SECTION 5 MODELING REQUIREMENTS

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This section of the application addresses the dispersion modeling analyses that are required as part of the PSD review.

Following NCDAQ policy, Trinity, on behalf of Enviva, submitted a dispersion modeling protocol describing the proposed methodologies and data resources for the project.³⁴ The protocol included a description of the proposed facility, an overview of the required PSD and State-only modeling analyses, and a description of the methodology proposed to be used in those modeling analyses. The analyses discussed included evaluations of National Ambient Air Quality Standards (NAAQS), PSD Increment, additional impacts analyses for visibility and non-air quality impacts, as well as the ambient impact assessment of toxic air pollutant (TAP) emissions. The protocol was approved by NCDAQ, with limited comments on September 13, 2013.³⁵ The remaining sections summarize the modeling requirements and methodologies and present the results of the analyses. The results demonstrate that the proposed project will not cause or contribute to a modeled violation of any federal or state pollutant standard.

5.1. PROJECT LOCATION AND CLASSIFICATION

Figure E-1 provides a map of the area surrounding the Sampson property. The approximate central Universal Transverse Mercator (UTM) coordinates of the facility are 756.7 kilometers (km) east and 3,890.2 km north in Zone 17 (NAD 83). A detailed site layout showing the locations of all modeled sources and structures is included in Figure E-2.

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

5.2. PSD APPLICABILITY

Part C of Title I of the Clean Air Act, 42 U.S.C. §§7470-7492, is the statutory basis for the PSD program. U.S. EPA has codified PSD definitions, applicability, and requirements in 40 CFR Part 51.166. PSD is one component of the federal New Source Review (NSR) permitting program applicable in areas that are designated in attainment of the NAAQS. Sampson County, in which the proposed facility will be located, is currently designated as unclassifiable or in attainment for all criteria pollutants.³⁶

As discussed in Section 3, PSD review will be triggered for NO_{X} , CO, PM, PM_{10} , and $PM_{2.5}$. PSD is also triggered for VOC but no modeling requirements presently exist for that criteria pollutant.

³⁵ Letter from Tom Anderson (NCDAQ) to Jonathan Hill (Trinity) dated August 13, 2013.
 ³⁶ 40 CFR §81.334

³⁴ Letter from Jonathan Hill (Trinity) to Mark Cuilla (NCDAQ) dated August 5, 2013.

5.3. SECONDARY PM2.5 FORMATION

The AERMOD model, the preferred dispersion model for near-field analyses, does not currently include chemical transformation algorithms required in order to address the formation of secondary $PM_{2.5}$. The Draft Guidance for PM_{2.5} Permit Modeling provides guidance on how applicants should address secondary $PM_{2.5}$ in the context of a PSD modeling analysis. The PSD SERs for NO_X and SO_2 ($PM_{2.5}$ precursors) are utilized to determine whether a proposed source or modification will contribute sufficient quantities of precursor emissions requiring consideration. In the draft guidance document, EPA proposed four "assessment" cases outlining what air quality analysis, if any, is required to demonstrate compliance with the PM_{2.5} NAAQS.

The proposed project falls under Assessment Case 3, with direct $PM_{2.5}$ emissions and NO_X emissions greater than the respective SERs. This case requires that both primary and secondary $PM_{2.5}$ impacts be addressed. Per the Guidance, an applicant can account for the impact of precursor emissions on secondary PM_{2.5} formation in a completely qualitative manner, through the use a hybrid of qualitative and quantitative assessment using existing technical work, or through a full quantitative photochemical

The only continuous source of precursor emissions at the facility will be the wood dryer. At facilities such as wood pellet mills, PM_{2.5} impacts are very localized in nature (along or very near the fenceline) and are generally dominated by the ambient/near-ambient release sources (e.g. hammermills, pellet coolers) which do not emit precursor pollutants. Further, the maximum impacts resulting from the dryer and other particulate emission sources are not typically collocated in time or space. In addition to the qualitative reasoning above, the modeled impacts presented in Tables 5-10 through 5-11 are below any NAAQS or increment standards such that negligible impacts from secondary formation do not alter the conclusions presented in the results sections. As such, Enviva asserts that a quantitative assessment of secondary PM_{2.5} formation does not need to be included in this modeling evaluation.

5.4. PSD MODELING ANALYSES

Trinity has prepared this modeling analysis to demonstrate that the Sampson plant does not cause or contribute to exceedances of the NAAQS or PSD Increment, as applicable, for NO_X , CO, PM_{10} , and $PM_{2.5}$ and that no other adverse impacts at Class I areas are attributable to the proposed facility. The dispersion modeling analyses were conducted in accordance with the following guidance documents:

- U.S. EPA's Guideline on Air Quality Models 40 CFR 51, Appendix W (Revised, November 9, 2005) U.S. EPA's AERMOD Implementation Guide •
- http://www.epa.gov/scram001/7thconf/aermod/aermod_implmtn_guide_19March2009.pdf

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- U.S. EPA's New Source Review Workshop Manual (Draft, October, 1990) U.S. EPA, Office of Air Quality Planning and Standards, Memorandum from Mr. Tyler Fox to Regional Air Division Directors. Additional Clarification Regarding Application of Appendix W Modeling
- Guidance for the 1-hour NO2 National Ambient Air Quality Standard (March 1, 2011) U.S. EPA, Office of Air Quality Planning and Standards, Guidance for PM2.5 Permit Modeling (May 20,

- North Carolina's PSD Modeling Guidance (January 6, 2012)
- North Carolina's Guidelines for Evaluating the Air Quality Impacts of Toxic Air Pollutants in North Carolina (February 2014)

A standard PSD air quality modeling analysis is conducted in three (3) principal steps. A flow chart of the overall PSD modeling process is included in Appendix F. Each of the steps for completing the Class II Area modeling analysis; the Significance Analysis, the NAAQS Analysis, and the PSD Increment Analysis, are described below.

5.5. SIGNIFICANCE ANALYSIS

The Significance Analysis is conducted to determine whether the emissions associated with the proposed new construction project could cause a significant impact upon the area surrounding the facility. "Significant" impacts are defined by ambient concentration thresholds commonly referred to as the Significant Impact Levels (SIL). Table 5-1 lists the SIL, NAAQS, and PSD Increments for all relevant NSR regulated pollutants for this project.

If the highest modeled ambient concentrations for a pollutant for all averaging periods are less than the applicable SIL when emissions from only the project are modeled, then further analyses (NAAQS and PSD Increment) are not required for that pollutant. If, however, modeled impacts are greater than the SIL for any averaging period, a full NAAQS and PSD Increment analysis is required for that pollutant and averaging period to demonstrate that the project neither causes nor contributes to any exceedances. The geographic extent to which significant impacts occur is used to define the significantly impacted receptors within which compliance with the NAAQS and PSD Increments must be demonstrated.

Pollutant	Averaging Period	PSD SIL (µg/m³)	Primary and Secondary NAAQS (µg/m³)	Class II PSD Increment (µg/m³)	Significant Monitoring Concentration (µg/m³)
NO ₂	1-hour	101	188 (100 ppb) ²		
	Annual	1	100 (0.053 ppm) ³	25	14
CO	1-Hour	2,000	40,000		
	8-Hour	500	10,000		575
PM10	24-hour	5	1504	30	10
	Annual	1	N/A	17	
PM _{2.5}	24-hour	1.25	35	95	6
	Annual	0.35	12	45	

Table 5-1. PSD Modeling Thresholds and Standards

Until EPA develops and promulgates a 1-hr NO2 SIL for the recently promulgated NO2 1-hr NAAQS, NCDAQ has adopted an interim 1hr NO2 SIL of 10 ug/m3. The 10 ug/m3 SIL was developed by the Northeast States for Coordinated Air Use Management (NESCAUM) and is based on the ratio of the existing 1-hr CO SIL to the 1-hr CO NAAQS.

2 The 3-year average of the 98th percentile of the daily maximum 1-hr average.

3 Annual arithmetic average.

4 Not to be exceeded more than three times in 3 consecutive years. 5

On January 22, 2013, the U.S. Court of Appeals for the District of Columbia Circuit vacated two provisions in EPA's PSD regulations containing SILs for PM2.5. (Sierra Club v. EPA, No. 10-1413 (D.C. Circuit), 2013 WL 216018). The court decision does not preclude the use of SILs for PM2.5, but requires that EPA correct the error in the SIL regulations for PM2.5 at 51.166(k)(2) and 51.166(k)(2). In the interim, the EPA states that permitting authorities may continue to apply SILs for PM25 to support a PSD permitting decision, but permitting authorities should take care to ensure that SILs are not used in a manner that is inconsistent with the requirements of Section 165(a)(3)

The PM25 SMC was vacated on January 22, 2013 (Sierra Club v. EPA, No. 10-1413 (D.C. Circuit), 2013 WL 216018). 6

5.6. AMBIENT MONITORING REQUIREMENTS

In addition to determining whether the applicant can forego further modeling analyses, the PSD Significance Analysis is also used to determine whether the applicant is exempt from ambient monitoring requirements. To determine whether pre-construction monitoring should be considered, the maximum impacts attributable to the proposed project are assessed against significant monitoring concentrations (SMC). The SMC for the applicable averaging periods for NO_X , CO and PM_{10} are listed in Table 5-1. A pre-construction air quality analysis using continuous monitoring data may be required for pollutants subject to PSD review. If either the predicted modeled impact from an emissions increase or the existing ambient concentration is less than the SMC, an applicant may be exempt from pre-construction ambient monitoring. As shown later in this report, ambient impacts exceeded the SMC for PM₁₀. However, given the availability of representative monitoring data in the vicinity of the project, Enviva is proposing to use existing ambient monitor data in lieu of pre-construction monitoring requirements.

The PM_{2.5} SMC was vacated on January 22, 2013 by the U.S. Court of Appeals for the District of Columbia Circuit.³⁷ Per the *Guidance for PM_{2.5} Permit Modeling*, as a result of the court decision, EPA will not rely on, and advises states with SIP-approved PSD programs not to rely on, the SMC for PM_{2.5} to exempt projects from preconstruction monitoring requirements.³⁸ However, EPA states that PSD permit applicants can continue to meet pre-construction monitoring requirements by using data from existing monitors that are determined by the permitting authority to be representative of the area surrounding the proposed project. Given the availability of representative monitoring data in the area surrounding the proposed project, Enviva is proposing to use existing ambient monitor data in lieu of preconstruction monitoring requirements.

5.7. BACKGROUND CONCENTRATIONS

If the maximum modeled impacts for a PSD triggering pollutant are greater than the SIL in the Significance Analysis, a NAAQS analysis is required for that pollutant. In the NAAQS analysis, modeled impacts from the facility will be combined with background concentrations, which represent the air quality concentrations due to sources that are not explicitly modeled (e.g., mobile sources, small but local stationary sources, non-regulated fugitive sources, and large but distant sources). Selection of the existing monitoring station data that is "representative" of the ambient air quality in the area surrounding the proposed facility is determined based on the following three criteria: 1) monitor location, 2) data quality, and 3) data currentness. Key considerations based on the monitor location criteria include proximity to the significant impact area of the proposed facility, similarity of emission sources impacting the monitor to the emission sources impacting the airshed surrounding the proposed facility. The data quality criteria refers to the monitor being an approved State and Local Air Monitor (SLAM) or similar monitor type subject to the quality assurance requirements in 40 CFR Part 58 Appendix A. Data currentness refers to the fact that the most recent three complete years of quality assured data are generally preferred.

As shown in Table 5-9, ambient impacts of NO₂, PM₁₀, and PM_{2.5} exceed their respective SILs and thus triggered NAAQS modeling requirements. Table 5-2 presents the background values that were provided by NCDAQ and added to the modeled impacts.³⁹

³⁷ Sierra Club v. EPA, No. 10-1413 (D.C. Circuit), 2013 WL 216018.

³⁸ U.S. EPA, Office of Air Quality Planning and Standards, *Draft Guidance for PM2.5 Permit Modeling* (March 4, 2013).

³⁹ Letter from Tom Anderson (NCDAQ) to Jonathan Hill (Trinity) on August 13, 2013.

Pollutant	Averaging Period	Background Concentration ¹ (µg/m ³)
NO ₂	1-Hour Annual	32.1 5.3
PM ₁₀	24-Hour	25.0
PM _{2.5} ²	24-Hour Annual	19.0 7.8

Table 5-2. Modeled Background Concentrations

¹ Background Concentrations provided in letter from Tom Anderson (NCDAQ) to Jon Hill (Trinity) on August 13, 2013.

5.8. SIGNIFICANT IMPACT AREA AND NAAQS/PSD INCREMENT INVENTORIES

For any off-site impact calculated in the PSD Significance Analysis that was greater than the SIL for a given pollutant, the radius of the significant impact area (SIA) was determined. The SIA encompasses a circle centered on the facility with a radius extending out to either (1) the farthest location where the emissions increase of a pollutant from the project causes a significant ambient impact (i.e., modeled impact above the SIL on a high first high basis), or (2) a distance of 50 km, whichever is less. All sources of the affected pollutant(s) within 50 km of that SIA were assumed to potentially contribute to ground-level concentrations within the SIA and were evaluated for possible inclusion in the NAAQS and PSD Increment analyses.

The NAAQS regional source inventory was comprised of all sources (major and minor) within the SIA along with those sources outside of the SIA that are not excluded based on the "20D" procedure.⁴⁰ Using this procedure, sources outside the area of significant impact are excluded from the inventory if the entire facility's emissions (tpy) are less than 20 times the distance (km) from the facility to the nearest edge of the SIA (long-term averaging period), and are excluded if the entire facility's emissions (tpy) are less than 20 times the distance (short term averaging period).

Sources in the inventories provided by NCDAQ⁴¹ (included on the CD-ROM in Appendix H) were evaluated for inclusion in the NAAQS and PSD Increment analyses. The complete list of modeled inventory sources and the associated model input parameters are provided in Appendix G.

5.9. NAAQS ANALYSIS

The primary NAAQS are the maximum concentration ceilings, measured in terms of total concentration of a pollutant in the atmosphere, which define the "levels of air quality that the EPA judges are necessary, with an adequate margin of safety, to protect the public health."⁴² Secondary NAAQS define

⁴⁰Federal Register 8079, March 6, 1992.

⁴¹ Email from Connie Horne (NCDAQ) to Joe Sullivan (Trinity) on August 12, 2013.

42 40 CFR §50.2(b).

the levels that "protect the public welfare from any known or anticipated adverse effects of a pollutant." The primary and secondary NAAQS are shown in Table 5-1 for NO_X, PM_{10} , and $PM_{2.5}$. In the NAAQS analysis, the potential emissions from all emission units at the facility as well as sources included in the regional NAAQS inventory were modeled together to compute the cumulative impact.

The objective of the NAAQS Analysis is to demonstrate through air quality modeling that emissions from the facility do not cause or contribute to an exceedance of the NAAQS at any ambient location at which the impact from the proposed project is greater than the SIL. The modeled cumulative impacts were added to appropriate background concentrations and assessed against the applicable NAAQS as listed in Table 5-1 to demonstrate compliance.

The following modeling results for each PSD triggering pollutant and averaging period were used to determine the design concentration in the NAAQS Analysis:

- The maximum-modeled annual arithmetic mean impact from the full five years of meteorological data to demonstrate compliance with the annual NO₂ standard.
- The modeled annual arithmetic mean impact averaged over the full five years to demonstrate compliance with the annual PM_{2.5} standard.
- The 24-hr PM₁₀ standard is not to be exceeded more than 3 times in any consecutive 3 year period, meaning that generally the highest sixth-high (H6H) modeled concentration over the full five years of meteorological data is compared against the NAAQS. However, the highest second-high concentrations was used as a more conservative approach to avoid the long model run times associated with running all five meteorological years within one model run.
- The 24-hr PM_{2.5} standard is the 98th percentile (approximated by the high-eighth-high, H8H modeled concentration) of 24-hr concentrations in a given year averaged over the full five years.
- Maximum five-year average of the 98th percentile (H8H) modeled daily maximum 1-hr concentration, on a receptor-by-receptor basis, to demonstrate compliance with the 1-hr NO₂ standard.

5.10. PSD INCREMENT ANALYSIS

The PSD regulations were enacted to "prevent significant deterioration" of air quality in areas of the country where the air quality was better than the NAAQS. To achieve this goal, the EPA established PSD Increments for NO₂, SO₂, PM₁₀, and PM_{2.5}.⁴³ The PSD Increments are divided into Class I, II, and III Increments. No Class III air quality areas have been established. The Class I modeling portion of this report is limited only to the increment screening procedure described later in the document. The Class II PSD Increments for NO₂, PM₁₀ and PM_{2.5} are listed in Table 5-1. The Sampson facility is the first PM_{2.5} increment consuming source in the area and as such there were no additional offsite sources to include in a regional inventory.

Since all short-term PSD Increments are not to be exceeded more than once per year, the highestsecond-high modeled impacts for PM_{10} and $PM_{2.5}$ from among the five meteorological years modeled were compared against the short-term increment. The highest annual average PM_{10} , $PM_{2.5}$ and NO_2 impacts were compared against the annual increments.

⁴³ The PM_{2.5} PSD Increments became effective on October 20, 2011 (i.e., one year after the date of promulgation).

The sum of the PSD Increment concentration and a baseline concentration defines a "reduced" ambient standard, either lower than or equal to the NAAQS that must be met in a designated attainment area. Significant deterioration is said to have occurred if the *change* in emissions occurring since a baseline date results in an off-property impact greater than the PSD Increment (i.e., the increased emissions "consume" more than the available PSD Increment).

The determination of whether an emissions change at a given source consumes or expands increment is based on the source definition (major or minor for PSD) and the time the change occurs in relation to baseline dates. The major source baseline date for SO₂, PM_{10} and $PM_{2.5}$ was established as January 6, 1975 and for NO_x as February 8, 1988. Increases or decreases in actual emissions at major sources after the major source baseline date as a result of construction of a new source, a physical or operational change (i.e., modification) to an existing source, or shutdown of an existing source affect the available increment, and therefore, must be included in an increment analysis. Actual emission changes at minor sources only affect increment after the minor source baseline date (MSBD), which is set at the date the first complete PSD permit application is submitted in a county. The MSBDs for PM_{10} , $PM_{2.5}$ and NO_x have not yet been established in Sampson County, and as such, no minor sources need to be included in the increment inventory.⁴⁴ In order to maintain conservatism, the increment modeling was performed by using the previously described NAAQS inventory.

5.11. OZONE AMBIENT IMPACT ANALYSIS

Elevated ground-level ozone concentrations are the result of photochemical reactions among various chemical species. These reactions are more likely to occur under certain ambient conditions (e.g., high ground-level temperatures, light winds, and sunny conditions). The chemical species that contribute to ozone formation, referred to as ozone precursors, include NO_X and VOC emissions from both anthropogenic (e.g., mobile and stationary sources) and natural sources (e.g., vegetation). While the facility will not directly emit ozone, the facility will emit both NO_X and VOC at levels that are greater than the PSD SER for ozone precursors, and thus, ambient ozone impacts must be addressed. Enviva proposes that no modeling be required for ozone since the use of reactive plume models is rarely conducted on an individual source basis. In addition, NCDAQ and other Region 4 states have only very rarely assessed single source impacts on ozone in PSD air quality analyses and as such a qualitative rather than quantitative analysis was performed.

The two closest ambient ozone monitors to the project site, located in Lenoir County and Cumberland County, NC, are in attainment with the current ozone standard. The Lenoir County monitored design value is 0.069 ppm and the Cumberland County monitored design value is 0.072 ppm, both in relation to the NAAQS of 0.075 ppm. The monitors are located in suburban to rural locations, with more vehicle traffic than the very rural project site would experience. Therefore, given the attainment status of the area, the low vehicle traffic counts and the very small individual source contributions associated with projects of this nature, Enviva believes that no further ozone ambient impact analysis is warranted.

5.12. CLASS I AREA ANALYSIS

Class I areas are federally protected areas for which more stringent air quality standards apply to protect unique natural, cultural, recreational, and/or historic values. There are three (3) Class I areas within 300 km of the Sampson facility as follow:

⁴⁴ http://daq.state.nc.us/permits/psd/docs/mbd1.pdf

- Swanquarter National Wildlife Refuge located 158 km to the east;
- Cape Romain National Wildlife Refuge located 252 km to the south-southwest; and
- James River Face Wilderness area located 294 km to the northwest.

The Federal Land Managers (FLM) have the authority to protect air quality related values (AQRVs), and to consider in consultation with the permitting authority whether a proposed major emitting facility will have an adverse impact on such values. Upon receiving the modeling protocol for this project, NCDAQ contacted the FLM and determined that no AQRV analysis would be required.⁴⁵

In addition to the AQRV analysis, Class I PSD Increment consumption at the affected Class I areas was required to be assessed. The assessment was performed in AERMOD by placing a ring of receptors at 50 km distance (along 1 degree radials), in the direction of the closest Class I area (Swanquarter). Figure E-3 illustrates the receptors included in the analysis. This Class I increment "screening" procedure was originally proposed by EPA Region 4 and has been used in several recent PSD applications to fulfill the Class I increment modeling requirement. Table 5-3 below illustrates that the proposed project impacts will not exceed any Class I SIL.

Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration (µg/m ³)	SIL (µg/m³)	Exceeds SIL? (Yes/No)
PM _{2.5}	24-Hour Annual	804,996.3 805.214.8	3,903,241.0 3,902.396.1	2008-2012 2008-2012	0.042 0.003	0.07	No No
PM ₁₀	24-Hour	806,084.4	3,898,121.7	10120224	0.166	0.32	No
	Annual	806,084.4	3,898,121.7	2010	0.007	0.20	No
NO ₂	Annual	806,084.4	3,898,121.7	2010	0.008	0.1	No

Table 5-3. Class I SIL Modeling Results

5.13. MODEL SELECTION

The latest version (14134) of the AERMOD modeling system was used to estimate maximum groundlevel concentrations in all Class II Area analyses conducted for this application. AERMOD is a refined, steady-state, multiple source, Gaussian dispersion model and was promulgated in December 2005 as the preferred model for use by industrial sources in this type of air quality analysis.⁴⁶ The AERMOD model has the Plume Rise Modeling Enhancements (PRIME) incorporated in the regulatory version, so the direction-specific building downwash dimensions used as inputs are determined by the Building Profile Input Program, PRIME version (BPIP PRIME), version 04274.⁴⁷ BPIP PRIME is designed to incorporate

 ⁴⁵ Protocol Approval Letter from Tom Anderson (NCDAQ) to Jonathan Hill (Trinity) on August 13, 2013.
 ⁴⁶ 40 CFR Part 51, Appendix W-Guideline on Air Quality Models, Appendix A.1- AMS/EPA Regulatory Model (AERMOD).

⁴⁷ Earth Tech, Inc., Addendum to the ISC3 User's Guide, The PRIME Plume Rise and Building Downwash Model, Concord, MA.

the concepts and procedures expressed in the GEP Technical Support document, the Building Downwash Guidance document, and other related documents, while incorporating the PRIME enhancements to improve prediction of ambient impacts in building cavities and wake regions.⁴⁸

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

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

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

5.14. RECEPTOR GRID AND COORDINATE SYSTEM

Modeled concentrations were calculated at receptors beginning at the ambient air boundary, which consists of those areas on facility property with clear deterrents to public access (e.g. fencing, regular security patrols). Receptors were placed along that "fenceline" and also on a Cartesian receptor grid. Fenceline receptors were spaced 25 meters apart as specified in NCDAQ's modeling guidance for facilities with sources within 100 meters of the fenceline.⁴⁹ Beyond the fenceline, receptors were spaced 500 meters apart in a Cartesian grid extending out 10 km for the significance analyses. Those results were reviewed to ensure that the grid captured all potential areas of significant impacts. Figure E-4 presents a plot of the receptor grid utilized in the significance analysis.

The NAAQS and Increment analyses included a 100 meter-spaced grid extending out 3 km from the facility (i.e. encompassing all areas with impacts above the SIL). Figure E-5 presents the NAAQS/Increment modeling receptor grid.

Receptor elevations required by AERMOD were determined using the AERMAP terrain preprocessor. AERMAP also calculates hill height parameters required by AERMOD. Terrain elevations from the USGS 1 arc second NED were used for the AERMAP processing. AERMAP was also used to determine elevations for the modeled sources and buildings.

⁴⁸ U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised)*, Research Triangle Park, North Carolina, EPA 450/4-80-023R, June 1985.
⁴⁹ http://www.ncair.org/permits/mets/psd_guidance.pdf

In all modeling analysis data files, the location of emission sources, structure, and receptors were represented in the UTM coordinate system. The Sampson plant will be located at approximately 756.7 kilometers (km) east and 3,890.2 km north in Zone 17 (NAD 83).

5.15. METEOROLOGICAL DATA

The AERMOD modeling results were based on sequential hourly surface observations from Fayetteville, NC and upper air data from Greensboro, NC. These stations are recommended by NCDAQ for modeling facilities located in Sampson County and the 2008-2012 files are downloaded from the NCDAQ website.⁵⁰ Per NCDAQ guidance, the base elevation (PROFBASE) for the Fayetteville surface station was set to 58 m.⁵¹

5.16. BUILDING DOWNWASH ANALYSIS

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

5.17. REPRESENTATION OF EMISSION SOURCES

5.17.1. Source Types and Parameters

The AERMOD dispersion model allows for emission units to be represented as point, area, or volume sources. The majority of the point sources planned for the facility have clearly discernable emission points with vertical orientations and no rain caps. As such those sources were modeled with actual stack parameters (i.e., height, diameter, exhaust gas temperature, and gas exit velocity). There are a few horizontal releases planned for the site and, per NCDAQ guidance, those sources were assigned an exit velocity of 0.01 m/s. A list of modeled point sources and locations is presented in Table 5-4 and the modeled stack parameters are shown in Table 5-5 (have these been updated and made currrent?). In addition to the modeled point sources, an area source (PAVEDRDS) was included in the model to represent ground-level emissions from the roadway traffic at the site. That source was polygon-shaped with a total surface area of 70,491 m².

⁵⁰ http://www.ncair.org/permits/mets/metdata.shtml

⁵¹ http://www.ncair.org/permits/mets/ProfileBaseElevations.pdf

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
EP1	Dryer WESP Stack	756,748.6	3,890,256.1	51.91
EP2	Hammermill Filter #1 and #2	756,691.4	3,890,157.1	52.07
EP3	Hammermill Filter #3 and #4	756,686.4	3,890,152.5	52.03
EP4	Hammermill Filter #5 and #6	756,680.0	3,890,147.1	52.03
EP5	Hammermill Filter #7 and #8	756,674.5	3,890,142.6	52.02
EP6	Pellet Silo Bin Vent	756,625.2	3,890,120.9	51.98
EP7	Pellet Cooler #1 Cyclone	756,618.9	3,890,100.4	51.96
EP8	Pellet Cooler #2 Cyclone	756,615.9	3,890,097.4	51.97
EP9	Pellet Cooler #3 Cyclone	756,612.2	3,890,093.8	51.98
EP10	Pellet Cooler #4 Cyclone	756,608.0	3,890,089.4	51.99
EP11	Pellet Cooler #5 Cyclone	756,604.3	3,890,086.0	51.99
EP12	Pellet Cooler #6 Cyclone	756,601.0	3,890,083.3	51.98
EP13	Emergency Generator	756,657.0	3,890,225.0	52.52
EP14	Firewater Pump	756,535.9	3,889,980.6	51.93
EP15	Fines Dust Bin Vent	756,700.3	3,890,164.4	52.13
EP16	Finished Goods Dust Collection Stack	756,537.0	3,890,036.0	51.94
EP17	Greenwood Hammermill #1 Bin Vent	756,728.3	3,890,272.4	51.93
EP18	Greenwood Hammermill #2 Bin Vent	756,729.6	3,890,266.6	51.95
EP19	Dryer Out Conv. Tail Bin Vent	756,720.0	3,890,215.0	52.13
EP20	Dryer Out Conv. Head Bin Vent	756,692.0	3,890,181.2	52.25
PAVEDRDS	Paved Roadway	756,731.0	3,889,783.5	52.25 51.97

Table 5-4. Modeled Source Locations

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Model ID	Stack Height (m)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
EP1	28.65	350.93	10.59	3.05
EP2	16.46	310.93	13.80	1.14
EP3	16.46	310.93	13.80	1.14
EP4	16.46	310.93	13.80	1.14
EP5	16.46	310.93	13.80	1.14
EP6	23.77	305.37	0.01	0.40
EP7	22.86	316.48	16.48	0.66
EP8	22.86	316.48	16.48	0.66
EP9	22.86	316.48	16.48	0.66
EP10	22.86	316.48	16.48	0.66
EP11	22.86	316.48	16.48	0.66
EP12	22.86	316.48	16.48	0.66
EP13	4.57	919.82	78.30	0.09
EP14	4.57	954.00	109.18	0.06
EP15	20.42	293.00	0.01	0.93
EP16	7.62	310.93	14.35	1.22
EP17	12.19	293.00	16.17	0.61
EP18	12.19	293.00	16.17	0.61
EP19	4.57	293.00	0.01	0.40
EP20	15.85	293.00	0.01	0.40

Table 5-5. Modeled Stack parameters

The emission rates for modeled criteria pollutants are shown in Table 5-7.

Model		Modele	d Emission Rat	es (g/s)	
ID	TSP	PM ₁₀	PM _{2.5}	СО	NO _x
EP1	1.48E+00	1.48E+00	1.48E+00	6.63E+00	6.31E+00
EP2	1.30E-01	1.30E-01	4.54E-04	-	-
EP3	1.30E-01	1.30E-01	4.54E-04	-	-
EP4	1.30E-01	1.30E-01	4.54E-04	-	-
EP5	1.30E-01	1.30E-01	4.54E-04	~	-
EP6	1.06E-02	1.06E-02	1.06E-02	-	-
EP7	2.85E-01	7.43E-02	9.11E-03	-	-
EP8	2.85E-01	7.43E-02	9.11E-03	-	-
EP9	2.85E-01	7.43E-02	9.11E-03	-	-
EP10	2.85E-01	7.43E-02	9.11E-03	-	-
EP11	2.85E-01	7.43E-02	9.11E-03	-	-
EP12	2.85E-01	7.43E-02	9.11E-03	9.05E-02	1.04E-01
EP13	1.04E-02	1.04E-02	1.04E-02	9.05E-02	1.04E-01
EP14	1.04E-02	1.04E-02	1.04E-02	-	-
EP15	4.23E-02	4.23E-02	4.23E-02	-	_
EP16	1.53E-01	1.40E-01	5.37E-04	-	-
EP17	4.32E-02	4.32E-02	4.32E-02	-	-
EP18	4.32E-02	4.32E-02	4.32E-02	-	
EP19	4.32E-03	4.32E-03	4.32E-03	-	-
EP20	4.32E-03	4.32E-03	4.32E-03	-	-
PAVEDRDS*	9.87E-07	1.97E-07	4.85E-08	-	-

Table 5-7. Modeled Emission Rates

* Area source emission rates expressed per unit area (g/s/m²)

5.17.2. GEP Stack Height Analysis

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

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

H_{GEP} = minimum GEP stack height,

H = structure height, and

L = lesser dimension of the structure (height or projected width).

This equation is limited to stacks located within 5L of a structure. Stacks located at a distance greater than 5L are not subject to the wake effects of the structure. The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis are determined using BPIP. In general, the lowest GEP stack height for any source is 65 meters by default.⁵² None of the proposed emission units at the Sampson plant will exceed GEP height.

Figure E-2 presents a site layout for the proposed facility that shows the source and building arrangement as modeled.

5.18. NO₂ MODELING APPROACH

EPA's *Guideline on Air Quality Models (Guideline)*, in 40 CFR Part 51, Appendix W, recommends a tiered approach for modeling annual average NO₂ from point sources. The tiers are described in Section 6.2.3 of the *Guideline*:

a) A tiered screening approach is recommended to obtain annual average estimates of NO₂ from point sources for New Source Review analysis, including PSD... For Tier 1 ... use an appropriate Gaussian model to estimate the maximum annual average concentration and assume a total conversion of NO to NO₂. If the concentration exceeds the NAAQS and/or PSD Increments for NO₂, proceed to the 2nd level screen.

b) For Tier 2 (2^{nd} level) screening analysis, multiply the Tier 1 estimate(s) by an empirically derived NO_2/NO_X value of 0.75 (annual national default).

c) For Tier 3 (3rd level) analyses, a detailed screening method may be selected on a case-by-case basis. For point source modeling, detailed screening techniques such as the Ozone Limiting Method may also be considered.

Enviva utilized the Ambient Ratio Method (ARM), or Tier 2 approach, which has evolved from previous representations of the oxidation of nitric oxide (NO) by ambient ozone and other photochemical oxidants to form nitrogen dioxide (NO₂ – the regulated ambient pollutant). EPA issued a memo on March 1, 2011 providing additional clarifications regarding application of Appendix W modeling guidance for the 1-hr NO₂ NAAQS.⁵³ Per the memo, EPA recommends the use of 0.80 as a default ambient ratio for the 1-hour NO₂ standard under the Tier 2 approach. Based on this updated EPA guidance, Enviva utilized 0.80 as the ambient NO₂ to NO_x ratio in the significance, NAAQS and PSD Increment modeling analyses, even conservatively for the annual analyses.

5.19. STATE-ONLY MODELING

In addition to the federal NAAQS and PSD increment standards that are required to be analyzed under PSD review, Enviva has performed TSP modeling and modeling under North Carolina's air toxics program.

⁵² 40 CFR §51.100(ii)

⁵³ U.S. EPA, Region 4, Memorandum from Mr. Tyler Fox to Regional Air Division Directors. Research Triangle Park, North Carolina. March 1, 2011.

5.19.1. Toxic Air Pollutant Modeling

As shown in Table B-3 of this application, several toxic air pollutants (TAP) will exceed their facilitywide toxics permitting emission rates (TPER) under the NC Air Toxics Rules. However, those emissions emanate from sources covered by a NESHAP/MACT regulation and as such, are exempt from modeling requirements. However, since this project is for a new, greenfield facility, as an informative conservative exercise, Enviva elected to perform a NC TAP modeling analysis. In that analysis, the TAP with the highest impact relative to the AAL, hexachlorodibenzo-p-dioxin, showed impacts of only 13.2% of the standard. Given that, along with the minor nature of the changes to TAP sources in this version of the application, Enviva asserts and DAQ has verbally concurred that no additional TAP modeling should be required as part of this revised application.⁵⁴

The TAP modeling analyses were performed in accordance with North Carolina's *Guidelines for Evaluating the Air Quality Impacts of Toxic Air Pollutants in North Carolina* (February 2014). The modeling was generally conducted using the same methodology and data resources in AERMOD as described in the previous sections of this report.

