Prevention of Significant Air Quality Deterioration Review

Preliminary Determination

August 11, 2011

Facility Name: Huber Engineered Woods, LLC
City: Commerce
County: Jackson
AIRS Number: 04-13-157-00014
Application Number: TV-19076 and TV-19319
Dates Applications Received: July 13, 2009 and November 24, 2009

Review Conducted by:
State of Georgia - Department of Natural Resources
Environmental Protection Division - Air Protection Branch
Stationary Source Permitting Program

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SUMMARY

The Environmental Protection Division (EPD) has reviewed the application submitted by Huber Engineered Woods, LLC (hereafter Huber) for a permit amendment to relax NOx, VOC, CO and PM PSD-avoidance emission limits and allow unrestricted use of resins containing melamine urea phenol formaldehyde (MUPF). The proposed project will allow Huber to use any of the three permitted resin with no restrictions.

As requested by Huber, the Commerce facility will become a major source under PSD regulations, as prescribed in 40 CFR 52.21(r)(4), by relaxing PSD avoidance limits which had restricted the resin usage. Because all existing enforceable PSD synthetic minor limits will be removed, allowing production increases, PSD permitting requirements are applicable for this modification, as though construction had not yet commenced.

The modification of Huber's process due to this project will result in an emissions increase in NOx, VOC, SO_2, CO, and PM. The sources of these increases in emissions include the Wellons wood fired burner and thermal oil heater (WBNR); the rotary dryers (DRY1, DRY2, and DRY3); and the board press group (BDFN). A Prevention of Significant Deterioration (PSD) analysis was performed for the facility for all pollutants to determine if any increase was above the "significance" level. The NOx, VOC, SO_2, CO, PM_{10} and $PM_{2.5}$ emission increases were above their PSD significant level thresholds. However, in Huber's updated application, dated December 22, 2010, they propose limiting SO_2 emission below 40 tpy, by requesting a limit on the quantity of accelerant used at this facility.

The Huber facility is located in Jackson County, which is classified as "attainment" or "unclassifiable" for SO_2, $PM_{2.5,}$ PM_{10}, NOx, CO, and ozone (VOC and NOx).

The EPD review of the data submitted by Huber related to the proposed modifications indicates that the project will be in compliance with all applicable state and federal air quality regulations.

It is the preliminary determination of the EPD that the proposal provides for the application of Best Available Control Technology (BACT) for the control of NOx, VOC, CO, PM_{10}, and $PM_{2.5}$, as required by federal PSD regulation 40 CFR 52.21(j).

It has been determined through approved modeling techniques that the estimated emissions will not cause or contribute to a violation of any ambient air standard or allowable PSD increment in the area. It has further been determined that the proposal will not cause impairment of visibility or detrimental effects on soils or vegetation. Any air quality impacts produced by project-related growth should be inconsequential.

This Preliminary Determination concludes that an Air Quality Permit Amendment should be issued to Huber Engineered Woods, LLC to remove all existing PSD synthetic minor emission limits and allow Huber increased operational flexibility at the oriented strand board (OSB) mill. Various conditions have been incorporated into the Title V operating permit to ensure and confirm compliance with all applicable air quality regulations. A copy of the draft permit amendment is included in Appendix A. This Preliminary Determination also acts as a narrative for the Title V Permit.

1.0 INTRODUCTION – FACILITY INFORMATION AND EMISSIONS DATA

On July 9, 2009, Huber submitted an application for an air quality permit to remove all PSD synthetic minor emission limits. The facility is located at 1442 Highway 334 in Commerce, Jackson County.

Table 1-1: Title V Major Source Status

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the Pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Yes	✓		
PM_{10}	Yes	✓		
SO_2	Yes			✓
VOC	Yes	✓		
NO_x	Yes	✓		
CO	Yes	✓		
TRS				✓
H_2S				✓
Individual HAP	Yes	✓		
Total HAPs	Yes	✓		

Table 1-2 below lists all current Title V permits, all amendments, 502(b)(10) changes, and off-permit changes, issued to the facility, based on a review of the "Permit" file(s) on the facility found in the Air Branch office.

Table 1-2: List of Current Permits, Amendments, and Off-Permit Changes

Permit Number and/or Off-Permit Change	Date of Issuance/ Effectiveness	Purpose of Issuance
2493-157-0014-V-02-0	April 18, 2007	Title V Renewal
2493-157-0014-V-02-1	May 15, 2007	Administrative Amendment
2493-157-0014-V-02-2	December 12, 2007	502(b)(10) change to install a wood products enclosure over the press.

Based on the proposed project description and data provided in the permit application, the estimated incremental increases of regulated pollutants from the facility are listed in Table 1-3 below:

Table 1-3: Emissions Increases from the Project

Pollutant	Baseline Years	Potential Emissions Increase (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD Review
PM	N/A	170.44	25	Yes
PM_{10}	N/A	170.44	15	Yes
$PM_{2.5}$	N/A	61.63	10	Yes
VOC	N/A	435.29	40	Yes
NO_X	N/A	730.11	40	Yes
CO	N/A	333.13	100	Yes
*SO_2	N/A	<40.0	40	No
TRS	N/A	0.0	10	No
Pb	N/A	0.0	0.6	No
Fluorides	N/A	0.0	3	No
H_2S	N/A	0.0	10	No
SAM	N/A	0.0	7	No

* The initial application indicated that SO_2 emissions would be 59.56 tpy, which is above the PSD significant emission rate. However, the Permittee requested a PSD avoidance limit for SO_2 emissions in their updated application, dated December 22, 2010. SO_2 emissions will be limited below 40 tpy by limiting accelerant usage below 151 tpy.

This permit amendment serves as a retroactive PSD permit; since all PSD avoidance limits are to be relaxed. As a retroactive PSD permit, this review is not concerned with baseline actual emissions or future projected actual emissions. The facility wide emission totals are used as the net increase for each pollutant. These increases have been used to determine which criteria pollutants trigger the PSD significance threshold. Table 1-4 contains an emissions summary. The emissions calculations for Tables 1-3 and 1-4 can be found in detail in the facility's PSD application (see Section 13 in the Title V application and Appendix B in PSD Application No. TV-19076). These calculations have been reviewed and approved by the Division.

Table 1-4: Net Change in Emissions Due to the Major PSD Modification

Pollutant	Total Increase (tpy)
PM/PM_{10}	170.44
$PM_{2.5}$	61.63
VOC	435.29
NO_X	730.11
CO	333.13
SO_2	< 40
TRS	0.0
Pb	0.0
Fluorides	0.0
H_2S	0.0
SAM	0.0

Based on the information presented in Tables 1-3 and 1-4 above, Huber's proposed modification, as specified in Georgia Air Quality Application No. TV-19076 along with additional information submitted, is classified as a major modification under PSD because the potential emissions of NOx, VOC and CO are greater than 250 tpy and the potential emissions of PM, PM_{10} and $PM_{2.5}$ are greater than the significant emission rates of 25, 15, and 10 tpy, respectively.

Because the PSD avoidance limits are released from this permit, the dryers will have a potential increase in throughput capacity from 47 ODT/hr to 50 ODT/hr. The press will also have an increased throughput capacity from 70 MSF/hr to 77 MSF/hr. Production increases are due to reductions in down time and the removal of limitations on resin use.

Table 1-5 shows the potential HAP emissions from the dryers and Table 1-6 shows the potential HAP emissions from the press. Both show that HAP emissions are predicted to increase after this permit is issued and MUPF resin is allowed to be used at all times. However, these potential emission rates are set conservatively, as demonstrated by the results of performance tests conducted in 2007 through 2010. As shown in Table 1-5 and table 1-6, emissions were lower than the potential rates indicated. Therefore, as also indicated in the tables, actual emission rates of phenol and formaldehyde are very likely to be lower than the current allowable emission rates, from both the dryers and the press. Therefore, the emission limits are not being increased and are unchanged in this amendment.

To assure that emission rates do not exceed these limits, some testing is required under the new throughput capacities. These tests are also to insure that the maximum ground level concentration (MGLC) for each pollutant remains below its acceptable ambient concentration (AAC) after this amendment. The HAP emission limits previously required on the board press and dryers will remain unchanged in this amendment. It is expected that emissions of phenol and formaldehyde from the dryers will increase no more than the production rate, so additional testing is not required. However, since phenol and formaldehyde emission rates from the press are related to the resin used, as well as the production rate, it is harder to be sure what the increase in emissions from the press will be when using a different resin at a higher production rate. To ensure the press remains in compliance with the limits for phenol and formaldehyde, performance tests are being required to be carried out under the new operating conditions. Huber must verify that formaldehyde and phenol emission rates from the press do not exceed the emission limits specified in Table 1.6 below.

This will help assure that press emission rates do not exceed the limits found in Condition 3.2.3 when MUPF is used. Note that Huber is not being required to test for methanol emissions. Methanol is a natural component of the wood and therefore its emissions will not be significantly altered due to use of a different resin. We note also that methanol emissions from the press only represent 6 percent of the facility’s total methanol emissions and the methanol toxic assessment found the proposed methanol emission rate from the facility to be only 13 percent of the allowable 24-hour AAC.

Note that there are no HAP testing requirements for the dryers. Because raw resins are not present in the dryers, methanol, phenol and formaldehyde emissions are only emitted as the result of drying wood. Higher HAP emission would only be expected due to production increases. A good estimate of emissions after the production rate is increased can be determined by scaling the previous test results by the maximum expected production rate of 77 MSF/hr. When these scaled rates, and the rest of the plant-wide HAP totals, are modeled it has been demonstrated that the off-site concentrations of each HAP are less than the allowable AACs, with the highest being methanol, at 83% of the 24-hour AAC.

Table 1-5: Rotary Dryers Emissions Summary – Hazardous Air Pollutants

Pollutant	*Emission Factor (lb/ODT)	♦Potential Emission: Prior to Amendment (lb/hr)	♦♦Potential Emission: After PSD Amendment (lb/hr)	†Emission Rates from Performance Tests (lb/hr)	Emission Limits (lb/hr)
Phenol	0.0889	4.18	4.45	2.37	3.84
Formaldehyde	0.138	6.49	6.90	1.39	5.98
**Methanol	0.0185	0.87	0.93	0.523	NA

* Emission factors defined in Huber’s PSD application, dated July 2009.
† Emission rates from Huber’s performance tests conducted in 2010 and 2007.
♦ Potential emissions calculated using the pre amendment maximum dryer production throughput of 47 ODT/hr.
♦♦ Potential emissions calculated using the after amendment maximum dryer production throughput of 50 ODT/hr.
** The pervious permit required testing to verify methanol emission rates from the press and dryers, it did not contain methanol emission limits.

Table 1-6: Board Press Emissions Summary – Hazardous Air Pollutants

Pollutant	*Emission Factor (lb/MSF⅜”)	♦Potential Emission: Prior to Amendment (lb/hr)	♦♦Potential Emission: After PSD Amendment (lb/hr)	†Emission Rate from Performance Test (lb/hr)	Emission Limit (lb/hr)
Phenol	0.0434	3.04	3.34	0.49	3.04
Formaldehyde	0.0620	4.34	4.77	1.21	4.34
**Methanol	0.0086	0.60	0.66	0.51	NA

* Emission factors defined in Huber’s PSD application, dated July 2009.
† Emission rates from Huber’s performance tests conducted in 2008.
♦ Potential emissions calculated using the pre amendment maximum press production throughput of 70 MSF/hr.
♦♦ Potential emissions calculated using the after amendment maximum dryer production throughput of 77 MSF/hr.
** The pervious permit required testing to verify methanol emission rates from the press and dryers, it did not contain methanol emission limits.

The emission rates in Tables 1-7 show the past potential and baseline actual emissions from pre-amended operations and the future projected actual and future potential emissions, with an increased throughput rate, from post amended operations. As expected criteria pollutants will increase as a result of this amendment.

Table 1-7: Huber's OSB Emissions Summary – Criteria Pollutants

Pollutant	Annual Emission Prior to Amendment		Annual Emissions After PSD Amendment	
	♦Past Potential Emissions (tpy)	†Past Actual Emissions (tpy)	♦♦Future Potential Emission (tpy)	††Future Projected Actual Emission (tpy)
NO_x	244	165.2	730.11	620.6
CO	244	105.2	333.13	283.2
VOC	244	133.1	435.29	370
PM	*134.6	101.1	170.44	144.9

† Baseline Actual emissions are based on highest 12-month total in 2007.
♦ Past Potential emissions are based on the PSD major source limit of 249 tpy minus a 5 tpy buffer.
* Past Potential PM emissions are estimated by reducing the maximum throughput capacities by 21%, since facility wide potential PM emissions cannot reach the PSD avoidance limit of 244 tpy.
†† Future Projected Actual emissions are determined by reducing the maximum throughput capacities by 15%, based on projected down time. This is a conservative assumption, since Huber has determined that the past actual production rate is as much as 24% less than maximum production rate.
♦♦ Future Potential emissions are calculated using post amendment throughput capacities of 50 ODT/hr and 77 MSF/hr for the dryers the press, respectively as well as emission factors defined in Huber's PSD application, dated July 2009.

Annual Emission increases are calculated using information in Table 1-7. The future projected actual emission rate is determined by subtracting the past actual missions from the future projected actual emissions. The future potential emission rate is determined by subtracting the past potential emissions from the future potential emission increases. This is shown in Table 1-8. Since this amendment serves as a retroactive PSD permit, future potential emission were used to determine PSD significant emission increases, as seen in Table 1-3. These PSD emission increases are specified in Table 1-8 as retroactive PSD increases. Table 1-8 illustrates the difference between future projected actual emission increases, future potential emission increases, and retroactive PSD emission increases. As expected, both the future projected actual and future potential emission increases following the proposed throughput increases, resulting from this amendment, are significantly less than the retroactive PSD increases shown in Table 1-3.

Table 1-8: Huber's OSB Emission Increases

Pollutant	Future Projected Actual Increase (tpy)	Future Potential Increase (tpy)	Retroactive PSD Increase (tpy)
NO_X	455.4	486.1	730.11
CO	178	89.1	333.13
VOC	236.9	191.3	435.29
PM	43.8	35.8	170.44

Through its new source review procedure, EPD has evaluated Huber's proposal for compliance with State and Federal requirements. The findings of EPD have been assembled in this Preliminary Determination.

2.0 DESCRIPTION OF MODIFICATION

The facility is an existing OSB plant with a permit containing PSD avoidance conditions for NOx, CO, VOC, and PM. Huber Engineered Woods, LLC (Huber) submitted Application TV-19076, which proposed the removal of all existing PSD avoidance limits from the operating permit, to allow an increase in operational flexibility. By relaxing these PSD avoidance limits, Huber will be allowed to increase production and have unrestricted use of melamine urea phenol formaldehyde (MUPF) resin. MUPF resin contains more nitrogen than the other two resins used at the mill, one of which is based on methylene diphenyl di-isocyanate (MDI) and the other on phenol formaldehyde (PF). In this plant, reject material containing resin is recycled and routed to the furnace, where it is combusted to generate heat for the plant. Therefore, the use of more MUPF resin will cause greater emissions of NOx as compared to MDI or PF resins. However, even without that change, potential emissions of all pollutants are to be increased, since production restrictions are to be removed, thus allowing production increases.

This permit amendment will also modify the monitoring strategy for the board press wood products enclosure, as requested in Application No. TV-19319.

This permit amendment incorporates the following requested changes: Baghouse SC08, controlling the dry screen and blender operations, is now to be identified as Baghouse BH01; Baghouse SC45, controlling the forming and mat reject system, is now to be identified as Baghouse BH23; Baghouse SC09, controlling the trim and grade equipment, is now to be identified as Baghouse BH04; and Baghouse SC67, controlling the sander and tongue & groove equipment, is now to be identified as Baghouse BH05. Huber also requested a PSD avoidance limit for SO_2 emissions in an updated application.

The Huber permit applications and supporting documentation are included in Appendix A of this Preliminary Determination and can be found online at www.georgiaair.org/airpermit.

3.0 REVIEW OF APPLICABLE RULES AND REGULATIONS

State Rules

Georgia Rule for Air Quality Control (Georgia Rule) 391-3-1-.03(1) requires that any person prior to beginning the construction or modification of any facility which may result in an increase in air pollution shall obtain a permit for the construction or modification of such facility from the Director upon a determination by the Director that the facility can reasonably be expected to comply with all the provisions of the Act and the rules and regulations promulgated thereunder. Georgia Rule 391-3-1-.03(8)(b) continues, stating that no permit to construct a new stationary source or modify an existing stationary source shall be issued unless such proposed source meets all the requirements for review and for obtaining a permit prescribed in Title I, Part C of the Federal Act [i.e., Prevention of Significant Deterioration of Air Quality (PSD)], and Section 391-3-1-.02(7) of the Georgia Rules (i.e., PSD).

Georgia Rule 391-3-1-.02(2)(b), Visible Emissions, is a general rule limiting the opacity of emissions from a source to less than 40 percent. Rule (b) is an applicable requirement for the rotary dryers (DRY1, DRY2, and DRY3), the board press and its associated equipment (BDFN), the ink applicator (IA), the fire pump (FP), and the green end painting operations (GEP).

Georgia Rule 391-3-1-.02(2)(d), Fuel Burning Equipment, limits opacity and particulate matter emissions from all fuel-burning equipment. Emissions of fly ash and other particulate emissions from fuel burning equipment rated between 10 and 250 MMBtu/hour and constructed after January 1, 1972 is limited to less than $P = 0.5\ (10/R)^{0.5}$ pounds per MMBtu heat input. Opacity from fuel burning equipment constructed or modified after January 1, 1972 cannot exceed 20 percent. Rule (d) is an applicable requirement for the Wellons fixed grate wood burner (WBNR) because it produces heat for an oil heater. Wet Electrostatic Precipitators (WESPs) WES1, WES2 and WES3 are used to control PM emissions from the dryers and wood burner.

Georgia Rule 391-3-1-.02(2)(e), Particulate Emissions from Manufacturing Processes, also known as the process weight rule, limits PM emissions based on the following equations:

$E = 4.1\ P^{0.67}$ for process input weight rate up to 30 tons per hour
$E = 55\ P^{0.11} - 40$ for process input weight rate above 30 tons per

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

Rule (e) is an applicable requirement for the rotary dryers (DRY1, DRY2, and DRY3), the board press and its associated equipment (BDFN), the ink applicator (IA), and the green end painting operations (GEP). Baghouses are used to control emissions from the green end painting operations, flake screening, blending, forming, mat reject, trimming, sanding and tongue & groove equipment. The board press and press unloader are within a total enclosure and this enclosure is vented to regenerative thermal oxidizer (RTO) DRTO. The rotary dryers are vented to WESPs WES1, WES2 and WES3 before passing through RTOs SRTO, HRTO, and PRTO.

Georgia Rule 391-3-1-.02(2)(g), Sulfur Dioxide, applies to all fuel-burning sources. Any fuel burning equipment rated at 100 MMBtu per hour or greater must not burn fuel containing more than 3 percent sulfur by weight and fuel burning sources below 100 MMBtu must not burn fuel containing more than 2.5 percent sulfur by weight. The Wellons fixed grate wood burner, with a heat input capacity of 150 MMBtu/hr, burns waste wood containing less than 1 percent sulfur. The emergency engine and the fire pump will fire diesel fuel containing 0.5 percent sulfur or less. Therefore compliance with this rule is expected.

Georgia Rule 391-3-1-.02(2)(n), Fugitive Dust, applies to any construction, operation, process, handling, transportation or storage facility that may result in fugitive dust. Georgia Rule (n) applies to the plant roads and material handling operations, limiting opacity to 20 percent. With paved roads and the measures proposed by Huber to minimize fugitive emissions, compliance is expected.

Federal Rule - PSD

The regulations for PSD in 40 CFR 52.21 require that any new major source or modification of an existing major source be reviewed to determine the potential emissions of all pollutants subject to regulations under the Clean Air Act. The PSD review requirements apply to any new or modified source, which belongs to one of 28 specific source categories having potential emissions of 100 tons per year or more of any regulated pollutant, or to all other sources having potential emissions of 250 tons per year or more of any regulated pollutant. They also apply to any modification of a major stationary source which results in a significant net emission increase of any regulated pollutant.

Georgia has adopted a regulatory program for PSD permits, which the United States Environmental Protection Agency (EPA) has approved as part of Georgia's State Implementation Plan (SIP). This regulatory program is in the Georgia Rules at 391-3-1-.02(7). This means that Georgia EPD issues PSD permits for new major sources pursuant to the requirements of Georgia's regulations. It also means that, while Georgia EPD considers EPA comments and makes use of EPA guidance, EPD is not legally bound to act on this. A commonly used source of EPA guidance on PSD permitting is EPA's Draft October 1990 New Source Review Workshop Manual for Prevention of Significant Deterioration and Nonattainment Area Permitting (NSR Workshop Manual). The NSR Workshop Manual is a comprehensive guidance document on the entire PSD permitting process.

The PSD regulations require that any major stationary source or major modification subject to the regulations meet the following requirements:

- Application of BACT for each regulated pollutant that would be emitted in significant amounts.
- Analysis of the ambient air impact.
- Analysis of the impact on soils, vegetation, and visibility.
- Analysis of the impact on Class I areas.
- Public notification of the proposal in a newspaper of general circulation.

Definition of BACT

The PSD regulation requires that BACT be applied to all regulated air pollutants emitted in significant amounts. Section 169 of the Clean Air Act defines BACT as an emission limitation reflecting the maximum degree of reduction that the permitting authority (in this case, EPD), on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such a facility through application of production processes and available methods, systems, and techniques. In all cases BACT must establish emission limitations or specific design characteristics at least as stringent as applicable New Source Performance Standards (NSPS). In addition, if EPD determines that there is no economically reasonable or technologically feasible way to measure the emissions, and hence to impose an enforceable emissions standard, it may require the source to use a design, equipment, work practice or operations standard or combination thereof, to reduce emissions of the pollutant to the maximum extent practicable.

EPA's NSR Workshop Manual includes guidance on the 5-step top-down process for determining BACT. In general, Georgia EPD requires PSD permit applicants to use the top-down process in the BACT analysis. The five steps of a top-down BACT review procedure identified by EPA per BACT guidelines are listed below:

Step 1: Identification of all control technologies.
Step 2: Elimination of technically infeasible options.
Step 3: Ranking of remaining control technologies by control effectiveness.
Step 4: Evaluation of the most effective controls and documentation of results.
Step 5: Selection of BACT.

The following is a discussion of the applicable federal rules and regulations pertaining to the equipment that is the subject of this preliminary determination, which is then followed by the top-down BACT analysis.

Federal New Source Performance Standards

40 CFR 60, Subpart A

40 CFR 60, Subpart A, General Provisions, imposes generally applicable provisions for initial notifications, initial compliance testing, monitoring, and recordkeeping requirements for equipment at the facility that is subject to certain New Source Performance Standards, as indicated by those NSPS Standards.

40 CFR 60, Subpart Db

40 CFR 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, is an applicable requirement for the Wellons Fixed grate wood burner heater (WBNR). Subpart Db applies to each heat recovery/steam generating-unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a design heat input capacity greater than 100 MMBtu/hr.

The allowable PM emission rate, for facilities with an annual capacity factor greater than 30 percent for wood, is 0.1 lb/MMBtu heat input. The NSPS standard for visible emissions is less than 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity. This regulation also requires Huber to install, calibrate, maintain, and operate a continuous opacity monitoring system (COMS) for the emissions. Since there are three stacks which can receive emissions from WBNR, three COMS are required, one on each RTO stack. This regulation subsumes Georgia Rule 391-3-1-.02(2)(d)(3) for PM and opacity limits, being more stringent.

Huber has taken limits on the annual capacity factor for natural gas and/or fuel oil fired in the Wellons furnace to avoid the NSPS NOx limit of 0.3 lb/MMBtu. A federally enforceable limit requiring the capacity factor for natural gas and fuel oil to remain below 10 percent as been added to the permit. As long as Huber maintains the annual capacity factor for natural gas and/or fuel oil below 10 percent they will not be subject to the NOx limit established in Subpart Db.

Huber is required to maintain records of each fuel combusted during each day and submit quarterly reports. Since this unit is subject to NSPS Subpart Db, the general provisions of Subpart A apply to this unit as well.

40 CFR 60, Subpart IIII

40 CFR 60, Subpart IIII, Stationary Compression Ignition Internal Combustion Engines, applies to stationary compression ignition internal combustion engines for which construction commences after July 11, 2005 and are manufactured after April 11, 2006, or are certified fire pump engines manufactured after July 1, 2006. The emergency fire pump located at this facility was manufactured in November 2006 and is therefore subject to the provisions of NSPS Subpart IIII. When Huber purchased a fire pump in 2006, it was certified to meet the NSPS emission limits, as required by Subpart IIII. Huber's emergency engine

generator was manufactured in 1989, which is before the NSPS Subpart IIII applicability date of July 11, 2005. Therefore, the emergency engine is not subject to the requirements of this NSPS.

Federal National Emissions Standards For Hazardous Air Pollutants

40 CFR 63 Subpart DDDD

The facility is a major source of hazardous air pollutants (HAP) because the facility has potential to emit formaldehyde at greater than 10 tpy. It will therefore be subject to any applicable 40 CFR 63 NESHAP.

40 CFR 63, Subpart DDDD, National Emission Standards for Hazardous Air Pollutants Plywood and Composite Wood Products (PCWP), is specifically applicable to OSB mills and related manufacturing equipment located at major sources of HAPs. HAP emissions from the following affected sources are addressed by this regulation: wood fired furnace (WBNR), rotary flake dryers (DRY1, DRY2, and DRY3), multi-opening press (BP), paint booths, green-end equipment, forming equipment, finishing equipment and resin storage tanks.

Huber is complying with Subpart DDDD by using the add-on control option for the dryers, furnace, and the press. The furnace/dryers are controlled by two RTOs with one swing RTO, while one RTO controls the press. Compliance is achieved with the RTOs by a 90% destruction efficiency of HAP emissions, specifically methanol and formaldehyde.

Huber is subject to the work practice requirements listed in 40 CFR 63, Subpart DDDD Table 3, including the use of non-HAP coating in the paint booths. The MACT standard specifies the development of a startup, shutdown, and malfunction plan (SSMP) for the affected units and requires a semiannual compliance report to be submitted containing the information in 40 CFR, 63.2281 (c) through (g).

40 CFR 63 Subpart ZZZZ

40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE), applies to any existing, new, or reconstructed stationary reciprocating internal combustion engine located at major and area sources of HAP emissions.

The emergency engine generator and the emergency fire pump at this facility are classified as emergency stationary RICE under Subpart ZZZZ and therefore subject to Subpart ZZZZ. The fire pump which was constructed after June 12, 2006, is considered a new stationary RICE. So, in accordance with 40 CFR 63.6590(c), the fire pump must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII. However, Huber's emergency engine generator was constructed before July 11, 2005. Therefore, in accordance with 40 CFR 63.6590(b)(3), it is not required to meet the requirements of Subpart ZZZZ or Subpart A and no initial notification is required.

40 CFR 63 Subpart DDDD

Because flue gases from the Wellons unit pass through the dryer and come in direct contact with the drying material, the emissions are regulated as dryer emissions according to 40 CFR 63, Subpart DDDD - Plywood and Composite Wood Products. According to Subpart 63.7491(l), any boiler and process heater specifically listed as an affected source in another standard(s) under 40 CFR part 63 will not be subject to the Boiler MACT. Therefore, this unit will not be subject to Boiler MACT rules. There are no other boilers onsite

This amendment will not change the existing permit Conditions 3.2.2 and 3.2.3, which limit HAP emissions from the board press and dryers. These HAP emission limits will remain unchanged in the permit. Performance testing will insure continued compliance with these limits after issuance of this amendment.

State and Federal – Startup and Shutdown and Excess Emissions

Excess emission provisions for startup, shutdown, and malfunction are provided in Georgia Rule 391-3-1-.02(2)(a)7. Excess emissions from the wood fired furnace (WBNR), rotary flake dryers (DRY1, DRY2, and DRY3), or multi-opening press (BP), associated with the proposed project would most likely result from a malfunction of the associated control equipment. The facility cannot anticipate or predict malfunctions. However, the facility is required to minimize emissions during periods of malfunction, as well as startup and shutdown.

