHP	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	– Baghouse	Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
		Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each noncompliant observation and actions taken to correct, and results of corrective action.	N/A
Dried Wood Handling	ES-DWH-1 and 2	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	Baghouses	Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
bried wood Hariding	L3-DWH-1 aliu 2	Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non-compliant observation and actions taken to correct, and results of corrective action.	N/A
	IES-ADD	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515		Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
Additive Handling and Storage		Opacity	Baghouse 15A NCAC 02D .0521	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each noncompliant observation and actions taken to correct, and results of corrective action.	N/A	

Summary of Regulatory Requirements and Associated Compliance Requirements Enviva Pellets Northampton, LLC

Emission Source Description	ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordkeeping	Reporting
		PM, CO, NO _X , NMHC, SO ₂	40 CFR Part 60 Subpart IIII	N/A	All requirement are outlined in the regulation, including the following: use certified emergency engines, operate according to manufacturers procedures, use fuel oil with fuel content of no more than 15 ppmw sulfur and cetane index of at least 40, install non-resettable hour meter.	Maintain records of engine certification, fuel certifications and hours/year of operation of each engine.	N/A
Emergency Generator	IES-GN-1 and IES-GN-2	SO ₂	15A NCAC 02D .0516	N/A	Non required because inherently low sulfur content of fuel achieves compliance.		
		Opacity	15A NCAC 02D .0521	N/A	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non-compliant observation and actions taken to correct, and results of corrective action.	N/A
		HAPs	40 CFR Part 63 Subpart ZZZZ	N/A	Comply with the NSPS requirements. No other requirements apply.	Comply with the NSPS requirements. No other requirements apply.	N/A
		PM, CO, NO _x , NMHC, SO ₂	40 CFR Part 60 Subpart IIII	N/A	All requirement are outlined in the regulation, including the following: use certified emergency engines, operate according to manufacturers procedures, use fuel oil with fuel content of no more than 15 ppmw sulfur and cetane index of at least 40, install non-resettable hour meter.	Maintain records of engine certification, fuel certifications and hours/year of operation of each engine.	N/A
Fire Water Pump	IES-FWP	SO ₂	15A NCAC 02D .0516	N/A	Non required because inherently low sulfur content of fuel achieves compliance.		
		Opacity	15A NCAC 02D .0521	N/A	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each noncompliant observation and actions taken to correct, and results of corrective action.	N/A
		HAPs	40 CFR Part 63 Subpart ZZZZ	N/A	Comply with the NSPS requirements. No other requirements apply.	Comply with the NSPS requirements. No other requirements apply.	N/A

FORM E4 EMISSION SOURCE COMPLIANCE SCHEDULE

REVISED 09/22/16

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

ı	= 1	
I	=4	

	COMPL	IANCE STATUS I	WITH RESPECT TO ALL APPLICABLE REQU	<u> UIREMENTS</u>
Will each emiss comply with the			npliance with all applicable requirements at the time of per	rmit issuance and continue to
	✓ YES	□ NO	If NO , complete A through F below for each requirer compliance is not achieved.	ment for which
		ompliance with all s on a timely basi	applicable requirements taking effect during the	ne term of the permit and
	✓ YES	☐ NO	If NO , complete A through F below for each requirer compliance is not achieved.	ment for which
If this applicatio requirements?	n is for a mod	dification of existing er	missions source(s), is each emission source currently in co	ompliance with all applicable
	✓ YES	□ NO	If NO, complete A through F below for each requirer compliance is not achieved.	ment for which
A.	Emission So	ource Description (Incl	lude ID NO.)	
В.	Identify appl	icable requirement for	which compliance is not achieved:	
C.	Narrative de	scription of how comp	pliance will be achieved with this applicable requirements:	
D.		nedule of Compliance:		Data Expected
	Step(s)			<u>Date Expected</u>
E.	Frequency f	or submittal of progres	ss reports (6 month minimum):	
F.	Starting date	e of submittal of progre	ess reports:	

FORM E5

TITLE V COMPLIANCE CERTIFICATION (Required)

E5 REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate In accordance with the provisions of Title 15A NCAC 2Q .0520 and .0515(b)(4) the responsible company official of: SITE NAME: **Enviva Pellets Northampton, LLC** SITE ADDRESS: 309 Enviva Blvd. CITY, NC: **Garysburg NC** COUNTY: Northampton **PERMIT NUMBER :** 10203R05 CERTIFIES THAT (Check the appropriate statement(s): The facility is in compliance with all applicable requirements In accordance with the provisions of Title 15A NCAC 2Q .0515(b)(4) the responsible company official certifies that the proposed minor modification meets the criteria for using the procedures set out in 2Q .0515 and requests that these procedures be used to process the permit application. The facility is not currently in compliance with all applicable requirements If this box is checked, you must also complete Form E4 "Emission Source Compliance Schedule" The undersigned certifies under the penalty of law, that all information and statements provided in the application, based on information and belief formed after reasonable inquiry, are true, accurate, and complete. 3/22/19 Signature of responsible company official (REQUIRED, USE BLUE INK) Royal Smith, Executive Vice President Operations Name, Title of responsible company official (Type or print)

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ıct/Operate		В
EMISSION SOURCE				EMISSION S	SOURCE ID I	NO:	IES-Bark	
Bark Hog				CONTROL	DEVICE ID N	O(S): None		
OPERATING SCENARIO 1	OF	1				CK) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION S	OURCE PRO	CESS (ATTAC	H FLOW DIA		,	, -()	<u>'</u>	
Bark from the Debarker and purchased		•		•	ARK) via con	veyor for furt	her processin	ıg.
TYPE OF EMISSION SOUR	CE (CHECK A	ND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON T	HE FOLLOW	ING PAGES)	:
Coal,wood,oil, gas, other burner (Forr	•		rking (Form E			. of chemicals		
Int.combustion engine/generator (For	,		inishing/printi	•		ration (Form B	-	(,
Liquid storage tanks (Form B3)		_	Storage silos/bins (Form B6)					
START CONSTRUCTION DATE:			•	JFACTURED		,		
MANUFACTURER / MODEL NO.:								
			EXPECTED	OP. SCHED	JLE: <u>24</u> H	IR/DAY _ <u>7</u> _	_ DAY/WK _	_ <u>52</u> _ WK/YF
IS THIS SOURCE SUBJECT T(UN	SPS (SUBPAR	RTS?):		_ L NESH	HAP (SUBPA	RTS?):		
PERCENTAGE ANNUAL THROUGHPUT	(%): DEC-FE	B 25 %	MAR-MAY 2	5% JUN-Al	JG 25%	SEP-NOV 25	%	
CRITERIA AI	R POLLUTA	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IIS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	к С			
PARTICULATE MATTER<10 MICRONS (P	M ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (F	PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	DC)							
LEAD	,							
OTHER								
HAZARDOUS	AIR POLLU	TANT EMIS	SSIONS IN	IFORMAT	ION FOR	THIS SOUP	RCE	
		SOURCE OF				POTENTIAL EMISSIONS		
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
			n Calculation		k C	,,	·	.,
				_ ··				
TOXIC AIR	POLLUTAN	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF				AFTER CON		TATIONS
		EMISSION	EXPECT	ED ACTUAL	LIVIIOOIONO	AFTER CON	INOLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb	/day	lb	/yr
		See Emission	n Calculation	s in Appendix	k C			
Attachments: (1) emissions calculations and su								
emission rates) and describe how these are me	onitored and with	what frequency	r; and (3) descr	ibe any monito	ring devices, ga	auges, or test po	orts for this sour	rce.

EMISSION SOURCE (OTHER)

EMISSION SOURCE ID NO: CONTROL DEVICE ID NO(S EMISSION POINT (STACK) I): None D NO(S): N/A
EMISSION POINT (STACK)	D NO(S): N/A
e Bark Hog (IES-BARK) via conve	yor for further processing.
MAY DESIGN	REQUESTED CAPACITY
	LIMITATION(UNIT/HR)
r 234,377	N/A
MAX. DESIGN	REQUESTED CAPACITY
	LIMITATION (UNIT/BATCH
	- (
	<u> </u>
S/VR)·	
	UDTI/UD). N/A
·	
TED CAPACITY ANNUAL FUEL	USE: N/A
	MAX. DESIGN CAPACITY (UNIT/HR) 234,377 MAX. DESIGN CAPACITY (UNIT/BATCH) CAPACITY (UNIT/BATCH) ES/YR): MAX. DESIGN CAPACITY (UNIT/BATCH) MAX. DESIGN CAPACITY (UNIT/BATCH) MAX. DESIGN CAPACITY (UNIT/BATCH) ES/YR): MAX. DESIGN CAPACITY (UNIT/BATCH)

REVISED 09/22/16 NC	DEQ/Division of	f Air Quality	- Application	n for Air Pern	nit to Constr	uct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	10:	IES-Debark	
Debarker				CONTROL [DEVICE ID NO	O(S): None		
OPERATING SCENARIO 1	OF	1				K) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION	SOURCE PROC	ESS (ATTAC	H FLOW DIA		,	, , ,	· ·	
Logs will be debarked by the electric-p	owered rotary d	rum Debarke	er (IES-DEBA	RK).				
TYPE OF EMISSION SOL	JRCE (CHECK A	ND COMPLE	TE APPROP	RIATE FORM	/I B1-B9 ON T	THE FOLLOW	VING PAGES):	
Coal,wood,oil, gas, other burner (Fo	rm B1)	Woodwo	rking (Form E	34)	Manuf.	of chemicals/	/coatings/inks (Form B7)
Int.combustion engine/generator (Fo	orm B2)	Coating/f	inishing/print	ing (Form B5)	Inciner	ation (Form B	8)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo	rm B6)	√ Other ((Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED	•			
MANUFACTURER / MODEL NO.:								
			EXPECTED			IR/DAY <u>7</u>	DAY/WK	<u>52</u> _ WK/YR
	NSPS (SUBPAR		 	-	HAP (SUBPAF	,		
PERCENTAGE ANNUAL THROUGHPU	, ,			5% JUN-AL		SEP-NOV 25		
CRITERIA	AIR POLLUT			-ORMATIC	N FOR II	HIS SOUR)E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIA	L EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTR	OLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendiz	k C			
PARTICULATE MATTER<10 MICRONS (
PARTICULATE MATTER<2.5 MICRONS	(PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (\	/OC)							
LEAD								
OTHER					1011 500	T		<u></u>
HAZARDOUS	S AIR POLLU				ION FOR			
		SOURCE OF					L EMISSIONS	
		EMISSION	_`	ROLS / LIMITS)	`	TROLS / LIMITS)	(AFTER CONTR	1 .
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix	K C			
								-
	+							
TOYIC AL	R POLLUTA	NT FMISSI	ONS INFO	PMATION	I FOR THI	S SOURCE	=	
TOXIC AII	I	JUUNUL	ONS IN C	INNIA I ION	I I OK IIII	3 300NCL		
		OF	EXPEC	TED ACTUAL	EMISSIONS	AFTER CON	ITROLS / LIMIT	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	Ih	/hr	lb/	day	lb/	vr
TOXIO AIRT GELOTARI	OAO ITO.			s in Appendix		auy	157	y ,
		See Emission		з потррении				
	1							
	1							
					1			
Attachments: (1) emissions calculations and	supporting docume	entation: (2) indi	cate all reques	ted state and fe	ederal enforcea	ble permit limits	(e.g. hours of or	peration.
emission rates) and describe how these are r								

EMISSION SOURCE (OTHER)

OPERATING SCENARIO:1 OF1 DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):		S): None
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Logs will be debarked by the electric-powered rotary drum Debarker (IES-I MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS	EMISSION POINT (STACK)	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Logs will be debarked by the electric-powered rotary drum Debarker (IES-I MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS	DEBARK).	ID NO(S): N/A
Logs will be debarked by the electric-powered rotary drum Debarker (IES-I MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		
	MAX. DESIGN	REQUESTED CAPACITY
		LIMITATION(UNIT/HR)
Dried Wood Materials ODT/y		N/A
Differ wood Materials OD1/3	701,233	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): (BATCH	ES/YR):	
	MAXIMUM FIRING RATE (MILLIO	N BTU/HR): N/A
	STED CAPACITY ANNUAL FUEL	
COMMENTS:		

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ıct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID N IES-EPWC				
Electric Powered Green Wood Chipper				CONTROL I	DEVICE ID N	O(S): None		
OPERATING SCENARIO1	OF _	1_		EMISSION F	POINT (STAC	CK) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION S	SOURCE PROC	CESS (ATTAC	H FLOW DIA	AGRAM):	•			
Logs are debarked and sent to an electr	ic powered gre	en wood chip	per.					
TYPE OF EMISSION SOUR	•						-	
Coal,wood,oil, gas, other burner (For	,		rking (Form E	,		. of chemicals	•	(Form B7)
Int.combustion engine/generator (For	m B2)		٠.	ing (Form B5)		ration (Form B	88)	
Liquid storage tanks (Form B3) START CONSTRUCTION DATE: 2013		Storage	silos/bins (Fo	rm 66) JFACTURED		(Form B9)		
START CONSTRUCTION DATE. 2013			DATE MAIN	JEACTONED	•			
MANUFACTURER / MODEL NO.:								
CEM 112" 15KN SUS Pellet Process			EXPECTED	OP. SCHEDI	JLE: 24 +	HR/DAY _7_	DAY/WK	<u>52</u> WK/YF
	ISPS (SUBPAF	RTS?):			IAP (SUBPA			
PERCENTAGE ANNUAL THROUGHPU	•		MAR-MAY 2	- :5% JUN-Al	•	SEP-NOV 25	%	
CRITERIA AI			SIONS INF	ORMATIO	N FOR TH	IIS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	,
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	c C			
PARTICULATE MATTER<10 MICRONS (F	PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (F	PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	OC)							
LEAD								
OTHER HAZARDOUS	AID DOLLU	TANTERN	CCIONC IN	IFORMAT	ON FOR	TUIC COLU	205	
HAZARDOUS	AIR PULLU		_		UN FUR			
		SOURCE OF EMISSION		D ACTUAL	(DEEODE 001)		EMISSIONS	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	Ib/hr	tons/yr	(BEFORE CON	TROLS / LIMITS)	Ib/hr	ROLS / LIMITS)
HAZARDOUS AIR FOLLUTANT	CAS NO.		1	s in Appendix		tons/yr	ID/III	tons/yr
		See Ellission		з ні Арренціл	I			
				1				
TOXIC AIR	POLLUTAI	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF	FXPECT	FD ACTUAL	FMISSIONS	AFTER CON	TROLS / LIMI	TATIONS
		EMISSION		LD 7101071E	1	711 1211 0011	1110207 2	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		/day	lb)/yr
		See Emission	n Calculation	s in Appendix	C C			
		1	-					
			<u> </u>		1		1	
			-					
					<u> </u>		<u>.</u>	
Attachments: (1) emissions calculations and s emission rates) and describe how these are m								

EMISSION SOURCE (OTHER)

EMISSION SOURCE ID NO: CONTROL DEVICE ID NO(S) EMISSION POINT (STACK) I MAX. DESIGN CAPACITY (UNIT/HR)): None
EMISSION POINT (STACK) I	D NO(S): N/A
MAX. DESIGN	
	REQUESTED CAPACITY
	REQUESTED CAPACITY
	LIMITATION(UNIT/HR)
781,255	N/A
701,233	N/A
	REQUESTED CAPACITY
CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)
(D) .	
	LDTIMUD) receive
D CAPACITY ANNUAL FUEL (USE: N/A
	MAX. DESIGN CAPACITY (UNIT/BATCH) (R): IMUM FIRING RATE (MILLION D CAPACITY ANNUAL FUEL

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ıct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID N ES-GWHS				
Green Wood Handling and Storage				CONTROL I	DEVICE ID N	O(S): None		
OPERATING SCENARIO 1	OF	1				CK) ID NO(S):	EP-23	
DESCRIBE IN DETAILTHE EMISSION S	OURCE PRO	CESS (ATTAC	H FLOW DIA		,	, , ,		
Green wood is delivered to the plant via		•		•	from comme	ercial harvesti	ng for on-site	e chipping.
All transfer points and storage piles are	captured by th	ie Green Woo	d Handling a	nd Storage en	nission ID (E	S-GWHS).		
TYPE OF EMISSION SOUR	CE (CHECK A	ND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON T	HE FOLLOW	ING PAGES)	:
Coal,wood,oil, gas, other burner (Form	•		rking (Form E			. of chemicals	•	
Int.combustion engine/generator (For	,			ing (Form B5)		ration (Form B	Ū	,
Liquid storage tanks (Form B3)	,		silos/bins (Fo	O (,		(Form B9)	-,	
START CONSTRUCTION DATE:				JFACTURED		, ,		
MANUFACTURER / MODEL NO.:								
			EXPECTED	OP. SCHEDI	JLE: <u>24</u>	IR/DAY _7_	DAY/WK	<u>52</u> WK/YF
IS THIS SOURCE SUBJECT T(N	ISPS (SUBPAF	RTS?):	•	_ NESH	HAP (SUBPA	RTS?):		
PERCENTAGE ANNUAL THROUGHPU	Γ (%): DEC-FE	B 25%	MAR-MAY 2	5% JUN-AU	JG 25%	SEP-NOV 25	%	
CRITERIA AI			SIONS INF	ORMATIO	N FOR TH	IIS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	k C	,		
PARTICULATE MATTER<10 MICRONS (P	M ₁₀)			FF				
PARTICULATE MATTER<2.5 MICRONS (F	107							
SULFUR DIOXIDE (SO2)	2.07							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	OC)							
LEAD								
OTHER								
HAZARDOUS	AIR POLLU	TANT EMI	SSIONS IN	IFORMATI	ION FOR	THIS SOUP	RCE	
		SOURCE OF		D ACTUAL			EMISSIONS	,
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
			n Calculation	s in Appendix	x C			
			1		1			
TOXIC AIR	POLLUTAI	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
7 9 10 7 111		T JOUNGE						
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	Ib	/hr	lb	/day	Ib)/yr
				s in Appendix		,		· ,
				FF				
	<u> </u>							
	<u> </u>							
	+		1					
		1	<u> </u>					
	1		1					
Attachments: (1) emissions calculations and si	inporting docume	entation: (2) indi	icate all regues	ted state and fe	ederal enforces	hle nermit limite	(e a hours of	oneration
emission rates) and describe how these are m								

EMISSION SOURCE (OTHER)

REVISED 09/22/16 NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	ES-GWHS	
Green Wood Handling and Storage	•	CONTROL DEVICE ID NO(S)	: None	
OPERATING SCENARIO:1 OF1	_	EMISSION POINT (STACK) I	D NO(S): EP-23	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM				
Green wood is delivered to the plant via trucks as either pre-chipp All transfer points and storage piles are captured by the Green Wo				-site chipping.
An transfer points and storage piles are captured by the dreen wo	ou manuming a	and Storage emission id (ES-0	W113j.	
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	_	MAX. DESIGN	REQUESTED	
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION((UNII/HR)
Dried Wood Materials	ODT/yr	781,255	N/A	
MATERIALS ENTERING PROCESS - BATCH OPERAT	ION	MAX. DESIGN	REQUESTED	CADACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	
TIFE	UNITS	CAPACITI (UNIT/BATCIT)	LIMITATION (O	NII/BATCII)
MAXIMUM DESIGN (BATCHES / HOUR):	•		•	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/Y	/R)·		
FUEL USED: N/A		IMUM FIRING RATE (MILLION	JRTII/HP): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		CAPACITY ANNUAL FUEL I		
COMMENTS:	INLQUEUTE	O OAI AOITT AINTOALT OLL (JOL. N/A	

REVISED 09/22/16 NCE	EQ/Division	of Air Quality	- Application	n for Air Pern	nit to Cons	truct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID N IES-GWFB				
Green Wood Fuel Bin				CONTROL D	DEVICE ID N	IO(S): None		
OPERATING SCENARIO 1	OF	1				CK) ID NO(S): N	/A	
DESCRIBE IN DETAILTHE EMISSION S	OURCE PROC	ESS (ATTAC	H FLOW DIA		,	, , , ,		
Following storage in the raw wood storage	ge piles, the ba	ırk will be tra	nsferred via	a walking flo	or to a cove	red conveyor, the	en to a fully er	ıclosed
Green Wood Fuel Bin (ES-GWFB).								
TYPE OF EMISSION SOUR	CE (CHECK	AND COMPLI	ETE APPROF	PRIATE FOR	M B1-B9 ON	THE FOLLOW	NG PAGES):	
Coal,wood,oil, gas, other burner (Form	B1)	Woodwo	rking (Form E	34)	Manu	f. of chemicals/co	oatings/inks (F	orm B7)
Int.combustion engine/generator (Form		Coating/f	inishing/printi	ing (Form B5) Incineration (Form B8)			•	,
Liquid storage tanks (Form B3)	,	_	silos/bins (Fo		_	(Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED:				
MANUFACTURER / MODEL NO.:								
			EXPECTED	OP. SCHEDU	JLE: <u>24</u>	HR/DAY <u>7</u>	DAY/WK5	<u>52</u> _ WK/YR
IS THIS SOURCE SUBJECT T(N	SPS (SUBPAR	TS?):		_ NESH	IAP (SUBPA	ARTS?):		
PERCENTAGE ANNUAL THROUGHPUT	(%): DEC-FE	B 25 % I	MAR-MAY 2	5% JUN-AL	JG 25 %	SEP-NOV 25%		
CRITERIA A	R POLLUT	ANT EMIS	SIONS IN	FORMATIC	ON FOR T	THIS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE C	ONTROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	C C			
PARTICULATE MATTER<10 MICRONS (PM	1 ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (P	M _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD								
OTHER								
HAZARDOUS	AIR POLLU	JTANT EM	ISSIONS I	NFORMA1	TION FOR	THIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL	POTENTIAL EMISSION		EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE C	ONTROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix	C			
TOXIC AIR	POLLUTA	NT EMISS	IONS INFO	ORMATION	FOR TH	IIS SOURCE		
		OF						ATIONIO
		EMISSION	EXPEC	, TED ACTUAL	L EMISSION	IS AFTER CONT	ROLS / LIMIT	ATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr		lb/day	lb	/yr
		See Emission	n Calculation	s in Appendix	c C			
Attachments: (1) emissions calculations and su	oporting docume	entation; (2) indi	cate all reques	ted state and fe	deral enforce	able permit limits (e	e.g. hours of ope	eration,
emission rates) and describe how these are mo								

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Div	ision of Air Q	uality - Ap	plication	n for Air Permit to	o Construct/Operate	В6
EMISSION SOURCE DESCR	IPTION:				EMISSION	SOURCE ID NO: IES-GWFB	
Green Wood Fuel Bin					CONTROL	L DEVICE ID NO(S): None	
OPERATING SCENARIO:		<u>1</u> OF	1		_ EMISSION	N POINT(STACK) ID NO(S): N/A	
DESCRIBE IN DETAIL THE F Following storage in the raw Green Wood Fuel Bin (IES-GV	wood storage p			ısferred	via a walking floo	or to a covered conveyor, then to a f	ully enclosed
MATERIAL OTORER B					DENOITY OF MA	TEDIAL (LD/ETO), MDD	
MATERIAL STORED: Bark	CUBIC FEET.					TERIAL (LB/FT3): TBD	
CAPACITY DIMENSIONS (FEET)	CUBIC FEET: HEIGHT:	DIAMETI	ED: TDD	(OR)	TONS: LENGTH:	WIDTH: HEIGHT:	
ANNUAL PRODUCT THRO				(0.1)		1 DESIGN CAPACITY:	
PNEUMATICALLY FI			MECHANIC	ALLY F	•	FILLED FROM	
BLOWER		SCREW	CONVEYO)R		RAILCAR	
COMPRESSOR			ONVEYOR			☐ TRUCK	
OTHER:				R		STORAGE PILE	
NO. FILL TUBES:		OTTIER.	OOVER C	onveye	•	LI OTTLEN.	
MAXIMUM ACFM:							
MATERIAL IS UNLOADED TO		ED FROM SIL	0?				
MAXIMUM DESIGN FILLING	RATE OF MATE	ERIAL (TONS/	HR): TBD				
MAXIMUM DESIGN UNLOAD	ING RATE OF I	MATERIAL (TO	ONS/HR): 1	BD			
COMMENTS:							

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1	DEQ/Division	n of Air Qualit	ty - Application	on for Air Permit t	o Construct	Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION SOUF	CE ID NO:	ES-GHM-1	through ES-0	GHM-5
Green Hammermills 1 through 5				DEVICE ID				
ODEDATING COENADIO	0.5			NO(S):		, CD-RTO-1 , C		D-RTO-2
OPERATING SCENARIO 1	OF			EMISSION POIN	I (STACK) ID	NO(S): EP-1,	EP-4	
DESCRIBE IN DETAILTHE EMISSION Green wood chips are processed in the		•		•	am provided	in the permit a	pplication na	arrative.
TYPE OF EMISSION SO	•						•	
Coal,wood,oil, gas, other burner (For	,		rking (Form B	34)	Manut	f. of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (Fo	rm B2)	Coating/f	inishing/printi	ng (Form B5)	_	ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (For		√ Other	(Form B9)		
START CONSTRUCTION DATE:				JFACTURED:				
GHM-1, 2: 2013 GHM 3, 4, 5: TBD			GHM-1, 2: 20	013 GHM 3, 4, 5: T	BD			
MANUFACTURER / MODEL NO.: GHM-1, 2: Williams #490 GHM 3, 4, 5: T	BD		EXPECTED	OP. SCHEDULE:	<u>24</u> HR/DA	AY <u>7</u> DA	Y/WK <u>52</u>	WK/YR
IS THIS SOURCE SUBJECT 📙 NS	SPS (SUBPAR	TS?):		NESHAP (SUBPARTS?	'):		
PERCENTAGE ANNUAL THROUGHPU	` '		MAR-MAY			P-NOV 25%		
CRITERIA	AIR POLL	UTANT EM	IISSIONS I	NFORMATION	I FOR THI	S SOURCE		
		SOURCE OF	EXPEC	TED ACTUAL		POTENTIAL	EMISSIONS	
	EMIS			ONTROLS / LIMITS)	(BEFORE CO	NTROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculations	in Appendix C				
PARTICULATE MATTER<10 MICRONS (I	PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS ((PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (V	OC)							
LEAD								
OTHER								
HAZARDOU	IS AIR POL	LUTANT E	MISSIONS	SINFORMATIC	N FOR TH	HIS SOURC	E	
		SOURCE OF	EXPEC	TED ACTUAL	POTENTIAL EMISSIONS			
		EMISSION	(AFTER CO	ONTROLS / LIMITS)	(BEFORE CO	NTROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	1 Calculations	in Appendix C				
TOXIC A	IR POLLU	TANT EMIS	SSIONS IN	FORMATION F	OR THIS	SOURCE		
		OF EMISSION	EXPE	CTED ACTUAL EI	MISSIONS AI	TER CONTRO	OLS / LIMITA	TIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		lb/hr	Ib	/day	lb	o/yr
		See Emission	1 Calculations	in Appendix C		-		
Attachments: (1) emissions calculations and si	upporting docum	entation; (2) ind	licate all reques	ted state and federal	enforceable pe	rmit limits (e.g. h	ours of operatio	n, 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.

EMISSION SOURCE (OTHER)

REVISED 09/22/16		f Air Quality - Application	n for Air Permit to Construct/Ope	erate	В9
EMISSION SOURCE DESCRIF	PTION:		EMISSION SOURCE ID NO: ES-0	GHM-1, 2, 3, 4, 5	
Green Hammermills 1 through	5		CONTROL		
			DEVICE ID	0.4	
OPERATING SCENARIO:	OF	1	NO(S): CD-WESP-1, CD-RTC		
DESCRIBE IN DETAIL THE PR			EMISSION POINT (STACK) ID N	O(5). EP-1	
Green wood chips are processe	ed in the Green Wood Ha	mmermills. The Green W	ood Hammermills will also have th	ne ability to be routed a	nd controlled by
the CD-WESP-2 and CD-RTO-	2 when the CD-WESP-1 a	and CD-RTO-2 are shutdo	wn.		
MATERIAI S ENTERIN	IG PROCESS - CONTINU	IOUS PROCESS	MAX. DESIGN	REQUESTED	CAPACITY
	TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION	
	111.2				(ORTITION)
Green Wood		ODT/hr	150	N/A	
MATERIALS ENTER	ING PROCESS - BATCI	H OPERATION	MAX. DESIGN	REQUESTED	CAPACITY
	TYPE		CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)	
		UNITS	,		,
				+	
				_	
MAXIMUM DESIGN (BATCHES	S / HOUR):				-
REQUESTED LIMITATION (BA	TCHES / HOUR):	(BATCHES/Y	'R):		
FUEL USED: N/A		TOTAL MAXI	MUM FIRING RATE (MILLION BT	TU/HR): N/A	
MAX. CAPACITY HOURLY FU	EL USE: N/A		CAPACITY ANNUAL FUEL USE		
COMMENTS:		1			
I					

REVISED 09/22/16 NCD	EQ/Division	of Air Quality	· - Applicatio	n for Air Permit	to Construct	/Operate		l B
EMISSION SOURCE DESCRIPTION:				EMISSION SOL				
				CONTROL				
Green Wood Direct-Fired Dryer System	(Dryer #1)			DEVICE ID				
				NO(S):	CD-WESP-	1, CD-RTO-1		
OPERATING SCENARIO 1	OF	1		EMISSION POIL	NT (STACK) I	D NO(S): EP-	1	
DESCRIBE IN DETAILTHE EMISSION S	SOURCE PRO	CESS (ATTA	CH FLOW D		, ,			
Green wood is conveyed to a rotary dryo		•			via a 175.3 M	IMBtu/hr bur	ner system.	Air
emissions will be controlled utilizing a								
controlled by a regenerative thermal ox				ne dryer (ES-DRY	ERBYP-1) an	d furnace (ES	-FURNACEBY	(P-1) will be
used to exhaust hot gases during startu	p, shutdown, a	and malfunct	ions.					
TYPE OF EMISSION SOU	RCE (CHECK	AND COMPL	ETE APPRO	PRIATE FORM	B1-B9 ON TH	IE FOLLOWI	NG PAGES):	
Coal,wood,oil, gas, other burner (For	m B1)	Woodwo	rking (Form E	34)	Manuf.	of chemicals	/coatings/inks	(Form B7)
Int.combustion engine/generator (For		Coating/f	finishing/printi	ing (Form B5)	Inciner	ation (Form B	8)	
Liquid storage tanks (Form B3)	,		silos/bins (Fo	• ,		(Form B9)	,	
START CONSTRUCTION DATE:			DATE MANU	JFACTURED:		·		
2012			2012					
MANUFACTURER / MODEL NO.:								
Buettner 5x26R			EXPECTED	OP. SCHEDULE	: 24 HR/E	DAY 7 D	0AY/WK <u>5</u>	2 WK/YR
IS THIS SOURCE SUBJECT NS	SPS (SUBPAR	(TS?):	•	NESHAF	(SUBPARTS	S?):		
PERCENTAGE ANNUAL THROUGHPUT	Γ (%): DEC-FI	EB 25 %	MAR-MAY	25% JUN-AUG	`	P-NOV 25%		
	` '			IFORMATION				
		SOURCE OF		ED ACTUAL	l	POTENTIAL		
		EMISSION		TROLS / LIMITS)	(DEFORE CON	TROLS / LIMITS)	(AFTER CONT	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	Ib/hr	·
		ł			ID/TII	toris/yi	ID/III	tons/yr
PARTICULATE MATTER (PM)		See Emission	i Calculation	s in Appendix C				
PARTICULATE MATTER 10 F MICRONS (P	.07							
PARTICULATE MATTER<2.5 MICRONS (F	2IVI _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	OC)							
LEAD								
OTHER		<u> </u>						<u></u>
HAZARDOUS	AIR POLL		_		ON FOR II			
		SOURCE OF	EXPECT	ED ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	`	TROLS / LIMITS)	,	TROLS / LIMITS)	•	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix C				
								1
TOXIC AIR	RPOLLUTA	ANT EMISS	SIONS INF	ORMATION I	FOR THIS	SOURCE		
	T	- SUURVEE	l					
		OF EMISSION	EXPEC	CTED ACTUAL E	MISSIONS A	FTER CONTR	ROLS / LIMITA	ATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		lb/hr	lb/	day	lh	/yr
TOXIO AIRT GLEGIAITI	CAO NO.	!		s in Appendix C	157	day	10	yı
		See Emission	Carculation	s in Appendix C				
	1							
	+							
	1							
	1							
	1							
Attachments: (1) emissions calculations and su								ation, emission
rates) and describe how these are monitored a	nu with what free	quency; and (3)	uescribe any n	ionitoring devices, (gauges, or test	ports for this so	urce.	