5.19.2. Total Suspended Particulate Modeling

15A NCAC 2D .0403 establishes the ambient air quality standards for total suspended particulate matter (TSP). The standards are the following:

- (1) 75 micrograms per cubic meter annual geometric mean,
- (2) 150 micrograms per cubic meter maximum 24-hour concentration not to be exceeded more than once per year.

Enviva performed an analysis to demonstrate compliance with this applicable state standard. The results are presented in Table 5-13.

5.20. PSD MODELING RESULTS

The following sections summarize the results of the PSD Class II dispersion modeling analyses which demonstrate that Enviva's proposed Sampson facility will neither cause nor contribute to an exceedance of the NAAQS or PSD Increment. Electronic copies of all modeling input and output files are included on the CD-ROM in Appendix H.

5.21. SIGNIFICANCE ANALYSIS

5.21.1. Class II Significance Analysis

As discussed in Section 5.5, a Significance Analysis was conducted to determine the need for further pollutant modeling. The results of the Significance Analysis for each pollutant are provided in Table 5-9. Figures E-6 through E-11 present plots of the significance results which were used to determine the SIA.

⁵⁴ Phone call between William Willets and Mark Cuilla of NCDAQ and Dale Overcash and Jon Hill of Trinity Consultants on August 18, 2014.

Pollutant	Averaging Period	Concentration Basis	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration (µg/m ³)	SIL (µg/m ³)	SIA (km)
CO	1-Hour 8-Hour	H1H in any year H1H in any year	757,035.7 757,035.7	3,890,062.2 3,890,062.2	12021117 09040716	49.65	2,000	N/A
NO ₂	1-Hour Annual	5-Year Avg. H1H H1H in any year	756,879.8 756,452.5	3,890,807.8 3,889,774.7	2008-2012 2009	38.35 39.71 2.29	500 10	2.5
PM ₁₀	24-Hour Annual	H1H in any year H1H in any year	756,549.9 756,452.5	3,889,681.0 3,889,774.7	11122424 2009	34.84 4.62	1 5 1	2.5
PM _{2.5}	24-Hour Annual	5-Year Avg. H1H 5-Year Avg. H1H	756,442.7 756,462.2	3,889,780.8 3,889,765.4	2008-2012 2008-2012	7.45	1.2 0.3	3.0

Table 5-9. Significance Model Results

As shown in the results table, NO_2 , PM_{10} , and $PM_{2.5}$ exceed the Class II SILs, requiring further analysis to demonstrate compliance with NAAQS and Class II Increment (where established).

5.22. NAAQS ANALYSIS

The NAAQS Analysis for NO₂, PM₁₀, and PM_{2.5} was conducted using the approach described in Section 5-9 with the emissions and stack parameter data shown in Tables 5-4 through and 5-6 for the proposed emissions sources and Appendix G for regional sources.

Table 5-10 presents the results for the NAAQS modeling analyses. The concentrations shown represent the maximum modeled concentrations required by each standard at which the proposed Sampson facility is also significant. The results demonstrate that the proposed facility will neither cause nor contribute to a violation of the NAAQS.

Table 5-10.	NAAQS	Modeling	Results
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Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration (µg/m³)	Background Concentration ¹ (µg/m ³)	Total Concentration (µg/m ³)	NAAQS (µg/m ³)	Exceeds NAAQS?
NO ₂	1-Hour	756,359.1	2 000 005 6				(10/ 11)	(P6/ III)	(Yes/No)
	Annual	-	-//	=	46.27	32.10	78.37	188	No
	Annua	756,379.4	3,889,821.1	2008	3.14	5.30	8.44		
PM 10	24-Hour	756,514.9	3,889,712.1	11100404			0.14	100	No
			0,007,712.1	11122424	29.62	25.00	54.62	150	No
PM _{2.5}	24-Hour	756,462.2	3,889,765.4	2008-2012	5.32	10.00			
			3,889,765.4	2008-2012		19.00	24.32	35	No
			5,565,703.4	2008-2012	1.19	7.76	8.95	12	No

¹ Background Concentrations provided in letter from Tom Anderson (NCDAQ) to Jon Hill (Trinity) on August 13, 2013.

5.23. PSD INCREMENT ANALYSIS

The PSD Increment Analysis for NO_x , PM_{10} and $PM_{2.5}$ was conducted using the approach described in Section 5.10. Emissions and stack parameter data are shown in Tables 5-4 through and 5-6 for the facility proposed emissions sources and Appendix G for regional sources. The modeling results presented in Table 5-11 demonstrate that the proposed facility will neither cause nor contribute to an exceedance of the PSD Increment for NO_2 , PM_{10} , or $PM_{2.5}$.

Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration (µg/m³)	Increment (µg/m³)	Exceeds Increment? (Yes/No)
NO ₂	Annual	756,379.4	3,889,821.1	2008	3.14	25	No
PM10	24-Hour	756,514.9	3,889,712.1	11122424	29.62	30	No
	Annual	756,452.5	3,889,774.7	2009	4.62	17	No
PM _{2.5}	24-Hour	756,572.6	3,889,691.3	11110724	7.60	9	No
	Annual	756,462.2	3,889,765.4	2009	1.31	4	No

Table 5-11. Class II PSD Increment Results

5.24. STATE-ONLY MODELING RESULTS

5.24.1. Toxic Air Pollutant Modeling

In the original application, TAP modeling analyses were conducted using the approach in described in Section 5.19. Table 5-12 presents the results for the state toxics modeling that was previously performed for the proposed Enviva Sampson facility. As shown, the project will not cause an exceedance of any pollutant AAL. All modeled TAP had impacts less than 50% of the AAL, and as such, only the most recent meteorological year (2012) was modeled to determine the maximum result. Given the small magnitude of these results, no further TAP modeling was conducted for this application.

Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time (YYMMDDHH)	Maximum Concentration (µg/m ³)	AAL (µg/m ³)	% of AAL (%)
Arsenic	Annual	757,048.70	3,890,762.10	2012	1.00E-05	2.30E-04	4.35%
Benzo(a)pyrene	Annual	757,048.70	3,890,762.10	2012	2.00E-05	3.30E-02	0.06%
Cadmium*	Annual	757,048.70	3,890,762.10	2012	1.91E-06	5.50E-03	0.03%
Chlorine	1-Hour 24-Hour	757,035.70 756,640.70	3,890,062.20 3,889,722.60	12021117 12102724	0.13 5.50E-02	900 37.5	0.01% 0.15%
Formaldehyde	1-hour	756,595.40	3,889,701.60	12012519	6.32	150	4.21%
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	Annual	757,048.70	3,890,762.10	2012	1.00E-05	7.60E-05	13.16%
Hydrogen chloride (hydrochloric acid)	1-Hour	757,035.70	3,890,062.20	12021117	0.31	700	0.04%
Vinyl chloride	Annual	757,048.70	3,890,762.10	2012	1.20E-04	0.38	0.03%

Table 5-12. TAP Modeling Results

mium impacts are presented in nanograms per cubic meter in the electronic output files in order to maintain enough significant figures in the results.

5.24.2. Total Suspended Particulate Modeling

Table 5-13 presents the results for the TSP modeling analysis that was performed for the proposed Sampson facility. As shown, the project will not cause any violation of the TSP SAAQS.

Table 5-13.	TSP Modeling	Results
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Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration (µg/m³)	SAAQS (µg/m ³)	Exceeds SAAQS? (Yes/No)
TSP	24-Hour Annual	756,514.9 756,452.5	3,889,712.1 3,889,774.7	11110724 2009	74.1 10.5	150 75	No

SECTION 6 ADDITIONAL IMPACTS

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In addition to the NAAQS and PSD Increment modeling analyses described previously in this report, applicants are required to perform additional impacts evaluations including: a growth analysis, a soil and vegetation analysis, and a plume visibility analysis.

6.1. PLUME VISIBILITY ANALYSIS

There are no airports or state parks located within the maximum SIA (3.0 km) and as such, no plume visibility analysis was required.

6.2. GROWTH ANALYSIS

The project will consist of the construction and operation of a new wood pellet facility. There will be temporary jobs associated with facility construction as well as the creation of approximately 80 permanent jobs to staff the site. It is anticipated that the large majority of the permanent jobs will be filled with residents that are already located in the area, and thus, no significant growth (in population or infrastructure) is expected in association with the new facility.

6.3. SOIL AND VEGETATION ANALYSIS

To assess soil and vegetation impacts, two comparisons were used. First, the NAAQS results (or significance results if SILs were not reached) were assessed against the secondary NAAQS standards, which provide protection for public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Second, the NAAQS results (or significance results if SILs were not reached) were compared to values from the EPA document, *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals* (EPA 450/2-81-078), 1981.⁵⁵

The results for both comparisons are presented in Table 6-1 and show that no impacts exceed the secondary NAAQS or the EPA screening levels. Thus, there are no adverse impacts expected on soils or vegetation.

⁵⁵ EPA, A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals (EPA 450/2-81-078), 1981.

Pollutant	Averaging Period	Total Concentration (µg/m ³)	Ve Sensitive (µg/m³)	getation Sensitiv Intermediate (μg/m ³)	rity ¹ Resistant (µg/m ³)	Secondary NAAQS (µg/m ³)	Minimum Threshold (µg/m ³)	Exceeds Threshold? (Yes/No)
NO ₂ ²	4-Hour	78.37	3,760	6,400	16,920		270	
	8-Hour	78.37	3,760	7,520	15,040	-	3,760	No
	1-Month	78.37	-	564	13,040	~	3,760	No
	Annual	8.44	-	94	-	- 100	564 94	No
PM ₁₀ ³	24-Hour	54.62	-	-	-	150		No
	Annual	12.70	-	-			150	No
PM _{2.5}	24-Hour	19.00	-	-	-	50	50	No
	Annual	7.76	_		-	35	35	No
	4		_	-	-	12	12	No
CO	1-Week ⁴	1,529.23	1,800,000	-	18,000,000		1,800,000	No

Table 6-1. Soil and Vegetation Impacts

Screening Concentrations based on Table 3.1 A Screening Procedure for Impact of Air Pollution Sources on Plants, Soil and Animals, USEPA, Dec. 12, 1980. ² 4-Hour, 8-Hour and Monthly Averages are conservatively estimated by the 1-hour NAAQS modeling results.

³ Annual results are based on the increment analysis (with background added), since no annual NAAQS exists.

⁴ 1-Week Results are approximated by the 8-hour average SIL results and include 2013 background concentrations from Raleigh, NC.

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APPENDIX A NCFAQ APPLICATION FORMS

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APPENDIX A - NCDAQ APPLICATION FORMS

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Facility Forms

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FORM A1

			FACIL	ITY (Ge	neral In	formatio	n)			
REVISED 11/01/02		NCDENF	VDivision of Air Qu	ality - Applie	ation for A	ir Permit to C	Onstruct/Operate			A1
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Legal Corporate/Owne	er Name:	Enviva P	ellets Sampson, Li	.C						_
Site Name: Enviva P										
Site Address (911 Address Line 2:	ass) Line 1:	5 Connee	tor Road							
City: Faison										
Zip Code:					State:	North Ca	olina			
Zip Code:	283	341			County:	Sampson				
Permit/Technical Cont		_	C	ONTACT	INFORM/	ATION				
Name/Title: Joe Harre					Facility/In:	spection Con	rtact:			
Mailing Address Line 1:					Name/Title	Joe Harre	11			
Mailing Address Line 1: Mailing Address Line 2:	142 N.C. Route 5	561 East			Mailing Add	dress Line 1:	142 N.C. Route 5	61 East		
	0					ress Line 2:				
City: Ahoskie Phone No. (area code)	State:	NC	Zip Code:	27910	City:	Ahoskie	State:	NC	Zip Code:	2791
Email Addres: Joe.Harre	(252) 209-6032	Fax No. (a	irea code)			(area code)	(252) 209-6032	Fax No. (a		2101
		om			Email Addr	es: Joe Harre	Il@envivabiomass.c	om	,	
Responsible Official/A Name/Title: Norb Hint					Invoice Co	intact:				
Mailing Address Line 1:					Name/Title:	Same as p	ermit/technical con	tact		
	7200 Wisconsin	Avenue			Mailing Add	iress Line 1:				
Mailing Address Line 2: City: Bethesda	Suite 1000				Mailing Add	ress Line 2:				
City: Bethesda Phone No. (area code)		MD	Zip Code:	20814	City:		State:		Zip Code:	
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ity: Morrisville	One Copley Parkv				Mailing Addr	ess Line 2:	Suite 310			
		State:	North Carolina		Zip Code:	27560		County:	Wake	
hone No (919) 462 6	1035	Fax No.	(919) 462-9694	NIGURA E	Email Addres	ss:	damara a salitariante	ana sharehe en o		
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ame (typed):	Norb Hintz	SIGNATI	JRE OF RESPO		Title:	Senior Vice	President and Chie	f Engineer		-
	North Hingz		JRE OF RESPO			Senior Vice	President and Chie	f Engineer		

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	EMISSION SOURCE LISTING: New	uality - Application for Air Permit to Constru	A2
EMISSION SOURCE ID NO.	DESCRIPTION	w, Modified, Previously Unpermitted, CONTROL DEVICE ID NO.	CONTROL DEVICE
ES-CHIP-1	Equipment To Be ADDED By This A	oplication (New, Previously Unperm	DESCRIPTION Itted, or Replacement)
		N/A	N/A
ES-GHM-1, 2	Green Wood Hammermills	CD-RCHP-BV	Bin Vent Baghouse
ES-CHIP-2	Portable Chipper	N/A	N/A
ES-BARKHOG	Bark Hog	N/A	N/A
ES-DRYER	Green Wood Direct-Fired Dryer System	CD-DC	
		CD-WESP	Three (3) Simple Cyclones
ES-HM-1, through 8	Eight (8) Hammermills	CD-HM-CYC-1 CD-HM-BF1	Wet Electrostatic Precipitator
		CD-HM-CYC-2 CD-HM-BF2	Simple Cyclone, Bagfilter
		CD-HM-CYC-3 CD-HM-BF3	Simple Cyclone, Bagfilter
		CD-HM-CYC-4 CD-HM-BF4	Simple Cyclone, Bagfilter
		CD-HM-CYC-5 CD-HM-BF5	Simple Cyclone, Bagfilter
			Simple Cyclone, Bagfilter
			Simple Cyclone, Bagfilter
			Simple Cyclone, Bagfilter
ES-HMA	Hammermill Area Filter	CD-HM-CYC-8 CD-HM-BF8 CD-PFB-BF	Simple Cyclone, Bagfilter
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	Bin Vent Baghouse
ES-CLR-1 through 6	Six (6) Pellet Coolers		Bin Vent Baghouse
ES-PFB	Pellet Fines Bin	CD-CLR-1 through 6 CD-PFB-BF	Six (6) Pellet Cooler Cyclones
S-FPH	Finished Product Handling	CD-FFB-BF	Bin Vent Baghouse
S-PB-1 through 4	Four (4) Pellet Loadout Bins	CD-FPH-BF	
S-PL-1, -2	Pellet Mill Loadout 1 and 2		Finished Product Handling Bagfilter
S-GN	Emergency Generator (250 bhp)		
S-FWP	Fire Water Pump (250 bhp)	N/A	N/A
		N/A	N/A
	Existing Permitted Equipm	nent To Be MODIFIED By This App	lication
	Equipment To Be	DELETED By This Application	

 112(f) APPLICABILITY INFORMATION

 Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act?

 Yet Colspan="2">Yet Colspan="2">A 3

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

 A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?
 Yet Sole

 Yes Sole
 No Sole(required RMP submitted) date:
 If submitted, RMP submittal date:

 B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?
 Yes Sole

 Yes Sole
 No Sole
 If yes, please specify:

Attach Additional Sheets As Necessary

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Page 2 of 47

						000 Certified? () YES (X	,
Facility Name:	Enviva Pellets Sa				Permit Number:	N/A	
Facility ID:	to be assigned	County:	Sampson		Environmental Contact:	Joe Harrell	
Mailing Address		US Highway 117			Phone No. ()	(252) 209-6032	Fax No. ()
Malling Address					Zip Code:	28341	County: Sampson
City:	Faison	State:	North Carolina		Email Address:	Joe.Harrell@envivabiom	
AIR EMISSIONS	SOURCE REDUCT	IONS	A				u33.00m
Source Description and ID	Air Pollutant	Enter Code for Emission Reduction Option (See Codes)	Date Reduction Option Implemented (mo/yr)	Quantity Emitted from prior annual report to DAQ (lb/yr)	n the past year? / 1YES Quantity Emitted from current annual report to DAQ (lb/yr)	Has reduction activity been discontinued? If so, when was it discontinued?	Addition detail about so
ACILITY - WIDE	REDUCTIONS & R Pollutant	FCYCLING ACTIVITIES		Any Reductions or Re	cycling Activities in the n	st year? () YES (X) NO	
Source	or	Enter Code for Emission	Date Reduction	Country Childed	Quantity Emitted	Has reduction activity been	Addition detail about sou
Description or Activity		Reduction	Implemented	from prior annual	from current annual	discontinued? if so, when	
	Recycled or Reduced Materials	Option (See Codes)	(mo/yr)	report	report	was it discontinued? (mo/yr)	
N/A							

Attach Additional Sheets As Necessary

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FORM D1 FACILITY-WIDE EMISSIONS SUMMARY

CRITER	IA AIR POLLUT	ir Quality - Application for Air Permit to ANT EMISSIONS INFORMATION -	Construct/O	perate		D1
		EXPECTED ACTUAL EMISSIONS	ACILITY-W	IDE	- Allehan	ultor samo
		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS /	POTENTIA	LEMISSIONS	POTENT	AL EMISSIC
AIR POLLUTANT EMITTED		LIMITATIONS)	I OFFORE I	CONTROLS /	AFTER	CONTROL
PARTICULATE MATTER (PM)		tons/yr		ATIONS)		TATIONS)
PARTICULATE MATTER (PM)		See Emission Calculations in Appe	to	ins/yr		tons/yr
PARTICULATE MATTER < 10 MICRONS (PM	0)		naix B			
PARTICULATE MATTER < 2.5 MICRONS (PM	2.5)					
SULFUR DIOXIDE (SO2)						
NITROGEN OXIDES (NOx)						
CARBON MONOXIDE (CO)						
OLATILE ORGANIC COMPOUNDS (VOC)						
EAD						
THER						
HAZARDO	US AIR POLLU	ANT EMISSIONS INFORMATION				
		EXPECTED ACTUAL EMISSIONS	FACILITY-W	VIDE	Sillen and	STORE MELTING
		(AFTER CONTROLS /	POTENTIAL	EMISSIONS	POTENTIA	L EMISSIO
AZARDOUS AIR BOLL			(DEFORE C	ONTROLS /	(AFTER	CONTROLS
AZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	LIMITA		LIMIT	ATIONS)
		See Emission Calculations in Appen	ton	s/yr		ns/yr
		and an earchattons in Appen	dix B		_	
					_	
TOXIC AL	RPOLLUTANT	ENICEION CINESE				
CATE REQUESTED ACTUAL EMISSIONS A	FTER CONTROL	EMISSIONS INFORMATION - FACI	LITY-WIDE	THE MERICAN REP	50,8,5	
A A A A A A A A A A A A A A A A A A A		JUNITATIONS EMISSIONS ADOVES	The second second second	RMIT EMISSI	ONPATE	(TPER) IN
NCAC 2Q .0711 MAY REQUIRE AIR DISPER	SION MODELING	LISE NETTING FORM DO IS HEARING	HE TOXIC PL		VNINAIE	
REQUIRE AIR DISPER	RSION MODELING	B. USE NETTING FORM D2 IF NECESS	ARY.			a a
NCAC 2Q .0711 MAY REQUIRE AIR DISPER	RSION MODELING		ARY.	Modeling Req		
REQUIRE AIR DISPER	CAS NO.	lb/hr lb/day	ARY.			
A REQUIRE AIR DISPER	RSION MODELING		ARY.	Modeling Req	uired ?	
REQUIRE AIR DISPER	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
A REQUIRE AIR DISPER	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
REQUIRE AIR DISPER	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
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A REQUIRE AIR DISPER	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
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REQUIRE AIR DISPER	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
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KIC AIR POLLUTANT EMITTED	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
REQUIRE AIR DISPER	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
KIC AIR POLLUTANT EMITTED	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
KIC AIR POLLUTANT EMITTED	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	
KIC AIR POLLUTANT EMITTED	RSION MODELING	lb/hr lb/day	ARY.	Modeling Req	uired ?	

Attach Additional Sheets As Necessary

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FORM D4 EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

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

ACTIVITICO EVEN

	INSIGNIFICANT ACTIVITIE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICAN
1.	Green Wood Handling and Sizing Operations	N/A	ACTIVITY 15A NCAC 2Q .0503(8)-low emissions, see Appendix B
2.	Dried Wood Handling and Sizing Operations IES-DWHS	N/A	15A NCAC 2Q .0503(8) -negligible emissions, enclosed
3.	Emergency Generator Diesel Fuel Storage Tank TK-1	Up to 2,500 gallons	15A NCAC 2Q .0503(8)
4.	Firewater Pump Diesel Fuel Storage Tank TK-2	Up to 1,000 gallons	15A NCAC 2Q .0503(8)
	Green Wood Storage Piles IES-GWSP1 and IES-GWSP2	N/A	15A NCAC 2Q .0503(8) -low emissions, see Appendix B
	Debarker IES-DEBARK-1		15A NCAC 2Q .0503(8) -negligible emissions
	Green Wood Fuel Bin IES-GWFB	13.93 ODT/hr	15A NCAC 2Q .0503(8) -no quantifiable emissions
	Mobile Fuel Diesel Tank TK-3	Up to 2,500 gallons	15A NCAC 2Q .0503(8)

Attach Additional Sheets As Necessary

REVISED: 12/01/01

D4

	TECHNICAL ANALYSIS TO SUPP		
REVISED: 12/01/01	NUDENR/Division of Air Ougliby Application for A		
F DE	PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUP MONSTRATIONS MADE IN THIS APPLICATION. INCLUDE NECESSARY TO SUPPORT AND CLARIFY CALCULA FOLLOWING SPECIFIC ISSUES	PORT ALL EMISSION, CONTROL, AND REGULATORY A COMPREHENSIVE PROCESS FLOW DIAGRAM AS	D5
A SPECIFIC EMISS BALANCES, AND OF POTENTIAL I NEEDED TO SUI	SIONS SOURCE (EMISSION INFORMATION) (FORM B) - SHOW CA WOR OTHER METHODS FROM WHICH THE POLLUTANT EMISSIO BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEAR PPORT MATERIAL BALANCE CALCULATIONS	LCULATIONS USED, INCLUDING EMISSION FACTORS MATERI	AL LCULATION RENCES AS
B SPECIFIC EMISS INDIVIDUAL SOU REQUIREMENTS RATES OR OTHE SIGNIFICANT DE POLLUTANTS (N	HON SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V JRCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSIO 5) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICU 3: OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR TERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARD ESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDER IT ANY REQUIRED TO DOCUMENT COMPLIANCE WITH ANY REG	ONLY) - PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLI N OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING LARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION (DS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOU)	CABLE TO PROCESS DF
CONTROL DEVIC LISTED ON SECT PARAMETERS (e CRITICAL TO ENS	E ANALYSIS (FORM C) - PROVIDE A TECHNICAL EVALUATION W TION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALC .g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDA SURING PROPER PERFORMANCE OF THE CONTROL DEVICES). NTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PRO NEW MONITORING SYSTEMS AND MAINTENANCE TO DE DEDEOR	/ITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIEN ULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPE FIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICAT	ICIES ERATING
PROCESS AND O	PERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ON ATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. R RE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS TH TH THE ARRUCARI E RECULATIONS.	LY) - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN	
IA PROFESSIONA	ENGINEERING SEAL - PURSUANT TO 15A NCAC 2Q.0112 L ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQ ND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTION	"APPLICATION REQUIRING A PROFESSIONAL ENGINEERING S UIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION DNS FOR FURTHER APPLICABILITY).	EAL," FOR
l,	M. Dale Overcash	adjustion for	
package may nay and have judged person who know may include a find	g plans, calculations, and all other supporting documentation t oposed design has been prepared in accordance with the app re been developed by other professionals, inclusion of these n it to be consistent with the proposed design. Note: In accord ingly makes any false statement, representation, or certification e not to exceed \$10,000 as well as civil penalties up to \$25,000	d is accurate, complete and consistent with the information s o the best of my knowledge. I further attest that to the best o licable regulations. Although certain portions of this submitte naterials under my seal signifies that I have reviewed this ma ance with NC General Statutes 143-215 60, and 43-215 60,	of my al
NAME:	IE INK TO COMPLETE THE FOLLOWING)	PLACE NORTH CAROLINA SEAL HERE	
DATE:	M. Dale Overcash		
COMPANY:	Trinity Consultants of North Carolina P.C.		
ADDRESS:	One Copley Parkway, Suite 310 Morrisville, NC 27560		
TELEPHONE: SIGNATURE: PAGES CERTIFIED	(919) 462-9693	SEAL 12627	
	myon	12627	
(DENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT	MANNE	
	THAT IS BEING CERTIFIED BY THIS SEAL)		

Page 6 of 47

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FORM E1 **TITLE V GENERAL INFORMATION** REVISED: 12/01/01 Division of Air Quality - Application for Air Permit to Construct/Operate E1 IF YOUR FACILITY IS CLASSIFIED AS "MAJOR" FOR TITLE V YOU MUST COMPLETE THIS FORM AND ALL OTHER REQUIRED "E" FORMS (E2 THROUGH E5 AS APPLICABLE) Indicate here if your facility is subject to Title V by: X Emissions d Other If subject to Title V by other, check or specify: NESHAPS (MACT) **TITLE IV** Other, specify: If you are or will be subject to any maximum achievable control technology standards (MACT) issued pursuant to section 112(d) of the Clean Air Act, specify below: EMISSION SOURCE ID EMISSION SOURCE DESCRIPTION MACT MACT ES-EG, ES-FWP Emergency Generator and Firepump Subpart ZZZZ ES-DRYER Green Wood Direct-Fired Dryer System 40 CFR 63 Subpart B, [112(g)] List any additional regulation which are requested to be included in the shield and provide a detailed explanation as to why the shield should be granted: REGULATION EMISSION SOURCE (Include ID) EXPLANATION EMISSION SOURCE (Include ID) **EXPLANATION** 15A NCAC 2D .1111 All sources at site A pellet manufacturing facility has operations similar to a PCWP (Subpart DDDD) facility as defined by the rule, but a pellet manufacturing facility and it's operation are not included in this subpart. Comments: Attach Additional Sheets As Necessary

FORM E2 EMISSION SOURCE APPLICABLE REGULATION LISTING

VISED 12/01/01	Division of	Air Quality - Application for	or Air Permit to Co	onstruct/Operate	E2
EMISSION SOURCE ID NO.	EMISSION	OPERATING SCENARIO		APPLICABLE REGULATION and associated compliance require.	
See attached	table following Form E3 for a	summary of regulator	requirements	and associated compliance require	ments
· · · · · · · · · · · · · · · · · · ·					
1					

Attach Additional Sheets As Necessary

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REVISED 12/01/	EMISSION SC	DURCE COMPL	IANCE METH	OD	
A REAL PROPERTY AND A REAL	01 NCDENR/Division Of Air Qu ID NO. See attached table following Form	uality - Application for	Air Permit to Constr	uct/Operate	E3
E3 for a summ	ary of regulatory requirements and	Regulated Polluta			
associated co	mpliance requirements	regulated Foliula			
	-France reduitents				
Alternative Opera	ting Scenario (AOS) NO:	Applicable Regula	ition		
STREAM PROFESSION OF	ATTACH A SEPARATE PAGE	TO EXPAND ON AN	IY OF THE BELO	V COMMENTS	
	MON	NITORING REQUIRE	MENTS	the and all the property in the second	feeting es
Is Complia	nce Assurance Monitoring (CAM) 40 CFR Part 64 A				and a second second
If yes, is C	AM Plan Attached (if applicable, CAM plan must be	pplicable? Ye	- 0	No	
Describe N	Anitoring Device Type:	attached)? 👌 Ye	s 🤌	No	
Describe N	fonitoring Location:				_
Other Mon	itoring Methods (Describe In Detail):				
					-
-					
Describe t	he frequency and duration of monitoring and how the aken to produce an hourty average).	e data will be recorded (i	.e. every 15 minutes	1 minuto instanta a	
readings ta	aken to produce an hourty average):		in the start of the start and the	, I minute instantaneous	
					e
Participation of the second					
	RECOR	DKEEPING REQUIR	MENTS		1000-1000-010
Data (Parar	neter) being recording:				
Frequency of	of recordkeeping (How often is data recorded?):				
-					
-					
-					
	REPC	RTING REQUIREME	NTS		
Generally de	scribe what is being reported:		a contract of the second		SEPARATE.
Concruity Go	scribe what is being reported:				
10					
requency:	MONTHLY	QUARTERL	1.0.000		1
	OTHER (DESCRIBE):	QUARTERL	🕴 EVERY 6	MONTHS	
DURAN SAUSA					
ecify proposed		TESTING			
ecity proposed ret	erence test method:				
ecity reference tes ecity testing freque	at method rule and citation:				
NDT	Ency:				1
	E - Proposed test method subject to approv	al and possible char	nge during the tes	t protocol process	
		ional Shoota An I		-	
	Auden Additi	ional Shoote Ao I	Magazaam.		

FORM E3 EMICOUC

Attach Additional Sheets As Necessary

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File:Enviva Sampson Forms v12 Sheet:E3

		A DINIT IN A DINIT A MARCA	Аррисарие кедија Елујуа Ре	Community of Applicable Regulations and Compliance Demonstration Procedures Envive Pellets Sameson, 1.1.C	edures	
Emission Source Description and ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordition	
Wood-fired Dryer System (ES-DRYER)			Cyclones + WESP	PM critistions shall be controlled by a an ESP. To assure compliance, daily verification of power and rapper operations are functioning. Monthly visual inspection of the ductwork and material collection units. Every 24 months internal inspection of the	www.www.gov.gov.gov.gov.gov.gov.gov.gov.gov.gov	Reporting Any maintenance performed on the scrubbet within 30 days of a written request by DAQ. Scati-annual progress report and annual compliance certification
Coarse Hammermulls Acta RES-MAR Coarse Hammermills (REAL) through B Police Mail Pered Strin (Di No. E.SPMPS), Peller fürst Bin (ES-PPB), Finished Product Handling (ES-FPH)	PM/ PM10/PM2.5	15A NCAC 2D .0515	Fabric Filter	ann ann ann an ann ann ann ann ann ann	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation	Semi-annual progress report and annual compliance certification
Pellet Presses & Coolers (ES-CLR-1 through 6) Green Wood Hammermills (ES-OHM-1 & 2)			Cyclones	Inspections and maintenance, including monthly inspection of ductwork and amual internal inspection of cycloae	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation	Semi-annual progress report and annual compliance certification
Wood-fited Dryer System (ES-DRYER)	\$02	15A NCAC 2D .0516	WESP	None required by	None required because inherently low suffir content of mood fuel achieved to	
Linuscury Uniciation (ID No. ES-EU) and Fire Water Pump (ID No. ES-FWP)	S02	15A NCAC 2D .0516	N/A	None required	None required because inherently low suffir content of fuel achieves compile	cves tompusnee
Water Light Drive Assignment (Assignment) Annwennik Assignment (Assignment) Coanse Hammernulla (ES-HM-1 theorage) Peller Mill Freed Shi (D. No. ES-PMFS) Fuller Frees Bin (ES-FPE) Peller Presses & Conders (FEG, PE) Peller Presses & Conders (FEG, PE) and Peller Peller Presses & Conders (FEG, PE)	Opacity	15A NCAC 2D. 0521	Cwlones + WESP Fabric Filter	Monthly visible observation for "normal," If above monthly visible observation for "normal," If above normal, correct action or Method 9 observation required	Written or cleationic log of data/lime/result of catch Observation, results of each non-compliant observation and actions taken to correct, and results	s compliance Scini-entrual progress report and annual compliance certification
Green Wood Hammermills (ES-GHM-1 & 2)			Cyclones		of the corrective action	
Emergency Generator (ID No. ES-EG) Fire Water Pump (ID No. ES-FWP)	Opacity	15A NCAC 2D, 0521	V/N	Monthly visible observation for "normal." If above normal, correct action or Method 9 observation required	Written or electronic log of date/time/result of each observation, results of each non-compliant observation and actions taken to correct, and results of the corrective action	Semi-umual progress report and annual compliance certification
Emergency Generator (ID No. ES-EG) Fire Water Pump (ID No. ES-FWP)	PM. CO, NOX, NMHC, SO2	40 CFR Part 60 Subpart III	N/A	All requirements as outlined in the regulation, including the following: use certified envergency- engines, operate according to manufacturers procedures, use fatel oil with fate i.content of no more than 15 ppmw sulfur and cetture index of at least 40,	Mainhain records of crugine certification, fuel certifications and hours/year of operation of each engine	NIA
Emergency Generator (ID No. ES-EG) Fire Water Pump (ID No. ES-FWP)	HAPs	40 CFR Part 63 Subpart 2222	N/A	Comply with the NSPS requirements above and no other commencements.	Comply with the NSPS requirements above and no	
Wood-fired Dryer System (ES-DRYER)	P.M/ P.M.I.0/P.M.2.5 NOC VOC CO		Cyclones + W/ESP	fidde susanatha and	olher requiremonis apply	VM
Hammermill Area (ES-HMA)	PM/ PM10/PM2.5					
Coarse Hammermills (ES-HM-1 through 7)	PM/ PM10/PM2.5 VOC					
Pelict Mill Feed Silo (ID No. ES-PMFS)	PM/ PM10/PM2.5	PSD	Fabric Filter	8	See Proposed BACT Limit Table 4-2 of Application	
Pelici Fincs Bin (ES-PFB)	PM/ PM10/PM2.5					
Finished Product Handling (ES-FPH)	PM/ PM10/PM2,5					
Pollet Presses & Coolers (ES-CLR-1 through 6)	PM/ PM10/PM2.5					
Green Wood Hammermills (ES-GHM-1 & 2)	PM/ PM10/PM2.5 VOC		Cyclones			

