Prevention of Significant Air Quality Deterioration Review
Of Norbord Georgia OSB
Located in Cordele, Crisp County, Georgia

FINAL DETERMINATION
SIP Permit Application No. 15812
Title V Permit Application No. 15812
June 2005

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

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Background

On November 5, 2004, Norbord Georgia, Inc. – Norbord Georgia OSB ["Norbord"] submitted, to the Environmental Protection Division ["the Division"] an application for an air quality permit to construct and operate a plant expansion designed to increase plan production capacity of oriented strandboard (OSB) by up to 650 million square feet per year (3/8" basis). The application was determined to be complete in February 2005.

On April 15, 2005, the Division issued a Preliminary Determination stating that the construction and operation of the plant expansion should be approved. The Preliminary Determination contained a draft Air Quality Permit for the construction and operation of the facility.

Upon issuance of the Preliminary Determination, the Division requested that the applicant place a public notice in a newspaper of general circulation in the area of the proposed facility, notifying the public of the proposed plant expansion and providing the opportunity for written public comment. Such public notice was placed in the *Cordele Dispatch* (legal organ for Crisp County) on April 21, 2005. During the comment period, comments were received from Norbord and the U.S. EPA. The public comment period expired May 21, 2005.

The comments from Norbord and the EPA (including requested permit changes) are transcribed below, along with the Division's written responses and indication when the permit has been changed based on the comments. Not all revisions made to correct typographical or grammatical errors are elaborated on.

A copy of the final permit is provided in Appendix A. A copy of the full written comments received during the public comment period is provided in Appendix B.

Review of Norbord's Comments

Section 1.3 Process Description of Modification
Comment: In the Facility Description portion of the permit we would like to add a sentence to the last sentence of the last paragraph as follows: "After passing through the thermal oil heater, the exhaust gases from this process combine with those gases entering the dryers."
Response: The Division agrees to make this change to Section 1.3; revised Section 1.3 will read as follows:

Trees (typical southern yellow pine) are received by truck, cut to length, debarked, flaked, stored in two green metering bins, and dried in one of two wood flake rotary dryers. The dry flakes are collected in the primary cyclones, fed to two rotary screens for fines removal, and conveyed to the core and/or surface dry storage bins. The flakes are metered from the dry bins and mixed with wax and resin in the core and/or surface dry storage bins. Orienting heads align the flakes into a continuous mat on the forming line. The mat is cut into sections, pressed several minutes at elevated temperature and pressure in a board press, trimmed to size, graded, sanded as required, edge coated, and packaged.

Emissions from the board press are controlled by a thermal catalytic oxidizer (TCO) system (capable of operating in either the thermal mode or catalytic mode). Emissions from the mat forming and trimming operations are controlled by baghouses.

Energy for the new wood flake dryers and thermal oil system for press heat is supplied by a new wood-fired energy system that is rated at approximately 285 MMBtu/hr. A portion of the energy system exhaust gas is ducted through a thermal oil heater. The exhaust from this heater is then recombined with the rest of the energy system exhaust and used as drying air in the rotary dryers mentioned above. The exhaust from the dryers is ducted through a wet electrostatic precipitator (WESP) and finally through a regenerative thermal oxidizer system (two RTOs) before being emitted to the atmosphere.

Section 3.1.1 Additional Emission Units

Comment: Permit Condition 3.1.1, specifically the note "(2)PRS2 will first exhaust to a pretreatment system before entering the oxidizer system." Norbord would prefer to add in the term "particulate" before "pretreatment" to read "particulate pretreatment." It is our feeling that the term "pretreatment" used alone could be misinterpreted. Also, a reminder for any changes made to reference of oxidizers in regards to the press that the table will need to be updated as well.

Response: The Division agrees to make the changes requested. It now reads: "PRS2 will first exhaust to a **particulate** pretreatment system before entering the oxidizer system." The press control device now just reads: "Thermal Catalytic Oxidizer," the references to other possible control devices having been removed.

Draft Condition 3.3.14

Comment: Permit Condition 3.3.14, specifically the note "The compliance date for 40 CFR 63 Subpart DDDD is October 1, 2007." Norbord would prefer to add the phrase "or as otherwise indicated by supplements to the rule" to the end of the sentence as it is their understanding that supplements to the rule could adjust the compliance date(s).

Response: The Division agrees to make this change. The condition will now read: "The Permittee shall comply with all applicable provisions of the 40 CFR Part 63, Subpart A – "General Provisions" and Subpart DDDD – "National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products," for the operation of equipment defined in 40 CFR 63.2232. The compliance date for 40 CFR 63 Subpart DDDD is October 1, 2007, or as otherwise indicated by amendments to the rule.

Draft Condition 3.3.16

Comment: Draft Condition 3.3.16 pertains to 40 CFR 60 Subpart Db applicability. Norbord would like to add a statement that "if EPA deems Subpart Db or Dc not applicable to this facility, only an administrative amendment will be required to remove requirements under this rule."

Response: The Division does not believe that such a permit modification could be done via a Title V Administrative Amendment, so the language would not serve the purpose suggested by Norbord.. However, this should not be an obstacle to Norbord; the Division believes that, if such a determination is made, it can be processed as a non-PSD change. No change is made to the condition.

Draft Condition 3.3.23

Comment: Draft Condition 3.3.23 pertains to the use of a "total enclosure" around the board press/unloader (Source Code PRS2). Norbord requests that the term "total enclosure" be replaced with the term "wood products enclosure" as stipulated in the PCWP MACT. Norbord asserts that the term "total enclosure" was removed from the promulgated MACT standard since most facilities had never gone through Method 204 (no data to back up

EPA's original claim).
Response: The Division agrees to make the change requested. The condition will now read: "The Permittee shall install and operate and maintain a ***wood products*** *enclosure* around the Board Press/Unloader (Source Code PRS2) and vent the captured emissions from the ***wood products*** *enclosure* to the oxidation system (Source Code C202)."

Draft Condition 3.3.24
Comment: Draft Condition 3.3.24 defines the term "total enclosure." Norbord requests that Draft Condition 3.3.24 define the term "wood products enclosure" as a structure that is designed and maintained to capture all emissions for discharge through a control device.
Response: The Division agrees to make the change requested. It now reads: "For purposes of this Permit, the term wood products enclosure shall mean a structure that is constructed around a source of emissions and operated so that all VOC emissions are collected and exhausted through a stack. [40 CFR 52.21]"

Draft Condition 3.3.25
Comment: Draft Condition 3.3.25 states that the "total enclosure" required by Draft Condition 3.3.23 shall comply with Method 204 for a "permanent total enclosure." Norbord requests that this draft condition be revised to concur with 40 CFR Part 63 Subpart DDDDD (Plywood and Composite Wood Products (PCWP) NESHAP) in that the promulgated standard of the PCWP NESHAP noted that Method 204 is difficult to use on batch presses. Norbord suggested that the tracer gas method and all alternatives to testing such as proper design of the enclosure be considered. A general statement such as "the Permittee will follow the requirements of 40 CFR Part 63 Subpart DDDD (Plywood and Composite Wood Products NESHAP) in regards to construction, maintenance, and if required testing of a wood products enclosure" be used since supplements to the rule could further alter the requirements of an enclosure. Please note that the tracer gas method and proper design to avoid testing requirements are part of the promulgated standard.
Response: The Division agrees to make the changes requested. The condition will now read: "The *wood products enclosure* required by Condition 3.3.23 shall comply with criteria listed in 40 CFR Part 63 Subpart DDDD ""National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products," for the construction, maintenance, and (if required) testing of a wood products enclosure. This requires that it be a permanently installed containment that was designed to meet the following physical design criteria (or alternative methods such as tracer gas):
[40 CFR 52.21 and 40 CFR 63.2292]"

a. Any natural draft opening shall be at least four equivalent opening diameters from each HAP-emitting point, except for where board enters and exits the enclosure, unless otherwise specified by the EPA Administrator.

b. The total area of all natural draft openings shall not exceed 5 percent of the surface area of the enclosure's four walls, floor, and ceiling.

c. The average facial velocity of air through all natural draft openings shall be at least 3,600 meters per hour (200 feet per minute). The direction of airflow through all natural draft openings shall be into the enclosure.

d. All access doors and windows whose areas are not included in item 2 of this definition and are not included in the calculation of facial velocity in item 3 of this definition shall be

closed during routine operation of the process.

e. The enclosure is designed and maintained to capture all emissions for discharge through a control device.