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

REVISED 09/22/16	NCDEQ/Division of A	ir Quality - Ap	oplication for Air F	ermit to Constru	ct/Operate	B1
EMISSION SOURCE DESCRIPTI	ION:		EMISS	SION SOURCE ID	NO: ES-DRYER-1	
Green Wood Direct-Fired Dryer S	System (Dryer #1)		CONT	ROL DEVICE ID N	NO(S): CD-WESP-1,	CD-RTO-1
OPERATING SCENARIO:	<u>1</u> OF	1	EMISS	SION POINT (STA	CK) ID NO(S): EP-1	
DESCRIBE USE: PROCE	SS HEAT	SPACE HEAT	•	ELECTRICAL GE	ENERATION	
CONTIN	NUOUS USE	STAND BY/EN	MERGENCY [OTHER (DESCR	RIBE):	
HEATING MECHANISM:	INDIRECT	✓	DIRECT			
MAX. FIRING RATE (MMBTU/HO	DUR): 175.3					
		WOOD-	FIRED BURNE	R		
WOOD TYPE: BARK	☐ WOOD/BARK	✓ WET WO		RY WOOD	OTHER (DES	CRIBE):
PERCENT MOISTURE OF FUEL:	<u>~50%</u>					
	CONTROLLE	D WITH FLYA	ASH REINJECTION	√	CONTROLLED W/O R	EINJECTION
FUEL FEED METHOD: N/A		HEAT TRANSF	ER MEDIA:	STEAM 🗹 AIR	OTHER (DESCRI	BE)
		COAL-F	FIRED BURNER	र		
TYPE OF BOILER	IF OTHER DESCR	RIBE:				
PULVERIZED OVERFEED STOR	KER UNDERFEED	STOKER	SPREADER	RSTOKER	FLUIDIZED BED	
□ WET BED □ UNCONTROLLED □ UNCONTROLLED □ UNCONTROLLED □ CIRCULATING						
□ DRY BED □ CONTROLLED □ CONTROLLED □ FLYASH REINJECTION □ RECIRCULATING						1G
☐ NO FLYASH REINJECTION						
		OIL/GAS	-FIRED BURNE	R		
TYPE OF BOILER:	UTILITY INDU	STRIAL	COMMERCIA	L	INSTITUTIONAL	
TYPE OF FIRING:	NORMAL TANG	ENTIAL	LOW NOX BU	JRNERS	NO LOW NOX BURNE	£R
		OTHER FU	EL-FIRED BUR	NER		
TYPE(S) OF FUEL:			_	_		
TYPE OF BOILER:	UTILITY INDU	STRIAL	COMMERCIA	L	INSTITUTIONAL	
TYPE OF FIRING:		CONTROL(S)		A OLCUP FUEL	2)	
	FUEL USAG	E (INCLUL	E STARTUP/B		,	D. CARACITY
FUEL TYPE	LINUTO		MAXIMUM DESIG			D CAPACITY
FUEL TYPE	UNITS		CAPACITY (UNIT/	TK)	LIMITATIO	N (UNIT/HR)
FI	UEL CHARACTERIS	STICS (CO	MDIETE ALL T	THAT ARE AD	DI ICARI E)	
	OLL CHARACTERS	-	PECIFIC	SULFUR CONT	i	I CONTENT
FUEL TYP	F		CONTENT	(% BY WEIGH		BY WEIGHT)
Bark/Wet W			4,200 BTU/lb	0.011	(11)	
Daik/ Wet W	000	Nomina	14,200 B10/10	0.011		
COMMENTS:				Ļ	I	

FORM C2

CONTROL DEVICE (Electrostatic Precipitator)

REVISED 09/22/16	NCDEQ/Division	on of Air Quality - Applic	cation for Air Permit to Co	onstruct/Ope	rate			C2		
CONTROL DEVICE ID NO: (CD-WESP-1		CONTROLS EMISSIONS FR ES-GHM-5	OM WHICH E	MISSION SOU	RCE ID N	IO(S): ES-DRYER	-1, ES-GHM-1 through		
EMISSION POINT (STACK)			POSITION IN SERIES OF	CONTROL:	NO. 1	OF	2 UNITS (E	ES-DRYER-1)		
			POSITION IN SERIES OF	CONTROL:	NO. 1	OF	2 UNITS (E	S-GHM-1 through 5)		
MANUFACTURER: Lundberg	g E-Tube 115719		MODEL NO. Lundberg E-	Tube 11571	9					
	PERATING SCENARIO:		3-							
OPERATING SCENA	ARIO: <u>1</u>	OF <u>1</u>	P.E. SEAL REQUIRED (F	PER 2Q .0112	2)?	YES	☐ NO			
DESCRIBE CONTROL SYST Emissions from the Dryer #1			d by the WESP through a common duct for additional PM, metallic HAP, and HCl removal.							
EQUIPMENT SPECIFICATIO	INS		GAS DISTRIBUTION GRI	IDS:	✓	YES	□ NO			
TYPE:	WET	DRY	✓ SINGLE-ST	AGE		TWO-S	TAGE			
TOTAL COLLECTION PLATE	E AREA (FT ²): 29,904		NO. FIELDS 2	NO. COLLEC	TOR PLATE	S PER	FIELD: 567 tube	es		
COLLECTOR PLATE SIZE (F	T): LENGTH: TBD	WIDTH: TBD	SPACING BETWEEN CC	LLECTOR P	LATES (INC	HES): 1	2" hextube			
TOTAL DISCHARGE ELECTI	RODE LENGTH (FT): 19		GAS VISCOSITY (POISE							
NUMBER OF DISCHARGE E	LECTRODES: 667		NUMBER OF COLLECTION	NG ELECTRO	DE RAPPE	RS: no	ne			
MAXIMUM INLET AIR FLOW	RATE (ACFM): 117,000)	PARTICLE MIGRATION \	VELOCITY (F	T/SEC): 0.2	34				
MINIMUM GAS TREATMENT			BULK PARTICLE DENSI		•					
FIELD STRENGTH (VOLTS)	,	COLLECTING N/A	CORONA POWER (WAT							
ELECTRICAL USAGE (KW/H	IOUR): 141.5	•	•							
CLEANING PROCEDURES:	RAPPING	☐ PLATE VIBI	RATING WASHING		OTHER					
OPERATING PARAME		DROP (IN. H20): MIN		WARNING A		YES	□ NO			
RESISTIVITY OF POLLUTAN		, ,	GAS CONDITIONING:							
INLET GAS TEMPERATURE			OUTLET GAS TEMPERA			,	,			
VOLUME OF GAS HANDLED			INLET MOISTURE PERC	` ,		MAX				
POWER REQUIREME	,	GY MANAGEMENT SYS			NO					
FIELD NO.	NO. OF SETS	CHARGING	EACH TRANSFORME			ACH RE	CTIFIER Kv Ave	/Peak Ma Dc		
1	1		118				83/1265			
1 2	1		118 118				83/1265 83/1265			
2	1	PM		PM _{2.5}						
2 POLLUTANT(S) COLLECTED	1 D:	PM	118	PM _{2.5}						
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION	1 D:		PM ₁₀				83/1265			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSIO CAPTURE EFFICIENCY:	1 D: ON RATE (LB/HR):	PM%	118		%		83/1265			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSIO CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIE	1 D: ON RATE (LB/HR): NCY:	% %	PM ₁₀ %		%		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSIO CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIE CORRESPONDING OVERAL	1 D: ON RATE (LB/HR): NCY: LL EFFICIENCY:		PM ₁₀		% %		83/1265			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSIO CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIEN CORRESPONDING OVERAL EFFICIENCY DETERMINATION	1 ON RATE (LB/HR): NCY: LL EFFICIENCY: ON CODE:	% % %	PM ₁₀		%		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSIO CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIE CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EI	1 O: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR):	% % % See Emission Calculation	PM ₁₀ % % % %		% %		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EI PART	1 ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO	% % % See Emission Calculatio	PM ₁₀		% %		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSIO CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL ENTER SIZE	1 D: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTION WEIGHT %	% % See Emission Calculation N CUMULATIVE	PM ₁₀ % % % %		% %		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EI PART SIZE (MICRONS)	1 ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO	% % % See Emission Calculatio	PM ₁₀ % % % % ms in Appendix C DESCRIBE STARTUP PF	ROCEDURES	% % :: TBD		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EI PART SIZE (MICRONS) 0-1	1 D: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTION WEIGHT %	% % See Emission Calculation N CUMULATIVE	PM ₁₀ % % % %	ROCEDURES	% % :: TBD		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSIO CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIEN CORRESPONDING OVERAL EFFICIENCY DETERMINATIO TOTAL AFTER CONTROL ENT SIZE (MICRONS) 0-1 1-10	1 D: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTION WEIGHT %	% % See Emission Calculation N CUMULATIVE	PM ₁₀ % % % % ms in Appendix C DESCRIBE STARTUP PF	ROCEDURES	% % :: TBD		83/1265 ————————————————————————————————————			
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EI PART SIZE (MICRONS) 0-1 1-10 10-25	1 D: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTION WEIGHT %	% % See Emission Calculation N CUMULATIVE	PM ₁₀ % % % ms in Appendix C DESCRIBE STARTUP PF	ROCEDURES	% :: TBD		83/1265 	DOI SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EMISSION SIZE (MICRONS) 0-1 1-10 10-25 25-50	1 D: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTION WEIGHT %	% % See Emission Calculation N CUMULATIVE	PM ₁₀ % % % % ms in Appendix C DESCRIBE STARTUP PF	ROCEDURES	% :: TBD	UCEDII	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL ENTER (MICRONS) 0-1 1-10 10-25 25-50 50-100	1 D: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTION WEIGHT %	% % See Emission Calculation N CUMULATIVE	PM ₁₀ % % % ms in Appendix C DESCRIBE STARTUP PF	ROCEDURES	% :: TBD	UCED II	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EMISSION SIZE (MICRONS) 0-1 1-10 10-25 25-50	1 O: ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO WEIGHT % OF TOTAL	% % See Emission Calculation N CUMULATIVE %	PM ₁₀ % % % % Ins in Appendix C DESCRIBE STARTUP PR DESCRIBE MAINTENANG DESCRIBE ANY AUXILIA	ROCEDURES	% :: TBD	UCEDII	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL ENTERORY SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100	1 ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO WEIGHT % OF TOTAL	% % % See Emission Calculation N CUMULATIVE % . = 100	PM ₁₀ % % % % The standard of the standard o	ROCEDURES	% :: TBD	UCEDII	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERALE EFFICIENCY DETERMINATION TOTAL AFTER CONTROL ENTER (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100 DESCRIBE ANY MONITORIN	1 ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO WEIGHT % OF TOTAL	% % % See Emission Calculation N CUMULATIVE % . = 100	PM ₁₀ % % % % The standard of the standard o	ROCEDURES	% :: TBD	UCED II	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EN PART SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100 DESCRIBE ANY MONITORIN	1 ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO WEIGHT % OF TOTAL	% % % See Emission Calculation N CUMULATIVE % . = 100	PM ₁₀ % % % % The standard of the standard o	ROCEDURES	% :: TBD	UCED II	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EN PART SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100 DESCRIBE ANY MONITORIN	1 ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO WEIGHT % OF TOTAL	% % % See Emission Calculation N CUMULATIVE % . = 100	PM ₁₀ % % % % The standard of the standard o	ROCEDURES	% :: TBD	UCED II	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERAL EFFICIENCY DETERMINATION TOTAL AFTER CONTROL ENTER (MICRONS) 0-1 1-10 10-25 25-50 50-100	1 ON RATE (LB/HR): NCY: L EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO WEIGHT % OF TOTAL	% % % See Emission Calculation N CUMULATIVE % . = 100	PM ₁₀ % % % % The standard of the standard o	ROCEDURES	% :: TBD	UCED II	83/1265 	ROL SYSTEM		
POLLUTANT(S) COLLECTED BEFORE CONTROL EMISSION CAPTURE EFFICIENCY: CONTROL DEVICE EFFICIENCY CORRESPONDING OVERALE EFFICIENCY DETERMINATION TOTAL AFTER CONTROL EN SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100 DESCRIBE ANY MONITORING COMMENTS:	1 O: ON RATE (LB/HR): NCY: LL EFFICIENCY: ON CODE: MISSION RATE (LB/HR): ICLE SIZE DISTRIBUTIO WEIGHT % OF TOTAL TOTAL	% See Emission Calculation N CUMULATIVE % . = 100 OR TEST PORTS AS AT	PM ₁₀ % % % % The standard of the standard o	CE PROCED	% S: TBD URES: TBD		% % % NTO THE CONTI			

FORM C3

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/10 NCDEQ/DIVISION	i oi Aii Quality - A	phication for Air Peri	iii to Construct/C	perate		<u> </u>
AS REQUIRED BY 15A NCAC 2Q .0112, TI	HIS FORM MUST B	E SEALED BY A PRO	FESSIONAL ENG	SINEER (P.E.) LI	CENSED II	N NORTH CAROLINA.
CONTROL DEVICE ID NO: CD-RTO-1	CONTROLS EMIS	SIONS FROM WHICH	EMISSION SOUR	CE ID NO(S): F	S-DRVFR-1	ES-GHM-1 through ES-GHM-5
EMISSION POINT (STACK) ID NO(S): EP-1	1	IES OF CONTROLS			= <u>2</u>	UNITS (ES-DRYER-1)
, , , ,		IES OF CONTROLS			OF <u>2</u>	UNITS (ES-GHM-1 through 5)
MANUFACTURER: TBD		NO: TBD				
OPERATING SCENARIO:						
1 OF1						
TYPE ☐ AFTERBURNER ✓ REGENERATIVE TH	IERMAL OXIDATIO	N RECUPERAT	IVE THERMAL OX	KIDATION	CATALYTIC	COXIDATION
EXPECTED LIFE OF CATALYST (YRS): TBD	METHOD OF DET	ECTING WHEN CATA			D	
	_	SILICONE	PHOSPHOROUS	COMPOUND		EAVY METAL
	R COMPOUND	OTHER (SPEC			∐ NC	DNE
TYPE OF CATALYST: TBD CATALYST VO	OL (FT°): TBD	VELOCITY THRO	DUGH CATALYST	(FPS): TBD		
SCFM THROUGH CATALYST: TBD DESCRIBE CONTROL SYSTEM, INCLUDING RELATION 1	O OTHER CONTR	OL DEVICES AND SO	LIDCES AND AT		I OF SVST	EM.
POLLUTANT(S) COLLECTED:	voc					
BEFORE CONTROL EMISSION RATE (LB/HR):						<u> </u>
CAPTURE EFFICIENCY:	%		%	%		%
CONTROL DEVICE EFFICIENCY:	97.5 %		%	%		 %
CORRESPONDING OVERALL EFFICIENCY:	%		%	%		 %
EFFICIENCY DETERMINATION CODE:						
TOTAL AFTER CONTROL EMISSION RATE (LB/HR) :	See Emission Calc	ılations in Appendix (_
PRESSURE DROP (IN. H ₂ C MIN MAX TBD	Ol	JTLET TEMPERATUR	E (°F): <u>TBD</u> N	/IN	TBD MA	4X
INLET TEMPERATURE (°F) MIN MAX TBD	RE	ESIDENCE TIME (SEC	ONDS): TBD			
INLET AIR FLOW RATE (ACFM): TBD (SCFM): TBD	CC	OMBUSTION TEMPER	ATURE (°F): TBD			
COMBUSTION CHAMBER VOLUME (FT ³): TBD	IN	LET MOISTURE CON	ΓΕΝΤ (%): TBD			
% EXCESS AIR: TBD	CC	ONCENTRATION (ppm	nv) <u>TBD</u>	INLET _	<u>TBD</u> OL	JTLET
AUXILIARY FUEL USED: Natural Gas	TC	TAL MAXIMUM FIRIN	G RATE (MILLION	N BTU/HR): 32		
DESCRIBE MAINTENANCE PROCEDURES: TBD						
DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED IF N/A	NTO THE CONTRO	L SYSTEM:				
COMMENTS:						

EMISSION SOURCE DESCRIPTION. Green Wood Direct Pired Dyery etystem (Dyery et i Bypass) OPERATING SCENARIO J C	REVISED 09/22/1 NCD	EQ/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
OPERATING SCENARIO	EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	S-DRYERBY	P-1	***************************************
DEFECTION OF THE MISSION POINT (STACK) ID NO(S), EP2 DESCRIBE IN DESCRIBE IN DESCRIBE THE DESCRIBE AND POINT (STACK) ID NO(S), EP2 DESCRIBE IN DESCRIBE THE DESCRIBE AND AGRAMS: Green wood is conveyed to a retary dryer system. Direct contact heat is provided to the system via a 175.3 MMIRLy/th burner system. Air emissions will be controlled utilizing a wet electrostatic precipitator (WRS) for particulate removals. VOR and granic-HAP emissions will be controlled by a regenerative thermal oxidizer (RTO). Bypass stacks following the dryer (Ex-DRYERBYP-1) and furnace (Ex-FURNACEBYP-1) will be used to exhaus the passed suring saturp, shutdown, and malfunctions be used to exhaus the passed suring saturp, shutdown, and malfunctions in passed suring saturp, shutdown, and malfunction in passed suring saturp, shutdown, and malfunction in passed suring saturp, shutdown, and malfunction in passed suring saturp, shutdown on pinelegenerate (Ferm B1) Coalivendinishing pinishing (Ferm B3) Manual of chemicals/coatings/insk (Form B7) Manual of chemicals/coatings/insk (Form	Green Wood Direct-Fired Dryer System	n (Dryer #1 By	pass)		CONTROL I	DEVICE ID NO	O(S): N/A		
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAN); force wood is conveyed to a rotary drop system. Direct contact heat is provided to the system via a 175.3 MMItu/hr burner system. All emissions will be controlled utilizing a wet electrostatic precipitator (WSP) for particulate removal. VOC and organic-IAP emissions will be controlled utilizing a wet electrostatic precipitator (WSP) for particulate removal. VOC and organic-IAP emissions will be used to exhaust hot gases during startup, shutdown, and malfunctions. TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-89 ON THE FOLLOWING PAGES): Coalwood, Jas, Other burner (Form B1)	OPERATING SCENARIO 1	OF	1				` ' '	EP-2	
Green wood is conveyed to a rotary diver system. Direct contact heat is provided to the system via a 175.3 MMRILy/In bruner system. Air emissions will be controlled withing and vet electrostatic precipitator (WES) for particulate removal. VOC and organic-IIAP emissions will be controlled by a regenerative thermal oxidizer (IRTO). Bypass stacks following the driver (Ex-DIRYERBYP-1) and furnace (ES-FURNACRBYP-1) will be used to exhaus the gases during startup, shutdown, and malfunctions will be used to exhaus the gases during startup, shutdown, and malfunctions will be used to exhaus the gases during startup, shutdown, and malfunctions will be used to exhaus the gases during startup, shutdown, and malfunctions of chemicals locatingspinks (Form B7). Coalwood, gas, other burner (Form B1)			CESS (ATTA	CH FLOW D		0 (0.17.0	11) 12 110(0). 1		
emissions will be controlled utilizing a wet electrostatic precipitator (WESP) for particulate removal. VOC and organic-HAP emissions will be used to exhaust bot gases during startup, shutdown, and malfunctions. TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-89 ON THE FOLLOWING PAGES): Coal,wood, oil, gas, other burner (Form B1) Woodworking (Form B4) Manuf, of chemicals/coatings/inks (Form B7) Incidental on repire/generator (Form B2) Coating/finishing/printing (Form B3) Other (Form B9) Other (For			•		•	em via a 175	3 MMRtu/hr h	urner systen	n Air
controlled by a regenerative thermal oxidizer (RTO). Bypass stacks following the dryer (ES-DRYERBYF-1) and furnace (ES-FURNACEBYF-1) will be used to exhaus the gases during startup, shutdown, and malfunctions be used to exhaus the gases during startup, shutdown, and malfunctions be used to exhaus the gases during startup, shutdown, and malfunctions in a property of the property o									
TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-89 ON THE FOLLOWING PAGES): Coalwood.oil.gas. other burner (Form B1)									
Coating/finishing/printing (Form B4)	be used to exhaust hot gases during sta	artup, shutdow	n, and malfun	ctions.					
Coating/finishing/printing (Form B4)									
Int.ombustion engine/generator (Form B2)		•		ETE APPROP	PRIATE FORI	M B1-B9 ON	THE FOLLOW	ING PAGES):
Comparison of Comparison Co	└॔ Coal,wood,oil, gas, other burner (Fo	orm B1)		rking (Form B	34)	Manuf	of chemicals/	coatings/inks	(Form B7)
START CONSTRUCTION DATE: TIBD TIBD TIBD TIBD TIBD TIBD EXPECTED OP, SCHEDULE: 24, HR/DAY 7, DAY/WK 52, WK/YR EXPECTED ACTUAL FOR FORWARD AND ALL THROUGHPUT (%): DEC-FEB 25% CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTED ACTUAL EMISSION FACTOR FACTO	Int.combustion engine/generator (Fe	orm B2)	Coating/f	inishing/printi	ng (Form B5)	Inciner	ration (Form B	8)	
TIBD	Liquid storage tanks (Form B3)		Storage s	silos/bins (For	m B6)	Other	(Form B9)		
MANUFACTURER / MODEL NO.: TIBD EXPECTED OP, SCHEDULE: 14, HRIDAY 7, DAY/WK 52, WK/YR STHIS SOURCE SUBJECT NSPS (SUBPARTS?): PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25% MARMAY 25% JUN-AUG 25% SEP-NOV 25% CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTO ACTUAL EMISSION (AFTER CONTROLS / LIMITS), (BEFORE CONTROLS / LIMITS), (BEF	START CONSTRUCTION DATE:			DATE MANU	JFACTURED:	:			
EXPECTED OP, SCHEDULE: 24 HRDAY 7. DAY/WK 52 WK/YR IS THIS SOURCE SUBJECT NSPS (SUBPARTS?): PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25% MAR-MAY 25% JUN-AUG 25% SEP-NOV 25% CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTED ACTUAL POTENTIAL EMISSIONS EMISSION (AFTER CONTROLS ; LIMITS) (BEFORE CONTROLS ; LIMIT	TBD			TBD					
IS THIS SOURCE SUBJECT 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 SOURCE OF EMISSION (INFERCONTROL \$1 (AMTS)). (INFERCONTROL \$1 (AMTS)). (IMPROVED \$1 (AMTS)). (IMPROVE	MANUFACTURER / MODEL NO.:								
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEE 25% MAR-MANY 25% JUN-AUG 25% SEP-NOV 25% CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE FEMISSION AIR POLLUTANT EMISSIONS FACTOR ID-POTENTIAL EMISSIONS (MEPORE CONTROLS / LIMITS) (M	TBD			EXPECTED	OP. SCHEDU	JLE: <u>_24</u> H	IR/DAY _ <u>7</u>	_DAY/WK _	_ <u>52</u> _ WK/YR
SOURCE OF EXPECTED ACTUAL EMISSIONS SOURCE OF EXPECTED ACTUAL EMISSION (AFTER CONTROL S / LIMITS) (BEFORE CONTROL S / LIMITS) (AFTER CONTROLS / LIMITS) ARR POLLUTANT EMITTED ARRENDOUS ARR POLLUTANT EMISSIONS (PM-1) PARTICULATE MATTER (PM) P	IS THIS SOURCE SUBJECT \(\subseteq \n	SPS (SUBPAR	TS?):		NESH	HAP (SUBPA	RTS?):		
SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (BE	PERCENTAGE ANNUAL THROUGHP	JT (%): DEC-F	EB 25 %	MAR-MAY	25% JUN-	AUG 25%	SEP-NOV 25	5%	
EMISSION	CRITERIA A	AIR POLLUT	TANT EMIS	SIONS INI	FORMATIO	ON FOR TH	HIS SOURC	Έ	
AIR POLLUTANT EMITTED PARTICULATE MATTER (PM) PARTICULATE (PM) P			SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
AIR POLLUTANT EMITTED PARTICULATE MATTER (PM) PARTICULATE (PM) P						(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
PARTICULATE MATTER (PM)	AIR POLLUTANT EMITTED				i '	,		`	T . '
PARTICULATE MATTER<2 5 MICRONS (PM ₁₀) PARTICULATE MATTER<2.5 MICRONS (PM ₂₀) SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOx) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EMISSION EMISSION FACTOR See Emission Calculations in Appendix C TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) Ib/hr tons/yr lib/hr tons/yr lib/hr tons/yr lib/hr tons/yr TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS) EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS) TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS) TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS FACTOR By Control of the co							10.10, y.	127111	101.107 y
PARTICULATE MATTER<2.5 MICRONS (PM2.2) SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOX) CARBON MONOXIDES (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER MAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTED ACTUAL POTENTIAL EMISSIONS EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITATIONS (BEFORE CONTROLS / LIMITATIONS (BEFORE CONTROLS / LIMITATIONS (BEFORE CONTROLS / LIMITS) (BEFO	` '	(PM. _o)	See Elinission		Пппррепал	T			
SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOX) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EMISSION EMISSION FACTOR See Emission Calculations in Appendix C TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) (BEFORE CONTRO		,							
NITROGEN OXIDES (NOX) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION EMIS		(1 1012.5)							
CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (BEFOR	. ,								
VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (,								1
DTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTRO	` '	(00)							
Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation,	,	70C)							
HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (AFTER CONTR									
SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (AFTER CONTROLS / LIMITAL CONTROLS /		4/5 50//		100101101	VEODIA.	104 505	T. 110 00115	205	
HAZARDOUS AIR POLLUTANT CAS NO. EMISSION FACTOR Ib/hr tons/yr Ib/hr EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS EXPECTED ACTUAL EMISSIONS AFTER CONTROLS	HAZARDOUS	AIR POLL				TON FOR			
HAZARDOUS AIR POLLUTANT See Emission Calculations in Appendix C EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS FACTOR B/hr B/hr B/hr B/hr See Emission Calculations in Appendix C 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,			SOURCE OF EXPECTED ACTUAL			POTENTIAL	EMISSIONS		
See Emission Calculations in Appendix C TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS FACTOR See Emission Calculations in Appendix C EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS Ib/hr Ib/day Ib/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	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS FACTOR 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,	HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
TOXIC AIR POLLUTANT CAS NO. FACTOR Description Descr			See Emission	n Calculations	in Appendix	C			
TOXIC AIR POLLUTANT CAS NO. FACTOR See Emission Calculations in Appendix C 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,									
TOXIC AIR POLLUTANT CAS NO. FACTOR Description Descr									
TOXIC AIR POLLUTANT CAS NO. FACTOR Description Descr									
TOXIC AIR POLLUTANT CAS NO. FACTOR Description Descr									
TOXIC AIR POLLUTANT CAS NO. FACTOR Description Descr									
TOXIC AIR POLLUTANT CAS NO. FACTOR Description Descr									
TOXIC AIR POLLUTANT CAS NO. FACTOR Description Descr		1							
TOXIC AIR POLLUTANT CAS NO. FACTOR See Emission Calculations in Appendix C 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,	TOXIC AII	R POLLUTA	NT EMISS	IONS INFO	PRMATION	FOR THIS	SSOURCE		
TOXIC AIR POLLUTANT CAS NO. FACTOR Ib/hr Ib/day Ib/yr	7 07 11 0 7 11 1	T	300110 =						
TOXIC AIR POLLUTANT CAS NO. FACTOR Ib/hr Ib/day Ib/yr See Emission Calculations in Appendix C See			_	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
See Emission Calculations in Appendix C See In Sign 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,	TOXIC AIR POLLUTANT	CAS NO		lb	/hr	lb	/day	lh	/vr
Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation,	TOXIO AIRT GEEGTART	OAO NO.					uuy	10	7 91
		+	500 LIII 133101	. Juiculations	, r.ppenulx				
		+							
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		+							
		+							
		+							
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EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16 No.	CDEQ/Division of Air Qu	uality - Application fo	or Air Pe	ermit to Construc	t/Operate	B1
EMISSION SOURCE DESCRIPTION:	(D		EMISSI	ON SOURCE ID I	NO: ES-DRYERBYP-1	
Green Wood Direct-Fired Dryer Syste	m (Dryer #1 Bypass)		CONTR	OL DEVICE ID N	O(S): N/A	
OPERATING SCENARIO: 1	OF <u>1</u>		EMISSI	ON POINT (STAC	CK) ID NO(S): EP-2	
DESCRIBE USE: PROCESS H	HEAT SPA	CE HEAT		ELECTRICAL GE	NERATION	
CONTINUO	JS USE □STA	ND BY/EMERGENCY		OTHER (DESCRI	BE):	
HEATING MECHANISM:	INDIRECT	✓ DIRECT				
MAX. FIRING RATE (MMBTU/HOUR)	175.3					
	١	WOOD-FIRED BU	IRNER			
WOOD TYPE: ☐ BARK ☐	WOOD/BARK ✓	WET WOOD	☐ DF	RY WOOD	OTHER (DESCRI	BE):
PERCENT MOISTURE OF FUEL:	<u>~50%</u>					
	CONTROLLED W	TITH FLYASH REINJE	CTION	\checkmark (CONTROLLED W/O REIN	IJECTION
FUEL FEED METHOD: N/A	HEAT	TRANSFER MEDIA:		STEAM 🗸 AIR	OTHER (DESCRIBE))
	(COAL-FIRED BU	RNER			
TYPE OF BOILER	IF OTHER DESCRIBE:	:				
PULVERIZED OVERFEED STOKER	UNDERFEED STC	KER SPRI	EADER :	STOKER	FLUIDIZED BED	
☐ WET BED ☐ UNCONTROLLED	UNCONTROLLED UNCONTROLLED UNCONTROLLED CIRCULATING					
□ DRY BED □ CONTROLLED □ CONTROLLED □ FLYASH REINJECTION □ RECIRCULATING						
☐ NO FLYASH REINJECTION						
	0	IL/GAS-FIRED B	URNE	R		
TYPE OF BOILER: UTIL	TY INDUSTRI	IAL COMM	IERCIAL		NSTITUTIONAL	
TYPE OF FIRING: NOR	MAL TANGENT	IAL LOW N	NOX BUF	RNERS N	NO LOW NOX BURNER	
	OTH	IER FUEL-FIRED	BURN	IER		
TYPE(S) OF FUEL:						
TYPE OF BOILER:	TY INDUSTRI	IAL COMM	IERCIAL	. <u> </u>	NSTITUTIONAL	
TYPE OF FIRING:		ITROL(S) (IF ANY):				
	FUEL USAGE (I	INCLUDE START			,	
		MAXIMUM			REQUESTED C	
FUEL TYPE	UNITS	CAPACITY ((UNIT/HI	R)	LIMITATION (L	JNIT/HR)
EUE	CHARACTERISTIC	CS (COMPLETE	AII TI		NICABLE)	
FUEL	. CHARACTERISTIC	SPECIFIC	ALL II	SULFUR CONT	i	ONTENT
FUEL TYPE		BTU CONTENT		(% BY WEIGH		VEIGHT)
			711-	,	(70 11)	VEIGITI)
Bark/Wet Wood		Nominal 4,200 BTU/	1D	0.011		
COMMENTS:						
OCIVIIVILIVI O.						

REVISED 09/22/1 NCDE	Q/Division of	Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		ј В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	NO: ES-FURNA	CEBYP-1	
Green Wood Direct-Fired Dryer System	(Furnace #1	Bypass)		CONTROL [DEVICE ID NO	O(S): N/A		
OPERATING SCENARIO <u>1</u>	OF	1		EMISSION F	POINT (STAC	K) ID NO(S):	EP-3	
DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	OCESS (ATT	ACH FLOW [DIAGRAM):				
Green wood is conveyed to a rotary dry								
emissions will be controlled utilizing a				-		_		
controlled by a regenerative thermal or will be used to exhaust hot gases during	, ,		U	,	·DKIEKBIP-1	.) and furnace	¿ (ES-FUKNAC	TERIL-1)
TYPE OF EMISSION SOUR					M R1-R9 ON	THE FOLLOW	VING PAGES	٠.
Coal,wood,oil, gas, other burner (For	•		rking (Form E			of chemicals		•
Int.combustion engine/generator (Fo	•	_	٠,	ing (Form B5)	_	ation (Form B	ū	, (i oiiii <i>bi)</i>
Liquid storage tanks (Form B3)	1111 02)	= -	silos/bins (Fo	• ,		(Form B9)	0)	
START CONSTRUCTION DATE:				JFACTURED:				
твр			TBD					
MANUFACTURER / MODEL NO.:								
твр			EXPECTED	OP. SCHEDU	JLE: <u>24</u> H	IR/DAY _ <u>7</u>	DAY/WK	<u>52</u> _ WK/YF
IS THIS SOURCE SUBJECT NS	PS (SUBPAR	RTS?):		_ L NESI	HAP (SUBPAI	RTS?):		
PERCENTAGE ANNUAL THROUGHPU				25% JUN-		SEP-NOV 2	•	
CRITERIA AI	R POLLUT	ANT EMIS	SIONS IN	FORMATIO	ON FOR TI	HS SOURC	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendi	x C			
PARTICULATE MATTER<10 MICRONS (F	PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (V	OC)							
LEAD								
OTHER								
HAZARDOUS A	AIR POLLU				TION FOR			
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	_	ROLS / LIMITS)	,	TROLS / LIMITS)		ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendiz	K C			
								-
								-
								
								
TOXIC AIR	POLLITA	NT FMISS	IONS INFO	ORMATION	I FOR THI	S SOURCE		
TOXIC AIR	TOLLOTA	INT LIMISS	10113 1111		TON IIII	3 300NCL		
		SOURCE	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	rrols / Limi	TATIONS
		OF						
		EMISSION						
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		day	lb	/yr
		See Emission	n Calculation	s in Appendi	x C			
					-			
	<u> </u>				<u> </u>		<u> </u>	
Attachments: (1) emissions calculations and su	•	,	•			•	. •	•

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

REVISED 09/22/16	NCDEQ/Division of A	ir Quality - Ap	pplication for Air F	Permit to Constru	ct/Operate		B1
EMISSION SOURCE DESCRIPT)	EMISS	SION SOURCE ID	NO: ES-FUR	NACEBYP-1	
Green Wood Direct-Fired Dryer	System (Furnace #1 Bypa	assj	CONT	ROL DEVICE ID I	NO(S): N/A		
OPERATING SCENARIO:	<u>1</u> OF	1	EMISS	SION POINT (STA	CK) ID NO(S	S): EP-3	
DESCRIBE USE: PROCE	ESS HEAT	SPACE HEAT] ELECTRICAL G	ENERATION	I	
□сонті	NUOUS USE	STAND BY/EN	MERGENCY [OTHER (DESC	RIBE):		
HEATING MECHANISM:	INDIRECT	V	DIRECT				
MAX. FIRING RATE (MMBTU/HC	OUR): 175.3						
		WOOD-I	FIRED BURNE	R			
WOOD TYPE: ☐ BARK	☐ WOOD/BARK	✓ WET WC		ORY WOOD	□ отн	HER (DESCRIB	E):
PERCENT MOISTURE OF FUEL	_: <u>~50%</u>						
	CONTROLLE	D WITH FLYA	SH REINJECTION	✓	CONTROLL	ED W/O REINJ	ECTION
FUEL FEED METHOD: N/A		HEAT TRANSF	ER MEDIA:	STEAM 🗹 AIR	OTHER	R (DESCRIBE)	
		COAL-F	IRED BURNE	R			
TYPE OF BOILER	IF OTHER DESCR	RIBE:					
PULVERIZED OVERFEED STO	SPREADER	R STOKER	FLUIDI	ZED BED			
□ WET BED □ UNCONTRO	LLED UNCONTRO	LLED	UNCONTRO	DLLED	CIRC	ULATING	
☐ DRY BED ☐ CONTROLLE	DRY BED CONTROLLED CONTROLLED FLYASH REINJECTION						
			☐ NO FLYASH	REINJECTION			
		OIL/GAS	FIRED BURNE	ER			
TYPE OF BOILER:	UTILITY INDU	STRIAL	COMMERCIA	AL	INSTITUTIO	NAL	
TYPE OF FIRING:	NORMAL TANG	ENTIAL	LOW NOX BI	JRNERS	NO LOW NO	OX BURNER	
		OTHER FU	EL-FIRED BUR	NER			
TYPE(S) OF FUEL:							
TYPE OF BOILER:	UTILITY INDU	STRIAL	COMMERCIA	AL	INSTITUTIO	NAL	
TYPE OF FIRING:		CONTROL(S)					
	FUEL USAG	SE (INCLUD	E STARTUP/B				
			MAXIMUM DESIG			EQUESTED CA	
FUEL TYPE	UNITS		CAPACITY (UNIT/	HR)	L	IMITATION (UN	11T/HR)
Bark/Wet Wood	ODT/hr		0.0				
-	LIEL CHARACTER!	STICS (COI	MDLETE ALL 3	FUAT ADE AD	DLICABLI	E \	
F	UEL CHARACTERI	-	PECIFIC	SULFUR CON		ASH COI	NTENT
FUEL TYF	DE .		CONTENT	(% BY WEIG		(% BY W	
				,	111)	(70 10 1 10	
Bark/Wet W	νουα	Nominal	4,200 BTU/lb	0.011			
COMMENTS:				1	<u> </u>		
OCIVIIVILINI 3.							