Federal Rule – 40 CFR 64 – Compliance Assurance Monitoring

Under 40 CFR 64, the Compliance Assurance Monitoring Regulations (CAM), facilities are required to prepare and submit monitoring plans for certain emission units with the Title V application. The CAM Plans provide on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies to units that use a control device to achieve compliance with an emission limit and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program. This applicability evaluation addresses the wood fired furnace, the dryers, and the press, which are controlled by WESPs and RTOs, as well as the screens, dry bins, conveyors, forming, blending, and the finishing processes, which are controlled by baghouses. CAM was addressed during the last Title V permit renewal, and has been incorporated into the current Title V permit, No. 2493-157-0014-V-02-0. Huber is not requesting any changes to the CAM plans for any units covered under 40 CFR 64, and is not requesting any changes at the facility that would change the current applicability determinations under the CAM rule. Therefore, no CAM requirements are triggered by this proposed modification. [Note that CAM conditions are found in existing Conditions 5.2.9 and 5.2.10.]

4.0 CONTROL TECHNOLOGY REVIEW

The proposed project will result in emissions that are significant and therefore trigger PSD review for the following pollutants: PM_{10}, $PM_{2.5}$, NOx, CO, VOC, and GHG. This section describes in detail each piece of equipment with PM_{10}, $PM_{2.5}$, NOx, CO, and VOC emissions, identifies possible control technologies for the pollutants involved, and determines source and emission-specific BACT.

4.1 Wellons Furnace/Dryer(s) - Background

The Wellons Furnace (WBNR), with a heat input capacity of 150 MMBtu/hr, provides heat to dry the wood strands in the three rotary dryers (DRY1, DRY2, and DRY3) and to the hot oil loop, which provides heat to the press. This heat is provided directly to the wood strands by routing the exhaust from the furnace through the dryers. Note, BACT for the furnace/dryer exhaust is evaluated as a single emission source for all pollutants, since these processes share airflows and exhaust through a common manifold. The furnace uses an indirect heat exchanger to provide energy to the hot oil loop, which provides heat to the press. The emissions from the furnace/dryer currently are controlled by three WESPs (APCD ID No. WES1, WES2, and WES3) and two RTOs with one swing RTO (APCD ID No. SRTO, HRTO, and PRTO).

For the furnace and dryers, the facility has proposed the use of WESPs with an emissions limit of 21.65 pounds PM per hour; the use of RTOs with an emissions limitation of 42.89 pounds per hour of VOC and 64.30 pounds per hour of CO, as BACT for PM, VOC, and CO. For the wood fired furnace and RTOs, Huber has proposed staged combustion/controlled burn, as well as the use of low NOx burners in the RTOs, with an emission limitation of 142.55 pounds NOx per hour as BACT. Stack test data for CO, NOx, VOC, and condensable PM was used to calculate emissions from the dryers and the furnace and establish the BACT limits. Dividing the emission rate from the test by the production rate yielded an emission factor for that facility. To determine a conservative emission factor at Huber, a safety factor of 1.33 was used to account for test variability. That emission factor was then multiplied by the maximum production rate (77 MSF/hr or 50 ODT/hr) to determine a maximum potential hourly emission rate in pounds per hour. Huber requested a PSD avoidance limit of 151 tpy of accelerant usage to maintain the SO_2 emission rate below 40 tpy. Therefore, a BACT analysis for SO_2 was not necessary.

Furnace/Dryer System – PM_{10} and $PM_{2.5}$ Emissions

Particulate matter emissions are generated from the combustion of wood in the furnace and from drying wood strands in the dryers. PM emissions from the furnace/dryer consist of filterable particles plus a significant amount of non-filterable (condensable) fine particles coming from the drying process. Baghouse, dry electrostatic precipitator (ESP), WESP, and venturi scrubber were evaluated for control of PM emissions from the furnace/dryer at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

The first step in a BACT analysis is identifying possible control technologies for each applicable pollutant based on previously demonstrated controls on comparable emissions sources. For most source types, the U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC) database is the preferred reference. Table 4-2, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. These controls correspond with entries in the RBLC, which are reproduced in Appendix C of the application.

Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies for each pollutant in order of decreasing emission reduction potential.

Table 4.1-1: Evaluated Control Options for PM Emissions – Furnace/Dryer

Pollutant	Control Technology
PM_{10} and $PM_{2.5}$	Baghouse
	Dry Electrostatic Precipitator (ESP)
	Wet Electrostatic Precipitator (WESP)
	Venturi Scrubber
	Good Design/Operation

Step 2: Eliminate technically infeasible options

The second step in a BACT analysis is eliminating any technically infeasible control technologies. Huber considered each control technology for PM emissions, and eliminated those that are clearly technically infeasible.

Baghouse

A baghouse, also referred to as a fabric filter, consists of a number of fabric bags placed in parallel. The gas stream is filtered when it passes through the bags, and PM is collected on the surface of the fabric. The collected PM is periodically removed from the bags to hoppers located beneath the bags. PM removal from the filters is accomplished by reversing airflow or shaking the filters in an isolated compartment of the baghouse, or by short blasts of high-pressure air (pulsejet).

A baghouse can be designed to remove up to 99 percent or more of PM. However, a baghouse can only be used for exhaust streams at temperatures less than 1,000 ^{o}F. While the wood fired furnace/dryer exhaust has a temperature of approximately 320 ^{o}F, the exhaust contains a significant amount of moisture. The moisture content combined with the presence of condensable (non-filterable) PM can cause "blinding" of the fabric filter. This will in turn result in lower airflow rates, greater pressure drop, and finally, failure of the control device. Therefore, a baghouse is not considered technically feasible for the wood fired furnace/dryer exhaust.

Step 3: Rank remaining technologies by control effectiveness

Step 3 ranks the remaining technologies by control effectiveness. Infeasible technologies identified in Step 2 are excluded from this step. Table 4.1-2 lists the remaining technically feasible controls and their efficiencies. The efficiencies are vendor quotes, when available, or accepted industry literature values.

Table 4.1-2: Wood Fired Furnace/Dryer - Remaining Control Technologies Ranked by Effectiveness

Pollutant	**Listed Control Technologies**	**Potential Control Efficiency (%)**
PM_{10} and $PM_{2.5}$	Dry Electrostatic Precipitator (ESP)	95-98%
	Wet Electrostatic Precipitator (WESP)	90+%
	Venturi Scrubber	50-90%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Following the next step in the "top-down" BACT approach, the highest ranked control option is evaluated first. If the highest ranked option is technically and economically feasible, and the option has acceptable energy and environmental impacts, the option is deemed BACT. Otherwise, the next ranked control option is evaluated. The evaluation process continues until a control option is found that meets all of the BACT requirements. Once BACT is determined, it is unnecessary to evaluate any remaining options that are ranked below the selected BACT.

Dry Electrostatic Precipitators

Dry electrostatic precipitators (ESPs) are used in industry to control PM emissions from process units and have an average emission control efficiency that ranges from 95 to 98%. ESP technology induces a charge on the particles in an exhaust stream. The charged particles are then collected onto oppositely charged electrodes where they are held until the electrodes are cleaned.

Cleaning is completed by "rapping" the electrodes and allowing the particles to fall into a collector below the electrodes. During rapping, a certain amount of collected particles re-enter the exiting exhaust stream.

When handling streams with high adhesive content, like that of a rotary dryer operation, the adhesion results in "sticky" particles adhering to the electrode walls, requiring increased "rapping force" to clean them. Increased rapping leads to increased re-entrainment of particles and lowers the effectiveness of an ESP. Despite this decreased effectiveness, Huber's Easton facility uses an ESP to control particulate emissions. Therefore an economic analysis was performed for the use of an ESP to control PM emissions from the dryers and furnace.

Huber's economic analysis for the use of an ESP to control PM emissions from the furnace/dryer established cost per ton bases of $3,059 and $2,090, for a life recovery of 10 years and 20 years, respectively. However, as seen in Table D-9, the incremental cost for WESPs at 75% efficiency and ESPs at 95% efficiency is $7,826 per ton of pollutant. This is a conservative value, because the incremental difference in controlled emissions would likely be lower than 76 tpy, since efficiency of the ESP would be compromised by particle adhesion. Therefore, 95% efficiency would not be achieved and the incremental cost would be even greater than $7,826 per ton.

As shown in Figure 1 of Huber's Reasonableness Analysis For PM_{10} As A Surrogate for $PM_{2.5}$, the average $PM_{2.5}$ control efficiency is slightly lower than the average PM_{10} control efficiency. Therefore, the dollar per ton control cost for $PM_{2.5}$ would be greater than that of PM_{10}, so the ESP technology is economically infeasible for $PM_{2.5}$ as well.

Wet Electrostatic Precipitators

The WESP control device is the highest ranked technology remaining for PM control on this process unit. Huber is proposing the use of WESPs prior to the RTOs on the wood fired furnace/dryers. As the highest rated of the remaining control devices, no further options are evaluated.

Huber relied on the PM_{10} BACT and NAAQS analysis as guidance for $PM_{2.5}$ for the Commerce Mill. In the Reasonableness Analysis For PM_{10} As A Surrogate for $PM_{2.5}$, dated September 25, 2009, Huber's analysis shows a consistent relationship between $PM_{2.5}$ and PM_{10} emission and the pollution control technology that is BACT for PM_{10} is also BACT for $PM_{2.5}$.

<u>Step 5: Select BACT</u>

Step 5 is the selection of a BACT control strategy and PM emission limits for the wood fired furnace/dryer system. The selected control technologies are those remaining from Step 4. Proposed emission limits are from data presented in Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

Huber proposes the utilization of one WESP for each dryer, three total. They propose a total emission limitation of 21.60 lb/hr for PM and PM_{10} from the furnace/dryer system, as BACT. In Huber's updated application dated December, 22, 2010, a $PM_{2.5}$ BACT limit of 10.21 lb/hr was proposed. Huber claims, and the Division has verified, that the proposed PM BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.1-3 summarizes the BACT determination requirements being proposed for these units.

Table 4.1-3: Huber BACT Summary for furnace/Dryer PM Emissions

Process Operation	Emission Unit Groups	Proposed BACT Limit
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	The use of 3 WESPs to control PM and PM_{10} emissions to 21.60 lb/hr.
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	The use of 3 WESPs to control $PM_{2.5}$ emissions to 10.21 lb/hr.

EPD Review – PM, PM_{10} and $PM_{2.5}$ Control

The Division agrees with Huber's BACT determination for the use of three WESPs to control PM, PM_{10} and $PM_{2.5}$ emissions from the furnace/dryer system (in Emission Groups WBNR and DRYR). Compliance with the BACT PM limits must be established including both filterable and non-filterable PM emissions.

Conclusion – PM, PM_{10} and $PM_{2.5}$ Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.1-4:

Table 4.1-4: EPD BACT Summary for the Wellons Furnace/Dryer(s)

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
PM and PM_{10}	WESP	0.432 lb/ODT not to exceed 21.60 lb/hr	Length of time to conduct stack test	Testing: EPA Method 5 in conjunction with EPA Method 202 Testing
$PM_{2.5}$	WESP	10.21 lb/hr	Length of time to conduct stack test	Testing: EPA Method 5 in conjunction with EPA Method 202 Testing

Typically Georgia Rule 391-3-1-.02(2)(d)(3) would be subsumed by the BACT Total-PM limit. However, in this case, the BACT Total-PM limit will include both condensable and non-condensable PM emissions due to the high percentage of non-filterable PM driven off the wood in the drying process. Whereas Georgia Rule 391-3-1-.02(2)(d) PM limits only apply to PM emissions from the combustion process, which emits an insignificant amount of condensable material. It is therefore reasonable, in this circumstance, to have a higher total-PM BACT limit than the PM limit in Georgia Rule (d).

Furnace/Dryer System – NOx Emissions

Most of the NOx emissions are generated from the combustion of waste wood that contains resin (PF, MDI and/or MUPF) in the furnace and from nitrogen in the natural gas that is combusted in the RTO control device. NOx is also emitted due to thermal generation, because of excess air combustion, in the RTOs. SNCR, SCR, Low NOx Burner Technology, Water/Steam Injection, FGR, Reduced Air Preheat, resin substitution, and staged combustion were evaluated for control of NOx emissions from the furnace/dryer at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. Table 4-2, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.1-5: Evaluated Control Options for NOx Emissions – Furnace/Dryer

Pollutant	Control Technology
NOx	Selective Non-Catalytic Reduction (SNCR)
	Selective Catalytic Reduction (SCR)
	Low NOx Burner Technology
	Water/Steam Injection
	Flue Gas Recirculation (FGR)
	Reduced Air Preheat
	Resin Substitution
	Staged Combustion with over fire air (OFA)
	Low Excess Air/Oxygen Trim
	Proper Design/Operation

Step 2: Eliminate technically infeasible options

Selective Catalytic Reduction (SCR)

SCR reduces NOx by spraying ammonia over a catalyst in the presence of oxygen. On the catalyst surface, ammonia (NH_3) decomposes into NH_2 free radicals, reacts with NOx molecules, and reduces to nitrogen and water as expressed in the following reaction:

$$2NO + 2NH_3 + \frac{1}{2}O_2 \longrightarrow 2N_2 + 3H_2O$$

The SCR process requires a reactor vessel, a catalyst, and an ammonia storage and injection system. The effectiveness of an SCR system is dependent on a variety of factors, including the inlet NOx concentration, the exhaust temperature, the ammonia injection rate, the type of catalyst, and the presence of catalyst maskants and poisons, such as particulate matter and SO_2. SCR units typically achieve 70 to 90% NOx reduction with an ammonia slip of 5 to 10 parts per million by volume on a dry basis (ppm) at 15% oxygen.

Although SCR is included as a potential control technology in this BACT analysis, the use of such a system is not technically feasible for the wood fired furnace/dryer exhaust based on the following:

- The high particulate loading in wood fired operations reduces the number of active catalyst sites available for the reaction to occur, reducing the NOx removal efficiency and increasing ammonia slip (i.e., blinds the catalyst).

- The firing rate for the wood fired furnace changes frequently to accommodate the variable heat demand of each rotary dryer and the inconsistency in fuel. This makes it difficult to optimize the ammonia injection rate. As a result, significant ammonia slip would occur and/or higher NOx emissions.

- The alkalinity of wood ash can contaminate the catalyst and significantly reduce NOx removal efficiency.

Using SCR after the dryers and RTOs would not affect flake properties. However, exhaust temperatures from an RTO (270°F to 325°F) are lower than that required by SCR (475°F to 850°F). Burning natural gas to increase the exhaust temperature would reduce energy efficiency and increase air pollutants. EPD and Huber are unaware of any attempts to utilize SCR after the RTOs at a wood products facility.

Therefore, the use of SCR on the wood fired furnace/dryer exhaust is not technically feasible and Huber will not consider it for the remainder of this analysis.

Selective Non-Catalytic Reduction (SNCR)

SNCR reduces NOx to molecular nitrogen (N_2) and water (H_2O) by injecting an ammonia or urea ($CO(NH_2)_2$) spray into the post-combustion area of the unit. Typically, injection nozzles are located in the upper area of the furnace and convective passes. Once injected, the urea or ammonia decomposes into NH_3 or NH_2 free radicals, reacts with NOx molecules, and reduces to nitrogen and water. The ammonia and urea reduction equations are provided below:

$$2NO + 2NH_3 + \frac{1}{2}O_2 \longrightarrow 2N_2 + 3H_2O$$

$$2NO + CO(NH_2)_2 + \frac{1}{2}O_2 \longrightarrow 2N_2 + CO_2 + 2H_2O$$

SNCR is considered a selective chemical process because, under a specific temperature range, the reduction reactions described above are favored over reactions with other flue gas components. Although other operating parameters such as residence time and oxygen availability can significantly affect performance, temperature is the most important factor affecting SNCR performance.

Although the overall chemistry is identical to that used in the SCR system, the absence of a catalyst results in several differences. One is that the un-catalyzed reaction requires a higher reaction temperature and is not as effective. For ammonia, the optimum reaction temperature range is 1,615 to 2,000 °F; for urea the optimum temperature range is 1,650 to 2,100 °F. The process is very temperature sensitive. The reaction needs a certain minimum temperature (1614 °F) to occur or the ammonia will not react. Temperatures below the temperature window cause the reduction rate to slow, resulting in high ammonia slip. Above the temperature window (>2,012 °F), the oxidation of ammonia to NOx is too high, thus producing NOx instead of decreasing it.

With ammonia slip, unreacted ammonia will enter the dryers and directly contact the wood flakes during the drying process. This exposure results in ammonia-based salts on the flakes, which alter the pH of the flake surface. This will impede the bond between resin and flake. As a result, they would be forced to increase resin use to counter the salt effect on flake chemistry. The increase in resin use will cause increased methanol and formaldehyde emissions from the forming line, as well as increased NOx formation in the RTOs, since both resin-generated ammonia and SNCR-derived ammonia slip will be combusted in the RTOs.

Currently, only one wood products manufacturing facility utilizing SNCR for NOx control appears in the RBLC. The facility (Homanit USA in Montgomery County, Mt. Gilead, NC) later opted to become a PSD minor facility and no longer operates the SNCR controls. Also, that facility is a thin high-density fiberboard mill, not on OSB mill.

Huber is aware that Langboard, Quitman is a PSD minor source in Georgia that utilizes SNCR to control NOx from its energy, drying and press areas. However, this system is unique in that the combustion gases do not come into contact with the flakes in the dryer. Therefore, utilizing SNCR on this system does not have any impact on the flakes. The Langboard system is not comparable to Huber's operations. It is therefore not evidence that SNCR is feasible for Huber.

Huber pointed out a PSD permitting review of Norbord's Cordele Georgia Mill in which Georgia EPD acknowledged that the use of SNCR is not technically feasible, while reviewing a plant expansion that included new debarkers, flakers, dryers and a wood fired furnace.[1] Like Huber, Norbord directs exhausts from the furnace to dry the flakes in the dryer, so ammonia slip and its effect on the flakes from the SNCR system is unavoidable. Therefore, SNCR is not feasible.

[1] Georgia EPD. "Prevention of Significant Air Quality Deterioration Review of Norbord Georgia OSB located in Cordele, Crisp County Georgia – Preliminary Determination". SIP Permit Application No. 15812, Title V Permit Application No. 15812, April 2005.

On the other hand, using SNCR after the RTOs would not affect flake properties. However, exhaust temperatures from the RTO (270°F to 325°F) are much lower than that required by SNCR (1,615°F to 2,000°F for ammonia and 1,650°F to 2,100°F for urea). As with the SCR, burning natural gas to increase the exhaust temperature would increase air pollutants and reduce energy efficiency. EPD and Huber are unaware of any attempts to utilize SNCR after an RTO at a wood products facility.

Based on the information provided above, SNCR is deemed technically infeasible for direct-fired dryers.

Water/Steam Injection
Water/steam injection (WSI) is not an add-on control technology. Water or steam is injected into the combustion chamber to provide thermal ballast to the combustion process. This ballast effectively lowers the combustion temperature, minimizing thermal formation of NOx.

However, adding moisture to a system designed for drying wood wafers is counterproductive for drying wood. Also the use of WSI would not be that useful since there is very little thermal NOx produced by combustion of wood. Therefore, WSI is not considered a technologically feasible option for the wood fired furnace/dryer exhaust. Note: this technology is not identified in the RBLC database as a control alternative for any similar unit.

Step 3: Rank remaining technologies by control effectiveness

Table 4.1-6 lists the remaining technically feasible controls and their efficiencies.

Table 4.1-6: Wood fired furnace/Dryer - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
NO_X	Material Usage (Resin Substitution)	Based on Resin Used
	Staged Combustion/Controlled Burn	40%
	Flue Gas Recirculation	40%
	Low NOx Burners	<40%
	Reduced Air Preheat	25%
	Low Excess Air	10%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Material Usage (Resin Substitution)
Nitrogen is a component of all current resin formulations used in OSB manufacturing. No non-nitrogen resins are available that are technically feasible for the OSB production process.

As already stated, Huber wishes to be able to use MUPF resin interchangeably with other resins so as not to be affected by resin availability restrictions, or swings in resin pricing, as well as to reduce the maintenance costs for the press that are high for MDI resin use. While it is unlikely that the Commerce mill would use MUPF resin at all times, Huber believes the mill needs the flexibility to do so if necessary.

This was illustrated in 2005, when the demand for MDI resin nearly exceeded the resin production capacity. This resulted in increased prices and difficulty obtaining the resin necessary to meet customer demand. Furthermore, MUPF resin is common within the wood products industry and has been incorporated in recent PSD permits for OSB mills. Since Huber's competitors use MUPF resin in their mills, Huber would be at a significant financial disadvantage and would not be able to maintain their current market share. Although MUPF resin results in higher NOx emissions, compared to the other resins used at the Commerce mill, economic constraints and resin supply dynamics require Huber to have the flexibility to use this resin without limitation.

Since combusting MUPF resin that is in wood product waste results in higher NOx emissions, when compared to alternative resins, it could be argued that BACT would prevent the use of MUPF resins. However, according to The New Source Review Workshop manual[2], this is not the case:

Historically, EPA has not considered the BACT requirement as a means to redefine the design of the source when considering available control alternatives. For example, applicants proposing to construct a coal-fired electric generator, have not been required by EPA as part of a BACT analysis to consider building a natural gas-fired electric turbine although the turbine may be inherently less polluting per unit product (in this case electricity). However, this is an aspect of the PSD permitting process in which states have the discretion to engage in a broader analysis if they so desire. Thus, a gas turbine normally would not be included in the list of control alternatives for a coal-fired boiler.

Based on the logic above, Huber's initial BACT submittal did not consider resin substitution in its NOx analysis, since they believe that the BACT process cannot dictate the process design, and therefore cannot specify the resin to be used (and thus not specify the nitrogen content of the resin). The Division agreed that the BACT process does not require a review of alternative process designs, when considering available control alternatives. However, in this case, the process design is not at issue, since Huber has shown that the plant can already use more than one resin, with little or no change to the physical set-up and operating procedures. Since resin substitution is considered technically feasible, an economic analysis was completed by analyzing alternative resin usage in the process for NOx control from the furnace/dryer. Upon EPD's request, this analysis was provided in Huber's updated application submitted on Feb. 18, 2010 in Attachment 2 "Resin Usage Economic Calculations". According to this document, the cost of using MDI and PF resin, in lieu of MUPF resin to reduce NOx emissions in the furnace/dryer, would be $12,954/ton of NOx removed. EPD does not consider this cost to be economically feasible. Therefore no further analysis of this control strategy is required.

Staged Combustion/Controlled Burn

Controlled burn is the highest ranked technology remaining for NOx control on these process units. This technology is equivalent to staged combustion from a control efficiency standpoint. The Wellons furnace provides combustion air to each of four cells via two forced draft fans. Ductwork on the discharge of the forced draft fans routes air either below the fixed grates (under fire air, or UFA) or above the grate in the flame zone (over fire air, or OFA). OFA is split into a manifold and is introduced to the cell via "tweeter" holes that extend through the refractory into the combustion zone. UFA is introduced at a single inlet under the grate on each cell. The split between UFA and OFA can be adjusted using dampers, allowing optimal combustion and minimal fuel carryover to the dryers. The level of control that can be achieved is 40 percent.

A controlled burn procedure achieves a similar level of control. Since controlled burn is the highest rated of the remaining control technologies, no further options are evaluated. Huber is proposing the use of controlled burn technology on the wood fired furnace (WBNR).

<u>Step 5: Select BACT</u>

Step 5 is the selection of a BACT control strategy and NOx emission limit for the wood fired furnace/dryer system. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

[2] EPA Office of Air Quality Planning and Standards, <u>New Source Review Workshop Manual.</u> October 1990, pgs. B13-B14.

Huber proposes controlled burn in the wood fired furnace and the use of low NOx burners in the RTOs, with an emissions limitation of 142.55 lb/hr, to control NOx emissions from the furnace/dryer system as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.1-7 summarizes the BACT determination requirements being proposed for these units.

Table 4.1-7: Huber BACT Summary for furnace/Dryer NOx Emissions

Process Operation	Emission Unit Groups	Proposed BACT Limit
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	Controlled burn in the wood fired furnace and the use of low NOx burners in the RTOs to control NOx emissions to 142.55 lb/hr.

EPD Review – NOx Control

The Division agrees with Huber's BACT determination for the use of controlled burn in the wood fired furnace and the use of low NOx burners in the RTOs to control NOx emissions from the furnace/dryer system in Emission Groups WBNR and DRYR. Compliance must be established by determining total emissions from the stacks of the following RTOs: HRTO, PRTO, and SRTO. Performance tests for NOx, CO and VOC must be done concurrently, since tuning the system for low emissions of one pollutant could result in higher emissions of another pollutant.

Conclusion – NOx Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.1-8:

Table 4.1-8: EPD BACT Summary for the Wellons Furnace/Dryer(s)

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
NOx	Controlled burn in the furnace; low NOx burners in the RTOs	2.85 lb/ODT not to exceed 142.55 lb/hr	Length of time to conduct stack test.	Testing: EPA Method 7

Furnace/Dryer System – CO Emissions

CO emissions from the furnace/dryer are generated primarily from incomplete combustion. Regenerative Catalytic Oxidation (RCO), RTO, and Proper Design/Operation were evaluated for control of CO emissions from the furnace/dryer at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-2, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.1-9: Evaluated Control Options for CO Emissions – Furnace/Dryer

Pollutant	Control Technology
CO	RTO
	RCO
	Proper Design/Operation

Step 2: Eliminate technically infeasible options

Regenerative Catalytic Oxidation

RCO technology is widely used in the reduction of VOC emissions, and concurrently to reduce CO emissions. Catalytic oxidation systems employ a catalyst bed to reduce combustion temperatures to about 700°F – 900°F, well below the range of 1,300°F – 1,800°F seen in typical thermal oxidizers. Both RCOs and RTOs utilize a ceramic bed to recapture the heat of the stream exiting the combustion zone.

RCO technology is not considered technically feasible for the wood fired furnace/dryer exhaust due to the level of PM loading. Even with a highly efficient upstream PM control system, catalyst blinding, poisoning, plugging, or masking will eventually occur in this type of application and will significantly reduce the efficiency of the control device. As compared to the common use of RTOs, industry practice makes it clear that RCO technology is not successful in controlling wood fired furnace and dryers.

Step 3: Rank remaining technologies by control effectiveness

Table 4.1-10 lists the remaining technically feasible controls and their efficiencies. The efficiencies are vendor quotes when available, or accepted industry literature values.

Table 4.1-10: Wood fired furnace/Dryer - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
CO	RTO	75%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Regenerative Thermal Oxidation

An RTO has the highest control efficiency for CO and therefore, according to the top down approach, must be considered first. Huber has determined that the use of RTO technology is both technically feasible and cost effective at the facility, since it is considered BACT for VOCs, and so is proposing the use of RTO technology on the wood fired furnace/dryer exhaust. Therefore, no further analysis is required for CO.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and CO emission limit for the wood fired furnace/dryer system. The selected control technologies are those remaining from Step 4, and emission limits are proposed, using data presented in Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

Huber proposes the utilization of two RTOs to control CO, with an emissions limitation of 64.30 lb/hr as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.1-11 summarizes the BACT determination requirements being proposed for these units.

Table 4.1-11: Huber BACT Summary for furnace/Dryer CO Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	The use of two RTOs controlling CO emissions to 64.30 lb/hr.

EPD Review – CO Control

The Division agrees with Huber's BACT determination for the use of two RTOs with one back-up RTO to control CO emissions from the furnace/dryer system (in Emission Groups WBNR and DRYR). The total emissions from the stacks exhausting from the following RTOs: HRTO, PRTO, and SRTO must be totaled to establish compliance. Performance tests for CO, NOx, and VOC must be done concurrently.