Summary of Title V Applicable Regulations and Compliance Demonstration P

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File:Enviva Sampson Forms v12 Sheet:Regulatory Summary
		Ellipoiou	FORM E4	
Revi	sed 12/01/01	CMISSION	SOURCE COMPLIANCE SCHEDU	_E
		DENIGENAISION (or Air Quality - Application for Air Permit to Constru-	ct/Operate
,	COMPLIAN	CE STATUS	WITH RESPECT TO ALL APPLICABLE RE	Contract of Contra
	continue to comply with these re	ur facility be in equirements?	a compliance with all applicable requirements	s at the time of permit issuance and
	X Yes	No	If NO, complete A through F below for ea which compliance is not achieved	ach requirement for
n n	Will your facility be in compliance equirements on a timely basis?	e with all appli	icable requirements taking effect during the t	erm of the permit and meet such
	∧ res	No	Which compliance is not activut	ch requirement for
lf a	this application is for a modification pplicable requirements?	ation of existin	g emissions source(s), is each emission sou	rce currently in compliance with all
	A Yes	No	If NO, complete A through F below for each which compliance is not achieved	ch requirement for
A . E	mission Source Description (Inc	clude ID NO.)		
	dentify applicable requirement for			
_				
-				
_				
C. Na	arrative description of how comp	pliance will be	achieved with this applicable requirements:	
_				
_				
-				
. De <u>Ste</u>	tailed Schedule of Compliance: ap(s)			
				Date Expected
_				
_				
Fre	quency for submittal of progress	s reports (6 m	onth minimum):	
Sta	rting date of submittal of progres	ss reports:		
		Attach A	dditional Sheets As Necessary	

Attach Additional Sheets As Necessary

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	TITLE V COMPLIANCE CERTIFICATION (Required)	
Revised 01/01/07	NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate	E5
In accordance with	h the provisions of Title 15A NCAC 2Q .0520 and .0515(b)(4) the responsible company official o	of:
SITE NAME:	Enviva Pellets Sampson, LLC	
SITE ADDRESS:	5 Connector Road	
CITY, NC :	Faison, NC	
COUNTY:	Sampson	
PERMIT NUMBER :	Ν/Α	
CERTIFIES THAT(Check	the appropriate statement(s):	
X The facility is in	n compliance with all applicable requirements	
the proposed m	with the provisions of Title 15A NCAC 2Q .0515(b)(4) the responsible company official certififies that ninor modification meets the criteria for using the procedures set out in 2Q .0515 and requests that es be used to process the permit application.	
The facility is no If this box is checke	ot currently in compliance with all applicable requirements ed, you must also complete form E4 "Emission Source Compliance Schedule"	
The undersigned certifies information and belief for	under the penalty of law, that all information and statements provided in the application, base med after reasonable inquiry, are true, accurate, and complete.	∋d on
Signature of responsi	ble company official (REQUIRED, USE BLUE INK) Date: 8-22-14	
<u>Norb Hintz, Senior Vice F</u> Name, Title of respons	President and Chief Engineer sible company official (Type or print)	

FORM E5

Attach Additional Sheets As Necessary

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Source Specific Forms - Chipper

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FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Divisio	n of Air Quality	Application	for Air Permi	t to Construe	ct/Operate	,	В
EMISSION SOURCE DESCRIPTION:				SOURCE ID I		ES-CHP	
Chipper						N/A	
			CONTROL	DEVICE ID N	O(S):	IUA	
OPERATING SCENARIO 1 OF	1		EMISSION	POINT (STAC	CK) ID NO(S):	N/A	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCE	SS (ATTACH FL	OW DIAGRA	M)-		луны но <u>(</u> б).	100	
Green wood chips are screened and oversized chips w	ill undergo addit	ional chippin	ng as required	f.			
	0		.g do roquire				
TYPE OF EMISSION SOURCE (CHECH	K AND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON TH	E FOLLOWIN	G PAGESI-	
I WAA	dworking (Form B	4)	Manufa	t of chemica	lls/coatings/ink	s (Form B7)	
Int.combustion engine/generator (Form B2)	ng/finishing/printi	(Form B5)		tion (Form B8	no oodanganna.	a (i 0iii 07)	
Liquid storage tanks (Form B3)	ge silos/bins (For		Other (F		<i>''</i>		
	ION DATE:	TBD		JFACTURED			
MANUFACTURER / MODEL NO.: TBD	IOIT DATE.		OP. SCHEDU	JFACTURED		TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?)	NESH	AP (SUBPAR	UP. SCHEDU			DAY/WK 5	2 WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%) DECLEER	25% MAR-		JUN-AU		(SUBPART?):		
EXPECTED ANNUAL HOURS OF OPERATION 8.1	760 VISIBLE STA	CK EMISSIO	NS UNDED N	OPMAL OPF	SEP-NOV	04 00010	
CRITERIA AIR POLLU	TANTEMISS	TONS INF	ORMATION	IORMAL OPE	RATION: <	20 % OPAC	
	SOURCE OF	EXPECT	DACTUAL				
	EMISSION		ROLS / LIMITS)			L EMSSIONS	
AIR POLLUTANT EMITTED	FACTOR	Ib/hr	tons/yr		NTROLS / LIMITS)		ROLS / LIMITS)
PARTICULATE MATTER (PM)	See Emissio	n Calculation	ns in Appendi	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM.,)	out cimadio	l	is in Appendi				
PARTICULATE MATTER <2 5 MICRONS (PM)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOUS AIR POLL	TITANT EMIS	SIANS IN	CODUCATIO	NIFOR T	IN BAILBA		
	SOURCE OF	EXDECTE	DACTUAL	IN FOR IT	IIS SOURC	E容割相對種	的推动的印度的资源
	EMISSION					L EMSSIONS	
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR		ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
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TOXIC AIR POLLUTA	NT EMISSIO		I A TONIC	00 7000			
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INDICATE EXPECTS	ED ACTUAL EMI						
VA	EF SOURCE	Ib/	/hr	lb/	day	lb/	yr
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ttachments: (1) emissions calculations and supporting documentation							
	on: (2) indicate all re-	quested state a	nd federal enfer	and the second of the			

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

Attach Additional Sheets As Necessary



FORM B9 EMISSION SOURCE (OTHER)

EMISSION SOURCE DESCRIPTION:		n for Air Permit to Construct/Ope	rate B9
MISSION SOURCE DESCRIPTION: Rechipper		EMISSION SOURCE ID NO:	ES-CHP
		CONTROL DEVICE ID NO(S):	N/A
OPERATING SCENARIO: 1 OF	1	EMISSION POINT (STACK) ID N	0(5):
DESCRIBE IN DETAIL THE PROCESS (ATTACH	FLOW DIAGRAM):		O(S): N/A
Green wood chips are screened and ov		al chipping as required.	
MATERIALS ENTERING PROCESS -	CONTINUOUS PROCESS	MAX. DESIGN	1
TYPE	UNITS	CAPACITY (UNIT/HR)	REQUESTED CAPACITY
Green Wood	ODT	71.71	LIMITATION(UNIT/HR)
MATERIALS ENTERING PROCESS TYPE	SATCH OPERATION	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
AXIMUM DESIGN (BATCHES / HOUR):			
EQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR		
AV CADAOTTICIOUTIC	TOTAL MAXIM	UM FIRING RATE (MILLION BTU/	IR): N/A
OMMENTS:	REQUESTED	CAPACITY ANNUAL FUEL USE:	N/A

Attach Additional Sheets as Necessary

Trinity Consultants

Source Specific Forms - Green Wood Hammermills

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FORM B SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 1201/01 REVISED 1201/01 REVIS	REVISED 12/01/01 NCDENR/Div	ision of Air Quality	- Application	for Air Permi	it to Construe		OURCES	в
Orean Wood Hammermills CONTROL DEVICE ID NO(S): CD-GHM.BV(, 2 OPERATING SCENARIO OF 1 EMISSION POINT (STACK) ID NO(S): EP-17 & EP-18 DESCRIBE IN DEFAILTHE EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):	EMISSION SOURCE DESCRIPTION:			EMISSION	SOURCE ID	NO	ES CLIM 4	_
OPERATING SCENARIO 0F 1 Devide Device Note (0,0) DESCRIBE IN DETAILTHE EMISSION SOURCE FROCESS (ATTACH FLOW DIAGRAM); EMISSION POINT (STACK) ID NO[S): EP-47 & EP-18 Orgen wood chips are screened and oversized chips will undergo additional chipping as required. TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES); Imanufact. of chemicate/ocaling/inis/ (Form B1) Incombustion engine/generator (Form B1) Woodworking (Form B3) Incineration (Form B3) Incineration (Form B3) Induction engine/generator (Form B2) Coaling/finishing/piniting (Form B3) Incineration (Form B3) TBD StrAR SOURCE SUBJECT TO? NSPS (SUBPART?): NSTART CONSTRUCTION DATE: TBD DEVPECTED OP: SCHEDOP:	Green Wood Hammermills							
DESCRIBE IN DETALTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM): Centrol (Stack) ID NU(S): EP-17 & EP-18 Green wood chips are screened and oversized chips will undergo additional chipping as required. Manufact. of chemical/coatings/mks (Form B7) Calumod (Jags, other burner (Form B1) Woodworking (Form B4) Manufact. of chemical/coatings/mks (Form B7) Into combustion engine/generator (Form B3) Coating/fining/printing (Form B4) Other (Form B9) Start CONSTRUCTION DATE: TBD DATE MANUFACTURED: TBD MANUFACTURER / MODEL NO: TBD EXPECTED OP, SCHEDULE: 24 MP/OAY: DATE MANUFACTURED: TBD STMS CONSTRUCTION DATE: TBD DATE MANUFACTURED: TBD DATE MANUFACTURED: DATE MANUFACTURED: DATE MANUFACTURED: TBD STMS CONSTRUCTION DATE: TBD DATE MANUFACTURED: TBD DATE MANUFACTURED: DATE MANUFACTURED: TBD STMS CONSTRUCTION DATE: TBD DATE MANUFACTURED: TBD DATE MANUFACTURED: TBD STMS CONSTRUCTION DATE: TBD DATE MANUFACTURED: TBD DATE MANUFACTURED: TBD STMS CONSTRUCTION DATE: TBD NESHAP (SUBMART): MACT (SUBPART): MACT (SUBPART): MACT (SUBPART): <t< td=""><td></td><td></td><td></td><td>CONTROL</td><td>DEVICE ID N</td><td>O(S):</td><td>OD-OTIM-DY</td><td>1, 2</td></t<>				CONTROL	DEVICE ID N	O(S):	OD-OTIM-DY	1, 2
Crean wood chips are screened and oversized chips will undergo additional chipping as required. TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM 81-B9 ON THE FOLLOWING PAGES): Coal,wood, oli, gas, other burner (Form 81) Woodworking (Form 84) Incineration (Form 86) Coal,wood, oli, gas, other burner (Form 81) Woodworking (Form 85) Incineration (Form 88) START CONSTRUCTION DATE: TDD [OPERATION B3/]] START CONSTRUCTION OATE: TDD [OPERATION B4] STUBS SOURCE SUBJECT TO? NSPS (SUBPART?): MACT (SUBPART?): MA	OPERATING SCENARIOOF	1		EMISSION	POINT (STAC	K) ID NO(S)	EP-17 & EP.	18
TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES): Coal,wood,oil, gas, other burner (Form B1) Woodworking (Form B4) Manufact. of chamicals/coatings/inks (Form B7) Incombustion engine/generator (Form B2) Coating/inishing/printing (Form B3) Incompating (Form B3) Theoremating (Form B3) START CONSTRUCTION DATE: TBD OPERATION DATE: TBD DEPECTED DP, SCHEDULE: TBD START CONSTRUCTION DATE: TBD OPERATION DATE: TBD DATE MANUFACTURED: TBD START CONSTRUCTION DATE: TBD DEPECTED DP, SCHEDULE: ALR MARAY 25% JUN-AUG 25% START CONSTRUCTION DATE: TBD DEPECTED DP, SCHEDULE: ALR MARAY 25% JUN-AUG 25% START CONSTRUCTION DATE: TBD DEPECTED ANNUAL HOUGHPUT (%): DEC-FEB 25% MARAY 25% JUN-AUG 25% CARDAN MARAY 25% JUN-AUG 25% CARDAN MARAY 25% JUN-AUG 25% CARDAN CARDAN <td>DESCRIBE IN DETAILTHE EMISSION SOURCE PRO</td> <td>DCESS (ATTACH FL</td> <td>OW DIAGRA</td> <td>MIX.</td> <td></td> <td>y 10 110(0).</td> <td>er - m er er -</td> <td></td>	DESCRIBE IN DETAILTHE EMISSION SOURCE PRO	DCESS (ATTACH FL	OW DIAGRA	MIX.		y 10 110(0).	er - m er er -	
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Int.combustion and Dollar Grow 120 □ Coating/finishing/fonishing/finishing/finishing/fini	TPE OF EMISSION SOURCE (CH	ECK AND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON TI	E FOLLOWIN	G PAGES):	
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□LIDIQUI storage sinsk/ins (Form B6) □Dther (Form B9) START CONSTRUCTION DATE: TBD DPERATION DATE: TBD DATE: TBD DATE: TBD DATWIK_S2 MANUFACTURED: TBD STHIS SOURCE SUBJECT TOY NSPS (SUBPART): NESHAR (SUBPART): MARUFACTURER / MODEL NO: SEP-ADV 25% SEP-NOV 25% EXPECTED ANNUAL THROUGHPUT (%): DEC-FEB 25% MARAWAY 25% SUP-NOV 25% OPACITY CRITERIA AIR POLLUTANT EMISSIONS INFORMAL OPERATION: 22 % OPACITY CRITERIA AIR POLLUTANT EMISSIONS POTENTIAL EMISSIONS PARTICULATE MATTER (PM) See Emission Calculations in Appendix B POTENTIAL EMISSIONS POTENTIAL EMISSIONS PARTICULATE MATTER (PM) See Emission Calculations in Appendix B Ibhr tons/yr Ibhr tons/yr SULFUR DIOXIDE (SO2) SULFUR DIOXIDE (SO2) SULFUR DIOXIDE (SO2) SULFUR OXIDES (NOX) SULFUR DIOXIDE (SO2) SULFUR DIOXID		oating/finishing/printi	ng (Form B5)	[] Incinera	tion (Form Ba	1)	,	
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TOXIC AIR POLLUTANT AND CAS NO. EF SOURCE Ib/hr Ib/day Ib/yr V/A I IIII A IIIII AIR IIIIII AIR IIIIII AIR IIIIII AIR IIIII AIR IIIII AIR IIIII AIR IIIII AIR IIIIII AIR IIIII AIR IIIII AIR IIIIII AIR IIIII AIR IIIIII AIR IIIIII AIR IIIII AIR IIIIII AIR IIIII AIR IIIIII AIR IIIIIII AIR IIIIII AIR IIIIIII AIR IIIIIII AIR IIIIIII AIR IIIIIII AIR IIIIIII AIR IIIIII AIR IIIIII AIR IIIIIIII	TOXIC AIR POLL	TANT EMISSIC	NS INFOR	MATION	OP THIS	MIDOF		ALC: NO.
VAC AIR POLLUTANT AND CAS NO. EF SOURCE b/hr b/day b/yr		CTED ACTUAL FMI	SSIONS AFT	-R CONTROL	STITIS S	OUNCE	民國制度加強電視	·····································
Idea Idea Idea	OXIC AIR POLLUTANT AND CAS NO.	FF SOUPCE						
	I/A	LI OUNCE	10/	nr	ID/	day	b/	r
			_					
Mochemania, (4) and indicate a second s								
Hookmanin (4)								
Lacintens: (1) emissions calculations and supporting documentation; (2) indicate all exercises in the second support of the second support	ttachments: (1) emissions calculations and supporting document	atation: (2) indicate c*						

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

FORM B9 EMISSION SOURCE (OTHER)

REVISED: 12/01/01 NCDENR/Division of Air Q	Quality - Applicatio	n for Air Permit to Construct/Oper	rate	B9	
MISSION SOURCE DESCRIPTION: Green Wood Hamn	nermills	EMISSION SOURCE ID NO:			
		CONTROL DEVICE ID NO(S):	CD-GHM-BV1, 2		
PERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID NO	D(S): EP-17	& EP-18	
ESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM) Green wood chips are screened and oversized chips will	: I undergo addition	al chipping as required.			
MATERIALS ENTERING PROCESS - CONTINUOUS PR	OCESS	MAX, DESIGN			
TYPE	UNITS	CAPACITY (UNIT/HR)		D CAPACITY	
Green Wood	ODT	71.71	LIMITATIO	N(UNIT/HR)	
MATERIALS ENTERING PROCESS - BATCH OPERA TYPE	UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTE LIMITATION (D CAPACITY UNIT/BATCH)	
XIMUM DESIGN (BATCHES / HOUR):					
QUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YF	2).			
EL USED: N/A			a 1995	_	
X. CAPACITY HOURLY FUEL USE: N/A	REQUESTED	AUM FIRING RATE (MILLION BTU/ CAPACITY ANNUAL FUEL USE:	HR): N/A N/A		
DMMENTS:					
Attach Adc	litional Sheet	s as Necessary			

Trinity Consultants

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REVISED 12/01/01 NCDENR/Division	NOL DEVICE (FABRIC of Air Quality - Application for A	FILTER)	netruct/Ococreto		-
CONTROL DEVICE ID NO: CD-GHM-BV1. 2 CONT	TROLS EMISSIONS FROM WHICH		ist accoperate		
	TION IN SERIES OF CONTROLS	EMISSION SO		ES-GHM-1, 2	
MANUFACTURER: TBD1		BD	NC	. 1 OF	1 UNITS
DATE MANUFACTURED: TBD	PROPOSED OPER		TBD		
OPERATING SCENARIO:	PROPOSED STAR			TBD	
OF1	P.E. SEAL REQUIR				# NO
DESCRIBE CONTROL SYSTEM:				100	
A bin vent filter is used to create a slight negative pressure on each g from the air volume present in the hammermili. The bin vent is sized feed to the hammermili.	preen hammermill. The bin vent on to offset the air displacement cre	collects dust sated by the ma	terial		
POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5		
BEFORE CONTROL EMISSION RATE (LB/HR):				-	_
CAPTURE EFFICIENCY:					_
CONTROL DEVICE EFFICIENCY:	%		%	_%	_%
	<u>~99.9</u> %	~99.9	% _~99.9	%	%
CORRESPONDING OVERALL EFFICIENCY:	%		%	%	_%
EFFICIENCY DETERMINATION CODE:					_
TOTAL EMISSION RATE (LB/HR):	See o	calculations	in Appendix B		
PRESSURE DROP (IN, H ₂ 0): MIN: MAX: 4"	GAUGE? (YES) &	NO WA	RNING ALARM?	(YES)	 NO
BULK PARTICLE DENSITY (LB/FT ³): 1.43E-06	INLET TEMPERATU		Amblent		
	GR/ED OUTLET TEMPERA	TURE (°F);	Ambient		
INLET AIR FLOW RATE (ACFM):	FILTER MAX OPER	ATING TEMP. (
NO. OF COMPARTMENTS: 1 NO. OF BAGS PER CO	MPARTMENT: 1		LENGTH OF BAG	(IN.): 120	
	DUCED/NEG. FORCED/P	os)	FILTER SURFACE		377
AIR TO CLOTH RATIO: 6 FILTER MATERIAL:			# WOVEN		
DESCRIBE CLEANING PROCEDURES:			PART	ICLE SIZE DISTR	
d AIR PULSE d SO			SIZE	WEIGHT %	CUMULATIVE
	IPLE BAG COLLAPSE		(MICRONS)	OF TOTAL	%
∲ MECHANICAL/SHAKER ∲ RI ∲ OTHER	ING BAG COLLAPSE		0-1	Un	known
			1-10		
DESCRIBE INCOMING AIR STREAM:			10-25		
The air stream will contain wood dust particulate emissi	ons	1	25-50		
			50-100		
			>100		
METHOD FOR DETERMINING WHEN TO CLEAN:				TOT	AL = 100
¿ AUTOMATIC JIMED & MANUAL					
METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:					
	IBLE EMISSION	FØ			
SPECIAL CONDITIONS: None					
ℰ MOISTURE BLINDING ℰ CHEMICAL RESISTIVITY EXPLAIN:	& OTHER				
DESCRIBE MAINTENANCE PROCEDURES: Per manufacturer recomm	iendations				
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATION	ONSHIP OF THE CONTROL DEVIC	CE TO ITS EMIS	SION SOURCE(S)		

Attach Additional Sheets As Necessary ¹Final equipment selection has not yet occurred but will be similar in design to specifications shown.

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Source Specific Forms - Bark Hog

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FORM B SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Division o	f Air Quality -	Application	for Air Permi	to Construct	Operate	,	В
EMISSION SOURCE DESCRIPTION:				SOURCE ID N		ES-BARKHO	
Barkhog						N/A	
			CONTROLI	DEVICE ID NO)(S):		
OPERATING SCENARIO 1 OF	1		EMISSION F	POINT (STACI	() ID NO(S)	N/A	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	(ATTACH FL	OW DIAGRA	MD-		910110107.		
Green wood bark fuel is sent to the bark hog to break up b	ark into smal	ler pieces pr	ior to the dry	R r .			
TYPE OF EMISSION SOURCE (CHECK A	ND COMPLET	E APPROPR	IATE FORM	B1-B9 ON TH	E FOLLOWIN	G PAGES):	
Ucal,wood,oil, gas, other burner (Form B1) Woodwo	rking (Form B	4)		t. of chemical			
Int.combustion engine/generator (Form B2)	finishing/printir	ig (Form B5)		tion (Form B8)			
	silos/bins (For		Other (F	(
START CONSTRUCTION DATE: TBD OPERATION		TBD		JFACTURED:		TBD	
MANUFACTURER / MODEL NO.: TBD			OP SCHEDU	LE: 24 HF	VDAY 7		2 WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESH	AP (SUBPAR	T71		SUBPART?):	DATIVAN 3	ZVVNTR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-EEB 2		MAY 25%	JUN-AUC		SEP-NOV	25%	
EXPECTED ANNUAL HOURS OF OPERATION 8,760	VISIBI E STA	CK EMISSIO	NS LINDER N	OPMAL OPE	DATION:	0 0/ ODA(VTV
CRITERIA AIR POLLUTA	NTEMISS	IONS INFO	ORMATION	FOR THIS	SOURCE	Contraction of the second	CONTRACTOR DE LA CONTRACTA DE
	SOURCE OF	EXPECTE	DACTUAL			L EMSSIONS	
	EMISSION		ROLS / LIMITS)	(REFORE COM	TROLS / LIMITS)	1	0010 (110/070)
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/vr	lb/hr	tons/yr	Ib/hr	TROLS / LIMITS)
PARTICULATE MATTER (PM)	See Emissio		s in Appendi	x B	torisiyi	PD/111	tonsry
PARTICULATE MATTER<10 MICRONS (PM10)			I	1			
PARTICULATE MATTER < 2.5 MICRONS (PM2.5)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER			12.2				
HAZARDOUS AIR POLLU	TANT EMIS	SIONS IN	ORMATIC	ON FOR TH	IS SOURC	E	Start Conte
	SOURCE OF	EXPECTE	DACTUAL	1	POTENTIA	L EMSSIONS	
	EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CONT	ROLS / LIMITS)	AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
N/A							
TOXIC AIR POLLUTAN	TEMISSIO	NS INFOR	MATION F	OR THIS S	OURCE		(1994)。在1996年5月
INDICATE EXPECTED	ACTUAL EMI	SSIONS AFT	ER CONTROL	S/LIMITATIC	DNS		
N/A	EF SOURCE	Ib.	ĥr	lb/d	lay	lb	/yr
Attachments: (1) emissions calculations and supporting documentation: ((2) indicate off		10.1.1.0				

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

Attach Additional Sheets As Necessary

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FORM B9

		for Air Permit to Construct/Opera EMISSION SOURCE ID NO:	ES-BARKHOG		
		CONTROL DEVICE ID NO(S):	N/A		
PERATING SCENARIO: 1 OF 1					
ESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM)		EMISSION POINT (STACK) ID NO	(S): N/A		
Green wood bark fuel is sent to the bark hog to break up	bark into smaller p	ieces prior to the dryer.			
MATERIALS ENTERING PROCESS - CONTINUOUS PR					
TYPE		MAX. DESIGN	REQUESTED CAPACITY		
Green Wood	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)		
orean wood	ODT	8.02			
MATERIALS ENTERING PROCESS - BATCH OPERA TYPE	TION	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY		
XIMUM DESIGN (BATCHES / HOUR):					
QUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR)				
EL USED: N/A		IM FIRING RATE (MILLION BTU/H	R): N/A		
X. CAPACITY HOURLY FUEL USE: N/A	REQUESTED C	APACITY ANNUAL FUEL USE:	N/A N/A		

Attach Additional Sheets as Necessary

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Source Specific Forms - Dryer Source

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FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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REVISED 12/01/01 NCDENR/Divis	ion of Air Quali	v - Applicatio	n for Air Ro	mit to Count	UNALL	SUURCES	-
EMISSION SOURCE DESCRIPTION:			EMISSION	mit to Consti	uct/Operate		В
Green Wood Direct-Fired Dryer System			CONTROL	SOURCE ID	NO:	ES-DRYER	
OPERATING SCENARIO 1 OF	1		ENISSION	DEVICE ID N	O(S):	CD-DC, CD-W	ES
DESCRIBE IN DETAIL THE EMISSION SOURCE PROCE Green wood is conveyed to either a steam deserved	ESS (ATTACH F	OW DIAGRA	EMISSION	POINT (STAC	K) ID NO(S):		EP-1
Green wood is conveyed to either a rotary dryer syste emissions are controlled by cyclones for bulk particul	m. Direct cont:	act heat is no	uvij. Isticional de die s				
emissions are controlled by cyclones for bulk particul (WESP) operating after the cyclones.	ate removal an	d additional a	vided to the	system via a	205 mmBtu/	1r burner systen	n. Air
(WESP) operating after the cyclones.		u additional p	articulate is	removed util	tizing a wet e	lectrostatic pre-	cipitator
TYPE OF EMISSION SOUTHER (SUS							
TYPE OF EMISSION SOURCE (CHE	CK AND COMPL	ETE APPRO	RIATE FOR	M B1-B9 ON	THE FOLLOW	INC DAOLON	
						ING PAGES):	
	ing/finishing/print	ting (Form B5)		ation (Form Ba	na coataiga/im	(FOITT B7)	
	ige slios/bins (Fo	Prm B6)	Other (Form BO	'		
VION CONSTRUCTION TATE: TBO COPERAT	ION DATE:	TBD	DATE MAN	UFACTURED			
TROUGH AGI UKER / MUDDEL NO -		EXPECTED	OR SCUED			TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NES	HAP (SUBPAR	OF. SCHEDI	JLE: 24 H	R/DAY 7	DAY/WK 52	WK/YR
FERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	25% MAR	-MAY 25%	IT INLAT	0 0000	(SUBPART?)		
EXPECTED ANNUAL HOURS OF OPERATION 87	RO DUCIDI E OT	A CALL MAN ALL AND ALL AND			SEP-NO	V 25%	
CRITERIA AIR POLL	UTANT EMIS	SIONS INF	ORMAN	NORMAL OPE	RATION: <	20 % OPACIT	Ϋ́
	SOURCE OF	EXPECT	DACTUAL	N FOR TH	S SOURCE		STOP FAIL OF STOP
	EMISSION			water and	POTENT	IAL EMSSIONS	
AIR POLLUTANT EMITTED	FACTOR	Ib/hr	ROLS / LIMITS)		TROLS / LIMITS)	AFTER CONTR	ROLS / LIMITS)
PARTICULATE MATTER (PM)	See Emissic	on Calculation	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM10)	out chilasic	T	is in Append	lix B			1
PARTICULATE MATTER 2 5 MICPONE (DAL)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
EAD							
DTHER							
HAZARDOUS AIR POL	LUTANTEM	ISSIGNS IN	CODINAT	OIV FOR MIN			
HAZARDOUS AIR POL	SOURCE OF	EXPLOT	FORMAII	UN FOR TI	IIS SOURC	E	State States
	EMISSION	LAFEVIEL	AGIUAL		POTENTI	AL EMSSIONS	
IAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	(AFTER CONTR		(BEFORE CONT	ROLS / LIMITS)	(AFTER CONTRO	OLS/LIMITS)
	See Emission	D/nr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	COC Lititaalo	I Calculation:	in Appendi	xB			
	1						
	1 1						
TOXIC AIR POLLUT	ANT EMISSI	ONS INCOL	A TION				
TOXIC AIR POLLUT INDICATE EXPECT DXIC AIR POLLUTANT AND CAS NO.	ED ACTUAL EN		MATION	OR THIS S	OURCE	No. of the other states of the	
DXIC AIR POLLUTANT AND CAS NO.	EF SOURCE		LIL CONTRO	CST LIMITATI	ONS		the second s
	See Emission	lb/h	r I	lb/d	ay	lb/yr	r.
	See Emission	valculations	in Appendix	8			
	1						
	++			_			
	+						
	++	_					
achments: (1) emissions calculations and supporting documentation	(0) :						
scribe bow these and a supporting documentation	n; (2) indicate all re	cuested state a	ad fadocal ante	an able to the			

cribe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source. COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE BI THROUGH B9 FORM FOR EACH SOURCE Attach Additional Sheets As Necessary

EMIC		F	ORM B	1			
REVISED 12/01/01	SION SOURCE (W	OOD, COA	L, OIL, GA	S, OTHER FI	JEL-FIR	ED BURNER)	
EMISSION SOURCE DESCRIPT	NODEIN/DIVISIO	n of Air Quality	- Application for	Air Permit to Con	struct/Oper	ate	B1
Green Wood Direct-Fired Dryer	Svetom		1	EMISSION SOURC	E ID NO:	ES-DRYER	
OPERATING SCENARIO:	1 OF	1		CONTROL DEVICE	ID NO(S):	CD-DC, CD-WESP	
	CESS HEAT			EMISSION POINT (EP-1
	TINUOUS USE	SPACE HEAT	-		ICAL GENE		
HEATING MECHANISM:	INDIRECT	STAND BY/E		OTHER	(DESCRIBE):	
MAX. FIRING RATE (MMBTU/HC	Ad Anna A		DIRECT				
	250 250	THE R OF THE R.	CIDED DU				
WOOD TYPE: BAR	Contraction of the second of t			INER			Y
PERCENT MOISTURE OF FUEL	20 to 50%	WET WO	DOD	DRY WOOD	đ	OTHER (DESCRIBE)	
FUEL FEED METHOD:	CONTROLL	ED WITH FLYAS		N <	CONT	ROLLED W/O REINJE	CTIOND
		HEAT TRAN	SFER MEDIA:	STEAM		DTHER	
METHOD OF TUBE CLEANING:	N/A						
DARE OF DOM ST			FIRED BUR	NER MARKEN		Non Production	State Real States
TYPE OF BOILER PULVERIZED OVERFEED ST	IF OTHER DESCI						
CTLINE COULT			SPRE	ADER STOKER		FLUIDIZED BED	
			UNCONTR		ø	CIRCULATING	
DRY BED CONTROLL	ED 🔮 CONTROLLI	ED	d El Vagua Benna			RECIRCULATING	
METHOD OF LOADING:				H REINJECTION			
METHOD OF LOADING:	CYCLONE HANDI	IRED		NG GRATE	OTHER (DE	SCRIBE):	
METHOD OF TOBE CLEANING:	SECONDEPENDING SECONDER 12		CLEANING SC	HEDULE			
TYPE OF BOILER:			FIRED BUR			出た。()目的のなどの)日本	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
TYPE OF FIRING:				RESIDENTIAL			
METHOD OF TUBE CLEANING:			N BURNERS		URNER		
		OTHED FU	CLEANING SCI	HEDULE:			
TYPE OF FUEL:	and the second second second second second second	UTHERFU	EL-FIRED BU	JRNER	1.19 - 203	の一個があるの	
TYPE OF BOILER:		ENT MOISTURE		RESIDENTIAL			
TYPE OF FIRING:	TYPE OF CO			REGIDENTIAL			
METHOD OF TUBE CLEANING:		NTROL (IF ANY)				FUEL FEED METHOD:	
A. 你的话,你们就是这些一个问题。"	FUEL US		CLEANING SCH	BACKUP FUEL			
			MAXIMUM DE		5)	这里,当些高校委员会	行的成功和他的的
FUEL TYPE	UNITS		CAPACITY (UN			REQUESTED CAP	
Bark/Wet Wood	tons					LIMITATION (UNI	T/HR)
				29.8			
出った。 出来にいた。 上国 古い名 音	FUEL CHARACTER	RISTICS (COI		11 1 1 1	LICADU	A CONTRACTOR OF A LAND	
		SP	ECIFIC	SULFUR CO	ATTENT		
FUEL TYP	E		CONTENT	(% BY WE		ASH CONT	
Bark/Wet Wood			200 BTU/Ib			(% BY WE!	GHT)
				0.0			
AMPLING PORTS, COMPLIANT V	/ITH EPA METHOD 1 WILL	BE INSTALLED	ON THE STACK	S: YES	De N		
COMMENTS:				ALIE0	20 N	0	

Attach Additional Sheets As Necessary

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			FO	RM C4					
CON REVISED 12/01/01	TROL DEVICE	(CYCLON	E, MUI	Dication for Ai	NE, OR OT			NICAL)	_
CONTROL DEVICE ID NO:	CD-DC	CONTROLS	EMISSIO	NS FROM WHICH	Fernine to Com	struct/Op	erate		C
EMISSION POINT (STACK) IE	D NO(S): EP-1	POSITION IN	SERIES	OF CONTROLS	1 EMISSION SO	JRCE ID	NO(S): OF 2	ES-DRYER	
MANUFACTURER: TBD ¹			MODEL		NO.	1	OF Z	UNITS	_
DATE MANUFACTUREITED			-	SED OPERATION					
OPERAT	TING SCENARIO:	a where the second	PROPOS	SED START CON	STRUCTION DA	TE	TBD		-
1	OF 1			L REQUIRED (PI			e YES	¢ NO	
DESCRIBE CONTROL SYSTE Four identical simple cyclom Emissions from each the cyc The parameters presented he	es are equipped to the	discharge of t ito a common ie:	be reteri	d		l emissio			
POLLUTANT(S) COLLECTED			PM	PM10	PM _{2.}				
BEFORE CONTROL EMISSIO	N RATE (LB/HR):					5			
CAPTURE EFFICIENCY:			98.5	5 % 98.	5 % 98	.5 %		— %	
CONTROL DEVICE EFFICIEN				%	%	%			
CORRESPONDING OVERALL				%	%	_ % _		%	
OTAL EMISSION RATE (LB/									
RESSURE DROP (IN. H20):		5.0" W/	ARNING A	LARM? YES	1 NO				
NLET TEMPERATURE (°F):	MIN MAX	Nominal 400		OUTLET TEMPE	RATURE (°F):	MIN	MAX	Nominal 400	
NLET AIR FLOW RATE (ACFN	A): 117,000			BULK PARTICLE		-T ³):	3.43E-05		
OLLUTANT LOADING RATE									
the second s		111	XCLONE			新一個的的時	New State MI	JLTICYCLONE	1
ENGTH (INCHES): VIDTH (INCHES):	INLET VELOCITY (F		95	CIRCULAR	RECTANGLE	NO. TI	the second se		
EIGHT (INCHES):	DIMENSIONS (INC		uctions		AY UTILIZED	DIAME	TER OF TI	UBES:	
ELOCITY (FT/SEC.):	H: W:	Dd:		LIQUID USED:		HOPPI	ER ASPIRA	TION SYSTEM?	
O. TRAYS:	De: 79"		156"	FLOW RATE (GI		ê Y	ES	NO NO	
O. BAFFLES:		Lc:	312"	MAKE UP RATE	(GPM):	LOUVE	ERS?		
	TYPE OF CYCLONE:		~			1 8 Y	d YES d NO		
ESCRIBE MAINTENANCE PR	OCEDURES	ONVENTI	ONAD	HIGH IGH	EFFICIENCY		THER		
eriodic inspection of m		v during pla	unt ou to					STRIBUTION	STOR
s specified by manufac	turer	y during pie	int outa	ges	SIZE (MICRONS)		GHT % OTAL	CUMULATIVE %	
ESCRIBE INCOMING AIR STR	REAM:								
he flue gas from the dry	yer will be split an	d distribute	d throw	ab a set of	0-1			Unknown	
iree cyclones before er	itering the WESP.	After the cy	velonae	the gas	10-25				
ream will be combined	into a single duct	and directe	d to the	WESD intot	25-50				
pint.	•			WEOF IMet	50-100				_
					>100				
SCRIBE ANY MONITORING	DEVICES, GAUGES, TE	ST PORTS, E	TC:				10	OTAL = 100	
SCRIBE ANY MONITORING	DEVICES, GAUGES, TE	ST PORTS, E	TC:				T	OTAL = 100	
ONE									