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	.Q/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: ES-DRYER	l-2	
Green Wood Direct-Fired Dryer System ((Dryer #2)			CONTROL [DEVICE ID NO	O(S): CD-WES	SP-2, CD-RTO	-2
OPERATING SCENARIO 1	OF	1				K) ID NO(S):		
DESCRIBE IN DETAILTHE EMISSION S	OURCE PRO	CESS (ATTA	CH FLOW DI		,	, , ,		
Green wood is conveyed to a rotary drye emissions will be controlled utilizing a w controlled by a regenerative thermal oxi be used to exhaust hot gases during star	vet electrosta idizer (RTO).	tic precipitato Bypass stacks	or (WESP) for following th	particulate	removal. VOC	and organic-	HAP emission	ns will be
TYPE OF EMISSION SOURCE	CE (CHECK A	AND COMPLE	TE APPROP	RIATE FORM	1 B1-B9 ON 1	HE FOLLOW	ING PAGES)):
☑ Coal,wood,oil, gas, other burner (Form	n B1)	Woodwo	rking (Form E	34)	☐Manuf.	of chemicals/	coatings/inks	(Form B7)
☐ Int.combustion engine/generator (Form	m B2)	Coating/f	finishing/printi	ng (Form B5)	Inciner	ation (Form B	8)	
Liquid storage tanks (Form B3)		Storage :	silos/bins (Fo	rm B6)	Other (Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED				
TBD			TBD					
MANUFACTURER / MODEL NO.:								
TBD			EXPECTED	OP. SCHEDI	JLE: <u>_24</u> H	IR/DAY <u>7</u>	_ DAY/WK _	<u>52</u> WK/YF
	SPS (SUBPAR	,		-	HAP (SUBPAF	,		
PERCENTAGE ANNUAL THROUGHPUT	. ,			25% JUN-A		SEP-NOV 25		
CRITERIA AII	R POLLUT	ANT EMIS	SIONS INF	ORMATIO	N FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTR	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	c C			
PARTICULATE MATTER<10 MICRONS (PI	.0,							
PARTICULATE MATTER<2.5 MICRONS (P	M _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VC	OC)							
LEAD								
OTHER								
HAZARDOUS A	AIR POLLU	JTANT EMI	SSIONS IN	NFORMAT	ION FOR 1	THIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTR	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation:	s in Appendix	k C			
TOXIC AIR	POLLUTA	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	FROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr	1	day	lb,	/yr
		See Emission	n Calculation:	s in Appendix	k C			
	<u> </u>							
								
								
Attachments: (1) emissions calculations and su	pporting docum	nentation; (2) ind	dicate all reque	sted state and	federal enforce	able permit limit	s (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.

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

REVISED 09/22/16	NCDEQ/Division of A	ir Quality - Application fo	r Air Permit to Constru	uct/Operate	B1				
EMISSION SOURCE DESCRIP			EMISSION SOURCE ID	NO: ES-DRYER-2					
Green Wood Direct-Fired Drye	r System (Dryer #2)		CONTROL DEVICE ID	NO(S): CD-WESP-2 , CD-R	TO-2				
OPERATING SCENARIO:	OF	_1	EMISSION POINT (STA	ACK) ID NO(S): EP-4					
DESCRIBE USE: PROC	ESS HEAT	SPACE HEAT	ELECTRICAL G	GENERATION					
□сонт	INUOUS USE	STAND BY/EMERGENCY	OTHER (DESC	RIBE):					
HEATING MECHANISM:	INDIRECT	✓ DIRECT							
MAX. FIRING RATE (MMBTU/F	IOUR): 180								
		WOOD-FIRE	D BURNER						
WOOD TYPE: BARK	(WOOD/BARK	✓ WET WOOD	☐ DRY WOOD	OTHER (DESCRIB	E):				
PERCENT MOISTURE OF FUE	:L: <u>~50%</u>								
☐ UNCONTROLLED ☐ CONTROLLED WITH FLYASH REINJECTION ☐ CONTROLLED W/O REINJECTION									
FUEL FEED METHOD: N/A IEAT TRANSFER MEDIA: STEAM 🗹 AIR 🗌 OTHER (DESCRIBE)									
COAL-FIRED BURNER									
TYPE OF BOILER	IF OTHER DESCR	RIBE:							
PULVERIZED OVERFEED STO	OKER UNDERFEED	STOKER SPRI	EADER STOKER	FLUIDIZED BED					
☐ WET BED ☐ UNCONTRO	OLLED UNCONTRO	LLED UNCO	ONTROLLED	CIRCULATING					
☐ DRY BED ☐ CONTROLL	ED CONTROLLE	ED	SH REINJECTION	RECIRCULATING					
		☐ NO FI	YASH REINJECTION						
-		OIL/GAS-FIR	ED BURNER						
TYPE OF BOILER:	UTILITY INDU	STRIAL COMM	ERCIAL	INSTITUTIONAL					
TYPE OF FIRING:	NORMAL TANG	ENTIAL LOW N	IOX BURNERS	NO LOW NOX BURNER					
		OTHER FUEL-F	IRED BURNER						
TYPE(S) OF FUEL:									
TYPE OF BOILER:	UTILITY INDU	STRIAL COMM	ERCIAL	INSTITUTIONAL					
TYPE OF FIRING:	TYPE(S) OF	CONTROL(S) (IF ANY): _							
	FUEL	USAGE (INCLUDE S	TARTUP/BACKUP	FUELS)					
		MAXIMUM	DESIGN	REQUES ⁻	TED CAPACITY				
FUEL TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATI	ON (UNIT/HR)				
	FUEL CHARAC	TERISTICS (COMPL	ETE ALL THAT A	RE APPLICABLE)					
		SPECIFIC	SULFUR CON	TENT A	SH CONTENT				
FUEL TY	PE	BTU CONTENT	(% BY WEIG	HT) (%	BY WEIGHT)				
Bark/Wet V	Wood	Nominal 4,200 BTU/	lb 0.011						
COMMENTS:									

FORM C2

CONTROL DEVICE (Electrostatic Precipitator)

REVISED 09/22/16 NCDEQ/Division of Air Quality - App	olication for Air Permit to Construct/Operate C2							
CONTROL DEVICE ID NO: CD-WESP-2	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-DRYER-2							
EMISSION POINT (STACK) ID NO(S): EP-4	POSITION IN SERIES OF CONTROL NO. 1 OF 2 UNITS							
MANUFACTURER: TBD	MODEL NO. TBD							
OPERATING SCENARIO:								
OPERATING SCENARIO: 1 OF1	P.E. SEAL REQUIRED (PER 2Q .0112)?							
DESCRIBE CONTROL SYSTEM: Emissions from the Dryer will be controlled by the WESP through a comm	on duct for additional PM. metallic HAP. and HCl removal.							
	,							
EQUIPMENT SPECIFICATIONS	GAS DISTRIBUTION GRIDS:							
TYPE:								
TOTAL COLLECTION PLATE AREA (FT ²): TBD	✓ SINGLE-STAGE							
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/FT³): TBD							
FIELD STRENGTH (VOLTS) CHARGING: COLLECTING: TBD	CORONA POWER (WATTS/1000 CFM): TBD							
ELECTRICAL USAGE (KW/HOUR): TBD								
CLEANING PROCEDURES: RAPPING PLATE V	IBRATING WASHING OTHER							
OPERATING PARAMETERS PRESSURE DROP (IN. H20): M	IIN 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: TBIMIN TBD MAX							
POWER REQUIREMENTS IS AN ENERGY MANAGEMENT S	SYSTEM USED' YES NO							
FIELD NO. NO. OF SETS CHARGING	EACH TRANSFORMER (kVA) EACH RECTIFIER Kv Ave/Peak Ma Dc							
POLITIANT/O COLLECTED PM	DM DM							
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 Emission Calculated)								
PARTICLE SIZE DISTRIBUTION	DESCRIBE STARTUP PROCEDURES: TBD							
SIZE WEIGHT % CUMULATIVE (MICRONS) OF TOTAL %								
	DESCRIBE MAINTENANCE PROCEDURES: TBD							
0-1	BESSAIDE WAIRT ENANGE FROGEDORES. 180							
10-25	_							
25-50	DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE							
50-100	CONTROL SYSTEM							
>100	- 							
TOTAL = 100	- 							
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							
	IIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):							

FORM C3

CONTROL DEVICE (THERMAL OR CATALYTIC)

<u>C3</u>

NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate **REVISED 09/22/16** 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-2 CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-DRYER-2 EMISSION POINT (STACK) ID NO(S): EP-4 **UNITS** POSITION IN SERIES OF CONTROLS OF MODEL NO: TBD MANUFACTURER: TBD **OPERATING SCENARIO:** OF AFTERBURNER V REGENERATIVE THERMAL OXIDATION RECUPERATIVE THERMAL OXIDATION CATALYTIC OXIDATION TYPE EXPECTED LIFE OF CATALYST (YRS): TBD METHOD OF DETECTING WHEN CATALYST NEEDS REPLACMENT: TBD CATALYST MASKING AGENT IN AIR STRI HALOGEN SILICONE PHOSPHOROUS COMPOUND HEAVY METAL ✓ OTHER (SPECIFY) __TBD SULFUR COMPOUND NONE CATALYST VOL (FT3): TBD TYPE OF CATALYST: 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: % 97.5 % CORRESPONDING OVERALL EFFICIENCY: **EFFICIENCY DETERMINATION CODE:** TOTAL AFTER CONTROL EMISSION RATE (LB/HR): See Emission Calculations in Appendix C OUTLET TEMPERATURE (°F): TBD MIN **TBD** PRESSURE DROP (IN. H2C MIN MAX TBD INLET TEMPERATURE (°F MIN MAX TBD RESIDENCE TIME (SECONDS): TBD INLET AIR FLOW RATE (ACFM): TBD COMBUSTION TEMPERATURE (°F): TBD (SCFM): TBD COMBUSTION CHAMBER VOLUME (FT3): TBD INLET MOISTURE CONTENT (%): TBD <u>TBD</u> INLET % EXCESS AIR: TBD OUTLET CONCENTRATION (ppmv) 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:

REVISED 09/22/1 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	S-DRYERBY	P-2	-
Green Wood Direct-Fired Dryer Syster	n (Dryer #2 By	pass)		CONTROL I	DEVICE ID NO	O(S): N/A		
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I		
DESCRIBE IN DETAILTHE EMISSION		CESS (ATTA	CH FLOW D		0 (0.7.0	11) 12 110(0). 1		
Green wood is conveyed to a rotary dr		•		•	em via a 180 l	MMRtu/hr hu	rner system	Air
emissions will be controlled utilizing a								
controlled by a regenerative thermal (
be used to exhaust hot gases during sta	artup, shutdow	n, and malfun	ctions.					
TYPE OF EMISSION SOU	•		TE APPROP	RIATE FORI	M B1-B9 ON	THE FOLLOW	ING PAGES):
└॔ Coal,wood,oil, gas, other burner (Fo	orm B1)		rking (Form B	34)	Manuf	of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (F	orm B2)	Coating/f	inishing/printi	ng (Form B5)	Inciner	ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (For	m B6)	Other	(Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED:	:			
TBD			TBD					
MANUFACTURER / MODEL NO.:								
TBD			EXPECTED	OP. SCHEDU	JLE: _ 24 H	IR/DAY _ <u>7</u>	_DAY/WK _	_ <u>52</u> _ WK/YR
IS THIS SOURCE SUBJECT UN	SPS (SUBPAR	TS?):		NESH	HAP (SUBPA	RTS?):	-	
PERCENTAGE ANNUAL THROUGHP	UT (%): DEC-F	EB 25%	MAR-MAY	25% JUN-	AUG 25%	SEP-NOV 25	5%	
CRITERIA A	AIR POLLUT	TANT EMIS	SIONS INF	FORMATIC	ON FOR TH	HS SOURC	Ε	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		(ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			Calculations			torio/yi	15/111	torioryi
PARTICULATE MATTER (1 M)	/DM \	See Emission	Carculations	П Аррения	T			
PARTICULATE MATTER<2.5 MICRONS	,							1
	(PIVI _{2.5})							†
SULFUR DIOXIDE (SO2)					1			
NITROGEN OXIDES (NOx)								1
CARBON MONOXIDE (CO)								<u> </u>
VOLATILE ORGANIC COMPOUNDS (VOC)							ļ
LEAD								ļ
OTHER								
HAZARDOUS	S AIR POLL	<u>UTANT EM</u>	ISSIONS II	NFORMA1	TION FOR	THIS SOUR	?CE	
		SOURCE OF EXPECT		D ACTUAL		POTENTIAL	EMISSIONS	i
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTROLS / LIMITS	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculations	in Appendix	C			
								1
								1
								1
TOYIC AII	R POLLUTA	NT FMISS	IONS INFO	DEMATION	I FOR THIS	SOURCE		<u> </u>
TOXIC AII	I	T SOUNGE	ions in c	INIIA I IOI	TON TITE	3 300 NCL		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOYIC AIR DOLL LITANT	CAS NO.	EMISSION FACTOR	Ih	/hr	Ib	/dov	Ih.	ls m
TOXIC AIR POLLUTANT	CAS NO.					/day	UI	o/yr
		See Emission	Calculations	in Appendix	1 L			
	+							
Attachments: (1) emissions calculations and		,	•			•	, ,	•
emission rates) and describe how these are r	monitored and wit	h what frequenc	y; and (3) descr	ribe any monito	ring devices, ga	auges, or test po	rts for this sour	ce.

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

REVISED 09/22/16	NCDEQ/Division of A	ir Quality - Application fo	or Air Permit to Constru	ıct/Opei	rate	, B1				
EMISSION SOURCE DESCRIPT						-Fired Dryer System (Dryer #2 Bypass)				
Green Wood Direct-Fired Dryer	System (Dryer #2 Bypas	s)	CONTROL DEVICE ID			Thea Dryet System (Dryet #2 Bypass)				
OPERATING SCENARIO:	OF	1	EMISSION POINT (STA							
DESCRIBE USE: PROCE		SPACE HEAT	ELECTRICAL G							
		STAND BY/EMERGENCY								
HEATING MECHANISM:		DIRECT	3E.(DE30)							
MAX. FIRING RATE (MMBTU/HC		⊡ DIIXEOI								
LILITATIO TO TIE (MIMIETO/TIC	,	WOOD-F	IRED BURNER							
WOOD TYPE: ☐ BARK	WOOD TYPE: ☐ BARK ☐ WOOD/BARK ☑ WET WOOD ☐ DRY WOOD ☐ OTHER (DESCRIBE):									
PERCENT MOISTURE OF FUEL			-		, -: <u>-</u>					
		ED WITH FLYASH REINJE	:CTION	CONTR	ROLLED W/O REINJ	IECTION				
FUEL FEED METHOD: N/A		IEAT TRANSFER MEDIA:			THER (DESCRIBE)					
ii =22 iii iii ii			RED BURNER	3	(JEJOINIDE)					
TYPE OF BOILER	IF OTHER DESCR	RIBE:								
PULVERIZET OVERFEED STO		ı	EADER STOKER	FI	LUIDIZED BED					
· —					CIRCULATING					
☐ DRY BED ☐ CONTROLLE	ED	ASH REINJECTION	DN RECIRCULATING							
		NO F	LYASH REINJECTION							
		OIL/GAS-I	FIRED BURNER							
TYPE OF BOILER: UTILITY INDUSTRIAL COMMERCIAL INSTITUTIONAL										
TYPE OF FIRING:	NORMAL TANG		NOX BURNERS	NO LO	W NOX BURNER					
		OTHER FUE	L-FIRED BURNER							
TYPE(S) OF FUEL:										
	_		MERCIAL	INSTIT	UTIONAL					
TYPE OF FIRING:		CONTROL(S) (IF ANY):	CTARTURE	IID =	TI O					
-	FUL	EL USAGE (INCLUDE		UP FU		ESTED CARACITY				
FUEL TYPE	UNITS	MAXIMUM				ESTED CAPACITY				
FUEL LIPE	CLINIO	CAPACITY ((OIII I/III)	 	LIMII	TATION (UNIT/HR)				
				\vdash						
 		<u> </u>		 						
	FUEL CHAR	ACTERISTICS (COM	IPLETE ALL THAT	ARE A	APPLICABLE)					
	322 51741	SPECIFIC	SULFUR CON			ASH CONTENT				
FUEL TYP	'E	BTU CONTENT	(% BY WEIG			(% BY WEIGHT)				
Bark/Wet W		Nominal 4,200 BTU/	,							
,		, 0/	1 3 3 2 2	$\overline{}$						
			1							
COMMENTS:										
1		Attach Additional	l Chasta As No							

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCD	EQ/Division of	Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID NO: ES-FURNACEBYP-2				
Green Wood Direct-Fired Dryer System	m (Furnace #2	Bypass)		CONTROL I	DEVICE ID N	O(S): N/A			
OPERATING SCENARIO 1	L OF	1		EMISSION F	POINT (STAC	K) ID NO(S):	EP-6		
DESCRIBE IN DETAILTHE EMISSION	N SOURCE PRO	OCESS (ATT	ACH FLOW [DIAGRAM):	,	, , ,			
Green wood is conveyed to a rotary di emissions will be controlled utilizing controlled by a regenerative thermal will be used to exhaust hot gases duri	a wet electrost oxidizer (RTO)	atic precipita . Bypass stacl	tor (WESP) fo ks following t	or particulate	e removal. VO	C and organio	c-HAP emissi	ons will be	
TYPE OF EMISSION SOU	RCE (CHECK A	AND COMPLE	TE APPROP	PRIATE FOR	M B1-B9 ON	THE FOLLOV	VING PAGES	5):	
Coal,wood,oil, gas, other burner (Fe	orm B1)	Woodwo	rking (Form E	34)	Manuf.	of chemicals/	/coatings/inks	(Form B7)	
Int.combustion engine/generator (F	orm B2)		inishing/printi	O (_	ation (Form B	8)		
Liquid storage tanks (Form B3) START CONSTRUCTION DATE:		Storage	silos/bins (Fo	JFACTURED		(Form B9)			
TBD			TBD	DFACTURED	-				
MANUFACTURER / MODEL NO.:									
TBD			EXPECTED	OP. SCHED	JLE: <u>_24</u> ⊢	IR/DAY <u>7</u>	DAY/WK _	<u>52</u> WK/YR	
IS THIS SOURCE SUBJECT 📙 N	ISPS (SUBPAR	TS?):		_ L NESH	HAP (SUBPA	RTS?):			
PERCENTAGE ANNUAL THROUGHP	, ,			-	-AUG 25%				
CRITERIA A	AIR POLLUT	ANT EMIS	SIONS INI	FORMATIO	ON FOR TH	HIS SOURC	Œ		
SOURCE C			EXPECTE	D ACTUAL		POTENTIAL	. EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculation:	s in Appendix	к C				
PARTICULATE MATTER<10 MICRONS	(PM ₁₀)								
PARTICULATE MATTER<2.5 MICRONS	S (PM _{2.5})								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)								1	
VOLATILE ORGANIC COMPOUNDS ((VOC)								
LEAD	(122)								
OTHER									
HAZARDOUS	AIR POLLU	JTANT EM	ISSIONS I	NFORMAT	TION FOR	THIS SOUR	RCE		
		SOURCE OF		D ACTUAL	POTENTIAL EMISSIONS				
		EMISSION		ROLS / LIMITS)	(BEEORE CON	TROLS / LIMITS)		(AFTER CONTROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr	
TIAZARDOGO AIRT GELGTART	OAO NO.		n Calculation:		<u> </u>	toris/yi	15/111	t0113/y1	
		See Emission	i Calculation	з ні арренція					
TOYIC ALL	R POLLUTA	NT FMISS	IONS INFO	DRMATION	I FOR THI	S SOURCE			
TOXIC AII	TOLLUTA	- SCONCE	IONS IN C	JANIA HOI	VION IIII	3 300NCL			
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	FROLS / LIMI	TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lla	/hr	lh.	day	lh.	h re	
TOXIC AIR POLLUTANT	CAS NO.		<u> </u>		<u> </u>	day	ID	/yr	
		See Emission	n Calculation	s iii Appendix	I				
					 				
					 				
					-				
	_								
					 				
Attachments: (1) emissions calculations and	1				1 6-4 (-:	-f "	
MITACHMENTS: (1) EMISSIONS CAICUIATIONS AND	a Silinnortina docii	mentation: (')\ ii	naicate all reau	iesten state and	rederal entere	eanle permit lin	IIIS (A d houre	or 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.

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

REVISED 09/22/16	NCDEQ/Division of A	ir Quality - A	pplication for Air P	Permit to Constru	ct/Operate		B1
EMISSION SOURCE DESCRIPTION: EMISSION SOURCE ID NO: ES-FURNACEBYP-2							
Green Wood Direct-Fired Dryer S	ystem (Furnace #2 Bypa	ass)	CONT	ROL DEVICE ID N	NO(S): N/A		,
OPERATING SCENARIO:	<u>1</u> OF	1	EMISS	SION POINT (STA	.CK) ID NO(S): E	P-6	
DESCRIBE USE: PROCES	SS HEAT	SPACE HEAT	-	ELECTRICAL GI	ENERATION		
□contin	UOUS USE	STAND BY/EI	MERGENCY [OTHER (DESCR	RIBE):		
HEATING MECHANISM:	INDIRECT	_	DIRECT				
MAX. FIRING RATE (MMBTU/HO	UR): 180						
		WOOD-	FIRED BURNE	R			
WOOD TYPE: ☐ BARK	☐ WOOD/BARK	✓ WET W		ORY WOOD	OTHER	(DESCRIBE):
PERCENT MOISTURE OF FUEL:	<u>~50%</u>						
	CONTROLLE	D WITH FLYA	ASH REINJECTION	V	CONTROLLED	W/O REINJE	CTION
FUEL FEED METHOD: N/A		HEAT TRANSF	FER MEDIA:]STEAM ☑ AIR	OTHER (DI	ESCRIBE)_	
		COAL-I	FIRED BURNER	₹			
TYPE OF BOILER	IF OTHER DESCR	RIBE:					
PULVERIZED OVERFEED STOKER UNDERFEED STOKER				RSTOKER	FLUIDIZED) BED	
☐ WET BED ☐ UNCONTROLI	LED UNCONTROI	LLED	UNCONTRO	DLLED	CIRCULA	TING	
☐ DRY BED ☐ CONTROLLED	CONTROLLE	ED .	☐ FLYASH RE	INJECTION	RECIRCU	JLATING	
			☐ NO FLYASH	REINJECTION			
		OIL/GAS	-FIRED BURNE	ER			
TYPE OF BOILER: UTILITY INDUSTRIAL COMMERCIAL INSTITUTIONAL							
TYPE OF FIRING:		ENTIAL	LOW NOX BU		NO LOW NOX E	BURNER	
		OTHER FU	EL-FIRED BUR	NER			
TYPE(S) OF FUEL:			_	_			
TYPE OF BOILER:	ITILITY INDU	STRIAL	COMMERCIA		INSTITUTIONAL	-	
TYPE OF FIRING:		CONTROL(S)			•		
	FUEL USAG	SE (INCLUE	DE STARTUP/B	Ī	,	IEOTED OAE	A OUTLY
FUEL TV/DE	LINUTO		MAXIMUM DESIG			JESTED CAP	
FUEL TYPE	UNITS		CAPACITY (UNIT/	HR)	LIMI	FATION (UNI	1/HR)
EI	JEL CHARACTERI	STICS (CO	MDIETE ALL T	TUAT ADE AD	DI ICADI EV		
FU	JEL CHARACTERI	·	PECIFIC	SULFUR CONT		ASH CON	TENT
FUEL TYPE	<u>.</u>		CONTENT	(% BY WEIGI		(% BY WE	
				0.011	111)	(70 10 1 10 1	
Bark/Wet Wo)0a	Nomina	l 4,200 BTU/lb	0.011			
COMMENTS:				1			
OCIVIIVILIVI O.							

	DEQ/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	IES-DDB-1 th	rough IES-D	DB-4	
Dryer double duct burners				CONTROL DEVICE ID NO(S): None					
OPERATING SCENARIO 1	OF	<u>1</u>				K) ID NO(S):	N/A		
DESCRIBE IN DETAILTHE EMISSION	SOURCE PROC	ESS (ATTAC	H FLOW DIA			, - ()	'		
Each dryer system will include double burners will reduce condensation buil rated at 1 MMBtu/hr each. The double	ducts which wil d-up in the duct	l be heated by s, thereby red	four double ucing the ris	duct burners k of fire. The	double duct	burners will l	oe low NOX b	ourners	
TYPE OF EMISSION SOU	•	ND COMPLET	TE APPROPE	RIATE FORM	B1-B9 ON T	HE FOLLOWI	NG PAGES)	:	
└॔ Coal,wood,oil, gas, other burner (Fo	rm B1)	Woodwo	rking (Form E	34)	Manuf	of chemicals	coatings/inks/	(Form B7)	
Int.combustion engine/generator (Fo	orm B2)	Coating/f	inishing/printi	ing (Form B5)) Inciner	ation (Form B	8)		
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo	rm B6)	Other	(Form B9)			
START CONSTRUCTION DATE:		DATE MANU	JFACTURED:	:					
MANUFACTURER / MODEL NO.:			EVENTED	00.0011501	" F 04 1	ID/DAY =	D.43/04/1/		
IO THE COLUDER OF BEAT TO	NODO (OLIDDA	TOO)	EXPECTED			IR/DAY <u>7</u>	_ DAY/WK _	<u>52</u> _ WK/YF	
	NSPS (SUBPAR				HAP (SUBPAI	,			
PERCENTAGE ANNUAL THROUGHPU				5% JUN-AL		SEP-NOV 25			
CRITERIA A	AIR POLLUT				NFORTH				
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTROLS / LIMITS)		
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	1 Calculation	s in Appendix	x 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 (\	/OC)								
LEAD									
OTHER									
HAZARDOUS	AIR POLLU	TANT EMIS	SSIONS IN	IFORMATI	ON FOR T	HIS SOUR	CE		
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTROLS / LIMITS)		
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	1 Calculation	s in Appendix	k C	,			
				1				1	
TOXIC AII	R POLLUTAI	NT EMISSIO	ONS INFO	RMATION	FOR THIS	SOURCE			
		OF				AFTER CONT	TROLS / LIMI	TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lb	/hr	lb/	day	lb	/yr	
		See Emission	1 Calculation	s in Appendix	x C				
Attachments: (1) emissions calculations and s	supporting docume	ntation: (2) indica	ate all requeste	d state and fed	eral enforceable	e permit limits (e	a. hours of one	eration.	
emission rates) and describe how these are n		,	•						

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

REVISED 09/22/16	NC	DEQ/Division of A	Air Quality - A	pplication for Air	Permit to Constru	uct/Operate	Э	B1	
EMISSION SOURCE DESC	RIPTION:			EMIS	SSION SOURCE IE	NO: IES	S-DDB-1 through	h IES-DDB-4	
Dryer double duct burners					ITROL DEVICE ID			-	
OPERATING SCENARIO:	1_	OF	1	EMIS	SSION POINT (STA	ACK) ID NO	O(S): N/A		
DESCRIBE USE: ✓PI	ROCESS H	EAT	SPACE HEAT	Γ [ELECTRICAL G	SENERATIO	DN		
С	UOUNITNC	s use	STAND BY/EI	MERGENCY [OTHER (DESC	RIBE):			
HEATING MECHANISM:		NDIRECT	✓] DIRECT					
MAX. FIRING RATE (MMB)	U/HOUR):	1							
WOOD-FIRED BURNER									
WOOD TYPE: B	ARK 🗸] WOOD/BARK	☐ WET WO	OOD 🗆	DRY WOOD	o.	THER (DESCRIBI	Ξ):	
PERCENT MOISTURE OF	FUEL:								
UNCONTROL	LED	CONTROLLE	ED WITH FLYA	ASH REINJECTIO	N] CONTROL	LED W/O REINJ	ECTION	
FUEL FEED METHOD:			HEAT TRANSF	ER MEDIA:	STEAM AIF	₹ □ отні	ER (DESCRIBE) _		
			COAL-I	FIRED BURNE	R				
TYPE OF BOILER		IF OTHER DESCR	RIBE:						
PULVERIZED OVERFEED	STOKER	UNDERFEED	STOKER	SPREADE	ER STOKER	FLUI	DIZED BED		
☐ WET BED ☐ UNCON	TROLLED	UNCONTRO	LLED	UNCONTF	ROLLED	CIF	RCULATING		
☐ DRY BED ☐ CONTR	OLLED		ED	☐ FLYASH R	SH REINJECTION RECIRCULA				
				☐ NO FLYAS	SH REINJECTION				
			OIL/GAS	-FIRED BURN	IER				
TYPE OF BOILER: UTILITY INDUSTRIAL COMMERCIAL INSTITUTIONAL									
TYPE OF FIRING: NORMAL TANGENTIAL J LOW NOX BURNERS NO LOW NOX BURNER									
		1	OTHER FU	EL-FIRED BU	RNER				
TYPE(S) OF FUEL: <u>Nat</u>	_		RCENT MOIS	STURE:					
TYPE OF BOILER:	UTILI	Y L INDU	STRIAL	☐ COMMERC	IAL	INSTITUT	IONAL		
TYPE OF FIRING:D	<u>irect</u>		CONTROL(S)		None_	I 0\			
		FUEL USAG	SE (INCLUL		BACKUP FUE		DECLIFOTED OA	DA OLTI	
		LINUTO		MAXIMUM DES			REQUESTED CA		
FUEL TYPE		UNITS		CAPACITY (UNIT	/HR)		LIMITATION (UN		
Natural Gas or Propane		MMBtu		1.0			1.0		
	FUEL	CHARACTERI	STICS (CO	MPI FTF ALL	THAT ARE AF	PPI ICAR	I F\		
	TOLL	OTIAITAO I ETT	•	PECIFIC	SULFUR CON		ASH CON	NTENT	
FUE	TYPE			CONTENT	(% BY WEIG		(% BY WE		
Natu	ral Gas			20 Btu/scf		,	,		
	pane		·	00 Btu/gal	0.54 grains/1	00 ft ³			
	P		: =,c	2.2.2.7.8	July 1 grandy 1				
COMMENTS:					!				

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDEO	Q/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В		
EMISSION SOURCE DESCRIPTION:				EMISSION S	and 2					
Dried Wood Handling				CONTROL DEVICE ID NO(S): CD-DWH-BF-1, CD-DWH-BF-2						
OPERATING SCENARIO <u>1</u>	OF	1		EMISSION F	POINT (STAC	K) ID NO(S): I	EP-7 and EP-	21		
DESCRIBE IN DETAILTHE EMISSION SO	URCE PRO	CESS (ATTAC	CH FLOW DIA	AGRAM):	,	, , ,				
Dried Wood Handling (ES-DWH-1 and 2)		•		•	rs.					
	_ /2									
TYPE OF EMISSION SOURC	•									
Coal,wood,oil, gas, other burner (Form	,		rking (Form E	•		of chemicals/	•	(Form B7)		
Int.combustion engine/generator (Form Liquid storage tanks (Form B3)	B2)	_	inishing/printi silos/bins (Fo			ation (Form B Form B9)	8)			
START CONSTRUCTION DATE:		Storages	•	JFACTURED		roilli ba)				
START CONSTRUCTION DATE.			DATE MAIN	OF ACTORED	-					
MANUFACTURER / MODEL NO.:										
Bliss, Model 44-60 IS THIS SOURCE SUBJECT T NSI	PS (SUBPAR	TS2)·	EXPECTED		JLE: <u>24</u> H HAP (SUBPAF	R/DAY <u>7</u>	_ DAY/WK _	_ <u>52</u> _ WK/YR		
PERCENTAGE ANNUAL THROUGHPUT			MAR-MAY 3	-	•	SEP-NOV 25	0/2			
CRITERIA AIR	,			-			-			
CRITERIA AIIV	OLLOT	SOURCE OF		D ACTUAL	I	POTENTIAL				
	EMISSION			(DEEODE 001)		(AFTER CONTROLS / LIMITS)				
AIR BOLLUTANT EMITTED		FACTOR	lb/hr	ROLS / LIMITS)	(BEFORE CON	topo//r	Ib/hr	· · · · ·		
AIR POLLUTANT EMITTED				tons/yr		tons/yr	ID/III	tons/yr		
PARTICULATE MATTER (PM) PARTICULATE MATTER<10 MICRONS (PM)	\	See Emission	i Calculation:	s in Appenaix	T					
PARTICULATE MATTER<2.5 MICRONS (PM ₁₀)										
SULFUR DIOXIDE (SO2)										
NITROGEN OXIDES (NOx)										
CARBON MONOXIDE (CO)	21									
VOLATILE ORGANIC COMPOUNDS (VOC	رر									
LEAD										
OTHER HAZABDOUS A	ID DOLLI	TANT EMI	CCIONC IN	IEODMATI		THE SOLID	CE			
TIAZARDO03 A	IN FULLU	SOURCE OF	SSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL POTENTIAL EMISSIONS							
		EMISSION						ONTROLS / LIMITS)		
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	ROLS / LIMITS)	Ib/hr	,	Ib/hr	,		
HAZARDOUS AIR FOLLUTANT	CAS NO.	See Emission		tons/yr		tons/yr	ID/III	tons/yr		
		See Ellission	i Calculation	s III Аррениіл І	I					
TOXIC AIR I	ΡΟΙ Ι ΙΙΤΔΙ	NT FMISSI	ONS INFO	RMATION	FOR THIS	SOURCE				
TOXIO AINT	OLLOTA	JUU!\U L	0110 1111 0	MINATION	TOK TITIO	OOOROL				
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS		
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	Ib	/yr		
		See Emission	Calculation:	s in Appendix	с C					
Attachments: (1) emissions calculations and sup	porting docum	entation; (2) ind	icate all reques	sted state and f	ederal enforcea	ble permit limits	s (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.