Draft Condition Nos. 3.3.26, 3.3.28, 3.3.30, and 3.3.32
Comment: These draft conditions specify the allowable particulate matter emission rate of 1.89 lb/hr. Norbord states that a review of the permit application shows that the limit for particulate matter should be 1.0 lb/hr for the resinated fines baghouse, un-resinated fines baghouse, finishing line operation baghouse and the wet strand fines baghouse.
Response: Because the emission limit in the draft permit is what was found in the application, EPD requested that Norbord identify where these requested limit could be found in their application. They responded that it could found be in Section 9 - Emission Data of the application forms, Table 6 of the BACT Analysis. "Summary of Emissions in Title V Application forms." Class I Analysis. Appendix C. That being the case, the Division agrees to make the change. The condition will now read: "The Permittee shall not discharge, or cause the discharge, into the atmosphere from the Wet Strand Fines (Source Codes GB05 and GB06) on a combined basis, any gases that contain **Particulate Matter** in excess of 1.0 lb/hr."

Draft Condition 3.3.33
Comment: This draft condition specifies the allowable volatile organic compound emission rate of 4.5 lb/hr. Norbord states that a review of the permit application shows that the limit for volatile organic compounds should be 8.9 lb/hr for the wet strand fines baghouse.
Response: Because the emission limit in the draft permit is what was found in the application, EPD requested that Norbord identify where these requested limit could be found in their application. They responded that it could found be in Section 9 - Emission Data of the application forms, Table 6 of the BACT Analysis. "Summary of Emissions in Title V Application forms." Class I Analysis. Appendix C. That being the case, the Division agrees to make the change. The condition will now read: The Permittee shall not discharge, or cause the discharge, into the atmosphere from the Wet Strand Fines (Source Codes GB05 and GB06) on a combined basis, any gases that contain **Volatile Organic Compounds** in excess of 8.9 lb/hr."

Draft Condition 3.3.34
Comment: This draft condition specifies the allowable particulate matter emission rate of 2.1 lb/hr. Norbord states that the limit for particulate matter should be 1.6 lb/hr for the dry fuel storage baghouse.
Response: Because the emission limit in the draft permit is what was found in the application, EPD requested that Norbord identify where these requested limit could be found in their application. They responded that it could found be in Section 9 - Emission Data of the application forms, Table 6 of the BACT Analysis. "Summary of Emissions in Title V Application forms." Class I Analysis. Appendix C. That being the case, the Division agrees to make the change. The condition will now read: "The Permittee shall not discharge, or cause the discharge, into the atmosphere from the Dry Fuel Storage (Source Code DFS2), any gases that contain **Particulate Matter** in excess of 1.6 lb/hr."

Draft Condition 3.3.35
Comment: This draft condition specifies the allowable particulate matter emission rate of 0.26 lb/hr. Norbord states that the limit for particulate matter should be 0.5 lb/hr for the blowline baghouse.

Response: Because the emission limit in the draft permit is what was found in the application, EPD requested that Norbord identify where these requested limit could be found in their application. They responded that it could found be in Section 9 - Emission Data of the application forms, Table 6 of the BACT Analysis. "Summary of Emissions in Title V Application forms." Class I Analysis. Appendix C. That being the case, the Division agrees to make the change. The condition will now read: "The Permittee shall not discharge, or cause the discharge, into the atmosphere from the Blowline (Source Codes DB05, DB06, and HPW2) on a combined basis, any gases that contain **Particulate Matter** in excess of 0.5 lb/hr."

Draft Condition 4.1.3.m

Comment: Draft condition 4.1.3.m. references a NCASI Method as an alternative to measuring formaldehyde. Norbord asserts that the Division has provided the wrong name for the referenced NCASI Method. Norbord asserts that the proper NCASI Method name is "NCASI Method CI/WP-98.01 *Chilled Impinger Method for Use at Wood Products Mills Measure Formaldehyde, Methanol, and Phenol*."

Response: The Division agrees to make the change. The condition now reads: "EPA Method 316 in Appendix A of Part 63 shall be used for the determination of formaldehyde concentration. Alternatively, NCASI Method CI/WP-98.01 *Chilled Impinger Method for Use at Wood Products Mills to Measure Formaldehyde, Methanol, and Phenol*." may be used."

Draft Condition 4.1.3.n

Comment: Draft condition 4.1.3.n defines Method 204 as the method to be used for the verification of the enclosure around the board press/unloader (Source Code PRS2). As noted in comments for Draft condition numbers 3.3.23 to 3.3.24, Method 204 has proven to be inadequate for most batch processes. Norbord would prefer that the PCWP MACT standard be referenced instead so as to include all other alternatives.

Response: The Division agrees. The condition now reads: "Method 204, *Criteria and Verification of a Permanent or Temporary Total Enclosure*, shall be used for the verification of the enclosure around the Board Press/Unloader (Source Code PRS2). The alternative tracer gas method found in appendix A to 40 CFR part 63, subpart DDDD, which requires a minimum of three separate runs of at least 20 minutes each, may be used. If the alternative tracer gas method is used, the Permittee must sample the ambient air surrounding the enclosure, considering potential leak points, the direction of the release, and laminar flow characteristics in the area surrounding the enclosure. Samples should be collected from all sides of the enclosure, downstream in the prevailing room air-flow, and in the operating personnel occupancy areas. These samples shall be taken and analyzed in accordance with paragraph 8.6 of the Alternative Procedure to Determine Capture Efficiency From Enclosures Around Hot Presses in the Plywood and Composite Wood Products Industry Using Sulfur Hexafluoride Tracer Gas found in Subpart DDDD.

Draft Condition 4.1.3 – Last paragraph

Comment: Norbord requests the following changes: **Alternative test method or** Minor changes in methodology may be specified or approved by the Director or his designee when necessitated by process variables, changes in facility design, or improvement or corrections that, in his opinion, render those methods or procedures, or portions thereof, more reliable.

Response: The Division does not agree. The language used in the condition has been used in hundreds of permits and found to be satisfactory in allowing the flexibility that is authorized under the Clean Air Act. No change was made to this condition.