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

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FORM C2 CONTROL DEVICE (Electrostatic Precipitator)

REVISED 12/01/01	NCDENR/I	Vivision of Air Quality - App	lication for Air Permit to Construct/Operation	ate	C2
CONTROL DEVICE ID NO	CD-WESP		CONTROLS EMISSIONS FROM WHICH		ES-DRYER
EMISSION POINT (STACK	() ID NO(S): EP-1		POSITION IN SERIES OF CONTROLS:	NO. 2 OF 2	UNITS
MANUFACTURER:	SonicKleen			WESP-304L-567-12H19	
MANUFACTURE DATE:	тво		PROPOSED OPERATION DATE:	TBD	
	OPERATING SCENARK); 直接地址,她相关学师	PROPOSED START CONSTRUCTION D	DATE: TBD	
	OF		P.E. SEAL REQUIRED (PER 2Q .0112)?	(4 YES)4 N	10
and the second	CUIPMENT SPECIFICATI	ONS SAME SAME	GAS DISTRIBUTION GRIDS:	ES ANO	
TYPE:		DRY C		TWO-STAGE	
TOTAL COLLECTION PLA		29,904		TOR PLATE PER FIELD:	567 tubes
COLLECTOR PLATES SIZ	E (FT): LENGTH:	WIDTH:	SPACING BETWEEN COLLECTOR PLA	TES (INCHES):	2" hextube
TOTAL DISCHARGE ELEC	CTRODE LENGTH(FT):	19"-0"		2.054E-04 Poise	IZ HEALOUS
NUMBER OF DISCHARGE	ELECTRODES:	567	NUMBER OF COLLECTING ELECTROD		one
MAXIMUM INLET AIR FLO		117,000	PARTICLE MIGRATION VELOCITY (FT/S		.234
MINIMUM GAS TREATME	NT TIME (SEC):	2.3	BULK PARTICLE DENSITY (LB/FT3):	45 lb/cu. ft.	1.4. JP4
FIELD STRENGTH (VOLTS		COLLECTING: N/A	CORONA POWER (WATTS/1000 CFM):		000
ELECTRICAL USAGE (kw/	HOUR): 141.5			4	000
CLEANING PROCEDURES	S: 🛃 RAPPING	PLATE VIBRATING	WASHING OTHER		
OPERATING PARAM	PRESSURE	DROP (IN. H20): MIN	2" MAX 2" WARNING ALAR	M? d YES d I	
RESISTIVITY OF POLLUT	ANT (OHM-CM):	N/A	GAS CONDITIONING: & YES NO		
INLET GAS TEMPERATUR	RE ("F): 240 °F nominal			180 °F nominal	
VOLUME OF GAS HANDL	ED (ACFM):	117,000	The second s	MIN 40% MAX 50%	
POWER REQUIREN	IENTS			YES & NO	
FIELD NO.	NO. OF SETS	CHARGING	EACH TRANSFORMER (kVA)	EACH RECTIFIER Ky Av	Post Ma De
1	1		118	83 / 1265	or oak ma DC
2	1		118	83 / 1265	
				63/1200	
				63 / 1200	
				63 / 1200	
POLLUTANT(S) COLLECT	ED:	PM / PM to / PM to		63 / 1200	
		PM / PM ₁₀ / PM _{2.6} 150.00		63/1205	
POLLUTANT(S) COLLECT BEFORE CONTROL EMIS: CAPTURE EFFICIENCY:		150.00			
BEFORE CONTROL EMISS CAPTURE EFFICIENCY:	SION RATE (LB/HR):	<u>150.00</u> %	%	%%	
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI	SION RATE (LB/HR): ENCY:	%	%	%%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/	SION RATE (LB/HR): ENCY: ALL EFFICIENCY:	<u>150.00</u> %	%	%%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE:	% % %	% %%	%%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINA TOTAL EMISSION RATE (L	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: -B/HR):	% % %	%	%%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT	% % % <u>See calculati</u> ons in Appe	% % % % mdix B DESCRIBE STARTUP PROCEDURES:	%%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: B/HR): RTICLE SIZE DISTRIBUT WEIGHT %	% % % <u>See calculations in Appe</u> ION CUMULATIVE	%	%%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS)	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL	% % % <u>See calculati</u> ons in Appe	% % % mdix B DESCRIBE STARTUP PROCEDURES: See attached	%% %% %%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: B/HR): RTICLE SIZE DISTRIBUT WEIGHT %	% % % <u>See calculations in Appe</u> ION CUMULATIVE	%% % % % DESCRIBE STARTUP PROCEDURES: See attached DESCRIBE MAINTENANCE PROCEDURI	%% %% %%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1 1-10	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL	% % % <u>See calculations in Appe</u> ION CUMULATIVE	% % % mdix B DESCRIBE STARTUP PROCEDURES: See attached	%% %% %%	,
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINA' TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1 1-10 10-25	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL	% % % <u>See calculations in Appe</u> ION CUMULATIVE	%	%% %% %% 	
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1 1-10 10-25 25-50	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL	% % % <u>See calculations in Appe</u> ION CUMULATIVE	%%%	%% %% %% 	
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL	% % % <u>See calculations in Appe</u> ION CUMULATIVE		%% %% %% 	
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1 1-10 10-25 25-50	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL Unknown	%%%%%%% CUMULATIVE %	%%%	%% %% %% 	
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL Unknown	% % % % % CUMULATIVE % 		%% %% %% 	
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: .B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL Unknown	% % % % % CUMULATIVE % 		%% %% %% 	
BEFORE CONTROL EMISS CAPTURE EFFICIENCY: CONTROL DEVICE EFFICI CORRESPONDING OVER/ EFFICIENCY DETERMINAT TOTAL EMISSION RATE (L PA SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100 >100 DESCRIBE ANY MONITOR PLC	SION RATE (LB/HR): ENCY: ALL EFFICIENCY: TION CODE: B/HR): RTICLE SIZE DISTRIBUT WEIGHT % OF TOTAL Unknown TOTA ING DEVICES, GAUGES,			%% %% %% ES: INTRODUCED INTO THE C	

Attach Additional Sheets As Necessary

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Source Specific Forms - Hammermills & Hammermill Area

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SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES) NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate R **REVISED 12/01/01** EMISSION SOURCE DESCRIPTION: EMISSION SOURCE ID NO: ES-HM-1 thru 8 CD-HM-CYC-1 through 8 Eight (8) Hammermills CONTROL DEVICE ID NO(S): CD-HM-BF1 through 8 EMISSION POINT (STACK) ID NO(S): **OPERATING SCENARIO** EP-2 through 5 OF DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM): Dried materials are reduced to the appropriate size needed for pelletization using eight hammermills. TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES): Woodworking (Form B4) Manufact. of chemicals/coatings/inks (Form B7) Coal,wood,oil, gas, other burner (Form B1) Int.combustion engine/generator (Form B2) Coating/finishing/printing (Form B5) [] Incineration (Form B8) Liquid storage tanks (Form B3) Storage silos/bins (Form B6) Other (Form B9) START CONSTRUCTION DATE: OPERATION DATE: DATE MANUFACTURED: TBD TBD TBD 24_HR/DAY _7 MACT (SUBPART?) MANUFACTURER / MODEL NO .: EXPECTED OP. SCHEDULE: DAY/WK 52 WK/YR TBD): NESHAP (SUBPART?): MACT (SUBPAR EB 25% MAR-MAY 25% JUN-AUG 25% SEP-8,760 VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: IS THIS SOURCE SUBJECT TO? NSPS (SUBPART? PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB 25% SEP-NOV 25% EXPECTED ANNUAL HOURS OF OPERATION % OPACITY <20 CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE SOURCE OF EXPECTED ACTUAL POTENTIAL EMSSIONS EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) AIR POLLUTANT EMITTED tons/yr FACTOR lh/hr tons/yr lb/hr tons/yr lb/hr See Emission Calculations in Appendix B PARTICULATE MATTER (PM) PARTICULATE MATTER < 10 MICRONS (PM10) PARTICULATE MATTER <2.5 MICRONS (PM2 5) 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 POTENTIAL EMSSIONS EXPECTED ACTUAL EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS) HAZARDOUS AIR POLLUTANT AND CAS NO. FACTOR lb/hr tons/yr lb/hr tons/yr lb/hr tons/yr N/A TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS TOXIC AIR POLLUTANT AND CAS NO. EF SOURCE lb/hr lb/day ib/yr N/A Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and

FORM B

describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source. COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

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FORM B9 EMISSION SOURCE (OTHER)

6	MISSION SOURCE ID NO: CONTROL DEVICE ID NO(S): MISSION POINT (STACK) ID N sing eight hammermilis.	ES-HM-1 thru 8 CD-HM-CYC-1 through 8 CD-HM-BF1 through 8 C(S): EP-2 through 5
E E	MISSION POINT (STACK) ID N	CD-HM-BF1 through 8
E E	MISSION POINT (STACK) ID N	
lletization u	sing eight hammermills.	D(S): EP-2 through 5
To Relations		
	MAX, DESIGN	REQUESTED CAPACITY
UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
001	11.71	
KON DUMBRI	MAX. DESIGN	REQUESTED CAPACITY
UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH
		÷
ATCHES/VP	ŀ	
		14.153
EQUESTED (CAPACITY ANNUAL FUEL USE:	N/A
	ODT UNITS ATCHES/YR DTAL MAXIM	ODT 71.71

Trinity Consultants

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					-		-			
			FORI	CYCLONE	. OR (THER	MEC	HANICA	AL X	
REVISED 12/01/01	IN O D'EIN	R/Division of Ai	r Quality - Appli	cation for Air	Permit to	Construc	t/Onerati	•	()	C2
CONTROL DEVICE ID NO: C	D-HM-CYC-1 thru-8	CONTROLS	EMISSIONS FR	ROM WHICH E	MISSION	SOURCE	ID NO/S	1.	Pro sus a or second	
EMISSION POINT (STACK)	ID NO(S): EP-2 through	5 POSITION I	N SERIES OF C	ONTROLS		NO.		0F 2	ES-HM-1 through UNITS	-8
MANUFACTURER: Aircon			MODEL NO:	AC-96				-	UNITS	
DATE MANUFACTURED: T				PERATION D	ATE:	10201	4			
OF	ERATING SCENARIO:	認識品的意識者	PROPOSED S	TART CONST	RUCTION	TBD	<u> </u>			
DESCRIBE CONTROL SYST	1 OF 1		P.E. SEAL RE				G	ES	1 NO	
One cyclone is equipped fo hammermill.	r each hammermill to capture	bulk PM emissio	ons. The emiss	ions from the	cyclone a	ire then ro	uted to a	a dedicated	bagfliter per cyclone a	Ind
POLLUTANT(S) COLLECTER	D:		PM	DM		014	_			_
BEFORE CONTROL EMISSI	ON RATE (LB/HR):			PN alculations in		PM _{2.5}	- 8	_		
CAPTURE EFFICIENCY:			98.0%		1.0% %		-			
CONTROL DEVICE EFFICIE	KCY:			%	%	98.0%			<u> </u> %	
CORRESPONDING OVERAL	L EFFICIENCY:		-	-			- % -		%	
EFFICIENCY DETERMINATION				%	%		_% _		%	
TOTAL EMISSION RATE (LB	HR):		P		anso and					
PRESSURE DROP (IN. H20):	MIN MAX 6.0"	MADUNIO		alculations in	Appendix	В	-			
INLET TEMPERATURE ("F):	MIN MAX	WARNING A	ALARM?	e YE	_					_
INLET AIR FLOW RATE (ACF	THE OC	Ambient		OUTLET TEN			MIN	MAX	Amblent	_
POLLUTANT LOADING RATE	1	lone		BULK PARTI	CLE DENS	SITY (LB/F	T ³):	1.43E-03	and the second se	
SETTLING CHAMBER	N PLOGING ENGLISHING STREET	2012								_
LENGTH (INCHES):		The Article and				il or esti	in the second		ULTICYCLONE	
WIDTH (INCHES):	INLET VELOCITY (FT/S		114.65	CIRCULA			NO. TU	JBES:		
HEIGHT (INCHES):		VCHES) See inst		IF WET SI	PRAYUTI	LIZED	DIAME	TER OF TU	BES:	
VELOCITY (FT/SEC.):		5 Lb:		LIQUID USED			HOPPE	R ASPIRAT	TION SYSTEM?	_
NO. TRAYS:	-	5 Lc:		FLOW RATE			e vi	ES	d NO	
NO. BAFFLES:		6 S:	120	MAKE UP RA	TE (GPM)	:	LOUVE	RS?		
	TYPE OF CYCLONE	& CONVENTI	64.75				e y	ES	🛃 NO	
ESCRIBE MAINTENANCE P	ROCEDURES		IUNAL	e Hig	HEFFICI	ENCY		THER		
eriodic inspection of mecha	nical integrity during plant out	ages			1.000	AUX PESS			STRIBUTION	ALC: NI
s specified by manufacturer DESCRIBE INCOMING AIR ST						SIZE CRONS)		IGHT % TOTAL	CUMULATIVE	
B material will be suffer the	REAM:				-	0-1		_	Unknown	_
velopo will second the	ough the cyclone under negal	ive pressure. Ti	te		_	1-10		_	Unknown	
ischarge to an associated by	rial from the air stream and th	ie air will			1	0-25				
a a discharge stack common	g filter prior to being discharg	e to atmosphere	8		2	5-50				
a a alacitatige stack common	to all fillers in this area.				50	-100				
					>	100				
ESCRIBE ANY MONITORING	DEVICES, GAUGES, TEST PO				-			T	OTAL = 100	
one	241020, 00060, 1631 PC	KIS, EIC:								
N A SEPARATE PAGE, ATTA	CH A DIAGRAM OF THE RELA	TIONSHIP OF T	E CONTROL -							
							E(S):	_		
man equipment selection	has not yet occurred but	will be similar	in design to	specification	is shown	ı.				

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	RM C1			
	E (FABRIC FILTER)			
REVISED 12/01/01 NCDENR/Division of Air Quality - CONTROL DEVICE ID NO: CD-HM-BF-1 through 8 ICONTROLS FMIS	Application for Air Permit to Cons	struct/Operate		C1
Et llogiati a sur le su	SSIONS FROM WHICH EMISSION S			
MANUFACTURER: Aircon	MODEL NO: 10 RA 144-10	NO.	. 2 OF 2	UNITS
DATE MANUFACTURED: TBD	PROPOSED OPERATION DATE:			
OPERATING SCENARIO:	PROPOSED START CONSTRUC	TION DATE:	TBD	
OF1	P.E. SEAL REQUIRED (PER 2Q.			é NO
DESCRIBE CONTROL SYSTEM:				
Eight (8) bagfilters will be utilized for emission control on the eight hammermill cyclo	nes.			
Two bagfilters will share a common stack, so there will be 4 hammermill bagfilter stat	cks.			
All 4 stacks will be identical unless the height needs to be adjusted for the model.				
POLLUTANT(S) COLLECTED:	PM PM-10	PM-2.5		
BEFORE CONTROL EMISSION RATE (LB/HR):	See calculations in Appendix B			
CAPTURE EFFICIENCY:				
CONTROL DEVICE EFFICIENCY:			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	%
	%	%	_%	%
CORRESPONDING OVERALL EFFICIENCY:	%	_%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations In Appendix B			
PRESSURE DROP (IN. H ₂ 0): MIN: MAX: 6" GAUGE?	YES NO W	ARNING ALARM?	A YES	NO
BULK PARTICLE DENSITY (LB/FT ³): 1.43E-05	INLET TEMPERATURE (°F): 12			
POLLUTANT LOADING RATE: 0.1 gr/cf inlet g LB/HR GB/P	OUTLET TEMPERATURE ("F): 10	0		
INLET AIR FLOW RATE (ACFM): 15,000	FILTER MAX OPERATING TEMP.			
NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTME	ENT: 144	LENGTH OF BAG	(IN.): 120	
DIAMETER OF BAG (IN.): 5.75 DRAFT: INDUCED/NEC		FILTER SURFACE	EAREA (FT ²):	2,168
AIR TO CLOTH RATIO: 6.90 FILTER MATERIAL: Polyester or DESCRIBE CLEANING PROCEDURES:	equivalent	& WOVEN		
		PARTIC		100 C - 10 - 100
AIR PULSE SONIC REVERSE FLOW SIMPLE BAG C	0114205	SIZE	WEIGHT %	CUMULATIVE
MECHANICAL/SHAKER		(MICRONS) 0-1	OF TOTAL	%
♦ OTHER	JELAFSE	1-10	Unk	nown
DESCRIBE INCOMING AIR STREAM:		10-25		
The air stream will contain wood dust particles. Larger particles will have been		25-50		
removed by the upstream cyclone.		50-100		
		>100		
			TOTA	L = 100
METHOD FOR DETERMINING WHEN TO CLEAN:				
AUTOMATIO & TIMED & MANUAL METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:				
	1			
ALARM (# INTERNAL INSPECTION) VISIBLE EMISS SPECIAL CONDITIONS: None	ION OTHER			
é MOISTURE BLINDING é CHEMICAL RESISTIVITY	d OTHER			
EXPLAIN:	C - Friday			
DESCRIBE MAINTENANCE PROCEDURES: Per manufacturer recommendations				
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE	CONTROL DEVICE TO ITS EMISS	ON SOURCE(S):		

Attach Additional Sheets As Necessary 'Final equipment selection has not yet occurred but will be similar in design to specifications shown.

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Source Specific Forms - Pellet Presses & Coolers

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES) 9EV/ISED 12/01/04

NCDENR/Divisio	on of Air Qualit	y - Applicatio	on for Air Pen	nit to Construct	Operate		B
EMISSION SOURCE DESCRIPTION:				SOURCE ID NO:		ES-CLR1	
Pellet Coolers			CONTROL	DEVICE ID NO(S)	CD-CLP-1	through 6	nrough 6
OPERATING SCENARIO 1 OF	1			OINT (STACK)	D NO(S)	EP-7 throu	ab 49
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCES	SS (ATTACH FI	LOW DIAGRA	MALL.		- Andrew -	CF-/ Unou	ign 12
Six (6) Pellet Coolers follow the pellet presses to cool the	e newly forme	d pellets dow	in to an accer	otable storage to	moratura		
				sume storage te	mperature.		
TYPE OF EMISSION SOURCE (CHECK	AND COMPLE	TE APPROP	RIATE FORM	R1-R9 ON THE		DACEEL	
[L] Obal, Wood, oil, gas, outer builler (Fullit B1) (Woody	vorking (Form B	4)	Manufac	t. of chemicals/co	OLLOWING	FAGES):	
Int.combustion engine/generator (Form B2)	g/finishing/printi	na (Form B5)		ion (Com DA)	aungs/inks (P	om 87)	
	e silos/bins (For	m R6\					
START CONSTRUCTION DATE: TBD OPERATIO			Other (F	om B9)			
MANUFACTURER / MODEL NO.: TBD	IN DATE:	202014	DATE MANU			TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	ALCO!	EXPECTED	OP. SCHEDU		AY 7 DA	Y/WK 52	WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	NESI	HAP (SUBPA		MACT (SL	JBPART?):		
EXPECTED ANNUAL HOURS OF OPERATION 8,76	25% MAR	-MAY 25%	JUN-AU	G 25%	SEP-NOV	25%	
	VISIBLE STA	CK EMISSIO	NS UNDER N	ORMAL OPERAT	TION: <20	% OPACIT	Y
CRITERIA AIR POLLU	MIT EMISS	SIONS INF	ORMATION			Contraction of the	
	SOURCE OF		DACTUAL		POTENTIAL E	MSSIONS	
AIR POLLUTANT EMITTED	EMISSION		ROLS / LIMITS)	(BEFORE CONTR			ROLS / LIMITS
PARTICULATE MATTER (PM)	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM10)	See Emissio	n Calculation	ns in Appendi	xВ			1
PARTICULATE MATTER<2.5 MICRONS (PM10)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							1
LEAD							1
OTHER							1
							1
HAZARDOUS AIR POLL	UTANT EMIS	SSIONS IN	FORMATIC	IN FOR THIS	SOURCE	1000 1000 10000	and the second second
	SOURCE OF	EXPECTE	DACTUAL	P	OTENTIAL E	MSSIONS	
	EMISSION	(AFTER CONTR	ROLS / LIMITS)	(BEFORE CONTR		AFTER CONT	ROLS (LIMITS)
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
WA					1	- Ibirtin	Constyl
							-
						1	+
						1	
	NT EMISSIC	DNS INFOR	MATION F	OR THIS SOL	IRCE	BEER AND THE REAL	Contraction of the second
	D ACTUAL EMI	SSIONS AFT	ER CONTROL	S/LIMITATIONS			and the second second
UNIC AIR PULLUTANT AND CAS NO.	EF SOURCE	lb/		lb/da		lb/	L at
I/A				10/00	1	10/	
							_

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

Attach Additional Sheets As Necessary

FORM B9 EMISSION SOURCE (OTHE

EMISSION SOURCE DESCRIPTION: Pellet Coolers DPERATING SCENARIO: <u>1</u> OF <u>1</u> DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM): Six (6) Pellet Coolers follow the pellet presses to cool the new		For Air Permit to Construct/Opera	ES-CLR1 through 6
		CONTROL DELIGE IS IN	
DESCRIBE IN DETAIL THE PROCESS (ATTACH ELOW DIA ODANI		CONTROL DEVICE ID NO(S):	CD-CLR-1 through 6
Six (6) Pellet Coolers follow the pellet presses to cool the new		EMISSION POINT (STACK) ID NO	C(S): EP-7 through 12
	ly formed po	allets down to an acceptable stora	ge temperature.
MATERIALS ENTERING PROCESS - CONTINUOUS PROCES	6 10 Million Internet		
TYPE	UNITS		REQUESTED CAPACITY
Dried Wood	ODT	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
		76.07	
MATERIALS ENTERING PROCESS BATCH OPERATION		MAX. DESIGN	
TYPE	UNITS	CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)
XIMUM DESIGN (BATCHES / HOUR):			
QUESTED LIMITATION (BATCHES / HOUR): (B.	ATCHES/YR):	
EL USED: N/A	TAL MAXIM	UM FIRING RATE (MILLION BTU/HI	R): N/A
X. CAPACITY HOURLY FUEL USE: N/A RE	QUESTED (CAPACITY ANNUAL FUEL USE:	<u>N/A</u>
MMEATS.			

Attach Additional Sheets as Necessary

1 DESCRIBE CONTROL SYSTEM : Six (6) Identical high efficiency cy	S: EP-7 through 12	C	of Air Quality - App		emit to Conet-	uctiOnerate	CAL)
VANUFACTURER: TBD ¹ DATE MANUFACTURED: TBD OPER 1 DESCRIBE CONTROL SYSTEM : bits (6) Identical high efficiency co		P	ONTROLS EMISSIO	INS EPOM WHI		OURCE ID NO(S):	
DATE MANUFACTURED: TBD OPERU 1 DESCRIBE CONTROL SYSTEM : itx (6) Identical high efficiency co			DSITION IN SERIES	S OF CONTROLS	NO.	1 OF 1	
DPERJ 1 ESCRIBE CONTROL SYSTEM : ix (6) Identical high efficiency cy			MODE		, NO.		UNITS
1 ESCRIBE CONTROL SYSTEM : (6) Identical high efficiency cy	THE LOCK OF COMMENTS OF COMMENTS		PROP	DSED OPERATK	NIDATE: 101		
ix (6) Identical high efficiency cy	ATING SCENARIO:		PROPO	DSED START CO	INSTRUCTION (DATE: TBD	
ix (6) Identical high efficiency cy	OF1		P.E. SE	AL REQUIRED	PER 20.011212	YE JYE	S & NO
yclone. The cyclones will operate	clones are to be used t te under negative press	io capture i sure.					
OLLUTANT(S) COLLECTED:			PM	PM		2.5	
EFORE CONTROL EMISSION RA	TE (LB/HR):			issions Calcula			
APTURE EFFICIENCY:						90+ %	<u> </u>
ONTROL DEVICE EFFICIENCY:				%	%	%	
ORRESPONDING OVERALL EFF	CIENCY:			%			%
FFICIENCY DETERMINATION CO					%	%	%
OTAL EMISSION RATE (LB/HR):			See Em	issions Calculat	ions in Appendi	ix B	
RESSURE DROP (IN. H20): MIN	MAX 6.0"	WARN	ING ALARM?	4 YES			
LET TEMPERATURE (°F): MIN	MAX		bient	The second se		a statut	
LET AIR FLOW RATE (ACFM):	21,000 each		district.	BUIK DADTIC	PERATURE (°F) LE DENSITY (LE		X Amblent
LLUTANT LOADING RATE (GR/F	·T ³):	0.2		BOLKPARIN	LE DENSITY (LI	B/FT ³): 2.86E-	05
SETTLING CHAMBER			CYCLONE	and the second second			MIL WORKS AND
NGTH (INCHES):	INLET VELOCITY (F	FT/SEC):	94.75		R & RECTANGE		MULTICYCLONE
DTH (INCHES):	DIMENSIONS	(INCHES) S	See instructions		RAY UTILIZED		
IGHT (INCHES):	H: 38		22	LIQUID USED:		DIAMETER O	
LOCITY (FT/SEC.):	W: 25	5 Lb:	74.25	-			PIRATION SYSTEM?
). TRAYS:	De: 32	2 Lc:	84.5	MAKE UP RAT		d YES	e NO
BAFFLES:	D: 54	I S:	44.38	IN IRE OF TRAT		LOUVERS?	1
						e YES	# NO
	TYPE OF CYCLONE	: 00	CONVENTIONAL	A HIGH	EFFICIENCY	d oturn	
SCRIBE MAINTENANCE PROCE	DURES:		CONVENTIONAL	HIGH	EFFICIENCY		
SCRIBE MAINTENANCE PROCE iodic inspection of mechanical i	DURES:		CONVENTIONAL		A DESCRIPTION OF THE OWNER	PARTICLE SIZ	E DISTRIBUTION
lodic inspection of mechanical i specified by manufacturer	DURES: ntegrity during plant ou		CONVENTIONAL	Ca HIGH	SIZE	WEIGHT %	CUMULATIVE
todic inspection of mechanical i specified by manufacturer SCRIBE INCOMING AIR STREAM	DURES: ntegrity during plant ou	utages		C HIGH	SIZE	PARTICLE SIZ	CUMULATIVE %
Iodic inspection of mechanical i specified by manufacturer SCRIBE INCOMING AIR STREAM cyclones used for particulate c	DURES: ntegrity during plant ou : : apture the pellet cooler	utages 's will be du	icted to	C & HIGH	SIZE (MICRONS)	PARTICLE SIZ	CUMULATIVE
lodic inspection of mechanical i specified by manufacturer	DURES: ntegrity during plant ou : : apture the pellet cooler	utages 's will be du	icted to	C & HIGH	SIZE (MICRONS) 0-1	PARTICLE SIZ	CUMULATIVE %
Iodic inspection of mechanical i specified by manufacturer SCRIBE INCOMING AIR STREAM cyclones used for particulate c	DURES: ntegrity during plant ou : : apture the pellet cooler	utages 's will be du	icted to	C d HIGH	SIZE (MICRONS) 0-1 1-10	PARTICLE SIZ	CUMULATIVE %
Iodic inspection of mechanical i specified by manufacturer SCRIBE INCOMING AIR STREAM cyclones used for particulate c	DURES: ntegrity during plant ou : : apture the pellet cooler	utages 's will be du	icted to	C d HIGH	SIZE (MICRONS) 0-1 1-10 10-25	PARTICLE SIZ	CUMULATIVE %
Iodic inspection of mechanical i specified by manufacturer SCRIBE INCOMING AIR STREAM cyclones used for particulate c	DURES: ntegrity during plant ou : : apture the pellet cooler	utages 's will be du	icted to	્રિને HiGh	SIZE (MICRONS) 0-1 1-10 10-25 25-50	PARTICLE SIZ	CUMULATIVE %
odic inspection of mechanical i specified by manufacturer SCRIBE INCOMING AIR STREAM cyclones used for particulate c	DURES: ntegrity during plant ou apture the pellet cooler a common to all cooler i	utages 's will be du aspiration	ucted to systems.		SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	PARTICLE SIZ	CUMULATIVE %

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Source Specific Forms - Pellet Mill Feed Silo

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Divisi	ion of Air Quality	- Application	for Air Permi	it to Constru	ot/Operate		
			EMISSION	SOURCE ID	NO		В
Pellet Mill Feed Silo OPERATING SCENARIO 1 0F			CONTROL	DEVICE ID N		ES-PMFS	
OPERATING SCENARIO 1 OF	1		EMISSION	POINT (STAC	CK) ID NO(S):	CD-PMFS EP-6	S-BV
DESCRIBE IN DETAILTHE EMISSION SOURCE PROC	ESS (ATTACH FL	OW DIAGR	M):	out join	SK) 10 NO(3).	EP-0	
A pellet press silo stores dried ground wood prior to	transport to the	ellet presse	5.				
TYPE OF EMISSION SOURCE (CHEC	K AND COMPLET	E APPROP	RATE FORM	1.89 ON TH	E FOLLOWIN	0.04050	
	own offering the Offering	2°4)		ct of chemics	als/coatings/ink	G PAGES):	
Coa	ting/finishing/print	ing (Form 85) [Incinera	tion (Form B8	no/coaungs/mk	s (Form B7)	
L Equid storage tanks (Form B3)	age silos/bins (Fo	m B6)	Other (F)		
START CONSTRUCTION DATE: TRD TOPEDA	TION DATE:	TBD		orin B9)			
MANUFACIURER / MODEL NO TRO	HORE BATE.		DATE MAN	JFACTURED	:	TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	NESL	AP (SUBPA	OP. SCHEDU	ILE: 24 H	R/DAY 7	DAY/WK	52 WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC EEE	3 25% MAR-	MAY 25%		MACT	(SUBPART?):		
EARED ANNUAL HOURS OF OPERATION 0	760 VICIDI C OT	-			SEP-NOV		
CRITERIA AIR POLL	,760 VISIBLE STA	KONS INE	INS UNDER N	ORMAL OPE	RATION: <	20 % OP	ACITY
	SOURCE OF	EVOLOT	DRMATION	FOR THIS		1	(A)10-10-10-10-10-10-10-10-10-10-10-10-10-1
	EMISSION		ED ACTUAL		POTENTIA	L EMSSION	S
AIR POLLUTANT EMITTED	FACTOR	(AFTER CON	TROLS / LIMITS)		TROLS / LIMITS)	AFTER CO	NTROLS / LIMITS)
PARTICULATE MATTER (PM)		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM.)	000 21113510	il Calculatio	ns in Appendi	хВ			
PARTICULATE MATTER<2.5 MICRONS (PM)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOUS AIR POLI	UTANT EMIS	SIGNS MI	ODWATIO				
	SOURCE OF	EVDEOT	DACTUAL	VFOR IM	S SOURCE	7	医心下的 电输出通知
	EMISSION		DACIUAL		POTENTIAL	EMSSIONS	6
AZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CON	TROLS / LIMITS)
N/A	TACIÓN	IO/nr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
IOXIC AIR POLLUTA INDICATE EXPECTE	NTEMISSION	IS INCOD	TATION	A			
INDICATE EXPECTE	DACTUAL EMIS	SIGNIS ALTE	D COULDON FO	RIHISSO	DURCE	Reading of National	学業のない。
OXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	DIONO AFTE	K CONTROLS	LIMITATIO	NS		
/Α	LI OUUITOL	lb/	nr	lb/d	lay	łt	/yr
achments: (1) emissions calculations and supporting documentation							

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

Attach Additional Sheets As Necessary

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01	NCDEN	R/Division of Air Quality - A						,	
EMISSION SOURCE DESCR	RIPTION: Pellet	Aill Feed Silo	aprioati			DURCE ID I			B6
								ES-PMFS	
OPERATING SCENARIO:		OF		EMIS	SION PC	EVICE ID N	U(S):	CD-PMFS-BV	
DESCRIBE IN DETAIL THE	PROCESS (ATTAC	H FLOW DIAGRAM)	-		GION FC	DINTIGTAC	N) ID NO(S): EP-6	
A pellet press silo s	tores dried ground	l wood prior to transport to	the pell	et presses.					
MATERIAL STORED:					_				
CAPACITY				DENSITY OF	MATER	IAL (LB/FT:	3):	40	
DIMENSIONS (FEET)	CUBIC FEET:	TBD		TONS:	TBD				
ANNUAL PRODUCT TH	HEIGHT:	DIAMETER:	(OR)	LENGTH:		WIDTH:		IEIGHT:	
PNEUMATICALLY	FULED		-	MAXI	MUM DE	SIGN CAPA	CITY:		
BLOWER	TILLED	MECHANIC	COLUMN TWO IS NOT	LLED		ALCON DE	and a Day	FILLED FROM	
COMPRESSOR		SCREW CONVEYOR				Ø R	AILCAR		
OTHER:	r i	BELT CONVEYOR	>	MOTOR	HP:	0 T	RUCK		
V OTHER.	1	BUCKET ELEVATOR				d s	TORAGE	PILE	
NO EN TUDEO		OTHER:				0	DTHER:	Conveyor	
NO. FILL TUBES: MAXIMUM ACFM:									
BY WHAT METHOD IS MATE	RIAL UNLOADED F	FROM SILO?							
MAXIMUM DESIGN FILLING F	RATE OF MATERIA	L (TONS/HR):	105						
MAXIMUM DESIGN UNLOADI	NG RATE OF MAT	ERIAL (TONS/HR):	105						
COMMENTS:				c					
		Advant A duty							