Conclusion – CO Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.1-12:

Table 4.1-12: EPD BACT Summary for the Wellons Furnace/Dryer(s)

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
CO	The use of two RTOs with one back-up RTO	1.29 lb/ODT not to exceed 64.30 lb/hr	Length of time to conduct stack test	Testing: EPA Method 10

Furnace/Dryer System – VOC Emissions

VOC emissions are generated primarily in the drying process when the chips are heated to reduce the moisture content. RTO, RCO, gas recycle, biofiltration, and proper design/operation were evaluated for control of VOC emissions from the furnace/dryer at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-2, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.1-17: Evaluated Control Options for VOC Emissions – Furnace/Dryer

Pollutant	Control Technology
VOC	RTO
	RCO
	Biofiltration
	Proper Design/Operation

Step 2: Eliminate technically infeasible options

Regenerative Catalytic Oxidation
RCO technology is widely used in the reduction of VOC emissions. As previously discussed, it is not considered technically feasible for wood fired furnace/dryer applications due to the level of PM loading.

Biofilter
Biofiltration is a process in which living organisms are used to "consume" the VOC present in a waste stream. The microorganisms in a biofilter are highly temperature sensitive. The exhaust gases from the wood fired furnace/dryer are discharged at high flow rates with an exhaust temperature of approximately 320°F. Exhaust temperatures in the range of the wood fired furnace/dryer are too hot and would not allow active microorganisms to live in the biofilter. Biofilter control was therefore deemed technically

infeasible by Huber on this exhaust stream and not considered further in their BACT analysis for the wood fired furnace/dryer system.

However, the exhaust gases from the wood fired furnace/dryer can be cooled. Cooling the exhaust gases would allow the biofiltration system to affectively control VOC emissions from the wood fired furnace/dryer. Therefore, the Division disagrees with Huber and this control technology will be considered technically feasible and listed in Table 4.1-18 below.

Step 3: Rank remaining technologies by control effectiveness

Table 4.1-18: Wood fired furnace/Dryer - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	RTO	90-95%
	Biofiltration	< 90%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Regenerative Thermal Oxidation

An RTO control device is the highest ranked technology available for VOC control on this process unit. RTO technology is widely used in the reduction of VOC emissions at wood products facilities. Huber is proposing the use of RTOs as BACT for VOC control on the wood fired furnace/dryers.

Huber proposes a 90% reduction of VOC emissions for the furnace/dryers. This reduction percentage is consistent with the new source control efficiency required in the PCWP MACT. While higher efficiencies are possible for RTOs controlling wood fired dryers, based on previous stack test data and process knowledge, Huber believes that three RTOs would have to operate at all times for their inlet stream, using a fourth RTO as a swing, to achieve a VOC destruction efficiency of 95%. This would allow for a longer residence time while still accommodating the current airflow from the process. The two RTOs they use now cannot reach 95% destruction efficiency even at the maximum sustainable operating temperature of the RTOs. Huber performed an economic feasibility analysis and determined that the incremental cost of changing VOC emission control from 90% to 95%, going from using two RTOs with one back-up, to using three RTOs with one back-up, was not justified. The abbreviated economic analysis provided in Table D-29 of Appendix D shows the annual cost of electricity and natural gas for two operating scenarios. One scenario requires the simultaneous operation of three RTOs and the other scenario requires the operation of only two RTOs. The annualized cost is $2,523/ton when VOCs are controlled to 90% (Table D-29, with the updated controlled emission rate of 1,691 tpy, in the application submitted on Feb. 18, 2010). Huber developed a complete top-down analysis, including capital costs to own and operate the 4 RTOs that Huber believes are necessary to achieve 95% removal. The BACT determination included a calculation, which determined the cost of adding a fourth RTO, to be $6,967,465; the annualized cost is $3,904/ton of VOC controlled (Table D-26 in the updated application submitted on Feb. 18, 2010). Using the annual cost of electricity and natural gas, the incremental cost to achieve 95% control is $17,026/ton, which is not justified.

Table 4.1-19 Summarizes the above BACT cost analysis for operating 3 or 4 RTOs.

Table 4.1-19 Annual Cost Effectiveness and Incremental Cost.

Emissions			Economic Impacts			Incremental Fuel and Elec. Cost of Operating 2-RTOs @ 90% vs 3-RTOs @ 95%	
Control Alternative	**Emissions After control (tpy)**	**Emission Reductions (tpy)**	**Installed Capital Cost[1] ($)**	**Total Annualized Cost[2] ($/yr)**	**Cost Effectiveness[3] ($/ton)**	**Annual Fuel and Elec. Cost ($/yr)**	**Incremental Cost Effectiveness[4] ($/ton)**
4-RTOs 95% control	94	1,785	$12,717,691	$6,967,465	**$3,904**	$4,519,764	-
3-RTOs 90% Control	188	1,691	$7,150,139	$4,266,074	**$2,523**	$2,919,290	-
Incremental Difference	94	94	-	-	-	$1,600,474	**$17,026**

1. As specified in the cost spreadsheets (Application Appendix: Tables D-27 and D-25).
2. As specified in Application Appendix Tables D-26 and D-28. Using capital recovery of 10 years and 7% interest.
3. The total annualized cost divided by the emission reduction.
4. The annualized cost for the additional RTO, divided by the emission reduction which would occur.

According to EPA's New Source Review Workshop Manual, incremental and top-down economic analyses should be considered concurrently when evaluating BACT.[3]

In addition to the average cost effectiveness of a control option, incremental cost effectiveness between control options should also be calculated. The incremental cost effectiveness should be examined in combination with the total cost effectiveness in order to justify elimination of a control option.

The manual goes on to state the following:

A comparison of incremental costs can also be useful in evaluating the economic viability of a specific control option over a range of efficiencies. For example, depending on the capital and operational cost of a control device, total and incremental cost may vary significantly (either increasing or decreasing) over the operation range of a control device.

In accordance with the New Source Review Workshop Manual guidance, Huber has provided both incremental and top-down economic analyses to demonstrate that the installation of one additional RTO to achieve 95% control efficiency is economically infeasible.

Biofiltration

Control efficiency on the biofiltration system is expected to be below 90 percent because of the wide variety of VOCs in the exhaust and the exhaust gases are discharged at high flow rates. This is lower than the control efficiency achieved by the RTOs. Nevertheless, an economic analysis is not necessary, because control efficiency achieved by the RTOs is better than the expected control from the biofiltration system.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and VOC emission limit for the wood fired furnace/dryer system. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13 in Section 4 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

[3] EPA Office of Air Quality Planning and Standards, New Source Review Workshop Manual. October 1990, pgs. B41, B43.

Huber proposes the utilization of two RTOs with one back-up RTO to control at least 90 percent of the VOCs, with an emissions limitation of 42.89 lb/hr as BACT. The VOC BACT limit for the furnace/dryer system was achieved by assuming a destruction efficiency equivalent to the requirements of 40 CFR 63 Subpart DDDD. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.1-20 summarizes the BACT determination requirements being proposed for these units.

Table 4.1-20: Huber BACT Summary for furnace/Dryer VOC Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	The use of two RTOs with one back-up RTO controlling 90% of the VOC emissions to 42.89 lb/hr.

EPD Review – VOC Control

The Division reviewed and agrees with the calculation of the cost analyses and determined that the high incremental cost effectiveness of 95% control versus 90% control per ton of VOC removal makes 95% economically infeasible.

The Division agrees with Huber's BACT determination for the use of two RTOs, with one back-up RTO controlling 90% of the VOC from the furnace/dryer system (in Emission Groups WBNR and DRYR). The total emissions from the stacks exhausting from RTOs: HRTO, PRTO, and SRTO must be totaled to establish compliance. As discussed above, performance tests for VOC, NOx, and CO must be done concurrently.

Conclusion – VOC Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.1-21:

Table 4.1-21: EPD BACT Summary for the Wellons Furnace/Dryer(s)

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
VOC	Two RTOs with one backup RTO	0.858 lb/ODT not to exceed 42.89 lb/hr with 90% VOC control	Length of time to conduct stack test	Testing: EPA Method 25 or Method 25A

Furnace/Dryer System – CO_2 Emissions

On July 1, 2011 EPA issued a final rule that defers, for a period of three years, the application of the Prevention of Significant Deterioration (PSD) permitting requirements to carbon dioxide (CO_2) emissions from bioenergy and other biogenic stationary sources. Before permitting requirements can be applicable to CO_2 emissions from biogenic sources, EPA will examine the science associated with the carbon neutrality of biomass during this deferral period. Since the results of this study are currently unknown, biogenic CO_2 emissions are not included in the Greenhouse gas (GHG) totals. Most of the GHG emissions from the Huber facility are biogenic CO_2 from the combustion of wood. The CO_2 equivalents (CO_2e) of other GHG emissions (N_2O and CH_4) from Huber total much less than 75,000 tpy, the PSD significant emission level. Therefore, at this time, Huber is considered to be a minor source of GHG pollutants and a BACT determination for GHG emission is not required. However, since the Huber PSD application preceded the publication of the deferral, it included a top down BACT analysis for GHG emission. Based on their submittal, the EPD had already conducted a BACT analysis. The following BACT analysis is included for completeness.

According to Huber, the proposed project will have potential greenhouse gas (GHG) emissions of 177,552 tpy, which is greater than 75,000 tpy the PSD significance level for CO_2e. This section identifies possible control technologies and determines source and emission-specific BACT.

CO_2 emissions from the furnace/dryer are generated primarily from the combustion of wood waste. Carbon capture and sequestration (CCS), biomass fuel, and good combustion/operating practices were evaluated for control of CO_2 emissions from the furnace/dryer at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Table 1, in Huber's application dated December 22, 2010, lists potential control strategies. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls are consistent with the March 2011 Guidance for Determining Best Available Control Technology for Reducing Carbon Dioxide Emissions from Bioenergy Production. This guidance document is reproduced in Appendix C of the application.

Table 4.1-22: Evaluated Control Options for CO_2 Emissions – Furnace/Dryer

Pollutant	Control Technology
CO_2	Carbon Capture and Sequestration (CCS)
	Combustion of Biomass Fuel
	Good Combustion/Operating Practices

Carbon Capture and Sequestration

CCS would involve post combustion capture of the CO_2 from the furnace and sequestration of the CO_2 in some fashion. Carbon capture is an established process in some industry sectors. In general, carbon capture could be accomplished with low pressure scrubbing of CO_2 from the exhaust stream with either solvents (e.g., amines and ammonia), solid sorbents, or membranes. However, only solvents have been used to-date on a commercial (yet slip stream) scale; solid sorbents and membranes are only in the research and development phase.

In terms of post combustion CCS, a number of coal-fired power plants are conducting carbon capture and sequestration using a slipstream from the exhaust streams. These projects are listed as follows:

AEP Mountaineer (Sept. 2009- Present): AEP is conducting post-combustion CO_2 capture using Alstom's chilled ammonia process to capture 100,000 tpy CO_2e over a 12 to 18 month period on a 20 MW_e slipstream from the exhaust of its 1,300 MW coal-fired Mountaineer plant in New Haven, West Virginia. The captured CO_2 is being sequestered in deep geologic formations beneath the Mountaineer site.

First Energy R.E. Burger (Dec. 2008-Present): First Energy has been conducting a CO_2 capture pilot test using Powerspan's ECO_2 technology on a 1 MW slipstream from the outlet of the R.E. Burger Station (near Shadyside, Ohio) demonstration-scale 50 MW ECO unit (Powerspan's multipollutant control system). The ECO system is designed to control SO_2, NO_X, oxidized mercury, and fine particulate matter from a 110,000 scfm slipstream of a 156 MW coal boiler. The ECO_2 CO_2 capture system uses a proprietary ammonia-based solvent in a thermal swing absorption (TSA) process to remove CO_2 from the flue gas. The project handles 20 tpd dried, compressed, and sequestration-ready CO_2e, but the literature does not suggest the CO_2 is permanently sequestered in any geologic formation or by any other means.

AES Warrior Run (2000-Present)*:* AES captures 110,000 tpy CO_2e using ABB/Lummus' monoethanolamine (MEA) solvent-based system from a small slipstream of the 180 MW coalfired circulating fluidized bed (CFB) power plant at its Warrior Run station in Cumberland, Maryland. The extracted CO_2 is used in the food processing industry and related processes.

AES Shady Point (1991-Present)*:* AES captures 66,000 tpy CO_2e using ABB/Lummus' monoethanolamine (MEA) technology from a small slipstream of a 320 MW coal-fired CFB boiler at its Shady Point station in Panama, Oklahoma. The extracted CO_2 is used for food processing, freezing, beverage production, and chilling purposes.

IMC Chemicals (formerly Searles Valley Minerals) (1978-Present)*:* IMC Chemicals captures 270,000 tpy CO_2e from the flue gas of two 52-56 MW industrial coal boilers using amine scrubbing technology at its soda ash production plant in Trona, California. The captured CO_2 is used for the carbonation of brine from Searles Lake, and the brine is subsequently used in the soda ash production process.

WE Energy Pleasant Prairie (June 2008-Oct. 2009): WE Energy captured 16,500 tpy CO_2 using Alstom's chilled ammonia process from a 1.7 MW_e slipstream of the 1,210 MW coal-fired power plant at its Pleasant Prairie station in Pleasant Prairie, Wisconsin. The literature does not suggest the CO_2 was permanently sequestered in any geologic formation or by any other means.

Although these projects have demonstrated the technical feasibility of small-scale CO_2 capture on a slipstream of a coal-fired power plant's emissions using various solvent based scrubbing processes, until these post combustion technologies are installed on an industrial furnace, they are not considered "available" in terms of BACT. Three industrial CCS projects are being pursued under the Industrial Carbon Capture and Storage (ICCS) program for Leucadia Energy Lake Charles, Archer Daniels Midland, and Air Products; however, none of these projects have been designed or constructed.

In addition to the fact that that carbon capture has not been demonstrated on an industrial furnace, there is no available mechanism (pipeline or geologic formation) at this time for the Commerce Mill to permanently sequester the captured gas.

Based on these considerations, CCS is not an available control technology and is eliminated in Step 1 of this analysis.

Step 2: Eliminate technically infeasible options

The second step in a BACT analysis is eliminate any technically infeasible control technologies. Huber considered each control technology for CO_2 emissions, and found that none could be eliminated as technically infeasible.

The remaining two control technologies, combustion of biomass and good combustion/operating practices, are technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Step 3 ranks the remaining technologies by control effectiveness. Unavailable control technology and infeasible technologies identified in Steps 1 and 2 are excluded from this step. Table 4.1-23 lists the remaining technically feasible controls, which are the combustion of biomass and good combustion/operating practices. Note that there are no control efficiencies listed because they are not known. Also it is unclear which option would better reduce emissions of CO_2 from the furnace/dryer.

Table 4.1-23: Wood fired furnace/Dryer - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
CO_2	Combustion of Biomass Fuel	N/A
	Good Combustion/Operating Practices	N/A

Step 4: Evaluate most effective controls and document results

Combustion of biomass and good combustion/operating practices are the remaining selections for reducing CO_2 emissions from the Commerce Mill.

Through the use of waste biomass readily available from the OSB production process, the Commerce Mill does not require the combustion of fossil fuels. By burning the biomass, the disposed energy costs and its CO_2 are reduced. Therefore, biomass is the best fuel selection for the facility from an efficiency and heat rate standpoint, given the process heat requirements for the facility.

It is in the best interest of the Commerce Mill to operate the wood-fired furnaces as efficiently as possible in order to reduce the amount of fuel required to meet the process heat requirements of the facility and to avoid having to purchase fuel from external sources. Therefore, the Commerce Mill utilizes good combustion/operating practices to maximize efficiency. This minimizes CO_2 emissions, as well as emissions of other criteria pollutants. The Commerce Mill utilizes a controlled burn technology, which is similar to staged combustion as described above.

No adverse energy, environmental, or economic impacts are associated with the combustion of biomass or good combustion/operating practices for reducing CO_2 emissions from the woodfired furnace.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and CO_2 emission limit for the wood fired furnace/dryer system. The selected control technologies are those remaining from Step 4.

Based on both the combustion of biomass and the use of good combustion/operating practices (use of controlled burn technology), Huber proposes a total CO_2e BACT emission limit (for CO_2, CH_4, and N_2O) of 37,000 lb/hr, based on GHG emission factors provided in the Greenhouse Gas Mandatory Reporting Rule (40 CFR 98, Subpart C). This proposed limit includes GHG emissions from the Wellons Wood Fired Furnace, the emergency engine, and the fire pump, as well as contributions of GHG emissions from the RTOs, which have been determined to be BACT for VOC and CO emissions. Note: since the regulation of GHG is in its infancy, Huber requested that the permit include flexibility to revise this emission limit should additional guidance become available, regarding GHG emission calculations from the combustion of biomass or natural gas change or more representative emission factors.

Compliance with the proposed BACT limits will be demonstrated based on emission factors published in the Greenhouse Gas Mandatory Reporting Rule and fuel usage records. Table 4.1-24 summarizes the BACT determination requirements being proposed for the furnace/dryer.

Table 4.1-24: Huber BACT Summary for furnace/dryer CO_2 Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	The combustion of biomass and the use of good combustion/operating practices to control CO_2 emissions, limiting future CO_2e emissions to 37,000 lb/hr.

EPD Review – CO_2 Control

As cited in the March 2011 guidance for determining BACT for reducing CO_2 emissions from bioenergy production, CO_2 emissions from bioenergy merits unique consideration in the BACT analysis because land-based biomass carbon stocks can be replenished more quickly than fossil fuel carbon stocks, and these biogenic carbon stocks can act as a sink on a shorter time scale than fossil carbon. This guidance further states that utilizing mill residue (e.g., sawdust, planer shavings, panel trim) to generate energy, rather than leaving the residue to decompose, likely would not cause emissions over and above that which would have taken place if it was not burned. It therefore appears possible at this time to conclude that the atmospheric impact from biomass feed stock is negligible. Therefore, the Division agrees with Huber's determination that utilization of biomass fuel and the use of good combustion/operating practices to control CO_2 emissions from the furnace/dryer system (in Emission Groups WBNR and DRYR) is BACT. However, since the EPA has placed a three year deferral on GHG permitting requirements for industries using biomass-fired and other biogenic sources, the Division does not recommend a BACT emission limit at this time.

Conclusion – CO_2 Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.1-25:

Table 4.1-25: EPD BACT Summary for the Wellons Furnace/Dryer(s)

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
CO_2	The combustion of biomass fuel and the use of good combustion/operating practices.	Fire biogenic carbon stocks	Year-round	NA

Furnace/Dryer System – CH_4 Emissions

CH_4 emissions from the furnace/dryer are generated primarily from the combustion of wood waste. The only available control option for minimizing CH_4 emissions from the wood-fired furnace is the use of good combustion/operating practices.

Applicant's Proposal

Step 1: Identify all control technologies

Huber's application dated December 22, 2010, states that the use of good combustion/operating practices is the only available control option for minimizing CH_4.

Table 4.1-26: Evaluated Control Options for CH_4 Emissions – Furnace/Dryer

Pollutant	Control Technology
CH_4	Good Combustion/Operating Practices

Step 2: Eliminate technically infeasible options

The second step in a BACT analysis is eliminating any technically infeasible control technologies. Good combustion/operating practices is the only technically feasible control option for minimizing CH_4 emissions from the wood-fired furnace.

Step 3: Rank remaining technologies by control effectiveness

Table 4.1-27: Wood fired furnace/Dryer - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
CH_4	Good Combustion/Operating Practices	N/A

Step 4: Evaluate most effective controls and document results

No adverse energy, environmental, or economic impacts are associated with good combustion/operating practices for minimizing CH_4 emissions from the wood fired furnace.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and CH_4 emission limit for the wood fired furnace/dryer system, which is the use of good combustion/operating practices (use of controlled burn technology). As stated above, Huber proposes a CO_2e BACT emission limit of 37,000 lb/hr based on GHG emission factors provided in the Greenhouse Gas Mandatory Reporting Rule, with the flexibility to revise this emission limit should additional guidance regarding GHG emission calculations from the combustion of biomass or natural gas change or more representative emission factors become available.

Compliance with the proposed BACT limits will be demonstrated based on emission factors published in the Greenhouse Gas Mandatory Reporting Rule and fuel usage records. Table 4.1-28 summarizes the BACT determination requirements being proposed for the furnace/dryer.

Table 4.1-28: Huber BACT Summary for furnace/dryer CH_4 Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	The use of good combustion/operating practices to control CH_4 emissions, limiting total CO_2e emission to 37,000 lb/hr.

EPD Review – CH_4 Control

The Division agrees with Huber's BACT determination for the use of good combustion/operating practices to control CH_4 emissions from the furnace/dryer system (in Emission Groups WBNR and DRYR). However, since the EPA has placed a three year deferral on GHG permitting requirements for industries using biomass-fired and other biogenic sources, the Division does not recommend a BACT limit at this time.

Conclusion – CH_4 Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.1-29:

Table 4.1-29: EPD BACT Summary for the Wellons Furnace/Dryer(s)

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
CH_4	The use of good combustion/operating practices.	Fire biogenic carbon stocks	Year-round	NA

Furnace/Dryer System – N_2O Emissions

A tradeoff between NOx and N_2O emissions from the wood-fired furnace exists when developing a combustion control strategy which influences the BACT selection process. There are five (5) primary pathways of NOx production in combustion processes: thermal NOx, prompt NOx, NOx from N_2O intermediate reactions, fuel NOx, and NOx formed through reburning. Mechanisms including lowering the flame combustion temperature and air-to-fuel staging decrease the H atom concentration in the N_2O formation zone and can increase N_2O emissions.

Applicant's Proposal

Step 1: Identify all control technologies

Huber's application dated December 22, 2010, lists potential control strategies. Huber considered the following control technologies in order of decreasing emission reduction potential.

Table 4.1-30: Evaluated Control Options for N_2O Emissions – Furnace/Dryer

Pollutant	Control Technology
N_2O	N_2O Catalysts
	Good Combustion/Operating Practices

N_2O catalysts are a potential control option, as these have been used in nitric/adipic acid plant applications to minimize N_2O emissions. Through this technology, tailgas from the nitric acid production process is routed to a reactor vessel with a N_2O catalyst followed by ammonia injection and a NOx catalyst. A N_2O catalyst has not been used to control N_2O emissions in OSB mills, and to our knowledge, catalyst providers do not offer products to control N_2O emissions from wood-fired furnaces due to the low concentration of N_2O in the exhaust stream, compared to the high (1,000-2,000 ppm) N_2O concentration from Nitric Acid plants.

With N_2O catalysts eliminated, the only available control option for minimizing N_2O emissions from the wood-fired furnace is the use of good combustion/operating practices.

Step 2: Eliminate technically infeasible options

The second step in a BACT analysis is eliminating any technically infeasible control technologies. Good combustion/operating practices are the only technically feasible control option for reducing N_2O emissions from the wood-fired furnace.

Step 3: Rank remaining technologies by control effectiveness

Table 4.1-31: Wood fired furnace/Dryer - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
N_2O	Good Combustion/Operating Practices	N/A

Step 4: Evaluate most effective controls and document results

A recent report by the Climate Change Work Group provides guidance on cases when GHG control strategies have the potential to produce higher emission rates of criteria pollutants, as in the case of the competing NOx and N_2O combustion control strategies for the Commerce Mill's furnace/dryer. In such cases, the guidance suggests that the applicant should consider the effects of increases in emissions of other regulated pollutants that may result from the use of that GHG control strategy, and based on this analysis, the permitting authority can determine whether or not the application of that GHG control strategy is appropriate given the potential increases in other pollutants.

Given the low N_2O emissions relative to NOx emissions from the wood-fired furnace (620 tpy versus 6 tpy) and the recent proposed strengthening of the 8-hr ozone NAAQS indicating U.S. EPA's continued concern over adverse impacts from ozone formation due to NOx and VOC emissions, Huber does not consider it appropriate to control the combustion processes of the furnace/dryer to reduce N_2O emissions with a concurrent increase in NOx emissions. Therefore, good combustion practice for the purposes of minimizing N_2O formation is eliminated on the basis of adverse criteria pollutant impacts.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and N_2O emission limit for the wood fired furnace/dryer system. Based on adverse criteria pollutant impacts no control has been established to minimize N_2O emissions; the Commerce Mill proposes a CO_2e BACT emission limit of 37,000 lb/hr based on GHG emission factors provided in the Greenhouse Gas Mandatory Reporting Rule. This proposed limit includes the contribution of GHG emissions from the RTOs, which have been determined to be required to meet BACT emission limits for VOC and CO. Note: since the regulation of GHG is in its infancy, Huber requested that the permit include flexibility to revise this emission limit should additional guidance regarding GHG emission calculations from the combustion of biomass or natural gas change or more representative emission factors become available.

Compliance with the proposed BACT limits will be demonstrated based on emission factors published in the Greenhouse Gas Mandatory Reporting Rule and fuel usage records. Table 4.1-32 summarizes the BACT determination requirements being proposed for the furnace/dryer.

Table 4.1-32: Huber BACT Summary for furnace/dryer N_2O Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Wellons Wood fired Furnace/Dryers	WBNR and DRYR	Total CO_2e emissions limited to 37,000 lb/hr.

EPD Review – N_2O Control

The Division agrees with Huber's determination that there is no BACT to minimize N_2O formation. However, the Division does not recommend a BACT limit at this time.

Conclusion – N_2O Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.1-33:

Table 4.1-33: EPD BACT Summary for the Wellons Furnace/Dryer(s)

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
N_2O	None	Fire biogenic carbon stocks	Year-round	NA

4.2 Press- Background

The board press in Emission Group BDFN receives three layers of mats of aligned flakes from the forming line and then presses them into OSB, using high temperature and pressure. This press has an OSB processing capacity of 77 MSF/hr and so 674,520 MSF/yr. As discussed above, heat energy is supplied indirectly to the press, using hot oil heated by a fixed grate wood-fired Wellons unit.

During pressing, elevated temperature and pressure cause the strands and binding resin to produce off-gases, including VOC, PM, CO and NOx. VOC and NOx are generated due to the wax and resin used to bind flakes into OSB board. The PM emissions from the board press consist of filterable particles and a significant amount of non-filterable fine particles as a result of high temperatures. The exhaust gases from the pre-loader, the unloader, and the press are captured by a wood products enclosure, which has a design capture efficiency of 100%. Currently this exhaust air is conveyed to a Durr RTO (DRTO) for VOC, CO, and HAP removal and achieves some PM removal, prior to discharge to the atmosphere through the DRTO stack.

Press – NOx Emissions

NOx emissions are generated from the wax and resin formulation used during the OSB board making process. Nitrogen in the resin chemically reacts with oxygen (under conditions of high temperature and pressure) and is emitted from the board in the pressing process. The NOx emissions from the board press will vary depending upon which resin is used and the amount applied. Resin material usage and good operating practices were evaluated for control of NOx emissions from the board press.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-4, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.2-1: Evaluated Control Options for NOx Emissions – Board Press

Pollutant	Control Technology
NOx	Material Usage (Resin Substitution)
	Good Operating Practice

Step 2: Eliminate technically infeasible options

Material Usage (Resin Substitution)
Huber's initial BACT submittal considered substitution of resin with a lower nitrogen content to be technically infeasible, since economic constraints and customer demand require Huber to have the flexibility to use any resin without limitation. However, at the Division's request, Huber submitted an additional BACT analysis for resin substitution as described in Step 4 below as well as for Step 4 under the BACT analysis for the furnace/dryer. Thus, no technologies were eliminated due to technological infeasibility.

Step 3: Rank remaining technologies by control effectiveness

Table 4.2-2: Board Press - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
NOx	Material Usage (Resin Substitution)	Based on Resin Nitrogen Content
	Good Operating Practices	Base Case

Step 4: Evaluate most effective controls and document results

Material Usage (Resin Substitution)
As discussed above, in the furnace/dryer NOx BACT analysis, Huber's initial BACT submittal did not consider resin substitution in its NOx BACT analysis. However, this analysis is provided in Huber's updated application submitted on Feb. 18, 2010 in Attachment 2 "Resin Usage Economic Calculations". The cost of using MDI resin, in lieu of MUPF resin, to reduce NOx emissions from the press, is $12,954/ton of NOx removed, which is not economically feasible, so no further analysis of this control strategy is required.