EMISSION SOURCE (OTHER)

REVISED 09/22/16 NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/Ope	erate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO: ES	S-DWH-1 and 2	
Dried Wood Handling		CONTROL DEVICE ID NO(S):		DWH-BF-2
OPERATING SCENARIO:1 OF1		EMISSION POINT (STACK) ID	NO(S): EP-7 and E	P-21
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAN Dried Wood Handling (ES-DWH-1 and 2) will include drop points		rs to conveyors.		
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	ncess	MAX. DESIGN	REQUESTED	CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION	
			LIWITATION	ONTITUE
Dried Wood	ODT/hr	144		
MATERIALS ENTERING PROCESS - BATCH OPERAT	ΓΙΟΝ	MAX. DESIGN	REQUESTED	CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	NIT/BATCH)
		((1	,
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	/R)·		
,		·		
FUEL USED: N/A		IMUM FIRING RATE (MILLION		
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTE	D CAPACITY ANNUAL FUEL U	SE: N/A	
COMMENTS:				

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divis	ion of Air Quality -	<u>Applicatio</u>	n for Air	r Permit to	Construct/	Opera	ite		C1
CONTROL DEVICE ID NO: CD-DWH-BF-1	CONTROLS EMIS	SIONS FRO	M WHI	CH EMISS	SION SOURC	E ID I	NO(S): ES-E	OWH-1	
EMISSION POINT (STACK) ID NO(S): EP-7	POSITION IN SER	RIES OF CO	NTROL	S		NO.	1 OF	1 UNI	rs
OPERATING SCENARIO:									
<u>1</u> OF <u>1</u>		P.E. SEAL	REQUI	RED (PER	2q .0112)?	7	YES	\	10
DESCRIBE CONTROL SYSTEM: A bag filter will be utilized for emission control on Di	ried Wood Handling	goperation	s at the i	post drver	convevor fo	r Drve	er Line 1.		
ar oug meet win se demined for emission control of S	neu woou nunum.	5 operation	o ut the j	post aryer	conveyor to	2190	er zane 1		
POLLUTANTS COLLECTED:		PM		PM ₁₀	PM	I _{2.5}			
BEFORE CONTROL EMISSION RATE (LB/HR):									
CAPTURE EFFICIENCY:			<u></u>	~99.9	% <u>~9</u>	9.9	%	%	
CONTROL DEVICE EFFICIENCY:			%		<u> </u>		%	%	
CORRESPONDING OVERALL EFFICIENCY:			%		144		%	%	
EFFICIENCY DETERMINATION CODE:									
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):			on Calcu		Appendix C				
PRESSURE DROP (IN H_20): MIN: MAX: TBI BULK PARTICLE DENSITY (LB/FT ³): TBD	D GAUGE?	✓ YES INLET TEI	ADEBAT	NO NO	NAIN!		MAX TBD		
, ,	☑ GR/FT ³	OUTLET T		. ,			MAX TBD		
INLET AIR FLOW RATE (ACFM): 1,500	<u> </u>	FILTER O		<u> </u>		'	IVIAX IBD		
, , , ,	PER COMPARTMI		LIVAIII	INO TEIVII	LENGTH O	F BAG	(IN)· TBD		
	ACE AREA PER CA		(FT ²): T	ГВО	DIAMETER			BD	
TOTAL FILTER SURFACE AREA (FT ²): TBD	AIR TO CLOTH RA		((). 12		
DRAFT TYPE: INDUCED/NEGATIVE	FORCED/POSITIV			FILTER M	ATERIAL:		WOVEN	√ FEL	TED
DESCRIBE CLEANING PROCEDURES					F	PARTI	CLE SIZE D	DISTRIBUTI	ON
✓ AIR PULSE	SONIC				SIZE		WEIGHT	Г% С	JMULATIVE
☐ REVERSE FLOW	SIMPLE BAG COL	LAPSE			(MICRON	IS)	OF TOT	AL	%
☐ MECHANICAL/SHAKER ☐	RING BAG COLLA	APSE			0-1			Unknowi	1
OTHER:					1-10				
DESCRIBE INCOMING AIR STREAM:					10-25				
The air stream will contain wood dust particles.					25-50				
					50-100)			
					>100				
								TOTAL = 1	00
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHO	WING THE RELATION	ONSHIP OF	THE C	ONTROL I	DEVICE TO	ITS EI	MISSION S	OURCE(S):	
COMMENTS:									

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divis	ion of Air Quality -	Applicatio	n for Air	Permit to	Construct/	Operate	<u> </u>		C1
CONTROL DEVICE ID NO: CD-DWH-BF-2	CONTROLS EMIS	SIONS FRO	M WHI	CH EMISS	ION SOURC	CE ID N	O(S): ES-DWH	-2	
EMISSION POINT (STACK) ID NO(S): EP-21	POSITION IN SER	RIES OF CO	NTROL	S		NO.	1 OF	1 UNITS	
OPERATING SCENARIO:									
10F1		P.E. SEAL	REQUI	RED (PER	2q .0112)?	√ Y	ES	☐ NO	
DESCRIBE CONTROL SYSTEM: A bag filter will be utilized for emission control on Di	ried Wood Handling	goperation	s at the p	post dryer	conveyor fo	or Dryei	r Line 2.		
POLLUTANTS COLLECTED:		PM		PM ₁₀	PM	I _{2.5}		_	
BEFORE CONTROL EMISSION RATE (LB/HR):								_	
CAPTURE EFFICIENCY:		~99.9	<u></u>	~99.9	% ~99	9.9		%	
CONTROL DEVICE EFFICIENCY:			% _		%	%		%	
CORRESPONDING OVERALL EFFICIENCY:			% _		144	%		%	
EFFICIENCY DETERMINATION CODE:								_	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):			on Calcu	_	Appendix C			_	
PRESSURE DROP (IN H ₂ 0): MIN: MAX: TBI	D GAUGE?	✓ YES	4DEDAT	NO NO			IAV TDD		
BULK PARTICLE DENSITY (LB/FT³): TBD POLLUTANT LOADING RATE: 0.004 LB/HR	√ GR/FT ³	OUTLET TE					IAX TBD		
POLLUTANT LOADING RATE: 0.004 LB/HR INLET AIR FLOW RATE (ACFM): 2,500	3 3101 1	FILTER O				IV	IAN IBD		
` '	PER COMPARTME		ERATII	NG TEIMP	LENGTH OF	F BAG	(IN)· TRD		
	ACE AREA PER CA		(FT²)⋅ T	RD			G (IN.): TBD		
TOTAL FILTER SURFACE AREA (FT ²): TBD	AIR TO CLOTH RA		(1 1). 1	ВВ	DIAWETER	OI DA	O (IIV.). IBB		
DRAFT TYPE: INDUCED/NEGATIVE INDUCED/NEGATIVE	FORCED/POSITIV		F	FILTER MA	ATFRIAL ·	ΔN	/OVEN -	FELTED	
DESCRIBE CLEANING PROCEDURES			<u> </u>	12121111			LE SIZE DIST	<u> </u>	
✓ AIR PULSE	SONIC				SIZE	T	WEIGHT %	CUMULA	ATIVE
	SIMPLE BAG COL	LAPSE			(MICRON	IS)	OF TOTAL	%	
☐ MECHANICAL/SHAKER ☐	RING BAG COLLA				0-1	/		known	
OTHER:	Tanto Brito GOLLA	02			1-10				
DESCRIBE INCOMING AIR STREAM:					10-25				
The air stream will contain wood dust particles.					25-50				
					50-100)			
					>100				
							ТОТ	AL = 100	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHO	A/INC THE BELATIO	ONIGHID OF	THE C	ONTROL	DEVICE TO	ITC EM	ISSION SOLID	CE(8):	
COMMENTS:	WING THE RELATION	ONSHIP OF	THE	ONTROLL	DEVICE TO	II S EIVI	13310N 300K	CE(S).	

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O:	ES-PS-1 and	d -2	
Pellet Pre-Screeners 1 and 2				CONTROL D	DEVICE ID	N/A			
OPERATING SCENARIO 1	OF	1			POINT (STAC	K) ID NO(S): E	P-8 and EP-	-22	
DESCRIBE IN DETAILTHE EMISSION S	OURCE PROC	ESS (ATTACH	H FLOW DIA		(=	,			
The pre-screeners will screen chips: larg Mill Feed Silo. Emissions from the pre-sc	ge chips will be	sent to the Dr	y Hammermi	ills for furthe		Small chips wi	ll be sent to t	he Pellet	
TYPE OF EMISSION SOUR Coal,wood,oil, gas, other burner (Forn Int.combustion engine/generator (Forn Liquid storage tanks (Form B3) START CONSTRUCTION DATE:	n B1)	Woodwor Coating/fi	rking (Form E inishing/printi silos/bins (For	34) ng (Form B5)	☐Manuf. ☐Inciner. ☐Other (HE FOLLOWI of chemicals/ ation (Form Ba Form B9)	coatings/inks		
MANUFACTURER / MODEL NO.:			EXPECTED			R/DAY <u>7</u>	_DAY/WK _	_ <u>52</u> _ WK/YR	
	SPS (SUBPAR				IAP (SUBPAF				
PERCENTAGE ANNUAL THROUGHPUT				5% JUN-AU		EP-NOV 25%			
CRITERIA A	IR POLLUT				N FOR THI				
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	L EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	Calculations	in Appendix	С				
PARTICULATE MATTER<10 MICRONS (PI	M ₁₀)								
PARTICULATE MATTER<2.5 MICRONS (P	M _{2.5})								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (VC	C)								
LEAD									
OTHER									
HAZARDOUS	AIR POLLU	ITANT EMIS	SSIONS IN	IFORMATI	ON FOR T	HIS SOUR	CE		
		SOURCE OF	EXPECTE	EXPECTED ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CONTROLS / LIMITS)		(AFTER CONT	ROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	Calculations	in Appendix	С	,			
				1					
TOXIC AIR	POLLUTA	NT EMISSIC	ONS INFO	RMATION	FOR THIS	SOURCE			
		OF				AFTER CONT	ROLS / LIMI	TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lh	/hr	lh/	day	lh	/yr	
TOXIO AIR FOLLOTARI	CAS NO.	 		in Appendix		uay	ID	/ yı	
		Sec Emission	carcuiduulis	, iii appellulx					
Attachments (4)ii		totion: (0) ' "	to all reserve to the	Latata ===1 f = 1	rol onfere U	normalit limiti /	. have/	otion'	
Attachments: (1) emissions calculations and sup	pporting aocumen	ıtatıon, (2) indica	te all requested	state and fede	iai enforceable	permit limits (e.g	j. nours of oper	ation, 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.

EMISSION SOURCE ID NO: CONTROL DEVICE ID NO(S) EMISSION POINT (STACK) II nills for further reduction. So ttrol of particulates.	: N/A					
EMISSION POINT (STACK) I	D NO(S): EP-8 and EP-22					
nills for further reduction. S						
	nall chips will be sent to the Pellet					
	mail chips will be sent to the Pellet					
is of or pur ciculates.						
MAX. DESIGN	REQUESTED CAPACITY					
CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)					
144	N/A					
MAX. DESIGN	REQUESTED CAPACITY					
CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)					
₹):						
MUM FIRING RATE (MILLION	BTU/HR): N/A					
TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A UEL USE: N/A REQUESTED CAPACITY ANNUAL FUEL USE: N/A						
CAPACITY ANNUAL FUEL I						
	MAX. DESIGN CAPACITY (UNIT/BATCH)					

REVISED 09/22/16 NCDI	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ıct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID I	NO: IES-DLH			
Dry Line Hopper				CONTROL [DEVICE ID N	O(S): N/A			
OPERATING SCENARIO <u>1</u>	OF	1		EMISSION F	POINT (STAC	CK) ID NO(S):	EP-9		
DESCRIBE IN DETAILTHE EMISSION S	OURCE PRO	CESS (ATTAC	H FLOW DIA		,	, , ,			
Dry material is fed via front end loader in the Dry Line Conveyor (ES-DLC-1).	nto the dry lin	e hopper and	metered ont	to the convey	or belt. Drie	d wood mater	ials are trans	ferred to	
TYPE OF EMISSION SOUR	CE (CHECK V	ND COMBLE	TE ADDDODI	DIATE EODM	B1 B0 ON T	HE EOLI OW	ING DAGES		
Coal,wood,oil, gas, other burner (Form	•		rking (Form E						
Int.combustion engine/generator (Form	,	=	king (Form B4) Manuf. of chemicals/coatings/inks (Form B7) nishing/printing (Form B5) Incineration (Form B8)						
Liquid storage tanks (Form B3)	11 02)	_	silos/bins (Fo	• ,		(Form B9)	0)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED					
2014			2014						
MANUFACTURER / MODEL NO.:									
Enviva Built			EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	IR/DAY <u>7</u>	DAY/WK _	<u>52</u> WK/YF	
IS THIS SOURCE SUBJECT T(N	SPS (SUBPAF	RTS?):		_ NESH	HAP (SUBPA	RTS?):			
PERCENTAGE ANNUAL THROUGHPUT	, ,			5% JUN-AL		SEP-NOV 25			
CRITERIA AII	R POLLUTA	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	iis sourc	E		
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	c C				
PARTICULATE MATTER<10 MICRONS (PM	M ₁₀)								
PARTICULATE MATTER<2.5 MICRONS (P	M _{2.5})								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (VC	C)								
LEAD									
OTHER									
HAZARDOUS A	<u> IR POLLU</u>				ON FOR				
		SOURCE OF	EXPECTE	D ACTUAL	POTENTIAL EMISS			i	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	n Calculation	s in Appendix	C C				
TOYIO AID	DOLLUTA.	IT FMICOL		DIATION	FOR THE	COUDOE			
TOXIC AIR	POLLUTAI	T EMISSI	UNS INFO	<u>RMA HON</u>	FOR THIS	SOURCE			
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIMI	TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb	/day	lb	/yr	
		See Emission	n Calculation	s in Appendix	c C				
Attachments: (1) emissions calculations and su emission rates) and describe how these are mo									

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Dry material is fed via front end loader into the dry line hopper and m	EMISSION SOURCE ID NO: IES-DLH CONTROL DEVICE ID NO(S): N/A	
OPERATING SCENARIO: OF DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Dry material is fed via front end loader into the dry line hopper and m	CONTROL DEVICE ID NO(S): N/A	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Dry material is fed via front end loader into the dry line hopper and m	· · · · · · · · · · · · · · · · · · ·	
Dry material is fed via front end loader into the dry line hopper and m	EMISSION POINT (STACK) ID NO(S): EP-9	
the Dry Line Conveyor (ES-DLC-1).	etered onto the conveyor belt. Dried wood materials are tra	ansferred to
MATERIAL O ENTERNIA PROGRAM CONTINUO DE CO	MAY DEGICAL DEGLISOTED	OADAOIT)/
MATERIALS ENTERING PROCESS - CONTINUOUS PROCES		
	JNITS CAPACITY (UNIT/HR) LIMITATION(L	JNII/HR)
Dried Wood Materials C	DT/yr 781,255 N/A	
MATERIALS ENTERING PROCESS - BATCH OPERATION	MAX. DESIGN REQUESTED	CAPACITY
TYPE	INITS CAPACITY (UNIT/BATCH) LIMITATION (UN	IIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):		
	TCHES/YR):	
	TAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A RECOMMENTS:	QUESTED CAPACITY ANNUAL FUEL USE: N/A	

REVISED 09/22/16	NCDEQ/Division of	Air Quality -	Application f	or Air Permi	to Construc	t/Operate		В
EMISSION SOURCE DESCRIPTION	l:			EMISSION S	SOURCE ID N	ES-NDS		
Nuisance Dust System				CONTROL (CD-HM-BF- 1,CD-RCO-1	•	
OPERATING SCENARIO	1 OF	1			POINT (STAC	K) ID NO(S)	EP-9	
DESCRIBE IN DETAILTHE EMISSION	ON SOURCE PROC	ESS (ATTAC	H FLOW DIA	GRAM):				
Dry material is fed via front end loa pulls PM from the Dry Hammermill screen infeed system as well as emis	Area and routes to	a baghouse. I	Emissions fro	m the transfe	r of the mate	rial from thi	s conveyor be	elt to the pre-
screen infeed system as wen as emis	ssions if our the fluis	sance inic ai c	conti oneu us	ing the existi	ng nammern	iiii bagiibuse	(CD-IIM-DI-	J).
TYPE OF EMISSION SO	OURCE (CHECK A	ND COMPLET	E APPROPR	IATE FORM	B1-B9 ON TH	IE FOLLOW	ING PAGES)	:
Coal,wood,oil, gas, other burner ((Form B1)	Woodwo	rking (Form E	34)	Manuf	of chemical	s/coatings/ink	s (Form B7)
Int.combustion engine/generator	(Form B2)	Coating/f	inishing/printi	ng (Form B5)	Inciner	ation (Form	B8)	
Liquid storage tanks (Form B3)		√ Storage :	silos/bins (For	m B6)	Other	(Form B9)		
START CONSTRUCTION DATE:			1	JFACTURED:				
2014			2014					
MANUFACTURER / MODEL NO.:								
Enviva Built	1		EXPECTED	OP. SCHEDU			DAY/WK	<u>52</u> _ WK/Y
IS THIS SOURCE SUBJECT TC	NSPS (SUBPAR	,			HAP (SUBPA			
PERCENTAGE ANNUAL THROUGH	\ /		MAR-MAY 25			EP-NOV 25		
CRITERIA	A AIR POLLUTA				FOR THI			
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	3
		EMISSION	,	ROLS / LIMITS)	,	ROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix C							
PARTICULATE MATTER<10 MICRON	,							
PARTICULATE MATTER<2.5 MICRO	NS (PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS	S (VOC)							
LEAD								
OTHER		<u> </u>						
HAZARDO	US AIR POLLU	TANT EMIS	SSIONS IN	FORMATIO	ON FOR TH	HIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL	ACTUAL POTENTIAL			3
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CONT	ROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	1 Calculations	in Appendix	С			
TOXIC /	AIR POLLUTAN	IT EMISSIC	<u>ONS INFOR</u>	<u>RMATION I</u>	FOR THIS	<u>SOURCE</u>		
		OF	FXPECTI	ED ACTUAL I	-MISSIONS A	AFTER CON	TROLS / LIM	ITATIONS
		EMISSION						
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/d	day	lb	/yr
		See Emission	n Calculations	s in Appendix	С			
Attachments: (1) emissions calculations an	nd supporting documen	tation: (2) indica	ite all requested	state and fede	ral enforceable	nermit limits (a hours of one	eration

	Application 1	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	ES-NDS	
Nuisance Dust System		CONTROL DEVICE CD-HM-ID NO(S): RCO-1		
OPERATING SCENARIO:1 OF1		EMISSION POINT (STACK) I	D NO(S): EP-9	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM Dry material is fed via front end loader into a feed hopper (IES-DI pulls PM from the Dry Hammermill Area and routes to a baghouse pre-screen infeed system as well as emissions from the nuisance I	LH) and meter e. Emissions	from the transfer of the mater	ial from this convey	or belt to the
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	CESS	MAX. DESIGN	REQUESTED	CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(
Dried Wood Materials	ODT/yr	781,255	N/A	,
MATERIALS ENTERING PROCESS - BATCH OPERAT TYPE	TION UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED LIMITATION (U	
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	YR):		
FUEL USED: N/A	TOTAL MAX	IMUM FIRING RATE (MILLION	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A	†	D CAPACITY ANNUAL FUEL		
COMMENTS:				

REVISED 09/22/16 NO	CDEQ/Division of	Air Quality -	Application f	or Air Permi	t to Construc	t/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	ES-DLC-1			
Dry Line Feed Conveyor				CONTROL (N/A			
OPERATING SCENARIO 1	L OF	1			POINT (STAC		EP-23		
DESCRIBE IN DETAILTHE EMISSION		ESS (ATTAC	H FLOW DIA		01111 (01710	110(0)	. Li 20		
Dry material is fed via front end load		•		•	veyor belt (E	S-DLC-1).			
TYPE OF EMISSION SOI	URCE (CHECK A	ND COMPLET	E APPROPR	IATE FORM	B1-B9 ON TH	E FOLLOW	ING PAGES)	:	
Coal,wood,oil, gas, other burner (F	orm B1)	Woodwo	rking (Form B	34)	Manuf	. of chemical	s/coatings/ink	s (Form B7)	
Int.combustion engine/generator (F	orm B2)	Coating/f	finishing/printi	ng (Form B5)	Incine	ration (Form	B8)		
Liquid storage tanks (Form B3)		√ Storage :	silos/bins (For	m B6)	√ Other	(Form B9)			
START CONSTRUCTION DATE:				JFACTURED					
2014			2014						
MANUFACTURER / MODEL NO.: Enviva Built			EXPECTED	OP. SCHEDI	JLE: <u>24</u> +	IR/DAY 7	DAY/WK	<u>52</u> WK/Y	
IS THIS SOURCE SUBJECT TC	NSPS (SUBPAR	RTS?):		NESH	HAP (SUBPA	RTS?):		<u>———</u>	
PERCENTAGE ANNUAL THROUGHP	PUT (%): DEC-FEI	B 25 % N	MAR-MAY 25	5% JUN-AU	G 25% S	EP-NOV 25	%		
CRITERIA	AIR POLLUTA	ANT EMISS	IONS INFO	DRMATION	N FOR THI	S SOURC	E		
		SOURCE OF EXPECTED ACTUAL				POTENTIA	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTROLS / LIMITS)		
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculations	in Appendix	C				
PARTICULATE MATTER<10 MICRONS	(PM ₁₀)								
PARTICULATE MATTER<2.5 MICRONS	S (PM _{2.5})								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS ((VOC)								
LEAD									
OTHER									
HAZARDOU	S AIR POLLU	TANT EMIS	SSIONS IN	FORMATIC	ON FOR TI	HIS SOUR	CE		
		SOURCE OF	EXPECTE	D ACTUAL	CTUAL POTENTIAL EN			 }	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	n Calculations	in Appendix	C				
TOXIC A	IR POLLUTAN	IT EMISSIC	ONS INFOR	RMATION	FOR THIS	SOURCE			
		OF	EXPECT	ED ACTUAL	EMISSIONS A	AFTER CON	TROLS / LIM	ITATIONS	
		EMISSION	L/(1 LOT)	LD / (O T O/ LE	LIVIIOOIOITO	W TEN CON	TROLO / LIM	117(110110	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/d	day	lb	/yr	
		See Emission	n Calculations	in Appendix	<u>C</u>				
Attachments: (1) emissions calculations and	supporting documen	tation; (2) indica	ite all requested	state and fede	ral enforceable	permit limits (e	e.g. hours of op	eration,	

EMISSION SOURCE DESCRIPTION					
	ON:		EMISSION SOURCE ID NO:	ES-DLC-1	
Dry Line Feed Conveyor			CONTROL DEVICE ID NO(S): N/A		
OPERATING SCENARIO:	_ <u>1</u> OF _	1	EMISSION POINT (STACK) I	D NO(S): EP-9	
DESCRIBE IN DETAIL THE PROC Dry material is fed via front end l			red onto the conveyor belt (ES	S-DLC-1).	
MATERIALS ENTERING I	PROCESS - CONTI	NUOUS PROCESS	MAX. DESIGN	REQUESTED	CAPACITY
TYI		UNITS	CAPACITY (UNIT/HR)	LIMITATION(
Dried Wood Materials		ODT/yr	781,255	N/A	,
MATERIALS ENTERING			MAX. DESIGN	REQUESTED	
TYI	PE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UI	NIT/BATCH)
MAXIMUM DESIGN (BATCHES / I	HOUR).	<u> </u>			
REQUESTED LIMITATION (BATC	,	(BATCHES/	√R)·		
· · · · · · · · · · · · · · · · · · ·	511267 11661ty.		IMUM FIRING RATE (MILLION	ALDTII/UD\- N/A	
FUEL USED: N/A MAX. CAPACITY HOURLY FUEL	IISE: N/A		D CAPACITY ANNUAL FUEL I		
	USE. N/A	INLQUESTE	D CAFACITT ANNOAL FUEL	USE. N/A	

REVISED 09/22/16	NCDEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: ES-HM-1 tl	nrough ES-HI	и-8
Eight (8) Dry Wood Hammermills				CONTROL [DEVICE ID NO	O(S): CD-HM-C	CYC-1 through	h CD-HM-CYC
						D-HM-BF-3, CI		.CO-1
	1OF_	1			POINT (STAC	K) ID NO(S): I	:P-9	•
DESCRIBE IN DETAILTHE EMISSIO		•		•	J 1	1.		
Dried materials are reduced to appro	opriate size neede	u tor penetizn	ng using eigni	. (8) ary woo	u nammermii	is.		
TYPE OF EMISSION SO	•						•	
Coal,wood,oil, gas, other burner (I	,		rking (Form B	· ·		of chemicals/	•	(Form B7)
Int.combustion engine/generator (Form B2)	_	inishing/printi	• ,		ation (Form B	3)	
Liquid storage tanks (Form B3) START CONSTRUCTION DATE:		Storage	silos/bins (For	m во) JFACTURED:	Other (Form B9)		•
2012			2012	IFACTURED.				
			2012					
MANUFACTURER / MODEL NO.: Bliss, Model 44-60			EXPECTED	OP SCHEDI	∥ F · 24. H	R/DAY <u>7</u>	DAY/WK	52 WK/YR
IS THIS SOURCE SUBJECT T(NSPS (SUBPAR	TS2)·	LXI LOTED		IAP (SUBPAF			_ <u>JZ_</u> _ WIN/ IIX
PERCENTAGE ANNUAL THROUGH			MAR-MAY 2:	-	`	EP-NOV 25%	<u> </u>	
	A AIR POLLUT							
O.M. I.I.M.	1711111 022011	SOURCE OF	+	D ACTUAL			EMISSIONS	
			EMISSION (AFTER CONTROLS / LIMITS)			TROLS / LIMITS)		ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			Calculations			torio/yi	10/111	toris/yi
PARTICULATE MATTER (10 MICRON:	S (PM)	See Emission	Carculations	ПАРРСПИІХ	Ī			
PARTICULATE MATTER<2.5 MICRON	107							
SULFUR DIOXIDE (SO2)	10 (1 W _{2.5})							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS	(\(\(\cdot \) \(\cdot \)							
LEAD	(000)							
OTHER								
	US AIR POLLU	ITANT EMI	NI SNOISS	IFORMATI	ON FOR T	HIS SOLID	CF	
TIALARDO	T TOLLE	SOURCE OF		D ACTUAL	I			
		EMISSION		ROLS / LIMITS)	(DEEODE CON	POTENTIAL TROLS / LIMITS)		ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr
TIAZANDOUS AIN FULLUTANT	CAS NO.	+	Calculations			torio/yi	ID/III	toris/yi
		See Emission	Carculations	ПАРРСПИІХ	Ī			
TOXIC	AIR POLLUTAI	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
10,4107	1	JUUNUL						
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS .	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr
		+	Calculations				1.0	, , , .
		occ zmiooici			<u> </u>			
					<u> </u>			
					<u> </u>			
Attachments: (1) emissions calculations and	d supporting documen	ntation: (2) indica	ate all requester	state and fede	eral enforceable	permit limits (a	a, hours of one	ration.
emission rates) and describe how these are								

EMISSION SOURCE (OTHER)

В9

REVISED 09/22/16	NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/Op	erate	B9	
EMISSION SOURCE DESCRIPT			EMISSION SOURCE ID NO: I	ES-HM-1 through ES-	нм-8	
Eight (8) Dry Wood Hammermill	s		CONTROL DEVICE ID NO(S) 8, CD-HM-BF-1 through CD-H			
OPERATING SCENARIO:	<u>1</u> OF <u>1</u>	_	EMISSION POINT (STACK) II	O NO(S): EP-9		
	CESS (ATTACH FLOW DIAGRAM) ppropriate size needed for pelletiz		ht (8) dry wood hammermills.			
MATERIALS ENTERING	PROCESS - CONTINUOUS PROC	CESS	MAX. DESIGN	REQUESTED	CAPACITY	
T	YPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)	
Dried Wood		ODT/hr	144	N/A		
MATERIAL S ENTERIN	IG PROCESS - BATCH OPERATI	ON	MAX. DESIGN	REQUESTED	CADACITY	
	YPE	UNITS	CAPACITY (UNIT/BATCH)			
		ONTO	OALAGITT (GIVIT/BATOTT)	LIMITATION (UNIT/BATCH)		
MANUALINA DECICAL (DATOLIEC /	HOLID):					
MAXIMUM DESIGN (BATCHES / REQUESTED LIMITATION (BAT	<u> </u>	(BATCHES/\	/D):			
	oneo / noorg.			I DTI I (I I I D)		
FUEL USED: N/A MAX. CAPACITY HOURLY FUEL	LICE. N/A		IMUM FIRING RATE (MILLION			
	. USE: N/A	REQUESTE	D CAPACITY ANNUAL FUEL L	JSE: N/A		
COMMENTS:						

CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 09/22/16	NCDEQ/Div	ision of Air Quality - Ap	oplication for Air Pe	ermit to Construc	t/Operate		C4
CONTROL DEVICE ID NO: CD-H HM-CYC-8	M-CYC-1 through CD-	CONTROLS EMISSIO	NS FROM WHICH E	MISSION SOURC	CE ID NO(S): ES-H	M-1 through ES-HM-8	3
EMISSION POINT (STACK) ID N	O(S): EP-9	POSITION IN SERIES	OF CONTROLS	NO.	1 OF	4 UNITS	
OPERATIN	IG SCENARIO:						
1	OF <u>1</u>	P.E. SE	AL REQUIRED (PE	R 2Q .0112)?	✓ YES	□ NO	
One cyclone is equipped for each	n dry hammermill to c	apture bulk PM emissio	ons. The emissions	from the cyclones	are then routed t	o one of three bagfilt	ers.
POLLUTANT(S) COLLECTED:		PM	PM ₁₀	PM _{2.5}		_	
BEFORE CONTROL EMISSION	RATE (LB/HR):		_	144			
CAPTURE EFFICIENCY:			98 % 98	% 98	.%	%	
CONTROL DEVICE EFFICIENC	/ :		%		.%	%	
CORRESPONDING OVERALL E	FFICIENCY:		%		%	%	
EFFICIENCY DETERMINATION	CODE:					_	
TOTAL AFTER CONTROL EMIS	SION RATE (LB/HR):	See Emi	ssion Calculations i	n Appe <u>ndix C</u>	<u> </u>	_	
PRESSURE DROP (IN. H ₂ 0):	MIN	<u>6"</u> MAX					
INLET TEMPERATURE (°F):	MIN	_Ambient_ MAX	OUTLET TEMPE	RATURE (°F):	MIN	_Ambi	ent_ MAX
INLET AIR FLOW RATE (ACFM)	: 15,000 (each)		BULK PARTICLE	DENSITY (LB/FT	³): 1.43E-03		
POLLUTANT LOADING RATE (G	SR/FT ³): 10 (inlet)						
SETTLING CHAMBER		CYCLON	IE			MULTICYCLONE	
LENGTH (INCHES):	INLET VELOCITY (F	T/SEC): 114.65	☑circular [RECTANGLE	NO. TUBES:		
WIDTH (INCHES):	DIMENSIONS (IN	CHES) See instructions	IF WET SPR	AY UTILIZED	DIAMETER OF	TUBES:	
HEIGHT (INCHES):	H: 60"	Dd: 20 "	LIQUID USED:		HOPPER ASPIR	ATION SYSTEM?	
VELOCITY (FT/SEC.):	W: 32.25"	Lb: 60 "	FLOW RATE (GR	PM):	YES		
NO. TRAYS:	De: 45"	Lc: 120"	MAKE UP RATE	(GPM):	LOUVERS?		
NO. BAFFLES:	D: 96 "	S: 64.75"			☐ YES	□ NO	
	TYPE OF CYCLONE	: CONVENTIONAL	☐ HIGH EFF	FICIENCY	OTHER		
DESCRIBE MAINTENANCE PRO					PARTICLE S	SIZE DISTRIBUTION	
Periodic inspection of mechanic manufacturer.	al integrity during pla	int outages as specified	by the	SIZE	WEIGHT %	CUMU	LATIVE
				(MICRONS)	OF TOTAL	C	<u> </u>
DESCRIBE INCOMING AIR STR The material will be pulled thro		negative pressure. The	e cyclone will	0-1		Unknown	
separate the material from the a	ir stream and the air	will discharge to an ass	ociated bag filter	1-10			
prior to being discharged to the area.	atmosphere via a disc	aharge stack common t	to all filters in this	10-25			
ui cu.				25-50			
				50-100			
				>100			
						TOTAL = 100	
DESCRIBE ANY MONITORING I			HE CONTROL DE	VICE TO ITS EMIS	SION SOI IPCE/S)·	
ON A SEPARATE PAGE, ATTAC	OF THE	E KELATIONSHIP OF I	HE CONTROL DEV	ICE TO ITS EMIS	SION SOURCE(S	J-	

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16	NCDEQ/Divisi	on of Air Quality -	Application	n for A	ir Permit to	Cons	struct/Oper	ate			C1
CONTROL DEVICE ID NO: CD-HM-BF- HM-BF-3	1 through CD-	CONTROLS EMIS	SIONS FR	OM WE	HICH EMISS	SION S	SOURCE ID	NO(S): I	ES-HM-1 t	hrough ES-HM	-8, ES-NDS
EMISSION POINT (STACK) ID NO(S):	EP-9	POSITION IN SER	RIES OF CO	ONTRO	LS**		NO.	2 C)F 4	UNITS (ES-HI	M-1 to 8)
	•	POSITION IN SER	RIES OF CO	ONTRO	LS**		NO.	1 0)F 3	UNITS (ES-NI	DS)
OPERATING S	CENARIO:										
<u>1</u> OF	<u>1</u>		P.E. SEAI	L REQL	JIRED (PER	R 2a .0	112)? 🗸	YES		NO NO	
DESCRIBE CONTROL SYSTEM: Three (3) bag filters will be utilized for BF-1, Hammermills 4 and 5 vent throu **Dry Hammermills ES-HM-1 through 1 filters (CD-HM-BF-1 through 3). Refer	gh CD-HM-BF-2 ES-HM-8, ES-DS	, and emissions fro HM-1 and 2, and ES	hammern m Hamme G-NDS will a	nill cycl rmills 7	ones and tw 7 and 8 vent routed to th	vo (2) it to the	Dry Shavin CD-MH-BF scrubber (gs Hamm 7-3 along	with the	Nuisance Dust	System (ES-NDS).
POLLUTANTS COLLECTED:			PM	-	PM ₁₀	-	PM _{2.5}	_		-	
BEFORE CONTROL EMISSION RATE	(LB/HR):			-		-				-	
CAPTURE EFFICIENCY:			~99.9	_%	~99.9	%	~99.9	<u> </u>		<u></u> %	
CONTROL DEVICE EFFICIENCY:				_%		%		<u></u>		-%	
CORRESPONDING OVERALL EFFICIE	ENCY:			_%		<u></u> %		<u></u>		%	
EFFICIENCY DETERMINATION CODE	i:			-		•				-	
TOTAL AFTER CONTROL EMISSION I			ion Cal	culations in	Appe	ndix C	_		-		
PRESSURE DROP (IN H ₂ 0): MIN:	MAX: 6"	GAUGE?	✓ YES		NO						
BULK PARTICLE DENSITY (LB/FT³): 1		□ OD/FT ³		NLET TEMPERATURE (°F): MIN MAX 120 DUTLET TEMPERATURE (°IMIN MAX 100							
POLLUTANT LOADING RATE: 0.004		√ GR/FT ³						MAX 10	00		
INLET AIR FLOW RATE (ACFM): 45,00				PERAT	ING TEMP	` ′					
		PER COMPARTM		2			STH OF BA				
		ACE AREA PER CA		. ,		DIAM	ETER OF E	BAG (IN.)	: 5.75		
TOTAL FILTER SURFACE AREA (FT²)		AIR TO CLOTH RA									
DRAFT TYPE: INDUCED/NEG		FORCED/POSITIV	/E		FILTER M	ATERI	IAL:	WOVEN		FELTED	
DESCRIBE CLEANING PROCEDURES	;									SIZE DISTRIB	UTION
AIR PULSE		SONIC				SIZE WEIGHT %			GHT %		CUMULATIVE
✓ REVERSE FLOW		SIMPLE BAG COL	LAPSE			(MI	ICRONS)	OF 1	ΓΟΤΑL		%
☐ MECHANICAL/SHAKER		RING BAG COLLA	APSE			0-1				Unkno	own
OTHER:							1-10				
DESCRIBE INCOMING AIR STREAM: The air stream contains wood dust par	utialaa Tausauu						10-25				
for product recovery.	ucies. Larger p	articles are remov	ea by the t	ipstrea	m cyclone		25-50				
•						ţ	50-100				
							>100				
										TOTAL	= 100
ON A SEPARATE PAGE, ATTACH A D	IAGRAM SHOV	VING THE RELATION	ONSHIP O	F THE	CONTROL	DEVIC	E TO ITS E	MISSIO	N SOURC	E(S):	
COMMENTS:											