Attach Additional Sheets As Necessary

FORM C1 CONTROL DEVICE (FABRIC FILTER)

CD-PMES-BV CONT	of Air Quality - Application for Air Permit to (ROLS EMISSIONS FROM WHICH EMISSION			
EP-0 POSI	TION IN SERIES OF CONTROLS		ES-PMFS	
MEMORACIORER: TBD'	MODEL NO: TBD	N	0. 1 OF	1 UNITS
DATE MANUFACTURED: TBD	EDODOGCO COMPLEX			
OPERATING SCENARIO:	PROPOSED START CONSTRU	TBD		
OF1	P.E. SEAL REQUIRED (PER 20		TBD	
DESCRIBE CONTROL SYSTEM:		.0112)?	e YES	e NO
A bin vent filter is used to create a slight negative pressure on the Pel from the air volume present in the silo. The bin vent is sized to offset feed to the silo.	let Mill Feed Silo. The bin vent collects dust the air displacement created by the material			
POLLUTANT(S) COLLECTED:	PM PM-10			
EFORE CONTROL EMISSION RATE (LB/HR):	PMPM-10	PM-2.5		
APTURE EFFICIENCY:				
	%	%	%	~
CONTROL DEVICE EFFICIENCY:	-99.9 % -99.9	% ~99.9	%	~ ~
CORRESPONDING OVERALL EFFICIENCY:	%			
FFICIENCY DETERMINATION CODE:			_%	_%
OTAL EMISSION RATE (LB/HR):	See calculation	e in Annondiu D		_
RESSURE DROP (IN. H20): MIN: MAX: 4"				
ULK PARTICLE DENSITY (LB/FT ³): 1.43E-06		VARNING ALARM?	YES OI	10
DLLUTANT LOADING RATE: 0.1 A I BHP	INLET TEMPERATURE (°F):	Ambient		
LET AIR FLOW RATE (ACFM):		Amblent		
0. OF COMPARTMENTS: 1 NO. OF BAGS PER COM	FILTER MAX OPERATING TEMP			
AMETER OF BAG (IN.): 5.875 DRAFT: INDI		LENGTH OF BAG		
R TO CLOTH RATIO: 6 FILTER MATERIAL	JCED/NEG. FORCED/POS	FILTER SURFACE		377
ESCRIBE CLEANING PROCEDURES:		& WOVEN		
AIR PULSE & SON	C	SIZE	ICLE SIZE DISTR	
Ø REVERSE FLOW	LE BAG COLLAPSE	(MICRONS)	WEIGHT % OF TOTAL	CUMULATIV
d MECHANICAL/SHAKER d RIN	G BAG COLLAPSE	0-1		%
e OTHER		1-10	0	known
SCRIBE INCOMING AIR STREAM:		10-25		
he air stream will contain wood dust particulate emissio	ns	25-50		
		50-100		
		>100		
THOD FOR DETERMINING WHEN TO CLEAN:			TOT	AL = 100
AUTOMATIC ITIMED IN MANUAL THOD FOR DETERMINING WHEN TO REPLACE THE BAGS:				a = 100
ECIAL CONDITIONS: None	E EMISSION & OTHER			
MOISTURE BLINDING & CHEMICAL RESISTIVITY	1 071/27			
(PLAIN:	é other			
SCRIBE MAINTENANCE PROCEDURES: Per manufacturer recommer	dations			
A SEDADATE DAGE AND A				
A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATION	SHIP OF THE CONTROL DEVICE TO ITS EMI Iditional Sheets As Necessary	SSION SOURCE(S)-		

Source Specific Forms - Pellet Fines Bin

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES) PEVICED 40/04/04

NCDENR/Div	ision of Air Quality	- Application	for Air Dorm	the Country			-
			EMICCION	SOURCE ID	couperate		В
Pellet Fines Bin			CONTROL	DEVICE ID N	NO:	ES-PFB	
OPERATING SCENARIO 1 OF	1		EMISSION	POINT (STAC	U(S):	CD-PFB-BV	
DESCRIBE IN DETAILTHE EMISSION SOURCE PRO	CESS (ATTACH FL	OW DIAGRA	M).	POINT (STAC	(S):	EP-15	
Fine pellet material from hammermill pollution cont bin vent filter.	rol system and scr	Bening opera	my. tion is selles	A			
bin vent filter.		ooning opera	LION IS COLLEC	ted in the pe	llet fines bin	which is conti	olled by a
							-
TYPE OF EMISSION SOURCE (CHE Coal,wood,oil, gas, other burner (Form B1)	CK AND COMPLET		ATE FORM	1 00 001 00			
Coal,wood,oil, gas, other burner (Form B1)	loodworking (Form E	24)		PI-BBON TH	E FOLLOWIN	G PAGES):	
Int.combustion engine/generator (Form B2)	oating/finishing/print	ing (Form DE)		ct. of chemica	ls/coatings/ink	s (Form B7)	
Liquid storage tanks (Form B3)	torage silos/bins (Fo	my (Form Bo)		tion (Form B8	5)		
START CONSTRUCTION DATE: TRD LODGE	ATION DATE:		Other (F	Form B9)			
MANUFACTURER / MODEL NO : TRO		2Q2014	DATE MAN	JFACTURED		TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART2)	hitter	EXPECTED	OP. SCHEDL	ILE: 24 HI	R/DAY 7	DAY/WK 5	2 WK/YR
FERGENTAGE ANNUAL THROUGHPUT (%) DEC E	NESP	AP (SUBPAR		MACT	(SUBPART?):		TTIVITY
EXPECTED ANNUAL HOURS OF OPERATION	25% MAR-	MAY 25%	JUN-AU	2 250/	0000 1101	25%	
CRITERIA AIR POL	8,760 VISIBLE ST	ACK EMISSIO	NS UNDER N	ORMAL OPE	RATION: <2		TY
CRITERIA AIR POL	LOTANT LANDS	IONS INFC	RMATION	FOR THIS	SOURCE	A SAMPLE AND AND	这花台 和6天下
	SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMSSIONS	and the second
AIR POLLUTANT EMITTED	EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	
PARTICULATE MATTER (PM)	FACTOR	lb/hr	tons/yr	lh/br	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER<10 MICRONS (PM10)	See Emissio	n Calculation	is in Appendi	xB	1	10711	toria/yr
PARTICULATE MATTER<2.5 MICRONS (PM10)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)		(
LEAD							
OTHER				· · · · · · · · · · · · · · · · · · ·			
HAZARDOUS AIR DOL	ANT ANT FINS						
HAZARDOUS AIR POL	LUTANTEMIS	SIONS INF	ORMATIO	FOR THE	S SOURCE	State Lange States	Sec. ALLER
		CALCOLEI	JACIUAL		POTENTIAL	EMSSIONS	and the second
HAZARDOUS AIR POLLUTANT AND CAS NO.	EMISSION		ROLS / LIMITS)	OLS / LIMITS) (BEFORE CONTROLS / LIMITS)			OLS / LIM/TS)
N/A	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
							tomaryi
TOXIC AIR POLLUT	ALL PINSATA						
INDICATE EVERA	ANTEMISSION	IS INFORM	ATION FO	R THIS SC	URCE		and see a state to be
OXIC AIR POLLUTANT AND CAS NO.	LED HOI ONE LIVING	SIONS AFTER	R CONTROLS	/LIMITATION	NS .	which make the state of the state	ALC: NOT A
A	EF SOURCE	lb/i	ור	lb/d		lb/yi	
						107 91	
	_						
tachments: (1) emissions calculations and supporting documental							
actiments. (1) emissions calculations and supporting documentation	tion: (7) indicate all as a						

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

Attach Additional Sheets As Necessary

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01	NCDENR	Division of Air Quality - Applic	ation for Air Permit to Construct/Op		
EMISSION SOURCE DESCR	IPTION: Pellet Fir	nes Bin	EMISSION SOURCE ID I		B6
			CONTROL DEVICE ID N		
OPERATING SCENARIO:	1		EMISSION POINT(STAC	O(S): CD-PFB-BV	<u>/</u>
DESCRIBE IN DETAIL THE P	ROCESS (ATTACH	FLOW DIAGRAM):	LINISSION FORMISTAC	K) ID NO(S): EP-15	
Fine pellet material fi vent filter.	rom hammermill pol	llution control system and scre	ning operation is collected in the p	ellet fines bin which is contr	olled by a bin
ATERIAL STORED: Fine	pellet material		DEMOIT (OF MILES		
CAPACITY	CUBIC FEET:	2200	DENSITY OF MATERIAL (LB/FT3	l): 40	
DIMENSIONS (FEET)	HEIGHT:		TONS:		
ANNUAL PRODUCT THR	OUGHPUT (TONS)	ACTUAL:	THE THE THE	HEIGHT:	
PNEUMATICALLY	FILLED	MECHANICALLY	MAXIMUM DESIGN CAPA		
BLOWER		SCREW CONVEYOR	and the second se	FILLED FROM	
COMPRESSOR		BELT CONVEYOR		AILCAR	
OTHER:		BUCKET ELEVATOR		RUČK	
		OTHER:		TORAGE PILE	
O. FILL TUBES:		U Officie.	Ke	DTHER: Conveyor	
AXIMUM ACFM:					
Y WHAT METHOD IS MATER	IAL UNLOADED FR	OM SILO?			
AXIMUM DESIGN FILLING R					
XIMUM DESIGN UNLOADIN	G RATE OF MATER				
DMMENTS:	IOTATE OF MATER	CAL (TONS/HR):			
		Attach Additional Ob			

Attach Additional Sheets As Necessary

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Page 35 of 47
ι						
		RM C1				
	CONTROL DEVI	CE (FABRIC F	ILTER)			
REVISED 12/01/01 NCDEN	R/Division of Air Quality	- Application for Air	Permit to Con	struct/Operate		[C
CONTROL DEVICE ID NO: CD-PFB-BV EMISSION POINT (STACK) ID NO(S):	CONTROLS EMI	SSIONS FROM WHI	CH EMISSION :	SOURCE ID NO(S)	ES-HMA, ES-	PFB
MANUFACTURER: Aircon	POSHION IN SE	RIES OF CONTROLS	s	NO		2 UNITS
DATE MANUFACTURED: TBD		MODEL NO:	CAR 101-10	_		
OPERATING SCENARIO:		PROPOSED OPER		TONDATE		
OF1	Cardina - A Section of the later	P.E. SEAL REQUI			TBD	1
DESCRIBE CONTROL SYSTEM:						1 NO
The bin vent baghouse collects dust from when wood enter	s or exits the fines bin a	nd displaces air and	also provides	control from ham	nermill area cle	an up air and tran:
POLLUTANT(S) COLLECTED:		РМ	PM-10	PM-2.5		
BEFORE CONTROL EMISSION RATE (LB/HR):		See calculations in	Appendix B			_
CAPTURE EFFICIENCY:		~99.9 %	~99.			-
CONTROL DEVICE EFFICIENCY:						_%
CORRESPONDING OVERALL EFFICIENCY:		%		-%	%	%
EFFICIENCY DETERMINATION CODE:		%		_%	_%	_%
TOTAL EMISSION RATE (LB/HR):		See calculations in	Appendix B		-	-
PRESSURE DROP (IN. H ₂ 0): MIN: MAX: 6"	GAUGE				0	
BULK PARTICLE DENSITY (LB/FT ³): 1.4	I3E-05	INLET TEMPERATE		ARNING ALARM?	NYES 6	NO
POLLUTANT LOADING RATE: 0.1 gr/cf inlet 🤞 L	B/HR CI GRAP	OUTLET TEMPERA				
INLET AIR FLOW RATE (ACFM): 9,800		FILTER MAX OPER				
	BAGS PER COMPARTM	E 100	THE TEMP	LENGTH OF BAG	(IN): 120	
DIAMETER OF BAG (IN.): 5.75 DRAFT:		G. FORCED	POS	FILTER SURFAC		1,520
AIR TO CLOTH RATIO: 6.45 FILTER DESCRIBE CLEANING PROCEDURES:	MATERIAL: Polyester or	equivalent		& WOVEN		
AIR PULSE				PARTI	CLE SIZE DISTR	BUTION
REVERSE FLOW	e SONIC			SIZE	WEIGHT %	CUMULATIVE
MECHANICAL/SHAKER	SIMPLE BAG C			(MICRONS)	OF TOTAL	%
d OTHER	👌 RING BAG CO	JLLAPSE	2	0-1	Uni	nown
DESCRIBE INCOMING AIR STREAM:				1-10		
The air stream will contain wood dust particles. Larger partie	cles will have been			10-25 25-50		
emoved by the upstream cyclone. The filters will discharge	to a common stack. Thi	8		25-50		
stack will also accept the discharge air flow from a third bag	fliter (CD-HMA-BF)	-		>100		
located in this area.)	,				TOTA	AL = 100
METHOD FOR DETERMINING WHEN TO CLEAN:					1017	
	JAL					
ALARM						
ALARM A INTERNAL INSPECTION	VISIBLE EMISS		HER			
MOISTURE BLINDING & CHEMICAL RESISTIN	ATY	d oture				
EXPLAIN:		OTHER				
ESCRIBE MAINTENANCE PROCEDURES: Per manufacture	r recommendations					
IN A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE						

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

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SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

NCDENR/Divisi	ion of Air Quality	- Applicatio	n for Air Perm	it to Constru	ct/Onerate		В
EMISSION SOURCE DESCRIPTION: Hammermill Area			EMISSION	SOURCE ID	NO [.]	ES-HMA	
ODEDATING CORTINET			CONTROL	DEVICE ID N	0(S)·	CD-PFB-BV	
DESCRIPE IN DETAIL THE ENGLIDE	1			POINT (STAC	K) ID NO(S)	EP-15	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROC	ESS (ATTACH FI	LOW DIAGR	AM):		1010(0).	EL+19	
Hammermill area dust from the hammermill and scree particulate matter emissions.	ening operations	will be vent	ed to the pell	et fines bin bi	n vent filter /C		
particulate matter emissions.					vent litter (C	D-FFD-DV) (0	control
TYPE OF EMISSION SOURCE (CHEC	K AND COMPLET		NATE FORM				
Coal,wood,oil, gas, other burner (Form B1)	odworking (Form I		ATEFORM	B1-B9 ON TH	E FOLLOWING	G PAGES):	
I Int.compustion engine/generator (Form B2)	ting/finishing/adm	Uni Kan (Farm Dr	[] Manuta	act. of chemica	ls/coatings/ink	s (Form B7)	
	iting/finishing/print age silos/bins (Fo	ang (Form 85)		
	age slos/bins (Fo		📕 Other (Form B9)			
MANUFACTURER / MODEL NO.: TBD	TION DATE:	1Q2014	DATE MAN	UFACTURED		TBD	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):		EXPECTED	OP. SCHED	ULE: 24 H	R/DAY 7		2 WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	NESI	HAP (SUBPA	RT?):		SUBPART?):		- mont
EXPECTED ANNUAL HOURS OF OPERATION 8	3 25% MAR	-MAY 25%	JUN-AU	C 25%	OFF MAN	25%	
BIERATION 8	760 VISIBLE ST	ACK EMISSIC	ONS UNDER M	NORMAL OPE	RATION: <	0 % OPAC	TTY
CRITERIA AIR POLL	THUT LINGO	IONS INF	URMATION	FOR THIS	SOURCE	A OI AC	HERE THE REAL PROPERTY OF
	SUURCEO	EXPECT	ED ACTUAL	1	POTENTIAL	EMSSIONS	the grant of the state of the state
AIR POLLUTANT EMITTED	EMISSION	(AFTER CON	TROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	AFTER CONT	01010100
PARTICULATE MATTER (PM)	FACTOR	lb/hr	tons/vr	lb/br	tons/yr	lb/hr	
PARTICULATE MATTER (PM) PARTICULATE MATTER <10 MICRONS (PM10)	See Emissio	on Calculatio	ns in Append	lix B	tonaryi	10/11	tons/yr
PARTICULATE MATTER<2.5 MICRONS (PM10)					1		
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)			1				
VOLATILE ORGANIC COMPOUNDS (VOC)							
EAD							
OTHER							
				1			
HAZARDOUS AIR POLL	UTANT EMIS	SIONS INF	ORMATIO	N FOR THI	SSOURCE	TIDE STATE SALES	No. of Street Cont Street of
	In the second	EXPECTE	DACTUAL	I	POTENTIAL	EMECIONO	金田川の登場というな
AZARDOUS AID DOLLUTANT AND A SAME	EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CONT	ROLS / LIMITS)		
AZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	(AFTER CONTR	
UA			1	- Corrit	withsiyi	lb/hr	tons/yr
TOXIC AIR POLLUTA INDICATE EXPECTE	NT EMISSION	VS INFOR	MATION FO	DR THIS ST	VIDOE	or the state of the second second	No et a carte and
INDICATE EXPECTE	ED ACTUAL EMIS	SIONS AFTE	RCONTROL	S/LIMITATION	IS	The Production of the State	The second second
CAS NO.	EF SOURCE	lb	/hr	the second se	A PROPERTY AND A PROPERTY		
/A				lb/d	ay	lb/y	ſ
tachments: (1) emissions calculations and supporting documentation	n: (2) indicato all						

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

Attach Additional Sheets As Necessary

FORM B9 EMISSION SOURCE (OTHER)

EMISSION SOURCE ID NO: CONTROL DEVICE ID NO(S): EMISSION POINT (STACK) ID NO	ES-HMA CD-PFB-BV
CONTROL DEVICE ID NO(S): EMISSION POINT (STACK) ID NO	
EMISSION POINT (STACK) ID NO	CD-PFB-BV
	201
s will be vented to the pellet fines bin b	
	REQUESTED CAPACITY
T 71.71	LIMITATION(UNIT/HR)
MAX. DESIGN	REQUESTED CAPACITY
	LIMITATION (UNIT/BATCH)
ES/YR):	
AXIMUM FIRING RATE (MILLION BTU/H	R): N/A
TED CAPACITY ANNUAL FUEL USE:	N/A
	MAX. DESIGN S CAPACITY T 71.71 MAX. DESIGN CAPACITY (UNIT/BATCH)

Attach Additional Sheets as Necessary

Trinity Consultants

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Specific Forms - Final Product Handling

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

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

EMISSION SOURCE DESCRIPTION:	on of Air Quality	- Applicatio	n for Air Perm	it to Constru	ct/Operate		В
Finished Product Handling/ Pellet Loadout Bins / Pellet	at Londout		Et lloolou				S-PB1 thru 4,
				SOURCE ID		ES-PL1 ar	
OPERATING SCENARIO 1 OF	1		EMISSION	DEVICE ID N	IO(S):	CD-FPH-B	F
DESCRIPT IN DETAIL THE THREE IN THE	the second se		IEMISSION	POINT (STAC	CK) ID NO(S):	EP-16	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROC	ESS (ATTACH FL	OW DIAGR	AM):				
I STORAGE PRODUCT IS CONVEYED TO 4 DAllet loadout bing	100 4 0 0 AL			operations (ES-PL-12) F	missione fr	om the Dellet
Loadout Bins are controlled by a bagfilter. Pellet Load automatically telescopes upward during the loadout p	out is accomplis	shed by grav	ity feed of the	pellets into	rucks through	a covered	un tre renet
automatically telescopes upward during the loadout p emissions to the atmosphere from conveyance from the	rocess to mainta	in constant	contact with p	roduct as it i	s loaded to pr	event omice	ions Althous
emissions to the atmosphere from conveyance from the coolers, a slight negative pressure is maintained in the	ne storage bins	are minimal	because of dr	ied wood fin	es have been r	emoved in t	ha poliot
coolers, a slight negative pressure is maintained in the building. The slight negative pressure is produced via	e loadout buildin	g a fire prev	ention measur	e to prevent	any buildup of	f dust on su	face within A
building. The slight negative pressure is mantained if dia loading of the pellet press silo. Trucks are covered im	an induced draf	t fan that ex	hausts to the s	same baofilte	r that controls	minor duct	amicolone for
loading of the pellet press silo. Trucks are covered im	mediately after le	oading.				s minor dust	emasions no
TYPE OF EMISSION SOURCE (CHEC	K AND COMPLE	TE APPROP	RIATE FORM	B1-B9 ON TH	E FOLLOWIN	G PAGESI	
	anonang (Forme	141	 Manutar 	ct. of chemica	ls/coatings/inks	(Form 87)	
Int.combustion engine/generator (Form B2) Coat Coat	ing/finishing/printi	ng (Form B5) 🗍 Incinera	tion (Form B8	i)	5 (1 0111 07)	
Liquiu storage tanks (Form B3)	ge silos/bins (Forr	n B6)	Other (F		<i>y</i>		
START CONSTRUCTION DATE: TBD OPERAT	ION DATE:	1Q2014				TBD	
MANUFACTURER / MODEL NO.: TBD		EXPECTED	OP. SCHEDI	1 F 24 H	R/DAY 7		F0 144440 (D)
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):_	NESH	AP (SUBPA	RT?):		(SUBPART?):	DAY/WK	52_WK/YR
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	25% MAR-	MAY 25%	ILIN-ALI/	2 254/	OCD MON	25%	
EXPECTED ANNUAL HOURS OF OPERATION 8,	760 VISIBLE STA	CK EMISSI					CITY
CRITERIA AIR POLL	TAULI LINISS	nons inf	ORMATION	FOR TH	SOURCE	0 /0 OFF	
	SOURCE OF	EXPECT	ED ACTUAL	1	POTENTIA	L EMSSION	
AIR POLLUTANT EMITTED	EMISSION	(AFTER CON	TROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		TROLS / LIMITS)
PARTICULATE MATTER (PM)	FACTOR	lb/hr	fons/vr	lb/br	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM) PARTICULATE MATTER <10 MICRONS (PM19)	See Emissio	n Calculatio	ns in Appendi	хB	- ternary.	10/11	tonsryi
PARTICULATE MATTER<2.5 MICRONS (PM ₁₀)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)	_						
CARBON MONOXIDE (CO)	_						
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							
HAZARDOUS AIR POLL	TITANT ENT	SIALIS III	FORMER				
	SOURCE OF	SIONS IN	FORMATIO	IN FOR TH	IS SOURCE		THE REAL PROPERTY OF
	EMISSION	GALECIE	DACIUAL		POTENTIAL	EMSSIONS	
AZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	(AFTER CONT	ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CON	TROLS / LIMITS)
I/A	PACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		1000000					
TOXIC AIR POLLUTA INDICATE EXPECT	NT EMISSIO	NS INFOR	MATIONE	OP THIS S	OUDCE		and the second
	ED ACTUAL EMIS	SIONS AFT	ER CONTROL	S/I IMITATI	NIC	11 0110 10 12 3 S	Marshall Procession
OLEOTANT AND GAS NO.	EF SOURCE	lh	/hr I	lb/c			
/Α				10/0	ay		/yr
	_						
hash-sector (d) to the sector se							
tachments: (1) emissions calculations and supporting documentation	n; (2) indicate all red	uested state a	nd federal enforce	ochia e emit ti-	1. 1		

lescribe how these are monitored and with what frequency: and (3) describe any monitoring devices, gauges, or test ports for this source. COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE Attach Additional Sharts Ac No.

Attach Additional Sheets As Necessary

FORM B9 EMISSION SOURCE (OTHER)

EMISSION SOURCE DESCRIPTION: Finished Product Har	ndling	n for Air Permit to Construct/Ope EMISSION SOURCE ID NO:	the second se	B 9
		CONTROL DEVICE ID NO(S):	ES-FPH	
OPERATING SCENARIO: 1 OF 1		EMISSION POINT (STACK) ID N	CD-FPH-BF	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):			O(S): EP-16	_
Collection of transfer points, pellet screening operations, a	nd pellet conve	/ing.		
MATERIALS ENTERING PROCESS CONTINUOUS PROC	ESS ***	MAX. DESIGN	REQUESTED CA	
TYPE	UNITS	CAPACITY (UNIT/HR)		
Dried Wood	ODT	74.94		(HR)
MATERIALS ENTERING PROCESS - BATCH OPERATIO TYPE	ON UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAP LIMITATION (UNIT/B	
AXIMUM DESIGN (BATCHES / HOUR):				
EQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR).		
EL USED: N/A		/· UM FIRING RATE (MILLION BTU/I		_
AX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED	CAPACITY ANNUAL FUEL USE:		
DMMENTS:	1	A AOT ANNUAL FUEL USE:	N/A	

Attach Additional Sheets as Necessary

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V.

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01	NCDENR/Div	ision of Air Qua	lity - Applicat	ion for Air Permit to C			-
EMISSION SOURCE DESCRI	PTION: Four (4) Pell	et Loadout Bins	i i i i i i i i i i i i i i i i i i i		OURCE ID NO:		B6
					EVICE ID NO(S):	ES-PB1 throu	gh 4
OPERATING SCENARIO:	1	OF	1	EMISSION P	OINT(STACK) ID NO(S):	CD-FPH-BF	
DESCRIBE IN DETAIL THE PR	ROCESS (ATTACH FLC	W DIAGRAM):		Lindolohti	UNITIONACK) ID NO(S):	EP-16	
Pellet loadout bins ar areas.	e used to store peliets	for shipping. F	^s ellets are the	n loaded from the bin	s into trucks/train in either	r of the two pelle	t loadout
MATERIAL STORED: Pelle	t Product			DEMOITY			
CAPACITY	CUBIC FEET:			DENSITY OF MATER	RIAL (LB/FT3): 4	ю	
DIMENSIONS (FEET)	HEIGHT:	DIAMETER:	12 (OR)	TONS:	1		
ANNUAL PRODUCT THR		ACTUAL:	12 (01)	LENGTH:	WIDTH: HEIGH		
PNEUMATICALLY F	ILLED		HANICALLY F	MAXIMUM DE	SIGN CAPACITY:	71.19 ODT/	าก
BLOWER	6	SCREW CONV				D FROM DE LOUR	19-17-17-17-17-17-17-17-17-17-17-17-17-17-
COMPRESSOR	C.				RAILCAR		
OTHER:	0	BELT CONVEY		MOTOR HP:	TRUCK		
	e	BUCKET ELEV	ATOR		STORAGE PILE		
NO. FILL TUBES:		OTHER:			OTHER:	Conveyor	
AXIMUM ACFM: 750 e							
3Y WHAT METHOD IS MATER	IAL UNLUADED FROM	SILO?					
AXIMUM DESIGN FILLING RA		NS/HR)					
AXIMUM DESIGN UNLOADIN		(TONOUID)					
OMMENTS:	O TATLE OF MATERIAL	(TONS/HR):					

Attach Additional Sheets As Necessary

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FORM B9 EMISSION SOURCE (OTHER)

EMISSION SOURCE DESCRIPTION: Pellet Loadout 1 and 2		n for Air Permit to Construct/Ope		B 9
		EMISSION SOURCE ID NO:	ES-PL-1 and PL-2	
DPERATING SCENARIO: 1 OF 1		CONTROL DEVICE ID NO(S):	CD-FPH-BF	
ESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):		EMISSION POINT (STACK) ID N	O(S): EP-16	
Final product is loaded into trucks in either of the two (2) peil	iet loadout are	â\$.		
MATERIALS ENTERING PROCESS - CONTINUOUS PROCE	\$ 5	MAX. DESIGN	REQUESTED	CADAOITY
TYPE	UNITS	CAPACITY (ODT)		
Dried Wood	ODT	70.83	LIMITATION	UNIT/HR)
MATERIALS ENTERING PROCESS - BATCH OPERATION TYPE	N UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED LIMITATION (UN	
XIMUM DESIGN (BATCHES / HOUR):				
EQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):		
EL USED: N/A		UM FIRING RATE (MILLION BTU/		
AX. CAPACITY HOURLY FUEL USE: N/A	RECHESTED /	CAPACITY ANNUAL FUEL USE:		
DMMENTS:	LCGOLOTED (APACITY ANNUAL FUEL USE:	N/A	

Attach Additional Sheets as Necessary

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			RM C1				
REVISED 12/01/01	CON	TROL DEVIC	E (FABRIC F	ILTER)			
REVISED 12/01/01	NCDENR/Div	ision of Air Quality	- Application for Al	r Permit to Co	nstruct/Operate		10
CONTROL DEVICE ID NO: CD-FE EMISSION POINT (STACK) ID NO(S);		CONTROLS EMIS			SOURCE ID NO(S):	ES-PL1 and 2	PB-1 through 12,
MANUFACTURER: Aircon			MODEL NO:	TBD	Ň	D. 1 OF	1 UNITS
DATE MANUFACTURED: TBD			PROPOSED OPE		202014		
OPERATING SCI	MARIO:		PROPOSED STAP	RT CONSTRUC	TION DATE:	TBD	
OF1			P.E. SEAL REQUI	RED (PER 2Q	0112)?	-	é NO
DESCRIBE CONTROL SYSTEM:							
This bagfilter will be utilized to control particula loading finished product from the bins into the f	te form the finishe rucks.	d product handling	pellet conveyers a	nd screens, as	well as the pellet lo	ad out operation	n consisting of
POLLUTANT(S) COLLECTED:			РМ	PM-10	PM-2.5		
BEFORE CONTROL EMISSION RATE (LB/HR):			See calculations in			-	_
CAPTURE EFFICIENCY:							_
CONTROL DEVICE EFFICIENCY:			~99.9 %	~99.	9 %~99.	9%	%
CORRESPONDING OVERALL EFFICIENCY:			%		_%	%	%
			%		%	%	%
FFICIENCY DETERMINATION CODE:							_
OTAL EMISSION RATE (LB/HR):			See calculations in	Appendix B			-
PRESSURE DROP (IN. H ₂ 0): MIN: MAX:	6"	GAUGE?	YES)		ARNING ALARM?	Nume 1	_
BULK PARTICLE DENSITY (LB/FT3):	1.43E-05		INLET TEMPERATU			EXES	NO
OLLUTANT LOADING RATE: 0	10 & LB/HR		OUTLET TEMPERA		-		
	500		FILTER MAX OPER	ATING TEMP	(°F): N/A		
IO. OF COMPARTMENTS:	1 NO. OF BAGS	PER COMPARTME	NT:		LENGTH OF BAG	IN.): 144	
IAMETER OF BAG (IN.): 5.75 IR TO CLOTH RATIO: 7.30	DRAFT:	INDUCED/NEG		POS	FILTER SURFACE		4,842
IR TO CLOTH RATIO: 7.30 ESCRIBE CLEANING PROCEDURES:	FILTER MATER	RIAL: Polyester or a	equivalent		& WOVEN	FELTI	
AIR PULSE					PARTIC	E SIZE DISTRIC	UTION
REVERSE FLOW		SONIC			SIZE	WEIGHT %	CUMULATIVE
MECHANICAL/SHAKER		SIMPLE BAG CO			(MICRONS)	OF TOTAL	%
d OTHER		RING BAG CO	LLAPSE		0-1	Unk	nown
ESCRIBE INCOMING AIR STREAM:					1-10		
te air stream will contain wood dust particles.					10-25		
					25-50		
					50-100		
					>100		
ETHOD FOR DETERMINING WHEN TO CLEAN:						TOTA	L = 100
	& MANUAL						
ALARM							
ALARM INTERNAL INSPECT	ION	VISIBLE EMISSIC		IER			
	L RESISTIVITY		OTHER				
SCRIBE MAINTENANCE OBCORDUNE		man and will a set a					
SCRIBE MAINTENANCE PROCEDURES: Per m	anufacturer recom	mendadons					
SCRIBE MAINTENANCE PROCEDURES: Per m	anufacturer recom	mendadons					
SCRIBE MAINTENANCE PROCEDURES: Per m	anufacturer recom	mendadons					

Attach Additional Sheets As Necessary ¹Final equipment selection has not yet occurred but will be similar in design to specifications shown.