Draft Condition Nos. 4.2.3, 4.2.4 and 4.2.5

Comment 1: These draft conditions require Norbord to submit data from the stack testing event on the secondary voltage, quench chamber temperature, and water flow rate. Norbord asserts that operating ranges for the existing WESP have been established based on years of testing. They assume EPD will take a similar approach for the new WESP, but Norbord would like to express our concern that one test cannot adequately show a normal operating range over extended periods. Though the language in the permit condition does not specifically dictate how the operating range will be established, we feel it appropriate to convey that we feel the manufacturer's recommended operating range should also be taken into consideration.
Response 1: EPD notes that, per Norbord's request, Condition 5.2.13i has been removed; it had required monitoring the water flow rate. EPD agrees that the manufacturer's specifications for quench chamber temperature and voltage are relevant data that could be taken into account when setting ranges for these parameters, so that will be noted in these conditions. However, a discussion with EPD's in-house monitoring experts revealed that a parameter that is more useful that voltage, in monitoring a WESP, is total power. Therefore, the Permittee will be required to monitor both the secondary voltage and the secondary amperage, and then to determine the total power that is representative of good operation.

Condition 4.2.3 now reads: "During the performance tests specified in Condition 4.2.2 for PM emissions, the Permittee shall measure and record the secondary voltage and secondary amperage at least once per ten minutes and shall determine the total power range representative of good operation of the Wet Electrostatic Precipitator (WESP, Source Code WP02). The Permittee shall submit with the performance test report, for acceptance by the Division, the secondary voltage data and the secondary amperage date recorded during the performance test and the proposed total power range indicating good performance. If the Permittee made use of the manufacturer's recommendations in setting this range, those recommendations must also be submitted."

Condition 4.2.4 now reads: "During the performance tests specified in Condition 4.2.2 for PM emissions, the Permittee shall measure and record the temperature of the gas stream at the outlet of the quench chamber and shall determine the temperature range representative of good operation of the WESP (Source Code WP02). The Permittee shall submit with the performance test report, for acceptance by the Division, the temperature data recorded during the performance test and the selected temperature range indicating good performance. If the Permittee made use of the manufacturer's recommendations in setting this range, those recommendations must also be submitted."

Comment 2: Also if an opacity meter is required then the need to record WESP parameters is irrelevant. This appears to be in line with recent findings for other facilities required to have COMs.
Response 2: Because a CO CEMS is no longer being required, this argument is moot. No changes have been made to the permit based upon this comment.

Draft Condition Numbers 4.2.7, 6.1.7.c.xv
Comment: Draft condition 4.2.7 specifies the requirement that the Permittee determine the CO emissions rate in pound per hour that corresponds to a VOC emissions rate specified in draft condition 3.3.20 in order to identify a CO emissions rate that would be defined as an excursion of the VOC emissions rate specified in draft condition numbers 3.3.20 and 6.1.7.c. Norbord reminds the Division that CO emissions originate from the energy system and dryers, while VOC emissions originate primarily from the dryers. Theoretically, the energy system and dryers can put out various levels of CO and VOC, considering the temperature fluctuations, feed rates and

so forth, but there will not be a linear correlation. Therefore, establishing a CO level that corresponds to a VOC rate could grossly underestimate or overestimate emissions. Additionally, the RTOs will destroy CO and VOCs. Therefore, proper operation and maintenance of the RTOs should be more than adequate to ensure compliance with emission limits.
Response: Because EPD has agreed to remove the requirement for a CO CEMS, the continuous data that would allow the Permittee to comply with these conditions will not be available. Therefore, these conditions are removed

Draft Condition Numbers 4.2.10, 4.2.11, 4.2.12, and 4.2.13
Comment 1: These draft conditions specify the requirement for the Permittee to record data "at least once per ten minutes" during the performance test. Norbord suggests that this requirement be identical to that provided in the promulgated PCWP MACT standard (63.2260(k)). Basically, the firebox temperature must be recorded continuously during each 1-hour test run. The data is then reduced to 15-minute averages for the purposes of establishing a minimum firebox temperature. The minimum firebox temperature is then based on the average of the three lowest 15-minute firebox temperatures.
Response 1: EPD agrees. [Note that Conditions 4.2.12 and 4.2.13 have been removed, since they regarded testing if an RTO or RCO were used to control the board press; this is no longer an option.] Conditions 4.2.10 and 4.2.11 are changed to read, as follows:

4.2.10 During the performance tests specified in Condition 4.2.9 for VOC emissions from the Board Press/Unloader (Source Code PRS2) as controlled by Thermal Catalytic Oxidizer C202, when operating in catalytic mode, the Permittee shall measure and record the firebox temperature continuously during each 1-hour test run. The data must be reduced to 15-minute averages. The average of the three lowest 15-minute firebox temperatures shall then be set as the minimum firebox temperature. The Permittee shall submit, with the performance test report, the minimum firebox temperature and the firebox temperature data recorded during the performance test.
[391-3-1-.02(6)(b)1(i) and 40 CFR 52.21]

4.2.11 During the performance tests specified in Condition 4.2.9, for VOC emissions from the Board Press/Unloader (Source Code PRS2) as controlled by Thermal Catalytic Oxidizer C202, when operating in thermal mode, the Permittee shall measure and record the firebox temperature continuously during each 1-hour test run. The data must be reduced to 15-minute averages. The average of the three lowest 15-minute firebox temperatures shall then be set as the minimum firebox temperature. The Permittee shall submit, with the performance test report, the minimum firebox temperature and the firebox temperature data recorded during the performance test.
[391-3-1-.02(6)(b)1(i) and 40 CFR 52.21]

Comment 2: Draft condition numbers 4.2.11 and 4.2.12 specify the requirement for the Permittee to "determine the average inlet and outlet gas stream temperature for the recorded values." Norbord suggests that this requirement be identical to that provided in the promulgated PCWP MACT standard (63.2260(k)). Based on our experience and as provided in the standard, monitoring and recording the combustion chamber temperature is preferable for catalytic units.
Response 2: EPD agrees to replace the draft permit requirement with a requirement to record the firebox temperature of the catalytic control devices and to modify Condition 6.1.7c.xviii, which defines an excursion for the parameter. However, EPD has found that more than the temperature is necessary to assure that a catalytic device is operating as designed. Something must be monitored to assure that the catalyst continues to be active. Therefore, EPD is adding new Condition 4.2.12, as follows:

When operating the press TCO in catalytic mode, plant personnel shall remove one block every six-months to test the activity level of the catalyst block. Results of the analyses will be kept in a spreadsheet and reviewed to determine whether or not the catalyst is active within the designed operating range. If its activity level is insufficient (i.e., cannot achieve 90% destruction of VOCs), then the Permittee shall either increase the firebox temperature of the TCO to a level guaranteeing 90% destruction of VOCs, or remove the catalyst and convert operation to thermal mode. The Permittee may submit an action plan for approval, to address options regarding the reduction of the firebox temperature to normal operating conditions, such as replacing the catalyst or washouts. The first time that the facility begins to operate the TCO in thermal mode, testing as required in Condition 4.2.9 shall be conducted in the thermal mode, within 90 days.

Also, Condition 6.1.7d.1 is added, to require semiannual reporting of: "The results of each analysis of the catalyst activity of Thermal Catalytic Oxidizer C202, if it was determined that the catalyst was determined to be less active than necessary to achieve 90% destruction at the firebox temperature required and a description of any action taken to assure that 90% destruction of VOCs is taking place."