FORM C8 CONTROL DEVICE (WET PARTICULATE SCRUBBER)

REVISED 09/22/16 NCDEO	//Division of Ai	r Quality -	Application	for Air	Permit t	to Co	nstru	ict/Op	erate		C8
CONTROL DEVICE ID NO: CD-WS-1	CONTROLS E		FROM WHI	CH EMI	ISSION	SOUF	RCEI	D NO	(S): ES-HM	I-1 thro	ugh ES-HM-8, ES-DSHM-1 and ES-
EMISSION POINT ID NO(S): EP-9	POSITION IN	SERIES OI	F CONTROL	S:	NO.	3	OF	4	UNITS	(ES-HI	M-1 through 8)
	POSITION IN	SERIES OI	F CONTROL	S:	NO.	2	OF	3	UNITS	(ES-N	DS)
	POSITION IN	SERIES OI	F CONTROL	S:	NO.	1	OF	2	UNITS	(ES-D	SHM-1 and 2)
OPERATING SCENARIO:											
1 OF1		P.E. SEAL	NEEDED (P	ER 2Q	.0112)?	4	YE	S		NO	
DESCRIBE CONTROL SYSTEM: After leaving the bag filters (CD-HM-BF-1 throu Nuisance Dust System (ES-NDS) will also be rou								gh 8),	Dry Shav	ings Hai	mmermills (ES-DSHM-1 and 2), an
POLLUTANT(S) COLLECTED:			PM		PM	10			PM _{2.5}	_	
BEFORE CONTROL EMISSION RATE (LB/HR):		_					_			_	
CAPTURE EFFICIENCY:			~99.9	%	~99	9.9	%		~99.9	%	
CONTROL DEVICE EFFICIENCY:		_		 144			- %			- %	
CORRESPONDING OVERALL EFFICIENCY:		_		-			- %			- %	
EFFICIENCY DETERMINATION CODE:		-					_				
TOTAL AFTER CONTROL EMISSION RATE (L	3/HR):	<u>-</u>					_			_	
PRESSURE DROP (IN. H ₂ 0): <u>TBD</u>	MAX										
INLET TEMPERATURE (°F): <u>TBD</u>	MAX	OUTLET 1	ΓΕΜΡΕRATU	IRE (°F	TE	BD	MIN		<u>TBD</u> N	1AX	
INLET AIR FLOW RATE (ACFM): TBD		MOISTUR	E CONTENT	: INLE	T	TBD_	_	OU'	TLET	ГВD	_
THROAT VELOCITY (FT/SEC): TBD		THROAT	TYPE:		FIXED] VA	RIABLE		
TYPE OF SYSTEM TBD		TYPE OF	PACKING US	SED IF	ANY: <u>TI</u>	<u>BD</u> _					
ADDITIVE LIQUID SCRUBBING MEDIUM: TBD		PERCENT	RECIRCULA	ATED: 7	TBD						
MINIMUM LIQUID INJECTION RATE (GAL/MIN)	: TBD										
, ,	R ADDITIVE (G	AL/MIN): 1	BD								
DESCRIBE MAINTENANCE PROCEDURES:										SIZE DI	ISTRIBUTION
						SIZE CRON	IS)		EIGHT % F TOTAL		CUMULATIVE %
						0-1					
DESCRIBE ANY MONITORING DEVICES, GAU	GES, TEST PO	RTS, ETC:				1-10 10-25		_			
				ŀ		25-50		-			
				1		0-100		+			
				ľ	;	>100					
				ľ				ТО	TAL = 100)	
ATTACH A DIAGRAM OF THE RELATIONSHIP COMMENTS:	OF THE GONT	NOL DEVI	00 101131	WIGGIC		NOE(

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 NCDEQ/Division	of Air Qu	ality - Applicat	tion for Air Permit to C	Construct/Ope	rate			C3
AS REQUIRED BY 15A NCAC 2Q .0	112, THIS	FORM MUST I	BE SEALED BY A PRO	DFESSIONAL I	ENGIN	EER (P.E	.) LICE	NSED IN NORTH CAROLINA.
CONTROL DEVICE ID NO: CD-RCO-1	CONTRO NDS	LS EMISSIONS	S FROM WHICH EMIS	SION SOURCE	E ID NO)(S): ES-H	M-1 th	rough ES-HM-8, ES-DSHM-1 and ES-DSHM-2, ES-
EMISSION POINT (STACK) ID NO(S): EP-9	POSITIO	N IN SERIES O	F CONTROLS	NO.	_4_	OF	4_	_ UNITS (ES-HM-1 through 8)
	POSITIO	N IN SERIES O	F CONTROLS	NO.	_3_	OF	3	_ UNITS (ES-NDS)
	POSITIO	N IN SERIES O	F CONTROLS	NO.	2	OF _ <u>2</u>	UN	ITS (ES-DSHM-1 and 2)
MANUFACTURER: TBD		MODEL NO: T	BD					
OPERATING SCENARIO:								
<u>1</u> 0F <u>1</u>								
TYPE AFTERBURNER REGENERATIVE TI	HERMAL C	XIDATION [RECUPERATIVE TH	IERMAL OXIDA	ATION	✓ CAT	ALYTIC	OXIDATION
EXPECTED LIFE OF CATALYST (YRS): TBD		_	NG WHEN CATALYST					
	OGEN	SILICO	_	PHOROUS CC	MPOL	IND [AVY METAL
	R COMPC		, , , , ,		DO) #		NO	NE
TYPE OF CATALYST: TBD CATALYST VO	JL (F1°): 1	BD \	/ELOCITY THROUGH	CATALYST (FI	PS): Ti	3D		
DESCRIBE CONTROL SYSTEM, INCLUDING RELATION	TO OTHE	P CONTROL F	DEVICES AND SOLIDO	ES AND ATT	усн г	IACRAM	OE SV	STEM:
NDS), and Dry Line Conveyor (ES-DLC-1) will also be rout	ou to the	ver ser ubber (c	55 W 17 and 100/11	o (ob 100 1).				
POLLUTANT(S) COLLECTED:	voc							
BEFORE CONTROL EMISSION RATE (LB/HR):								
CAPTURE EFFICIENCY:			<u></u> %		 %			
CONTROL DEVICE EFFICIENCY:	95		<u></u> %		 %			 %
CORRESPONDING OVERALL EFFICIENCY:					<u></u> %			<u></u>
EFFICIENCY DETERMINATION CODE:					′°			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR) :	See Emiss	sion Calculation	ns in Appendix C					<u> </u>
PRESSURE DROP (IN. H ₂ (MIN MAX TBI)	OUTLET	TEMPERATURE (°F):	_ <u>TBD</u> _ MIN		_TBD	MA	x
INLET TEMPERATURE (°F MIN MAX TBI	<u> </u>	RESIDEI	NCE TIME (SECONDS): TBD				
INLET AIR FLOW RATE (ACFM): TBD (SCFM): TBD		COMBU	STION TEMPERATUR	E (°F): TBD				
COMBUSTION CHAMBER VOLUME (FT ³): TBD			IOISTURE CONTENT (
% EXCESS AIR: TBD		CONCE	NTRATION (ppmv)	_TBD_ INLE	ET	<u>TBI</u>	<u>D</u> OU	TLET
AUXILIARY FUEL USED: Natural Gas		TOTAL N	MAXIMUM FIRING RAT	E (MILLION B	TU/HR): 9.8		
DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED N/A COMMENTS:	INTO THE	CONTROL SY	'STEM:					

Attach Additional Sheets As Necessary

REVISED 09/22/16 NCI	DEQ/Division	of Air Quality	y - Applicatio	n for Air Pern	nit to Construct	/Operate		В			
EMISSION SOURCE DESCRIPTION:				EMISSION S	OURCE ID NO:	ES-DSHM-1	1 and ES-DH	M-2			
Dry Shavings Hammermills				CONTROL DEVICE ID NO(S): CD-WS-1, CD-RCO-1							
OPERATING SCENARIO 1	OF_	1			OINT (STACK) I						
DESCRIBE IN DETAILTHE EMISSION SO	URCE PROC	ESS (ATTAC	H FLOW DIA	GRAM):							
Dry shavings are reduced to appropriate	size needed fo	or pelletizing	using two (2)	dry shavings	hammermill.						
TYPE OF EMISSION SOU	RCE (CHECK	AND COMPL	ETE APPRO	PRIATE FORI	M B1-B9 ON TH	E FOLLOWIN	IG PAGES):				
Coal,wood,oil, gas, other burner (Form	B1)	Woodwo	rking (Form B	34)	☐Manuf. of	chemicals/coa	atings/inks (Fo	orm B7)			
Int.combustion engine/generator (Form	B2)	Coating/f	finishing/printi	ng (Form B5)	Incineratio	n (Form B8)					
Liquid storage tanks (Form B3)	ŕ	Storage	silos/bins (For	m B6)	Other (For	m B9)					
START CONSTRUCTION DATE:			DATE MANU	JFACTURED:							
TBD			TBD								
MANUFACTURER / MODEL NO.: TBD			EXPECTED	OP. SCHEDU	JLE: <u>24</u> HR/D	OAY <u>7</u> D)AY/WK <u>52</u>	<u>2</u> _WK/YR			
IS THIS SOURCE SUBJECT T(NS	PS (SUBPAR	TS?):		_ L NESH	IAP (SUBPARTS	?):					
PERCENTAGE ANNUAL THROUGHPUT	(%): DEC-FE	B 25% N	MAR-MAY 2	5% JUN-AU	G 25% SEP-	NOV 25%					
			SSIONS IN	FORMATIC	ON FOR THIS						
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL I	EMISSIONS				
		EMISSION		ROLS / LIMITS)	(BEFORE CONTR	_	1	TROLS / LIMITS)			
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr			
PARTICULATE MATTER (PM)				s in Appendix		torior yr	15/111	torioryi			
PARTICULATE MATTER<10 MICRONS (PM	11	See Emission		у на гаррениях							
PARTICULATE MATTER<2.5 MICRONS (PM	.0,										
SULFUR DIOXIDE (SO2)	12.57						-				
NITROGEN OXIDES (NOx)							-				
CARBON MONOXIDE (CO)							 	1			
VOLATILE ORGANIC COMPOUNDS (VO	2)						 	1			
LEAD	٥)	1	 				 	1			
OTHER		1	 				 	1			
HAZARDOUS	AID DOLL	IITANT EN	MESIONS		TION FOR TH	US SOUDO	E				
HAZARDOUS	AIR PULL										
		SOURCE OF		D ACTUAL		POTENTIAL I	1				
		EMISSION	,	ROLS / LIMITS)	(BEFORE CONTE	· · ·	,	ROLS / LIMITS)			
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr			
		See Emission	n Calculations	in Appendix	C		 				
							 				
							 	1			
							 	1			
							 				
							 				
	<u> </u>										
TOXIC AII	R POLLUTA	ANI EMISS	SIONS INF	ORMATION	FOR THIS	SOURCE					
		OF EMISSION	EXPE	CTED ACTUA	L EMISSIONS A	FTER CONTI	ROLS / LIMITA	ATIONS			
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/da	ay	lb	o/yr			
		See Emission	n Calculations	in Appendix	С						
Attachments: (1) emissions calculations and sup	oorting documer	ntation; (2) indica	ate all requested	d state and feder	ral enforceable per	mit limits (e.g. h	ours of operatio	n, emission			
rates) and describe how these are monitored and	l with what frequ	iency; and (3) de	escribe any mor	nitoring devices,	gauges, or test po	rts for this sour	ce.				

REVISED 09/22/16		on of Air Quality -	Application	or Air Permit to Construct/O	perate	БЭ
EMISSION SOURCE DESCRIP	HON:			EMISSION SOURCE ID NO:	ES-DSHM-1 and ES-	DHM-2
Dry Shavings Hammermills				CONTROL DEVICE ID NO(S): CD-WS-1, CD-RCO	-1
)F <u>1</u>		EMISSION POINT (STACK) I	D NO(S): EP-9	
DESCRIBE IN DETAIL THE PRODUCT SHAVINGS are reduced to apply the second				2) dry shavings hammermills	5.	
MATERIALS ENTERING	3 PROCESS - C	ONTINUOUS PRO	CESS	MAX. DESIGN	REQUESTED	CAPACITY
	TYPE		UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Shavings			ODT/hr	28	N/A	,
MATERIALS ENTERIN	NG PROCESS -	BATCH OPERAT	TION	MAX. DESIGN	REQUESTED	CAPACITY
Т	YPE		UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	
			+			
			<u> </u>			
MAXIMUM DESIGN (BATCHES			(0.4-0.:	(2)		
REQUESTED LIMITATION (BAT	TCHES / HOUR):		(BATCHES/	·		
FUEL USED: N/A				IMUM FIRING RATE (MILLION		
MAX. CAPACITY HOURLY FUE	LUSE: N/A		REQUESTE	D CAPACITY ANNUAL FUEL	USE: N/A	
COMMENTS:	Z GGE. HJT		INCOCOTE	O GIVE MONTH ANNOTAL FOLL	OCL. NYII	

REVISED 09/22/16 NCDI	EQ/Division o	f Air Quality -	Application	for Air Permi	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: ES-CLR-1	through ES-CI	LR-6
Pellet Coolers					EVICE ID NO		1 through CD	
OPERATING SCENARIO 1	OF	1				K) ID NO(S): 1	FP-18	
DESCRIBE IN DETAILTHE EMISSION SO		PESS (ATTAC	H EI OW DIA		01110	10 10 10 10 10 10 10 10 10 10 10 10 10 1	LI -10	
Six (6) pellet coolers follow the pellet pre		•		•	ntable storac	e temneratur	·e	
(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		y	F		F	, p		
TYPE OF EMISSION SOUR Coal,wood,oil, gas, other burner (Form	•		TE APPROPI rking (Form B				ING PAGES): /coatings/inks	
Int.combustion engine/generator (Form	,		• .	•			•	(FUIII D7)
Liquid storage tanks (Form B3)	1 62)		inishing/printii silos/bins (For	• ,	Other (ation (Form B	0)	
START CONSTRUCTION DATE:		Storage s	DATE MANU	,	1 ' 1	i oiiii bə)		
2012			2012	N AOTONED.				
MANUFACTURER / MODEL NO.:								
Kahl Press 60-1250	NDC (CLIDDAD	TC2\.	EXPECTED				_ DAY/WK _	<u>52</u> WK/YR
IS THIS SOURCE SUBJECT TO SERVICE NEWSFILL NEWSF	SPS (SUBPAR		MAR-MAY 2	-	IAP (SUBPAF	EP-NOV 25 %		
CRITERIA AI	` '			-	_			
OMILIOA AI	IN OLLO	SOURCE OF		D ACTUAL			EMISSIONS	
		EMISSION	(AFTER CONT	_	(DEFORE CON	TROLS / LIMITS)		ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			Calculations			toris/yi	ID/TII	toris/yi
PARTICULATE MATTER (1 MI)	1 \	See Emission	Calculations	пі Аррепціх	l			
PARTICULATE MATTER<2.5 MICRONS (PI	10,							
SULFUR DIOXIDE (SO2)	VI _{2.5})							
		1					 	
NITROGEN OXIDES (NOx)								-
CARBON MONOXIDE (CO)	C)							
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD								
OTHER HAZABBOUS	AID DOLLI	ITANT EMI	CCIONC IN	IFODMATI	ON FOR T	HIC COLID	CE	
HAZARDOUS	T POLLU				UN FUR I			
		SOURCE OF		D ACTUAL			EMISSIONS	
		EMISSION	(AFTER CONT		,	TROLS / LIMITS)	,	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculations	in Appendix	l I			
								+
								+
								+
TOYIC AID	DOLLUTA	NT EMICCI	ONE INFO	DMATION	FOR THIS	COURCE		
TOXIC AIR	PULLUTA	NI EMISSI	UNS INFU	RIVIATION	FUR ITIS	SOURCE		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	TROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb)/yr
		See Emission	Calculations	in Appendix		,		,
				• • • • • • • • • • • • • • • • • • • •				
	1							
	†							
	†							
	†							
Attachments: (1) emissions calculations and sup	porting docume	ntation: (2) indica	ate all requester	d state and fede	ral enforceable	permit limits (e	a hours of one	ration
emission rates) and describe how these are mor								

REVISED 09/22/16 NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/O	perate	В9						
EMISSION SOURCE DESCRIPTION: Pellet Coolers		EMISSION SOURCE ID NO:	ES-CLR-1 through ES	-CLR-6						
renet Coolers		CONTROL DEVICE ID NO(S): CD-CLR-1 through CD-CLR-6,CD-WS-2, CD-RCO-2								
OPERATING SCENARIO: 1 OF 1	_	EMISSION POINT (STACK) ID NO(S): EP-18								
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM Six (6) pellet coolers follow the pellet presses to cool the newly for		lown to an acceptable storage	temperature.							
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	CESS	MAX. DESIGN	REQUESTED	CAPACITY						
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION	(UNIT/HR)						
Wood Pellets	ODT/hr	144	N/A							
MATERIALS ENTERING PROCESS - BATCH OPERAT TYPE	ION UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED LIMITATION (U							
MAXIMUM DESIGN (BATCHES / HOUR):										
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	/R):								
FUEL USED: N/A		IMUM FIRING RATE (MILLION								
MAX. CAPACITY HOURLY FUEL USE: N/A COMMENTS:	REQUESTE	D CAPACITY ANNUAL FUEL I	USE: N/A							

CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 09/22/16	NCDEQ/Div	ision of Air Qu	uality - App	lication for Air Pe	ermit to	Construc	t/Operate		C4
CONTROL DEVICE ID NO: CD-CLR-1 through CD-CLR-6		CONTROLS E	MISSIONS	FROM WHICH E	MISSIO	N SOURC	E ID NO(S): ES-	CLR-1 through ES-CLR-6	,
EMISSION POINT (STACK) ID NO	· ·	POSITION IN	SERIES OF	CONTROLS	١	10.	1 OF	3 UNITS	
	G SCENARIO:								
1 DESCRIBE CONTROL SYSTEM	OF <u>1</u>		P.E. SEAL	REQUIRED (PER	2Q .01°	12)?	☐ YES	∐ NO	
Six (6) identical high efficiency will operate under negative pres	cyclones capture bul	k PM emissior	ns from six	(6) pellet coolers	s. Each (cooler vei	nts to one dedi	cated cyclone. The cyc	clones
POLLUTANT(S) COLLECTED:			PM	PM ₁₀	<u> </u>	PM _{2.5}			
BEFORE CONTROL EMISSION F	RATE (LB/HR):				144				
CAPTURE EFFICIENCY:			90+	% 90+	%	90+	%	%	
CONTROL DEVICE EFFICIENCY	′ :			%	%		%	%	
CORRESPONDING OVERALL EI	FFICIENCY:			%	%		%	%	
EFFICIENCY DETERMINATION (CODE:				_				
TOTAL AFTER CONTROL EMISS	SION RATE (LB/HR):		See Emissi	on Calculations in	n Appen	dix C			
PRESSURE DROP (IN. H ₂ 0):	MIN	<u>6"</u> MA	X						
INLET TEMPERATURE (°F):	MIN	_ Ambient _ M.	AX	OUTLET TEMPE	RATURE	(°F):	MIN	_Ambient	MAX
INLET AIR FLOW RATE (ACFM):	17,100 (each)			BULK PARTICLE	DENSIT	Y (LB/FT	³): 2.86E-05		
POLLUTANT LOADING RATE (G	R/FT ³): 0.01 (inlet)								
SETTLING CHAMBER		(CYCLONE					MULTICYCLONE	
LENGTH (INCHES):	INLET VELOCITY (F	T/SEC): 94.75		CIRCULAR [RECT	ANGLE	NO. TUBES:		
WIDTH (INCHES):	DIMENSIONS (INC	CHES) See inst	ructions	IF WET SPRA	AY UTILI	ZED	DIAMETER OF	TUBES:	
HEIGHT (INCHES):	H: 38"	Dd: 22 "		LIQUID USED:			HOPPER ASP	IRATION SYSTEM?	
VELOCITY (FT/SEC.):	W: 25 "	Lb: 74.25 "		FLOW RATE (GP	PM):		YES	□ NO	
NO. TRAYS:	De: 32 "	Lc: 84.5 "		MAKE UP RATE	(GPM):		LOUVERS?		
NO. BAFFLES:	D: 54 "	S: 44.38"					☐ YES ☐ NO		
	TYPE OF CYCLONE:	CONVEN	TIONAL	✓ HIGH EFF	CIENC	Y	OTHER		
DESCRIBE MAINTENANCE PRO			.c. 11	.3			PARTICLE SIZ	E DISTRIBUTION	
Periodic inspection of mechanica manufacturer.	al integrity during pia	nt outages as s	грес ииеа ву	tne		IZE	WEIGHT %	CUMULATIV	E
					(MICI	RONS)	OF TOTAL	%	
DESCRIBE INCOMING AIR STRE The material will be pulled throu		negative press	sure. The c	vclone will	C)-1		Unknown	
separate the material from the a					1	-10			
					10)-25			
					25	5-50			
					50	-100			
					>	100			
								TOTAL = 100	
DESCRIBE ANY MONITORING DIN/A	DEVICES, GAUGES, T	est pukts, E	:16:						

FORM C8 CONTROL DEVICE (WET PARTICULATE SCRUBBER)

LS EMISSION	S FROM WHI					
N IN SERIES C		CH EMI	SSION SOUR	CE ID	NO(S): ES-CLR-	1 through ES-CLR-6,
	F CONTROL		NO. 2 O		3 UNITS	
1						
P.E. SEA	L NEEDED (F	PER 2Q	.0112)? 🗸	YES		NO
vill be controll	led by a wet s	scrubbe	r.			
	PM		PM ₁₀		PM _{2.5}	
				-		
	~99.9	%	~99.9	%	~99.9	%
		%		%		%
		144		%		%
				•		
IAX						
AX OUTLET	TEMPERATU	JRE (°F	TBD!	MIN	<u>TBD</u> MA	X
MOISTUR	RE CONTENT	: INLE	T <u>TBD</u>		OUTLET TE	BD
THROAT	TYPE:		FIXED		VARIABLE	
TYPE OF	PACKING U	SED IF	ANY: <u>TBD</u> _			
PERCEN	IT RECIRCUL	ATED: 1	ГВD			
TBD						
E (GAL/MIN):	TBD					
					T T	
				S)	WEIGHT % OF TOTAL	CUMULATIVE %
			0-1			
I PORIS, EIC	<i>,</i> .	-			 	
		-			 	
		-	50-100			
		-	>100			
			N SOURCE(S)		TOTAL = 100	
	IAX IAX OUTLET MOISTUI THROAT TYPE OF PERCEN TBD E (GAL/MIN):	PM ~99.9 AND CONTENT THROAT TYPE: TYPE OF PACKING USE PERCENT RECIRCULE	PM 99.9 %	AS	PM PM10 99.9 %99.9 %	PM PM ₁₀ PM _{2.5} -99.9 % -99.9 % -99.9 % 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9% 9%

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 NCDEQ/Division	of Air Quali	ty - Applicatio	on for Air Permit to C	Construct/Opera	ate		С	3
AS REQUIRED BY 15A NCAC 2Q .011.	2, THIS FORI	M MUST BE S	EALED BY A PROF	ESSIONAL ENG	INEER (P	P.E.) LICE	ENSED IN NORTH CARO	LINA.
CONTROL DEVICE ID NO: CD-RCO-2	CONTROLS	EMISSIONS I	ROM WHICH EMIS	SION SOURCE	ID NO(S)	ES-CLR-	-1 through ES-CLR-6	
STATE OF THE STATE		N SERIES OF		NO		OF3		
MANUFACTURER: TBD		ODEL NO: TBI						
OPERATING SCENARIO:								
1OF1								
TYPE AFTERBURNER REGENERATIVE TH	HERMAL OXI	DATION	RECUPERATIVE TH	IERMAL OXIDA	TION 🗸	CATALY	YTIC OXIDATION	
EXPECTED LIFE OF CATALYST (YRS): TBD			WHEN CATALYST					
	OGEN R COMPOUN	☐ SILICON	E PHOS OTHER (SPECIFY) _	PHOROUS CON	MPOUND		HEAVY METAL NONE	
TYPE OF CATALYST: TBD CATALYST VO			LOCITY THROUGH		S): TBD			
SCFM THROUGH CATALYST: TBD	, ,	,		, , ,	,			
DESCRIBE CONTROL SYSTEM, INCLUDING RELATION	TO OTHER C	CONTROL DEV	/ICES AND SOURCE	ES, AND ATTAC	CH DIAGF	RAM OF S	SYSTEM:	
After leaving the pellet coolers (ES-CLR-1 through 6), em The RCO will have the ability to operate in thermal (RTO)								er / RCO (CD-RCO-2).
The KCO will have the ability to operate in thermal (RTO)	or catalytic	moue. See tne	torius associated Wi	ın tile pellet coo	iers for n	iore intol	ı mauvn.	
POLLUTANT(S) COLLECTED:	voc							
BEFORE CONTROL EMISSION RATE (LB/HR):		_						
CAPTURE EFFICIENCY:		%	%		<u> </u>		%	
CONTROL DEVICE EFFICIENCY:	95		%	-	- %		<u>~~~</u>	
CORRESPONDING OVERALL EFFICIENCY:		<u> </u>	<u></u> %		- %		<u>~~~</u> %	
EFFICIENCY DETERMINATION CODE:					_			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR) :	See Emissio	n Calculations	in Appendix C					
PRESSURE DROP (IN. H ₂ C MIN MAX TBD		OUTLET T	EMPERATURE (°F):	TBD MIN		TBD	MAX	
INLET TEMPERATURE (°F) MIN MAX TBD			CE TIME (SECONDS					
INLET AIR FLOW RATE (ACFM): TBD (SCFM): TBD			ΓΙΟΝ TEMPERATUR					
COMBUSTION CHAMBER VOLUME (FT ³): TBD			ISTURE CONTENT					
% EXCESS AIR: TBD			TRATION (ppmv)	_TBD_ INLE	Т	<u>TBD</u>	OUTLET	
AUXILIARY FUEL USED: Natural Gas		TOTAL MA	XIMUM FIRING RAT	TE (MILLION BT	U/HR): 9.8	8		
DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED I	NTO THE CO	NTROL SYST	EM:					
N/A								
COMMENTS:								

Attach Additional Sheets As Necessary

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCE	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: IES-DRYSH	IAVE	
Dry Shavings Material Handling and Sto	rage				DEVICE ID NO			
OPERATING SCENARIO1	OF	<u>1</u>				K) ID NO(S): I	N/A	
DESCRIBE IN DETAILTHE EMISSION S	OURCE PROC	ESS (ATTAC	H FLOW DIA		, -	, , ,	•	
For IES-DRYSHAVE, purchased dry shavi	ngs will be car	ried by front e	end loader fro	m1 of 2 exist	ing truck dun	nps or by wall	king floor at o	r near
uncontrolled storage pile to Dry Line Ho	pper via front (end loader and	d conveyed to	the Dry Ham	mermills inf	eed conveyor	(ES-DLC-1).	
TYPE OF EMISSION SOUR	RCE (CHECK A				B1-B9 ON T	HE FOLLOWI	NG PAGES):	
Coal,wood,oil, gas, other burner (Forn	n B1)	☐ Woodwo	rking (Form E	34)	Manuf.	of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (For	m B2)		0.1	ng (Form B5)		ation (Form B	8)	
Liquid storage tanks (Form B3)		Storage :	silos/bins (Fo			(Form B9)		
START CONSTRUCTION DATE:			DATE MANU					
2014			2014					
MANUFACTURER / MODEL NO.:			EVDEOTED	OD 0011ED1	U.E. 04 LI	D/DA)/ =	DANAMA	E0 \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Enviva Built	IODO (OLIDDAE	TOO)	EXPECTED			R/DAY _ <u>7</u>	_DAY/WK _	<u>_52</u> _ WK/YR
	ISPS (SUBPAR		44D MAY 21	_	IAP (SUBPAR	,		
PERCENTAGE ANNUAL THROUGHPUT CRITERIA A	` '					EP-NOV 25%		
01012107171	II OLLOT	SOURCE OF		D ACTUAL	T		EMISSIONS	
		EMISSION		ROLS / LIMITS)	(REFORE CON	TROLS / LIMITS)		ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	Ib/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)				s in Appendix		torio/yi	10/111	torioryi
PARTICULATE MATTER<10 MICRONS (PI	M ₁₀)	See Emission		Пппррепал				
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})								
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VC	DC)							
LEAD	•							
OTHER								
HAZARDOUS	AIR POLLU	ITANT EMI	SSIONS IN	IFORMATI	ON FOR T	HIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculations	s in Appendix	С			
TOYIO AIF	DOLLUTA	NT EMICOL		DIAATION	FOR TUIC	COURCE		
TOXIC AIR	POLLUTA	T SOUNCE	UNS INFO	RIVIATION	ruk inis	SOURCE		
		OF	EXPEC1	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	Ih	/hr	lb/	day	lh	/yr
107110711111 0220171111	5/10/110/	_		s in Appendix	!	aay	10	· y.
				· · · ·				
Attachments: (1) emissions calculations and sur	norting documen	itation: (2) indica	te all requested	l state and fede	ral enforceable	nermit limits (e.c	hours of oper	ation 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.

		Air Quality - Application f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION			EMISSION SOURCE ID NO:	IES-DRYSHAVE	
Dry Shavings Material Handling a	na Storage		CONTROL DEVICE ID NO(S)		
OPERATING SCENARIO:	_1 OF	1	EMISSION POINT (STACK) I	D NO(S): N/A	
DESCRIBE IN DETAIL THE PROC For IES-DRYSHAVE, purchased dry uncontrolled storage pile to Dry Li	shavings will be ca	rried by front end loader			
MATERIALS ENTERING P	ROCESS - CONTIN	JUOUS PROCESS	MAX. DESIGN	REQUESTED	CAPACITY
TYP		UNITS	CAPACITY (UNIT/HR)	LIMITATION(
Dried Wood Materials					Olvi i i i i i
Dried Wood Materials		ODT/yr	781,255	N/A	
MATERIALS ENTERING	PROCESS - BAT	CH OPERATION	MAX. DESIGN	REQUESTED	CAPACITY
TYF	PE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	NIT/BATCH)
MAXIMUM DESIGN (BATCHES / H	IOUR):				
REQUESTED LIMITATION (BATC	HES / HOUR):	(BATCHES/	/R):		
FUEL USED: N/A		TOTAL MAX	IMUM FIRING RATE (MILLION	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL U	JSF· N/A		D CAPACITY ANNUAL FUEL		
COMMENTS:					

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: IES-DRYSI	HAVE-1	
Dry Shavings Material Handling						O(S): CD-DSR-		
OPERATING SCENARIO 1	OF	1		!		K) ID NO(S): I		
DESCRIBE IN DETAILTHE EMISSION SO	OURCE PROC	ESS (ATTAC	H FLOW DIA		,	, , ,		
For IES-DRYSHAVE-1, purchased dry shav		•		•	eeds materia	l via enclosed	conveyors to	a bucket
elevator that ultimately fills a Dry Shavin		S) for storage	. From there	, the dry shav	ings will be tr	ansferred to	the Dry Shavi	ngs
Hammermills (ES-DSHM-1 and ES-DSHM	-2).							
TYPE OF EMISSION SOUR	CE (CHECK A	ND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON TI	HE FOLLOWI	NG PAGES):	
Coal,wood,oil, gas, other burner (Form	n B1)	Woodwo	rking (Form B	34)	☐Manuf.	of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (Forn	n B2)	Coating/f	inishing/printi	ng (Form B5)	Inciner	ation (Form B	3)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (For	m B6)	√ Other (Form B9)		
START CONSTRUCTION DATE:				JFACTURED:				
2014			2014					
MANUFACTURER / MODEL NO.:								
Enviva Built			EXPECTED			R/DAY <u>7</u>	_DAY/WK _	<u>52</u> WK/YR
	SPS (SUBPAF				IAP (SUBPAF			
PERCENTAGE ANNUAL THROUGHPUT				5% JUN-AU		EP-NOV 25%		
CRITERIA AI	R POLLUT				N FOR THI			
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	1 Calculations	in Appendix	С			
PARTICULATE MATTER<10 MICRONS (PM								
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})								
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD								
OTHER					01/ 505 5			
HAZARDOUS	AIR POLLU	_			ON FOR I			
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL		
		EMISSION	,	ROLS / LIMITS)	`	TROLS / LIMITS)	(AFTER CONTI	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	1 Calculations	in Appendix	C			
		ļ						
TOYIC AID	DOLLUTA	NT EMICOL	ONC INFO	DMATION	FOD THIS	COURCE		
TOXIC AIR	POLLUTA	NI EMISSI	UNS INFU	RIVIATION	FUR I HIS	SOURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS .	AFTER CONT	ROLS / LIMI	TATIONS
TOYIC AIR ROLL LITANT	CASNO	EMISSION	lh.	/hr	lh/	day	lla	h ne
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		day	ID	/yr
		See Emission	i caiculations	s in Appendix	l l			
					 			
					 			
					 			
A44h		4-4: (0): "	40					_t: · ·
Attachments: (1) emissions calculations and sup	porting documen	ıtatıon; (2) indica	ne an requested	state and fede	rai entorceable	permit limits (e.g	j. nours of oper	ation, 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.

		vision of Air	Quality - Applicat	tion f	or Air Permit to Construct/O	perate	B9		
EMISSION SOURCE DESCRIPTI	ION:				EMISSION SOURCE ID NO:	IES-DRYSHAVE-1			
Dry Shavings Material Handling CONTROL DEVICE ID NO(S): CD-DSR-BF									
OPERATING SCENARIO:	1	OF	_1		EMISSION POINT (STACK) I	D NO(S): EP-20			
DESCRIBE IN DETAIL THE PRO For IES-DRYSHAVE-1, purchased elevator that ultimately fills a Dr Hammermills (ES-DSHM-1 and E	dry shavin y Shavings	gs will be un Silo (IES-DSS	loaded from truck						
MATERIALS ENTERING	PROCESS	- CONTINU	OUS PROCESS		MAX. DESIGN	REQUESTED	CAPACITY		
TY	PE		UNI	ΓS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)		
Dried Wood Materials			ODT,	/vr	245,000	N/A	,		
Direct Wood Materials			001)	yı.	213,000	14/11			
MATERIALS ENTERING TY	G PROCES /PE	SS - BATCH	OPERATION UNIT	S	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED LIMITATION (U			
MAXIMUM DESIGN (BATCHES /	HOUR):								
REQUESTED LIMITATION (BAT		UR):	(BATCH	HES/Y	′R):				
FUEL USED: N/A		<u> </u>			IMUM FIRING RATE (MILLION	N BTU/HR): N/A			
MAX. CAPACITY HOURLY FUEL	USF: N/A				CAPACITY ANNUAL FUEL				
COMMENTS:									

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NO	CDEQ/Division o	of Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: ES-DSR		•
Dry Shavings Reception				CONTROL D	DEVICE ID NO	D(S): CD-DSR	-BF	
OPERATING SCENARIO1	OF_	<u>1</u>				K) ID NO(S): I		
DESCRIBE IN DETAILTHE EMISSION	SOURCE PROC	ESS (ATTACI	H FLOW DIA	GRAM):	,	, , ,		
Purchased dry shavings will be unload	ed from trucks ii	nto a hopper.						
TYPE OF EMISSION SOU Coal,wood,oil, gas, other burner (Fo Int.combustion engine/generator (Fo Liquid storage tanks (Form B3) START CONSTRUCTION DATE:	orm B1)	Woodwo Coating/f	rking (Form B inishing/printi silos/bins (For	4) ng (Form B5)	☐Manuf. ☐Inciner ☐Other (HE FOLLOWI of chemicals/ ation (Form Bi Form B9)	coatings/inks	
MANUFACTURER / MODEL NO.: Enviva Built			EXPECTED		JLE: <u>24</u> H		_DAY/WK _	_ <u>52</u> _ WK/YR
IS THIS SOURCE SUBJECT TC	NSPS (SUBPAR			•	HAP (SUBPAF	,		
PERCENTAGE ANNUAL THROUGHPU				5% JUN-AU		EP-NOV 25%		
CRITERIA	AIR POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	S SOURCE		
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	See Emission	Calculations	in Appendix	С				
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								
HAZARDOU	S AIR POLLU	ITANT EMI	SSIONS IN	<u>IFORMATI</u>	ON FOR T	HIS SOUR	<u>CE</u>	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculations	in Appendix	C			
TOXIC A	IR POLLUTA	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	Ib	o/yr
		See Emission	Calculations	in Appendix	С			
		<u> </u>						
		<u> </u>						
Attachments: (1) emissions calculations and s	supporting documen	ntation: (2) indica	te all requested	state and fedo	ral enforceable	nermit limite (o.	hours of oper	ration 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.