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Source Specific Forms - Emergency Generator & Fire pump

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 NCDENR/Division of	of Air Quality -	Application f	or Air Permit	to Construct	Operate		В
EMISSION SOURCE DESCRIPTION:			EMISSION S	OURCE ID N	D:	ES-EG	
Emergency Generator (250 bhp)			CONTROL D	EVICE ID NO	(S):	N/A	
OPERATING SCENARIO 1 OF	1		EMISSION P	OINT (STACK	() ID NO(S):	EP-13	
DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS	S (ATTACH FLC	W DIAGRAM					
Diesel-fired internal combustion generator to provide por	wer in the case	of an emerg	ency.				
			-				
TYPE OF EMISSION SOURCE (CHECK A	ND COMPLETE	APPROPRIA	ATE FORM B	1-B9 ON THE	FOLLOWING	PAGES):	
Coal,wood,oil, gas, other burner (Form B1)	orking (Form B	4)	🗌 Manufac	t. of chemical	s/coatings/inks	(Form B7)	
Int.combustion engine/generator (Form B2)	/finishing/printir	a (Form 85)	Incinerati	on (Form B8)			
	silos/bins (For		Other (Fo	orm B9)			
START CONSTRUCTION DATE: TBD OPERATIO		TBD	DATE MANU			TBD	
MANUFACTURER / MODEL NO.: TBD			OP. SCHEDU		DAY 7		52 WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):		(SUBPART?			BPART?): ZZ		
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB			JUN-AUG		SEP-NOV	25%	
EXPECTED ANNUAL HOURS OF OPERATION 50	VISIBLE STA	CK EMISSION	IS UNDER NO	ORMAL OPER			CITY
CRITERIA AIR POLLUT							
	SOURCE OF		DACTUAL		Statement of the local division of the local	EMSSIONS	states of the local day is not in
	EMISSION	(AFTER CONT		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)			s in Appendi		toris j.	10/11	torio ji
PARTICULATE MATTER<10 MICRONS (PMm)			[
PARTICULATE MATTER<2.5 MICRONS (PM25)	-						1
SULFUR DIOXIDE (SO2)	1						1
NITROGEN OXIDES (NOx)	1						1
CARBON MONOXIDE (CO)							1
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD			C				
OTHER							
HAZARDOUS AIR POLLU	TANTEMIS	SIONS INF	ORMATIO	VFOR TH	S SOURCE	live entry and	增加加于法律的法师
	SOURCE OF	EXPECTE	DACTUAL	1	POTENTIAL	EMSSIONS	
	EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	AFTER CON	TROLS / LIMITS)
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	See Emissio	n Calculation	s in Appendi	хВ			
					1		
					1		
TOXIC AIR POLLUTA	NT EMISSIO	NS INFOR	MATION F	OR THIS S	OURCE	The state	
INDICATE EXPECTE	D ACTUAL EMI	SSIONS AFTE	R CONTROL	S/LIMITATIC	ONS		
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb	/hr	(b)	day	1	b/yr
	See Emissio	n Calculation	is in Appendi	хB			
Attachments: (1) emissions calculations and supporting documentation	n: (2) indicate all re	quested state a	nd federal enford	eable permit lim	its (e.g. hours of	operation, emi	ssion rates) and

describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source. COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

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EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATORS)

REVISED 12/01/01	NCDENR/Division of Air				te	B2
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE I		ES-GN
				CONTROL DEVICE ID	NO(S):	N/A
OPERATING SCENARIO:	1 OF	1		EMISSION POINT (ST	ACK) ID NO(S):	EP-13
CHECK ALL THAT APPLY	EMERGENCY	SPACE I	IEAT	ELECTRICAL (GENERATION	
4	PEAK SHAVER	OTHER	DESCRIBE):			
GENERATOR OUTPUT (KW):	AN	TICIPATED AC	TUAL HOURS OF	OPERATION AS PEAK	SHAVER (HRS/YR)	
ENGINE OUTPUT (HP):						THE THE PLOT
TYPE ICE: CASOLINE ENGINE OTHER (DESCRIBE		CHARLES BELLEY		EL ENGINE GREATER (complete belo	CALL DO YOUR PROVIDENCE	DUAL FUEL ENGINE
ENGINE TYPE 🛛 👌 RICH BURI		(N/A)				OTHER
EMISSION REDUCTION MODIFICATION		TIMING RETAR		GNITION CHAMBER CO		
OR STATIONARY GAS TURE	The loon proto a crown			COMPRESSOR OR TU		elow) TURBINE
FUEL: A NATURAL GAS	OIL EN	GINE TYPE:	2-CYCLE L		'CLE LEAN describe):	TURBINE
OTHER (DESCRIBE):			4-CYCLE F	ION MODIFICATIONS (
CYCLE: COGENERATION	0 0111 10	NTROLS:	E CATALYTIC RE		ECTIVE CATALYTIC	REDUCTION
				STION CHAMBER	UNCONTRO	
	LEAN-PREMIX	CLEAN BURN	AND FRECOMDO	STICH CHANDER	0.0110011110	
UNCONTROLLED	FUEL USA	SE (INCLUD	E STARTUP/E	ACKUP FUEL)	10.00 (Street Street	AND THE PARTY AND
			AXIMUM DESIG		REQUESTED C/	APACITY
FUEL TYPE	UNITS		APACITY (UNIT/H		LIMITATION (U	
No. 2 Fuel Oil	gal		6.55		6.55	
NO. 2 Fuel Oli	Hen					
	FUEL CHARACTERIS	STICS (COM	PLETE ALL T	HAT ARE APPLIC	ABLE) 1 Stratis	信由的问题不是这些问题
					SULFUR CO	INTENT
FUEL TYPE	BTU/UNIT		UNITS		(% BY WEI	ЭНТ)
No. 2 Fuel Oil	19,300		lb		<15 ppmw	
South and the state of the method of the	MANUFACTURER'S	SPECIFIC E	MISSION FAC			
POLLUTANT	NOX	co	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						
DESCRIBE METHODS TO MININ	IZE VISIBLE EMISSIONS	DURING IDL	ING, OR LOW I	OAD OPERATIONS	:	
Periodic equipment maintenance wi	I minimize opacity by follo	wing manufact	urers specificatio	n or common industry	practices.	
COMMENTS:						
~						
	Attack	Additiona	Sheets As	Necessarv		

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SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES) -terent/Onerate

REVISED 12/01/01 NCDENR/Divisi	on of Air Quality - Ap	plication for A	AIT Perinkt to	Constructor	, I	ES-FWP	
MISSION SOURCE DESCRIPTION:		EN	AISSION SC	URCE ID NO		N/A	
ire Water Pump (250 bhp)		C	UNTROL DE	VICE ID NO	- · · · · · · · · · · · · · · · · · · ·	EP-14	
DEDATING SCENARIO 1 OF	1	E	AISSION PC	INT (STACK)	10 NO(5): 1	GP*14	
ESCRIPTION DETAIL THE EMISSION SOURCE PROC	ESS (ATTACH FLOW	DIAGRAM):					
iesel-fired internal combustion pump to provide wa	ter in the case of a fir	re emergency	•				
				DO ON THE	OLLOWING	PAGES)	
TYPE OF EMISSION SOURCE (CHEC	K AND COMPLETE A	APPROPRIAT	E FORM B1	-RA ON THE	coatings/inks	(Som 87)	
Coal.wood.oil, gas, other burner (Form B1)	podworking (Form B4)		Manuracu	of chemicais	coaungsmiks	(10111127)	
Int combustion engine/generator (Form B2)	ating/finishing/printing			on (Form B8)			
Liquid storage tanks (Form B3)	brage silos/bins (Form	B6) [Other (Fo	rm 89)			
START CONSTRUCTION DATE: TBD OPER	ATION DATE:	TBD D.	ATE MANU	ACTURED:		TBD	52 WK/YR
MANUFACTURER / MODEL NO.: TBD	E	XPECTED OF	SCHEDUL	E: 24 HR			52 WWWTR
S THIS SOURCE SUBJECT TO? NSPS (SUBPART?):	IIII NESHAP (SUBPART?):_			BPART?): ZZ	22	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FE	D 25% MAR.MA	Y 25%	JUN-AUG	25%	SEP-NOV	25%	CITY
		K EMISSIONS	UNDER NO	ORMAL OPER	ATION: <20	the second second second	
EXPECTED ANNUAL HOURS OF OPERATION CRITERIA AIR POLL	UTANT EMISSIO	INS INFOR	MATION	FOR THIS	SOURCE	of sense she that a sense	
A PROPERTY OF A	SOURCE OF	EXPECTED	ACTUAL		POTENTIAL	EMSSIONS	5
	EMISSION	(AFTER CONTRO	LS / LIMITS)		ROLS / LIMITS)		TROLS / LIMITS)
AIR POLLUTANT EMITTED	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	See Emission	Calculations	in Appendi	кВ			
PARTICULATE MATTER<10 MICRONS (PM10)							
PARTICULATE MATTER < 2.5 MICRONS (PM2.5)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
			BILLENO	TEAD TU	COUDOR	the plan in sin for	and the state of the second
OTHER HAZARDOUS AIR PO	LLUTANT EMISS	SIONS INFC	RMAIIU	N FOR TH	POTENTIA	ENESION	C.
	SOURCE UF	EXPECTED	ACTUAL				NTROLS / LIMITS)
	EMISSION	(AFTER CONTRI			tons/yr	lb/hr	tons/yr
HAZARDOUS AIR POLLUTANT AND CAS NO.	FACTOR	ib/hr	tons/yr	lb/hr	tonsiyi	10/11	10110-11
	See Emission	Calculations	in Append	IX B			_
							1.
					-		
					-		
OX(CAIR POLL	TTUTEUREIA	IS INFOR	ATION	OR THIS S	OURCE	in the second	
TOXIC AIR POLL	ECTED ACTUAL EMIS	CIONS ALTE	CONTRO	S/IMITATI	ONS		
	ECTED ACTUAL EMIS	BIONS AFTE	CONTINO	I II	/day	1	lb/yr
TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE See Emission						
	See Emission	Galculation	a machhauc				
				-			
				-			
		survey and a set	d fodoral cofo	rceable nermit li	mits (e.o. hours o	of operation, e	mission rates) ar

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source. COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

Trinity Consultants

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FORM B2 EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATORS) -it to Construct/Operate

REVISED 12/01/01	NCDENR/Division of Air Quali	ty - Application for Air Permit t	Construct/Operate		B2
EMISSION SOURCE DESCRIPTION:		EM	SSION SOURCE ID	NO: ES	S-FWP
EMISSION SOURCE DESCRIPTION.	The mater i drip (not stip)	со	NTROL DEVICE ID N	IO(S): N/	A
OPERATING SCENARIO:	1 OF 1	EM	SSION POINT (STA	CK) ID NO(S): EF	2-14
CHECK ALL THAT APPLY	EMERGENCY	SPACE HEAT OTHER (DESCRIBE):	ELECTRICAL GE	ENERATION	
GENERATOR OUTPUT (KW):	ANTICIP	ATED ACTUAL HOURS OF OPE	RATION AS PEAK S	HAVER (HRS/YR):	
ENGINE OUTPUT (HP):					
TYPE ICE: GASOLINE ENGINE OTHER (DESCRIBE	Contraction of the second s	TO 600 HP & DIESEL E	NGINE GREATER T (complete below	CALES AND ALCOMENTS OF THE	UAL FUEL ENGINE
ENGINE TYPE RICH BURI	LEAN BURN	N/A)			******
EMISSION REDUCTION MODIFICATI	ONS INJECTION TIMIN	IG RETARD 🕴 PREIGNIT	ION CHAMBER COM		THER
OR STATIONARY GAS TURE	Addressed Constant Contraction in the second second	NATURAL GAS PIPELINE CO		BINE (complete below)	DINE
FUEL: A NATURAL GAS	OIL ENGINE				BINE
OTHER (DESCRIBE):		4-CYCLE RICH	MODIFICATIONS (D	R (DESCRIBE):	
CYCLE: COGENERATION	SIMPLE CONTR			CTIVE CATALYTIC RE	DUCTION
REGENERATIVE		SELECTIVE CATALYTIC REDUCEN BURN AND PRECOMBUSTIC		UNCONTROLLE	
		AN BURN AND PRECOMBUSTIC		0 0110011110111	
UNCONTROLLED	LEAN-PREMIX	NCLUDE STARTUP/BAC	KUP FUEL	· Standard and State	
Chanter of the part of the second	FUEL USAGE	MAXIMUM DESIGN		REQUESTED CAPA	CITY
	UNITS			LIMITATION (UNIT/	
FUEL TYPE		6.55		6.55	
No. 2 Fuel Oil	gal	0.00			
		S/COMPUTERAL THA		BLE)	
	FUEL CHARACTERISTIC	S (COMPLETE ALL THA	AREAPPLICA	BLE)	enansi ya hasini NT
			TARE APPLICA	BLE) SULFUR CONTE (% BY WEIGHT)	ENT
FUEL TYPE	BTU/UNIT	UNITS		SULFUR CONTE (% BY WEIGHT)	ENT
				SULFUR CONTE	ENT
FUEL TYPE	BTU/UNIT	UNITS		SULFUR CONTE (% BY WEIGHT)	ENT
FUEL TYPE No. 2 Fuel Oil	BTU/UNIT 19,300	UNITS Ib		SULFUR CONTE (% BY WEIGHT) <15 ppmw	ENT
FUEL TYPE No. 2 Fuel Oil	BTU/UNIT 19,300 MANUFACTURER'S SP	UNITS		SULFUR CONTE (% BY WEIGHT) <15 ppmw	
FUEL TYPE No. 2 Fuel Oil POLLUTANT	BTU/UNIT 19,300	UNITS Ib ECIFIC EMISSION FACTO	RS (IF AVAILAR	SULFUR CONTE (% BY WEIGHT) <15 ppmw	
FUEL TYPE No. 2 Fuel Oil POLLUTANT EMISSION FACTOR LB/UNIT	BTU/UNIT 19,300 MANUFACTURER'S SP	UNITS Ib ECIFIC EMISSION FACTO	RS (IF AVAILAR	SULFUR CONTE (% BY WEIGHT) <15 ppmw	
FUEL TYPE No. 2 Fuel Oil POLLUTANT	BTU/UNIT 19,300 MANUFACTURER'S SP NOX	UNITS	PM10	SULFUR CONTE (% BY WEIGHT <15 ppmw BLE) VOC	
FUEL TYPE No. 2 Fuel Oil POLLUTANT EMISSION FACTOR LB/UNIT UNIT	BTU/UNIT 19,300 MANUFACTURER'S SP NOX	UNITS	PM10	SULFUR CONTE (% BY WEIGHT <15 ppmw BLE) VOC	

Attach Additional Sheets As Necessary

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APPENDIX B Emissions Calculations

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APPENDIX B - EMISSIONS CALCULATIONS

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TABLE B-1 PSD APPLICABILITY SUMMARY ENVIVA PELLET SAMPSON, LLC

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								_			CO _{2e biomass}
Source	Unit	CO	NOx	TSP	PM-10	PM-2.5	S02	VOC	Pb	CO_{2e}	1 deferral
Description	Ð	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
Drver Svstem	ES-DRYER	230.45	219.35	51.55	51.55	51.55	27.42	288.25	0.00E+00	229,828	3,064
enerator	ES-EG	0.36	0.41	0.02	0.02	0.02	0.0002	0.41	,	67	67
	ES-FWP	0.36	0.41	0.02	0.02	0.02	0.0002	0.41	ı	67	67
	ES-HM-1 thru 8	ŧ		18.02	18.02	0.06		34.37	ı	•	•
ed Silo	ES-PMFS		1	0.37	0.37	0.37	'	ı	ı	٤	'
'Hammermill Area	ES-PFB, ES-HMA	•	•	1.47	1.47	1.47	•	'	ı	ı	•
	ES-CLR1 thru -6	1	1	59.47	15.49	1.90		227.64	1	ı	
	ES-BARKHOG							0.37			
	ES-CHIP-1	•	,	1	ŧ)	ı	•	1.25	•	•	1
Iammermills	ES-GHM-1, ES-GHM-2	•	ı	3.00	3.00	3.00	1	50.53	ı	•	•,
g/ Pellet Loadout	ES-FPH/ ES-PL/ ES-PB-1	,	•	5.33	4.85	0.02	•	•	ı		'
Bins/ Pellet Loadout Area	& 2										
Paved Roads		•	'	2.42	0.48	0.12		'	1	1	•
Handling	IES-DWH			0:30	0.30	0.30					
Handling	IES-GWH	•	١	0.016	0.008	0.001	'	'	ł	r	•
	IES-GWSP1 & 2	1	1	4.01	2.00	0.30	r	2.93	ı	,	•
	TK1, TK2, & TK3	•	•	•	1	T	•	4.00E-03	•	•	
	Project Emissions	231.17	220.17	145.99	97.59	59.13	27.42	909	0.00E+00	229,961	3,197
S OSA	PSD Significant Emission Rate	100	40	25	15	10	40	40	09.0	75,000	75,000
	PSD Review Required	Yes	Yes	Ves	Yes	Yes	No	Yes	N0	Yes	0N

1. CO_{2e} does not include CO₂ from biomass combustion.

Enviva Sampson Emission Calculations and BACT v35 Total HAP

TABLE B-2 FACILITYWIDE HAP EMISSIONS SUMMARY ENVIVA PELLET SAMPSON, LLC

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	ES-DRYER	ES-EG	ES-FWP	ES-HM-1 through 7	ES-CLR-1 through 6	ES-BARKHOG	ES-CHIP-1	ES-GHM-1 & 2	Total
ncostripting	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
1 3-Butallione		1.71E-05	1.71E-05	•					0.00
Austalidehyde	6.520	3.36E-04	3,36E-04	0.645	2,075	B	,	1.297	10.54
Acctophenone	0.000						x	•	0.00
Acrolein	0.000	4.05E-05	4.05E-05	0.000	0.000		*	0.000	0.00
Antimony & Compounds	100.0	×			•	•			0.00
Arsenie & Compounds	0.002		•	•	•		·		0.00
Benzene		4.08E-04	4.08E-04						0.00
Beryllium metal (un-reacted) (Also include in BEC)	0.000	4		•					0070
Cadmium Meta? (elemental un-reauted) -(Add w/CDC)	0.000							'	0.00
Carbon tetrachloride	0.049		e			×		3	0.05
Chlorine	0.866		,				•		0.87
Chlorubenzene	0.036	•	•	E	54) 	•	•		0.04
Chromum-Other compute (add w/chrom acid to get CRC)	0.001	3		•	•	•	•		0.00
Cohalt compounds	0.001		•	•					0.00
Chloroform		•	•					4	0.00
Cumene								8	0,00
Dinitrophenol, 2,4-	0.000		r			•	•		0.00
Di(2-ethylbexvi)phtbalate (DBHP)	0.000	1							0.00
Ethyl benzene	0,034		*						0.03
Ethylene dichloride (1.2-dichtorochane)	0.032		1	•		•			0.03
Formaldehyde	16.597	5.16E-04	5.16E-04	1.017	1.355		•	0.772	9.74
Hydrogen chloride (hydrochloric acid)	2.084	,		9	ı		•	•	2.08
Lead and Lead computinds	0.004			4		,			0.00
m-,p-Xylene		1.25E-04	1.25E-04				•	æ	0.00
Manuarce & computade	0.127	•	ſ		•			1	0.13
Mercury, varior (Indude in Mercury&Compdu)	0.000	•		4		•			0.00
Methanol	35.643		•	0.484	2.098	0.079	0.209	6/2/0	59.13
Methyl bromide (bromumethane)	0.016							•	0.02
Methyl chloride (chloromethane)	0.025								20.0
Methyl chloroform [1,1,1 trichløroethane)	0.034			•				,	0.01
Methyl ethyl ketone	0.006	,					•		10.0
Methvi isobutvi ketone						•	+		000
Methylene chloride		•	4						0.00
Nickel metal (Component of Nickel & Compounds)	0.003		•	•					0000
Nitrophenol, 4-	0.000						•		0.00
0-Xylene			•						0.00
Pentachloro phenol	0.000		•	•		•	•		0.04
Perchlurouthylene (fetrachloroethylene)	0.042			0000	0000			0.000	0.00
Plenol	0.000			0,000	0000				0.00
Phosphorus Maclai, Y cilow of White	0000								0.00
CONCILION BALLING BALLING BALLING	8.840			0.430	0.406			0.188	9.86
Protytene dichloride (1,2 dichloropropane)	0.036					B	•	1	0.04
Selenium com pounds	0:000	-	100	×			•	•	0.00
Stytene		*				•		•	0.00
Tetmchlorodibenzo-p-dioxin, 2,3,7,8-	0.000								0.00
Toluene		1.79E-04	I.79E=04				4	1	0.00
Total PAH (POM)	0.137	7.35E-05	7.35E-05						0.14
Trichloroethylene	0.033						•		0.03
Trichlorophenol. 2,4,6-	0,000					•	•		0.00
Vinyl chloride	0.020		4				1	4	0,02
TOTAL HAPs	71.19	1.69E-03	1.69E-03	2.58	5,93	0.08	0.27	2.83	82.89
MAX INDIVIDUAL HAP	Formaldchyde	Formaldehyde	Formaldehyde	Methanol	Methanol	Methanof	Methanol	Methanol	Methanol
MAX INDIVIDUAL HAP VALUE	35.64	5.16E-04	5.16E-04	1.02	2.10	0.08	0.27	1.30	39.15

TABLE B-3 DETERNINATION OF POLLUTANTS SUBJECT TO AIR TOXICS PERMITTING ENVIYA PELLET SAMPSON, LLC

TAP Emission

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			here			Hammertulle			Pullet Coslera	1	SIN	Keinergeber, Gemeratur		1	ALLEY AND A ATIN				411-1-1
Description			a line	AL AL	ALA.	(the/other	Carles!	dhiter	Alb/days	Calves	(http://	(Ib/day)	(hort)	(MAR)	(th/dmy)	(14.97)	(hhr)	(b/de))	(IN)
Pulletant	CAS Number	(9-9-1)	(Julian)	(14,51)	(Incal)	1 mail					0.040	0.005	0.034	0.000	0.002	1-50'0	0.050	0.003.0	0.048
1 3-Butabute	0-64-501		•	•					100.00	TAK NEV T	100.0	10.000	11621	000	0.622	1600	3 468	59 224	18 491 803
Acetakehide	15-07-0	1 739	11 246	13,040 643	0 172	4 128	569'6R2'1	1.00	13 280	100000		Contract of Contra	1 NU N	in etfer	11 (1123	0.031	0.000	() (ÚB	0 162
Armlein	107-02-8	1.000		,	•	•	•		•		No.	NON A					0.000	0.010	3449
Andress		000.0	0.010	3 494			•	·	•	-	1000	10.0	0.016	0.00	0100	0.816	0.003	0.07%	1633
0	71-43-2					•		•		,	e.001-	6000	0.000	1000	1000	0000	0.001	0.016	5 703
Barris anno	50-32-8	0.001	0.016	5 703				•	•	-	1001	0 1541	200	2007	CAN'N	-	Cherline 1	La Calato	0175
D likin		0,000	0000	0 175			+								Ī	Ī	- CV#1	0.003	0.652
time to the time t		0,000	0.002	0.652	•		•								Ī	Ī	1100	0220	802 30
C. Martinette		0.611	0.270	93 708			•								Ī	Ī	ant v	47.1	1 313 644
Carbrin Legandor Ne		6.198	1748	1.732 #68						1						Ī	AVE I	401.7	To Tat
Chuoruse		0.568	0.194	72.386			1	•	•						Ī	I	0.00	0.10	-
CINOL DOCTOR	10000		1		•		•		-		•	·		·	·		UVU II	1000	11 557
CINOTOMITIA	2778.04.5	0.000	0.002	0.557	•			•		•					Ī	Ī	10000	0.040	0.101
two and the transformer of		0.000	0.000	0 105		1										Ī	CIMU D	0.174	63.612
C hand disht with a 1 Dality his wet have		4/10'0	0.174	63.612	•	1						1	1401	4 605	000	1 023	1005	111 546	17.940.110
Evenes in such that the second s	50.00-02	4.428	106.361	33, 194 265	0.271	6513	2,034 534	0.361	1 672	3,709.140	1000	In Ark	1 (13)	7000	Man	-	1 CIAN	0.010	3 510
Hererhterolly		0.000	0:010	3.510	•					1							0.476	11.418	4,107 058
H. dr. en chloride III. tochkric acid		0.476	11.418	4,167 658	4			•	•							Ī	0.029	1.697	941 HSZ
Menumera 2 0 Minute		0.029	0.697	254.446	1	•			·								N O(M)	0.402	0.557
Marcury varies Include an Marcury & Computer		0.000	0.003	0 557			•		ſ								0.000	01,116	62.999
Medi i chiorufonu 1 uichloroethune		0.008	0.1%6	64 1999		-	·	+	·								0.001	6.032	11 245
Mestini alhvi ketoria		1000	0.032	516.11			·	•			0.000	410.0	0.240	0000	210.0	0.249	100.0	0.024	0.499
X kase	1330-20-7	-					•	•	·		N DOG								•
Nictini sobului kotane	108-10-1		•					-											•
Mouthin letter of historiade	15-09-51	-		·	•		•										0.001	110.0	\$.248
Nickel metal (Component of Nickel & Consertable)		0.001	0.014	5.248	-	-											0.000	0,000	0112
Partachtor anti-and		0.000	0.000	0 112	•			-									9010	0.228	125 253
Purchloroeth dense (mirachloroeth-furne)		0.010	0.228	ESE [%													4		
Phenol	108-95-2	•					•	·	-								0.000	0.609	\$10.0
Pulvehheinsted bijninnyis		0.000	000.0	0.018			•		,									-	•
Shritte	100-12-5			1		-	-										0.000	0,000	0.000
Tetrachicrodib		0.000	0,000	0.000	•		+				Const.	410.0	0.356	0.001	0.017	0.358	0.001	0.014	0.716
Tolucus	104-MB-3		•						I		1000						0.008	0.180	65 805
Trichlorost in lane		0.003	0.130	65 805		-											0010	0 246	\$5 934
Truchlorafhiotomethane (CRC 111)		0010	0.246	89.934	•	-			1								002 N	0,108	18F 6E
Wined oblight		0.005	0,108	ET 65	•			-											

TI'ER Comparison Table

			Total			1170' 00 N311		Simonau
The second s	CAR Number	(hihr)	(Briday)	(Huyt)	(14/14)	(thide)	(14)(1)	Respired?
14 Date Land	University			6.848-02			1.102+01	R
	1611241	7 4784685			6.30E+0u			90
Austaliantige	102.02.8	A 74B-64			2.40E-02			ny.
Accession				3 50E+00			1.60E-02	tin .
United and a second sec	71-43-2			1.63E+00			\$. LUE+00	Ŋ
DERUZING	Su-32-8			5.70E+00			2,206+00	14
Defined Protein				1756-01			2 80E-01	Ŋ
anini ani				6 52E-01			3.708-01	105
Cataban Datises Teleschlodde				0.876+01			4.60E+1/2	A.
		1088-01	4.75E+00		2.308-01	10-306-5		14
Children Annuare			10-282.01			4.008+01		9%
Childraform.	67-66-7			0.60E+06			2 90E+02	%
Characterian article actions VI's	STOTAELL		1.528-03			1.308-02		92
Diractional and a state of a HPI			2.87E-04			6.30E-01		No
11 - Ime decktoorde - 1 3-dicht.weethane				6 36E+01			2.608+02	ex.
Terms Mehren	000005	\$.06E+00			4 00B-412			100
Dama Marrishter - Strein 1 2 2 5 7				3.518+00			5.10E-03	Les
tioner an eklaside te techkein anit		4 768-01			10-803 1			Yer
Maximum & compared in the second in the seco			6 97E-01			5,30B-01		T.u
Merries water (he)ade in Marcury&Connie)			1.528-03			1.308-02		2
total of exhercitents (1,1,1 trichloroothane)		7.766-03	1.265-01		6.408+01	2.50E+02		Nr.
Lighting atheit fragme		1 35E-03	3.25E-02		2.24B+01	7.\$06+01		9X
where .	1330-20-7	PO-235-6	2.395-02		1.648+01	3.705+01		2
ki i solvist-i kreisme	10k-10-1	0.008+00	U UOE+00		7.605-00	5.20E+01		2
Mail Inter ekheride	75-09-2	0.0013+00		0.00E+00	3 905-01		1.602+03	9X
Neter metal (Company of Nickel & Company			1.48-02			1,308-01		2
Pentachioro henoi		1 288-05	3 DFE-04		6-40E-03	6 30B-02		9
Perchistrative lense (tetras Norocthylane)				8.34E+01			H0+H0E.1	Pro-
Phenol	108-95-2	0.0012+00			10-H0+ C			Q.
Post recipient birth the				1 798-01			S 60)E+00	2
	100-42-5	0.058400			2 7uE+00			240
Teruthendbergeningen inter 13 7 %-				1 198-05			2,006-04	2
Talitate	108-86-3		3 442-02		1448+01	9 #0F+01		Ŷ
Tototoo				6.58E+01			4.008+63	×
To ALL ALCONOMINATION		1.038-02			1.408403			744
Visit showing				3.95E+UL			2.60E+01	215

Envive Sampten Envission Calculations and BACT V35 TPER Comparison

9age 3 of 19

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

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Dryer Inputs

Drver Throughout (@ Drver Exit)	575,000 tons/year @ 6.5% moisture
Annual Dried Wood Throughput of Dryer	537,625 ODT/year
Hourly Dried Wood Throughput of Dryer	71.71 ODT/hr
Flow rate =	180,000 ACFM
Frit Termerature =	355.40 deg K
Standard flow rate ==	148,472 SCFM
Annual Ultilization Factor	100%
Burner Heat Innut	250.4 MMBtu/hr
Annual Burner Heat Input at Annual Utilization	2,193,504.0 MIMBtu/yr
Percent Hardwood	25%
Derrent Softword	75%

Criteria Pollutant Calculations:

All Variation Constants of Constants	and the state of the state of the	Baseline Emission F	Factors	Prope	Proposed BACI, Emission Factor	Factor			Total Controlled Potential	led Potent
	王が見たいである	Train		Controlled Risman	Calle	Emission Factor	Baseline Emissions	missions	Emissions	tions
Include	Uncontrolled Blomass]	Finiseion Factor Source	Emission Factor	Structure and	Source	(lb/hr)	(tpy)	(lb/hr)	(tpy)
C.	0.210	Ih/MMBtu	Note 1	0.210	Ib/MMBtu	Baseline	52.61	230.5	52.61	230.5
Nov	0.200		Note 6	0.200	lb/MMBtu	Note 6	50.08	219.4	50.08	219.4
PM/PM ₁₀ /PM _{2.5} Condensityle Beartion	0.017	Ib/MMBtu	AP-42 Section 1.6	0.017	Ib/MMBtu	AP-42 Section 1.6	4.26	18.6	4.26	18.6
TSP (Filterable)	2.092	Ib/ODT	Note 6	0.030	lb/MMBtu	NSPS emission limit	150.00	562.3	7.51	32.9
Total TSP Filterable + Condensible)							154.26	580.9	11.77	51.5
PM ₁₀ (Filterable)	2.092	Ib/ODT	Note 6	0.030	Ib/MMBtu	NSPS emission limit	150.00	562.3	7.51	32.9
Total PM ₁₀ Triterable + Condensible)							154.26	580.9	11.77	51.5
PM225 (Filterable)	2.092	Ib/ODT	Note 6	0.030	lb/MMBtu	NSPS emission limit	150.00	562.3	7.51	32.9
Total PM25 Differable + Condensible)							154.26	580.9	11.77	51.5
-08	0.025	Ib/MMBtu	AP-42, Section 1.6 ³	0.025	Ib/MMBtu	AP-42, Section 1.6 ³	6.26	27.4	6.26	27.4
Cor	1.07	Ib/ODT	Note 2	1.07	Ib/ODT	Baseline	76.90	288.3	76.90	288
P REA	0.00		N/A	00.0	N/A	N/A	0.00	0.0	0.00	0.0

Note: C O emissions are based on stack testing conducted at Absolve. NC facility on June 7, 2012 with a conservative safety margin on CO due to the significant variability that is possible with this pollutant. C O emissions are based on yendor guarantee of 0.95 fb/ODT as propane converted to alpha -pinene and Enviva Wiggins October 2013 Stack Test Data as Total VOC as alpha-pinene using OTM 26.

AP-42, Section 1.6 were included. The vendor only provided the filterable fraction of particulate matter in the emission factors.

Envive has conservatively calculated the condensible fraction based upon the heat input of the dryer burners

using an emission factor for wood combustion from AP-42, Section 1.6.

⁴ No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Envive 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.

 3 Controlled filterable particulate matter emissions based on NSPS Subpart Db limit of 0.03 lb/MMB1u. 6 NO₄ and filterable PMPM10 emissions based on TSI guarantee on 7/15/14. The PM_{2.5} filterable emission factor is assumed to be the same as PM and PM10.



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TABLE B-5 ROTARY DRYER - HAP AND TAP EMISSIONS ENVIVA PELLET SAMPSON, LLC

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Calculation Inputs:

527 625 Annual Composition and Throughput

Hardwood Composition	25%
Softwood Composition	75%

Short Term Composition and Throughput

	<u> </u>	
E	71.71	75%
	ľ	Softwood Composition

Emission Calculations:

「「ない」の「いい」には、「「ない」」なり、「ない」」ない、「ない」」ない、	ないであるのである	ないのない	「「「「「「「」」」	のないないないない	* Comparison	ison				たいないの	
		HAP	NCTAP	VOC	Stack Tests	ests	Weigh	Weighted Emission Factor	actor	Potential	Potential Emissions
Pollutant	CAS	(Vee/No)	(Ves/No)	(Ves/No)	Emission Factor	Reference	Short-term EF Annual EF	Annual EF			
		(autora)		()	(ID/ODT)		(lb/ODT)	(lb/ODT)	EF Source	(lb/hr)	(tpy)
Acetaldehvde	75-07-0	Yes	Yes	Yes	0.024	-	0.024	0.024	stack test	1.74	6.52
Acrolein	107-02-8	Yes	Yes	Yes	0.000	_	0.000	0.000	stack test	0.00	00.0
Formaldehvde	50-00-0	Yes	Yes	Yes	0.062	-	0.062	0.062	stack test	4.43	16.60
Methanol	67-56-1	Yes	No	Yes	0.133	-	0.133	0.133	stack test	9.51	35.64
Phenol	108-95-2	Yes	Yes	Yes	0.000	_	0.000	0.000	stack test	0.00	0.00
Propionaldehvde	123-38-6	Yes	No	Yes	0.033	-	0.033	0.033	stack test	2.36	8.84

Notes: 1 HAP emissions from Enviva Wiggins October 2013 Stack Testing on Dryer No. 2.