[Note that Norbord has explained their use of a TCO in a follow-up email: "If we knew the catalyst (say 6-month testing of block showed this) was beginning to deactivate (having some sort of problems) then it might be best from a compliance standpoint to operate in thermal mode. We had a similar situation at our Joanna facility and began operating in thermal mode when the catalyst deactivated. We later changed out the catalyst during a week long shutdown and began operating in catalytic mode again. So, the only time we would likely operate in thermal mode is if there was a question as to the state of the catalyst again which we will be testing every 6-months (regardless of whether or not that requirement is in the permit – company policy).]

Comment 3: Norbord has chosen to install on the press a TCO and as such Norbord requests that the conditions for an RTO and an RCO be removed (i.e., 4.2.10 and 4.2.11). In addition, draft conditions 4.2.12 and 4.2.13 specify the parameters to be monitored for a TCO, namely the inlet and outlet gas stream temperature. Norbord reminds the Division that with a catalyst in the thermal oxidizer (TO), one cannot test the TO in thermal mode as it would destroy the catalyst. Subsequently, one cannot arbitrarily switch between catalytic and thermal mode. We had previously discussed with EPD the likelihood of a requirement to notify EPD of when the TCO was switched from catalytic mode to thermal mode (or vice versa). Testing would be required within a certain time period to verify operating ranges and so forth.
Response 3: Because the facility has decided to install a Thermal Catalytic Oxidizer (TCO), Conditions 4.2.10 and 4.2.11 are removed. With regard to Conditions 4.2.12 and 4.2.13, the Division's original intent was that these conditions would give Norbord the necessary flexibility to operate the TCO in either catalytic or thermal mode, without a permit modification. The Division still believes that the draft conditions provide for the flexibility requested by Norbord, so the conditions are not changed as a result of this comment.

Draft Condition Numbers 4.2.15, 4.2.16, 4.2.17, 4.2.18, 4.2.19, and 4.2.20
Comment: These draft conditions specify the initial testing requirements for each baghouse (C203, C204, C205, C206, C207, and C208). Considering the sources controlled by the baghouses and potential emissions, Norbord feels only three baghouses, as per condition 4.1.3 (C203, C204 and C206 only), will have any appreciable emissions. As such, Norbord recommends only baghouses C203, C204 and C206 be tested.
Response: The Division does not take lightly the removal of proposed tests, so a minimal analysis was done regarding the required tests that are requested to be removed. The processes

controlled by Baghouses C205, C207, and C208 are, as follows, along with the pollutants that have limits and the proposed testing conditions:

The Finishing Line Operation (Source Codes L2SD and L2SS), controlled by Baghouse C205:
Particulate Matter
Volatile Organic Compounds

a. Performance tests for particulate matter to verify compliance with Condition 3.3.30.
b. Performance tests for volatile organic compounds to verify compliance with Condition 3.3.31.
c. Performance tests for opacity to verify compliance with Condition 3.3.13.

The Dry Fuel Storage Operation (Source Code DFS2), controlled by Baghouse C207:
Particulate Matter

a. Performance tests for particulate matter to verify compliance with Condition 3.3.34.
b. Performance tests for opacity to verify compliance with Condition 3.3.35.

the Blowline Operation (Source Codes DB05, DB06, and HPW2), controlled by Baghouse C208:
Particulate Matter

a. Performance tests for particulate matter to verify compliance with Condition 3.3.35.
b. Performance tests for opacity to verify compliance with Condition 3.3.13.

A further response from Norbord via email, Regarding C207 and C208, was that similar units "at our other mills are reported to have no [VOC] emissions. We have never officially tested these baghouses but have tested them internally with readings at or near zero for VOCs. The same can be said for C205. We reported VOC emissions from C207 and C205 in the application (lowest by far of all baghouses) to be conservative."

The Division agrees to remove the VOC testing requirements for the Finishing Line Operation (Source Codes L2SD and L2SS), controlled by Baghouse C205, the Dry Fuel Storage Operation (Source Code DFS2), controlled by Baghouse C207, and the Blowline Operation (Source Codes DB05, DB06, and HPW2), controlled by Baghouse C208. Given that the emissions are relatively insignificant, the PM testing requirements are also removed. However, the opacity testing requirements remain in place.

Draft Condition 4.2.21
Comment: Draft condition 4.2.21 specifies the frequency of testing for the board press/unloader (Source Code PRS2). Norbord asserts that the required frequency of testing is excessive. The most frequent testing we are currently required to do at any of our other facilities is every two-years. The most typical testing requirement is every five years. Norbord also attempted to find any EPD guidance documents that might reflect a similar requirement for testing frequency and could not locate such a document. Therefore, we propose testing occur every two years with an option of testing every five years when two consecutive tests indicate compliance with permit limits (which would replace 4.2.21 paragraphs a and b). Additionally, it should be noted that operation in thermal mode at the specified temperature should be more than enough to ensure proper VOC removal. Sampling of the catalyst, as required under the PCWP MACT, should also be more than enough to ensure the catalyst is in proper operating condition.
Response: The EPD has reviewed permits for similar facilities in Georgia and, after consultation with its in-house monitoring experts, decided that periodic VOC and PM tests need not be required. As the commenter suggests, operating the incineration device at the proper

temperature should be more than enough to ensure proper VOC removal in the thermal mode. That is also true in the catalytic mode, as long as catalyst sampling is done to assure catalyst activity. On the other hand, PM testing for this source is unwarranted because (1) the predicted emission rate is not very high and (2) periodic PM testing for similar sources has not been required by EPD

Draft Condition Numbers 5.2.10.a and 5.2.11
Comment: These draft conditions require the Permittee install and operate a NOx CEMS and perform the required quality assurance on the monitor. Norbord asserts that the requirements for a NOx CEMS are not necessary. Norbord asserts that in the cases we have reviewed, CEMS are typically requested for situations in which limits are known to be tight or close to the PSD thresholds for synthetic minor PSD sources (i.e. < 250 tpy). Due to its future size, the Cordele facility clearly is and will be a Major PSD source for most pollutants. Though obviously we cannot say for certain what our actual emissions will be until compliance testing is undertaken, we feel compliance can be shown by proper operation of the energy system and control devices. Please also note that modeling data indicated a significant cushion with the NAAQS.

Additionally, the NOx formed in the energy system is mainly fuel based and should remain relatively steady based on experience and discussions with the energy system vendor. Therefore, a CEM would not be useful for situations that are not close to the permit limit. Please also note that Subpart Db and Dc do not require a NOx CEM for wood-fired boilers. This is likely partially due to our aforementioned points.
Response: The EPD has reviewed Norbord's request and agrees that the great majority of NOx emissions from wood-firing equipment is due to fuel NOx, which is not practically within the control of Norbord. The other source of NOx is thermal NOx generated by the RTO. Since it is clear that the facility will only use as much auxiliary fuel in the RTO (natural gas) as necessary to destroy VOCs and CO, and this will tend to keep temperatures down as low as possible, the Division is removing the requirement for NOx CEMS.

Draft Condition Numbers 5.2.10.b and 5.2.12
Comment: These draft conditions require the Permittee install and operate a CO CEMS and perform the required quality assurance on the monitor. Norbord asserts that the requirements for a CO CEMS are not necessary. Norbord asserts that in the cases we have reviewed, CEMS are typically requested for situations in which limits are known to be tight or close to the PSD thresholds for synthetic minor PSD sources (i.e. < 250 tpy). Due to its future size, the Cordele facility clearly is and will be a Major PSD source for most pollutants. Though obviously we cannot say for certain what our actual emissions will be until compliance testing is undertaken, we feel compliance can be shown by proper operation of the energy system and control devices. Please also note that modeling data indicated a significant cushion with the NAAQS.