		VISION OF All Qu	anty Application	or Air Permit to Construct/O	perate	БЭ				
EMISSION SOURCE DESCRIP	TION:			EMISSION SOURCE ID NO:	ES-DSR					
Dry Shavings Reception				CONTROL DEVICE ID NO(S): CD-DSR-BF						
OPERATING SCENARIO:	1	_ OF1		EMISSION POINT (STACK) I	D NO(S): EP-20					
DESCRIBE IN DETAIL THE PROPURCE OF THE PROPURE OF THE PROPURCE OF THE PROPURCE OF THE PROPURCE OF THE PROPURCE										
MATERIAL O ENTERING	2 PROOFES	CONTINUOUS	2 22 22 22 22 22 22 22 22 22 22 22 22 2	L MAY DEGION	I DEQUEOTES	204040171/				
MATERIALS ENTERING		- CONTINUOUS		MAX. DESIGN	REQUESTE					
	YPE		UNITS	CAPACITY (UNIT/HR)	LIMITATION	(UNIT/HR)				
Dried Wood Materials			ODT/yr	245,000	N/A					
MATERIALS ENTERII	NG PROCES	SS - BATCH OP	ERATION UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTEI LIMITATION (L					
MAXIMUM DESIGN (BATCHES	/ HOUR)·		<u> </u>	<u> </u>	<u> </u>					
REQUESTED LIMITATION (BAT		UR):	(BATCHES/	/R):						
FUEL USED: N/A		,		IMUM FIRING RATE (MILLION	I RTII/HR\· NI/A					
MAX. CAPACITY HOURLY FUE	I LIGE: NI/A			D CAPACITY ANNUAL FUEL						
COMMENTS:										

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NO	CDEQ/Divisi	on of Air Quality -	Application	n for A	ir Permit to	Constru	uct/Oper	ate			C1
CONTROL DEVICE ID NO: CD-DSR-BF		CONTROLS EMIS	SIONS FRO	OM WH	IICH EMISS	SION SO	URCE ID	NO(S):	ES-DSR, IE	S-DRYSHA	VE-1
EMISSION POINT (STACK) ID NO(S): EF	-20	POSITION IN SER	RIES OF CO	NTRO	LS		NO.	1 (OF 1	UNITS	
OPERATING SCE	NARIO:										
<u>1</u> OF	1		P.E. SEAL	REQU	IIRED (PER	2q .0112	2)? 🗸	YES		NO	
A baghouse will control the transfer of c	lry shavings	from trucks into	a hopper.		-						
POLLUTANTS COLLECTED:			PM		PM ₁₀	. <u> </u>	PM _{2.5}	. <u>-</u>		-	
BEFORE CONTROL EMISSION RATE (LE	3/HR):					- –					
CAPTURE EFFICIENCY:			~99.9	%	~99.9	<u></u> %	~99.9			%	
CONTROL DEVICE EFFICIENCY:				%		%		<u></u>		%	
CORRESPONDING OVERALL EFFICIENCY:				%		144		-		%	
EFFICIENCY DETERMINATION CODE:						-		. -		•	
TOTAL AFTER CONTROL EMISSION RA				on Cal	culations in	Append	ix C				
PRESSURE DROP (IN H ₂ 0): MIN:	MAX: TBI	GAUGE?	✓ YES	L	NO						
BULK PARTICLE DENSITY (LB/FT³): TBD		33			TURE (°F):			MAX T			
	LB/HR [√ GR/FT ³			RATURE (°I			MAX T	BD		
INLET AIR FLOW RATE (ACFM): 3,600				PERAT	ING TEMP						
		PER COMPARTM					H OF BAC				
		ACE AREA PER CA		(FT ²):	TBD	DIAMET	ER OF B	AG (IN.	.): TBD		
TOTAL FILTER SURFACE AREA (FT ²): TI	BD	AIR TO CLOTH RA	ATIO: TBD								
DRAFT TYPE: INDUCED/NEGAT	IVE 🗸	FORCED/POSITIV	/E		FILTER M	ATERIAL	.: 🗌	WOVE	N 🗸	FELTED	
DESCRIBE CLEANING PROCEDURES					ı		PART	ICLE SI	IZE DISTRI	BUTION	
☑ AIR PULSE		SONIC				SI	ZE	WEI	IGHT %	CUMUL	ATIVE
REVERSE FLOW		SIMPLE BAG COL	LAPSE			(MICF	RONS)	OF	TOTAL	%)
☐ MECHANICAL/SHAKER		RING BAG COLLA	APSE			0	-1		Unk	nown	
OTHER:						1-	·10				
DESCRIBE INCOMING AIR STREAM:						10	-25				
The air stream will contain wood dust par	ticles.					25	-50				
						50-	100				
						>1	100				
									TOTA	L = 100	
ON A SEPARATE PAGE, ATTACH A DIAG	GRAM SHOV	VING THE RELATION	ONSHIP OF	THE	CONTROL I	DEVICE :	TO ITS E	MISSIC	N SOURC	E(S):	
COMMENTS:											

REVISED 09/22/1 NCD	DEQ/Division of	Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	NO: ES-DSS		-	
Dry Shavings Silo				CONTROL	DEVICE ID N	O(S): CD-D S	SS-BF		
OPERATING SCENARIO	<u>1</u> OF	1			POINT (STAC	` ,			
DESCRIBE IN DETAILTHE EMISSION	N SOURCE PR	OCESS (ATT	ACH FLOW I		,	, ,	'		
Stores dry shavings used in pellet pro		•		•	havings Bagh	ouse (CD-D	SS-BF).		
TYPE OF EMISSION SOU	RCE (CHECK /	AND COMPLE	TE APPROF	PRIATE FORI	W B1-B9 ON	THE FOLL	OWING PAGES	S):	
Coal,wood,oil, gas, other burner (F	•		rking (Form E				lls/coatings/inks	•	
Int.combustion engine/generator (F	,		• ,	ing (Form B5)	_	ation (Form	-	- (
Liquid storage tanks (Form B3)	J 22)	_	silos/bins (Fo		_	(Form B9)	20)		
START CONSTRUCTION DATE:			DATE MANUFACTURED:						
TBD			TBD						
MANUFACTURER / MODEL NO.:			EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/Y						
	NSPS (SUBPAR	TS?):	<u> </u>		IAP (SUBPAI				
PERCENTAGE ANNUAL THROUGH	` `		MAR-MAY	25% JUN-	,	,	/ 25%		
	AIR POLLUT								
5111211111		SOURCE OF		D ACTUAL	<u> </u>		AL EMISSIONS		
		EMISSION		ROLS / LIMITS)	(BEFORE CON			TROLS / LIMITS)	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)			s in Appendix		torioryi	15/111	tono, y.		
PARTICULATE MATTER<10 MICRONS	S (PM _{ss})	See Eliiissioi		<u> Питррении</u>				†	
PARTICULATE MATTER<2.5 MICRON	(10)						-	+	
SULFUR DIOXIDE (SO2)								†	
NITROGEN OXIDES (NOx)								+	
CARBON MONOXIDE (CO)								†	
VOLATILE ORGANIC COMPOUNDS	(VOC)							+	
LEAD	(100)							+	
OTHER								+	
HAZARDOUS	AIR POLL	ITANT EM	ISSIONS I	NFORMAT	TION FOR	THIS SO	URCE		
	1	SOURCE OF		D ACTUAL	1		AL EMISSIONS		
		EMISSION		ROLS / LIMITS)	(BEFORE CON		1	TROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	Ib/hr	tons/yr	
TIALARDOGO AIRT GLEGTART	GAO NO.			s in Appendix		t0115/ y1	10/111	torioryi	
		JCC EMISSION	Carculation	Пиррении			-	+	
	+							+	
	+							+	
								+	
								†	
								†	
								†	
TOXIC AII	R POLLUTA	NT EMISS	IONS INFO	DRMATIO	FOR THI	S SOUR	CE		
		OF					NTROLS / LIM	ITATIONS	
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	Ih	/hr	lh/	/day		o/yr	
TOXIO AIRT OLLOTARI	OAC NO.			s in Appendix		uay	- IL	5/ Y1	
		JCC EMISSION	Carculation	з ін пррении			-		
	+								
	 						+		
	 						+		
	+						+		
Attachments: (1) emissions calculations an	d supporting door	mentation: (2) is	ndicate all regi	lested state and	l federal enforc	eable permit	limits (e.g. hours	of operation	
emission rates) and describe how these are		,	•			•	ν •		

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Divis	ion of Air Quality - Ap	plicatio	n for Air Permit to	Construct/Operate	В6
EMISSION SOURCE DESCR	IPTION:			EMISSION	SOURCE ID NO: ES-DSS	
Dry Shavings Silo				CONTROL	DEVICE ID NO(S): CD-DSS-BF	
OPERATING SCENARIO:	1	OF <u>1</u>		_ EMISSION	POINT(STACK) ID NO(S): EP-10	
DESCRIBE IN DETAIL THE F Stores dry shavings used in p			ontrolle	ed by the Dry Shavi	ings Baghouse (CD-DSS-BF).	
MATERIAL OTORER R. G				DENOITY OF MA	TEDIAL (I D/ETO), mpp	
MATERIAL STORED: Dry Sha					TERIAL (LB/FT3): TBD	
CAPACITY DIMENSIONS (FEET)	CUBIC FEET: HEIGHT:	DIAMETER: TBD	(OR)	TONS: LENGTH:	WIDTH: HEIGHT:	
ANNUAL PRODUCT THRO			(011)	1	DESIGN CAPACITY:	
PNEUMATICALLY FI		MECHANIC	ALLY F		FILLED FROM	
BLOWER	İr	SCREW CONVEYO			RAILCAR	
COMPRESSOR		7			TRUCK	
✓ OTHER: TBD		BUCKET ELEVATO	R		STORAGE PILE	
		OTHER:			OTHER: Conveyor	
NO. FILL TUBES:					content donte, or	
MAXIMUM ACFM:						
MATERIAL IS UNLOADED TO BY WHAT METHOD IS MATE		D FROM SILO?				
MAXIMUM DESIGN FILLING	RATE OF MATER	RIAL (TONS/HR): TBD				
MAXIMUM DESIGN UNLOAD	ING RATE OF MA	ATERIAL (TONS/HR): 1	BD			
COMMENTS:						

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Division	on of Air Quality -	Application	n for Air	Permit to	Construct	Opera	ate			C1
CONTROL DEVICE ID NO: CD-DSS-BF	CONTROLS EMIS	SIONS FRO	M WHI	CH EMISS	SION SOUR	CE ID	NO(S): E	S-DSS		
EMISSION POINT (STACK) ID NO(S): EP-10	POSITION IN SER	RIES OF CO	NTROL	S		NO.	1 OF	1	UNITS	
OPERATING SCENARIO:										
1OF1		P.E. SEAL	REQUI	RED (PER	?(2q .0112)?	1	YES		NO	
DESCRIBE CONTROL SYSTEM: The silo baghouse will control emissions from the dry	shavings silo (ES-D	OSS).								
POLLUTANTS COLLECTED:		PM		PM ₁₀	PN	M _{2.5}	. <u> </u>			
BEFORE CONTROL EMISSION RATE (LB/HR):					· —		_			
CAPTURE EFFICIENCY:		~99.9		~99.9	% ~9	9.9	<u></u>		%	
CONTROL DEVICE EFFICIENCY:			%		<u> </u>		<u> </u>		%	
CORRESPONDING OVERALL EFFICIENCY:		%		144		<u> </u>		%		
EFFICIENCY DETERMINATION CODE:							_			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):			on Calcu		Appendix (_			
PRESSURE DROP (IN H ₂ 0): MIN: MAX: TBD	GAUGE?	✓ YES		NO NO			MAY TO	`		
BULK PARTICLE DENSITY (LB/FT³): TBD POLLUTANT LOADING RATE: 0.004 LB/HR	√ GR/FT ³	OUTLET T		. ,			MAX TBI			
POLLUTANT LOADING RATE: 0.004 LB/HR INLET AIR FLOW RATE (ACFM): 3,600	<u> </u>	FILTER O					WAX IBI	,		
` ' '	PER COMPARTME		ERATII	NG TEIVIE	LENGTH O	F BAC	3 (INI): TE	₽D		
	ACE AREA PER CA		(FT²): T	'RD	DIAMETER					
	AIR TO CLOTH RA		(1 1). 1	ББ	DIAWIE I EI		// (IIV.).	TDD		
	FORCED/POSITIV			FILTER MA	ATERIAI ·		WOVEN	7	FELTED	
DESCRIBE CLEANING PROCEDURES	T GROED/I GGITIV			121211111			ICLE SIZI			
	SONIC				SIZE	_	WEIG		CUMULA	ATIVE
	SIMPLE BAG COL	LAPSE			(MICROI		OF TO		%	
	RING BAG COLLA				0-1	,			nown	
OTHER:	THIT BY G GGLLY	02			1-10				10 11 1	
DESCRIBE INCOMING AIR STREAM:					10-25					
The air stream will contain wood dust particles.					25-50					
					50-100					
					>100					
								TOTAL	_ = 100	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOV	VING THE RELATION	ONSHIP OF	THE C	ONTROL I	DEVICE TO	ITS E	MISSION	SOURCE	E(S):	
COMMENTS:										

REVISED 09/22/16 NC	DEQ/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		l R
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: ES-PMFS		•
Pellet Mill Feed Silo				CONTROL I	DEVICE ID N	O(S): CD-PMF	S-BV	
OPERATING SCENARIO 1	OF	1				K) ID NO(S):		
DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	CESS (ATTA	CH FLOW DI	AGRAM):	,	, , ,		
A pellet press silo stores dried ground	d wood prior to t	ransport to tl	ne pellet pres	ses.				
TYPE OF EMISSION SOU	JRCE (CHECK A	ND COMPLE	TE APPROP	RIATE FORM	I B1-B9 ON 1	HE FOLLOW	/ING PAGES	<u></u>
Coal,wood,oil, gas, other burner (Fo	orm B1)	Woodwo	rking (Form E	34)	Manuf.	of chemicals	/coatings/inks	s (Form B7)
Int.combustion engine/generator (F	form B2)	Coating/f	finishing/printi	ng (Form B5)	Inciner	ation (Form B	88)	, ,
Liquid storage tanks (Form B3)	•	√ Storage :	silos/bins (Fo	rm B6)	Other	(Form B9)	•	
START CONSTRUCTION DATE:			DATE MANU	JFACTURED				
2013								
MANUFACTURER / MODEL NO.:								
Laidig 533			EXPECTED	OP. SCHEDI	JLE: <u>24</u> F	IR/DAY <u>7</u>	DAY/WK	<u>52</u> _ WK/YF
IS THIS SOURCE SUBJECT T	NSPS (SUBPAR	RTS?):		_ NESH	HAP (SUBPAI	RTS?):		
PERCENTAGE ANNUAL THROUGHP	, ,		MAR-MAY			SEP-NOV 25		
CRITERIA A	AIR POLLUT	ANT EMIS	SIONS INF	ORMATIC	N FOR TH	iis sourc	Œ	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	. EMISSIONS	,
		EMISSION	(AFTER CONTROLS / LIMITS)		(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	TROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	, ,		n Calculation	s in Appendix	c C			
PARTICULATE MATTER<10 MICRONS	(PM ₁₀)							
ARTICULATE MATTER<2.5 MICRONS (PM _{2.5})								
SULFUR DIOXIDE (SO2)	,							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS ((VOC)							
LEAD								
OTHER								
HAZARDOUS	S AIR POLLU	TANT EMI	SSIONS II	IFORMAT	ION FOR	THIS SOUI	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	. EMISSIONS	;
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	TROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		N/A						
TOXIC All	<u>R POLLUTAI</u>	<u>NT EMISSI</u>	<u>ONS INFO</u>	<u>RMATION</u>	FOR THIS	S SOURCE	:	
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIM	ITATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	Ib	o/yr
		N/A						
Attachments: (1) emissions calculations and	supporting docum	nentation; (2) inc	licate all reques	sted state and f	ederal enforce	able permit limit	ts (e.g. hours of	f operation,
emission rates) and describe how these are		,	•			•	` •	•

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Divis	ion of Air Quality - Ap	plicatio	n for Air Permit to	Construct/Operate	В6
EMISSION SOURCE DESCR	RIPTION:			EMISSION S	SOURCE ID NO: ES-PMFS	
Pellet Mill Feed Silo				CONTROL I	DEVICE ID NO(S): CD-PMFS-BV	
OPERATING SCENARIO:	1	OF <u>1</u>		_ EMISSION F	POINT(STACK) ID NO(S): EP-11	
DESCRIBE IN DETAIL THE F A pellet press silo stores drie	·	The state of the s	pellet p	oresses.		
				<u></u>		
MATERIAL STORED: Pellet I					ERIAL (LB/FT3): 40	
CAPACITY DIMENSIONS (FFFT)	CUBIC FEET:	DIAMETER	(OR)	TONS:	MIDTH	
DIMENSIONS (FEET)	HEIGHT:	DIAMETER:) ACTUAL:	(ON)	LENGTH:	WIDTH: HEIGHT: DESIGN CAPACITY:	
ANNUAL PRODUCT THRO PNEUMATICALLY FI		MECHANIC	ALLY F	•	FILLED FROM	
BLOWER		SCREW CONVEYO			RAILCAR	
COMPRESSOR			/IX		TRUCK	
OTHER:		BUCKET ELEVATO	Ð		STORAGE PILE	
OTTLEK.		OTHER:	11		OTHER: Conveyor	
NO. FILL TUBES:		J OTHER.			OTHER. Collveyor	
MAXIMUM ACFM:						
MATERIAL IS UNLOADED TO	I					
INIATERIAL IS UNLOADED IN	0.					
BY WHAT METHOD IS MATE	ERIAL UNLOADEI	FROM SILO?				
MAXIMUM DESIGN FILLING	RATE OF MATER	RIAL (TONS/HR): 105				
MAXIMUM DESIGN UNLOAD	DING RATE OF MA	ATERIAL (TONS/HR): 1	.05			
COMMENTS:						

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-BV	7	CONTROLS EMIS	SIONS FRO	OM WH	IICH EMISS	SION SOURCE I	NO(S): E	S-PMFS		
EMISSION POINT (STACK) ID NO(S):	EP-11	POSITION IN SEF	RIES OF CO	NTRO	LS	NO	. 1 OF	1 1	UNITS	
OPERATING SO	ENARIO:									
<u>1</u> OF	1		P.E. SEAL	REQU	IIRED (PER	2q .0112)? 🗸	YES		NO	
DESCRIBE CONTROL SYSTEM:			1							
A bin vent filter is used to create a sligh The bin vent is sized to offset the air dis					e bin vent c	ollects dust from	the air vo	lume pres	ent in the	silo.
POLLUTANTS COLLECTED:			PM		PM ₁₀	PM _{2.5}				
BEFORE CONTROL EMISSION RATE (LB/HR):									
CAPTURE EFFICIENCY:			~99.9	%	~99.9	% ~99.9	%		%	
CONTROL DEVICE EFFICIENCY:		%		<u> </u>	<u> </u>		%			
CORRESPONDING OVERALL EFFICIENCY:				%			<u></u> %		%	
EFFICIENCY DETERMINATION CODE:						· <u> </u>	_			
TOTAL AFTER CONTROL EMISSION R			ion Cal		Appendix C					
PRESSURE DROP (IN H ₂ 0): MIN:	MAX: 4"	GAUGE?	✓ YES	L	NO					
BULK PARTICLE DENSITY (LB/FT ³): 1.4		3			TURE (°F):		MAX Am			
POLLUTANT LOADING RATE: 0.004	_ LB/HR	√ GR/FT ³			RATURE (°I		MAX Am	bient		
INLET AIR FLOW RATE (ACFM): 2,500				PERAT	ING TEMP	` , ,				
		S PER COMPARTM				LENGTH OF BA				
		FACE AREA PER CA		(FT²):		DIAMETER OF	BAG (IN.):	5.875		
TOTAL FILTER SURFACE AREA (FT ²):	377	AIR TO CLOTH R	ATIO: 6							
DRAFT TYPE: INDUCED/NEG.	ATIVE _	FORCED/POSITIN	/E		FILTER M	ATERIAL:	WOVEN	4 1	FELTED	
DESCRIBE CLEANING PROCEDURES					ı	PAR	FICLE SIZI	E DISTRIE	BUTION	
☑ AIR PULSE		SONIC				SIZE	WEIG	SHT %	CUMULA	ATIVE
REVERSE FLOW		SIMPLE BAG CO	LLAPSE			(MICRONS)	OF T	OTAL	%	
☐ MECHANICAL/SHAKER		RING BAG COLLA	APSE			0-1		Unkn	own	
OTHER:						1-10				
DESCRIBE INCOMING AIR STREAM:						10-25				
The air stream will contain wood dust p	articles.					25-50				
						50-100				
						>100				
								TOTAL	. = 100	
ON A SEPARATE PAGE, ATTACH A DI	AGRAM SHO	WING THE RELATI	ONSHIP OF	THE	CONTROL	DEVICE TO ITS	EMISSION	SOURCE	:(S):	
COMMENTS:										

REVISED 09/22/1 NCDE	Q/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В			
EMISSION SOURCE DESCRIPTION:				EMISSION S							
Pellet Cooler HP Fines Relay System				CONTROL DEVICE ID NO(S): CD-PCHP-BV							
OPERATING SCENARIO 1	OF	1		+		K) ID NO(S):					
DESCRIBE IN DETAILTHE EMISSION	SOURCE PR	OCESS (ATT	ACH FLOW I			, - ()					
Fine pellet material from the hammern		•		•	n is collected	in the pellet o	ooler high pi	ressure fines			
relay system which is controlled by a b	aghouse.			-		-					
TYPE OF EMISSION SOUR	CE (CHECK A	AND COMPLE	ETE APPROI	PRIATE FOR	M B1-B9 ON	THE FOLLOV	VING PAGES	3):			
Coal,wood,oil, gas, other burner (For	•		rking (Form E			of chemicals		•			
Int.combustion engine/generator (Fo	,		٠,	ing (Form B5)		ation (Form B	•	,			
Liquid storage tanks (Form B3)	,	_	silos/bins (Fo	,	_	(Form B9)	-,				
START CONSTRUCTION DATE:			DATE MANU	JFACTURED	:	` '					
MANUFACTURER / MODEL NO.:											
Aircon			EXPECTED	OP. SCHED	JLE: <u>24</u> H	IR/DAY <u>7</u>	DAY/WK	<u>52</u> _ WK/YF			
IS THIS SOURCE SUBJECT NS	SPS (SUBPAR	TS?):	S?): NESHAP (SUBPARTS?):								
PERCENTAGE ANNUAL THROUGHPL	JT (%): DEC-I	FEB 25 %	MAR-MAY	25% JUN-	-AUG 25%	SEP-NOV 2	25%				
CRITERIA AI	R POLLUT	ANT EMIS	SIONS IN	FORMATION	ON FOR TI	HIS SOUR	CE				
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS				
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)			
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr			
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	к С						
PARTICULATE MATTER<10 MICRONS (PM ₁₀)										
PARTICULATE MATTER<2.5 MICRONS	(PM _{2.5})										
SULFUR DIOXIDE (SO2)											
NITROGEN OXIDES (NOx)	NITROGEN OXIDES (NOx)										
CARBON MONOXIDE (CO)											
VOLATILE ORGANIC COMPOUNDS (VOC)											
LEAD											
OTHER											
HAZARDOUS A	AIR POLLU	JTANT EM	ISSIONS I	NFORMA	TION FOR	THIS SOU	RCE				
		SOURCE OF		D ACTUAL			EMISSIONS				
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)			
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr			
		N/A				,					
		,									
TOXIC AIR	POLLUTA	NT EMISS	IONS INFO	ORMATIOI	N FOR THI	S SOURCE	E				
7 07110 7 1111		JUUNUL									
		OF EMISSION	EXPEC1	TED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIMI	TATIONS			
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb)/hr	lb/	day	lb)/yr			
		N/A		<u> </u>		,		· ,			
		,									
	1										
	1										
Attachments: (1) emissions calculations and	supporting docu	mentation: (2) i	ndicate all regi	iested state and	d federal enforc	eable permit lin	nits (e.a. hours	of operation			
emission rates) and describe how these are n											

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Division	n of Air Quality - Ap	plicatio	n for Air Permit to	Construct/Operate	В6				
EMISSION SOURCE DESCRI	IPTION:			EMISSION	EMISSION SOURCE ID NO: ES-PCHP					
Pellet Cooler HP Fines Relay S	System			CONTROL	DEVICE ID NO(S): CD-PCHP-BV					
OPERATING SCENARIO:	1_	OF <u>1</u>		_ EMISSION	POINT(STACK) ID NO(S): EP-12					
DESCRIBE IN DETAIL THE P Fine pellet material from the is controlled by a baghouse.	•		dling is	collected in the pe	llet cooler high pressure fines relay sy	stem which				
MATERIAL OTORER EL P				DENOITY OF MA	FEDIAL (LD/FTO), 40					
MATERIAL STORED: Fine Pe					ΓERIAL (LB/FT3): 40					
	CUBIC FEET: 2,200		(OR)	TONS:	WIDTH: HEIGHT.					
· · · · · · · · · · · · · · · · · · ·	HEIGHT:	DIAMETER: 12	(ON)	LENGTH:	WIDTH: HEIGHT:					
ANNUAL PRODUCT THRO PNEUMATICALLY FII	, ,	ACTUAL: MECHANIC	ΔΙΙΥΕ		DESIGN CAPACITY: 6 tph FILLED FROM					
				ILLLU						
BLOWER		SCREW CONVEYOR	ik.		☐ RAILCAR☐ TRUCK					
COMPRESSOR		BELT CONVEYOR	Б							
OTHER:		BUCKET ELEVATO	ĸ		STORAGE PILE OTHER: Conveyor					
=		OTHER:			OTHER: Conveyor					
NO. FILL TUBES:										
MAXIMUM ACFM:										
MATERIAL IS UNLOADED TO):									
BY WHAT METHOD IS MATE	RIAL UNLOADED F	ROM SILO?								
MAXIMUM DESIGN FILLING	RATE OF MATERIA	L (TONS/HR): TBD								
MAXIMUM DESIGN UNLOAD	ING RATE OF MAT	ERIAL (TONS/HR): T	BD							
COMMENTS:										

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16	NCDEQ/Divisi	on of Air Quality -	- Application	n for	Air Permit to	Construct	/Opei	ate			C1
CONTROL DEVICE ID NO: CD-PCHP-B	v	CONTROLS EMIS	SSIONS FR	OM V	VHICH EMISS	SION SOUR	CE ID	NO(S): I	ES-PCHP		
EMISSION POINT (STACK) ID NO(S):	EP-12	POSITION IN SEF	RIES OF CO	ONTR	ROLS		NO.	1 0	F 1	UNITS	
OPERATING S	CENARIO:							_	_		_
<u>1</u> 0F	11		P.E. SEAL REQUIRED (PER 2q .0112)?								
DESCRIBE CONTROL SYSTEM: A baghouse is used to create a slight ne						ie baghouse	colle	cts dust f	rom the ai	r volume p	oresent
in the silo. The baghouse is sized to of	fset the air disp	lacement created	by materia	l feed	to the silo.						
POLLUTANTS COLLECTED:			РМ	_	PM ₁₀	P	M _{2.5}				
BEFORE CONTROL EMISSION RATE	(LB/HR):			-		<u> </u>		_			
CAPTURE EFFICIENCY:			~99.9	<u></u> %	~99.9	% ~9	9.9	%		%	
CONTROL DEVICE EFFICIENCY:			- %		%		<u></u> %		%		
CORRESPONDING OVERALL EFFICIE			<u></u> %		%		<u></u>		%		
EFFICIENCY DETERMINATION CODE	:			-				_			
TOTAL AFTER CONTROL EMISSION I				ion C	alculations in	Appendix (
PRESSURE DROP (IN H ₂ 0): MIN:	MAX: TBI	GAUGE?	✓ YES	MDE	∐ NO			144V mp			
BULK PARTICLE DENSITY (LB/FT³): T		☑ GR/FT ³			RATURE (°F):			MAX TB			
POLLUTANT LOADING RATE: 0.004 [√ GR/FT³			PERATURE (°			MAX TB	SD .		
INLET AIR FLOW RATE (ACFM): 3,600 NO. OF COMPARTMENTS: TBD		PER COMPARTM		PERA	ATING TEMP	LENGTH C	E DA	C (IN): T	PD		
NO. OF COMPARTMENTS. 1BD). TDD	DIAMETER		. ,							
TOTAL FILTER SURFACE AREA (FT ²)		ACE AREA PER C AIR TO CLOTH R		(F I). ТВО	DIAMETER	OF	SAG (IIV.)	. тви		
DRAFT TYPE: INDUCED/NEG		FORCED/POSITIV			FILTER M	ΔΤΕΡΙΔΙ ·		WOVEN	1 7	FELTED	
DESCRIBE CLEANING PROCEDURES		TOROLD/I COITI	<u> </u>		TILILIVIA		PARI		E DISTRI		
☐ AIR PULSE		SONIC				SIZE		_	GHT %	CUMUL	ΔΤΙ\/Ε
REVERSE FLOW		SIMPLE BAG COI	LLAPSE			(MICRO			TOTAL	% %	
☐ MECHANICAL/SHAKER		RING BAG COLLA				0-1	10)			nown	
OTHER:		KING BAG COLLA	AF OL			1-10			Olik	ilowii	
DESCRIBE INCOMING AIR STREAM:						10-25					
The air stream will contain wood dust	particles. Larg	er particles will be	e removed l	y the	e upstream	25-50					
cyclone.						50-10					
						>100					
									TOTA	L = 100	
ON A SEPARATE PAGE, ATTACH A D	IAGRAM SHOV	VING THE RELATI	IONSHIP O	F THI	E CONTROL I	DEVICE TO	ITS E	EMISSIO	N SOURC	Ξ(S):	
COMMENTS:											
	A 44	aab Additias	-1.01	4- 4	\ - N						

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		l B
EMISSION SOURCE DESCRIPTION:		_		EMISSION S	SOURCE ID N	IO: ES-FPH, ES	S-PB-1 throug	gh ES-PB-12,
Finished Product Handling, Pellet Load	out Bins, Pelle	t Loadout		ES-PL-1, ES-				
				CONTROL [DEVICE ID NO	O(S): CD-FPH-	BF	
OPERATING SCENARIO <u>1</u>	OF	1_			POINT (STAC	K) ID NO(S): I	EP-13	
DESCRIBE IN DETAILTHE EMISSION SPELLETING PROBLEMS PELLO PROBLEMS	t loadout bins er (CD-FPH-BI opes upward o ons to the atm ight negative p duced draft fa nediately after	that feed two f). Pellet Load during the load osphere from pressure is ma in that exhaust loading.	pellet loador lout is accon dout process conveyance intained in t s to the same	ut operations nplished by gu to maintain o from storage he loadout bu e bagfilter tha	ravity feed of constant cont bins are min uilding as a fir at controls PM	the pellets int act with the p imal because e protection r I emissions fr	o trucks thro roduct as it i dried wood f neasure. Tho om loading o	ough a s loaded to ines have e slight f the pellet
Coal,wood,oil, gas, other burner (For	m B1)	Woodwor	king (Form E	34)	☐Manuf.	of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (Fo	rm B2)	Coating/f	inishing/print	ing (Form B5)	Inciner	ation (Form B	8)	
Liquid storage tanks (Form B3)		✓ Storage s	ilos/bins (Fo	rm B6)	√ Other (Form B9)		
START CONSTRUCTION DATE: 2013			DATE MAN	JFACTURED	:			
MANUFACTURER / MODEL NO.:								
Agra 1200 Pellet Storage			EXPECTED	OP. SCHEDU			_ DAY/WK _	_ <u>52</u> _ WK/YR
	SPS (SUBPAR	,	MAD MAY		HAP (SUBPA	,	10/	
PERCENTAGE ANNUAL THROUGHPU CRITERIA A				25% JUN-A		SEP-NOV 25		
CRITERIA	IN FOLLUT				T TOK III			
		SOURCE OF		D ACTUAL	(222222	POTENTIAL		
AID DOLLUTANT FAUTTED		EMISSION	•	ROLS / LIMITS)	,	TROLS / LIMITS)	,	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM) PARTICULATE MATTER<10 MICRONS (F	204 \	See Emission	Carculation	s in Appendix	1 T			
,	,							
PARTICULATE MATTER<2.5 MICRONS (PIVI _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)	00)							
VOLATILE ORGANIC COMPOUNDS (V	UC)							
LEAD OTHER								
HAZARDOUS	AID BOLLI	ITANIT EMI	CCIONC I	NEODIAAT	ION FOR 1	THIS SOLID	CE	
HAZARDOUS	T PULLU				TON FOR I			
		SOURCE OF		D ACTUAL		POTENTIAL		
HAZADDOHO AID DOLLHTANT	CACNO	EMISSION	,	ROLS / LIMITS)	,	TROLS / LIMITS)	`	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		N/A						
	+							-
TOYIC AIR	POLLUTA	NT EMICCI	ONS INEC	DMATION	EOD TUIS	SOURCE		
TOXIC AIR	T	T CIVIL 331	ONS INFO	KINIATION	FOR THIS	SOURCE		
		OF EMISSION	EXPECT	TED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lk	o/hr	lb/	day	lb	/yr
	1	N/A						
	1							
	1							
Attachments: (1) emissions calculations and su	nnorting docume	ntation: (2) indica	ate all requests	d state and fode	aral enforceable	normit limite (o.	hours of once	ration 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.