Good Operating Practices
Huber proposes good operating practices as BACT for emissions of NOx from the press, as it is the only remaining control technology.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and NOx emission limit for the board press. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

Huber proposes the use of good design and operating practice as BACT for control of NOx, with an emissions limitation of 0.297 lb/MSF as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.2-3 summarizes the BACT determination requirements being proposed.

Note that, since it is in Huber's self-interest to efficiently utilize resins in order to minimize operating expenses, there is no need to require this in the permit. By using resin efficiently, Huber will minimize NOx emissions resulting from the combustion of the resin.

Table 4.2-3: Huber BACT Summary for Board Press NOx Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Board Press	BDFN	The use of good operating practice to control NOx emissions to 0.297 lb/MSF.

EPD Review – NOx Control

The Division reviewed Huber's cost analysis that compares use of MUPF resin with alternative resin usage in the process for NOx control, and accepts these calculations, which show that the cost of using MDI resin in lieu of MUPF resin to reduce NOx emissions in the board press is $12,954/ton of NOx removed. The Division agrees resin substitution is not economically feasible.

The Division also agrees with Huber's BACT determination for the use of good operational practice on the board press (in Emission Group BDFN) to control NOx emissions. Compliance must be established by measuring emissions from the DRTO stack exhaust.

Conclusion – NOx Control

The BACT selection for the board press is summarized below in Table 4.2-4:

Table 4.2-4: EPD BACT Summary for the Board Press

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
NOx	Good operating practice	0.297 lb/MSF	Length of time to conduct stack test	Testing: EPA Method 7

Board Press – VOC Emissions

VOC emissions are generated primarily from the wood strands during pressing and secondarily from the resin; the elevated temperatures cause the strands and binding resin to produce off-gases, which include VOC. Off-gases accumulating within the press hood are exhausted via a fan to downstream treatment equipment. RTO, RCO, biofiltration, and proper design/operation were evaluated for control of VOC emissions from the board press at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-4, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.2-5: Evaluated Control Options for VOC Emissions – Board Press

Pollutant	Control Technology
VOC	RTO
	RCO
	Biofilter
	Good Design/Operating Practices

Step 2: Eliminate technically infeasible options

Huber considered each control technology for VOC emissions in Table 4.1-5 to be technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.2-6: Board Press - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	RTO	90-95
	RCO	90-95
	Biofilter	70
	Good Design/Operating Practices	Base Case

Step 4: Evaluate most effective controls and document results

RTO or RCO

The RTO is the highest ranked of the remaining control technologies for VOC emissions. Huber currently operates an RTO for control of VOC from the press, which has 90% destruction efficiency. This RTO cannot reach 95% control with the inlet stream. Destruction efficiencies of 95% or greater could only be achieved by adding an additional RTO or by replacing the existing unit with a larger RTO. This is a similar scenario to the furnace and dryers, for which Huber performed an incremental analysis to demonstrate the economic infeasibility of operating at 95% DRE. Since the VOC concentration in the press exhaust is less than in the furnace and dryer exhaust streams, an incremental analysis would have a similar result to the previous analysis performed on the furnace and dryer exhausts and show that increasing to 95% is cost prohibitive. Therefore, Huber proposes 90% control with an RTO as BACT for VOC.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and VOC emission limit for the board press. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

Huber proposes the utilization of an RTO as BACT for control of VOC, with an emissions limitation of 0.132 lb/MSF as BACT. The VOC BACT limit for the board press was achieved by assuming a destruction efficiency equivalent to the requirements of 40 CFR 63 Subpart DDDD. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.2-7 summarizes the BACT determination requirements being proposed for this unit.

Table 4.2-7: Huber BACT Summary for Board Press VOC Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Board Press	BDFN	The use of an RTO for control of VOC emissions to 0.132 lb/MSF.

EPD Review – VOC Control

Since the VOC concentration in the press exhaust is less than in the furnace and dryer exhaust streams, the Division agrees that an incremental cost analysis on the press would be similar to the furnace and dryers analysis, by which Huber showed the economic infeasibility of operating at 95% control.

The Division agrees with Huber's BACT determination for the use of an RTO on the board press (in Emission Group BDFN) to control 90% of the VOC emissions. Compliance must be established by measuring emissions from the DRTO stack exhaust. Note: though not proposed by Huber, the use of an RCO is also deemed BACT for VOC control from the press, since the same control efficiencies are expected from an RCO and it is considered both technologically and economically feasible.

Conclusion – VOC Control

The BACT selection for the furnace/dryer system is summarized below in Table 4.2-8:

Table 4.2-8: EPD BACT Summary for the Board Press

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
VOC	RTO or RCO	0.132 lb/MSF	Length of time to conduct stack test.	Testing: EPA Method 25 or Method 25A

Press – PM_{10} and $PM_{2.5}$ Emissions

PM emissions are generated when pressing wood strands. This pollutant is driven off the board in the pressing process, when exposed to high temperature and pressure. PM emissions from the board press consist of filterable particles along with a significant amount of non-filterable fine particles coming from the pressing process. Baghouse, Dry Electrostatic Precipitator (ESP), Wet Electrostatic Precipitator (WESP), venturi scrubber and good operating practices were evaluated for control of PM emissions from the board press at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-4, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.2-9: Evaluated Control Options for PM Emissions – Board Press

Pollutant	Control Technology
PM_{10} and $PM_{2.5}$	Baghouse
	ESP
	WESP
	Venturi Scrubber
	Good Design/Operation

Step 2: Eliminate technically infeasible options

Baghouse
A baghouse can remove up to 99 percent or more PM_{10}. However, the waxes and resins used in the board have the potential to blind the baghouse filters. Blinding of the filters results in lower airflow rates and greater pressure drop, which leads to bag failure. Although a baghouse would be effective at PM control in this context, it would only be able to operate for a short period of time until the bags are blinded. As a result, the use of a baghouse is considered technically infeasible for the press vent.

Since the fabric filters were determined to be technically infeasible for PM_{10} due to blinding of the bags resulting from the use of waxes and resins in the press, the baghouse is also deemed technically infeasible for $PM_{2.5}$ control.

Dry Electrostatic Precipitator
An ESP on an OSB press would have to accommodate the presence of adhesive particles in the exhaust airstream. The increased "rapping" needed to clean the ESP of resins/waxes and to accomplish the requisite air stream conditioning would necessitate retrofitting modifications to process equipment that are deemed technically infeasible. Therefore, the ESP is no longer considered in this BACT analysis.

Because the ESP was deemed technically infeasible for PM_{10} due to the presence of adhesive particles in the exhaust stream, the ESP is also deemed technically infeasible for $PM_{2.5}$ control.

Venturi Scrubber
The next highest rated control is a venturi scrubber, which is capable of achieving between 50 to 90% control depending upon particle size and inlet concentration. The use of a venturi scrubber is deemed infeasible for the following reasons. Implementation of a venturi scrubber would require significant additional quantities of fresh water and water disposal facilities (i.e., retention ponds) and, given the

nature of OSB manufacturing, necessitate the handling of this water as industrial waste. Therefore, a venturi scrubber is eliminated from consideration as BACT.

Because the venturi scrubber was removed from consideration for PM_{10}, due to the additional water use and need for retention ponds for the industrial waste water, a venturi scrubber will not be considered for $PM_{2.5}$ control.

Step 3: Rank remaining technologies by control effectiveness

Table 4.2-10: Board Press - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
PM_{10} and $PM_{2.5}$	Wet Electrostatic Precipitator (WESP)	80+%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

WESP

A top-down economic analysis was completed for using a WESP as PM control from the press. This analysis is provided in Appendix D, Tables D-30 and D-31 (updated tables were provided on May 12, 2010). These tables included a PM cost analysis, based on a 20-year life recovery for a WESP. Since the PM emissions from the press are very low when compared to the flow of air out of the press (81,537 acfm), the resulting cost per ton of pollutant controlled ($21,909/ton) demonstrates that a WESP is economically infeasible.

The WESP was determined to be cost prohibitive for PM_{10}, due to low pollutant concentration compared to the air flow from the press. Since there is a consistent relationship between PM_{10} and $PM_{2.5}$ and the control technology will be consistent, the dollar per ton cost for $PM_{2.5}$ would be greater than that of PM_{10}. Therefore, the WESP is also economically infeasible for $PM_{2.5}$.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and PM emission limit for the Board Press. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

Huber proposes the utilization of good design/operation practice for the board press, with a PM_{10} emissions limitation of 0.132 lb/MSF as BACT. Huber's updated application dated December, 22, 2010 proposed a $PM_{2.5}$ BACT limit of 0.0501 lb/MSF. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.2-11 summarizes the BACT determination requirements being proposed for these units.

Table 4.2-11: Huber BACT Summary for Board Press PM_{10} and $PM_{2.5}$ Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Board Press	BDFN	The use of good design/operation to control PM_{10} emissions to 0.132 lb/MSF.
Board Press	BDFN	The use of good design/operation to control $PM_{2.5}$ emissions to 0.0501 lb/MSF.

EPD Review – PM Control

The Division believes Huber has shown the consistent relationship between $PM_{2.5}$ and PM_{10} emissions and that the pollution control technologies used to establish BACT for PM_{10} are also the best technologies for controlling $PM_{2.5}$.

The Division agrees with Huber's BACT determination for the use of good design/operation in the board press to control PM emissions from the board press in Emission Group BDFN. Compliance must be established by measuring emissions from the DRTO stack exhaust, including both filterable and non-filterable PM emissions.

Since the RTO serving the board press will remove PM emissions, especially condensable particulates, the Division believes good design and operation of the RTO are necessary to control PM emissions from the board press. Therefore, good design and operation of the RTO will be included in the BACT requirements.

Conclusion – PM_{10} and $PM_{2.5}$ Control

The BACT selection for the board press is summarized below in Table 4.2-12:

Table 4.2-12: EPD BACT Summary for the Board Press

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
PM_{10}	Good design/operation of both the board press and the RTO	0.132 lb/MSF	Length of time to conduct stack test.	Testing: EPA Method 5 in conjunction with EPA Method 202 Testing
$PM_{2.5}$	Good design/operation of both the board press and the RTO	0.0501 lb/MSF	Length of time to conduct stack test.	Testing: EPA Method 5 in conjunction with EPA Method 202 Testing

Press – CO Emissions

CO emissions are generated primarily from the wood strands during pressing; the elevated temperatures cause the strands and binding resin to generate off-gases, which include CO. Off-gases accumulating within the press hood are exhausted via a fan to downstream treatment equipment. RTO, RCO, and proper design/operation were evaluated for control of CO emissions from the board press at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-4, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.2-13: Evaluated Control Options for CO Emissions – Board Press

Pollutant	Control Technology
CO	RTO
	RCO
	Good Design/Operating Practices

Step 2: Eliminate technically infeasible options

Huber considered each control technology for CO emissions in Table 4.2-13 to be technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.2-14: Board Press - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
CO	RTO	75
	RCO	75
	Good Design/Operating Practices	Base Case

Step 4: Evaluate most effective controls and document results

RTO or RCO

The RTO is the highest ranked control technology for CO emissions. Huber currently operates an RTO for control of CO and VOC from the press. Huber proposes the use of an RTO as BACT for CO.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and emission limit for the board press and CO emissions. The selected control technologies are those remaining from Step 4, and an emission limit is proposed using data presented in Table 4-13 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009.

Huber proposes the utilization of an RTO as BACT for control of CO, with an emission limitation of 0.149 lb/MSF as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.2-15 summarizes the BACT determination requirements being proposed for this unit.

Table 4.2-15: Huber BACT Summary for board press CO Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Board Press	BDFN	The use of an RTO to control CO emissions to 0.149 lb/MSF.

EPD Review – CO Control

The Division agrees with Huber's BACT determination for the use of an RTO to control CO emissions from the board press (in Emission Group BDFN). Compliance must be established by measuring emissions from the RTO stack exhaust. Note: though not proposed by Huber, the use of an RCO is also deemed BACT for CO control from the press, since the same control efficiencies are expected from an RCO and it is considered both technologically and economically feasible.

Conclusion – CO Control

The BACT selection for the board press is summarized below in Table 4.2-16:

Table 4.2-16: EPD BACT Summary for the Board Press

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
CO	RTO or RCO	0.149 lb/MSF	Length of time to conduct stack test.	Testing: EPA Method 10

4.3 Dry Screening and Blending - Background

Dried strands from the dryers enter one of three screening bins. Screening bins separate fines and oversized pieces of wood from the strands. One bin screens for the strands that will make up the core of the OSB and the other two screen for the strands that will make up the two surface layers. The fines are sent to the dry fuel storage silo and then fed into the Wellons furnace as fuel. The oversized pieces are either reclaimed as process material or as fuel for the Wellons furnace. The dried strands are metered out of the dry strand storage bins onto weigh belts which control the amount of resin and wax added to one of two blenders. The resin and wax are distributed in the blenders. The resin may be any combination of three types of resin. The dry screening and blending operations result in emissions of PM and VOC.

Emissions from the screening operations are currently vented through the Screening and Blending baghouse (BH01) for PM control.

Dry Screening and Blending – PM_{10} and $PM_{2.5}$ Emissions

Particulate matter emissions are generated from the dry screening and blending operations. Baghouse, Dry Electrostatic Precipitator (ESP), Wet Electrostatic Precipitator (WESP), venturi scrubber, multiclones and good design/operation were evaluated for control of PM emissions from the facility's dry screening and blending operation.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-6, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.3-1: Evaluated Control Options for PM Emissions – Dry Screening and Blending

Pollutant	Control Technology
PM_{10} and $PM_{2.5}$	Baghouse
	ESP
	WESP
	Venturi Scrubber
	Multiclones
	Good Design/Operation

Step 2: Eliminate technically infeasible options

WESP or Venturi Scrubber

The PM emissions that are collected from the dry screening and blending operations are used as fuel for the wood fired furnace at the facility. The use of a WESP or a venturi scrubber would render the collected wood fuel useless due to the volumes of moisture that would be added to the material stream. As a result, the application of either a WESP or a venturi scrubber to control dry screening and blending emissions is considered technically infeasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.3-2: Dry Screening and Blending - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
PM_{10} and $PM_{2.5}$	Baghouse/Fabric Filter	99%
	Dry Electrostatic Precipitator (ESP)	95%
	Multiple Cyclones	60%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Baghouse/Fabric Filter

The baghouse/fabric filter control device is the highest ranked technology remaining for PM_{10} control on the dry screening and blending operations. Huber proposes the use of baghouses as BACT for PM_{10} emissions from the dry screening and blending operations, which allows for product recovery for beneficial fuel use.

Based on particle size distributions for wood particulate generated in wood handling and processing operations (Figure 2, in Huber's Reasonableness Analysis For PM_{10} As A Surrogate for $PM_{2.5}$), Huber expects nearly all PM generated to be larger than 1.0 micron in aerodynamic diameter, so that equivalent control for $PM_{2.5}$ and PM_{10} can be expected. Additionally, the EPA has concluded in the proposed revision to 40 CFR 60, Subpart Y - Standards of Performance for Coal Preparation Plants and Processing Plants, that fabric filters control PM equally across this size distribution. Therefore, fabric filters controlling PM_{10} and $PM_{2.5}$ emissions from the dry screening and blending operations are expected to have equal effectiveness for both PM species.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and PM emission limit for the dry screening and blending operation. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009 and the summary of results from April 2005 performance tests conducted at Huber's Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes the utilization of a baghouse for the dry screening and blending equipment, with a PM_{10} emissions limitation of 3.8×10^{-3} gr/scf, as BACT. In Huber's updated application dated December, 22, 2010, a $PM_{2.5}$ BACT limit of 3.17×10^{-4} gr/scf was proposed. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.3-3 summarizes the BACT determination requirements being proposed for these units.

Table 4.3-3: Huber BACT Summary for Dry Screening and Blending PM Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Dry Screening and Blending	DRYR and BDFN	The use of a baghouse to control PM_{10} emissions to 3.8×10^{-3} gr/scf.
Dry Screening and Blending	DRYR and BDFN	The use of a baghouse to control $PM_{2.5}$ emissions to 3.17×10^{-4} gr/scf.

EPD Review – PM_{10} and $PM_{2.5}$ Control

The Division believes Huber has shown the consistent relationship between $PM_{2.5}$ and PM_{10} emissions and that the pollution control technologies that establish BACT for PM_{10} are also the best technologies for controlling $PM_{2.5}$.

The Division agrees with Huber's BACT determination for the use of a baghouse to control both PM_{10} and $PM_{2.5}$ emissions from the dry screening and blending equipment (in Emission Groups DRYR and BDFN). Huber's proposed PM BACT limits are based on the outlet grain loading of 0.0029 gr/dscf, from stack tests conducted at Huber's Broken Bow mill in Oklahoma. The BACT limit was determined by multiplying the test results by 33 percent because of uncertainty and variability. Performance testing will not be required, since the emission factor is conservative and the design of the existing baghouse (BH01) is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing if deemed necessary.

Conclusion – PM_{10} and $PM_{2.5}$ Control

The BACT selection for the dry screening and blending equipment is summarized below in Table 4.3-4:

Table 4.3-4: EPD BACT Summary for the Dry Screening and Blending Operation

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
PM_{10}	Baghouse	$3.8x10^{-3}$ gr/scf	3 hours	Method 5
$PM_{2.5}$	Baghouse	$3.17x10^{-4}$ gr/scf	3 hours	Method 5

Dry Screening and Blending – VOC Emissions

VOC emissions are generated from the dry screening and blending operations. RTO, RCO, biofilter, and good design/operation were evaluated for control of VOC emissions from the facility's dry screening and blending operation.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-6, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.3-5: Evaluated Control Options for VOC Emissions – Dry Screening and Blending

Pollutant	Control Technology
VOC	RTO
	RCO
	Biofilter
	Good Design/Operation

Step 2: Eliminate technically infeasible options

Each control option in Table 4.2-5 was considered technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.3-6: Dry Screening and Blending - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	WESP/ESP + RTO/RCO	95%
	WESP/ESP + RTO/RCO	95%
	Biofilter	70%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Regenerative Thermal Oxidation
Installation of a stand-alone RTO downstream of a baghouse/fabric filter is generally considered technically infeasible in wood products operations that have high particulate loading. Having an RTO installed downstream from a baghouse would pose a serious fire risk, as a rupture of the baghouse would force a very large amount of wood particulate into the RTO. Therefore, the use of an RTO in combination with a baghouse is generally considered not technically feasible.

However, as previously discussed, it is theoretically possible to utilize particulate control technology, such as a wet electrostatic precipitator or dry electrostatic precipitator, for gas stream conditioning between a baghouse and an RTO, to ensure PM control is maintained in the event of a baghouse rupture. Installing a WESP or ESP after the baghouse, prior to the RTO, would allow recovery of the dust from the baghouse and still achieve VOC destruction. This combination of particulate control and an RTO are therefore, considered technically feasible.

Regenerative Catalytic Oxidation
Installation of a stand-alone RCO is generally not considered technically feasible for the dry screening and blending exhaust due to the level of PM loading. Even with highly efficient PM control, catalyst blinding, poisoning, plugging, or masking would eventually occur and would certainly occur if there was a baghouse failure. However, if an ESP or WESP was installed between the baghouse and RCO, the ESP or WESP would provide sufficient protection of the catalyst in the event of a baghouse malfunction. Therefore, this combination of an RCO and ESP or WESP is considered technically feasible.

WESP/RTO or ESP/RTO
As shown above, an RTO plus a WESP or ESP after the baghouse, is considered technically feasible. Huber conducted an abbreviated economic analysis, conservatively assuming zero capital costs for the project. The cost effectiveness, considering only the annual operating cost of an RTO, is greater than $9,000/ton of VOC removed, which is not economically feasible. This analysis is provided in Huber's application in Appendix D, Table D-11. Any costs for installing and operating a WESP or ESP would be in addition to those accounted for in the current analysis. Also, the capital costs for one RTO to accommodate the 50,000 acfm exhaust flow rate and one WESP or ESP to serve as a buffer between the baghouse and the RTO would need to be added. However, since the abbreviated economic analysis shows that this option is not feasible, no further analysis is required.

WESP/RCO or ESP/RCO
An RCO and an RTO have approximately the same control efficiency. While an RCO operates at a lower temperature than an RTO, an RCO has higher capital costs than an RTO. Since an RCO will have costs on the same order as an RTO, and an RTO has already been determined to be economically infeasible, an RCO is also considered economically infeasible. No further analysis is required.

Biofilter
A biofilter is an effective control device for VOC emissions. Biofilter control technology was evaluated for reducing VOC emissions from the dry screening and blending equipment. The cost of installing and

operating a biofilter for VOC control on the dry screening and blending operations is $22,844/ton of VOC removed, which is not economically feasible. A detailed economic analysis was provided in Huber's application in Appendix D, Tables D-17 and D-18.

Good Design/Operation
The RBLC database contains several entries for material handling operations, which are reproduced in Appendix C of Application No. TV-19076, that specify good design/operation as BACT for VOC. Thus, Huber proposes good design/operation as BACT for these sources.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and VOC emission limit for the dry screening and blending operation. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Appendix B Emission Tables, located in Huber's application updated April 5, 2011 and the summary of results for performance tests conducted at Huber's Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes, as BACT, the use of good design/operation for the dry screening and blending equipment, with an emissions limitation of 0.229 lb/MSF. Table 4.3-7 summarizes the BACT determination requirements being proposed for these units.

Table 4.3-7: Huber BACT Summary for Dry Screening and Blending VOC Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Dry Screening and Blending	DRYR	The use of good design/operation to control VOC emissions to 0.229 lb/MSF

EPD Review – VOC Control

Huber's proposed VOC BACT limit is based on the results of stack tests conducted at Huber's Broken Bow mill in Oklahoma. The VOC BACT limit is derived by multiplying the stack test results by a safety factor of 33 percent. Performance testing is not proposed to be required, since VOC emissions are very low and it is not expected that VOC emissions from this process will be as high as the BACT limit. Also, the BACT limit for the dry screening and blending operations was established for uncontrolled VOC emissions. An abbreviated economic analysis of the possible controls resulted in a very high cost per ton of pollutant removed. Therefore, add-on controls would not be necessary, even if the emission rate were to be much higher than the BACT limit. Also, since computer modeling of the VOC emissions from the facility was not required, an increase in VOCs would not affect a model. Finally, we again note that the design of the existing baghouse is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing if deemed necessary.

The Division agrees with Huber's BACT determination for the use of good design/operation on the dry screening and blending equipment in Emission Group DRYR to control VOC emissions.

Conclusion – VOC Control

The BACT selection for the dry screening and blending equipment is summarized below in Table 4.3-8:

Table 4.3-8: EPD BACT Summary for the Dry Screening and Blending Operation

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
VOC	Good design/operation	0.229 lb/MSF	3 hours	Method 25

4.4 Forming Operation – Background

The resinated strands from the dry bins are transported to the forming line where they are separated into distribution bins. If strands have been coated with MUPF resin, they are separated into the bins that will make up the two outside surfaces of the board. The strands are dropped onto the conveyor in layers. The bottom layer is dropped onto the belt directly, lengthwise or parallel to the belt, and will make up one face of the board. Core layer strands are layered cross-wise or perpendicular to the belt. The last layer is the top layer and will make up the other face of the board, dropped lengthwise similar to the first face layer.

After all of the layers are dropped onto the mat forming line, the mats are cut to length by the forming line saw. Any mats that are rejected are dropped into the mat reject bin and recycled back to the forming bins for reuse or burned as fuel in the Wellons furnace. The forming process results in emissions of VOC (including formaldehyde and methanol) and PM.

Emissions from the forming area are currently vented through the forming baghouse (BH23) for PM control.

Forming – PM_{10} and $PM_{2.5}$ Emissions

Particulate matter emissions are generated from the forming operations. ESP, a WESP, venturi scrubber, multiclones and good design/operation were evaluated for control of PM emissions from the facility's forming operations.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-8, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies for each pollutant in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.4-1: Evaluated Control Options for PM Emissions – Forming Operation

Pollutant	Control Technology
PM_{10} and $PM_{2.5}$	Baghouse
	ESP
	WESP
	Venturi Scrubber
	Multiclones
	Good Design/Operation

Step 2: Eliminate technically infeasible options

WESP and Venturi Scrubber

The PM emissions that are collected from the forming operations are used as fuel for the wood fired furnace at the facility. As stated previously, the use of a WESP or a venturi scrubber would render the collected wood dust useless as a fuel, due to the moisture that would be added. As a result, the application of a WESP or a venturi scrubber to control forming emissions is considered technically infeasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.4-2: Forming Operation - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
PM_{10} and $PM_{2.5}$	Baghouse/Fabric Filter	99%
	ESP	95%
	Multiple Cyclones	60%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Baghouse/Fabric Filter

The baghouse/fabric filter control device is the highest ranked technology remaining for PM_{10} control on the forming operations. Huber proposes the use of a baghouse as BACT for PM_{10} emissions from the forming operations, which allows by-product recovery for beneficial use as fuel.

As discussed above, in the BACT analysis for dry screening and blending, the PM generated from the forming operation is expected to be larger than 1.0 micron in aerodynamic diameter, so baghouse control across this size distribution is expected to have equal effectiveness for $PM_{2.5}$.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and PM emission limit for the forming operation. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13, Appendix B Emission Tables, located in Huber's application dated July 9, 2009 and the summary of results from performance tests conducted at Huber's Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes the utilization of a baghouse for the forming equipment, with a PM_{10} emissions limitation of $3.8x10^{-3}$ gr/scf as BACT. In Huber's updated application dated December, 22, 2010, a $PM_{2.5}$ BACT limit of $3.17x10^{-4}$ gr/scf was proposed. The proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009.

Table 4.4-3: Huber BACT Summary for Forming PM Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Forming Equipment	BDFN	The use of a baghouse to control PM_{10} emissions to $3.8x10^{-3}$ gr/scf.
Forming Equipment	BDFN	The use of a baghouse to control $PM_{2.5}$ emissions to $3.17x10^{-4}$ gr/scf.

EPD Review – PM_{10} and $PM_{2.5}$ Control

The Division believes Huber has shown the consistent relationship between $PM_{2.5}$ and PM_{10} emissions and that the pollution control technologies that establish BACT for PM_{10} are also the best technologies for controlling $PM_{2.5}$.

The Division agrees with Huber's BACT determination for the use of a baghouse to control both PM_{10} and $PM_{2.5}$ emissions from the forming equipment in Emission Group BDFN. Huber has proposed PM BACT limits by using the outlet grain loading of 0.0038 gr/dscf. This BACT limit was developed from stack tests conducted at Huber's Broken Bow mill in Oklahoma, by multiplying the highest test result by a 33 percent safety factor because of uncertainty and variability. Performance testing will not be required, since the emission factor is conservative and the design of the existing baghouse (BH23) is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing if deemed necessary.

Conclusion – PM_{10} and $PM_{2.5}$ Control

The BACT selection for the forming equipment is summarized below in Table 4.4-4:

Table 4.4-4: EPD BACT Summary for the Forming Equipment

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
PM_{10}	Baghouse	$3.8x10^{-3}$ gr/scf	3 hours	Method 5
$PM_{2.5}$	Baghouse	$3.17x10^{-4}$ gr/scf	3 hours	Method 5

Forming – VOC Emissions

VOC emissions are generated from the forming operations. RTO, RCO, biofilter, and good design/operation were evaluated for control of VOC emissions from the facility's forming operation. Note that the VOC concentration from this process is very low.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-8, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.4-5: Evaluated Control Options for VOC Emissions – Forming Operation

Pollutant	Control Technology
VOC	RTO
	RCO
	Biofilter
	Good Design/Operation

Step 2: Eliminate technically infeasible options

Each control option in Table 4.4-5 was considered technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.4-6: Forming Operation - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	WESP/ESP + RTO/RCO	95%
	WESP/ESP + RTO/RCO	95%
	Biofilter	70%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Regenerative Thermal Oxidation

Installation of a stand-alone RTO downstream of a baghouse/fabric filter is generally considered technically infeasible in wood products operations, which has high particulate loading. Having an RTO installed downstream from a baghouse poses a serious fire risk, as a rupture of the baghouse would force a very large amount of wood particulate into the RTO. Therefore, the use of an RTO, in combination with a baghouse, is considered not technically feasible.