In regards to CO, the use of an RTO should assure CO emissions are controlled as CO will be burned along with the VOCs, as long as the minimum destruction temperature is maintained in the combustion chamber.
Response: Based on Norbord's comment, EPD did not agree to remove the requirement because it is the CO CEMS is most foolproof way of assuring that the facility is operating the combustion systems as efficiently as possible and that CO and VOC emissions are minimized.

However, Norbord, submitted another response to this on May 31, 2005, which included additional information and data to bolster Norbord's case that a CO CEMS would be superfluous in this situation. That documentation is found in its entirety at the end of this Final

Determination. The main arguments that Norbord made, and reasonably defended, were: 1) the RTO is properly designed to prevent leakage that might occur in older RTO units; 2) proper operating temperatures will maintain control efficiency; 3) compliance testing will be at worst-case conditions and will ensure compliance with emission limits and federal enforceability of these limits; 4) there are apparently no CO CEMs on PSD major wood products facilities with RTO control; and 5) Review of different regulations potentially applicable to wood-fired burners and/or the wood products industry lead us to conclude that a CO CEMS is not required. Norbord further commented in an email dated June 1, 2005 stating that the RTO vendor said that "CO destruction will/can occur at lower temperatures. So, we could theoretically be compliant with CO (with a CEM) and not have proper VOC destruction."

EPD has reviewed this information, as well as its own information regarding wood products facilities in Georgia, and determined that monitoring the RTO temperature is sufficient to assure that CO and VOC emissions are minimized by the RTO, as required by BACT. Conditions 5.2.10b and 5.2.12 have been removed from the permit and CAM for CO and VOCs from the Energy System, Dryer #5, and Dryer #6 is modified to reflect that there will not be a CO CEMS.

Draft Condition 5.2.10.c

Comment: This draft conditions requires the installation and operation of a COMS. Norbord indicates that a COMS may not work properly because the COMS will be measuring the opacity of a wet gas stream. Norbord also indicates that from previous U.S. EPA Applicability Determination Index Rulings, a COM is not required (under Subpart Db) based on determinations (i.e. Control Number 0300047 for COMs having to be installed downstream of wet scrubber. A general search for COM requirements on WESP/RTO combinations was not fruitful, but checking with a manufacturer of WESP/RTOs it was felt that there would be some problems in regards to water condensation and thus false opacity readings especially during cold weather.

Response: The Division agrees with Norbord that there are numerous U.S. EPA ADI Rulings regarding the use of a COMS in a saturated environment. The example ADI ruling (No. 0300047) regards 40 CFR 60 Subpart D Alternate Opacity Monitoring. The Division does not agree with the Permittee that this ADI Ruling provides a "blanket" alternative for all such occasions. Norbord must receive written EPA approval to utilize an alternative opacity monitoring protocol for the energy system/dryer combined stack. As of the date of this Final Determination, Norbord has not provided such written approval. Thus, this condition is not changed based on this comment.

Draft Condition 5.2.13

Comment: Norbord has chosen to install on the press a TCO and as such Norbord requests that the conditions for an RTO and an RCO be removed (i.e., draft condition numbers 5.2.13c, 5.2.13d).

Response: The Division agrees with this change.

Draft Condition Numbers 5.2.13.g, 5.2.13.h, 5.2.13.i, 6.1.7.c.xii, 6.1.7.c.xiii, 6.1.7.c.xiv

Comment: These draft conditions specify the monitoring parameters for WESP (Source CodeWP02). Norbord does not feel it is necessary to monitor both the quench chamber temperature and water flow rate. Both readings are interrelated since water flow affects the chamber temperature and the chamber temperature affects the water flow rate. Consequently, Norbord feels the most important of these readings is the quench chamber temperature.

Response: EPD agrees to remove Condition 5.2.13i, which had required monitoring the water flow rate at the mist flow pump of the WESP (Source Code WP02) and Condition 6.1.7c.xiv,

which defined an excursion for that parameter. In addition, Condition 4.2.5 is removed because it is moot. It had required that "During the performance tests specified in Condition 4.2.2 for PM emissions, the Permittee shall measure and record the water flow rate at the mist flow pump and shall determine the water flow rate range representative of good operation of the WESP."

Draft Condition 5.2.14.c
Comment: This draft condition requires the Permittee to monitor the gas stream velocity pressure in the total enclosure duct before the inlet of the oxidizer system with Source Code C202 fan. Norbord proposes that the requirements of the promulgated PCWP MACT standard be followed. The requirement to monitor "gas stream velocity pressure" is not consistent with the standard and aforementioned requirements for an enclosure appear to be more than adequate to ensure capture of emissions.
Response: According to EPD's Monitoring Program, design criteria are not, of themselves, sufficient to assure proper performance. Some sort of monitoring is necessary. The company added in a subsequent email: "The PCWP MACT requires that once the enclosure is tested and passes then it must be maintained in its current state (structurally). I propose an inspection of the enclosure (not sure how often). Maybe something along the lines of: checking for damage, all sections/panels in place. Initial pictures of the sides of the enclosure could be maintained in the file for inspection/compliance purposes. One can also visually check for leaks. You can actually see (looks like smoke) emissions that escape from an enclosure. Perhaps add a statement to check for visible emissions from non-permanent openings. There could be some steam release and so on from permanent openings so that's why I'm purposely excluding those areas."

The EPD believes that monitoring of this enclosure is required. The condition will be modified to allow the company to submit alternative monitoring for approval. The condition was proposed to be changed, Norbord followed up by stating that the flow will not change so drastically as to require monitoring very frequently. Norbord suggested once per shift was sufficient. This is acceptable to the Division. the condition will now read: "The gas stream velocity pressure in the total enclosure duct before the inlet of the oxidizer system with Source Code C202 fan. The velocity pressure shall be measured in inches of water column using a pitot tube. Data shall be recorded once per week. Note: The Permittee may submit an alternative monitoring plan to the Division, which is designed to assure that the enclosure remains intact. If approved, it replaces this paragraph."

Draft Condition 6.1.7.a.i
Comment: This condition defines an excess emissions for the 40 CFR 60 Subpart Db opacity standard. Norbord wishes to indicate that periods of Startup, Shutdown and Malfunction are not considered excess emissions as per Subpart Db. However, these periods of time must still be reported.
Response: The Division agrees that, for purposes of compliance with 40 CFR 60 Subpart Db, periods of startup, shutdown, and malfunction are not subject. However, for purposes of compliance with the PSD opacity standard, periods of startup, shutdown, and malfunction are subject. The condition has not been changed in response to this comment.

Draft Condition Numbers 6.1.7.c.xvi, 6.1.7.c.xvii
Comment: Norbord has chosen to install and operate a TCO rather than an RTO or RCO. Thus these conditions can be deleted.
Response: The Division agrees that these changes should be made. Condition Numbers 6.1.7.c.xvi, 6.1.7.c.xvii are removed.