Enviva Sampson Emission Calculations and BACT v35 Dryer System HAP & TAP Revised

Appendix B Page 5 of 19

TABLE B-6 ROTARY DRYER -HAP AND TAP WOOD COMBUSTION EMISSIONS ENVIYA PELLET SAMPSON, LLC

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Calculation Inputs:

HAP & TAP Emission Calculations:

All and the line of	144	Carlos and	and the second	Emission Factors	OFS		19. K. W. A.			Emissions	sions	and the state of the		The state
「「「「「「「「」」」」	RAPTAP? V	VOCT		Biomass	Service Service Service Service	1.11	Bioman	Atta Contractor	Maxim	Maximum Uncontrolled Tota	I Total	Maxim	Maximum Controlled Total	
	2	1	lb/mmBtu	Control	Ib/mmBtu	Ref.	LA Ib/hr	11	lb/hr	· Ib/yr	tpy	2 lb/hr	lb/yr	tpy .
		*	Uncontrolled	Rfficiency	Controlled		Uncontrolled Controlled	Controlled		2				1. 1.
A advantation of the second	HAP V	VOC	3 20E-09	0%	3.20E-09	~	8.01E-07	3.20E-09	8.01E-07	7.02E-03	3.51E-06	3.20E-09	2.80E-05	1.40E-08
Antimont: & Communde		2	7.90E-06	92.75%	5.73E-07	1,2	1.98E-03	1.43E-04	1.98E-03	1.73E+01	8.66E-03	1.43E-04	1.26E+00	6.28E-04
Areatic	TAP/HAP		2.20E-05	92.75%	1.60E-06	1, 2	5.51E-03	3.99E-04	5.51E-03	4.83E+01	2.41E-02	3.99E-04	3.50E+00	1.75E-03
Benzofaltwarene	-	VOC	2.60E+06	0%0	2.60E-06	-	6.51E-04	6.51E-04	6.51E-04	5.70E+00	2.85E-03	6.51E-04	5.70E+00	2.85E-03
Bervilium	TAP/HAP		1.10E-06	92.75%	7.98E-08	1,2	2.75E-04	2.00E-05	2.75E-04	2.41E+00	1.21E-03	2.00E-05	1.75E-01	8.75E-05
Cadmittee	TAP/HAP	_	4.10E-06	92.75%	2.97E-07	1,2	1.03E-03	7.44E-05	1.03E-03	8.99E+00	4.50E-03	7.44E-05	6.52E-01	3.26E-04
Control to the second pride		voc	4.50E-05	0%	4.50E-05		1.13E-02	1.13E-02	1.13E-02	9.87E+01	4.94E-02	1.13E-02	9.87E+01	4.94E-02
	-	2	7.90E-04		7.90E-04	-1	1.98E-01	1.98E-01	1.98E-01	1.73E+03	8.66E-01	1.98E-01	1.73E+03	8.66E-01
Chlorobenzene	-	voc	3.30E-05	0%	3.30E-05	-	8.26E-03	8.26E-03	8.26E-03	7.24E+01	3.62E-02	8.26E-U3	7.24E+01	3.62E-02
	$T \Delta P^4$		3 \$0F-06	92 75%	2 54E-07	2	8.76E-04	6.35E-05	8.76E-04	7,68E+00	3.84E-03	6.35E-05	5.57E-01	2.78E-04
Chromium_Other controls (add wichtom acid to ret CRC)	HAP		1.75E-05	92.75%	1.27E-06	12	4.38E-03	3.18E-04	4.38E-03	3.84E+01	1.92E-02	3.18E-04	2.78E+00	L.39E-03
Curuituter Onite compus (add wyshour ave to 5% 5%)	HAP		6.50E-06	92.75%	4.71E-07	1,2	1.63E-03	1.18E-04	1.63E-03	1.43E+01	7.13E-03	1.18E-04	I.03E+00	5.17E-04
Dimitronhenol 2.4-	-	VOC	L.80E-07	%0	1.80E-07	-	4.51E-05	4.51E-05	4.51E-05	3.95E-01	1.97E-04	4.51E-05	3.95E-01	1.97E-04
Di(2-ethylhexy)hhthalate (DEHP)	6	voc	4.70E-08	%0	4.70E-08	-	1.18E-05	1.18E-05	1.18E-05	1.03E-01.	5.15E-05	1.18E-05	1.03E-01	5.15E-05
Ethyl betizene	HAP V	voc	3.10E-05	%0	3.10E-05	-	7.76E-03	7.76E-03	7.76E-03	6.80E+01	3.40E-02	7.76E-03	6,80E+01	3.40E-02
Ethylene dichloride (1.2-dichloroethane)	TAP/HAP \	voc	2.90E-05	0%	2.90E-05	-	7.26E-03	7.26E-03	7.26E-03	6.36E+01	3.18E-02	7.26E-03	6.36E+01	3.18E-02
Hexachlorodibenzo-p-dioxin 1.2.3.6.7.8	TAP	voc	1.60E-06	%0	1.60E-06	-	4.01E-04	4.01E-04	4.01E-04	3.51E+00	1.75E-03	4.01E-04	3.51E+00	.75E-03
Hydrogen chloride (hydrochloric acid)	TAP/HAP		1.90E-02	90.00%	1.90E-03	l, 3	4.76E+00	4.76E-01	4.76E+00	4.17E+04	2.08E+01	4.76E-01	4.17E+03	2.08E+00
Lead and Lead compounds	HAP		4.80E-05	92.75%	3.48E-06	1, 2	1.20E-02	8.71E-04	1.20E-02	1.05E+02	5.26E-02	8.71E-04	7.63E+00	3.82E-03
Manganese & compounds	TAP/HAP	_	1.60E+03	92.75%	1.16E-04	L, 2	4.01E-01	2.90E-02	4.01E-01	3.51E+03	1.75E+00	2.90E-02	2.54E+02	1.27E-01
Mercury, vapor (Include in Mercury&Compds)	TAP/HAP		3.50E-06	92.75%	2.54E-07	1, 2	8.76E-04	6.35E-05	8.76E-04	7.68E+00	3.84E-03	6.35E-05	5.57E-01	2.78E-04
Methyl bromide (bromomethane)	-	voc	1.50E-05	%0	1.50E-05	-	3.76E-03	3.76E-03	3.76E-03	3.29E+01	1.65E-02	3.76E-03	3.29E+01	1.65E-02
Methyl chloride (chloromethanc)		VOC	2.30E-05	0%	2.30E-05	-	5.76E-03	5.76E-03	5.76E-03	5.05E+01	2.52E-02	5.76E-03	5.05E+0	2.52E-02
Methyl chloroform (1. l, l trichlorocthane)	_		3.10E-05		3.10E-05	-	7.76E-03	7.76E-03	7.76E-03	6.80E+01	3.40E-02	7.76E-03	6.80E+01	3.40E-02
Methyl ethyl ketone	а,	VOC	5.40E-06	0%	5.40E-06		1.35E-03	1.35E-03	1.35E-03	1.18E+01	5.92H-03	1.35E-03	1.186+01	0.926-03
Naphthalcne	-	VOC	9.70E-05	%0	9.70E-05	- 1	2.43E-02	2,435-02	2.45E-02	2.135+02	10-200.1	20-32-02	2.136402	10-200.1
Nickel metal (Component of Nickel & Compounds)			3.30E-05	92.75%	2.396-06	7,7	8.405-405	40-966'C	5.20E-05	10-347.7	20-220.0	2758-06	0.416-01	1 216-04
Nitrophenol, 4-	_	202	1.105-07	0%0	1.10E-07		20-36/7	1 305-00	1.725-05	1.175-01	20-012-1	1 288-115	10,871	5 59F-05
Pentachlorophenol	TAP/DAF		00-201.C		2 901.005	• -	0 575-03	0 57F-03	0 57E-03	8 34E+01	4 17E-02	9 52E-03	8.34E+01	4.17E-02
Perchloroethylene (tetrachlorochrylene)	HAD		20-T05.C	%a52 Cb	1 96F-06		6.76E-03	4.90E-04	6.76E-03	5.92E+01	2.96E-02	4.90E-04	4.29E+00	2,15E-03
Price priority averal, 1 critic of the price	-	VUC	8 15F_00	0%	8.15E-09		2.04E-06	2.04E-06	2.04E-06	1.79E-02	8.94E-06	2.04E-06	1.79E-02	8.94E-06
Polycuto mance Diparentes	-	2	1.25E-04		1.25E-04	-	3.13E-02	3.13E-02	3, 13E-02	2.74E+02	1.37E-01	3.13E-02	2.74E+02	1.37E-01
Providene dichloride (1 2 dichloronronane)	-	voc	3.30E-05	%0	3.30E-05		8.26E-03	8.26E-03	8.26E-03	7.24E+01	3.62E-02	8.26E-03	7.24E+01	3.62E-02
Seleminm communds	-		2.80E-06	92.75%	2.03E-07	1, 2	7.01E-04	5.08E-05	7.01E-04	6.14E+00	3.07E-03	5.08E-05	4.45E-01	2.23E-04
Tetrachlandihenzo-p-diaxin 2.3.7.8-	-	VOC	8.60E-12	%0	8.60E-12	-	2.15E-09	2.15E-09	2.15E-09	1.89E-05	9.43E-09	2.15E-09	1.89E-05	9.43E-09
Trichlanethylena	-	VOC	3.00E-05	%0	3.00E-05		7.51E-03	7.51E-03	7.51E-03	6.58E+01	3.29E-02	7.51E-03	6.58E+01	3.29E-02
Trichlorofluoromethane (CFC 111)	TAP V	VOC	4.10E-05	%0	4.10E-05	1	1.03E-02	1.03E-02	1.03E-02	8.99E+01	4.50E-02	1.03E-02	8.99E+01	4.50E-02
Trichloronhenol 2.4 6-	HAP	VOC	2.20E-08	%0	2.20E-08	1	5.51B-06	5.51E~06	5.51E-06	4.83E-02	2.41E-05	5.51E-06	4.83E-02	2.41E-05
Viryl chloride	TAP/HAP	VOC	1.80E-05	0%0	1.80E-05		4.51E-03	4.51E-03	4.51E-03	3.95E+01	1.97E-02	4.51E-03	3.95E+01	1.97E-02
Total							\$.55E+00	8.S6E-01	5.55E+00	4,86E+04	24.31	8.56E-01	7.50E+03	3.75
						ĺ								

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

The control efficiency of the wet electrostatic precipitator (WESP) for filterable particulate matter is applied to all metal hazardous and toxic pollutants. Actual design filterable efficiency is estimated to 96.4%, but 92.75% is assumed for toxics permitting.
 The WESP employs a caustic solution in its operation in which hydrochoric acid will have high water solubility. This caustic solution will neutralize the acid and effectively control it by 90%, per conversation on 10/18/2011 with Sternable and will have high water solubility. This caustic solution will neutralize the acid and effectively control it by 90%, per conversation on 10/18/2011 with Sternable acid will have high water solubility. A such chronic acid is a subset of effortively control it by 90%, per conversation on 10/18/2011
 Chromic acid is a subset of effortene compounds, which is accounted for septrately as a HAP. As such, chronic acid is only calculated as a TAP.

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

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Calculation Inputs:

_		Based on
537,625		53.3%
Total Plant Throughput ODT/yr	% of Total Throughput to the	Hammermills

53.3% sent through Enviva Northampton site

Annual Composition and Throughput	
Hammermills Throughput ODT/yr	286,554
Hardwood Composition	25%
Softwood Composition	75%

Short Term Composition and Throughput

put	38.22	25%	75%
NUMBER OF THE COMPANY POST IN TAR AND A POST OF THE PO	0DT/hr	Hardwood Composition	Softwood Composition

Emission Calculations:

NCTAP VOC Stack Tests Weighted Emission Factor Potential Ent NCTAP VOC Stack Tests Factor Reference Potential Ent (Yes/No) (Yes/No) Factor Reference Short-term Eft Annual Eft Potential Ent N/A N/A N/A 0.240 1 0.24 9.17 Potential Ent Ves Yes 0.005 1 0.24 0.24 Stack test 9.17 Ves Yes 0.000 1 0.006+00 stack test 0.006+00 1 7.10E-03 stack test 0.006+00 1 Ves Yes 0.000 1 7.10E-03 stack test 0.006+00 1 Ves Yes 0.000 1 7.10E-03 stack test 1.72E-01 N Ves Yes 0.000 1 7.10E-03 stack test 1.72E-01 N Ves Yes 0.000 1 7.10E-03 stack test 1.72E-01 N </th <th></th> <th></th> <th></th> <th></th> <th></th> <th>Emission Factor</th> <th>Factor</th> <th></th> <th></th> <th>at Q La</th> <th>「「「「「</th> <th></th>						Emission Factor	Factor			at Q La	「「「「「	
CAS Number(Yes/No)(Yes/No)(Yes/No)(FanistionReference(Ih/ODT)<			HAP	NC TAP		Stack	Tests	Weigh	ted Emission F	actor	Potential	Emissions
N/A N/A <th>Pollutant</th> <th>CAS Number</th> <th>(Yes/No)</th> <th>(Yes/No)</th> <th>(Yes/No)</th> <th>Emission Factor</th> <th>Reference</th> <th>Short-term EF</th> <th></th> <th></th> <th></th> <th></th>	Pollutant	CAS Number	(Yes/No)	(Yes/No)	(Yes/No)	Emission Factor	Reference	Short-term EF				
N/A 0.240 1 0.001 EF Source (Bhr) 75-07-0 Yes Yes Yes Yes Yes 0.005 1 0.24 0.24 54 stack test 9.17 107-02-8 Yes Yes Yes 0.005 1 0.005+00 stack test 1.72E-01 50-00-0 Yes Yes Yes 0.007 1 7.10E-03 stack test 0.006+00 67-56-1 Yes Yes 0.007 1 7.10E-03 stack test 0.006+00 108-95-2 Yes Yes 0.0034 2 3.38E-03 stack test 1.29E-01 108-95-2 Yes Yes 0.003 1 0.00E+00 stack test 1.29E-01 123-38-6 Yes Yes 0.003 1 0.00E+00 stack test 1.29E-01 123-38-6 Y						(Ib/ODT)		(Th/Ohr)	(IL/ODT)			To be a first of the second se
75-07-0 Yes -0.04 0.24 0.24 0.24 0.17 9.17 $107-02-8$ Yes Yes Yes 0.005 1 $4.50E-03$ stack test $1.72E-01$ $107-02-8$ Yes Yes Yes 0.005 1 $4.50E-03$ stack test $1.72E-01$ $50-00-0$ Yes Yes Yes 0.007 1 $7.10E-03$ stack test $1.72E-01$ $67-56-1$ Yes Yes 0.007 1 $7.10E-03$ stack test $1.29E-01$ $108-95-2$ Yes No Yes 0.0034 2 $3.38E-03$ stack test $1.29E-01$ $108-95-2$ Yes Yes 0.0034 2 $3.38E-03$ stack test $1.29E-01$ $108-95-2$ Yes Yes 0.000 1 $0.00E+00$ stack test $1.29E-01$ $123-38-6$ Yes Yes 0.003 1 $0.00E+00$ stack test $1.29E-01$	Total VOC	N/A	N/A	N/A	NIA	0.340	-	(TAD A)	(TOD/OI)	EF Source	(Ib/hr)	(tpy)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Acetaldehvde	76 07 0				01-910		0.44	0.24	stack test	9.17	34.37
		n-10-c1	res	Yes	Yes	0.005		4 50F-03	A 500 02		· · · · · · ·	
50-00-0 Yes Ves Ves Ves Ves 0.00E+00 stack test 0.00E+00 stack test 0.00E+01 stack test 1.29E-01 stack test 1.29E-01 stack test 1.29E-01 stack test 1.29E-01 stack test 1.15E-01 stack test 1.	Acrolein	107-02-8	Yes	Yes	Vec	0000	-	CO-TRO-1	cu-200.4	stack test	1.72E-01	6.45E-01
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Formaldehvde	50.00.0	12		102	0,000	·	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
$67-56-1$ Yes No Yes 0.0034 2 $3.38E-03$ $3.38E-03$ $3.38E-64$ $2.71E-01$ $1.29E-01$ $108-95-2$ Yes Yes 0.000 1 $0.00E+00$ $stack test$ $1.29E-01$ $c_{1.29E-01}$ $c_{1.29E-01}$ $c_{1.23E-03}$ $stack test$ $1.29E-01$ $c_{1.23E-03}$		0-00-00	Yes	Yes	Yes	0.007	1	7.10E-03	7 10F-03	otach tact	10 11 1	
108-95-2 Yes Ves Yes 0.000 1 3.38E-03 stack test 1.29E-01 123-38-6 Yes Yes 0.000 1 0.00E+00 stack test 0.00E+00 123-38-6 Yes No Yes 0.003 1 3.00E-03 3.00E+00 stack test 0.00E+00	Methanol	67-56-1	Yes	Nn	Vec	0.0024	2		CO-TO1-1	SIGCA ICSI	2./1E-01	1.02E+00
123-38-6 Yes 0.000 1 0.00E+00 stack test 0.00E+00 123-38-6 Yes 0.003 1 3.00E-03 3.00E-03 stack test 1.15E-01	Phenol	108-95-2	Vac		201	+0000		3.38E-03	3.38E-03	stack test	1.29E-01	4.84E-01
123-38-6 Yes No Yes 0.003 ¹ 3.00E-03 3.00E-03 stack test 1.15E-01	Provionaldahuda		ICS	Yes	Yes	0.000	-	0.00E+00	0.00E+00	stack test	0.008+00	U DOLLAND
IN-JCI'I ICI VANIC CONTRACT	antionerioder	123-38-6	Yes	No	Yes	0.003		3.00E-03	3.00F-03	ctack tact	1 1 5 5 01	0.000 D
											TATC1'T	4.3UE-(

Notes: ¹ HAP emissions from Enviva Wiggins October 2013 Stack Testing with a throughput of 62.5% softwood.

² Total VOC emissions from Enviva Amory October 2013 Stack Testing with a throughput of 60% softwood.

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2,58

0.69

Total HAPs

Enviva Sampson Emission Calculations and BACT v35 Pellet Cooler Revised

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Trinity Consultants

TABLE B-8 PELLET PRESSES AND COOLERS - VOC, HAP, AND TAP EMISSIONS ENVIVA PELLET SAMPSON, LLC

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Calculation Inputs:

Annual Composition and Throughput

Throughput ODT/yr	231,022
Hardwood Composition	25%
Softwood Composition	75%

╞		ODT/hr	7171
	_	11 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1020

Emission Calculations:

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	ないという	Service Service	A W. L. Sea		Emission Factor	Factor ison				4 4 4 4 4 8 4 8	
		BAP	NCTAP	voc	Stack1	Stack Texts	Select	Selected Emission Factor	ctor.	Potential I	tial Emissions
Pollutant	CAS Number	(Yes/No)	(Yes/No)	(Yes/No)	Emission Factor	Reference	Short-term EF	Annual EF	EF Source		
		¢ .			(Ib/ODT)		(Ib/ODT)	(lb/ODT)		(lb/hr)	(tpy)
Total VOC	N/A	N/A	N/A	N/A	0.85	-	0.85	0.85	stack test	60.73	227.64
Acetaldehvde	75-07-0	Yes	Yes	Yes	7.72E-03	-	7.72E-03	7.72E-03	stack test	5.54E-01	2.08E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.00E+00	-	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	5.04E-03	-	5.04E-03	5.04E-03	stack test	3.61E-01	1.35E+00
Methanol	67-56-1	Yes	No	Yes	7.80E-03	-	7.80E-03	7.80E-03	stack test	5.60E-01	2.10E+00
Phenol	108-95-2	Yes	Yes	Yes	0.00E+00	-	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Propionaldehyde	123-38-6	Yes	No	Yes	1.51E-03	I	1.51E-03	1.51E-03	stack test	1.08E-01	4.06E-01
				Č					Total VOC	60.73	227.64

Notes:

¹ HAP emissions from Enviva Wiggins October 2013 Stack Testing with a throughput of 62.5% softwood.

5,93

1.58

Total HAPs

TABLE B-9 BAGFILTER AND CYCLONE EMISSIONS ENVIVA PELLET SAMPSON, LLC

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and the state of t	and the providence of the	AFilter. Vent-or- A. S. Bullutant	ふ、 ちょう あっ	Pollutant	Annual	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		i. d.	Late and	P. Ocher and	Potential Emissions	Emissions	Surger Las	Acres 1
-10	Prop. S Emilation 8 S. M	Cyclòne 💰 🔪	Flowrate Loading Operation	Loading ²	Operation	*	N. P. P.M that is		PM	M	PMIN	. ei	PM13	
Emission Unit	Source ID	D in the second	(cfm)	· (gr/cf) ·	(hours)	PM10 PM25	(PM15	Reference	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Green Wood Hammermills	ES-GHM-1	CD-GHM-BV1	10,000	0.004	8,760	100.0%	100.0%	4	0.34	1.50	0.34	1.50	0.343	1.50
Green Wood Hammermills	ES-GHM-2	CD-GHM-BV2	10,000	0.004	8,760	100.0%	100.0%	4	0.34	1.50	0.34	1.50	0.343	1.50
Hammernills Bagfilter 1	ES-HM-I	CD-HM-BF1	15,000	0.004	8,760	100.0%	0.35%	4.6	0.51	2.25	0.51	2.25	0.002	0.01
Hanmermills Bagfilter 2	ES-HM-2	CD-HM-BF2	15,000	0.004	8,760	100.0%	0.35%	4.6	0.51	2.25	0.51	2.25	0.002	0.01
Hammennills Bagfilter 3	ES-HM-3	CD-HM-BF3	15,000	0.004	8,760	100.0%	0.35%	4,6	0.51	2.25	0.51	2.25	0.002	0.01
Hammernuills Bagfilter 4	ES-HM-4	CD-HM-BF4	15,000	0.004	8,760	100.0%	0.35%	4,5	0.51	2.25	0.51	2.25	0.002	0.01
Hammermills Bagfilter 5	ES-HM-5	CD-HM-BF5	15,000	0.004	8,760	100.0%	0.35%	4,6	0.51	2.25	0.51	2.25	0.002	0.01
Hammermills Bagfilter 6	ES-HM-6	CD-HM-BF6	15,000	0.004	8,760	100.0%	0.35%	4,6	0.51	2.25	0.51	2.25	0.002	0.01
Hammermills Bagfilter 7	ES-HM-7	CD-HM-BF7	15,000	0.004	8,760	100.0%	0.35%	4,6	0.51	2.25	0.51	2.25	0.002	0.01
Hammermills Bagfilter 8	ES-HM-8	CD-HM-BF8	15,000	0.004	8,760	100.0%	0.35%	4.6	0.51	2.25	0.51	2.25	0.002	0.01
Dry Wood Handling	Dryer Out Conv. Tail Bin Vent	CD-DC-BV1	1,000	0.004	8,760	100%	100%	4	0.03	0.15	0.03	0.15	0.034	0.15
Dry Wood Handling	Dryer Out Conv. Head Bin Vent	CD-DC-BV2	1,000	0.004	8,760	100%	100%	4	0.03	0.15	0.03	0.15	0.034	0.15
Peltet Mill Feed Silo Bin Vent Baghouse	ES-PMFS	CD-PMFS-BV	2,444	0.004	8,760	100%	100%	4	0.08	0.37	0.08	0.37	0.084	0.37
Pellet Mill Fines Bin & Hammermill Filter	ES-PFB, ES-HMA	CD-PFB-BV	9,800	0.004	8,760	100%	100%	4	0.34	1.47	0.34	1.47	0.336	1.47
Pellet Coolers Cyclone 1	ES-CLR-1	CD-CLR-1	12,000	0.022	8,760	26.1%	3.2%	3	2.26	16.6	0.59	2.58	0.072	0.32
Pellet Coolers Cyclone 2	ES-CLR-2	CD-CLR-2	12,000	0.022	8,760	26.1%	3.2%	3	2.26	16'6	0.59	2.58	0.072	0.32
Pellet Coolers Cyclone 3	ES-CLR-3	CD-CLR-3	12,000	0.022	8,760	26.1%	3.2%	3	2.26	16'6	0.59	2.58	0.072	0.32
Pellet Coolers Cyclone 4	ES-CLR-4	CD-CLR-4	12,000	0.022	8,760	26.1%	3.2%	3	2.26	16'6	0.59	2.58	0.072	0.32
Pellet Coolers Cyclone 5	ES-CLR-5	CD-CLR-5	12,000	0.022	8,760	26.1%	3.2%	9	2.26	16'6	0.59	2.58	0.072	0.32
Pellet Coolers Cyclone 6	ES-CLR-6	CD-CLR-6	12,000	0.022	8,760	26.1%	3.2%	۳1	2.26	16'6	0.59	2.58	0.072	0.32
Finished Product Handling Bagfilter	ES-FPH, ES-PL, ES-PB-1 & 2	CD-FPH-BF	35,500	0.004	8,760	91%	0.35%	5,6	1.22	5.33	11.1	4.85	0.004	0.02
Note:								TOTAL	20.08	87.96	56.6	43.51	1.63	7.12
¹ Filter, Vent, and Cyclone inlet flow rate (cfm) provided by design engineering firm (Mid-South Engineering Co.).	e (cfm) provided by design engineering	firm (Mid-South Eng	meering Co.)											

cumig cu.j. ņ runer, veut, and eventue must now rate (cum) province by design engin ² Pollutant Loading (gr/cf) provided by Aircon, a control device vendor.

³ Based on September 2013 Enviva Northampton Engineering Tests

⁴ No speciation data is available for PM 10. Therefore, it is assumed PM=PM10.

³ 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 particulate matter from finished product handling is anticipated to be larger than flyash, this factor is believed to be a conservative indicator of speciation.

TABLE B-10 ELECTRIC POWERED CHIPPER EMISSIONS ENVIVA PELLET SAMPSON, LLC

Chipper Throughput 537,625 tons dry wood

	Emission Factors	Emis	Emissions ³
Pollutant	(lb/dry wood tons)	(lb/yr)	(tợy)
PM ³	N/A	0.00E+00	0.00
THC as Carbon ¹ THC as alpha-pinene ²	0.0041 0.0047	2.20E+03 2.50E+03	1.10 1.25
Methanol ¹	0.0010	5.38E+02	0.27

¹ Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Table 7

and Section 10.6.4, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.

 2 Emission factor converted from as carbon to as alpha-pinene by multiplying by 1.14.

 3 PM emission factor is not applicable as emissions are routed downward to the ground.

Enviva Sampson Emission Calculations and BACT v35 Chipper

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TABLE B-11 ELECTRIC POWERED BARKHOG EMISSIONS ENVIVA PELLET SAMPSON, LLC

Hog Throughput 157,680

tons dry wood Based on max hourly design throughput of 30 tph

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	Emission Factors	Emis	Emissions ³
Pollutant	(lb/dry wood tons)	(lb/yr)	(tpy)
PM ³	N/A	0.00E+00	0.00
THC as Carbon ¹	0.0041	6.46E+02	0.32
THC as alpha-pinene ²	0.0047	7.34E+02	0.37
Methanol ¹	0.0010	1.58E+02	0.08

¹ Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Table 7

and Section 10.6.4, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.

 2 Emission factor converted from as carbon to as alpha-pinene by multiplying by 1.14.

 3 PM emission factor is not applicable as emissions are routed downward to the ground.

Enviva Sampson Emission Calculations and BACT v35 BarkHog

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TABLE B-12 GREEN HAMMERMILLS - VOC, HAP, AND TAP EMISSIONS ENVYA PELLET SAMPSON, LLC

Calculation Inputs:

Total Plant Throughput ODT/yr 537,625 % of Total Throughput to the Green	7,625
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the green hammermills due to pre-screener

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Annual Composition and Throughput	
Green Hammermills Throughput	
ODT/yr	376,338
Hardwood Composition	25%
Softwood Composition	75%

2011W000 CONDONINON	0/.0/
Short Term Composition and Throughput	tput
ODT/hr	50.20
Hardwood Composition	25%
Softwood Composition	75%

Emission Calculations:

「「「「「「「」」」」「「「」」」」」」」」」」」」」」」」」」」」」」	「「「「「「「」」」	ないのないで	9.40 Sec. 201.6	Alas Sala		State of the state	Emission Factor Comparison	r Comparison	suzilitation of the	STANDS:	· · · · · · · · · · · · · · · · · · ·	1. A.			
		BAD	NCTAP	VOC	Stack Tests	Teats	AP-42 Calculated Direct wood-fired, hardwood factors	ated Direct hardwood rs	AP-42 Green, Direct wood- fired softwood factors	Direct wood- od facters	Weigh	Weighted Emission Factor	Pactor 200	Potential 1	Endetone*
Pollutant	CAS	(VanNa)	(Vad No)	(Vee/No)	Emission	Reference	Emission Factor	Reference	Emission	Reference	Short-term EF	Amual EP			•\$
			Sec		(T/00/dl)		(Ib/ODT)		(Ib/ODT)		(Ib/ODT)	(Ib/ODT)	EF Source	(lb/hr)	(tpy)
Total VOC	N/A	N/A	N/A	N/A	0.27	ş	4.75E-02	2.3	1.25E+00	1.3	0.27	0.27	stack test	13.48	50.53
Acetaldehvde	75-07-0	Yes	Yes	Yes	0.007	~	8.46E-04	2.3	1.66E-02	1.3	6.89E-03	6.89E-03	stack test	3.46E-01	1.30E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.000	~	2.59E-04	2.3	5.08E-03	1.3	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Formaldehvde	50-00-0	Yes	Yes	Yes	0.004	~	1.58E-03	2.3	3.09E-02	E.1	4.11E-03	4.11E-03	stack test	2.06E-01	7.72B-01
Methanol	67-56-1	Yes	No	Yes	0.003	5	1.24E-03	2, 3	2.43E-02	L, 3	3.05E-03	3.05E-03	stack test	1.53E-01	5.74E-01
Phenol	108-95-2	Yes	Yes	Yes	0.000	~	3,16E-04	2.3	6.18E-03	1,3	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Proninnaldehvde	123-38-6	Yes	9N	Yes	0.001	~	1.47E-04	2, 3	2.87E-03	1.3	1.00E-03	1.00E-03	stack test	5.02E-02	1.88E-01
													Total VOC	13.48	50.53

DUN NOC

2.83

0.76 Total HAPs

Notes:

¹ HAP & TAP emission factors for "Rotary Dryer, green, direct wood-fired, (inlet moisture content >50%, dry basis) softwood were obtained from AP-42, Section 10.6.2, Table 10.6.2-3.
² To account for hardwood emissions since no HAP/TAP emission factors are given for direct hardwood-fired, factors were conservatively calculated by multiplying AP-42 Section 10.6.2-3. HAP factors for

green, direct softwood fired by the ratio of the VOC emission factors for hardwood to softwood drying (0.24/4.7).

3 Both AP-42 hardwood and softwood flator emissions from dryers were adjusted to represent the hammermills by multiplying the emission facotr time the ratio of the VOC from hammermills to dryers based on engineering testing conducted at the Enviro Wiggins facility (19.8%).

4 Short-term emissions were calculated based upon a worst-case scenario of 25% softwood firing on an hourly basis.

Annual emissions were calculated based on the Annual average % Hardwood and Softwood Composition. ³ HAP emissions from Enviva Wigginis October 2013 Stack Testing with a throughput of 62.5% softwood

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TABLE B-13 EMERGENCY GENERATOR AND FIRE PUMP EMISSIONS ENVIVA PELLET SAMPSON, LLC

Emergency Generator Emissions (ES-EG)

Equipment and Fuel Characteristics

Engine Output	0.19	MW
Engine Power	250	hp (brake)
Hours of Operation	500	hr/yr ¹
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	2,545	Btu/hr/hp

Criteria Pollutant Emissions

	States and States		in the second	Potential En	nissions
Pollutant	Category	Emission Factor	Units	ib/hr	tpy
TSP	PSD	0.20	g/KW-hr	0.08	0.02
PM ₁₀	PSD	0.20	g/KW-hr	0.08	0.02
PM _{2.5}	PSD	0.20	g/KW-hr	0.08	0.02
NO _x	PSD	4.00	g/KW-hr	1.64	0.41
SO ₂	PSD	15.00	ppmw (3)	9.89E-04	2.47E-04
СО	PSD	3.50	g/KW-hr	1.44E+00	3.59E-01
VOC (NMHC)	PSD	4.00	g/KW-hr	1.64E+00	4.11E-01
		5.37E-06	lb/hp-hr (4)	1.34E-03	3.36E-04
Toxic/Hazardous Air Pollutant Emis Acetaldehyde	HAP/TAP	5 37E-06	lb/hp_hr(4)	1 34E-03	3.36E-04
Acrolein	HAP/TAP	6.48E-07	lb/hp-hr (4)	1.62E-04	4.05E-05
Benzene	HAP/TAP	6.53E-06	lb/hp-hr (4)	1.63E-03	4.08E-04
Benzo(a)pyrene ⁶	HAP/TAP	1.32E-09	lb/hp-hr (4)	3.29E-07	8.23E-08
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	6.84E-05	1.71E-05
Formaldehyde	HAP/TAP	8.26E-06	lb/hp-hr (4)	2.07E-03	5.16E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	2.94E-04	7.35E-05
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	7.16E-04	1.79E-04
Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	4.99E-04	1.25E-04
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr (4)	2.07E-03	5.16E-04
Total HAPs				6.78E-03	1.69E-03

Note:

¹ NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency

generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

² Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2010 construction.

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 3.3, 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 and VOC.

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

TABLE B-13 EMERGENCY GENERATOR AND FIRE PUMP EMISSIONS ENVIVA PELLET SAMPSON, LLC

Firewater Pump Emissions (ES-FWP)

Equipment and Fuel Characteristics

Ì	Engine Output	0.19	MW
I	• ·		TAT AA
1	Engine Power	250	hp
۱	Hours of Operation	500	hr/yr
ł	Heating Value of Diesel	19,300	Btu/lb
	Power Conversion	2,545	Btu/hr/hp

Criteria Pollutant Emissions

				Potential E	missions
Pollutant	Category	Emission Factor	Units	lb/hr	tpy
TSP	PSD	0.20	g/KW-hr	0.08	0.02
PM ₁₀	PSD	0.20	g/KW-hr	0.08	0.02
PM _{2.5}	PSD	0.20	g/KW-hr	0.08	0.02
NOx	PSD	4.00	g/KW-hr	1.64	0.41
SO ₂	PSD	15.00	ppmw (3)	9.89E-04	2.47E-04
CO	PSD	3.50	g/KW-hr	1.44E+00	3.59E-01
VOC (NMHC)	PSD	4.00	g/KW-hr	1.64E+00	4.11E-01
Acetaldehyde Acrolein	НАР/ТАР НАР/ТАР	5.37E-06 6.48E-07	lb/hp-hr (4) lb/hp-hr (4)	1.34E-03 1.62E-04	3.36E-04 4.05E-05
Toxic/Hazardous Air Pollutant Emissio					
Benzene	HAP/TAP HAP/TAP	6.53E-06	ib/hp-hr (4)	1.63E-03	4.03E-03
Benzo(a)pyrene ⁶	НАР/ТАР	1.32E-09	lb/hp-hr (4)	3.29E-07	8.23E-08
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	6.84E-05	1.71E-05
Formaldehyde	HAP/TAP	8.26E-06	lb/hp-hr (4)	2.07E-03	5.16E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	2.94E-04	7.35E-05
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	7.16E-04	1.79E-04
Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	4.99E-04	1.25E-04
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr (4)	2.07E-03	5.16E-04
Total HAPs				6.78E-03	1.69E-03

Note:

¹ NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency

generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

² Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2009 construction.

³ Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.

⁴ Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.

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

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

TABLE B-14 GREEN WOOD HANDLING DROP POINT EXAMPLE EMISSIONS ENVIVA PELLET SAMPSON, LLC

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		Type of Operation	Number of Drop Pointa	PM Particle Size Multiplier	PM ₁₀ Particle Size Multiplier	PM _{2.5} Particle Size Muttiplier	Mean Wind Speed (U)	Material Moisture Content (M) ¹	P.M. Emission Factor	PM ₁₀ Emission Factor ²	PM _{2.8} Emination Fector ²	Potential Throughput	Potential PM Emlasiona	Potential PM:s Emissiona	Potential PM _{2.5} Emissions
ID Emission Source Group	Transfer Activity			(dimensionless)		(dimensionless)	(qda)	8	(Ib/toot)	(Ib/ton)	(ID/ton)	(db))	(iddi)	(Kda)	(Ada)
ANNU 94 HALID	Purchased Hard Thursfire in Childron Sings & Ares	Batch Droo	-	0.74	0.35	0.053	7.9	48%	4.97E-05	2.35E-05	3.56E-06	13,733	8.63E-05	4.08E-05	6.18E-06
t	The Design of Contraction Barty Dida to Date	Batch Doon	4	0.74	0.35	0.053	1.9	42%	5.92E-05	2.808-05	4.24E-06	13,733	4.LIE-04	1,95E-04	2.95E-05
CIDED ES CAUE	Therefore Durchased Wood Chine (Wet) to Outdoor Storate	Batch Drop	-	0.74	0.35	0.053	7.9	49%	4.78E-05	2.26E-05	3.42E-06	140,600	8.50E-04	4.02E-04	6.08E-05
┝	Drue Paints via Converting from Chin Pile to Dryst	Batch Drop	S	0.74	0.35	0.053	6.0	41%	4.36E-05	2.06E-05	3.12E-06	530.451	1.46E-02	6.91E-03	1.05E-03
┝	Total Errinstons												1,60E-02	7.55E-03	1.14E-03

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1. Arenye novlana centara fee laga, bade, mah wood dipatotavi baad an matrici bahance provided by dianga napimening firm (Ada Stants Brgistmeting). 2. Emirana katara akatatara baade an farmaka fina Ad-ad, Section (13.2.4. Aggregate Headlang and Shanga PHCa. Equation (13.2.1.11)06) arkaca ... 1: ee meninga katara (Phone).