However, as previously discussed, it is theoretically possible to utilize particulate control technology, such as a wet electrostatic precipitator, for gas stream conditioning between a baghouse and an RTO, to ensure PM control is maintained in the event of a baghouse rupture. Installing a WESP or ESP after the baghouse, prior to the RTO, would allow recovery of the dust from the baghouse and still achieve VOC destruction. This combination of particulate control and an RTO are therefore considered technically feasible.

Regenerative Catalytic Oxidation

Installation of a stand-alone RCO is not generally considered technically feasible for the forming operation exhaust, due to the level of PM loading. Even with highly efficient PM control, catalyst blinding, poisoning, plugging, or masking would eventually occur and would certainly occur if there was a baghouse failure. However, if an ESP or WESP was installed between the baghouse and RCO, the ESP or WESP would provide sufficient protection of the catalyst in the event of a baghouse malfunction. Therefore, this combination of an RCO and ESP or WESP is considered technically feasible.

WESP/RTO or ESP/RTO

As shown above, an RTO with an upstream WESP or ESP to control VOC emissions was evaluated for reducing VOC emissions from the forming operations. Huber carried out an abbreviated economic analysis, conservatively assuming zero capital costs for the project. The cost effectiveness, considering only the annual operating cost of an RTO to control VOC emissions from the forming operations, is greater than $20,000/ton of VOC removed, which is not economically feasible. This analysis is provided in Huber's application in Appendix D, Table D-12. Since the existing RTOs at the facility do not have the capacity to accommodate the airflow from the blending, forming, and finishing equipment, a detailed economic analysis would need to include the capital costs for an additional RTO to accommodate the 54,200 acfm exhaust flow rate and the cost of installing a WESP or ESP to serve as a buffer between the baghouse and the RTO. However, since the abbreviated economic analysis shows that this option is economically infeasible, no further analysis is required.

WESP/RCO or ESP/RCO

An RCO and an RTO have approximately the same control efficiency. While an RCO operates at a lower temperature than an RTO, an RCO has higher capital costs than an RTO. Since an RCO will have costs on the same order as an RTO, and an RTO has already been determined to be economically infeasible, an RCO is also considered economically infeasible. No further analysis is required.

Biofilter

A biofilter is an effective control device for VOC emissions. Biofilter control technology was evaluated for reducing VOC emissions from the forming equipment. The cost of installing and operating a biofilter for VOC control on the forming operations is $44,878/ton of VOC removed, which is not economically feasible. A detailed economic analysis is provided in Huber's application in Appendix D, Tables D-19 and D-20.

Good Design/Operation

The RBLC database contains several entries for material preparation operations, which specify good design/operation as BACT for VOC. Therefore, Huber proposes good design/operation as BACT for these sources.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and VOC emission limit for the forming operation. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Appendix B Emission Tables, located in Huber's application updated April 5, 2011 as well as the summary of results for performance tests conducted at Huber's Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes the use of good design/operation, with an emissions limitation of 0.11 lb/MSF as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.4-7 summarizes the BACT determination requirements being proposed for these units.

Table 4.4-7: Huber BACT Summary for forming VOC Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Forming	BDFN	The use of good design/operation to control VOC emissions to 0.11 lb/MSF

EPD Review – VOC Control

Huber's proposed VOC BACT limit is based on the results of stack tests conducted at Huber's Broken Bow mill in Oklahoma. The VOC BACT limit is derived by multiplying the stack test results by a safety factor of 33 percent. Performance testing is not proposed to be required, since VOC emissions are very low and it is not expected that VOC emissions from this process will be as high as the BACT limit. Also, the BACT limit for the forming operation was established for uncontrolled VOC emissions. An abbreviated economic analysis of the possible controls resulted in a very high cost per ton of pollutant removed. Therefore, add-on controls would not be necessary, even if the emission rate were to be much higher than the BACT limit. Also, since computer modeling of the VOC emissions from the facility was not required, an increase in VOCs would not affect a model. Finally, we again note that the design of the existing baghouse is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing if deemed necessary.

The Division agrees with Huber's BACT determination for the use of good design/operation on the forming equipment in Emission Group BDFN to control VOC emissions.

Conclusion – VOC Control

The BACT selection for the forming equipment is summarized below in Table 4.4-8:

Table 4.4-8: EPD BACT Summary for the Forming Equipment

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
VOC	Good design/operation	0.11 lb/MSF	3 hours	Method 25

4.5 Trim and Grade Equipment – Background

From the press unloader system, individual unfinished panels are fed to the finishing end through a series of conveyors. The panels are trimmed to size, sanded, stacked, edge sealed, branded, and strapped for shipment. The trim and grade operations make up the first half of the finishing operations and result in emissions of PM and VOC. This operation is currently controlled by a baghouse.

Trim and Grade Equipment – PM_{10} and $PM_{2.5}$ Emissions

Particulate matter emissions are generated from the trim and grade equipment. Baghouse, ESP, WESP, venturi scrubber, multiple cyclones and good design/operation were evaluated for control of PM emissions from the trim and grade equipment at the facility.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-9, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies for each pollutant in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.5-1: Evaluated Control Options for PM Emissions – Trim and Grade

Pollutant	Control Technology
PM_{10} and $PM_{2.5}$	Baghouse
	ESP
	WESP
	Venturi Scrubber
	Multiple cyclone
	Good Design/Operation

Step 2: Eliminate technically infeasible options

WESP/Venturi Scrubber

The PM emissions that are collected from the trim and grade operations are used as fuel for the wood fired furnace at the facility. As stated previously, the use of a WESP or a venturi scrubber would render the collected wood fuel useless, due to the moisture that would be added to the material stream. Therefore, the application of a WESP or a venturi scrubber to control PM emissions is considered technically infeasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.5-2: Trim and Grade - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
PM_{10} and $PM_{2.5}$	Baghouse/Fabric Filter	99%
	Dry Electrostatic Precipitator (ESP)	95%
	Multiple Cyclones	60%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Baghouse/Fabric Filter
The baghouse/fabric filter control device is the highest ranked technology remaining for PM_{10} control on the trim and grade operations. Huber proposes the use of a baghouse as BACT for PM_{10} emissions, which allows for by-product recovery for beneficial fuel use.

As discussed above, in the BACT analysis for dry screening and blending, the PM generated from the trim and grade operation is expected to be larger than 1.0 micron in aerodynamic diameter so baghouse control across this size distribution is expected to have equal effectiveness for $PM_{2.5}$.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and PM emission limit for the trim and grade operations. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009 as well the summary of results from performance tests conducted at Huber's Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes the utilization of a baghouse for the trim and grade operations with a PM_{10} emissions limitation of $3.8x10^{-3}$ gr/scf as BACT. In Huber's updated application dated December 22, 2010, a $PM_{2.5}$ BACT limit of $3.17x10^{-4}$ gr/scf was proposed. The proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.5-3 summarizes the BACT determination requirements being proposed for these units.

Table 4.5-3: Huber BACT Summary for Trim and Grade PM Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Trim Grade Equipment	BDFN	The use of baghouse to control PM_{10} emissions to $3.8x10^{-3}$ gr/scf.
Trim Grade Equipment	BDFN	The use of baghouse to control $PM_{2.5}$ emissions to $3.17x10^{-4}$ gr/scf.

EPD Review – PM_{10} Control

The Division believes Huber has shown the consistent relationship between $PM_{2.5}$ and PM_{10} emissions and that the pollution control technologies that establish BACT for PM_{10} are also the best technologies for controlling $PM_{2.5}$.

The Division agrees with Huber's BACT determination for the use of a baghouse to control PM_{10} and $PM_{2.5}$ emissions from the trim and grade equipment in Emission Group BDFN. Huber has proposed PM BACT limits by using the outlet grain loading of 0.0038 gr/dscf. This BACT limit was developed from stack tests conducted at Huber's Broken Bow mill in Oklahoma, by multiplying the highest test result by a 33 percent safety factor because of uncertainty and variability. Performance testing will not be required, since the emission factor is conservative and the design of the existing baghouse (BH04) is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing when deemed necessary.

Conclusion – PM_{10} and $PM_{2.5}$ Control

The BACT selection for the trim and grade equipment is summarized below in Table 4.5-4:

Table 4.5-4: EPD BACT Summary for Trim and Grade Equipment

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
PM_{10}	Baghouse	$3.8x10^{-3}$ gr/scf	3 hours	Method 5
$PM_{2.5}$	Baghouse	$3.17x10^{-4}$ gr/scf	3 hours	Method 5

Trim and Grade – VOC Emissions

VOC emissions are generated from the trim and grade equipment. RTO, RCO, biofilter, and good design/operation were evaluated for control of VOC emissions from the facility's trim and grade operations. Note that the VOC concentration from this equipment is very low.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-9, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.5-5: Evaluated Control Options for VOC Emissions – Trim and Grade Operation

Pollutant	Control Technology
VOC	RTO
	RCO
	Biofilter
	Good Design/Operation

Step 2: Eliminate technically infeasible options

Each control option in Table 4.5-5 was considered technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.5-6: Trim and Grade - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	WESP/ESP + RTO/RCO	95%
	WESP/ESP + RTO/RCO	95%
	Biofilter	70%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Regenerative Thermal Oxidation

Installation of a stand-alone RTO downstream of a baghouse/fabric filter is generally considered technically infeasible in wood products operations, which have high particulate loading. Having an RTO installed downstream from a baghouse poses a serious fire risk, as a rupture of the baghouse would force a very large amount of wood particulate into the RTO. Therefore, the use of an RTO in combination with a baghouse is generally considered not technically feasible.

However, as previously discussed, it is theoretically possible to utilize particulate control technology, such as a wet electrostatic precipitator for gas stream conditioning, between a baghouse and an RTO, to ensure PM control is maintained in the event of a baghouse rupture. Installing a WESP or ESP after the baghouse, prior to the RTO, would allow recovery of the dust from the baghouse and still achieve VOC destruction. This combination of particulate control and an RTO is considered technically feasible.

Regenerative Catalytic Oxidation
Installation of a stand-alone RCO is generally not considered technically feasible for the trim and grade exhaust due to the level of PM loading. Even with highly efficient PM control, catalyst blinding, poisoning, plugging, or masking will eventually occur and would occur if there was a baghouse failure. However, if an ESP or WESP were installed between the baghouse and RCO, the ESP or WESP would provide sufficient protection of the catalyst in the event of a baghouse malfunction. Therefore, this combination of an RCO and ESP or WESP is considered technically feasible.

WESP/RTO or ESP/RTO
As shown above, an RTO with an upstream PM control device, such as a WESP or ESP, was evaluated for reducing VOC emissions from the trim and grade operations. Huber carried out an abbreviated economic analysis. The cost effectiveness, considering only the annual operating costs of an RTO to control VOC emissions from the trim and grade operations, is greater than $16,000/ton of VOC removed, which is not economically feasible. This analysis is provided in Huber's application in Appendix D, Table D-10. Since the existing RTOs at the facility do not have the capacity to accommodate the airflow from the trim and grade equipment, a detailed economic analysis would include the capital costs for an RTO to accommodate the combined 40,300 acfm exhaust flow rate from the trim and grade baghouse and a WESP or ESP. However, since an abbreviated economic analysis shows that this option is economically infeasible, no further analysis is required.

WESP/RCO or ESP/RCO
An RCO and an RTO have approximately the same control efficiency. While an RCO operates at a lower temperature than an RTO, an RCO has higher capital costs than an RTO. Since an RCO will have operating costs on the same order as an RTO, and an RTO has already been determined to be economically infeasible, an RCO is also considered economically infeasible. No further analysis is required.

Biofilter
A biofilter is an effective control device for VOC emissions. Biofilter control technology was evaluated for reducing VOC emissions from the trim and grade equipment. The cost of installing and operating a biofilter for VOC control on the trim and grade equipment is $37,154/ton of VOC removed, which is not economically feasible. A detailed economic analysis is provided in Huber's application in Appendix D, Tables D-15 and D-16.

Good Design/Operation
The RBLC database contains several entries for trim and grade emission units, which specify good design/operation as BACT for VOC. Therefore, Huber proposes good design/operation as BACT for these sources.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and VOC emission limit for the trim and grade operation. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Appendix B Emission Tables, located in Huber's application updated April 5, 2011 as well as the summary of results for performance tests conducted at Huber's Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes the use of good design/operation, with an emission limit of 0.165 lb/MSF as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.5-7 summarizes the BACT determination requirements being proposed for these units.

Table 4.5-7: Huber BACT Summary for Trim and Grade VOC Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Trim and Grade Equipment	BDFN	The use of good design/operation to control VOC emissions to 0.165 lb/MSF.

EPD Review – VOC Control

Huber's proposed VOC BACT limit is based on the results of stack tests conducted at Huber's Broken Bow mill in Oklahoma. The VOC BACT limit is derived by multiplying the stack test results by a safety factor of 33 percent. Performance testing is not proposed to be required, since VOC emissions are very low and it is not expected that VOC emissions from this process will be as high as the BACT limit. Also, the BACT limit for the trim and grade equipment was established for uncontrolled VOC emissions. An abbreviated economic analysis of the possible controls resulted in a very high cost per ton of pollutant removed. Therefore, add-on controls would not be necessary, even if the emission rate were to be much higher than the BACT limit. Also, since computer modeling of the VOC emissions from the facility was not required, an increase in VOCs would not affect a model. Finally, we again note that the design of the existing baghouse is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing if deemed necessary.

The Division agrees with Huber's BACT determination for the use of good design/operation on the trim and grade equipment in Emission Group BDFN to control VOC emissions.

Conclusion – VOC Control

The BACT selection for the trim and grade equipment is summarized below in Table 4.5-8:

Table 4.5-8: EPD BACT Summary for Trim and Grade Equipment

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
VOC	Good design/operation	0.165 lb/MSF	3 hours	Method 25

4.6 Sanding and Tongue & Groove - Background

From the trim and grade process, individual unfinished panels are fed to the sanding and tongue & groove process by lift truck and conveyors. The panels are sanded, tongue & grooved, stacked, edge sealed, branded, and strapped for shipment. The sanding and tongue & groove operations result in emissions of PM_{10} and VOC.

Sanding and Tongue & Groove – PM_{10} and $PM_{2.5}$ Emissions

Particulate matter emissions are generated from the sanding and tongue & groove operations. Baghouse, ESP, WESP, venturi scrubber, multiple cyclones and good design/operation were evaluated for control of PM emissions from the facility's sanding and tongue & groove operations.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-11, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies for each pollutant in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.6-1: Evaluated Control Options for PM Emissions – Sanding and Tongue & Groove

Pollutant	Control Technology
PM_{10} and $PM_{2.5}$	Baghouse
	ESP
	WESP
	Venturi Scrubber
	Multiclones
	Good Design/Operation

Step 2: Eliminate technically infeasible options

WESP and Venturi Scrubber

The PM emissions that are collected from the sanding and tongue & groove operations are used as fuel for the wood fired furnace at the facility. As stated previously, the use of a WESP or a venturi scrubber would render the collected wood fuel useless due to the moisture that would be added to the material stream. Therefore, the application of a WESP or a venturi scrubber to control these emissions is considered technically infeasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.6-2: Sanding and Tongue & Groove Operations-Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
PM_{10} and $PM_{2.5}$	Baghouse/Fabric Filter	99%
	Dry Electrostatic Precipitator (ESP)	95%
	Multiple Cyclones	60%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Baghouse/Fabric Filter

A baghouse/fabric filter control device is the highest ranked technology remaining for PM_{10} control on the sanding and tongue & groove operations. Huber proposes the use of a baghouse as BACT for PM_{10} emissions and product recovery for beneficial fuel use from the sanding and tongue & groove operations.

As discussed above, in the BACT analysis for dry screening and blending, the PM generated from the sanding and tongue & groove operation is expected to be larger than 1.0 micron in aerodynamic diameter so baghouse control across this size distribution is expected to have equal effectiveness for $PM_{2.5}$.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and PM emission limit for the sanding and tongue & groove equipment. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Table 4-13 and Appendix B Emission Tables, located in Huber's application dated July 9, 2009 as well as the summary of results from performance tests conducted at Huber's Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes the utilization of a baghouse for the sanding and tongue & groove equipment, with a PM_{10} emissions limitation of $3.8x10^{-3}$ gr/scf, as BACT. In Huber's updated application dated December, 22, 2010, a $PM_{2.5}$ BACT limit of $3.17x10^{-4}$ gr/scf was proposed. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.6-3 summarizes the BACT determination requirements being proposed for these units.

Table 4.6-3: Huber BACT Summary for Sanding and Tongue & Groove PM Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Sanding and Tongue & Groove	BDFN	The use of a baghouse to control PM_{10} emissions to $3.8x10^{-3}$ gr/scf.
Sanding and Tongue & Groove	BDFN	The use of a baghouse to control $PM_{2.5}$ emissions to $3.17x10^{-4}$ gr/scf.

EPD Review – PM_{10} and $PM_{2.5}$ Control

The Division believes Huber has shown the consistent relationship between $PM_{2.5}$ and PM_{10} emissions from this equipment and that the pollution control technologies that establish BACT for PM_{10} are also the best technologies for controlling $PM_{2.5}$.

The Division agrees with Huber's BACT determination for the use of a baghouse to control both PM_{10} and $PM_{2.5}$ emissions from the sanding and tongue & groove equipment in Emission Group BDFN. Huber has proposed PM BACT limits by using the outlet grain loading of 0.0038 gr/dscf. This BACT limit was developed from stack tests conducted at Huber's Broken Bow mill in Oklahoma by multiplying the highest test result by a 33 percent safety factor because of uncertainty and variability. Performance testing will not be required, since the emission factor is conservative and the design of the existing baghouse (BH05) is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing if deemed necessary.

Conclusion – PM_{10} and $PM_{2.5}$ Control

The BACT selection for the sanding and tongue & groove equipment is summarized below in Table 4.6-4:

Table 4.6-4: EPD BACT Summary for the Sanding and Tongue & Groove Equipment

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
PM_{10}	Baghouse	3.8×10^{-3} gr/scf	3 hours	Method 5
$PM_{2.5}$	Baghouse	3.17×10^{-4} gr/scf	3 hours	Method 5

Sanding and Tongue & Groove – VOC Emissions

VOC emissions are generated from the sanding and tongue & groove operations. RTO, RCO, biofilter, and good design/operation were evaluated for control of VOC emissions from the facility's sanding and tongue & groove equipment. Note that the concentration of VOC is very low, so the possibility of finding cost-effective add-on controls is very low.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-11, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.6-5: Evaluated Control Options for VOC Emissions – Sanding and Tongue & Groove

Pollutant	Control Technology
VOC	RTO
	RCO
	Biofilter
	Good Design/Operation

Step 2: Eliminate technically infeasible options

Each control option in Table 4.6-5 was considered technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.6-6: Sanding and Tongue & Groove - Remaining Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	WESP/ESP + RTO/RCO	95%
	WESP/ESP + RTO/RCO	95%
	Biofilter	70%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

Regenerative Thermal Oxidation

Installation of a stand-alone RTO downstream of a baghouse/fabric filter is generally not considered technically feasible in wood products operations, since there is a high particulate loading. Having an RTO installed downstream from a baghouse poses a serious fire risk, as a rupture of the baghouse would force a very large amount of wood particulate into the RTO. Therefore, the use of an RTO in combination with a baghouse is generally considered not technically feasible.

However, as previously discussed, it is theoretically possible to utilize particulate control technology such as a wet electrostatic precipitator for gas stream conditioning, between a baghouse and an RTO, to ensure PM control is maintained in the event of a baghouse rupture. Installing a WESP or ESP after the baghouse, prior to the RTO, would allow recovery of the dust from the baghouse and still achieve VOC destruction. This combination of particulate controls and an RTO is considered technically feasible.

Regenerative Catalytic Oxidation

Installation of a stand-alone RCO is generally considered not technically feasible for the sanding and tongue & groove exhaust due to the level of PM loading. Even with highly efficient PM control, catalyst blinding, poisoning, plugging, or masking would eventually occur and definitely occur if there was a baghouse failure. However, if an ESP or WESP was installed between the baghouse and RCO, the ESP or WESP would provide sufficient protection of the catalyst in the event of a baghouse malfunction. Therefore, this combination of an RCO with an ESP or WESP is considered technically feasible.

WESP/RTO or ESP/RTO

As shown above, an RTO with an upstream PM control device, such as a WESP or ESP, was evaluated for reducing VOC emissions from the sanding and tongue & groove operations. Huber carried out an abbreviated economic analysis. The cost effectiveness, considering only the annual operating costs of an RTO to control VOC emissions is greater than $17,000/ton of VOC removed, which is not economically feasible. This analysis is provided in Huber's application in Appendix D, Table D-13. Since the existing RTOs at the facility do not have the capacity to accommodate the airflow from the sanding and tongue & groove equipment, a detailed economic analysis would need to include the capital costs for one RTO to accommodate the combined 71,600 acfm exhaust flow rate from the two sanding and tongue & groove baghouses and one WESP or ESP to serve as a buffer between the baghouse and the RTO. However, since the abbreviated economic analysis shows that this option is economically infeasible, based on annual operating costs alone, no further analysis is required.

WESP/RCO or ESP/RCO

An RCO and an RTO have approximately the same control efficiency. While an RCO operates at a lower temperature than an RTO, an RCO has higher capital costs than an RTO. Since an RCO will have costs in the same order as an RTO, and an RTO has already been determined to be economically infeasible, an RCO is also considered economically infeasible. No further analysis is required.

Biofilter

Biofilters are an effective control device for VOC emissions. Biofilter control technology was evaluated for reducing VOC emissions from the sanding and tongue & groove equipment. The cost of installing and operating a biofilter for VOC control on the sanding and tongue & groove equipment is $34,194/ton of VOC removed, which is not economically feasible. A detailed economic analysis is provided in Huber's application in Appendix D, Tables D-21 and D-22.

Good Design/Operation

The RBLC database contains several entries for sanding and tongue & groove emission units, which specify good design/operation as BACT for VOC. Thus, Huber proposes good design/operation as BACT for these sources.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy and VOC emission limit for the sanding and tongue & groove operation. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Appendix B Emission Tables, located in Huber's application updated April 5, 2009 as well as the summary of results for performance tests conducted at Huber's

Broken Bow facility in Oklahoma. These test results are found in Appendix B of this PSD preliminary determination.

Huber proposes the use of good design/operation, with an emissions limitation of 0.060 lb/MSF as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.6-7 summarizes the BACT determination requirements being proposed for these units.

Table 4.6-7: Huber BACT Summary for Sanding and Tongue & Groove Equipment VOC Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Sanding and Tongue & Groove	BDFN	The use of good design/operation to control VOC emissions to 0.060 lb/MSF

EPD Review – VOC Control

Huber's proposed VOC BACT limit is based on the results of stack tests conducted at Huber's Broken Bow mill in Oklahoma. The VOC BACT limit is derived by multiplying the stack test results by a safety factor of 33 percent. Performance testing is not proposed to be required, since VOC emissions are very low and it is not expected that VOC emissions from this process will be as high as the BACT limit. Also, the BACT limit for the sanding and tongue & groove equipment was established for uncontrolled VOC emissions. An abbreviated economic analysis of the possible controls resulted in a very high cost per ton of pollutant removed. Therefore, add-on controls would not be necessary, even if the emission rate were to be much higher than the BACT limit. Also, since computer modeling of the VOC emissions from the facility was not required, an increase in VOCs would not affect a model. Finally, we again note that the design of the existing baghouse is not conducive to stack testing. However, the Division reserves the right to require BACT verification by testing if deemed necessary.

The Division agrees with Huber's BACT determination for the use of good design/operation on the sanding and tongue & groove equipment in Emission Group BDFN to control VOC emissions.

Conclusion – VOC Control

The BACT selection for the sanding and tongue & groove equipment is summarized below in Table 4.6-8:

Table 4.6-8: EPD BACT Summary for the Sanding and Tongue & Groove Equipment

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
VOC	Good design/operation	0.060 lb/MSF	3 hours	Method 25

4.7 Ink Branding and Stamping – Background

From the sanding and tongue & groove process, panels are stacked, edge sealed, branded, and strapped for shipment. The ink branding and stamping operations result in 20 tpy of VOC emissions. These emissions are captured inside a booth and vented through filters into the building.

Ink Branding and Stamping – VOC Emissions

VOC emissions are generated from the ink branding and stamping operations. RTO, RCO, biofilter, and good design/operation were evaluated for control of VOC emissions from the facility's ink branding and stamping operations. The concentration of VOC in the exhaust is very low.

Applicant's Proposal

Step 1: Identify all control technologies

Table 4-11, in Huber's application, lists commercially available controls, regardless of the industrial sector or process. Consistent with U.S. EPA's top-down approach, Huber considered the following control technologies in order of decreasing emission reduction potential. These controls correspond with entries in the RBLC database, which are reproduced in Appendix C of the application.

Table 4.7-1: Evaluated Control Options for VOC Emissions – Ink Branding and Stamping

Pollutant	Control Technology
VOC	RTO
	RCO
	Biofilter
	Good Design/Operation

Step 2: Eliminate technically infeasible options

Huber considered each control technology for VOC emissions in Table 4.7-1 to be technically feasible.

Step 3: Rank remaining technologies by control effectiveness

Table 4.7-2: Ink Branding and Stamping - Control Technologies Ranked by Effectiveness

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	RTO	95%
	RCO	95%
	Biofilter	70%
	Good Design/Operation	Base Case

Step 4: Evaluate most effective controls and document results

RTO or RCO

An RTO or RCO is an effective control device for VOC. For the purposes of this top-down analysis, it was assumed that the operational costs of these two control devices are equivalent, so only an RTO was evaluated for reducing VOC emissions from the ink branding and stamping operations. Huber carried out an abbreviated economic analysis, assuming that the emissions would be routed to an existing RTO. The annual operating cost of an RTO alone to control VOC emissions from the ink branding and stamping operations is greater than $24,000/ton of VOC removed, which is not economically feasible. This analysis is provided in Huber's application in Appendix D, Table D-32. Since the existing RTOs at the facility do not have the capacity to accommodate the airflow from the ink branding and stamping equipment, a detailed economic analysis would include the capital costs for one RTO to accommodate the exhaust flow rate from the ink branding and stamping operations. However, since the abbreviated economic analysis shows that this option is economically infeasible based on annual operating costs alone, no further analysis is required.

Biofilter
Biofilters are an effective control device for VOC emissions. Biofilter control technology was evaluated for reducing VOC emissions from the ink branding and stamping equipment. The cost of installing and operating a biofilter for VOC control on the ink branding and stamping equipment is $38,233/ton of VOC removed, which is not economically feasible. A detailed economic analysis is provided in Huber's application in Appendix D, Tables D-33 and D-34.

Good Design/Operation
The RBLC database contains several entries for ink branding and stamping emission units, which specify good design/operation as BACT for VOC. Thus, Huber proposes good design/operation as BACT for these sources.

Step 5: Select BACT

Step 5 is the selection of a BACT control strategy for minimizing VOC emissions from the branding and stamping equipment. The selected control technologies are those remaining from Step 4.

Huber proposes the use of good design/operation, in order to effectively control VOC emissions, as BACT. Huber claims, and the Division has verified, that the proposed BACT is consistent with similar entries in the RBLC database, which are reproduced in Appendix C of Application No. TV-19076, dated July 9, 2009. Table 4.7-3 summarizes the BACT determination requirements being proposed for these units.

Table 4.7-3: Huber BACT Summary for Ink Branding and Stamping VOC Emissions

Process Operation	Emission Unit Group	Proposed BACT Limit
Ink Branding and Stamping	BDFN	The use of good design/operation to control VOC emissions

EPD Review – VOC Control

The Division agrees with Huber's BACT determination for the use of good design/operation on the ink branding and stamping operations in Emission Group BDFN to control VOC emissions. Good design and operation is accomplished by using low-VOC ink and maintaining the ink system such that ink use and leaks are minimized.