Draft Condition Numbers 5.2.20, 5.2.21, 6.1.7.c.xviii, 6.1.7.c.xix
Comment: These conditions define an excursion as any three-hour period during which .... Norbord would prefer to be consistent with language utilized in the PCWP MACT as follows: "Maintain the 3-hour block average firebox temperature above the minimum temperature established during the performance test." (Also, see condition 5.2.20 and 5.2.21)
Response: EPD agrees. Conditions **, 6.1.7.c.xviii, 6.1.7.c.xix are changed to:**

xviii Any three-hour block average outlet temperature for Thermal Catalytic Oxidizer C202 (if in the catalytic mode) that is below the minimum temperature established during the performance test required by Condition No. 4.2.9. For purposes of this condition, the Permittee does not need to account for any time period when the applicable process equipment is not in operation.

xix. Any three-hour block average firebox temperature for Thermal Catalytic Oxidizer C202 (if in the thermal mode) that is below the minimum temperature established during the performance test required by Condition No. 4.2.9. For purposes of this condition, the Permittee does not need to account for any time period when the applicable process equipment is not in operation.

Also, the "Averaging Period" for the Combustion Temperature of the RTO CAM plans in 5.2.20 and 5.2.21 will be changed to "Three-hour block average".

Draft Condition 6.1.7.c.xxi
Comment: The current requirement is for two consecutive determinations of visible emissions. This allows for immediate corrective action to occur without the need to report the situation and seems adequate for any baghouse.
Response: EPD agrees. The condition will now read "Any time that visible emissions from a baghouse is determined, in accordance with Condition 5.2.15, for two consecutive determinations.

Draft Condition Numbers 6.1.7.x, 6.1.7.c.xi, 6.1.7.c.xviii, 6.1.7.c.xix
Comment: Norbord would like to add language that reads similar to some of our other facilities (and a Georgia Pacific facility in Georgia) and reads as follows:

"The obligation to maintain temperatures or any other permit condition (such as opacity) is not required during periods when the dryer(s) and/or press are not operating or during previously scheduled startup and shutdown periods (including bakeouts and washouts), and Force Majeure events (including unavoidable malfunctions, which qualify as Force Majeure events). These startup and shutdown periods shall not exceed the minimum amount of time necessary for these events, and during these events, emissions shall be minimized to the greatest extent practicable." Please note that burnouts on the RTOs (or catalytic unit) will cause higher than usual opacity, and temperature variations outside of normal operating ranges are needed for these events, etc."
Response: EPD agrees with this request and the condition, as indicated in the comment, will be included in the permit as Condition 6.1.8.

Review of U.S. EPA Region IV Comments

Comment #1: We are unable to tell exactly how emissions estimates were made for nitrogen oxides (NO_x) emissions from the S201 dryer system exhaust. The estimated total hourly NO_x emissions rate is 78.4 lb/hr. This rate appears to be derived in part from an emission factor of 0.25 lb/MMBtu that we understand was supplied by a "vendor." We are not sure of the heat

input value to which this factor should be applied. If it is applied to the Wellons heat input of 285 MMBtu/hr, the resulting emissions rate is about 71.3 lb/hr, leaving a difference of 7.1 lb/hr. This difference may be due to operation of the regenerative thermal oxidizer (RTO). If so, NO_x emissions attributable to the dryer system RTO would appear to be lower than emissions from the press RTO (see below) even though we would expect the dryer system RTO to be larger than the press RTO based solely on the listed exhaust gas flow rates in the application.
Response from Norbord (attached to email sent 5/13/2005): The proposed limit of 78.4 lb/hour is 71.3 lb/hr plus a 10% safety factor (71.3 + 7.13 = 78.4).
EPD Response: The response from Norbord is sufficient. Note that, in response to a later comment from EPA, the limit has been changed to 0.25 lb/MMBtu.

Comment #2: The estimated hourly NO_x emissions rate for the S202 press exhaust is 20.4 lb/hr. We understand these emissions to be due entirely to operation of the RTO and to be based on "experience at other facilities." We request information on the specifics of experience elsewhere. We also ask whether consideration was given to the rate of NO_x emissions from the thermal oxidizer used to control emissions from the existing Norbord facility press.
Response from Norbord: They commented "Bottom line is we took worst-case NOx emissions for modeling purposes assuming there would be no permit limit to worry about anyway. Roughly, our TCO unit in Joanna and Lanett have NOx emissions around 5 lb/hr. In thermal mode we figure that will be around 10-20 lb/hr and thus our 20.4 lb/hr guesstimate. I guess we were being too honest but those locations are PSD minor so we keep up (internally) with these emissions. We don't have NOx limits by the way at these facilities so the testing is strictly internal policy to ensure compliance with all permit terms. Also, I don't think we have "official" NOx data for any of our presses but do have internal data."
EPD Response: The control device for the press is now determined to be a TCO that will operate in catalytic mode most of the time. The emissions during operation in the catalytic mode will be expected to be lower than the proposed 20.4 lb/hour BACT limit, because little thermal NOx will be generated at such low temperatures. Therefore, it appears that the initially proposed NOx limit is only relevant when the TCO is operating in the thermal mode. As indicated in the comment from Norbord, the NOx emissions from presses controlled by TCOs ,at two of their other facilities, is around 5 lb/hour. In a further comment made on 6/1/2005, they stated that the TCOs in those facilities were "much smaller…maybe 1/2 the size or smaller." Therefore, the emissions from the Norbord press, with the TCO in catalytic mode, would be expected to be over 10 lb/hour in catalytic mode. EPD therefore will include a BACT limit for the press, when the TCO is in catalytic mode. Norbord stated that 15 lb/hour is an acceptable BACT limit, "…based on vendor guarantees with a margin of safety." EPD will therefore modify the permit to include this additional BACT limit. Given the little available data, and the reasonable expectation that the TCO will operate very little in thermal mode (due to the cost of natural gas, the NOx BACT limit for the press, with the TCO in thermal mode, will remain 20.4 lb/hour.

Comment #3: Further related to NO_x emissions from the press exhaust, the draft permit does not contain a limit for these emissions. We can understand not having a limit for emissions attributable only to a control device when such emissions are very low, but a NO_x emissions rate of 20.4 lb/hr (equivalent to about 90 tons per year) is not trivial. We request that GEPD give further consideration to establishing a NO_x emissions limit for the press.
Response from Norbord: Norbord pointed out, in an email dated 5/16/2005, that nitrogen-containing compounds (emissions from resins) are to be combusted in the TCO, approximately doubling NOx emissions from the modification. Norbord included NOx emissions from the press in the application package to ensure that the model for NOx emissions is conservative. Norbord is aware that some OSB facilities still ignore NOx emissions from the press when

considering plantwide limits. Norbord does not believe a NOx limit is warranted considering that the analysis performed was under worst-case emissions.
EPD Response: It would appear that NOx emissions from this source will be mainly due to combustion of nitrogen-containing resins and from thermal NOx generated by the TCO. The Division agrees with Norbord that NOx emissions from OSB presses are not considered in most permit reviews. The Division is unaware of any facility that does anything to minimize NOx emissions from volatile resins being incinerated. However, because the incineration is by a TCO that will usually be operated in catalytic mode, the relatively low combustion temperature will minimize thermal NOx. Therefore, it appears to EPD to be superfluous as to whether NOx emissions from this source are monitored. However, as indicated by Region 4, the emission rate is rather high, so it seems reasonable to limit NOx emissions requirement it to be tested. If testing reveals that emissions are higher than expected, monitoring will be addressed again. Condition 3.3.23 is added:

3.3.23 The Permittee shall not discharge, or cause the discharge, into the atmosphere from the Board Press/Unloader (Source Code PRS2), any gases that contain **Nitrogen Oxides** in excess of 20.4 lb/hr.