EMISSION SOURCE (OTHER)

EMISSION SOURCE DESCRIPTION: Finished Product Handling OPERATING SCENARIO: OPERATING SCENARIO: OPERATING DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Collection of transfer points, pellet screening operations, and pellet conveying. MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS TYPE UNITS ODT/yr 781,255 MAX. DESIGN CAPACITY Wood Pellets ODT/yr 781,255 MAX. DESIGN CAPACITY UNITS MATERIALS ENTERING PROCESS - BATCH OPERATION TYPE UNITS MAX. DESIGN CAPACITY CAPACITY CAPACITY (UNIT/BAT	REQUESTED CAPACITY LIMITATION(UNIT/HR) N/A REQUESTED CAPACITY LIMITATION (UNIT/HR)
CONTROL DEVICE ID NO CONTROL D	REQUESTED CAPACITY LIMITATION(UNIT/HR) N/A REQUESTED CAPACITY LIMITATION (UNIT/HR)
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Collection of transfer points, pellet screening operations, and pellet conveying. MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS	REQUESTED CAPACITY LIMITATION(UNIT/HR) N/A REQUESTED CAPACITY
MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS MAX. DESIGN TYPE UNITS CAPACITY Wood Pellets ODT/yr 781,255	LIMITATION(UNIT/HR) N/A REQUESTED CAPACITY
TYPE UNITS CAPACITY Wood Pellets ODT/yr 781,255	LIMITATION(UNIT/HR) N/A REQUESTED CAPACITY
TYPE UNITS CAPACITY Wood Pellets ODT/yr 781,255 ADDT/yr 781,255	LIMITATION(UNIT/HR) N/A REQUESTED CAPACITY
Wood Pellets ODT/yr 781,255	N/A REQUESTED CAPACITY
MATERIALS ENTERING PROCESS - BATCH OPERATION MAX. DESIGN	REQUESTED CAPACITY
	· ·
	· ·
	· ·
	· ·
TITE UNITS CAPACITY (UNIT/BAT	CH) LIMITATION (UNIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):	
FUEL USED: N/A TOTAL MAXIMUM FIRING RATE (MII	LLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A REQUESTED CAPACITY ANNUAL F	UEL USE: N/A
COMMENTS:	,

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/DIVISION (of Air Quality - A	Application	n for Air Permit to C	onstruct/Operate	D0				
EMISSION SOURCE DESCRI	IPTION:			EMISSION S	SOURCE ID NO: ES-PB-1 throug	h ES-PB-12				
Pellet Loadout Bins				CONTROL D	DEVICE ID NO(S): CD-FPH-BF					
OPERATING SCENARIO:	1	OF	1	_ EMISSION P	POINT(STACK) ID NO(S): EP-13					
DESCRIBE IN DETAIL THE PI Pellet Loadout Bins are used t areas.				aded from the bins i	into trucks/trains in one of two	pellet loadout				
MATERIAL STORED: Pellet P	·roduct			DENSITY OF MATERIAL (LB/FT3): 40						
CAPACITY	CUBIC FEET: 2,200			TONS:						
DIMENSIONS (FEET)	HEIGHT: D	IAMETER: 12	(OR)	LENGTH:	WIDTH: HEIGHT:					
ANNUAL PRODUCT THRO	OUGHPUT (TONS)	IT (TONS) ACTUAL:			DESIGN CAPACIT' 781255 ODT	/yr				
PNEUMATICALLY FIL	LLED	MECHAN	NICALLY F	ILLED	FILLED FRO	М				
BLOWER COMPRESSOR OTHER:	SCREW CONVEYOR BELT CONVEYOR BUCKET ELEVATOR OTHER:				RAILCAR TRUCK STORAGE PILE OTHER: Conveyor					
NO. FILL TUBES:										
MAXIMUM ACFM: 750 each										
BY WHAT METHOD IS MATE										
MAXIMUM DESIGN FILLING F		. ,								
MAXIMUM DESIGN UNLOADI	ING RATE OF MATER	RIAL (TONS/HR): 105							
COMMENTS:										

EMISSION SOURCE (OTHER)

MAX. DESIGN CAPACITY (UNIT/HR) 781,255	: CD-FPH-BF
MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION(UNIT/HR)
CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
781,255	N/A
MAX. DESIGN	REQUESTED CAPACITY
	LIMITATION (UNIT/BATCH)
,	
•	
APACITY ANNUAL FUEL C	JSE: N/A
	MAX. DESIGN APACITY (UNIT/BATCH) M FIRING RATE (MILLION PACITY ANNUAL FUEL L

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divisi	ion of Air Quality -	Applicatio	n for	Air Permit to	Cons	truct/Ope	ate			C1
CONTROL DEVICE ID NO: CD-FPH-BF	CONTROLS EMIS PB-12, ES-PL-1 and		V MC	VHICH EMISS	SION S	OURCE ID	NO(S): I	ES-FPH, ES	-PB-1 thro	ugh ES-
EMISSION POINT (STACK) ID NO(S): EP-13	POSITION IN SER	RIES OF CO	NTR	ROLS		NO.	1 0	F 1	UNITS	
OPERATING SCENARIO:										
<u>1</u> OF <u>1</u>		P.E. SEAL	REC	QUIRED (PER	R 2q .01	12)? 🗸	YES		NO	
DESCRIBE CONTROL SYSTEM: The bag filter will be utilized to control PM emissions consisting of loading finished product from the Pellet	_			g conveyors a	nd scre	eens, as we	ell as the	pellet load	lout operat	ion
POLLUTANTS COLLECTED:		PM	-	PM ₁₀		PM _{2.5}	_			
BEFORE CONTROL EMISSION RATE (LB/HR):			-				_			
CAPTURE EFFICIENCY:		~99.9	<u></u> %	~99.9	<u></u> %	~99.9	<u></u> %		%	
CONTROL DEVICE EFFICIENCY:			%		<u></u> %		<u> </u>		%	
CORRESPONDING OVERALL EFFICIENCY:			<u></u> %		<u></u> %		<u> </u>		%	
EFFICIENCY DETERMINATION CODE:			-				_		•	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):			ion C	alculations in	Appen	dix C			,	
PRESSURE DROP (IN H ₂ 0): MIN: MAX: 6"	GAUGE?	✓ YES		∐ NO				_		
BULK PARTICLE DENSITY (LB/FT³): 1.43E-05	3			RATURE (°F):			MAX 12			
	☑ GR/FT ³			PERATURE (°			MAX 10	0		
INLET AIR FLOW RATE (ACFM): 35,500			PER/	ATING TEMP	<u>` </u>					
	PER COMPARTMI					TH OF BA				
	ACE AREA PER CA	ARTRIDGE	(FT ²):	DIAME	ETER OF E	BAG (IN.)	: 5.75		
TOTAL FILTER SURFACE AREA (FT ²): 4,842	AIR TO CLOTH RA	ATIO: 7.30								
DRAFT TYPE: INDUCED/NEGATIVE ✓	FORCED/POSITIV	/E		FILTER M	ATERIA	AL:	WOVEN	1 1	FELTED	
DESCRIBE CLEANING PROCEDURES						PART	ICLE SIZ	E DISTRI	BUTION	
AIR PULSE	SONIC				;	SIZE	WEI	GHT %	CUMULA	ATIVE
✓ REVERSE FLOW	SIMPLE BAG COL	LAPSE			(MIC	CRONS)	OF 1	TOTAL	%	
☐ MECHANICAL/SHAKER ☐	RING BAG COLLA	APSE				0-1		Unk	nown	
OTHER:						1-10				
DESCRIBE INCOMING AIR STREAM:					1	10-25				
The air stream will contain wood dust particles.					2	25-50				
					5	0-100				
					;	>100				
								TOTA	L = 100	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOW	WING THE RELATION	ONSHIP O	F THI	E CONTROL	DEVIC	E TO ITS E	EMISSIO	N SOURC	E(S):	_
COMMENTS:										

REVISED 09/22/1 NCDE	Q/Division of	Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	NO: IES-ADD		
Additive Handling and Storage						O(S): CD-ADD	-BF	
OPERATING SCENARIO 1	OF	1				K) ID NO(S): 1		
DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	OCESS (ATT	ACH FLOW [, (-,		
Bulk additive material will be delivered		•			e silo. The ad	ditive will the	en be conveye	ed via screw
conveyor from the storage silo to the m								
handling are controlled by a baghouse.								
TYPE OF EMISSION SOUR	CE (CHECK A	AND COMPLI	ETE APPROF	RIATE FORI	M B1-B9 ON	THE FOLLOV	VING PAGES	5):
Coal,wood,oil, gas, other burner (For	•	Woodworking (Form B4)				of chemicals/		•
Int.combustion engine/generator (Fo	,	Coating/f	finishing/printi	ng (Form B5)	Inciner	ation (Form B	8)	,
Liquid storage tanks (Form B3)	,	Storage : ■ ■ ■ ■ ■ ■ ■	Storage silos/bins (Form B6) Other (Form B9)					
START CONSTRUCTION DATE:			DATE MANU	JFACTURED:	:			
TBD			TBD					
MANUFACTURER / MODEL NO.:								
TBD			EXPECTED	OP. SCHEDI	JLE: <u>24</u> F	IR/DAY <u>7</u>	_ DAY/WK _	_ <u>52</u> _ WK/YF
IS THIS SOURCE SUBJECT NS	PS (SUBPAR	TS?):		NESH	HAP (SUBPAI	RTS?):		
PERCENTAGE ANNUAL THROUGHPU	` '			25% JUN-		SEP-NOV 2		
CRITERIA AI	R POLLUT	ANT EMIS	SIONS INI	FORMATIO	ON FOR T	HIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation:	s in Appendix	к C			
PARTICULATE MATTER<10 MICRONS (I	PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS ((PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (V	OC)							
LEAD								
OTHER								
HAZARDOUS A	AIR POLLU	TANT EM	ISSIONS I	NFORMA1	TION FOR	THIS SOU	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation:	s in Appendix	k C			
TOXIC AIR	<u>POLLUTA</u>	<u>NT EMISS</u>	<u>IONS INFO</u>	<u>PRMATION</u>	N FOR THI	S SOURCE	<u> </u>	
		OF	FXPECT	FD ACTUAL	FMISSIONS	AFTER CONT	TROLS / LIMI	TATIONS
		EMISSION	27(1 201	2071010712		7.1 12.1 00.11	11(020 / 211111	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr
		See Emission	n Calculation:	s in Appendix	k C			
Attachments: (1) emissions calculations and semission rates) and describe how these are n								

EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Division	n of Air Quality - Ap	plicatio	n for Air Permit to	Construct/Operate	B6
EMISSION SOURCE DESCR	IPTION:			EMISSION S	SOURCE ID NO: IES-ADD	
Additive Handling and Storag	ge			CONTROL [DEVICE ID NO(S): CD-ADD-BF	
OPERATING SCENARIO:	1_	OF <u>1</u>		_ EMISSION F	POINT(STACK) ID NO(S): EP-14	
	e delivered by truck lo to the milled fiber	and pneumatically u			. The additive will then be conveyed v ellet Presses. Emissions from additive	
MATERIAL STORED: Additiv	7e			DENSITY OF MATI	ERIAL (LB/FT3): TBD	
	CUBIC FEET:			TONS:	ETTILE (EBIT TO). TBB	
	HEIGHT:	DIAMETER: TBD	(OR)	(OR) LENGTH: WIDTH: HEIGHT:		
ANNUAL PRODUCT THRO	L	ACTUAL:		MAXIMUM DESIGN CAPACITY:		
PNEUMATICALLY FI		MECHANIC	ALLY F	ILLED	FILLED FROM	
☑ BLOWER		SCREW CONVEYO	R		RAILCAR	
COMPRESSOR		BELT CONVEYOR			☑ TRUCK	
OTHER:		BUCKET ELEVATO	R		☐ STORAGE PILE	
		OTHER:			OTHER:	
NO. FILL TUBES:						
MAXIMUM ACFM:						
MATERIAL IS UNLOADED TO	D:					
BY WHAT METHOD IS MATE	RIAL UNLOADED F	ROM SILO?				
MAXIMUM DESIGN FILLING	RATE OF MATERIA	L (TONS/HR): TBD				
MAXIMUM DESIGN UNLOAD	ING RATE OF MAT	ERIAL (TONS/HR): 1	BD			
COMMENTS:						

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Division	on of Air Quality -	Applicatio Applicatio	n for Air	Permit to	Construct/C	perate			C1
CONTROL DEVICE ID NO: CD-ADD-BF	CONTROLS EMIS	SIONS FRO	OM WHI	CH EMISS	SION SOURCE	E ID NO	O(S): IES-ADD		
EMISSION POINT (STACK) ID NO(S): EP-14	POSITION IN SER	IES OF CO	NTROL	S		NO.	1 OF 1	UNITS	
OPERATING SCENARIO:									
1OF1		P.E. SEAL	REQUI	RED (PER	? (2q .0112)?	√ YE	S [NO	
DESCRIBE CONTROL SYSTEM: The silo baghouse will control air displaced by the load	ded additive.								
POLLUTANTS COLLECTED:		PM		PM ₁₀	PM ₂	.5		-	
BEFORE CONTROL EMISSION RATE (LB/HR):			. –					-	
CAPTURE EFFICIENCY:		~99.9	% _	~99.9	% ~99	.9%		%	
CONTROL DEVICE EFFICIENCY:			<u></u>			%		<u></u> %	
CORRESPONDING OVERALL EFFICIENCY:		<u></u>		<u> </u>	%		%		
EFFICIENCY DETERMINATION CODE:								-	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):			on Calcu	_	Appendix C			<u>-</u>	
PRESSURE DROP (IN H ₂ 0): MIN: MAX: TBD	GAUGE?	✓ YES	4DEDAT	NO NO			VEDD		
BULK PARTICLE DENSITY (LB/FT³): TBD POLLUTANT LOADING RATE: 0.004 LB/HR	√ GR/FT ³	OUTLET T					X TBD		
POLLUTANT LOADING RATE: 0.004 LB/HR INLET AIR FLOW RATE (ACFM): 1,652	<u> </u>	FILTER O				IVIA	W IPD		
` ' '	PER COMPARTME		ERATII	NG TEIVIF	LENGTH OF	BAG (II	N)· TRD		
	ACE AREA PER CA		(FT²)⋅ T	'RD	DIAMETER (
	AIR TO CLOTH RA		(1 1). 1	ББ	DIAMETER	or bac	(IIV.). IBD		
	FORCED/POSITIV		F	FILTER MA	ATFRIAL ·	□wo	OVEN 🗸	FELTED	
DESCRIBE CLEANING PROCEDURES			<u> </u>	121211111			E SIZE DISTRI		
	SONIC				SIZE		WEIGHT %	CUMULA	ATIVE
	SIMPLE BAG COL	LAPSE			(MICRONS		OF TOTAL	%	
	RING BAG COLLA				0-1	,		nown	
OTHER:	THIT BY GOLLY	02			1-10				
DESCRIBE INCOMING AIR STREAM:					10-25				
The air stream will contain wood dust particles.					25-50				
					50-100				
					>100				
						<u> </u>	TOTA	L = 100	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOV	VING THE RELATION	ONSHIP OF	THE C	ONTROL	DEVICE TO IT	S EMIS	SSION SOURC	E(S):	
COMMENTS:									

Diesel Fired Emergency Generator (350 brake horsepower) OPERATING SCENARIO 1 OF 1 EMISSION POINT (STACK) ID NO(S): RP-15 DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM): Diesel-fired internal combustion engine to provide power in the case of an emergency. TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES): Coal,wood, oil, gas, other burner (Form B1)	REVISED 09/22/16 NO	DEQ/Division	of Air Quality	y - Application	on for Air Permit	to Construc	t/Operate		В		
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM): Diesel-fired internal combustion engine to provide power in the case of an emergency. Describe in Detail The Emission Source (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES): Coal, wood, oil, gas, other burner (Form B1)	EMISSION SOURCE DESCRIPTION:				SOURCE ID	IES-GN-1					
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM): Direct-fired internal combustion engine to provide power in the case of an emergency. TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM 81-89 ON THE FOLLOWING PAGES): Cally Company of the power in the case of an emergency. Cally Company of the power in the ca	Diesel Fired Emergency Generator (35	0 brake horsep	ower)		CONTROL DEV	/ICE ID NO(S): N/A				
TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES): Coal,wood.oil, gas, other burner (Form B1)	OPERATING SCENARIO <u>1</u>	OF	1	 	EMISSION POIL	NT (STACK) I	D NO(S): EP-	15			
TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES): Coal, wood, oil, gas, other burner (Form B1)	DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	CESS (ATTA	CH FLOW D	IAGRAM):						
Coating/finishing/initing (Form B4)	Diesel-fired internal combustion engi	ne to provide po	ower in the ca	ase of an eme	rgency.						
Coating/finishing/initing (Form B4)											
Coating/finishing/initing (Form B4)											
Coaling/finishing/printing (Form B3)		,									
Liquid storage tanks (Form B3) Storage silosobins (Form B9) Other (Form B9)		•									
START CONSTRUCTION DATE: 2013 2013 2013 2013 AMANUFACTURER / MODEL NO.: Generac 8D200 EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR EXPECTED ACTUAL POTENTIAL EMISSIONS HB/FIR CONTROLS / LIMITS) (AFTER CONTR	1—	orm B2)									
2013			Storage								
MANUFACTURER / MODEL NO.: Generac 50240 EXPECTED OP. SCHEDULE: 24 HRJDAY 7 DAY/WK 52 WK/YR STHIS SOURCE SUBJECT V NSPS (SUBPARTSY): IIII V NSPS (IIIII V NSP											
EXPECTED OP SCHIEDULE: 24 HIRDAY 2 DAYWK 52 WK/R STHIS SOURCE SUBJECT:				2013							
ISTHIS SOURCE SUBJECT MSPS (SUBPARTS?):				EXPECTED	OP SCHEDIII E	: 24 HD/F)AV 7 F)AV/MK 5	2 WK/VP		
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25% MAR-MAY 25% JUN-AUG 25% SEP-NOV 25%		ISPS (SUBPAR	TS2)· IIII	ILXI LOTED				<u>////////</u>	<u>2</u> _ WIOTI		
CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION EXPECTED ACTUAL. (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (BEFO		,		MAR-MAY		•	/				
SOURCE OF EMISSION AIR POLLUTANT EMITTED AIR POLLUTANT EMITTED ARRICULATE MATTER (PM) PARTICULATE MATTER (PM) PARTICULATE MATTER (PM) See Emission Calculations in Appendix C PARTICULATE MATTER 2.5 MICRONS (PM _{0.0}) PARTICULATE MATTER 2.5 MICRONS (PM _{0.0}) PARTICULATE MATTER 2.5 MICRONS (PM _{0.0}) SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOX) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EMISSION FACTOR FACTOR See Emission Calculations in Appendix C EMISSION FACTOR FACTOR FACTOR FACTOR FACTOR FACTOR ATTACHMENT TO SINCE EXPECTED ACTUAL POTENTIAL EMISSIONS (GEFORE CONTROLS / LIMITS) (GEFORE		\ /									
EMISSION FACTOR ID/hr tons/yr ID/hr ID/h						T			s		
AR POLLUTANT EMITTED FACTOR Ib/hr tons/yr Ib/hr tons/yr Ib/hr tons/yr Ib/hr tons/yr Ib/hr tons/yr			1			(BEFORE CON		1			
PARTICULATE MATTER (PM) PARTICULATE MATTER ≥ MICRONS (PM ₂₀) PARTICULATE MATTER ≥ MICRONS (PM ₂₀) SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOX) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION LEMISSION CAS NO. FACTOR See Emission Calculations in Appendix C POTENTIAL EMISSIONS BEMISSION CAS NO. FACTOR See Emission Calculations in Appendix C EXPECTED ACTUAL POTENTIAL EMISSIONS TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE FEMISSION CAS NO. FACTOR SEE EMISSION TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EMISSION CAS NO. FACTOR SEE EMISSION CAS NO. FACTOR DEPARTMENT OF THIS SOURCE EXPECTED ACTUAL POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS)	AIR POLLUTANT EMITTED				· · · · · · · · · · · · · · · · · · ·	<u> </u>		<u> </u>	· · ·		
PARTICULATE MATTER<2.5 MICRONS (PM _{2.3}) SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOx) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTED ACTUAL EMISSIONS (BEFORE CONTROLS / LIMITS) FACTOR INFORMATION FOR THIS SOURCE EMISSION FACTOR INFORMATION FOR THIS SOURCE TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL BEFORE CONTROLS / LIMITS) ID/hr tons/yr ib/hr tons/yr ib/hr tons/yr ID/hr tons/yr ib/hr tons/yr ID/hr tons/yr ib/hr tons/yr ID/hr tons/yr ib/hr tons/yr ID/hr	PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix C		,				
SULFUR DIOXIDE (SO2) NITROGEN OXIDES (NOX) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER SOURCE OF EXPECTED ACTUAL POTENTIAL EMISSIONS HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EMISSION FACTOR Ib/hr tons/yr Ib/hr tons/yr Ib/hr tons/yr Ib/hr tons/yr Ib/hr tons/yr See Emission Calculations in Appendix C TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) (BEFORE CONTROL	PARTICULATE MATTER<10 MICRONS	(PM ₁₀)									
NITROGEN OXIDES (NOX) CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER	PARTICULATE MATTER<2.5 MICRONS	(PM _{2.5})									
CARBON MONOXIDE (CO) VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER MAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (AFTER CONTROLS / LIMIT	SULFUR DIOXIDE (SO2)										
VOLATILE ORGANIC COMPOUNDS (VOC) LEAD OTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTED ACTUAL BMISSIONS EMISSION FACTOR Ib/hr tons/yr Ib/hr	NITROGEN OXIDES (NOx)										
DTHER HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTRO	CARBON MONOXIDE (CO)										
ATTACK AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL EMISSION FACTOR BMSSION FACTOR See Emission Calculations in Appendix C TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL BEFORE CONTROLS / LIMITS) BEFORE CONTROLS / LIMITS BEFORE	VOLATILE ORGANIC COMPOUNDS (VOC)									
HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTED ACTUAL (BEFORE CONTROLS / LIMITS) (BEFORE CONTR	LEAD										
SOURCE OF EMISSION (AFTER CONTROLS / LIMITS)	OTHER										
HAZARDOUS AIR POLLUTANT CAS NO. EMISSION FACTOR Ib/hr tons/yr Ib/hr	HAZARDOU	<u>S AIR POLL</u>				ON FOR T					
HAZARDOUS AIR POLLUTANT CAS NO. FACTOR Ib/hr tons/yr Ib/hr			•								
See Emission Calculations in Appendix C TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS EMISSION FACTOR FACTOR See Emission Calculations in Appendix C 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,					1	<u> </u>	T	`			
TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE 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,	HAZARDOUS AIR POLLUTANT	CAS NO.		,		lb/hr	tons/yr	lb/hr	tons/yr		
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr			See Emission	n Calculation	s in Appendix C	-		<u> </u>			
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr								<u> </u>	_		
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr											
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr								 	-		
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr						+			-		
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr					1						
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr											
TOXIC AIR POLLUTANT CAS NO. FACTOR B/HSSION FACTOR Ib/hr Ib/day Ib/yr	TOXIC A	IR POLLUT	ANT EMIS	SIONS INF	ORMATION	FOR THIS	SOURCE				
TOXIC AIR POLLUTANT CAS NO. FACTOR Body	7 6741 6741		JUUNUL								
TOXIC AIR POLLUTANT CAS NO. FACTOR Ib/hr Ib/day Ib/yr See Emission Calculations in Appendix C See Emission Calculation Calculation C See Emission Calculation				EXPE	CIED ACTUAL E	MISSIONS A	FIER CONTE	ROLS / LIMIT	ATIONS		
Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation,	TOXIC AIR POLLUTANT	CAS NO.			lb/hr	lb	/day	II.	b/yr		
			See Emission	n Calculation	s in Appendix C						
			ļ	ļ		_					
emission rates) and describe now these are monitored and with what traditancy, and ist describe any monitoring devices, defines or feet horte for this course											

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 NC	DEQ/Division of Air Q	uality -	Application for Air Perm	nit to Construct/Ope	rate	B2	
EMISSION SOURCE DESCRIPTION	N:			EMISSION SOURCE	EID NO: IES-G	N-1	
Diesel Fired Emergency Generator	(350 brake horsepow	er)		CONTROL DEVICE	ID NO(S): N/A		
OPERATING SCENARIO:	<u>1</u> OF		1	EMISSION POINT (STACK) ID NO(S):	EP-15	
ENGINE SERVICE	EMERGENCY		SPACE HEAT	· —	GENERATION		
(CHECK ALL THAT APPLY)	PEAK SHAVER		OTHER (DESCRIBE): _				
GENERATOR OUTPUT (KW):		ANTICIF	PATED ACTUAL HOURS	OF OPERATION (HE	RS/YR):		
ENGINE OUTPUT (HP):				,	,		
TYPE ICE: GASOLINE ENGI	NE 🗸 DIESEL EN	IGINE UI	P TO 600 HP DIES	EL ENGINE GREATE	R THAN 600 FD	UAL FUEL ENGINE	
OTHER (DESCRI	_			(complete bel			
ENGINE TYPE RICH BUF	,	N		· ·	,		
EMISSION REDUCTION MODIFIC	ATIONS INJECTION	TIMING	RETARD PREI	GNITION CHAMBER	COMBUSTIO O	THER	
OR STATIONARY GAS TU	RBINE (complete below	/)	NATURAL GAS PIPELIN	NE COMPRESSOR C	R TURBINE (com	olete below)	
FUEL: NATURAL GAS	OIL	ENGINE	TYPE: 2-CYCLE LE	AN BURN 4	-CYCLE LEA TI	JRBINE	
OTHER (DESCRIBE):_	 -		4-CYCLE RIC	144 🗌 0	THER (DESCRIB	E):	
CYCLE: COGENERATION	N SIMPLE	CONTR	OLS: COMBUSTIC	N MODIFICATIONS	(DESCRIBE):		
REGENERATIVE	☐ COMBINED	NON	ISELECTIVE CATALYTIC	C REDUCTION 🗌 S	ELECTIVE CATA	LYTIC REDUCTION	
CONTROLS: WATER-S	STEAM INJECTION	CLE	AN BURN AND PRECOM	MBUSTION CHAMBE	UNCONTROL	_ED	
☐UNCONTROLLED ☐	LEAN-PREMIX						
OTHER (SPECIFY):							
	FUEL USAG	E (INC	LUDE STARTUP/B	ACKUP FUEL)			
FUEL TYPE			MAXIMUM DESIG CAPACITY (UNIT/F		REQUESTED CAPACITY LIMITATION (UNIT/HR)		
No. 2 Fuel Oil	gal				6.55		
FUEI	L CHARACTERIST	TICS (C	 COMPLETE ALL TH	IAT ARE APPLIC	ABLE)		
FUEI	L CHARACTERIST	TICS (C	COMPLETE ALL TH	IAT ARE APPLIC	ABLE) SULFUR CON	TENT	
FUEL TYPE	L CHARACTERIST	TICS (C	COMPLETE ALL TH	IAT ARE APPLIC	,		
		TICS (C		AT ARE APPLIC	SULFUR CON (% BY WEIGH	IT)	
FUEL TYPE	BTU/UNIT	TICS (C	UNITS	IAT ARE APPLIC	SULFUR CON	IT)	
FUEL TYPE	BTU/UNIT	TICS (C	UNITS	IAT ARE APPLIC	SULFUR CON (% BY WEIGH	IT)	
FUEL TYPE No. 2 Fuel Oil	BTU/UNIT 19,300		UNITS		SULFUR CON (% BY WEIGH < 15 ppmw	IT)	
FUEL TYPE No. 2 Fuel Oil	BTU/UNIT 19,300	SPECIF	UNITS lb		SULFUR CON (% BY WEIGH < 15 ppmw	IT)	
FUEL TYPE No. 2 Fuel Oil MAI	BTU/UNIT 19,300 NUFACTURER'S S	SPECIF	UNITS Ib FIC EMISSION FAC	TORS (IF AVAIL)	SULFUR CON (% BY WEIGH <15 ppmw	IT)	
FUEL TYPE No. 2 Fuel Oil MAN POLLUTANT EMISSION FACTOR LB/UNIT UNIT	BTU/UNIT 19,300 NUFACTURER'S S NOX	SPECIF	UNITS Ib FIC EMISSION FAC CO PM	TORS (IF AVAIL)	SULFUR CON (% BY WEIGH <15 ppmw	IT)	
FUEL TYPE No. 2 Fuel Oil MAI POLLUTANT EMISSION FACTOR LB/UNIT	BTU/UNIT 19,300 NUFACTURER'S S NOX ZE VISIBLE EMISSION	S DURIN	UNITS Ib FIC EMISSION FAC CO PM NG IDLING, OR LOW LO	TORS (IF AVAIL) PM10 AD OPERATIONS:	SULFUR CON (% BY WEIGH <15 ppmw ABLE) VOC	OTHER	

REVISED 09/22/16 NCDE	Q/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: IES-FWP		•
Fire Water Pump (300 bhp)				CONTROL	DEVICE ID NO	D(S): N/A		
OPERATING SCENARIO <u>1</u>	OF	11		EMISSION F	POINT (STAC	K) ID NO(S):	EP-16	
DESCRIBE IN DETAILTHE EMISSION SO	OURCE PRO	CESS (ATTA	CH FLOW DI	AGRAM):	·			
Diesel-fired internal combustion engine	to provide wa	ater in the cas	se of a fire em	ergency.				
TYPE OF EMISSION SOURCE	•							•
Coal,wood,oil, gas, other burner (Form	,		rking (Form E	•	_	of chemicals/	-	(Form B7)
☑ Int.combustion engine/generator (Forn	n B2)	_	inishing/printi			ation (Form B	8)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo			Form B9)		
START CONSTRUCTION DATE: 2013			DATE MANU	JFACTURED	•			
MANUFACTURER / MODEL NO.: Clarke/John Deere PE6068L220451			EXDECTED	OD SCHEDI	E · 24	R/DAY 7	DAV/MK	52 WK/YR
	PS (SUBPAR		LXI LOTED			RTS?): <u>ZZZZ</u>		<u>34_</u> WIN/III
PERCENTAGE ANNUAL THROUGHPUT	•		MAR-MAY	25% JUN-A	`	SEP-NOV 25		
CRITERIA AIR	` '			-			-	
-		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION		ROLS / LIMITS)	(BEFORE CONT	TROLS / LIMITS)		ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation:	s in Appendix	к C	·		
PARTICULATE MATTER<10 MICRONS (PM	Л ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (PI	M _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD								
OTHER								
HAZARDOUS A	<u>IR POLLU</u>	TANT EMI	<u>SSIONS II</u>	<u>NFORMAT</u>	ION FOR T	THIS SOUP	₹CE	
		SOURCE OF EXPECTED ACTUAL		D ACTUAL		3		
		EMISSION		ROLS / LIMITS)	`	ROLS / LIMITS)	,	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix I	K C			
TOXIC AIR F	POLLUTAI	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
10000000		OF						
		EMISSION	EXPECT	ED ACTUAL	EMISSIONS .	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	o/yr
		See Emission	n Calculation:	s in Appendi	k C			
Attachments: (1) emissions calculations and supermission rates) and describe how these are mo								

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

		-,,	I I I I I I I I I I I I I I I I I I I	ermit to Construct/Ope	iate	B2
EMISSION SOURCE DESCRIPTIO	N:			EMISSION SOURCE	ID NO: IES-FWP	
Fire Water Pump (300 bhp)				CONTROL DEVICE II	D NO(S): N/A	
OPERATING SCENARIO:	1	OF	1	EMISSION POINT (S	TACK) ID NO(S): EP-16	
ENGINE SERVICE	EMERGENCY		SPACE HEAT	ELECTRICAL (GENERATION	
(CHECK ALL THAT APPLY) \Box	PEAK SHAVER		OTHER (DESCRIBE):			
GENERATOR OUTPUT (KW):		ANTICIF	PATED ACTUAL HOURS	OF OPERATION (HRS	S/YR):	
ENGINE OUTPUT (HP):						
TYPE ICE: GASOLINE ENGI		ENGINE U	P TO 600 HP DIES	SEL ENGINE GREATER (complete below		UEL ENGINE
ENGINE TYPE RICH BUF	RN 🗌 LEAN E	BURN				
EMISSION REDUCTION MODIFIC	ATIONS INJECT	TION TIMING	RETARD PRE	IGNITION CHAMBER C	OMBUSTION 🗌 OTHER	
OR STATIONARY GAS TU	RBINE (complete b	elow)	NATURAL GAS PIPELI	NE COMPRESSOR OR	TURBINE (complete below	′)
FUEL: NATURAL GAS	OIL	ENGINE	TYPE: 2-CYCLE LE	<u>—</u>	CYCLE LEAN TURBIN	E
OTHER (DESCRIBE):_			4-CYCLE RI		HER (DESCRIBE):	
CYCLE: COGENERATION		CONTR		ON MODIFICATIONS (D	,	
REGENERATIVE					LECTIVE CATALYTIC RED	DUCTION
l	STEAM INJECTION	CLE	AN BURN AND PRECO	MBUSTION CHAMBE_	UNCONTROLLED	
	LEAN-PREMIX					
OTHER (SPECIFY):	EUEL II	SACE (IN	CLUDE STARTUP	DACKLID ELIEL \		
	FUEL U	SAGE (IN	I	<u> </u>		
FUEL TYPE	UNITS	8	MAXIMUM DESIC CAPACITY (UNIT/		REQUESTED CAPACITY LIMITATION (UNIT/HR)	
No. 2 Fuel Oil	gal		6.55		6.55	
FU	EL CHARACTE	RISTICS	(COMPLETE ALL	THAT ARE APPLIC	CABLE)	
					SULFUR CONTENT	
FUEL TYPE	BTU/UN	IIT	UNITS		(% BY WEIGHT)	
No. 2 Fuel Oil	19,300)	lb		< 15 ppmw	
M	ANUFACTURE	R'S SPEC	IFIC EMISSION FA	CTORS (IF AVAIL	ABLE)	
POLLUTANT	NOX	(CO PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						
	ZE VICIDI E EMICO	IONG DUDIN		AD ODEDATIONS:	1	
Periodic equipment maintenance of COMMENTS:			NG IDLING, OR LOW LO		ndustry practices.	