Performance tests will not be necessary, since VOC emissions can be conservatively determined by assuming all VOC is emitted from the ink. Therefore VOCs could be determined by the amount of ink used and its VOC concentration.

Conclusion – VOC Control

The BACT selection for the ink branding and stamping operation is summarized below in Table 4.7-4:

Table 4.7-4: EPD BACT Summary for the Ink Branding and Stamping

Pollutant	Control Technology	BACT Limit	Averaging Time	Compliance Determination Method
VOC	Good design/operation: use of low-VOC ink and minimize ink use and leaks	NA	NA	NA

5.0 TESTING AND MONITORING REQUIREMENTS

Furnace/Dryer System and Board Press:

Testing Requirements
As stated in a previous section of this document, the Permittee is required to test the Wellons wood burner and thermal oil heater (WBNR) and the board press (in Emission Group BDFN) exhaust for PM/PM_{10}, $PM_{2.5}$, NOx, CO, and VOC to demonstrate compliance with the BACT limits. Testing is required within 180 days of issuance of this permit amendment. There is one stack that vents board press exhaust from DRTO that must be tested. There are three stacks capable of venting the combined exhaust from the furnace, the dryers and the oil heaters from RTOs which must be tested. Therefore, performance tests must be performed while operating according to each of the following two worst-case RTO combinations: 1) SRTO and HRTO and 2) SRTO and PRT0, or an alternative test strategy approved by the Division. The Permittee must use all the temperature data collected during tests performed on each RTO to develop the minimum temperature, which assures that no emission rate specified Conditions 3.2.2, 3.2.3, 3.2.9, 3.2.10, 3.2.14, 3.2.15, 3.2.16, 3.2.17, and 3.2.22 will be exceeded

When the production rate is increased or the average RTO temperature is droped, the Permittee is required to conduct VOC destruction efficiency performance tests on SRTO, HRTO and PRTO used to control the Wellons Wood Fired Furnace in Emission Group WBNR and Dryers DRY1, DRY2, and DRY3 in Emission Group DRYR. Also, on the DRTO used to control the Board Press in Emission Group BDFN.

The Permittee is required to test the Wellons wood burner and thermal oil heater (WBNR) and the board press (in Emission Group BDFN) exhaust for NO_2 and the NO_2/NOx ratio. Huber must demonstrate compliance with the modeled hourly NO_2 emission rate and the NO_2/NOx ratio of 3%, which showed compliance with the new hourly NAAQS for NO_2. The PVMRM NO_2 ratio and modeled NO_2 hourly rates were established in a performance test conducted in 2010 using MDI resin. However, since performance testing in 2008 shows NOx emission rates while using MUPF resin to be up to 6.4 times higher, the performance test must be conducted while using MUPF resin during the testing.

The Permittee is required to verify through performance tests that actual emission rates of phenol and formaldehyde are below previously established HAP limits, while operating at the maximum production rate and using MUPF resin.

The Permittee is required to test the SO_2 emissions from the board press (in Emission Group BDFN) while using the accelerant. The AP-42 emission factor for SO_2 emissions, used to demonstrate the facility's potential emission were below 40 tpy, does not indicate accelerant usage. Since the PSD avoidance limit allows up to 151 tons of sulfur containing accelerant to be used, the test must demonstrate that SO_2 emissions will remain below 40 tpy when 151 tpy of accelerant is used.

Table 5.0-1 below provides SO_2 emissions from each source and shows total emissions to be under 40 tpy, the PSD avoidance limit, which is required in Condition 3.2.18. So, if the performance tests from the board press reveal that SO_2 emissions are greater than 12.48 tpy, the expected emissions rate when using 151 tpy of accelerant, Huber will need to establish an alternative SO_2 PSD avoidance strategy.

Table 5.0-1: Annual SO_2 Emissions Facility Wide

Wellons Furnace Accelerant Combustion	Wellons Furnace Wood combustion	Dryers	OSB Press	Fire Pump and Emergency Engine	Total SO_2 Emissions Facility Wide
7.34 tpy	16.43 tpy	3.07 tpy	12.48 tpy	0.42 tpy	39.74 tpy

The Permittee is required to perform annual testing, not to exceed 13 months from the previous test, on the Wellons wood burner and thermal oil heater (WBNR), to verify compliance with the filterable PM and opacity limits established in NSPS, Subpart Db. Since Georgia State Rule(d) PM requirements are subsumed by the NSPS requirements, verifying compliance with Subpart Db will also ensure compliance with Rule(d).

Monitoring Requirements
The Permittee is required to continuously monitor and record opacity with the COMS on each stack associated with the Wellons wood burner and thermal oil heater (WBNR), as the primary monitoring tool. The Permittee is required to monitor the temperature of gas stream at the quench chamber outlet, the secondary DC voltage, and the secondary amperage. Using the secondary voltage and secondary amperage, the Permittee must calculate the total secondary power of each WESP as a secondary monitoring tool. Opacity monitoring with a COMS on each RTO stack is a new requirement to assure compliance with the PM limits, and is required by Subpart Db. The existing monitoring requirements on the WESPs were previously implemented and will be retained in the permit to assure compliance with the PM limitations.

The Permittee is required to continuously monitor the combustion zone temperature from each RTO. The Permittee is also required to monitor the inlet static pressure and airflow to the RTO controlling the press to ensure proper capture efficiency from the press enclosure. These monitoring requirements were previously implemented and will be retained in the permit to assure compliance with the VOC and CO limits.

The Permittee is required to monitor and record the fuel consumption (natural gas and fuel oil) in the Wellons wood burner and thermal oil heater (WBNR) to ensure compliance with the annual capacity factor for both natural gas and fuel oil. This is a new monitoring requirement to assure compliance with NSPS Subpart Db.

CAM Applicability
Because CAM requirements were sufficiently implemented in the renewal permit for the units affected by this modification, additional CAM requirements will not be triggered by the proposed modification. Therefore, no additional CAM provisions are being incorporated into the facility's permit.

<u>Dry Screening, Blending, Forming, Trim, Grading, Sanding, Tongue & Groove Operations</u>

Testing Requirements
The Permittee is not required to test the dry screening and blending operations (in Emission Group DRYR and BDFN), the forming operation (in Emission Group BDFN), the trim and grade equipment (in Emission Group BDFN), or the sanding and tongue & groove equipment (in Emission Group BDFN) exhausts for PM or VOC emissions to demonstrate compliance with the BACT limits. Due to their design, which is forced draft, testing the four baghouses (BH01, BH23, BH04, and BH05) controlling PM from these operations would be relatively difficult and is not presently required. The Huber VOC, PM/PM_{10}, and $PM_{2.5}$ BACT limits for this plant were developed from stack tests conducted at Huber's Broken Bow mill. The VOC BACT limit was set using the stack test results, which were multiplied by a safety factor of 33 percent. The PM/PM_{10} BACT limit is derived from the stack tests which resulted in a outlet grain loading of 0.0029 gr/dscf, which was multiplied by a safety factor of 33 percent to obtain 0.0038 gr/dscf. The $PM_{2.5}$ BACT limit is derived from the PM_{10} test results, using particle size ratio for filterable particulate. The Division reserves the right to require that any of these BACT limits be verified by testing to assure that pollutants are not being emitted in excess of the BACT limits established.

Monitoring Requirements
The Permittee is required to perform daily visible emission checks from each baghouse stack (BH01, BH23, BH04, and BH05) as the primary monitoring tool. The Permittee is required to implement a Preventive Maintenance Program and inspect each baghouse for proper operation on a weekly basis as a secondary monitoring tool. These monitoring requirements were previously implemented and remain in the permit to assure compliance with the new PM limits.

CAM Applicability
Because CAM requirements were implemented in the renewal permit for the units affected by this modification, additional CAM requirements will not be triggered by the proposed modification. Therefore, no additional CAM provisions are being incorporated into the facility's permit.

Emergency Generator and Fire Pump

The Division proposes to track the hours operated during emergency service and in non-emergency service (maintenance and/or testing), to record the reason the engine was in operation during those time, and to record the cumulative total hours of operation. With this, Huber will be allowed to operate the engines between the hours of 8:00 am and 9:00 pm for maintenance and testing and up to 7-days under emergency operating scenarios. By tracking the engine hours Huber avoids modeling hourly NO_2 emissions under emergency scenarios, and they avoid modeling 24-hour worst case circumstances under maintenance and testing scenarios.

6.0 AMBIENT AIR QUALITY REVIEW

An air quality analysis is required to determine the ambient impacts associated with the construction and operation of the proposed modifications. The main purpose of the air quality analysis is to demonstrate that emissions due to the proposed modifications, in conjunction with other applicable emissions from existing sources (including secondary emissions from growth associated with the new project), will not cause or contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) or PSD increment in a Class I or Class II area. NAAQS exist for NO_2, CO, $PM_{2.5}$,, PM_{10}, SO_2, Ozone (O_3), and lead. PSD increments exist for SO_2, NO_2, and PM_{10}.

The proposed project at the Huber OSB mill triggers PSD review for PM_{10}, $PM_{2.5}$, NO_2, CO, and VOC. An air quality analysis was conducted to demonstrate the facility's compliance with applicable NAAQS and the PSD Increments for NO_2 and PM_{10}. An additional analysis was conducted to demonstrate compliance with the Georgia air toxics program. This section of the application discusses the air quality analysis requirements, methodologies, and results. Supporting documentation may be found in the Air Quality Dispersion Report of the application.

Modeling Requirements

The air quality modeling analysis was conducted in accordance with Appendix W of Title 40 of the Code of Federal Regulations (CFR) §51, *Guideline on Air Quality Models*, and Georgia EPD's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised).*

The proposed project will cause net emission increases of PM_{10}, $PM_{2.5}$, NO_2, CO, and VOC that are greater than the applicable PSD Significant Emission Rates. Therefore, air dispersion modeling analyses are required to demonstrate compliance with the NAAQS and PSD Increment. Emissions of VOC are not modeled because EPA has not developed a satisfactory single point source photochemical model, and VOC is regulated as a contributor to photochemical ozone formation. The project is not likely to have an adverse impact on the attainment of the ozone standard in the area, based on an analysis of the monitored levels of ozone in Clarke County. Given the level of emission increases from this project and the distance from the Athens monitor, Huber's plumes are not expected to adversely impact ozone ambient concentrations at this monitoring site.

Significance Analysis: Ambient Monitoring Requirements and Source Inventories

Initially, a Significance Analysis is conducted to determine if the PM_{10}, NO_2, and CO emissions increases at the Huber OSB mill, which exceed respective Significant Emission Rates, that would significantly impact the area surrounding the facility. Maximum ground-level concentrations are compared to the applicable pollutant-specific U.S. EPA-established Significant Impact Levels (SILs). The SILs for the pollutants of concern are summarized in Table 6-1.

If a significant impact does result for a pollutant (i.e., an ambient impact above the SIL), refined modeling is completed to demonstrate that the proposed project would not cause or contribute to a violation of the NAAQS or consume more than the available Class II Increment. If a significant impact does not result for a specific pollutant, no further modeling analysis of the impacts of that pollutant is necessary.

Under current U.S. EPA policies, the maximum impacts due to the emissions increases from a project are also assessed against monitoring *de minimis* levels to determine whether pre-construction ambient monitoring should be considered. These monitoring *de minimis* levels are also listed in Table 6-1. If either the predicted modeled impact from an emission increase or the existing ambient concentration is less than the monitoring *de minimis* concentration, the permitting agency has the discretionary authority to exempt an applicant from pre-construction ambient monitoring. An evaluation is required for PM_{10}, NO_2, and CO.

If any off-site pollutant impact calculated in the Significance Analysis exceeds the SIL, a Significant Impact Area (SIA) would be determined. The SIA encompasses a circle centered on the facility with a radius extending out to (1) the farthest location where the emissions increase of a pollutant from the project causes a significant ambient impact, or (2) a distance of 50 km, whichever is less. All sources within a distance of 50 km of the edge of a SIA are assumed to potentially contribute to ground-level concentrations within the SIA and would be evaluated for possible inclusion in the refined NAAQS and PSD Increment modeling analyses.

Table 6-1: Summary of Modeling Significance Levels

Pollutant	Averaging Period	PSD Significant Impact Level (ug/m^3)	PSD Monitoring de Minimis Concentration (ug/m^3)
PM_{10}	Annual	1	--
	24-Hour	5	10
$PM_{2.5}$	Annual	0.3	--
	24-Hour	1.2	4
NO_2	Annual	1	14
	1-Hour	9.4*	--
CO	8-Hour	500	575
	1-Hour	2000	--

* The CO 1-hour SIL is 5% of the CO NAAQS. This SIL was promulgated by EPA in 1978. Since the 1-hr NO_2 standard also has an averaging time of 1-hour, and since EPA did not promulgate a SIL for the standard in a timely manner, GA EPD derived an interim NO_2 1-hour SIL using a SIL/NAAQS ratio of 5% as the basis.

__NAAQS Analysis__

A primary NAAQS is the maximum concentration ceiling, measured in terms of total concentration of that pollutant in the atmosphere, which defines the level "of air quality which the U.S. EPA judges are necessary, with an adequate margin of safety, to protect the public health." A secondary NAAQS defines the level that protects "the public welfare from any known or anticipated adverse effects of a pollutant." Every primary and secondary NAAQS, for the pollutants for which refined modeled analyses are required, is listed in Table 6-2 below.

Table 6-2: Summary of National Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS Primary / Secondary (ug/m^3)
PM_{10}	24-Hour	150 / 150
$PM_{2.5}$	Annual	15 / 15
	24-Hour	35 / 35
NO_2	Annual	100 / 100
	1-Hour	188/188

If the maximum pollutant impact calculated in the Significance Analysis exceeds the SIL at an off-property receptor, a refined modeled NAAQS analysis is required. The NAAQS analysis requires modeling of the potential emissions from all emission units at the Huber OSB mill, except for units that are generally exempt from permitting requirements and are normally operated only in emergency situations. The emissions modeled for this analysis would reflect the results of the BACT analysis for each modified emission unit. Facility emissions would then be combined with the allowable emissions of sources included in the regional source inventory. The resulting impacts, added to appropriate background concentrations, would be assessed against the applicable NAAQS to demonstrate compliance. For an annual average NAAQS analysis, the highest modeled concentration among five consecutive years of meteorological data would be assessed. The highest 98th percentile of the daily maximum 1-hr NO_2 concentrations, averaged over the five-year period modeled on a receptor-specific basis, is the impact assessed against the 1-hour NO_2 standard. The maximum 24-hr concentration, averaged over the five-year period modeled on a receptor-specific basis, is the impact assessed against the $PM_{2.5}$ 24-hr standard. Note that the applicant has included in the application a discussion of the appropriate use of the interim $PM_{2.5}$ refined modeling guidance. The interim $PM_{2.5}$ refined modeling guidance of March 23, 2010, as applied in this case, requires the modeling of on-site sources of $PM_{2.5}$ only, and the addition of a representative $PM_{2.5}$ ambient background concentration to the receptor-specific modeled 24-hr maximum concentration. The highest 6^{th} high individual receptor concentration over the five-year period modeled is the impact assessed against the 24-hr PM_{10} standard.

PSD Increment Analysis

The PSD Increments were established to "prevent deterioration" of air quality in certain areas of the country where air quality was better than the NAAQS. To achieve this goal, U.S. EPA established PSD Increments for certain pollutants. 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 an attainment area. Significant deterioration is said to have occurred if the change in emissions occurring since the 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).

U.S. EPA has established PSD Increments for NO_X, SO_2, and PM_{10}; no increments have been established for CO. Increments have been established for $PM_{2.5}$, but will not be effective until October, 20, 2011. There are PSD Increments for Class I, II, and III areas. [At present, there are no Class III areas in the nation.] The Huber OSB mill is located in a Class II area. The PSD Increments are listed in Table 6-3.

Table 6-3: Summary of PSD Increments

Pollutant	Averaging Period	PSD Increment	
		Class I (ug/m^3)	Class II (ug/m^3)
PM_{10}	Annual	4	17
	24-Hour	8	30
NO_X	Annual	2.5	25

To demonstrate compliance with the PSD Increments, the increment-affecting emissions (i.e., all emissions increases or decreases after the appropriate baseline date) from the facility and those sources in the regional inventory would be modeled to demonstrate compliance with the PSD Class II increment for any pollutant greater than the SIL in the Significance Analysis. For an annual average analysis, the highest incremental impact would be used. For a short-term average analysis, the highest second-high impact would be used.

The determination of whether an emissions change at a given source consumes or expands increment is based on the source classification (major or minor) and the time the change occurs in relation to baseline dates. The major source baseline date for NO_X is February 8, 1988, and the major source baseline for SO_2 and PM_{10} is January 6, 1975. Emission changes with construction at major sources that occur after a major source baseline date affects Increment. In contrast, emission changes at minor sources only affect Increment after the minor source baseline date, which is set at the time when the first complete PSD application is received by EPD for a facility in a given area, usually arranged on a county-by-county basis. The minor source baseline dates have been set for Jackson County for PM_{10} and NO_2 as August 21, 1990.

Modeling Methodology

Details on the dispersion model, including meteorological data, source data, and receptors, can be found in EPD's PSD Dispersion Modeling and Air Toxics Assessment Review in Appendix C of this Preliminary Determination and in Huber's permit application under Dispersion Modeling and Additional Impacts Analysis in Section 5.

Modeling Results

Table 6-4 shows that the proposed project will not cause ambient impacts of CO above the appropriate SILs. Because the emissions increases from the proposed project result in ambient impacts less than the SILs, no further PSD analyses were conducted for this pollutant.

However, ambient impacts above the SILs were predicted for NO_2 for the 1-hour and annual averaging periods and PM_{10} for the 24-hour and annual averaging periods, requiring NAAQS and Increment analyses be performed for NO_2 and PM_{10}. $PM_{2.5}$ SILs were promulgated on December 7, 2010, but do not affect this application, since the interim $PM_{2.5}$ refined modeling guidance of March 23, 2010 is being used to demonstrate compliance with $PM_{2.5}$ standards.

Table 6-4: Class II Significance Analysis Results – Comparison to SILs

Pollutant	Averaging Period	Year*	UTM East (km)	UTM North (km)	Maximum Impact (ug/m^3)	SIL (ug/m^3)	Significant?
NO_2	1-hour	5-yr average	275.6	3,783.1	**159.2**	9.4	**Yes**
	Annual	1991	275.5	3,782.6	**9.8**	1.0	**Yes**
PM_{10}	24-hour	1991	275.5	3,782.6	**31.5**	5.0	**Yes**
	Annual	1991	275.5	3,782.6	**8.7**	1.0	**Yes**
$PM_{2.5}$	24-hour	5-yr average	275.5	3,782.6	**7.43**	1.2	**Yes**
	Annual		276.7	3,784.6	**1.49**	0.3	**Yes**
CO	1-hour	1991	275.5	3,783.3	**150.3**	2000	No
	8-hour	1989	275.5	3,783.2	**67.7**	500	No

*Data for worst year provided only.

As indicated in the table above, maximum modeled impacts were below the corresponding SILs for CO. However, maximum modeled impacts were above the SILs for NO_2 (1-hour and annual averaging periods) as well as PM_{10} and $PM_{2.5}$ (24-hour and annual averaging periods). Therefore, a Full Impact Analysis was conducted for NO_2 (1-hour and annual averaging periods) and PM_{10} (24-hour and annual averaging periods).

Significant Impact Area

For any off-site pollutant impact calculated in the Significance Analysis that exceeds the SIL, a Significant Impact Area (SIA) must be determined. The SIA encompasses a circle centered on the facility being modeled with a radius extending out to the lesser of either: 1) the farthest location where the emissions increase of a pollutant from the proposed project causes a significant ambient impact, or 2) a distance of 50 kilometers. All sources of the pollutants in question within the SIA, plus those within an additional 50 kilometers distance, are assumed to potentially contribute to ground-level concentrations and must be evaluated for possible inclusion in the modeled refined NAAQS and Increment Analysis.

Based on the results of the Significance Analysis, the distance between the facility and the furthest receptor from the facility that showed a modeled concentration exceeding the corresponding SIL was determined to be equal to or less than 4.6 kilometers for 24-hour PM, 2.4 kilometers for annual NO_2, and 24.4 kilometers for 1-hour NO_2. To be conservative, regional source inventories for these pollutants were prepared for sources located within 55 kilometers of the facility for 24-hour and annual PM, and 75 kilometers of the facility for 1-hour NO_2, and 53 kilometers of the facility for annual NO_2.

NAAQS and Increment Modeling

The next step in completing the NAAQS and Increment analyses is the development of a regional source inventory. All known nearby sources that have the potential to contribute significantly within the facility's SIA are included in this regional inventory. Huber requested EPD's assistance in developing an inventory of NAAQS and PSD Increment sources. Huber reviewed the data received and calculated the distance from the mill to each facility in the inventory.

The distance from the facility of each source listed in the regional inventories was calculated, and all NO_2 sources located more than 75 kilometers and PM sources located more than 55 kilometers from the mill were excluded from the analysis. Additionally, pursuant to the "20D Rule," facilities outside the SIA were excluded from the inventory for that pollutant if the entire facility's emissions (expressed in tons per year) were less than 20 times the distance (expressed in kilometers) from the facility to the center of emissions at the facility (for short-term averaging periods) or the edge of the SIA (for annual averaging periods). In applying the 20D Rule, facilities in close proximity to each other (within approximately 2 kilometers of each other) were considered as one source, prior to applying the screening technique. Minor sources were screened from the 1-hour NO_2 NAAQS model if they were located outside the SIA plus 5 km. Major sources were subject to 20D screening if located beyond the 1-hour NO_2 SIA. The Increment inventory is conservatively considered to be the same as the NAAQS inventory for each pollutant.

The regional source inventory used in the analysis is included for each pollutant in the permit application, the attached modeling report, and/or the model input/output files.

<u>NAAQS Analysis</u>

In the NAAQS analysis, impacts within the facility's SIA due to the potential emissions from all sources at the facility and those sources included in the regional inventory were modeled. Since the modeled ambient air concentrations only reflect impacts from industrial sources, a "background" concentration was added to the modeled concentrations prior to assessing compliance with the NAAQS.

The results of the NAAQS analyses are shown in Table 6-5. For the annual averaging period, the impacts are the highest impact. For the 1-hour NO_2 standard, the highest 98th percentile of the daily maximum 1-hour NO_2 concentrations, averaged over the five-year period modeled on a receptor-specific basis, is the impact assessed. For the $PM_{2.5}$ 24-hour standard, the maximum 24-hour concentration, averaged over the five-year period modeled on a receptor-specific basis, is the impact assessed. Note that the applicant has included in the application a discussion of the appropriate use of the interim $PM_{2.5}$ refined modeling guidance. The interim $PM_{2.5}$ refined modeling guidance of March 23, 2010, as applied in this case, requires the modeling of on-site sources of $PM_{2.5}$ only, and the addition of a representative $PM_{2.5}$ ambient background concentration to the receptor-specific modeled 24-hour maximum concentration. For the 24-hour PM_{10} standard, the highest 6th high individual receptor concentration over the five-year period modeled is the impact assessed. When the total impact at all significant receptors within the SIA for each pollutant is below the corresponding NAAQS, compliance is demonstrated.

Table 6-5: NAAQS Analysis Results

Pollutant	Averaging Period	Year*	UTM East (km)	UTM North (km)	Maximum Impact (ug/m^3)	Background (ug/m^3)	Total Impact (ug/m^3)	NAAQS (ug/m^3)	Exceed NAAQS?
NO_2	1-hour	1989-1993	265.3	3792.1	894.74	40	934.74	188	**Yes**
	Annual	1991	275.5	3,782.6	16.9	6.30	23.2	100	No
PM_{10}	24-hour	1993	277.7	3,782.5	37.5	38.00	75.5	150	No
	Annual	1991	275.5	3,782.6	8.95	20.00	28.95	50	No
$PM_{2.5}$	24-hour	1989-1993	275.5	3,782.6	7.43	25.00	32.43	35	No
	Annual	1989-1993	275.5	3,782.6	1.48	11.80	13.29	15	No

*Data for worst year provided only.

As indicated in Table 6-5 above, the total modeled impacts for the 24-hour and annual averaging periods for NO_2, PM_{10} and $PM_{2.5}$ are below the corresponding NAAQS at all significant receptors within the SIA.

However, maximum modeled impacts were above the NAAQS standard for the 1-hour NO_2. Several excesses of the 1-hour standard were the result of a very conservative PVMRM modeling protocol as well as assigning a 90% NO_2:NOx ratio to all offsite stacks. Huber assessed their contribution of NO_2 emissions to these modeled excesses and determined their contribution to any modeled concentration in excess of the 1-hour standard was less than 2.7 $\mu g/m^3$. So, the maximum Huber contribution to any modeled excess of the 1-hour standard is only 29% of the EPD interim 1-hour NO_2 SIL.

Increment Analysis

The modeled impacts from the NAAQS runs were evaluated to determine whether compliance with the Increment was demonstrated. The results are presented in Table 6-6.

Table 6-6: Class II Increment Analysis Results

Pollutant	Averaging Period	Year*	UTM East (km)	UTM North (km)	Maximum Impact (ug/m^3)	Increment (ug/m^3)	Exceed Increment?
NO_2	Annual	1991	275.5	3,782.6	9.87	25	No
PM_{10}	24-hour	1989	277.7	3,782.5	26.8	30	No
	Annual	1991	275.5	3,782.6	8.95	17	No

*Data for worst year provided only

Table 6-6 demonstrates that the impacts are below the corresponding increments for NO_2 (annual averaging period), and PM_{10} (24-hour and annual averaging periods) even with the conservative modeling assumption that all NAAQS sources were Increment consuming sources.

Huber assessed the Class II impacts of PM_{10}, but without reducing the hours of operation of a nearby minor source to it's appropriate operating schedule. As a result, there is a discussion of PM_{10} 24-hr Increment excesses in the modeled air quality assessment accompanying the application. The PM_{10} Increment was remodeled by the Division. When accounting for the appropriate hours of operation of the minor source, the resulting model generated no PM_{10} 24-hr Increment excesses.

Ambient Monitoring Requirements

Table 6-7: Significance Analysis Results – Comparison to Monitoring *de Minimis* Levels

Pollutant	Averaging Period	Year*	UTM East (km)	UTM North (km)	Monitoring de Minimis Level (ug/m^3)	Modeled Maximum Impact (ug/m^3)	Significant?
NO_2	Annual	1991	275.5	3,782.6	14	9.83	No
PM_{10}	24-hour	1991	275.5	3,782.6	10	31.5	**Yes**
$PM_{2.5}$	24-hour	NA-Interim $PM_{2.5}$	275.5	3,782.6	4	7.43	**Yes**
CO	8-hour	1989	275.5	3,783.2	575	67.7	No

*Data for worst year provided only

The impacts for NO_2, PM_{10}, $PM_{2.5}$ and CO quantified in Table 6-4 of the Class II Significance Analysis are compared to the monitoring *de minimis* concentrations, shown in Table 6-1, to determine if ambient monitoring requirements need to be considered as part of this permit action. Because all maximum modeled impacts are below the corresponding de minimis concentrations for NO_2 and CO, no pre-construction monitoring is required for NO_2 or CO.

Note that Huber's significance analysis showed modeled impacts of PM_{10} and $PM_{2.5}$ to be in excess of the respective de minimis concentrations. Huber proposed to use existing ambient data from Division run monitors in lieu of conducting pre-construction monitoring for these pollutants. However, the Division considers the ambient PM_{10} and $PM_{2.5}$ monitoring data collected at the Athens monitoring site to be adequately representative of the project area. Therefore, no pre-construction monitoring was required for PM_{10} and $PM_{2.5}$.