Comment #4: Norbord currently operates a dryer system and a press at the Cordele OSB mill. If not already done, we recommend that GEPD make a comparison between emissions from these existing units and the comparable units in the proposed new production process. Wherever emissions from existing units are less than emissions from comparable proposed units, this difference should be explained. In general, emissions from new units should be no higher than demonstrated emissions from comparable existing units at the same facility unless a valid explanation can be provided.
Response from Norbord (attached to email sent 5/13/2005): In the instance of the dryers, the only increase over current limits is the NOx limit. This is partially due to increased capacity and the addition of two RTOs. I'm not sure if the EPA is aware that the current system has no RTO control. As such, assuming a NOx emission rate of 30 lb/hr (existing dryers limit) for the current system and an increase of that emission rate of about 1.5 times the emission rate (due to overall increased capacity) at this point would be 45 lb/hr. Using the guaranteed exit NOx concentration from the RTO vendor of 15 ppm and a flow of 162,910 dscfm this equates to 17.5 lb/hr from the RTOs themselves. This equates to approximately 62.5 lb/hr compared to a proposed limit for the new system of 78.5 lbs/hr (i.e. 71.3 lbs/hr + a safety factor of 10%). There will also be a total of two burners in the energy system with an overall vendor guarantee of 36.1 lb/hr per burner (or 72.2 lb/hr from the awarded proposal). The emissions figures given in the application were from general vendor guarantees (0.25 lb/MMBtu at 285 MMBtu/hr), of course, and no doubt take into consideration other factors we are not considering. As such, we feel the current limit is appropriate, and the demonstration shown above is to merely illustrate that the limit is justified.

In regards to the Press RTO/TCO, quite simply the increase is due to production capacity and the method in which VOCs were calculated. Specifically, the requirement in the current operating permit is to measure VOCs by Method 25A as carbon including formaldehyde. Norbord has begun using a guidance document provided by the State of Oregon (and accepted in several states Norbord operates in) to conservatively approximate VOC emissions. As such, we determined uncontrolled emission from the press would be approximately 550 tpy (By Method 25A). Beginning with the calculation: 168 tpy VOCs as Carbon and 32 tpy of Formaldehyde as carbon. Converting these figures to VOC "as VOC" as per the Oregon Method, VOCs as propane = 205 tpy; Formaldehyde as Formaldehyde = 80 tpy and Methanol as Methanol is approximated to be around 80 tpy for a total of 365 tpy uncontrolled. Taking into consideration

the production increase of approximately 1.5 times the total uncontrolled emission are 550 tpy. At 90% control this equates to 55 tpy vs a proposed limit of 50 tpy.
EPD Response: EPD finds Norbord's response to EPA's comment to be satisfactory and complete. No change is made to the permit.

Comment #5: The cost analysis in the permit application for control of press particulate matter emissions using a baghouse includes a purchased equipment cost based on costs "originally estimated in third quarter 1986 dollars ... scaled to first quarter 2000 dollars." In other words, the purchased equipment cost does not appear to be based on current equipment information. The procedure used may provide a reasonable estimate, but we want to make sure that GEPD agrees with the results of this procedure.
Response from Norbord (in email sent 5/27/2005): That was an artifact from an old BACT analysis. The baghouse costs are based on 2004 vendor data, and I believe there is a note stating the use of 2004 data in the BACT analysis.
EPD Response: EPD finds Norbord's explanation acceptable. No change is made to the permit.
Comment #6: Most of the emissions limits in the draft permit for the energy system and wood flake dryers are pounds per hour limits. Please consider whether additional limits in pounds per million Btu heat input or pounds per ton of material processed might also be appropriate.
Response from Norbord (attached to email sent 5/13/2005 – as corrected in email dated 5/31/2005):
lb/MMBtu or lb/ODT factor for each pollutant:
PM – 28.5 lb/hr or 0.55 lb/ODT
VOC – 59.8 lb/hr or 1.2 lb/ODT
NOx – 78.4 lb/hr or 0.28 lb/MMBtu
CO – 78.4 lb/hr or 0.28 lb/MMBtu
EPD Response: EPD agrees with EPA and believes that lb/MMBtu and lb/ODT limits are more appropriate than lb/hour limits, for BACT limits. Therefore, EPD will replace the lb/hour limits with lb/MMBtu and lb/ODT limits.

Comment #7: Most of the emissions limits in the draft permit for the press are pounds per hour limits. Please consider whether additional limits in pounds per thousand square feet (3/8 inch equivalent) might also be appropriate.
Response from Norbord (attached to email sent 5/13/2005): Establishing both a pounds per hour limit and a pounds per thousand square feet limit for a press operation would be unusual especially for VOCs. Most press operations will have a pounds per hour limit and possibly a removal efficiency notation (i.e. 90%). As has been stated before, we will be testing as close to capacity as possible (including a 90% removal demonstration at least in terms of the PCWP MACT) so the need to stipulate an additional production-based limit is not warranted in our opinion. Norbord further commented, in an email on 5/27/05: We also noticed there are no mills in the RBLC database that have lb/MSF limits. All have lb/hr and/or removal efficiency requirements. We just don't want to be held to something nobody else has to do especially since BACT is set on lb/hr. We are effectively/potentially decreasing our BACT limit by going with a lb/MSF if are not 100% capacity during compliance testing. We understand EPA's concern that we could test at a lower capacity and be under a lb/hr limit so that's why I suggested the removal efficiency in conjunction with lb/hr.
EPD Response: The Division has reviewed the information in the RBLC and found no press operation emission limits that were set in terms of board-feet produced. Therefore, even though it appears more appropriate that BACT limits be set in terms of board-feet produced, EPD has determined that the limits can remain in terms of pounds per hour. No change is made to the permit.

Comment #8: In the preliminary determination discussion concerning the technical feasibility of selective non-catalytic reduction (SNCR) control of nitrogen oxides emissions from the drying system, EPD states that "the control efficiency which is achievable is not high enough to justify requiring [SNCR] as BACT" and then concurs with the applicant "that the use of SNCR is not technically feasible in this instance." Concluding that a control technology has low efficiency is not the same as concluding that it is technically infeasible. Furthermore, GEPD includes a memo documenting a telephone conversation with Wellons indicating that SNCR is a technically feasible control technology. Rather than concluding that SNCR is not technically feasible, we recommend that the final determination for this project contain an explanation to the effect that SNCR is marginally feasible from a technical standpoint but was not selected as BACT for reasons that include technical difficulties and expected low control efficiencies that would lead to a high cost effectiveness value.
Response: EPD agrees fully with this assessment. No change is made to the permit.

Comment #9: EPD acknowledges modeled violations of the national ambient air quality standards for particulate matter (violations to which Norbord is not a significant contributor) and indicates that a further investigation of the modeled violations will be conducted. Please advise us of the findings from this further investigation.
Response: EPD is investigating this and believes that the problem is in bad data from another source, and that there is not a violation. EPD will inform EPA as soon as this investigation is concluded.

Other Changes:

The middle paragraph of Section 1.3 was modified because the originally requested options of using an RTO or an RCO for the dryers have been eliminated because the company is now sure that they will use a thermal catalytic oxidizer (TCO) system (capable of operating in either the thermal mode or catalytic mode). That part of Section 1.3 now reads:

Emissions from the board press are controlled by a thermal catalytic oxidizer (TCO) system (capable of operating in either the thermal mode or catalytic mode). Emissions from the mat forming and trimming operations are controlled by baghouses.