11 e. examina factor fibriori)	k = particle size multiplier (dimensionless) for PM	k = particle sizz multipliei (dimensionless) for PM ₁₀	k = particle max multiplier (denonionless) for PM23

0.74 0.35 0.053

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 M. manual animate control with the second period p

Enviva Sampson Emission Calculations and BACT v35 Green Wood Handling

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TABLE B-15 GREEN WOOD STORAGE PILES FUCITIVE EMISSIONS ENVIVA PELLET SAMPSON, LLC

pha-Pinene siour (thy)	1.03	06'1	2.93
VOC as siph Emissio (b/hr)	0.24	0.43	0.67
Carbool tions (thy)	06.0	1.67	2.57
VOC at C Emissio (Ib/br)	0.21	0.38	0.59
	0.106	0.195	0.300
1, Entirion PM ₂₄ Entir	0.0242	0.0444	0.0686
	0.705	1.298	2.003
PM ₄ Edition PM	0.161	0.296	0.457
tesions (tpy)	1.410	2.595	4.006
PM Emissiona (Ib/br) (tpy	0.322	0.593	0.915
Outer Surface Area of Storage Pile (ft ³)	60,000	110,400	
Height (R)	10	01	
₩e	00†	400	
(u)	100	200	
on Factor? (Dhurlt?)	3.44E-06	3.44E-06	
VOC Emissi (b/day/acre)	3.60	3.60	
ten Pactor ¹ (IbAsr/16 ³)	5.37E-06	5.37E-06	
13F Emission Pactor (Midaylacre) (Mitr	1975	5.61	
attaion Dait 10 Description	GWSP1 Green Wood Pile No. 1	GWSP2 Green Wood Pile No. 2	Total - (* V(365-n)V f).
Chair D	GWSP1	GWSP2	Total

4

 $\frac{1}{1.15} E = 1.7 \left(\frac{s}{1.5}\right) \left(\frac{365-p}{235}\right) \left(\frac{1}{15}\right) (b/dey/sore) \frac{1}{16} hord Sources. Research Thingle Park, North Carolina, EPA-450-985-008. September 1988, Page 4-17.$

	a - silt context(%) for lumber :
	4.8
where	s, silt content of wood chips (%):

- p, number of days with rainfall greater than 0.01 inch: f(time that wind exceeds 5.36 m/s 12 mph) (%):

PMINTSP ratio:

- slit content(%) for handber savmills (minimum), from AP-42 Table 13.2.2.1 Based on AP-42, Section 13.2.2, Figure 13.2.1-2.
 Based on metocrological data averaged for 2007-2011 for Surgaon, NC. 120 14.8 50%
- PM₁₀ is assumed to equal SPA of TSP based on U.S. EPA *Control of Open Fighthe Durt Sources* , Research Thangle Park, North Cardina, EPA-45073-83-408. September 1988. 19M₂₃ is assumed to equal 7.5 % of TSP U.S. EPA Background Document for Revisions for fractions (based for AP-42 Puglitee Dast Entsion Factors. November 2006.
 - 7.5% PM1./ISP ratio:

The surface area is calculated as [2-11⁴/2-1/2⁴W³H-1.²W] + 20% to consider the sloping pile edges. Length and width based on proposed site design with a conservative height.

3. Entistion factors obtained from ICAS1 document provided by SC DHEC for the aelaulation of highine VOC entisions from Dougles Fir wood storage pilos. Emtission factors ranged from 1.6 to 3.6 h Octore-day. Enviro doors to employ the maximum emission factor for purposes of conservation.

4. Emissions are calculated in tons of carbon per year by the following formula: tour Closer = 3 days + 1.6 fb Closereday / 2000 fb/ton Emission factor converted from as carbon to as alphe-prizere by multiplying by 1.1.4.

Trinity Consultants Date: 8/28/2014

Appendix B Page 16 of 19

TABLE B-16	TANKS EMISSIONS	ENVIVA PELLET SAMPSON, LLC
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の言語のなれた		Rest Rest	Tank D	limensions	A Distance of the other	のないのないのないの	同語に記録がない	TANKS 4.0	S 4.0
		Volume ¹	Diameter	Height/Length	Orientation	Throughput	Turnovers	VOC Emission	nissions
Tank ID	Tank Description	(gal)	(tt)	(tt)	のないないです	(gal/yr)	Standard Stand	(lb/yr)	(tpy)
TK01	Emergency Generator Fuel Oil Tank ²	2,500	9	12	Vertical	12,000	4.80	0.37	3.57E-03
TK02	Fire Water Pump Fuel Oil Tank ²	1,000	S	6	Horizontal	10,300	10.30	0.86	4.30E-04
							TOTAL	1.23	4.00E-03

Note:

¹ Conservative design specifications.

 2 Throughput based on fuel consumption and 500 hours of operation per year.

Enviva Sampson Emission Calculations and BACT v35 Tanks

Appendix B Page 17 of 19 TABLE B-17 PAVED ROAD POTENTIAL FUGITIVE PM EMISSIONS ENVIVA PELLET SAMPSON, LLLC

Transfer Activity	Distance Transied per Round Trip ¹ 1	the state	Milles Trancked per Bay	Press Press Press	Truck Weight (Empty) Ibs	Truck Weight (Lowfed) Ibs	Average Weight (W) (tons)	Vehicle Milles Trancted (VNET/yr)	a ž	direiton Pact (Ib/V/MT) PM.	er"	Potential En PM (B/hr)		Potential Emi PM _{1a} (B/hr)	-	Potential Emission PML1 (B/Mr) (199)	(the second
1 not Deliver to Peans	12.800	47	113.94	365	40480	102540	35.8	41,588	0,25	0.05	0.012	0.12	0.51	0.02	0.10	5.7E-03	2.5E-02
Toge Delivery to Storage Arca	11,200	47	02.66	365	40480	102540	35.8	36,389	0.25	0.05	0.012	0.10	0.45	0.02	60'0	5.0E-03	2.2E-02
Chine Delivery	16,000	99	66.991	365	40960	101440	35.6	72,779	0.24	0.05	0.012	0.20	0.89	4.1E-02	1.8E-01	1.0E-02	4.4E-02
How Friel Delivery	16,000	28	85.45	365	40960	101440	35.6	31.191	0.24	0.05	0.012	0.09	0.38	0,02	0.08	4.3E-03	1.9E-02
Pellet Delivery	3,200	99	39.92	365	40960	101440	35.6	14,570	0.24	0.05	0.012	0.04	0.18	0.01	0.04	2.0E-03	8.7E-03
Employee Car Parking	4,000	75	56.8	365	4000	4000	2.0	20.739	0.01	0.00	0.001	0.00	10'0	0.00	0.00	1.5E-04	6.6E-04
Total Paved Road Emissions												0.55	2.42	0.11	0.48	0.03	0.12

r

). Distaton tuveko per mund traje was entimated based on track troute and stele brout. 2. Paved nod entsteine facture based on emission estimation Equation 2 from AP-42, Societa 13.2.1 (1/11) for paved node.

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4.845E-08

1.974E-07

9.869E-07

$E = \left[k(sL)^{0.91} (W)^{1.02}\right] \left[1 - \frac{P}{4^* 365}\right] (1b/VMT)$		
E = particulate emission factor (lb/VMT)	TSP	
k - particle size multiplier from AP-42 Table 13.2. 1-1	0.011	
 and another all trading from AB-42 Table 12 2 1.2 for ADT <500 	0.6	

PM 25 0.00054

PM ₁₀ 0.0022

st. - road surface silt loading from AP-42 Table W = mean vehicle weight (ton)

P-No. days with relabiling greater than 0.01 inch. Per AP-42. Section 13.2.1, Figure 13.2.1.4. (Sampson County, NC).
1. Percented rentskedon extended from approprise causation factor times which relates a first some of 190% for water / dark suppression activities followed by sworping. Per Table 5 in Chapter 4 AF Pollution Engineering Manuel, Air and Waste Managarant Ausociation page 141.
Control efficiency (\$3) = 540.361*V, where V is the number of which pages and a plane.

Enviva Sampson Emission Calculations and BACT v35 Paved Roads

Appendix B Page 18 of 19

TABLE B-18 POTENTIAL GHG EMISSIONS FROM COMBUSTION SOURCES **ENVIVA PELLET SAMPSON, LLC**

Potential GHG Emissions

Operating Data:

250.40 MMBtu/hr 8,760 hrs/yr	250 bhp 500 hrs/yr	11.9 gal/hr ¹	1.630 MMBtu/hr ²	250 bhp	500 hrs/yr	11.9 gal/hr ¹	1.630 MMBtu/hr ²
Dryer Heat Input Operating Schedule	Emergency Generator Output Operating Schedule	No. 2 Fuel Input	Energy Input	Fire Water Pump Output	Operating Schedule	No. 2 Fuel Input	Energy Input

mu-11a	Eust Trues	Emission Factors I	ctors from Table C-1 (kg/MMBtu)	(kg/MMBtu) ³	674	The state of	Emissions (tons)	tons)	The American
	ruci type	C02	CH4	N20	C02	CH4	N20	Total CO2e Total CO2e	Total CO2e5.
ES-DRYER	Wood and Wood Residuals	9.38E+01	7.20E-03	3.60E-03	226,798.97	17	6	329,828	3,064
ES-EG	No. 2 Fuel Oil (Distillate)	7.40E+01	3.00E-03	6.00E-04	66	2.70E-03 5.39E-04	5.39E-04	67	67
ES-FWP	No. 2 Fuel Oil (Distillate)	7.40E+01	3.00E-03	6.00E-04	66	2.70E-03 5.39E-04	5.39E-04	67	67

¹ Fuel consumption calculated using a factor of 0.0476 gal/hr-hp. Advanced Environmental Interface, Inc. (1998).

General Permits for Emergency Engines. INSIGHTS, 98-2, 3.

 2 Energy calculated on a fuel consumption basis, using an energy factor of 0.137 MMBtu/gal.

³ Emission factors from Table C-1 and C-2 of GHG Reporting Rule. Emission factors for methane and N2O already multiplied by their respective GWPs of 25 and 298.

⁴ As per NC DAQ Biomass Deferral Rule 15A NCAC 02D .0544, CO2 emissions from bioenergy and other biogeneic

sources are not applicable towards PSD and Title V permitting.

 5 $\rm CO_{26}$ reflects the biomass defferral which does not add in $\rm CO_2$ from biomass combustion.

APPENDIX C Zoning Consistency

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APPENDIX C - LOCAL ZONING CONSISTENCY DETERMINATION

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Zoning Consistency Determination

Facility Name	Enviva Pellets Sampson, LLC
Facility Street Address	US Highway 117 (Street Number TBD)
Facility City	Faison
Description of Process	Wood pellet manufacturing facility
SIC Code/NAICS	SIC – 2499 ; NAICS - 321999
Facility Contact	Joe Harrell
Phone Number	(252) 209-6032
Mailing Address	142 NC Route 561 East
Mailing City, State Zip	Ahoskie, NC 27910

Based on the information given above:

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

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

The proposed operation IS consistent with applicable zoning and subdivision ordinances

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

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

Г Other:

Agency	Clinton - Sampson Planning Dapl.
Name of Designated Official	Mary M. Rose
Title of Designated Official	Planning Director
Signature	m n. Roper
Date	9-9-13

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

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

All PSD and Title V Applications

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

Local Programs

- Attn: David Brigman
 Western NC Regional Air Quality Agency
 49 Mount Carmel Road
 Asheville, NC 28806
 (828) 250-6777
- Attn: Donald R. Willard Mecklenburg County Air Quality 700 N. Tryon Street, Suite 205 Charlotte, NC 28202-2236 (704) 336-5500

Division of Air Quality Regional Offices

- Attn: Paul Muller
 Asheville Regional Office
 2090 U.S. Highway 70
 Swannanoa, NC 28778
 (828) 296-4500
- Attn: Steven Vozzo
 Fayetteville Regional Office
 225 Green Street Suite 714
 Fayetteville, NC 28301
 (910) 433-3300
- Attn: Ron Slack Mooresville Regional Office
 610 East Center Avenue, Suite 301 Mooresville, NC 28115
 (704) 663-1699
- Attn: Patrick Butler, PE Raleigh Regional Office 1628 Mail Service Center Raleigh, NC 27699-1628 (919) 791-4200

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

- Attn: Robert Fisher
 Washington Regional Office
 943 Washington Square Mall
 Washington, NC 27889
 (252) 946-6481
- Attn: Wayne Cook
 Wilmington Regional Office
 127 Cardinal Drive Extension
 Wilmington, NC 28405
 (910) 796-7215
- Attn: Margaret Love, PE Winston-Salem Regional Office 585 Waughtown Street Winston-Salem, NC 27107 (336) 771-5000

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

APPENDIX D BACT TABLES

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APPENDIX D - BACT TABLES

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Capital Cost		Notes	References
Direct Capital Costs			
Total Equipment Cost + Freight	\$4,312,654		2(a), 8
Sales Taxes	\$129,380	0.03 EC	3(a)
Total Direct Capital Costs	\$4,442,033	A	
Indirect Installation Costs			
General Facilities	\$222,102	0.05A	1(a)
Engineering and Home Office Fees	\$444,203	0.10A	l(a)
Process Contingencies	\$222,102	0.05A	l(a)
Start-Up	\$88,841	0.02A	6
Performance Testing	\$44,420	0.01A	6
Total Indirect Installation Costs	\$1,021,668	в	1(a)
Project Contingency	\$819,555	$C = 0.15 \times (A + B)$	1(a)
Total Plant Cost	\$6,283,256	D = A + B + C	l(a)
Other Costs			
Preproduction Costs	\$125,665	$E = 0.02 \times (D)$	i(a)
Inventory Capital*	\$5,368	F=Volres(gal)*Costres(\$/gal)	1(a), 2 (d)
Initial Catalyst and Chemicals	0	G	l(a)
Total Capital Investment	\$6,414,289	$\mathbf{TCI} = \mathbf{D} + \mathbf{E} + \mathbf{F} + \mathbf{G}$	1(a)
Operating Cost			
Operation and Maintenance Costs			
Operating and Maintenance Cost	\$96,214	0.015TCI	l(b)
Total	\$96,214		
Reagent Costs (19% Aqueous Ammonia)			
Reagent Consumption	15.54	gal/hr	2(c), 2(d), 10
Unit cost	1.50	\$/gal	2(d)
Total	\$204,169		2(0)
Electricity			
Combustion Air Fan	21.16	rm.	24.2.0
Hydraulic Power unit	21.15	HP 7m	2(a), 9
Ammonia Pumps	3.44	HP	2(a), 10
Ammonia Pumps Misc./Instruments, Hydraulic Heaters	0.26	HP KW	2(a), 10
wise this unteris, right and readers	5.29	ĸw	2(a), 10
Fan Power to Overcome Catalyst Pressure	610	HP (14 iwc), Assumed 65% Efficiency	2(c), 5(a)
Total Power Requirement	479	ĸw	7
Unit cost	\$0.070	\$/kW-hr	4(b)
Total	\$293,522		
Fuel			
Natural Gas or fuel	0.68	MMBTU/hr	2(a), 9
Cost	\$6.88	\$/1000 ft ³	7
	1020	Btu/ft ³	· ·
Conversion			

TABLE D-1 REGENERATIVE SELECTIVE CATALYTIC REDUCTION COST ANALYSIS ENVIVA PELLET SAMPSON, LLC

Insurance	\$64,143	1% of TCI	l(c)
Property tax	\$64,143	1% of TCI	!(c)
Indirect Annual Costs Administrative Charges	\$128,286	2% of TCI	1(c)
Total Direct Annual Costs	\$894,008	DAC	
Catalyst Cost (Annualized) Total	\$256,329	A/F, 10%, 2 years	
Catalyst Cost (Future Value)	\$538,280	F/P, 3.5%, 2 years	2(0)
Catalyst Cost (Present Value) Catalyst Life	\$502,595 2.00		2(b), 9 2(b)
Catalyst Costs			
Total	\$3,406		
Cost	20.90 \$0.31	\$/1000 ft ³ air	2(a), 10 4(a)
Compressed Air Requirement	20.90	SCFM	2(-) 10

1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), October 2000, Section 4.2, Chapter 2.

Table 2.5: Capital Cost Factors for an SCR Application (OAQPS 2-44)

^b Equation 2.46 for maintenance (OAQPS 2-45)

⁶ Taxes, Insurance, Admin applies (OAQPS 2-48)

Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009. a RSCR Price/Quote of \$6,226,436 scaled from Hertford August 2008 Permit Application

 b Hertford Application detailing catalyst costs and life
 c Ammonia consumption of 58.72 gal/hr and 14 iwc for pressure drop across catalyst d Volume of initial ammonia fill, price per gallon, and density of ammonia (7.83 lb/gal)

 \$1.50/gallon for ammonia provided from vendor.
 U.S. EPA and Office of Air Quality Planning and Standards (OAQPS), EPA Air Pollution Control Cost Manual, 6th Ed. (EPA 452/B-02-001), Research Triangle Park, NC, Jan 2002. Section 1, Chapter 2, Cost Estimation: Concepts and Methodology a Table 2.4: Cost Ranges for Freight, Sales Tax, and Instrumentation; no sales tax and low end of range for freight (OAQPS 2-27)

4. Taken from Methodology for Estimating Control Costs for Industrial, Commercial, Institutional Boilers and Process Heaters Nation Emissions Standards for Hazardous Air Pollutants - Major Source ERG Memo April 2010.

a Electricity and Compressed Air Cost from Memo

5. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), July 2002, Section 6, Chapter 2.

a Equation 2.40 for fan HP (OAQPS 2-42)
 U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), September 2000, Section 3, Chapter 2.

Table 2.8: Capital Cost Factors for Thermal and Catalytic Incinerators (OAQPS 2-42) were used

because factors were not in SCR section

7. Energy Information Administration highest price for industrial natural gas between November 09 through April 10.

http://www.eia.gov/dnav/ng/ng_pri_sun

Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1*(S2/S1)^{0.6}) where S1 is Hertford Biomass Boiler (Wood Chips) flow rate of 331,969 acfm from Hertford August 2008 Application and S2 is Enviva dryer flow rate of 180,000 ACFM.
 Scaled Direct Annual Costs linearly based on Hertford flow rate of 331,969 ACFM and Enviva flow rate of Thermothyle August 2008 Application and S2 is Enviva dryer flow rate of 180,000 ACFM.

The resulting Quew/Qinitial = 0.542 10. Scaled Hertford August 2008 reagent consumption, electricity, and compressed air based on NOx emissions reduction at 715.2 MMBTU/hr versus the Enviva basis of 220 MMBtw/hr. Hertford Application specified NOX reduction from 0.25 lb/MMBTU to 0.075 lb/MMBTU with heat input of 715.2 MMBTU/hr or 125.1 lb/hr reduction. Enviva is assuming reduction from 0.228 lb/MMBtu to 0.077 lb/MMBtu or lb/hr reduction of = Thus, multiply Hertford cost by 23.1/125.1 = 0.265 33.1

Capital Cost	Boiler	OAQPS Notation ¹
Purchased Equipment Costs		
Total Equipment Cost ^{2,3}	3,843,236	А
Instrumentation ⁴	384,324	0.10 × A
Sales Tax ⁴	115,297	0.03 × A
Freight ⁴	192,162	0.05 × A
Total Purchased Equipment Costs	4,535,018	$B = 1.18 \times A$
Direct Installation Costs 6		
Foundations and Supports	453,502	0.10 × B
Handling and Erection	1,814,007	0.40 × B
Electrical	181,401	0.04 × B
Piping	90,700	0.02 × B
Insulation	45,350	0.01 × B
Painting	45,350	0.01 × B
Site Preparation (Site Specific)	272,101	0.01 × B
Total Direct Installation Costs	2,902,412	$C = 0.64 \times B$
Indirect Installation Costs		
General Facilities ⁶	1,487,486	$0.20 \times (B + C)$
Engineering and Home Office Fees	743,743	$0.10 \times (B + C)$
Process Contingencies	371,872	$0.05 \times (B + C)$
Construction Management ⁶	1,115,615	$0.15 \times (B + C)$
Owner's Cost ⁶	371,872	$0.05 \times (B + C)$
Total Indirect Installation Costs	4,090,587	$D = 0.55 \times (B + C)$
Project Contingency ⁶	2,305,603	$E = 0.20 \times (B + C + D)$
Total Plant Cost	13,833,620	$E = 0.20 \times (B + C + D)$ F = B + C + D + E
Allowance for Funds During Construction ⁵	968,353	$F = B + C + D + E$ $G = 0.07 \times F$
Royalty Allowance	0	
Preproduction Costs	-	H
Inventory Capital ^{7,3}	296,039	$I = 0.02 \times (F + G)$
Initial Catalyst and Chemicals	4,753	ĸ
Fotal Capital Investment		
	15,102,766	$\mathbf{TCI} = \mathbf{F} + \mathbf{G} + \mathbf{H} + \mathbf{I} + \mathbf{J} + \mathbf{K}$
Operating Cost	Boiler	OAQPS Notation
Direct Annual Costs		
Operating and Supervisory Labor	64,549	L
Maintenance Cost	226,541	$M = 0.015 \times TCI$
Reagent Consumption ¹⁰	70,334	N N
Electricity ¹⁰		
Catalyst Replacement ^{8, 10}	143,627	0
Catalyst Regeneration ^{6, 10}	222,703	P
	107,719	Q
Total Direct Annual Costs	835,474	DAC = L + M + N + O + P + O

TABLE D-2 CONVENTIONAL SELECTIVE CATALYTIC REDUCTION COST ANALYSIS ENVIVA PELLET SAMPSON, LLC

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Total Annual Cost	3,213,570	TAC = DAC + IDAC
Total Indirect Annual Costs	2.378,096	IDAC = R + S
Capital Recovery ⁹	1,773,965	S
Economic life of "Hot" SCR	20	
Annual Interest Rate	10%	
Overhead, Taxes, Insurance, Administration	604,111	R
Indirect Annual Costs		

1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Section 4.2, Chapter 2. Adjustments to lettering made as PEC and direct installation costs were broken out for this analysis.

2. Direct Capital Costs are based on an Oglethorpe Power Corporation (Baxley, Georgia) PSD Application Submitted 2009, which includes High Dust SCR, Ammonia Unloading and Storage, ID Fans, Flue Gas Handling System, Ash Handling System, and Extra Charge of Catalyst.

3. Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1*(S2/S1) 0.6) where S1 is Olgethorpe Biomass Boiler (Wood Chips) Capacity of 1,282 MMBtu/hr, S2 is Enviva dryer heat input of 220 MMBtu/hr, and C1 is \$10,238,805.

 Based on general OAQPS costs as presented on page 2-27 of Section 1, Chapter 2 of OAQPS Manual.
 Estimates based on engineering knowledge and evaluation of costs for other equipment as specified in OAQPS Manual.
 Costs were not included in OAQPS calculation or underestimated by OAQPS based on vendor data and experience. Costs have been included or adjusted.

7. Inventory capital is the cost to fill the reagent tank(s) for the first time, OAQPS Manual, Section 4.2, Chapter 2, page 2-44.

8. Catalyst replacement is calculated based on Future Worth Factor in Equations 2.51 and 2.52 of OAQPS Manual, Section 4.2, Chapter 2, page 2-47.

9. Capital Recovery calculated based on Equations 2.54 and 2.55 of OAQPS Manual, Section 4.2, Chapter 2, pages 2-48 and 2-49. 10. Scaled Olgethorpe reagent consumption, electricity, and catalyst based on NOx emissions reduction at 1282 MMBTU/hr versus the Enviva basis of 220 MMBtu/hr. Oglethorpe Application specified NOx reduction from 0.18 lb/MMBTU to 0.071 lb/MMBTU with heat input of 1,282 MMBTU/hr or 140.9 lb/hr reduction. Enviva is assuming reduction from 0.228 lb/MMBtu to 0.0771 lb/MMBtu or lb/hr reduction =

33.10 lbs/hr Thus, multiply Olgethorpe cost by the ratio of NOx reduction = 0.235

Cost Item		Notes	Reference
Direct Capital Costs			
Installed Capital Cost	\$207,791	51 1	2(a), 4
Total Capital Investment	\$207,791		2(0), 4
Operating Cost			
Direct Annual Costs			
Capacity Factor For Direct Annual Costs	100.0%		3(a)
Operation and Maintenance Costs	\$25,000		
	\$25,000		2(c)
Reagent Costs (50% Urea Solution)	. etc		
Reagent Consumption	6.16	gph	2(d), 5
Reagent Cost	\$2.00	(\$/gal)	2(d), 5 2(d)
Total	\$107,950	(-(4)
Compressed Air			
Compressed Air	31		
Air Price	\$0.15	scfm \$/1000 ft ³ air	2(e), 5
Total	\$2,459	3/1000 fr air	
Water Consumption			
Water	100		
Water Price	122 \$1.65	gph	2(f), 5
Total	\$1,765	\$/1000 gallons	3(b)
	<i>a</i> 1,705		
Electricity			
Power	2.19	k₩	3(c), 5
Unit Cost	\$0.070	\$/kWh	
Total	\$1,342		
Total Direct Annual Costs	\$138,516		
Indirect Annual Costs			
Administrative Charges	\$4,156	2% of TCI	
Property tax	\$2,078	1% of TCI	
Insurance	\$2,078	1% of TCI	
Annual Interest Rate	10%		
Economic life of SNCR	15		
Capital Recovery Factor	0.131		i(b)
Total Capital Recovery Cost	\$27,319		1(0)
Fotal Indirect Annual Costs	\$35,631		
Cotal Annual Cost	\$174,147		

TABLE D-3 SELECTIVE NON-CATALYTIC REACTOR COST ANALYSIS ENVIVA PELLET SAMPSON, LLC

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1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), March 2003, Section 4.2, Chapter 2.

* No taxes, Insurance, Admin applies (OAQPS 1-37)

No taxes, Insurance, Admin appres (UAQE 5 1-27)
 Equation 1.34 for CFI (OAQPS 1-38)
 Verbal quote provided by Chris Cubepper for Factory sales on 3-27-2012 for Capital cost. Other costs provided from Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.

0.109

- b BOP Interface Design Engineering and Erection Assumes Install = 1.25 x Mat'l & Engineering
- c Estimated Value, Parts and Labor
- d Reagent Consumption (gph) and Cost (\$/gal) from vendor-90% Capacity
- e Plant air + instrument air, based ou \$0.15 per 1000 cubic feet of air
- f Assumes 1 gpm per injector total flow and \$2.50 per 1000 gallons filtered water 3 Sources as follows:
- - a Capacity factor calculated as 8760 times the average hourly annual throughput divided by maximum hourly throughput (71.71 ODT/hr / 71.71 ODT/hr)
 - Base water price from Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.
 Base descricity price from Hertford Renewable Energy PSD Application (Hertford, North Carolina). Submitted 2008, Approved 2009.

 Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (Cl*(\$2/\$)^{0.6}) where SI is Hertford Biomass Boiler (Wood Chips) flow rate of 331.969 ACFM and S2 is the flow rate of 180000 ACFM 0.542

5. Scaled original quoted reagent consumption based on the Herford NOx emissions reduction at 762.5 MMBTU/hr versus the Enviva dryer heat input rating of 175 MMBtu/hr. Herford had a reduction from a NOx reduction from 0.30 lb/MMBTU to 0.15 lb/MMBTU at 762.5 MMBTU/hr or

114.4 lb/hr reduction. The dryer will have a NOx reduction of 0.22 lb/mmBtu to 0.114 lb/mmBtu or 12.52 lbs/hr reduction.

Thus, multiply the Hertford quote by 12.52/114.4, which is equal to Electricity, Water, and Compressed air were also scaled accordingly TABLE D-4 NOX BACT IMPACTS SUMMARY ENVIVA PELLET SAMPSON, LLC

a

					Economic Impacts	8	Energy Impacts	Environmental Impacts
Control Options (lb/MIMBTU)	Baseline Emissions (tons/yr)	Control Efficiency	Emissions Reduction (tous/year)	Total Capital Cost (S)	Annual Cost (\$/year)	Cost Effectiveness (\$/ton)	Increase Over Baseline (kW*hr/yr)	Adverse Environmental Impacts? (Yes/No)
0.068 (RSCR)	219.35	66.1%	145.0	\$6,414,289	\$1,904,000	\$13,132	4.19E+06	No
0.068 (HD SCR)	219.35	66.1%	145.0	\$15,102,766	\$3,213,570	\$22,164	2.51E+07	No
0.150 (SNCR)	219.35	25.0%	54.8	\$207,791	\$174,147	\$3,176	1.92E+04	No
0.200 (Baseline)	219.35	N/A	N/A	N/A	N/A	N/A	N/A	No

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Capital Cost		Notes	Ref.
Capital Investment			
Direct Costs			
Purchased Equipment Costs			
WESP	\$3,126,634	A	1.11
Freight Estimate	\$113,696		1(a), 11
Instrumentation	\$312,663	0.10A	2
Sales Tax	\$93,799	0.03A	2
Purchased Equipment Cost, PEC	\$3,646,793	в	
Direct Installation Costs			
Foundations and Support	\$145,872	0.04B	2
Handling & Erection	\$1,823,396	0.50B	2
Electrical	\$291,743	0.08B	2
Piping	\$36,468	0.01B	2
Insulation for ductwork	\$72,936	0.02B	2
Painting	\$72,936	0.02B	2
Total	\$2,443,351		
Total Direct Costs, DC	\$6,090,143	DC = B + 0.67 * B	
Indirect Costs (Installation)			
Engineering	\$729,359	0.20B	2
Construction and field expenses	\$729,359	0.20B	2
Contractor Fees	\$364,679	0.10B	2
Start-up	\$36,468	0.01B	2
Performance test	\$36,468	0.01B	2
Model study	\$72,936	0.02B	2
Contingencies	\$109,404	0.03B	2
Total Indirect Costs: IC	\$2,078,672	IC = 0.57 * B	
Total Capital Investment	\$8,168,815	TCI = DC + IC	
Operating Cost			
Direct Annual Costs			
Operating Labor			
Operator	\$56,130	3 hr/d * d/y * \$51.26/hr	3(a), 5
Supervisor	\$8,419	15% of operator	3(b)
Coordinator	\$18,710	1/3 of operator	3(c)
Total	\$83,259		
Maintenance			
Labor	\$2,512	0.825*ESP Plate Area (ft ²)	4, 11
Material	\$36,468		3(d)
Total	\$38,980		
Electricity Costs			
Requirement	228	kw/HR	6(a), 9, 11
Unit cost	\$0.070	\$/kW-hr	9
Total	\$140,114		
Water Costs	A		
Wastewater Disposal	\$1,703		6(b), 7
Municipal Water Usage	\$284		6(b), 8
	\$1,987	1	
Total Direct Annual Costs		1	- 11 - E

TABLE D-5 WET ESP ECONOMICS IMPACTS EVALUATION ENVIVA PELLET SAMPSON, LLC

al Annual Cost	\$1,738,421	TAC = DAC + IDAC	
Total Indirect Annual Costs	\$1,474,081		
Total Capital Recovery Cost	\$1,073,985		10
Capital Recovery Factor	0.131		10
Economic life of ESP	15		10
Annual Interest Rate	10.0%		10
Insurance	\$81,688	1% of TCI	3(e)
Property tax	\$81,688	1% of TCI	3(e)
Administrative Charges	\$163,376	2% of TCI	3(e)
Overhead	\$73,344	60% * (operating labor + maintenance)	3(e)
Indirect Annual Costs			

Quote of \$3,300,000 provided by TurboSonic (6/22/2010) for a 130 MMBtu/hr Wood-fired Boiler achieving similar performance levels. a Email from Rod Pennington (TurboSonic) to Joe Sullivan (Trinity) June 26, 2010 that stated additional freight costs no included. Freight cost \$215,000.
 Direct and Indirect capital costs associated with the purchase of the ESP determined in accordance with EPA OAQPS APCCM Sec. 6, Ch.3, Table 3.16
 EPA OAQPS APCCM Sec.6, Ch.3, Table 3.21
 (a) Operator costs calculated @ 3 hr per day and 2200 days of operation
 (b) Superator costs calculated @ 16 for more user a APCCM secience

(b) Supervisor labor costs calculated @ 15% of operator cost as per APCCM guidance
 (c) Coordinator costs calculated @ 1/3 of operator costs as per APCCM guidance
 (d) Maintenance material(s) calculated @ 1% of purchased equipment cost as per APCCM guidance

Indirect annual costs calculated in accordance with APCCM guidance
 EPA OAQPS APCCM Sec.6, Ch.3, Equation 3.45 for Maintenance Materials

5. US Dept of Labor - Bureau of Labor Statistics - \$51.26/hr (Stationary Engineers and Boiler Operators, 2008 dollars)

(a) Electrical power requirements
(b) Wastewater blowdown rate (0.6 gallons / minute); assumes water usage (blowdown rate +

50% sump vol) 7. Waste water disposal cost - \$0.0054/gal - provided by Air Compliance Advisor User Guide -

Version 7.5

Version 7.5
 Municipal water usage cost - \$0.0006 /gal - provided by Electric Power Research Institute
 Electricity unit cost provided by the Energy Information Administration
 Capital recovery calculated assuming 15 years of equipment life @ a recovery rate of 10% Capital Recovery Factor (CRF)

= (IR*(1+IR)^n)/((1+IR)^n - 1)

 Scale-up capital cost factor from Ulrich, Gael D. Chemical Engineering Process Design and Economics, 2004 (C1*(S2/S1)^{0.6}) where S1 is basis flow rate of 196,940 ACFM from a NC wood products facility and S2 is Enviva dryer flow rate of 215,000 ACFM. 0.91

8/28/2014

TABLE D-6 PM BACT IMPACTS SUMMARY FOR ROTARY DRYER ENVIVA PELLET SAMPSON, LLC

					Economic Imnacts		Energy Impacts	Environmental
Control	Baseline	Control	Emissions	Total Capital	Annual	Cost	Increase Over	Adverse Environmental
Options	Emissions	Efficiency	Reduction	Cost	Cost	Effectiveness	Baseline	Impacts?
(Ib/ODT)	(tons/yr)		(tons/year)	(\$)	(S/year)	(S/ton)	(kW*hr/yr)	(Yes/No)
0.105 (WESP)	562.29	95%	534.2	\$8,168,815	\$1,738,421	\$3,254	2.00E+06	No
2.092 (Baseline, Cyclone)	562.29	N/A	N/A	N/A	N/A	N/A	N/A	No
¹ Filterable reduction of PM to 0.105 lb/ODT conates to a limit of 0.03 lb/MMBtu filterable PM Condensible nortion is 0.017 lb/MMBtu as shown in the emission calculations	a 0.105 lb/ODT eau	uates to a limit of	° 0.03 lh/MMBni fi	Iterable PM Condensil	Me nortion is 0.017 lb/MM	WBtill as shown in the en-	vission calculations	

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ble portion is U.U1 / ID/MIMIBtu as shown in the emission calculations.

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