Ozone Ambient Impacts Assessment

Projected VOC and NOx emission increases resulting from the proposed modification exceed 100 tpy. For that reason, an ozone ambient impact assessment is required. Pre-construction and post-construction ozone monitoring will not be necessary, because EPD's monitoring network will provide sufficient ozone data.

The GA EPD Ambient Monitoring Program operates an ozone ambient air quality monitor on College Station Road in Athens, Georgia. The monitor was approved by Region 4 EPA for use as a background ozone monitor for implementation of the PVMRM modeling algorithm. The monitor is maintained and quality-assured by GA EPD. It has collected ozone data for at least the past 9 years at that site. The monitor is considered representative of ambient ozone concentrations in the Clarke and Jackson County area, as well as other areas nearby, since ambient ozone is a product of photochemical reactions that occur during the transport of various plumes.

In 2007, the Athens monitor indicated a design value of 0.083 ppm vs. an ambient standard of 0.085 ppm. In 2008, EPA lowered the standard to 0.075 ppm. The 2008 Athens monitor design value (the 4th highest 8-hr average concentration) in that year was 0.077 ppm. In 2009, the Athens design value was 0.067 ppm, and in 2010, the design value was 0.072 ppm.

Since 2008 and the change of the standard, the Athens monitor has recorded design value concentrations less than the standard. The three year average of the most recent design values is 0.072 ppm. The Huber site is located approximately 30 km from the Athens ozone monitor. While this distance is appropriate for representation purposes, to allow sufficient time for photochemical reactions to produce ozone from the Huber plumes, the distance is also large enough to suggest that Huber plumes will rarely persist toward the Athens monitor sufficiently to influence compliance with the 8-hr average standard.

Class I Area Analysis

Federal Class I areas are regions of special national or regional value from a natural, scenic, recreational, or historic perspective. Class I areas are afforded the highest degree of protection among the types of areas classified under the PSD regulations. U.S. EPA has established policies and procedures that generally restrict impacts on Class I Increments by a PSD source located near a federal Class I area. Historically, a distance of 100 km has been used to define "near", but more recently, a distance of 200 kilometers has been used for all facilities that do not combust coal.

The four Class I areas within approximately 200 kilometers of the Huber OSB mill are the Cohutta Wilderness Area (WA), located approximately 130 kilometers northwest of the facility; Shining Rock WA, located approximately 140 kilometers north of the facility; Joyce-Kilmer/Slickrock WA, located approximately 140 kilometers northwest of the facility; and Great Smoky Mountains National Park (NP), located approximately 141 kilometers north-northwest of the facility. The U.S. Forest Service (USFS) is the designated Federal Land Manager (FLM) responsible for oversight of the Cohutta WA, Shining Rock WA, and Joyce-Kilmer/Slickrock WA. The National Park Service is the designated FLM responsible for oversight of the Great Smoky Mountains NP.

Because the Linville Gorge Class I area is more than 200 km from the Huber site, and the FLM did not request an AQRV assessment of Linville Gorge or any Class I area within 300 km, assessment of Class I SILs was not required beyond 200 km from the Huber site.

Table 6-8: Class I Increment Analysis Results

Pollutant	Averaging Period	Year	UTM East (km)	UTM North (km)	Maximum Impact (ug/m^3)	Increment (ug/m^3)	Exceed Increment?
NO_2	Annual	1989	318.6	3,808.5	0.088	0.1	No
PM_{10}	24-hour	2003	421.9	3,946.7	0.022	0.3	No
	Annual	1989	318.6	3,808.5	0.026	0.2	No

EPA Region 4 has developed a screening technique using AERMOD to assess Class I Significance. The screening technique is to model the project's emissions, using a five-year set of meteorological data, for receptors located at 50 km toward the Class I areas of interest on a polar arc. A 1° receptor spacing at this 50 km distance is approximately 900m, which is less than the distance recommended by the FLMs for AQRV receptor spacing within the Class I areas. Huber employed the screening technique and found no excess of annual NO_2 or PM_{10} Significance levels. However, one receptor was found to exceed the 24-hr PM_{10} significance level on an azimuth, which would project the excess into the Great Smoky Mountain Park. Huber considered this excess to be due to the inclusion of fugitive sources in their screening modeling. The Division re-ran the screening model without the fugitive sources and found that the receptor was still in excess of the Class I significance level for the 24-hour average PM_{10} Increment. Other Class I areas assessed were: the Cohutta Wilderness Area, GA-TN; Joyce Kilmer/Slickrock Wilderness Area, NC; Shining Rock Wilderness Area, NC; and the Great Smoky Mountains National Park, TN-NC. No other screening-method receptor indicated an excess of an applicable significance level.

The Division conducted Class I area significance CALPUFF modeling of the potential Huber 24-hour PM_{10} impacts at the Great Smoky Mountain Park. Since all Class I areas are at least 50 km from the project site, no building downwash was required and no fugitive emissions were required to be included. The maximum 24-hour PM_{10} impacts within the Great Smokey Mountain National Park, predicted using the CALPUFF model, were well below the applicable proposed Class I SIL, as shown in Table 6-8.

7.0 ADDITIONAL IMPACT ANALYSES

PSD requires an analysis of impairment to visibility, soils, and vegetation that will occur as a result of a modification to the facility and an analysis of the air quality impacts projected for the area as a result of the general commercial, residential, and other growth associated with the proposed project.

Soils and Vegetation

Huber modeled the operation of the proposed project to assess the potential impacts to soils, vegetation, and wildlife. Impacts of lead, fluorides, beryllium, and reduced sulfur compounds are not projected to be emitted by the project in excess of PSD significant emission rates. The project CO emissions were modeled and showed impacts that are beneath the Class II significant concentrations. As such, they are exempt from further analysis.

Ambient background concentrations of NO_2 for all time-averaging periods other than annual were set equal to the project's Class II 1-hour ambient background concentration, monitored in 2009. The annual background concentration was the appropriate project concentration for that time-averaging period. The NO_2 impacts were evaluated with the Class II Increment and NAAQS modeling impacts. All impacts comply with the listed screening threshold concentrations of potential harm. The screening threshold concentrations of potential harm are taken from U.S. EPA's *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals*, EPA 450/2-81-078, 12/80.

The results of the soils and vegetation screening modeling of pollutants emitted in excess of PSD significant emission rates, but with impacts less than respective significance levels, indicated that worst-case project impacts are less than one percent of any proposed screening concentration threshold. Further assessment was considered to be unduly burdensome. Background ambient concentrations were approximated for perspective.

Table 7-1: Projected Impact – Project Significance Modeling

Pollutant	Averaging Period	Screening Threshold Concentrations of Potential Harm (µg/m3)	Maximum Modeled Impact (µg/m3)	Calculated Ambient Background Concentrations (µg/m3)	Total Project Impacts for Comparison with Screening Threshold Concentrations (µg/m3)
NO_2	1-hour	NA	1321.5	40	1361.5
	4-hour	3,760	221	40	261
	8-hour	3,760	175	40	215
	1-month	564	28.72	40	68.72
	Annual	94	23.2	6.3	29.5

Growth

No adverse impacts on growth are anticipated from the proposed project since it only involves a resin change and an increase in operational flexibility, rather than new source construction. There will be no significant increases in workforce and, as such, no major housing or commercial growth is expected.

Visibility

Visibility impairment is any perceptible change in visibility (visual range, contrast, atmospheric color, etc.) from that which would have existed under natural conditions. Poor visibility is caused when fine solid or liquid particles, usually in the form of volatile organics, nitrogen oxides, or sulfur oxides, absorb or scatter light. This light scattering or absorption actually reduces the amount of light received from viewed objects and scatters ambient light in the line of sight. This scattered ambient light appears as haze.

Another form of visibility impairment in the form of plume blight occurs when particles and light-absorbing gases are confined to a single elevated haze layer or coherent plume. Plume blight, a white, gray, or brown plume clearly visible against a background sky or other dark object, usually can be traced to a single source such as a smoke stack.

Georgia's SIP and the Georgia *Rules for Air Quality Control (the Rules)* provide no specific prohibitions against visibility impairment other than regulations limiting source opacity and protecting visibility at federally protected Class I areas. However, Rule 391-3-1(7)(b)12 indicates that 40 CFR 52.21(o) is incorporated and adopted by reference. 40 CFR 52.21(o) indicates that "the owner or operator shall provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of the source or modification and general commercial, residential, industrial and other growth associated with the source or modification." To demonstrate that visibility impairment will not result from operation of the mill, the VISCREEN model was used by the Division to assess potential impacts on ambient visibility at so-called "sensitive receptors", such as the Jackson County Airport, which is 11.8 kilometers from the facility, within Huber's SIA. Since there is no ambient visibility protection standard for Class II areas, this analysis is presented for informational purposes only. Impacts which may be predicted to be in excess of screening criteria are offered for the information of potentially concerned parties. Such impacts are not necessarily considered "adverse impacts", though they may cause further refined analyses to be conducted (see 40 CFR 51, Appendix W, Section 6.2.1d).

The primary variables that affect whether a plume is visible or not at a certain location are (1) quantity of emissions, (2) types of emissions, (3) relative location of source and observer, and (4) the background visibility range. For this exhaust plume visibility analysis, a Level-1 visibility analysis was performed using the latest version of the EPA VISCREEN model according to the guidelines published in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA-450/4-88-015). The VISCREEN model is designed specifically to determine whether a plume from a facility may be visible from a given vantage point. VISCREEN performs visibility calculations for two assumed plume-viewing backgrounds (horizon sky and a dark terrain object). The model assumes that the terrain object is perfectly black and located adjacent to the plume on the side of the centerline opposite the observer.

In the visibility analysis, the total project NO_X and PM_{10} emissions increases were modeled using the VISCREEN plume visibility model to determine the impacts. For both views inside and outside the Class II area, calculations are performed by the model for the two assumed plume-viewing backgrounds. The VISCREEN model output tabulates visibility criteria for both inside and outside the potentially sensitive receptor area. Each table contains several variables: theta, azi, distance, alpha, critical and actual plume delta E, and critical and actual plume contrast. These variables are defined as:

1. *Theta* – Scattering angle (the angle between direct solar radiation and the line of sight). If the observer is looking directly at the sun, theta equals zero degrees. If the observer is looking away from the sun, theta equals 180 degrees.

2. *Azi* – The azimuthal angle between the line connecting the observer and the line of sight.

3. *Alpha* – The vertical angle between the line of sight and the plume centerline.

4. *delta E* – Used to characterize the perceptibility of a plume on the basis of the color difference between the plume and a viewing background. A delta E of less than 2.0 signifies that the plume is not perceptible.

5. *Contrast* – The contrast at a given wavelength of two colored objects such as plume/sky or plume/terrain.

The analysis is generally considered satisfactory if *delta E* and *Contrast* are less than the critical values of 2.0 and 0.05. Above these values, the plume may be visibly perceptible, depending on the specific conditions coincident in time at the potentially sensitive receptor area. Since Huber did not identify any sensitive receptors within the final SIA for any visibility-affecting pollutant, they did not perform a plume blight analysis. However, because the Division identified the Jackson County airport as a potentially sensitive receptor for visual plume blight, within the 1-hour NO_2 impact area, VISCREEN was used to evaluate the plume blight from the project. The VISCREEN results predicted that the visual impact criteria (*delta E* and *Contrast*) at the affected sensitive receptors are exceeded for worst-case Level I conditions as a result of the proposed project. Therefore, a Level II analysis was required for these receptors.

A Level II analysis refines selected Level I worst-case input parameters by using representative wind speed and atmospheric stability conditions in the region encompassing both the emission source and the sensitive receptor. In contrast, the Level I analysis assumed worst-case parameters (Pasquill-Gifford stability class F, wind speed of 1.0 meter per second, and no specific wind direction) that are not necessarily indicative of local weather patterns that affect visibility when winds blow emissions from the Huber facility toward potentially sensitive receptors. For the Level II analysis, the representative meteorological conditions were determined by creating a joint frequency distribution of atmospheric stability and wind speeds during daylight hours (i.e., 7 am to 6 pm) from 1989 to 1993, made from observations at Athens, Georgia airport. This analysis indicated the specific, worst-case combination of atmospheric stability and wind speed that is most likely to occur when the wind direction is such that plume impairment would potentially occur at the Jackson County airport.

All other parameters were input as Level I default (worst-case) options. A background visual range of 25 kilometers was used for the Huber facility.

The results of the Level II VISCREEN analysis show that the screening criteria are not exceeded at the Jackson County airport when evaluated using the Level II input parameters. Therefore, the proposed modifications to facility are not anticipated to cause the plume to be visible at the Jackson County airport.

Moreover, because the perception of industrial plumes has not been an issue in the past, this is an additional indication that there is little reason to expect that visible industrial plumes from this site will be a substantial future issue.

Georgia Toxic Air Pollutant Modeling Analysis

Georgia EPD regulates the emissions of toxic air pollutant (TAP) emissions through a program authorized by the provisions of *Georgia Rules for Air Quality Control*, 391-3-1-.02(2)(a)3.(ii). A TAP is defined as any substance that may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. Procedures governing the Georgia EPD's review of TAP emissions as part of air permit reviews are contained in the agency's "*Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised June 21, 1998)*" (*the Guideline).*

Selection of Toxic Air Pollutants for Modeling

For projects with quantifiable increases in TAP emissions, an air dispersion modeling analysis is generally performed to demonstrate that off-property impacts are less than the Acceptable Ambient Concentration (AAC) values derived in accordance with the *Guideline*. The TAPs evaluated are restricted to those that may increase due to the proposed project.

For this review, the TAP analysis would be an assessment of off-property impacts due to facility-wide emissions of any TAP emitted by a facility. However, to conduct a facility-wide TAP impact evaluation for any pollutant that could conceivably be emitted by the facility is impractical, since a literature review would suggest that at least one molecule of hundreds of organic and inorganic chemical compounds could be emitted from the various combustion units. This is understandable given the nature of the wood waste, natural gas and diesel fuel that is fed to the combustion sources, and the fact that there are complex chemical reactions and combustion of fuel taking place. The vast majority of compounds potentially emitted, however, are emitted in only trace amounts that are not reasonably quantifiable and can be ignored for this analysis.

For each TAP identified for further analysis, both the short-term and long-term AAC were calculated following the procedures given in Georgia EPD's *Guideline*. Figure 8-3 of Georgia EPD's *Guideline* contains a flow chart of the process for determining long-term and short-term ambient thresholds. Huber referenced the resources previously detailed to determine the long-term (i.e., annual or 24-hr average) and short-term AAC (i.e., 15-minute). The AACs were verified by the EPD.

Determination of Toxic Air Pollutant Impact

Huber proposed to model potential emission of the three toxic air pollutants that will be emitted from MUPF resin. These TAPs are phenol, formaldehyde, and methanol. The EPD agrees that these are the three most significant TAPs and by demonstrating that these pollutants do not violate any State Air Toxics standards, Huber will demonstrate compliance for all TAPs, since their emission rates are significantly less. Huber has calculated the AACs for those pollutants in Sections 4-1 of the Class II Modeling Report (Revised), dated December 2010. These AACs were calculated for each contaminant and applicable time-averaging period according to the Georgia Air Toxics Guideline. Maximum ground-level concentrations (MGLCs) of each contaminant emitted from each source on the Huber site were assessed without downwash using maximum capacity emission rates and source characteristics. Table 7-

2 compares the modeled results to the AACs. All air toxic concentrations assessed were found to be less than their respective AAC concentrations. The EPD verified these results and concluded that the proposed project at this facility will not cause or contribute any violation of the State Air Toxics Standards.

TABLE 7-2: Toxic Modeling Results – Comparison to AAC

Pollutant	Avg. Period	Maximum Model Impact (ug/m^3)	AAC (ug/m^3)	Exceeds AAC?
Phenol	24- Hour	0.80	45.2	No
	15-minute	4.78	6000	No
Formaldehyde	Annual	0.64	0.8	No
	15-minute	63.22	246	No
Methanol	24-Hour	82.22	619	No
	15-minute	780.02	32,500	No

8.0 EXPLANATION OF DRAFT PERMIT CONDITIONS

The permit requirements for the proposed modification are included in draft Permit Amendment No. 2493-157-0014-V-02-3.

Section 1.0: Facility Description

Huber has proposed, in Application TV-19076, the removal of all PSD avoidance limits from the operating permit, allowing an increase in operational flexibility. By relaxing the PSD avoidance limits, Huber will be allowed unrestricted use of MUPF resin as well as production increases. However, in Huber's updated application, dated December 22, 2010, they propose maintaining SO_2 emission below 40 tpy, by implementing a limit on the quantity of accelerant used.

In Application No. TV-19319, Huber proposed modifications to the board press monitoring strategy.

Also, Huber requested changes to the ID numbers for the Baghouses from APCD ID Nos. SC08, SC45, SC09 and SC67 to BH01, BH23, BH04, and BH05, respectively.

Section 2.0: Requirements Pertaining to the Entire Facility

No conditions in Section 2.0 are being added, deleted or modified as part of this permit action.

Section 3.0: Requirements for Emission Units

Table 3.1 contains a list of all significant emission units, with the applicable permit conditions listed. It has been updated in this PSD permit by adding and removing conditions per this modification. Note that existing PSD avoidance conditions are no longer there. Also conditions for NSPS Subpart Db are now indicated to be applicable to emissions from the stacks of the Wellons fixed grate wood burner, the hot oil heaters, and dryers since it has been determined that the combustion unit is subject to Subpart Db and since it essentially exhausts through all dryer stacks. Baghouse APCD ID numbers have been changed as requested.

Conditions 3.2.1, 3.2.4, and 3.2.7, 3.2.8, specifying PSD avoidance limits and operation caps, have been removed. PSD avoidance emission caps and operating limits are no longer necessary, because this PSD permit removes all existing PSD avoidance limits. [Note that a new SO_2 PSD avoidance limit is being added in Condition 3.2.18.]

Conditions 3.2.2 and 3.2.3 are modified in this permit. The emission limits for formaldehyde and phenol are slightly changed, but the effective limits have either stayed the same or been reduced.

In current Condition 3.2.2, regarding the dryers, the emission limits for formaldehyde and phenol are 6.0 lb/hour and 4.0 lb/hour, respectively. New Condition 3.2.2 limits formaldehyde and phenol to 5.98 lb/hour and 3.84 lb/hour, respectively. The new limits are for only the dryers. The higher rates in current Condition 3.2.2 are for the entire Emission Unit Group DRYR, which includes flake screening as well as the drying operations. The flake screening emits through a baghouse, which is very difficult to test. So, effectively, the dryers are the only process that can be tested in this emission group. Note that the limits in new Condition 3.2.2 are exactly the same as the rates that the facility had been required to meet in current Condition 4.2.3. Testing required to show that actual emission rates are below these limits has been done; the test results demonstrate that actual emissions were lower than these rates. Therefore, rather than have, essentially, two separate limits on these pollutants, the limits in Condition 3.2.2 have been replaced by the rates expected from the dryers, in current Condition 4.2.3. Amended Condition 4.2.3 requires that Huber test to verify that actual emission rates of Phenol and Formaldehyde are in compliance with the emission limits specified in Condition 3.2.2. Note also that the new emission rates are not very different than the current limits; 5.98 is 0.3% lower than 6.0 and 3.84 is 4% lower than 4.0.

In the current Condition 3.2.3, regarding the board press, the emission limits for formaldehyde and phenol are 5.0 lb/hour and 4.0 lb/hour, respectively. New Condition 3.2.3 limits formaldehyde and phenol to 4.34 lb/hour and 3.04 lb/hour, respectively. Even though there is a difference in these numbers, there is essentially no change to the underlying formaldehyde and phenol emission limits. The new limit is for only the board press. The higher rates in current Condition 3.2.3 are for the entire Emission Unit Group BDFM, which includes blending, forming, mat reject, trimming, sanding, and tongue & groove operations as well as the board press operations. These other sources emit through 3 baghouses that are very difficult to test. So, effectively, the board press is the only piece of equipment that can be tested. [However, if we have reason to believe that the applicant's emission rates for the other equipment are higher, we can require that these sources be tested, though testing any of them would present a lot of difficulties.] Note that the limits in Condition 3.2.3 are the same as the rates which the facility had been required to meet in current Condition No. 4.2.3. Testing to show that actual emission rates are below these limits has already been done, and showed that actual emissions were lower than these rates.

For Condition 3.2.5, the PSD avoidance regulatory citations have been removed, since these are no longer applicable.

Condition 3.2.13 has been modified, as requested in Application TV-19319, by replacing the pressure drop requirements across the press enclosure with a requirement to ensure that the inlet static pressure is at least negative 1 inch of water column.

New Condition 3.2.14 requires the Permittee to not discharge particulate matter in excess of the limits representing Best Available Control Technology (BACT) for the following emission units: (a) furnace/dryer system, (b) board press, (c) dry screening and blending, (d) forming operation, (e) trim and grade equipment, and (f) sanding and tongue & groove. The PM_{10} BACT limits for the furnace/dryer system and the board press include both filterable and non-filterable PM emissions, since a high percentage of PM emissions from these processes are condensable. Similarly, $PM_{2.5}$ BACT limits for these units include all condensable particulate as $PM_{2.5}$.

New Condition 3.2.15 requires the Permittee to not discharge nitrogen oxides in excess of the limits representing BACT for the following emission units: (a) furnace/dryer system and (b) board press.

New Condition 3.2.16 requires the Permittee to not discharge carbon monoxide in excess of the limits representing BACT for the following emission units: (a) furnace/dryer system (in Emission Groups WBNR and DRYR) and (b) board press (in Emission Group BDFN).

New Condition 3.2.17 requires the Permittee to not discharge volatile organic compounds (VOCs) in excess of the limits representing BACT for the following emission units: (a) furnace/dryer system, (b) board press, (c) dry screening and blending, (d) forming operation, (e) trim and grade equipment, and (f) sanding and tongue & groove.

New Condition 3.2.18 establishes a PSD avoidance limit for SO_2 emissions, by limiting the accelerant usage to 151 tons per twelve consecutive months.

New Condition 3.2.19 requires the Permittee to not discharge nitrogen dioxide (NO_2) in excess of the limits representing the Modeled 1-hour NO_2 NAAQS Standard for the furnace/dryer system and the board press. Huber has selected the plume volume molar ratio method (PVMRM) with a NO_2/NOx ratio of 3%, to show compliance with hourly NAAQS for NO_2. Therefore, the limits in this condition are 3% of the NOx emission rate from the furnace/dryer system and the board press.

New Condition 3.2.20 limits the operation of the fire pump engine and emergency generator engine, for the purposes of testing and maintenance, to the hours between 8:00 am and 5:00 pm, since Huber only included these hours in its model done to show compliance with the 1-hour NO_2 NAAQS standard. This was done since night hours generally present the worst-case conditions, because inversions are more likely at night. This will not inconvenience Huber, since testing and maintenance operations are usually done during daytime hours.

New Condition 3.2.21 represents BACT control for VOC emissions. It specifies the minimum VOC destruction efficiency of the RTOs controlling emissions from the Board Press in Emission Group BDFN and the Wellons Wood Fired Furnace in Emission Group WBNR and Dryers in Emission Group DRYR.

New Conditions 3.3.1 and 3.3.2 state that the emissions from the Wellons wood burner and thermal oil heater are subject to NSPS, Subpart Db.

New Condition 3.3.3 limits gases containing particulate matter from the Wellons wood burner and thermal oil heater, per 40 CFR 60.43b(c).

New Condition 3.3.4 limits opacity from the Wellons wood burner and thermal oil heater to under 20 percent, except for one six minute period per hour of not more than 27 percent, per 40 CFR 60.43b(f).

New Condition 3.3.5 requires this facility to burn only very low sulfur oil (0.5 weight percent sulfur) in the Wellons wood burner and thermal oil heater, per NSPS Subpart Db.

New Condition 3.3.6 limits fuel oil and natural gas firing to a 10% annual capacity factor in the Wellons wood burner and thermal oil heater. This should not inconvenience Huber, since startup and clean-up activities are very infrequent and these are virtually the only times this boiler combusts fuel oil or natural gas. This limit prevents the equipment from being subject to the NOx limit for fossil fuel in 40 CFR 60, Subpart Db.

New Condition 3.3.7 subjects the Permittee to 40 CFR 63 Subpart ZZZZ - "National Emission Standards for Reciprocating Internal Combustion Engines (RICE)". In accordance with 40 CFR 63.6590(c), the fire pump, which is a new RICE, must meet the requirements of Subpart ZZZZ, by meeting the requirements of 40 CFR 60, Subpart IIII. However, in accordance with 40 CFR 63.6590(b)(3), the existing emergency engine generator is not required to meet the requirements of Subpart ZZZZ or Subpart A, nor will an initial notification be necessary.

New Conditions 3.3.8 and 3.3.9 subjects the Permittee to 40 CFR 60 Subpart A – "General Provisions" and 40 CFR 60 Subpart IIII – "Standards for Stationary Compression Ignition Internal Combustion Engines". When Huber purchased a fire pump in 2006, it was certified to meet the NSPS emission limits, as required by Subpart IIII. Huber must fire only fuel with a maximum sulfur content of 15 ppm, per new Condition 3.3.9, as required by Subpart IIII.

Conditions 3.4.1 and 3.4.5 have been modified, by removing references to Thermal Oil Preheaters TOP1 and TOP2, since these units were never installed. Emergency Engine Generator EG has been included in Condition 3.4.5, since it is subject to the fuel requirements of Georgia Rule (g).

Section 4.0: Requirements for Testing

Condition 4.1.3 has been modified to incorporate the Methods of old Condition 4.1.4, which was previously added in 502(b)(10) amendment No. 2493-157-0014-V-02-2.

Condition 4.1.3f. has been modified by requiring Method 5 in conjunction with Method 202 to be used when demonstrating compliance with the PM_{10} and $PM_{2.5}$ limits.

Old Condition 4.1.4a., requiring Method 25A to determine total HAP reduction through the RTO, and old Condition 4.1.4b., requiring use of Methods 204 and 204A – 204F or the tracer gas method to determine capture efficiency, have been removed. These methods have been incorporated into this permit as Conditions 4.2.1p and 4.2.1q.

Conditions 4.2.1 and 4.2.2, requiring annual performance testing to verify compliance with the PSD avoidance limits, have been removed, since this permit amendment removes all existing PSD avoidance emission caps and operating limits.

Condition 4.2.3, which had imposed testing requirements to verify that actual emission rates of phenol, formaldehyde, and methanol from the press and the dryers were below the indicated rates, has been fulfilled. Condition 4.2.3 in this permit will include additional testing for phenol and formaldehyde from the press, while MUPF is used as a resin. Note that, as explained above, additional HAP testing is not being required for the dryers, nor is methanol testing being required for the press.

Condition 4.2.4 has been modified to require testing to assure compliance with the new BACT requirements in Condition 4.2.11. This condition now requires that the combustion zone temperature be set while performing BACT and HAP testing.

Conditions 4.2.5, 4.2.6 and 4.2.8 required that the Permittee to establish, through performance testing, the minimum temperature and pressure drop which assures that the total hydrocarbon and formaldehyde removal efficiency of 90 percent is achieved by the RTOs. Since this has been done, these conditions have therefore been removed.

New Conditions 4.2.9 and 4.2.10 require the Permittee to conduct periodic performance tests for PM emissions and opacity from the Wellons wood burner and thermal oil heater (WBNR). These tests are needed to provide reasonable assurance of compliance with the NSPS limits in Conditions 3.3.3 and 3.3.4. If the tested emission rate, for testing done per Condition 4.2.9 or 4.2.10, is less than seventy-five (75) percent of the emissions limitation contained in Condition No. 3.3.3, no further testing will be required.

New Condition 4.2.11 requires the Permittee to conduct performance tests to demonstrate compliance with the BACT PM emission limits on the emissions from all stacks serving the Wellons wood burner and thermal oil heater and the board press, within 180 days of first manufacturing OSB with MUPF resin. Subsequent performance testing is required once every 12 months or once every 36 months if the tested emission rate is 75% or less than the BACT limit. EPA Test Method 5 in conjunction with EPA Method 202 must be used to demonstrate compliance with the PM_{10} and the $PM_{2.5}$ limits, in order to include both filterable and non-filterable PM.