Table 3.1.1: The control device for the press had been designated as an "Oxidizer System" and a note below indicated that "Oxidizer System = Regenerative Catalytic Oxidizer, Regenerative Thermal Oxidizer, or Thermal Catalytic Oxidizer". Since the decision has been made to use a TCO, the note has been removed.

Carbon Monoxide – Norbord CEM Write-up submitted 5/31/2005

In regards to my (Phil Towles) discussion with Richard Taylor (Georgia EPD) and a carbon monoxide (CO) CEM, Norbord has prepared this write-up to further explain our position and opinion of why we feel a CO CEM is not warranted. As per my conversation with Richard Taylor, EPD is concerned that monitoring the firebox temperature in the RTOs is perhaps not sufficient enough to ensure proper CO destruction. Based on this discussion, Norbord reviewed several aspects pertaining to this issue and results of this review are presented below.

Norbord believes a CO CEM would not be necessary based on the fact that 1) the RTO is properly designed to prevent leakage that might occur in older RTO units; 2) proper operating temperatures will maintain control efficiency; 3) compliance testing will be at worst-case conditions and will ensure compliance with emission limits and federal enforceability of these limits; 4) there are apparently no CO

CEMs on PSD major wood products facilities with RTO control; and 5) Review of different regulations potentially applicable to wood-fired burners and/or the wood products industry lead us to conclude that a CO CEMS is not required.

RTO Operation:

Norbord contacted Megtec, the company providing the RTO units for the project, and researched as time permitted any known RTO malfunctions that could occur to allow higher CO emissions even at established firebox temperatures.

Norbord spoke with Megtec and discussed potential scenarios in which elevated CO emissions could occur in an RTO exhaust while maintaining established firebox temperatures. It was the Megtec's opinion that CO destruction would occur regardless as long as temperatures were maintained in the firebox area since RTOs are oxidizer units and do not rely on catalysts (firebox chamber is designed for proper residence time). As per Megtec, the only scenario in which proper CO destruction might not occur would be if valve leakage were to take place, which could not happen in the proposed RTO. According to Megtec, valve leakage can happen in older RTO units (sometimes just the design) and will be cause for some units to have to be operated at higher temperatures. Please note, that higher temperatures are needed to reduce further the CO in the RTO firebox to make up for leakage. This problem, however, has been overcome with more modern equipment. See quotes from Megtec proposal below:

- "Flow is directed through the unit by a single valve such where one column is in a gas-heating (inlet) mode and the other column is in a gas-cooling (outlet) mode. The single switch valve incorporates a sealing system to ensure no bypass or leakage of process gas to clean exhaust gas."

- "VOC-laden air enters the oxidizer through the inlet manifold and is fed into the base of column A, where it passes vertically up through ceramic heat exchange media and is preheated almost to the combustion chamber temperature. The burner in the combustion chamber raises the air temperature to the operating set point where the oxidation process, which started in the ceramic media, is completed. Hot purified air then enters column B and passes vertically down through the ceramic media and is cooled before being exhausted to atmosphere."

From our understanding, valve leakage in older units is typically due to high pressure drop within the RTO, sometimes caused by buildup in the heat exchange media, allowing some inlet gases to escape to the exhaust portion of an RTO unit. As documented by multiple vendors and studies, another detriment of media buildup is the loss of thermal efficiency and pluggage, causing the need for higher gas usage to maintain oxidizer temperatures and more demand on the RTO fan(s) requiring more power. Neither of these, however, will affect CO destruction as long as the firebox temperatures are maintained since again all gases are being directed to the firebox chamber.

Upstream Processes Operation, generating CO

What about the actual sources of CO? Could there be unusual influxes of CO into the RTOs? CO will be generated in the energy system and dryers and possibly to a much lesser extent the RTOs themselves (burning natural gas). The highest CO concentration should occur at maximum operating conditions, including fuel usage, dryer throughput and temperatures. Of course, this situation will be the conditions under which stack testing will occur and is more than the sufficient to ascertain the ongoing compliance of the unit since the firebox temperature will

be set based on compliance testing. In older type energy system/rotary dryer system, rotary dryers are triple pass units, which require high inlet temperatures (typically 1100° to 1400°F) to achieve the required flake dryness. The higher the inlet temperature, the higher the CO generation potential in the dryer(s). At Cordele, Norbord will install 2 single pass rotary dryers, which require lower inlet temperature (typically 850°F) than triple-pass dryers. This intrinsic design feature will in itself minimize any potential for CO generation in the dryer and consequently unusual influxes of CO into the RTOs.

CO CEMS in the context of NSR/PSD

To reiterate our previous comments, the only CO CEMs that we are aware of on OSB facilities are PSD minor facilities that are near the 250 tpy threshold. We understand the need for CO CEMs in these cases where operating conditions and a significant limit are close. The Norbord facility is of course already PSD major, and inlet and outlet calculations are based on guaranteed maximum CO concentrations and guaranteed removal efficiencies. Please also note that modeling data indicated a significant cushion with the NAAQS so there is also no concern in this case.

RBLC Search

Norbord also conducted a RBLC database search for CO CEMs at wood products facilities. The only one found to have a CO CEM in the database is Potlatch Lumber Mill in Arkansas for a wood-fired boiler. The CO CEM is required because CO is not controlled.

During the BACT analysis process, Norbord also reviewed permits of wood products facilities in various states. Of the permits reviewed, Norbord could find no instance in which a PSD major source with RTO control had a CO CEM.

Norbord also reviewed PSD major sources in Georgia that could potentially be considered with or compared to the wood products category and found two sources that have wood-fired boilers (capable of burning other wastes as well):

Temple Inland in Rome (Permit 10/13/2004) - burns wood waste among many other wastes and it appears the only requirement for CO is staged combustion and good combustion practices (no CEM). No requirement for a RTO

Interstate Paper LLC (July 19, 2004) – Wood fired boiler (mixed fuel) no CEM, no RTO.

Norbord found that CEMs are not typically required on wood-fired boilers so it is not surprising to discover the lack of CEM requirements for the two aforementioned facilities even with high CO emissions.

CO CEMS in the Context of NSPS Subpart D

NSPS Subparts Db and Dc are often applicable to wood-fired boilers. Even though NSPS might not be applicable here, we believe its monitoring requirements can be looked at on a comparative basis. The main monitoring requirements of NSPS Subpart Db and Dc, applicable to wood combustion, are for opacity (COMS) and fuel usage. Initial stack testing is required for PM. There are no CO CEMS requirements, nor CO limits.

Additionally, a revised NSPS Subpart D has been proposed by EPA and CO CEMS are still not required.

NSPS Subpart D is typically applicable to wood-fired boilers with no additional gaseous pollutant control equipment. At Cordele, due to the combination with rotary dryers, a RTO system will be installed and ensure better control of gaseous pollutants than that of a NSPS-only controlled source.

CO CEMS in the Context of PCWP MACT (Subpart DDDD)

Although the PCWP MACT regulation applies to HAPs control, this recently promulgated MACT regulation does not contain any requirement for CO CEMS. The PCWP MACT rule will be applicable to this source and only requires the monitoring of the firebox temperature so one would assume that the EPA found that the firebox temperature monitoring was more than adequate to ensure compliance.

CO Properties

Literature indicates that the CO auto-ignition temperature is about 1100°F to 1200°F. We anticipate that the RTO will be operated at temperature well above 1200°F, probably closer to 1500°F.

APPENDIX A

FINAL PSD PERMIT

APPENDIX B

COMMENTS ON DRAFT PERMIT