REVISED 09/22/1 NC	DEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION	ON: EMISSION SOURCE ID NO: IES-PVAP							
Propane Vaporizer				CONTROL I	DEVICE ID N	O(S): N/A		
OPERATING SCENARIO	<u>1</u> OF	1		EMISSION F	POINT (STAC	K) ID NO(S):	EP-17	
DESCRIBE IN DETAILTHE EMISSION		•						
Liquid propane gas-fired propane va	aporizer to prov	ide propane g	as for Plant	operations.				
TYPE OF EMISSION SOU	•							•
Coal,wood,oil, gas, other burner (,		rking (Form I	*		of chemicals	_	s (Form B7)
Int.combustion engine/generator ((Form B2)	_	• .	ing (Form B5)		ration (Form B	·8)	
Liquid storage tanks (Form B3) START CONSTRUCTION DATE:		Storage s	silos/bins (Fo	UFACTURED		(Form B9)		
TBD			TBD	UFACTURED	=			
MANUFACTURER / MODEL NO.:			122					
TBD			EXPECTED	OP. SCHEDI	JLE: 24 H	IR/DAY 7	DAY/WK	52 WK/YF
	NSPS (SUBPAF	RTS?):			HAP (SUBPAF			
PERCENTAGE ANNUAL THROUGH	•		MAR-MAY	25% JUN-	•	,	 25%	
CRITERIA I	AIR POLLUT	ANT EMIS	SIONS IN	FORMATION	ON FOR TI	HIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	FROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	TROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	ı Calculation	s in Appendix	k C			
PARTICULATE MATTER<10 MICRON	S (PM ₁₀)							
PARTICULATE MATTER<2.5 MICRON	NS (PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS	(VOC)							
LEAD								
OTHER	0.410.001.11	ITANIT ENG	10010110	INFORMAT	FIGN FOR	TUIO OOU	1005	
HAZARDOUS	S AIR PULL				TION FOR			
		SOURCE OF		D ACTUAL	(EMISSIONS	
HAZADDOHE AID DOLLHTANT	CAS NO.	EMISSION FACTOR	(AFTER CONT	ROLS / LIMITS)	,	tons/yr	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.		,	tons/yr s in Appendix	lb/hr	tons/yr		
		See Ellission	i Calculation	is in Appenuiz	<u> </u>			
				1			 	+
								
TOXIC AI	IR POLLUTA	NT EMISSI	ONS INF	ORMATIO	V FOR THI	S SOURCE	E	
		OF	EVDECT	TED ACTUAL	EMISSIONS	VETED CON	TPOLS / LIM	ITATIONS
		EMISSION	EXFEC	IED ACTUAL	LIVIIOSIONS	AFTER CON	TROLS / LIMI	HAHONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lk	o/hr	lb/	day	lb	o/yr
		See Emission	ı Calculation	s in Appendix	c C			
							<u> </u>	
					-		 	
					 		 	
							 	
							<u> </u>	,
Attachments: (1) emissions calculations ar emission rates) and describe how these ar								
•		•	- ' '	,	- '			

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

REVISED 09/22/16	NCDEQ/Division of A	Air Quality - A	pplication for Air P	ermit to Constru	ct/Operate		B1
EMISSION SOURCE DESCRIPT	ΓΙΟΝ:		EMISS	ION SOURCE ID	NO: IES-PVAP		
Propane Vaporizer			CONTI	ROL DEVICE ID N	NO(S): N/A		
OPERATING SCENARIO:	<u>1</u> OF	1	EMISS	SION POINT (STA	.CK) ID NO(S): E	P-17	
DESCRIBE USE: PROC	ESS HEAT	SPACE HEAT	-	ELECTRICAL G	ENERATION		
CONT	INUOUS USE	STAND BY/EI	MERGENCY	OTHER (DESCR	RIBE):		
HEATING MECHANISM:	INDIRECT	✓	DIRECT				
MAX. FIRING RATE (MMBTU/H	OUR): 1						
		WOOD-	FIRED BURNER	₹			
WOOD TYPE: ☐ BARK	WOOD/BARK	☐ WET WO	DOD D	RY WOOD	OTHER	(DESCRIBE	Ξ):
PERCENT MOISTURE OF FUEI	L:						
	CONTROLLE	ED WITH FLYA	ASH REINJECTION		CONTROLLED	W/O REINJ	ECTION
FUEL FEED METHOD:		IEAT TRANSI	ER MEDIA:	STEAM 🗌 AIR	OTHER (D	ESCRIBE)_	
		COAL-I	FIRED BURNER	₹			
TYPE OF BOILER	IF OTHER DESC	RIBE:					
PULVERIZED OVERFEED STO	OKER UNDERFEED	STOKER	SPREADER	STOKER	FLUIDIZE) BED	
☐ WET BED ☐ UNCONTRO	LLED UNCONTRO	LLED	UNCONTRO	LLED		ATING	
☐ DRY BED ☐ CONTROLL	ED CONTROLLE	ΞD	☐ FLYASH REI	INJECTION	RECIRCI	JLATING	
			☐ NO FLYASH	REINJECTION			
		OIL/GAS	-FIRED BURNE	R			
TYPE OF BOILER:	UTILITY INDU	ISTRIAL	COMMERCIA	L	INSTITUTIONAL	<u>_</u>	
TYPE OF FIRING:		SENTIAL	LOW NOX BU		NO LOW NOX E	3URNER	
		OTHER FU	EL-FIRED BUR	NER			
TYPE(S) OF FUEL: <u>Liq</u>	uid Propane	-					
TYPE OF BOILER:		ISTRIAL	COMMERCIA	L 🗌	INSTITUTIONAL	-	
TYPE OF FIRING: <u>Direct</u>		CONTROL(S)		<u>None</u>			
	FUEL USAC	SE (INCLUE	DE STARTUP/B		•	IEOTED OA	DA OLTI
EUEL TYPE			MAXIMUM DESIG			JESTED CA	
FUEL TYPE	UNITS		CAPACITY (UNIT/F	IR)	LIMI	TATION (UN	III/HR)
Propane	MMBtu		1.0			1.0	
	<u> </u> FUEL CHARACTERI	STICS (CO	MDIETE ALL T	HAT ADE AD	DI ICARI E)		
<u> </u>	OLL CHARACTER	·	PECIFIC	SULFUR CONT		ASH CON	ITENT
FUEL TY	PF		CONTENT	(% BY WEIGI		(% BY WE	
				0.54 grains/10	·		
Propan	e	91,5	00 Btu/gal	0.54 grains/10	ou it		
COMMENTS:		ļ		ļ	<u> </u>		
<u>.</u>							

Attach Additional Sheets As Necessary

REVISED 09/22 NCD	EQ/Division of	f Air Quality -	Application	for Air Perm	it to Constru	uct/Operate		В
EMISSION SOURCE DESCRIPTION	N:			EMISSION S	SOURCE ID I	NO: IES-GN-2		
Diesel Fired Emergency Generator	(671 brake ho	rsepower)		CONTROL [DEVICE ID N	O(S): N/A		
OPERATING SCENARIO	1 ()F	1	EMISSION F	POINT (STAC	CK) ID NO(S):	EP-19	
DESCRIBE IN DETAILTHE EMISSION	ON SOURCE P	ROCESS (A	TTACH FLOV	V DIAGRAM)				
Diesel-fired internal combustion en	gine to provid	e power in th	e case of an e	mergency.				
TYPE OF EMISSION SOL	•							•
Coal,wood,oil, gas, other burner	,		rking (Form E	•		. of chemicals	-	s (Form B7)
Int.combustion engine/generator	(Form B2)		٠.	ing (Form B5)		ration (Form E	38)	
Liquid storage tanks (Form B3)		Storage	silos/bins (Fo	•		(Form B9)		
START CONSTRUCTION DATE: TBD			TBD	JFACTURED				
			1 60					
MANUFACTURER / MODEL NO.: Generac SD200			EXPECTED	OP. SCHEDU	II E · 24	JR/DAV 7		<u>52</u> WK/YF
	ISPS (SUBPAR	TS2)· IIII	ICXI COTED			RTS?): ZZZ		<u>JZ</u> _ WI(/II
PERCENTAGE ANNUAL THROUGH	-		MAR-MA	Y 25% JU	`			
CRITERIA						-		
-		SOURCE OF		D ACTUAL	1		EMISSIONS	
		EMISSION		ROLS / LIMITS)	(BEFORE CON	ITROLS / LIMITS)		FROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			n Calculation	s in Appendix	k C	1		
PARTICULATE MATTER<10 MICRON	NS (PM ₁₀)							
PARTICULATE MATTER<2.5 MICRO	NS (PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS	S (VOC)							
LEAD								
OTHER								
HAZARDOUS	S AIR POLL	UTANT EN			TION FOR	R THIS SO	URCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	}
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	ITROLS / LIMITS)	(AFTER CONT	TROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix	С C			
						-		
								+
								+
								+
TOXIC AL	R POLLUTA	ANT FMISS	L SIONS INF	ORMATIO	N FOR TH	IIS SOURC	F	
TOXIC AI	OLLOTA	JOURGE		ONINATIO	N I OK II	113 300KC		
		OF EMISSION	EXPEC1	TED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIM	ITATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lk)/hr	lb	/day	lk	o/yr
		+	n Calculation	s in Appendix		,		
Attachments: (1) emissions calculations a								
operation, emission rates) and describe h	iow tilese are mo	intoreu and Will	ı wılat ilequen	by, and (3) desc	inde any monit	omig devices, (jauges, or test	אווז וטו פווט

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

ELUCATION COLUDATE DECORPORTE				ermit to Construct/Ope		B2
EMISSION SOURCE DESCRIPTION	DN:			EMISSION SOURCE	ID NO: IES-GN	-2
Diesel Fired Emergency Generato	r (671 brake horsepov	wer)		CONTROL DEVICE II	O NO(S): N/A	
OPERATING SCENARIO:	<u>1</u> OF	=	1	EMISSION POINT (S	TACK) ID NO(S): EP-1	.9
ENGINE SERVICE	EMERGENCY		SPACE HEAT	ELECTRICAL (GENERATION	
(CHECK ALL THAT APPLY)	PEAK SHAVER		OTHER (DESCRIBE):			
GENERATOR OUTPUT (KW): 500)	ANTICIP	PATED ACTUAL HOURS	S OF OPERATION (HRS	S/YR): 500	
ENGINE OUTPUT (HP): 671						
TYPE ICE: GASOLINE ENG	INE J DIESEL EN	NGINE UF	P TO 600 HP DIES	EL ENGINE GREATER	THAN 600 HP DU	IAL FUEL ENGINE
OTHER (DESCR	IBE):			(complete below	w)	
ENGINE TYPE RICH BUF	RN 🗸 LEAN BUR	RN				
EMISSION REDUCTION MODIFIC	ATIONS INJECTION	N TIMING	RETARD PRE	IGNITION CHAMBER C	OMBUSTION 🗌 OT	HER
OR STATIONARY GAS TU	RBINE (complete below	w)	NATURAL GAS PIPELI	NE COMPRESSOR OR	TURBINE (complete	below)
FUEL: NATURAL GAS	OIL	ENGINE	TYPE: 2-CYCLE LE	EAN BURN 4-0	CYCLE LEAN TU	RBINE
OTHER (DESCRIBE):_			4-CYCLE RI		HER (DESCRIBE): _	
CYCLE: COGENERATION	N SIMPLE	CONTRO	_	ON MODIFICATIONS (D	,	
REGENERATIVE	_			IC REDUCTION SE	_	REDUCTION
	STEAM INJECTION	CLE	AN BURN AND PRECO	MBUSTION CHAMBE_	UNCONTROLLED	
UNCONTROLLED	LEAN-PREMIX					
OTHER (SPECIFY):	FUEL HOA	OF (IN)	OLUBE OTABILID	(DAOKUB FUEL)		
	FUEL USA	IGE (IN	CLUDE STARTUP			
FUEL TYPE	LINUTO		MAXIMUM DESIG		REQUESTED CAPAC	
FUEL TYPE	UNITS		CAPACITY (UNIT/	HK)	LIMITATION (UNIT/F	ik)
No. 2 Fuel Oil	gal		25.5		31.9	
FIL	L. CHARACTER	ICTICC	(COMPLETE ALL	THAT ADE ADDITION	ADIE)	
FU	EL CHARACTERI	131163	(COMPLETE ALL	THAT ARE APPLIC	•	
FUEL TYPE	DTI I/I INIT		LINUTO		SULFUR CONTE	NT
	BTU/UNIT		UNITS		(% BY WEIGHT)	
No. 2 Fuel Oil	19,300		lb		< 15 ppmw	
	ANUEACTURERS	C CDEC	IEIC EMISSION EA	CTORS (IF AVAIL	ADIE)	
POLLUTANT	NOX	1	CO PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT	NOX	`	SO FIVE	FINITO	VOC	OTTLER
UNIT						
UNIT						
DESCRIBE METHODS TO MINIMI			•			
Periodic equipment maintenance COMMENTS:			•		ndustry practices.	

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	NO: IES-TK-1		-
Emergency Generator Fuel Storage Tank	ζ				DEVICE ID N			
OPERATING SCENARIO 1	OF	1				CK) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION S	OURCE PRO	CESS (ATTAC	H FLOW DIA			, (-).	/	
Diesel storage tank for distributing fuel		•		,				
TYPE OF EMISSION SOUR	CE (CHECK A	ND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON T	HE FOLLOW	ING PAGES):
Coal,wood,oil, gas, other burner (Form	n B1)	Woodwo	rking (Form E	34)	Manuf.	of chemicals	coatings/inks	s (Form B7)
Int.combustion engine/generator (For	m B2)	Coating/f	inishing/printi	ng (Form B5)	Inciner	ation (Form B	8)	
☑ Liquid storage tanks (Form B3)		Storage	silos/bins (Fo	rm B6)	Other ((Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED	:			
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDI	JLE: <u>24</u> ⊢	IR/DAY <u>7</u>	DAY/WK	52 WK/YR
IS THIS SOURCE SUBJECT T(N	ISPS (SUBPAF	RTS?):	<u> </u>		HAP (SUBPAI			
PERCENTAGE ANNUAL THROUGHPUT	•	,	MAR-MAY 2	•	•	SEP-NOV 25	<u>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</u>	
CRITERIA AI	\ /							
011172111111		SOURCE OF		D ACTUAL	<u> </u>	POTENTIAL		
		EMISSION		ROLS / LIMITS)	(REFORE CON	TROLS / LIMITS)		TROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			1 Calculation		1	toris/yi	ID/III	toris/yi
PARTICULATE MATTER (FIM) PARTICULATE MATTER < 10 MICRONS (P	M)	See Ellission	i Calculation	з III Аррениіл І	I			+
PARTICULATE MATTER<2.5 MICRONS (F		<u> </u>						+
SULFUR DIOXIDE (SO2)	- IVI _{2.5})							+
,		<u> </u>						+
NITROGEN OXIDES (NOX)								+
CARBON MONOXIDE (CO)	20)							
VOLATILE ORGANIC COMPOUNDS (VO	JC)							
LEAD								
OTHER	415 501 1 1	 		(FOD144 T	101/ FOD 3		205	
HAZARDOUS	AIR POLLU				ON FOR I			
		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION	_`	ROLS / LIMITS)	<u> </u>	TROLS / LIMITS)	,	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix	С C			
								1
TOXIC AIR	POLLUTAI	NT EMISSI	ONS INFO	<u>RMATION</u>	FOR THIS	SOURCE		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIM	ITATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	′day	lk	o/yr
		See Emission	n Calculation	s in Appendix	с C			
Attachments: (1) emissions calculations and si	upporting docume	entation: (2) indi	cate all reques	ted state and fe	ederal enforcea	ble permit limits	(e.a. hours of	operation.
emission rates) and describe how these are m			•			•		

EMISSION SOURCE (LIQUID STORAGE TANK)

REVISED 09/22/16 NCDI	Q/Division of Air Quality -	- Application for	Air Perm	nit to Constr	uct/Operate	DJ		
EMISSION SOURCE DESCRIPTION	:	E	EMISSIO	N SOURCE	ID NO: IES-TK-1			
Emergency Generator Fuel Storage T	ank		CONTROL DEVICE ID NO(S): None					
OPERATING SCENARIO:	OF		EMISSION POINT (STACK) ID NO(S): N/A					
	• • • • • • • • • • • • • • • • • • • •	H STORAGE			, -() -1			
DESCRIBE IN DETAIL THE STORAG	GE TANK (ATTACH FLOW D	DIAGRAM):						
Diesel storage tank for distributing f	fuel to the emergency gener	rator.						
LIQUID STORED: Diesel		LIQUID MOLEC			D MOLE):			
		VAPOR MOLEC		`	,			
TANK CAPACITY (GAL): 2,500				,	•			
AVERAGE LIQUID SURFACE TEMP	` ′	•			SURFACE TEMP (PSIA):			
	MAX. LIQUID SURFACE	• • • • • • • • • • • • • • • • • • • •	•		/APOR PRESS. (PSIA):			
	BREATHER VENT SETT			ACUUM	PRESSURE			
SHELL DIAMETER (FT): 6	SHELL CONDITION:			S TANK HEA				
SHELL COLOR:	MAXIMUM THROUGHPL	·			JRNOVERS PER YEAR:			
WORKING VOLUME (GAL): 1,250	ACTUAL THROUGHPUT	,			RNOVERS PER YEAR:			
MAX. FILLS PER DAY:	MAX. FILLING RATE (GA	,			ON OF FILL (HR/FILL):			
	VERTICA	AL FIXED ROO	OF TAN	VKS				
SHELL HEIGHT (FT):	ROOF TYP	E: CONE		DOME	ROOF HEIGHT (FT):			
AVERAGE LIQUID HEIGHT (FT):	ROOF CON	IDITION:	GOOD		POOR			
MAXIMUM LIQUID HEIGHT (FT):	ROOF COL	OR:						
	НОІ	RIZONTAL TA	ANKS					
SHELL LENGTH (FT): 12	IS TANK UN	NDERGROUND ?	: 🔲	YES [NO			
	FLOA	TING ROOF	TANKS	3				
FOR ALL TANKS - DESCRIBE ANY	MONITORING OR WARNIN	NG DEVICES (SU	ICH AS L	EAK AND F	UME DETECTION INSTRUM	ENTATION):		
COMMENTS:								

REVISED 09/22/16 NCI	DEQ/Division o	f Air Quality -	 Application 	for Air Perm	it to Constru	ıct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID I	NO: IES-TK-2		-
Fire Pump Fuel Storage Tank				CONTROL	DEVICE ID N	O(S): None		
OPERATING SCENARIO 1	OF	1		1		CK) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	CESS (ATTAC	H FLOW DIA		,	, - ()		
Diesel storage tank for distributing fue		•		,				
TYPE OF EMISSION SOUI	RCE (CHECK A	ND COMPLE	TE APPROP	RIATE FORM	B1-B9 ON T	HE FOLLOW	ING PAGES):
Coal,wood,oil, gas, other burner (Fo	•		rking (Form I			. of chemicals		•
Int.combustion engine/generator (Fo	,		٠, ٠	ing (Form B5)		ration (Form E	-	- (/
☐ Liquid storage tanks (Form B3)	22)	_	silos/bins (Fo		_	(Form B9)	,	
START CONSTRUCTION DATE:				JFACTURED		,		
MANUFACTURER / MODEL NO.:			EVECTED	OR COUED	U.E. 24 I	ID/DAY =	DAMAM	F2 \AUZ\\(\(\)
IS THIS SOURCE SUBJECT T(NSPS (SUBPAF	PT921.	EXPECTED		JLE: <u>_24</u> F IAP (SUBPA	HR/DAY <u>7</u> RTS2)	DAY/WK	<u>52</u> _ WK/YF
PERCENTAGE ANNUAL THROUGHPU	`			_ <u> </u>	`	SEP-NOV 25	0/	
CRITERIA A								
CRITERIA A	IK FOLLOT				IN FOR IT			
		SOURCE OF	-	D ACTUAL			_ EMISSIONS	
		EMISSION		ROLS / LIMITS)		TROLS / LIMITS)	<u> </u>	TROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	c C			
PARTICULATE MATTER<10 MICRONS (I								
PARTICULATE MATTER<2.5 MICRONS ((PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (V	OC)							
LEAD						1		
OTHER								1
HAZARDOUS	AIR POLLU	TANT EMI	<u>SSIONS II</u>	<u>NFORMATI</u>	ON FOR	THIS SOUP	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	3
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	TROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix	c C			
TOXIC AIR	POLLUTA	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF EMISSION	EXPEC1	TED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIM	ITATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lk	o/hr	lb	/day	lk	b/yr
		See Emission	n Calculation	s in Appendix	C C			
	1							

EMISSION SOURCE (LIQUID STORAGE TANK)

REVISED 09/22/16 NCD	EQ/Division of Air Quality	- Application for	Air Permit to Const	ruct/Operate	В3
EMISSION SOURCE DESCRIPTION	N:	E	EMISSION SOURCE	ID NO: IES-TK-2	
Fire Pump Fuel Storage Tank		Ī	CONTROL DEVICE I	D NO(S): None	
OPERATING SCENARIO:	OF			STACK) ID NO(S): N/A	
	EAC	H STORAGE		, , , ,	
DESCRIBE IN DETAIL THE STORA Diesel storage tank for distributing	,	DIAGRAM):			
LIQUID STORED: Diesel		LIQUID MOLEC	ULAR WEIGHT (LB/I	LB-MOLE):	
TANK CAPACITY (GAL): 500		VAPOR MOLEC	ULAR WEIGHT (LB/	LB-MOLE):	
AVERAGE LIQUID SURFACE TEM	PERATURE (F):	VAPOR PRESS	URE AT AVE. LIQUII	D SURFACE TEMP (PSIA):	
	MAX. LIQUID SURFACE	TEMP (°F):	MAX. TRUE	VAPOR PRESS. (PSIA):	
	BREATHER VENT SETT	INGS (PSIG)	VACUUM	PRESSURE	
SHELL DIAMETER (FT): 3	SHELL CONDITION:	GOOD PC	OOR IS TANK HE	ATED: YES NO	
SHELL COLOR:	MAXIMUM THROUGHPL	JT (GAL/YR):	MAXIMUM T	URNOVERS PER YEAR:	
WORKING VOLUME (GAL): 250	ACTUAL THROUGHPUT	, ,		RNOVERS PER YEAR:	
MAX. FILLS PER DAY:	MAX. FILLING RATE (GA			ION OF FILL (HR/FILL):	
	,	AL FIXED RO			
SHELL HEIGHT (FT):	ROOF TYP	E: CONE	DOME	ROOF HEIGHT (FT):	
AVERAGE LIQUID HEIGHT (FT):	ROOF CON	NDITION:	GOOD [POOR	
MAXIMUM LIQUID HEIGHT (FT):	ROOF COL		_		
()		RIZONTAL TA	NKS		
SHELL LENGTH (FT): 10	IS TANK U	NDERGROUND ?	: YES [NO	
OHELE ELITOTIT (1-1). 10		ATING ROOF			
FOR ALL TANKS - DESCRIBE ANY	Y MONITORING OR WARNII	NG DEVICES (SU	CH AS LEAK AND I	FUME DETECTION INSTRUME	ENTATION):
COMMENTS:					

REVISED 09/22/16 NO	DEQ/Division o	f Air Quality -	- Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	NO: IES-TK-3		
Mobile Fuel Diesel Storage Tank				CONTROL I	DEVICE ID N	O(S): None		
OPERATING SCENARIO1	OF_	1		EMISSION I	POINT (STAC	CK) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION		•	H FLOW DIA	AGRAM):				
Diesel storage tank for distributing fu	el to mobile equi	ipment.						
TYPE OF EMISSION SOL	•							•
Coal,wood,oil, gas, other burner (Fo	,		rking (Form E	,	_	of chemicals	•	3 (Form B7)
Int.combustion engine/generator (F Liquid storage tanks (Form B3)	orm B2)	_	finishing/printi silos/bins (Fo			ration (Form B (Form B9)	8)	
START CONSTRUCTION DATE: TBD		Storage :		JFACTURED		(FOIIII D9)		
MANUFACTURER / MODEL NO.: TBD	1		EXDECTED	OP SCHED	III E∙ 24. ⊢	IR/DAY <u>7</u>	DAVMK	<u>52</u> WK/YF
IS THIS SOURCE SUBJECT T(NSPS (SUBPAR	RTS2)·	EXFECTED		HAP (SUBPA		DAT/WK	<u>32</u> _ VVI(/11
PERCENTAGE ANNUAL THROUGHP	•		MAR-MAY 2	_	<u> </u>	SEP-NOV 25	%	
	AIR POLLUT							
-		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		TROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			n Calculation			,.	,	1
PARTICULATE MATTER<10 MICRONS	(PM ₁₀)							+
PARTICULATE MATTER<2.5 MICRONS	,							†
SULFUR DIOXIDE (SO2)	(2.5)							
NITROGEN OXIDES (NOx)								+
CARBON MONOXIDE (CO)								+
VOLATILE ORGANIC COMPOUNDS (VOC)							†
LEAD	,							+
OTHER								†
HAZARDOUS	S AIR POLLU	TANT EMI	SSIONS IN	IFORMAT	ION FOR T	THIS SOUP	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	3
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	TROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendi	x C			
TOXIC AI	<u>R POLLUTAI</u>	NT EMISSI	<u>ONS INFO</u>	<u>RMATION</u>	FOR THIS	SOURCE		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIM	ITATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	Ib	/hr	lb/	/day	l lk	o/yr
			n Calculation			,		
				· · · · · ·				
		†	1					
Attachments: (1) emissions calculations and	supporting docum	entation: (2) indi	icate all reques	ted state and fe	ederal enforcea	ble permit limits	(e.a. hours of	operation.
emission rates) and describe how these are								

EMISSION SOURCE (LIQUID STORAGE TANK)

REVISED 09/22/16 NCDE	Q/Division of Air Quality -	- Application for	Air Permit to Const	ruct/Operate	DЗ			
EMISSION SOURCE DESCRIPTION	:		EMISSION SOURCE	ID NO: IES-TK-3				
Mobile Fuel Diesel Storage Tank			CONTROL DEVICE ID NO(S): None					
OPERATING SCENARIO:	OF		EMISSION POINT (STACK) ID NO(S): N/A					
		H STORAGE		, - () - 1				
DESCRIBE IN DETAIL THE STORAG	GE TANK (ATTACH FLOW D							
Diesel storage tank for distributing f	uel to mobile equipment.							
LIQUID STORED: Diesel		LIQUID MOLEC	ULAR WEIGHT (LB/	I P MOLE):				
TANK CAPACITY (GAL): 5,000			,	,				
AVERAGE LIQUID SURFACE TEMP	EDATURE (E), TRR	1	ULAR WEIGHT (LB	D SURFACE TEMP (PSIA):				
AVERAGE LIQUID SURFACE TEMP	` ′							
	MAX. LIQUID SURFACE		•	VAPOR PRESS. (PSIA):				
OUELL BLANETED (ET)	BREATHER VENT SETT		VACUUM _	PRESSURE				
SHELL DIAMETER (FT): 6	SHELL CONDITION:		OOR IS TANK HE					
SHELL COLOR:	MAXIMUM THROUGHPL	,	<u> </u>	URNOVERS PER YEAR:				
WORKING VOLUME (GAL): 2,500	ACTUAL THROUGHPUT			RNOVERS PER YEAR:				
MAX. FILLS PER DAY:	MAX. FILLING RATE (GA			TION OF FILL (HR/FILL):				
		AL FIXED RO		1				
SHELL HEIGHT (FT):	ROOF TYPI		DOME	ROOF HEIGHT (FT):				
AVERAGE LIQUID HEIGHT (FT):	ROOF CON	IDITION:	GOOD	POOR				
MAXIMUM LIQUID HEIGHT (FT):	ROOF COL							
	НОІ	RIZONTAL TA	ANKS					
SHELL LENGTH (FT): 23.7		NDERGROUND ?		NO				
	FLOA	TING ROOF	TANKS					
FOR ALL TANKS - DESCRIBE ANY	MONITORING OR WARNIN	NG DEVICES (SU	ICH AS LEAK AND	FUME DETECTION INSTRUME	ENTATION):			
COMMENTS:								

REVISED 09/22/16 NCDE	Q/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ıct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: IES-TK-4				
Diesel Storage Tank for Emergency Gener	ator #2			CONTROL	DEVICE ID N	O(S): None		
OPERATING SCENARIO 1	OF	1				CK) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION SO	URCE PROC	CESS (ATTAC	H FLOW DIA		,	, , ,	,	
Diesel storage tank for distributing fuel to		•		,				
TYPE OF EMISSION SOURC	E (CHECK A	ND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON T	HE FOLLOW	ING PAGES)	:
Coal,wood,oil, gas, other burner (Form	•		rking (Form E			. of chemicals		
Int.combustion engine/generator (Form	,		• ,	ng (Form B5)		ration (Form B	-	,
Liquid storage tanks (Form B3)	,		silos/bins (Fo	O (_	(Form B9)	-,	
START CONSTRUCTION DATE:				JFACTURED		,		
MANUFACTURER / MODEL NO.:								
			EXPECTED	OP. SCHEDI	JLE: _ 24	HR/DAY _ <u>7</u> _	_ DAY/WK	_ <u>52</u> _ WK/YR
IS THIS SOURCE SUBJECT T(NS	PS (SUBPAR	RTS?):	•	_ NESH	IAP (SUBPA	RTS?):		
PERCENTAGE ANNUAL THROUGHPUT ((%): DEC-FE	B 25%	MAR-MAY 2	5% JUN-AL	JG 25%	SEP-NOV 25	%	
CRITERIA AIR	POLLUTA	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IIS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	c C			
PARTICULATE MATTER<10 MICRONS (PM	10)			FF				
PARTICULATE MATTER<2.5 MICRONS (PM	,							
SULFUR DIOXIDE (SO2)	-2.0/							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VOC	2)							
LEAD	-)							
OTHER								
HAZARDOUS A	IR POLLU	TANT EMI	SSIONS IN	IFORMATI	ON FOR	THIS SOUR	RCE	
	1	SOURCE OF		D ACTUAL	1		EMISSIONS	
		EMISSION		ROLS / LIMITS)	(REFORE CON	TROLS / LIMITS)	г	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
IIALANDOGO AIRT GLEGTART	OAO NO.			s in Appendix	<u> </u>	torioryi	15/111	t0110/ y1
		See Lillission		Т	Ī			
TOXIC AIR F	ΡΟΙΙΙΤΔΝ	IT FMISSI	ONS INFO	<u>PMATION</u>	FOR THIS	SOURCE		
TOXIC AIR F	I	T GOOLOF	TONS INFO	KINATION	FOR THIS	SOURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lh	/hr	lh.	/day	lh	/yr
TOXIC AIR FOLLUTANT	CAS NO.			s in Appendix		ruay	ID	/ yı
		See Ellission		s in Appenuix	I			
Attachments: (1) emissions calculations and sup emission rates) and describe how these are mon								

EMISSION SOURCE (LIQUID STORAGE TANK)

REVISED 09/22/16 NCD	EQ/Division of Air Quality	- Application for Air	Permit to Construct/Operate	D3
EMISSION SOURCE DESCRIPTION	N:	EMIS	SSION SOURCE ID NO: IES-TK-4	
Diesel Storage Tank for Emergency	Generator #2	CON	TROL DEVICE ID NO(S): None	
OPERATING SCENARIO:	OF		SSION POINT (STACK) ID NO(S): N/A	
		H STORAGE TA		
Diesel storage tank for distributing fu				
LIQUID STORED: Diesel		LIQUID MOLECULA	R WEIGHT (LB/LB-MOLE):	
TANK CAPACITY (GAL): 1,000			R WEIGHT (LB/LB-MOLE):	
AVERAGE LIQUID SURFACE TEM	PERATURE (F):		AT AVE. LIQUID SURFACE TEMP (P	SIA)·
TWEIT TOE EIGOID OUT THE TENI	MAX. LIQUID SURFACE		MAX. TRUE VAPOR PRESS. (PSIA	•
	BREATHER VENT SETT		VACUUM PRESSURE	ιγ.
SHELL DIAMETER (FT): 6	SHELL CONDITION:			NO
			13 TANKTILATED TES	NO
SHELL COLOR:	MAXIMUM THROUGHPUT		ACTUAL TURNOVERS BER VEAR	
WORKING VOLUME (GAL): 500	ACTUAL THROUGHPUT		ACTUAL TURNOVERS PER YEAR	
MAX. FILLS PER DAY:	MAX. FILLING RATE (GA	AL/MIN): AL FIXED ROOF	MIN. DURATION OF FILL (HR/FILL):
OUTLA LIEUCET (TT)				
SHELL HEIGHT (FT):	ROOF TYP		DOME ROOF HEIGHT (FT):	<u></u>
AVERAGE LIQUID HEIGHT (FT):	ROOF CON	<u>—</u>	DOD POOR	
MAXIMUM LIQUID HEIGHT (FT):	ROOF COL		10	
	HOI	RIZONTAL TANK		
SHELL LENGTH (FT): 6		NDERGROUND ?:	☐ YES ☐ NO	
	FLOA	ATING ROOF TAI	VKS	
	MONITORING OR WARNIN	NG DEVICES (SUCH	AS LEAK AND FUME DETECTION IN:	STRUMENTATION):
COMMENTS:				

APPENDIX E SUPPORTING DOCUMENTATION FOR TAP MODELING ANALYSIS

Appendix E – Supporting Documentation for TAP Modeling Analysis is located on a USB drive provided with the application submitted September 28, 2018.	

APPENDIX F MODELED SOURCE LAYOUT