New Conditions 4.2.12 and 4.2.13 require the Permittee to conduct performance tests to demonstrate compliance with the hourly NO_2 limit and to verify the NO_2/NOx ratio used in the PVMRM modeling technique for NO_2 emissions.

New Condition 4.2.14 requires the Permittee to conduct performance tests to demonstrate compliance with the SO_2 PSD avoidance limit in Condition 3.2.18. Additional testing is required, any time an alternative sulfur bearing accelerant is used. If the performance test does not demonstrate that facility wide potential emissions are below 40 tpy, Huber must propose an alternative PSD avoidance scenario.

New Condition 4.2.15 requires the Permittee to perform tests showing the RTO removal efficiency of VOC emissions, if the Permittee increases the production rate by more than 10% of the rate used during the recent performance test or if the Permittee intends to operate the RTO firebox temperature below 1500°F. The 2010 testing was done with the dryers producing 43.2 ODT/hr and the press producing 61 MSF/hour, which is lower than what Huber claims the production capacities will be after this permit is issued. Since the Division does not know if the RTOs will be able to achieve the same performance at the higher rates of production, Huber is being required to perform a performance test when production exceeds 48 ODT/hr from the dryers or 70 MSF/hr from the press operations. These rates are at least 10% above the previously tested rates. The performance test must demonstrate compliance with the 90 percent BACT destruction efficiency. The Permittee must submit the results within 60 days of completion.

New Condition 4.2.16 requires that the Permittee record the WESP parameters of current, voltage, and prequench chamber outlet temperature during the performance tests. These parameters must be used to establish the normal operating range for monitoring purposes.

Section 5.0: Requirements for Monitoring

Conditions 5.2.2, 5.2.4, 5.2.5, 5.2.9 and 5.2.10 have been modified, as requested in an E-Mail received in March 2010, by changing the Baghouse APCD ID Nos. from SC08, SC45, SC09 and SC67 to BH01, BH23, BH04, and BH05, respectively.

Condition 5.2.1a, specifying monitoring parameters, has been modified to include secondary amperage as a monitoring parameter. Voltage and current must now be used calculate total power on each WESP.

Condition 5.2.3, requiring the Permittee to maintain and operate a monitoring system to measure and record the hours of operation for the Fire Pump (FP) and Thermal Oil Preheaters (TOP1 and TOP2), has been modified by removing references to TOP1 and TOP2, since these units were never installed. This condition now includes monitoring requirements for the emergency generator engine. The Permittee must monitor the time of day as well as the hours of operation of the fire pump engine and the emergency generator engine for testing and maintenance purposes, since the PSD modeling results were based on an operating hour window between 8:00 am and 5:00 pm.

Condition 5.2.5 has been updated. It now requires the observer to determine whether emissions have any occurrence of visible emissions and that the observer be a qualified observer, certified in accordance with EPA Method 9.

Condition 5.2.5 has been updated. It now requires a trained observer to determine whether emissions have any presence of visible emissions from the baghouse. For each check where it is determined that emissions are visible, a qualified observer certified in accordance with EPA Method 9, must determine whether the emissions equal or exceed the 10% opacity action level.

Condition 5.2.7, requiring the Permittee to keep production rates and operating hours of the specified units while using specified resins, has been removed. Since all existing PSD avoidance limits have been removed, these records are no longer necessary.

Condition 5.2.13, specifying Compliance Assurance Monitoring (CAM) requirements, has been modified by requiring total power from each WESP. The indicators now include both current and voltage measurements in each WESP. The total secondary power and the gas stream temperature have been updated to specify 3-hour averaging times.

Condition 5.2.16 has been modified, as requested in Application TV-19319, by replacing the pressure drop monitoring requirements across the press enclosure with requirements to measure the inlet static pressure and airflow to the RTO.

New Condition 5.2.17 contains the monitoring requirements for the three COMS, per 40 CFR 60, Subpart Db.

New Condition 5.2.18 requires a natural gas consumption meter on the Wellons wood burner and thermal oil heater. Startup activities and occasional use on the oil-preheater are the only times this unit combusts natural gas, so the totals will not be very high. However, these record keeping requirements are needed to ensure that the annual capacity factor for natural gas does not exceed 10 percent.

New Condition 5.2.19 requires the Permittee to maintain and operate a monitoring system to measure and record the accelerant usage on a monthly basis. This will ensure compliance with the PSD avoidance limit in Condition 3.2.18.

New Condition 5.2.20 has been added, requiring calculations that reflect the total WESP power, resulting from the average of 60 power measurements each hour.

Section 6.0: Other Record keeping and Reporting Requirements

Condition 6.1.4 has been modified, by changing the semiannual reporting period to quarterly reporting. Since Huber is now required by NSPS regulations to monitor opacity with a COMS, quarterly reporting is required according to EPD's Procedures for Testing and Monitoring Sources of Air Pollutants, Part I: General Provisions, Section 1.5: Notification and Record Keeping, Paragraph (c).

New Condition 6.1.7a.i. defines a reportable excess emissions as any six-minute period during which the average opacity, as measured by a COMS, of emissions from the Wellons wood burner and thermal oil heater, that is greater than or equal to 20 percent, except for one six-minute average per hour of not more than 27 percent opacity.

Condition 6.1.7b.i. has been modified to define a reportable exceedance as any time the 3-hour block average combustion zone temperature of an RTO is greater than 1500°F, or the temperature established in the most recent performance test. This is being modified to incorporate the reportable requirements of Condition 6.1.8.a.i.

Conditions 6.1.7b.ii, 6.1.7b.iii and 6.1.7b.iv, defining reportable exceedances for operating caps and emission limits, are being removed since the related PSD avoidance limits are being removed. The thermal oil preheaters have been removed from the permit, since they were never installed.

New Condition 6.1.7b.v defines a reportable exceedance as when the annual capacity factor for natural gas and fuel oil consumption is greater than 10 percent.

New Condition 6.1.7b.vi defines a reportable exceedance as any time the accelerant usage exceeds the PSD avoidance operating limit of 151 tons during any twelve consecutive month period.

New Condition 6.1.7b.vii defines a reportable exceedance as any time the fire pump engine or emergency generator engine is operated outside 8:00 am and 5:00 pm, for testing and maintenance operations. This limit insures that the Permittee operates these units during only the modeled hours established in the PSD permit application.

Condition 6.1.7 c.i, defining a reportable excursion for the WESPs has been modified and now defines an excursion as any three hour average total WESP power that is less than 75% of the value determined during the most recent performance test.

New Condition 6.1.7 c.viii, defines a reportable excursion for the board press, as a static pressure at the RTO inlet from the press that is greater than negative 1 inches water column.

Condition 6.1.8a.i had defined a reportable exceedance as any time a 3-hour block average combustion zone temperature is greater than that established in the most recent performance test and 6.1.8b.i defined a reportable excursion as any daily pressure drop from the press enclosure that falls below that established in the most recent performance test. As stated above, these exceedance definitions are moved into Condition 6.1.7 as Conditions 6.1.7bi. and 6.1.7cviii.

Condition 6.2.1, requiring the Permittee to submit an application to the Division and indicating how it intends to comply with the requirements of 40 CFR 63, Subpart DDDD, are being removed since these requirements have been met.

Conditions 6.2.2 and 6.2.3, requiring the Permittee to maintain records of the total weight of pine and non-pine wood used in production as well as the operating times for production which contains less than 80 percent pine are being removed. These conditions are no longer necessary because they were used to establish the RTO's VOC destruction efficiency, which helped to insure PSD avoidance.

Conditions 6.2.5, 6.2.6, 6.2.7, 6.2.8, 6.2.9, 6.2.10, and 6.2.11, requiring the Permittee to calculate the 12-month rolling total emissions of NOx, CO, VOC and PM and submit a report for each semiannual period, are being removed, since these conditions were part of the record keeping and reporting requirements for PSD avoidance. As a result of this permit amendment, the PSD avoidance requirements are no longer needed.

Condition 6.2.12, requiring the Permittee to notify the division when MUPF resin or PF resin is used, is no longer necessary, since tracking the emissions associated with these resins and performance tests while operating with these resins is no longer required, as a result of PSD avoidance limits being removed. Therefore, this condition is being removed.

New Condition 6.2.16 requires the Permittee to maintain monthly fuel records to calculate the total annual capacity factor for natural gas and fuel oil, on a 12-month rolling basis, to ensure compliance with the requirements of Condition 3.3.6.

New Conditions 6.2.17 and 6.2.18 require the Permittee to retain accelerant usage records and to calculate the 12-month rolling total quantities of accelerant used for each calendar month to ensure compliance with the PSD avoidance limit in Condition 3.2.18. Anytime the operating limit is exceeded the Permittee is required to notify the Division. The 12-month total usage must be reported in accordance with the semiannual reporting requirements.

New Condition 6.2.19 requires the Permittee to maintain records of operation on the emergency generator engine and the fire pump engine to ensure compliance with the operating limits established in Condition 3.2.20.

New Condition 6.2.20 requires, upon completion of RTO and baghouse stack modifications, the Permittee notify the Division and to confirm that each stack height and diameter corresponds with the stack height and diameter which was modeled to show compliance with an NAAQS. In order to pass the modeling analysis, it was necessary for Huber to model the RTO's with an increased stack height and to vertically direct the positive pressure baghouse exhaust, by constructing a plenum or collar. Because compliance was demonstrated using specific stack parameters, Huber must demonstrate that the reconstructed stack parameters correspond with the parameters that were modeled.

Section 7.0: Other Specific Requirements

No conditions in Section 7.0 are being added, deleted or modified as part of this permit action.

Section 8.0: General Provisions

New Condition 8.27.1 is a template condition added to cover diesel-fired internal combustion engine(s) subject to NSPS, Subpart IIII requirements.

APPENDIX A

Draft Title V Operating Permit Amendment
Huber Engineered Woods, LLC
Commerce (Jackson County), Georgia

APPENDIX B

Huber Engineered Woods, LLC PSD Permit Application and Supporting Data

Contents Include:

1. PSD Permit Application No. TV-19076 dated July 9, 2009, updated February 18, 2010, December 22, 2010, and April 4, 2011; and Application No. TV-19319 dated November 24, 2009.
2. PSD Application Updates, dated December 22, 2010 along with E-Mail updates of baghouse emissions and state toxics modeling results, dated April 5, 2011.
3. Class II Air Quality Modeling Report, dated March 30 2010.
4. Class II Air Quality Modeling Report (Revised), dated December 2010.
5. EPA Comments and Huber's response, dated August 18, 2009 and October 6, 2009, respectively.
6. Application Addendum: VOC and NOx BACT revisions, dated February 22, 2010.
7. Source Emission Survey for PM and VOC; Huber's Broken Bow, Oklahoma facility.
8. EPA's Guidance for Determining Best Available Control Technology for Reducing Carbon Dioxide Emissions from Bioenergy Production, dated March 2011.
9. Reasonableness Analysis for PM_{10} as a surrogate for $PM_{2.5}$, dated September 25, 2009.
10. Guidance for the 1-hour NO_2 National Ambient Air Quality Standard, dated March 1, 2011.
11. Huber's NSPS, Subpart Db Compliance Plan, dated July 22, 2009.
12. Title V Amendment No. TV-19319; Alternative Monitoring – Wood Products Enclosure.

APPENDIX C

EPD'S PSD Dispersion Modeling and Air Toxics Assessment Review

APPENDIX D

EPA'S Preliminary Comments on Huber's PSD Application

Huber submitted PSD Application TV-19319 to both the EPD and EPA on July 9, 2009. On August 18, 2009, Mr. Gregg Worley of EPA sent a letter to the Division in reference to the PSD application. EPA's letter presented comments regarding applicability, emissions calculations, and BACT analysis. Huber responded to the EPA comments; the responses are provided below, with comments from the Division where appropriate.

Carbon Dioxide ***- As is noted in the application, RTOs emit higher levels of CO_2 than other CO and VOC control methods. However no quantification of CO_2 emissions is provided. As a minimum, CO_2 emissions should be quantified as a possible additional environmental impact.***

Huber Response:
To quantify CO_2 emissions Huber used methodology set forth in the recently finalized rule for Mandatory Reporting of Greenhouse Gases. Design heat input for the four RTO units and the wood fired furnace (Wellons) were used for the annual potential CO_2e emissions. Huber used historical natural gas (non-renewable) and wood residual (biofuel) usage rates for actual annual emissions during the three year period January 1, 2006 through December 31, 2008. The EPA GHG-Calculator found in the Applicability Tool of the Final Mandatory Rule for Reporting Greenhouse Gases (http://www.epa.gov/climatechange/emissions/GHG-calculator/index.html) was used to perform the emission calculations. The results of this analysis are provided in the table below.

Year	Total Natural gas use (MMcf)	CO_2e – emission from non-renewable fuels (TPY)	Total residual wood combusted *(Tons)	CO_2e – emission from biofuels (TPY)
2006	278	15,152	78,331	2,369
2007	256	13,953	50,672	1,455
2008	219	11,936	68,363	1,954
** RTO PTE	622	33,902	--	--
*** Wellons PTE	--	--	85,436	2,742

* Adjusted to 12 percent moisture
** RTO PTE is based on total design heat input for all burners of 73 MMBtu
*** Wellons PTE includes furnace and wellans and is based on total design firing rate for the furnace of 150 MMBtu and 15.38 MMBtu/ton for wood fuel

It should be noted that EPA has yet to determine or propose standards for CO_2.

Division Response:
The Division used EPA's GHG-Calculator found in the Applicability Tool and arrived at the same results as Huber; specifically, the facility will emit at least 36,644 metric tons of GHG annually. Since the GHG-Calculator does not including any carbon neutral sources and Huber's main fuel source is from biomass such as wood dust and bark, which is carbon neutral, these CO_2 emissions are low in comparison to BACT emission calculations. Since Huber emits more than 25,000 metric tons of CO_2e from their stationary combustion sources, they are subject to the mandatory reporting requirements of 40 CFR 98. In January 2011, EPA announced its plan to defer, for three years, greenhouse gas (GHG) permitting requirements for carbon dioxide (CO_2) emissions from biomass fired sources. However, Huber submitted a BACT analysis for GHGs in their updated application on December 22, 2010. This analysis and the Division's conclusion are presented in the preliminary determination.

<u>$PM_{2.5}$</u> - The applicant states "the Georgia State Implementation Plan (SIP) currently does not require particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) to undergo PSD permitting, and the Georgia Environmental Protection Division (EPD) has been following the interim guidance to regulate $PM_{2.5}$ as PM_{10}." However, Region 4 finds that the application does not contain an adequate rationale to support the use of the PM_{10} surrogate approach for this project. The applicant should determine whether or not PM_{10} is a reasonable surrogate for $PM_{2.5}$ under the facts and circumstances of the specific project at issue and not proceed with the general presumption that PM_{10} is always a reasonable surrogate for $PM_{2.5}$.

<u>Huber Response:</u>
Huber has prepared an addendum to the PSD application entitled "A Reasonableness for PM_{10} as a Surrogate for $PM_{2.5}$". This addendum is provided as an attachment to this letter.

<u>Division Response:</u>
A Memorandum regarding Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS was published by the EPA on March 23, 2010. As a result of this memorandum, Huber and the EPD agreed that a $PM_{2.5}$ model was required. This model must include $PM_{2.5}$ from the Huber site, added to the Athens design value as the local background. Even though increments have been established for $PM_{2.5}$, they will not be effective until October, 20, 2011, so an offsite inventory was not needed in the modeling analysis. The modeled values were compared to the 24-hour and annual $PM_{2.5}$ NAAQS. The EPD has included $PM_{2.5}$ limits in the draft permit and has reviewed the facility's $PM_{2.5}$ modeling analysis.

<u>Safety Factor</u> - Use of a "safety factor" artificially increases emissions and ultimately results in a higher allowable emission limit than appropriate. Region 4 recommends eliminating its use (see VOC for Dryer, Furnace RTOs (page 3-2), PM for Board Press RTO (page 3-7), VOC SC-08 (page 3-8) VOC Edge Sealing (page 3-8).

<u>Huber Response:</u>
Safety factors have been and are currently being used in Huber's Title V permits to account for variability in the wood due to seasonality, moisture, species, etc. A 1.33 multiplier is referenced in the current permit, and has been used to calculate criteria pollutant emissions of CO, NOx, VOC, and PM based on stack testing results. Safety factors are essential to sources using variable raw material and fuel source characteristics to account for expected changes in pollutant content and resulting emissions.

For edge sealing and branding operations (page 3-8), a safety factor is used to allow for increased ink and edge seal application requirements. For example, customer-driven changes, as well as marketing related design changes to the nail grid, panel information, and logos that are printed on each panel may change the type and/or amount of required application.

<u>Division Response:</u>
The Division concurs with Huber's argument for the use of safety factors, since variability in moisture content and wood species will have a significant influence on pollutant emission rates.

<u>Accelerant Dosing</u> - It is unclear whether the appropriate dosing is 1.5% or 2.0%. The calculations on page 3-4 discuss 1.5% and cite a result of 321.1 tons per year of usage but the calculation below it uses 2.0%. Region 4 recommends this be clarified.

<u>Huber Response:</u>
The appropriate accelerant dosing is 2.0%. The text and sample calculation for SO_2 on page 3-4 should be revised as follows:

Huber uses accelerant at a rate of 2.0% by weight of the MUPF resin usage, yielding a potential accelerant usage of 558.2 tpy, as shown in the following:

$$\text{Max Accelerant Usage}\left(\frac{\text{tons}}{\text{yr}}\right) = \text{Max MUPF Usage}\left(\frac{\text{tons}}{\text{yr}}\right)\times 2.0\%\ \text{Accelerant Dosing Rate}$$
$$= 27{,}910\left(\frac{\text{tons MUPF}}{\text{yr}}\right)\times 2.0\%\ \text{Accelerant Dosing Rate}$$
$$= 558.2\left(\frac{\text{tons Accelerant}}{\text{yr}}\right)$$

In addition, footnote "6" on page 6 of Appendix B of the PSD application states that the accelerant dosing rate is 1.5%. However, the calculations are based on 2%. Huber has revised this footnote and has provided the Wellons furnace emission calculations (pages 5 and 6 of Appendix B) as an attachment to this letter.

Division Response:
The Division is satisfied with Huber's explanation above and with the update to Appendix B, which corrects the typo.

***Economic Analysis* - A ten year economic life for recovery of capital costs needs further justification and better documentation. Twenty years is more appropriate for baghouses and incinerators. Region 4 notes that several of the baghouses were installed in 1988, the existing WESPs were installed in 1991 and three of the RTOs were installed in 1995. All of this equipment apparently still has some remaining useful life. In order to justify less than twenty years, the permit application would need to explain why new equipment would not last as long.**

Huber Response:
The footprint of the original RTOs remains the same as it was on the date of installation; however, several complete overhauls of the RTOs have been conducted since the equipment was originally commissioned. Specifically for the RTOs, complete internal rebuilds have been required due to structural failure and media failures. The following table shows only the major capital projects since 2004 involved with rebuilding the RTOs so that they function as intended.

Date	Source	Description
April 2004	SRTO	replaced internal structure, cold face replaced, entire media replaced
June 2004	SRTO	exhaust side duct replacement
June 2005	SRTO	replaced internal structure, cold face replaced, entire media replaced
April 2007	SRTO	roof replacement, including new insulation and retaining grid
Feb 2008	HRTO	replaced internal structure, cold face, all dampers, entire media bed replaced
May 2009	SRTO	replaced internal structure, all canisters, all dampers, cold face, entire media bed replaced

Since installation, the SRTO has undergone the rebuilds listed above so that the only remaining portion of the original equipment is the exterior of the roof. Each of the other sections has been replaced through capital expenditure. Since no ten-year period has elapsed without a significant rebuild of the RTOs, Huber feels that a 10-year economic life is appropriate for pollution control equipment.

Division Response:
The Division is satisfied with Huber's above explanation for its using a 10-year life recovery on the RTOs. However, since it is standard for the Division to require a 20-year life recovery of capital costs for WESPs, the Division requested a cost analysis for these control devices, based on a 20-year life recovery. Huber provided this cost analysis in updated Tables D-30 and D-31, on May 12, 2010, for the WESP controlling PM from the board press. As demonstrated in the tables, the WESP remains economically infeasible, with a cost of $21,999 per ton of pollutant controlled. A 20-year economic life recovery is not needed for the baghouse, because a cost analysis was not used to eliminate the baghouse as a control devise for any emission source.

***Stranding Operations* - These emissions are being treated as fugitive even though it appears to be an enclosable operation with VOC emissions of 320 tons/year and significant emissions of formaldehyde and phenol. No documentation of the economic analysis was provided nor does the cost analysis or cost effectiveness analysis appear in the document. Better justification is needed to continue treating this source as a fugitive source and to conclude no control is BACT.**

Huber Response:
As stated in the permit application narrative, Huber has conducted an economic analysis for controlling VOC from this process. To conduct the analysis Huber explored two add-on control scenarios: biofiltration and thermal oxidation. Results from this analysis were included in the application in Appendix D, Tables D-1 through D-6.

In addition to the cost of the control equipment, controlling VOC from these sources would require that Huber enclose the area to allow the emissions to be captured by the control device. Huber's economic analysis did not include the cost of enclosing these units. Based on the economic analyses performed on these units, it was determined the operational costs alone (electricity, natural gas) make the control option economically infeasible. Therefore, Huber requests that this source remain fugitive and not subject to BACT.

Division Response:
The Division has reviewed the abbreviated economic analysis provided in Tables D-1 through D-6 and has concluded that VOC control from these sources is economically infeasible, since the cost per ton basis is approximately $8300 per ton of pollutant. When the capital expense of the enclosure is added to these costs, it is clear that the cost would be considerably higher.

***Wellons Furnace/Dryer Exhaust NO_x BACT* - The facility emits 624 tons/year of NOx and is a major source. The RTO achieves temperatures of 1500 degrees F. This is well above the necessary temperature range for SCR and close to the temperature needed to operate SNCR. We recommend investigating operating SCR/SNCR in conjunction with the RTOs. This avoids the blinding and product quality issues.**

Huber Response:
RTOs utilize ceramic media to capture heat from the exhaust air before it is released from the system. The heat that is captured is used to heat the incoming process gas stream. The high thermal energy recovery is a key benefit of the RTO, as it reduces the energy required to maintain the combustion temperature. Consequently, the temperature of the RTO exhaust stream is significantly lower than the combustion temperature within the RTO. In this case, the RTO exhaust gas temperature of the Smith (SRTO), Huntington (HRTO) and Pro (PRTO) RTOs typically range from 270 to 325 °F.

As stated on pages 4-7 and 4-8 of the PSD permit application, the optimal temperature range for selective catalytic reduction (SCR) is approximately 475 to 850 ^{o}F. The optimal temperature range for selective non-catalytic reduction (SNCR) is approximately 1,615 to 2,000 °F for ammonia and 1,650 to 2,100 °F for urea. The exhaust gas temperatures of the SRTO, HRTO, and PRTO controlling emissions from the furnace and dryers are well below these optimal temperature ranges, and re-heating the exhaust gas streams would be highly inefficient and cost prohibitive. Furthermore, the use of this technology following an RTO is not demonstrated in EPA's RACT/BACT/LAER Clearinghouse (RBLC) database for OSB mills. Therefore, operating SCR/SNCR in conjunction with the RTOs is technically infeasible.

Division Response:
The Division agrees; it would be unreasonable to heat the RTO exhaust stream, creating additional NOx emission, in order to meet the required inlet temperatures for SCR or SNCR.

***Wellons Furnace/Dryer Exhaust VOC BACT* - It appears the RTOs are of insufficient capacity to presently achieve more than 90% control for VOC. Typically regenerative thermal oxidizers achieve 95-99% combustion efficiency. The use of the proposed safety factor lowers the actual proposed overall efficiency further to less than 86.7%. The existing units were never considered BACT. Rather it appears to be a consequence of the facility choosing to accept PSD avoidance limits rather than install BACT controls previously. The facility should be reviewed as a new source, making the incremental cost analysis irrelevant. The costs and cost effectiveness of 95% VOC control are well established and supported by the cost analysis provided and should be considered BACT. Because the toxic emissions of formaldehyde and phenol are so significant, evaluation of increasing required control efficiencies to the higher end of the range should be considered.**

Huber Response:
The New Source Review Workshop Manual does not suggest or specify that the use of incremental cost analysis is inappropriate for minor sources in the process of becoming major sources. Neglecting capital invested in the Commerce Mill as a minor source is unreasonable, as the source has operated legally under all state and federal regulations and should not be penalized for investing capital in controls that met applicable federal requirements (e.g. 40 CFR 63 Subpart DDDD). Furthermore, the use of an incremental analysis for the destruction efficiency of RTOs at an OSB mill was allowed by EPA Region 4 for an identical scenario where a synthetic minor facility converted to a PSD major source (Grant Allendale, South Carolina DHEC Permit No. 0160-0020-CB, 11/25/2008). Therefore, the use of incremental cost analysis is justified with precedent. As demonstrated in the incremental cost analysis, the cost of replacing existing control devices with new control devices to achieve slightly improved control efficiency is overly burdensome from an economic standpoint. In response to the discussion of 86.7% control efficiency, the use of the proposed safety factor is to account for variability in the VOC content of the wood and should not be used to adjust the control efficiency. Huber is required to maintain a control efficiency of 90% under the Plywood and Composite Wood Products Maximum Achievable Control Technology (MACT) Standard (40 CFR 63 Subpart DDDD) and has demonstrated that the RTO control efficiencies exceed 90% through performance testing. The safety factor accounts for fluctuations in incoming pollutant concentrations from heterogeneous sources (i.e. wood).

Divisions Response:
The Division disagrees with the EPA Region 4 that incremental cost is not allowed to be part of a BACT analysis. However, the Division requested that Huber revisit the BACT determination regarding VOC emissions from the furnace/dryer system. This analysis is included in the main part of this preliminary determination, in the VOC BACT analysis for the furnace/dryer system.

***OSB Press Vent VOC BACT* - Insufficient data was presented to evaluate BACT for the OSB press vent. Most of the comments for the Wellons furnace/dryer exhaust VOC BACT also apply to this operation.**

Huber Response:
The permit application provides a complete top-down BACT analysis for the OSB press vent beginning on page 4-17 of the PSD permit application. The responses provided above with regard to the use of incremental cost analysis and safety factor-adjusted control efficiency apply to the OSB Press Vent BACT as well.

Division Response:
As discussed in the conclusion of the press BACT analysis, since the incremental cost analysis showed that 95% control on the furnace of VOC emissions was economically infeasible, an incremental cost analysis on the press would yield similar results, since the VOC concentration in the board press exhaust is lower than in the furnace exhaust stream.

Other Major VOC Sources (Forming, Screening and Blending, Trim and Grade. Sanding and Tongue & Groove. and Branding) - Each of these units emits 30 to 56 tons per year of VOC and individual RTOs have been deemed beyond BACT for each of these units. Further analysis is needed, exploring whether some or all of these units can be combined in a manifold to be more cost effectively combusted or, if the high cost is due to low VOC concentration, whether the more concentrated gas streams can be separated and controlled or whether carbon adsorption might be appropriate for the more dilute streams.

Huber Response:
The cost analyses provided in the PSD permit application for the forming, screening and blending, trim and grade, sanding and tongue & groove, and branding process areas are based solely on operating costs and do not include capital costs. The operating costs, which include the cost of natural gas for heating the exhaust gas stream and the cost of electricity to operate the exhaust fans, are a function of the exhaust gas flow rate of each individual process. The operating costs are additive and would not be reduced by combining exhaust streams in a manifold, as the exhaust gas flow rate for each process would remain unchanged. Furthermore, the addition of capital costs to the already economically infeasible operating costs would only increase the dollar per ton cost of control. Therefore, the use of RTOs is beyond BACT for these units. Due to the high cost of media replacement, carbon adsorption would result in greater operating costs than the RTOs, so this technology is also economically infeasible.

Division Response: The Division is satisfied with Huber's explanation above.