

Prevention of Significant Air Quality Deterioration Review

Preliminary Determination

February 2012

Facility Name: Simpson Lumber Company, LLC Meldrim Operations

City: Meldrim

County: Effingham

AIRS Number: 04-13-103-00004

Application Number: 20735

Date Application Received: October 14, 2011

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 Simpson Lumber Company, LLC Meldrim Operations (Simpson Lumber) for a permit to install a new batch lumber kiln and convert an existing kiln from batch to continuous operation. The proposed project will convert Kiln 3 from batch to continuous operation, which will increase the drying capacity of Kiln 3 from 42.0 million board feet per year to 65.0 million board feet per year, and construct a new direct-fired batch lumber drying kiln (Kiln 4) with a capacity of 73.0 million board feet per year.

The proposed project will result in an increase in emissions from the facility. The sources of these increases in emissions include the existing Planer Mill (including the Planer Mill Trim Block Chipper Cyclone and the Planer Mill Shavings Cyclone) and the existing Fuel Silo (including the Planer Shavings Truck Bin Baghouse and the Fuel Silo Cyclone).

The modification of Simpson Lumber due to this project will result in an emissions increase in PM, PM₁₀, PM_{2.5}, NO_x, SO₂, VOC, and CO. 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 VOC emissions increase was above the PSD significant level threshold.

Simpson Lumber is located in Effingham County, which is classified as “attainment” or “unclassifiable” for SO₂, PM_{2.5} and PM₁₀, NO_x, CO, and ozone.

The EPD review of the data submitted by Simpson Lumber 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 VOC, 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 surrounding the facility or in Class I areas located within 200 km of the facility. 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 should be issued to Simpson Lumber for the modifications necessary to install a new continuous lumber kiln and convert an existing kiln from batch to continuous operation. Various conditions have been incorporated into the current 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 March 1, 2011, Simpson Lumber Company, LLC Meldrim Operations (hereafter Simpson Lumber) submitted an application (logged in as Application No. 20293) which included the conversion of exiting batch Kiln 3 to continuous operation (maximum production of 96 million board feet per year) and the construction of new continuous Kiln 4 (maximum production of 126 million board feet per year). The proposal, however, changed, which is reflected in a new application submitted October 14, 2011. The new application, which was logged in as Application 20735, is for the conversion of Kiln 3 to continuous operation (maximum production of 65 million board feet per year) and the construction of a new batch Kiln 4 (maximum production of 73 million board feet per year). The original application (App. No. 20293) was closed out. The facility is located at 911 Old River Road in Meldrim, Effingham 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 | ✓ | | | ✓ |
| PM ₁₀ | ✓ | | | ✓ |
| SO ₂ | ✓ | | | ✓ |
| VOC | ✓ | ✓ | | |
| NO _x | ✓ | | | ✓ |
| CO | ✓ | | | ✓ |
| TRS | ✓ | | | ✓ |
| H ₂ S | ✓ | | | ✓ |
| Individual HAP | ✓ | ✓ | | |
| Total HAPs | ✓ | ✓ | | |

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 |
|--|---------------------------------|-------------------------------|
| 2421-103-0004-V-04-0 | December 21, 2010 | Second Title V Renewal Permit |

The net increases for Kiln 3 that will result by implementing the proposal were calculated by subtracting the baseline Kiln 3 actual emissions (based upon the annual average emissions from 2004-2005) from the future projected actual emissions of the Kiln 3 and associated emission increases from non-modified equipment. The definition of baseline actual emissions is the average emission rate, in tons per year, at which the emission unit actually emitted the pollutant during any consecutive 24-month period selected by the facility within the 10-year period immediately proceeding the date a complete permit application was received by EPD. For new emission units (Kiln 4), the net increase is the potential to emit for that equipment. Table 1-3, at the end of this section, details this emissions summary. The emissions calculations for Tables 1-3 and 1-4 can be found in detail in the facility's PSD application (see Appendix A of Application No. 20735). These calculations have been reviewed and approved by the Division.

Future Emissions – Kilns 3 and 4

Kiln 3 is projected to have a maximum production rate of 65,000 thousand board feet per year (mbf/yr), and Kiln 4 is projected to have maximum production rate of 73,000 mbf/yr. Kiln 3 will burn approximately 7,963 tons planer mill shavings per year, and Kiln 4 will burn approximately 12,775 tons per year planer mill shavings.

There is not an AP-42 section for lumber drying kilns. The best available emission factors for continuous direct-fired lumber kilns are based on tests conducted at Bibler Brother Lumber Company, Russellville, AR. The Bibler Brother data is for filterable PM only. This filterable PM emission factor is 0.068 lb/mbf. Condensable PM is based on unpublished data provided by the National Council for Air and Stream Improvement (NCASI). NCASI recommends a ratio of Condensable to Filterable PM of 1.016. The Condensable PM emission factor used in this review is therefore 0.069 lb/mbf. Filterable PM₁₀ is assumed to be 50% of filterable PM (based on Permit No. 2421-107-0011-V-02-3 issued to Rayonier Wood Products LLC-Swainsboro Sawmill). Filterable PM_{2.5} is assumed to be 87% of PM₁₀ based on AP-42 for wood combustion. All condensable PM is assumed to be PM₁₀ and PM_{2.5}. The resulting total PM, PM₁₀, and PM_{2.5} emission factors for the continuous kiln (Kiln 3) are, therefore, 0.138 lb/mbf, 0.104 lb/mbf, and 0.099 lb/mbf. The annual PM emission rate from Kiln 3 is therefore:

$$PM_{Kiln\ 3} = \frac{65,000\ mbf / yr \times 0.138\ lb / mbf}{2000\ lb / ton} = 4.49\ tons / yr$$

Similarly, PM₁₀ = 3.38 tons/yr and PM_{2.5} = 3.22 tons/yr.

The best available filterable PM emission factor is 0.32 lb/mbf (NCASI Environmental Resource Handbook for Wood Products Plants, Chapter 3, Table 3.3.1.1-1, Table 3.3.1.1-2, Table 3.3.1.1-3, and Table 3.3.1.2-1). The condensable PM emission factor, 0.087 lb/mbf, is based on unpublished data from NCASI. The same assumptions are made with regards to how much filterable PM is PM₁₀ and PM_{2.5}. The resulting total PM emission factors are 0.407 lb/mbf for PM, 0.247 lb/mbf for PM₁₀, and 0.226 lb/mbf for PM_{2.5}. The annual PM emission rate from Kiln 4 is therefore:

$$PM_{Kiln\ 4} = \frac{73,000\ mbf / yr \times 0.407\ lb / mbf}{2000\ lb / ton} = 14.86\ tons / yr$$

Similarly, PM₁₀ = 9.02 tons/yr and PM_{2.5} = 8.25 tons/yr.

The NCASI emission factor for NO_x emissions is 0.28 lb/mbf (NCASI Environmental Resource Handbook for Wood Products Plants, Chapter 3, Table 3.3.1.1-1, Table 3.3.1.1-2, and Table 3.3.1.1-3). The annual NO_x emission rate from Kiln 3 is therefore:

$$NOx_{Kiln\ 3} = \frac{65,000\ mbf / yr \times 0.28\ lb / mbf}{2000\ lb / ton} = 9.10\ tons / yr$$

For Kiln 4, NO_x = 10.22 tons/yr.

The NCASI emission factor for CO emissions is 0.67 lb/mbf (NCASI Environmental Resource Handbook for Wood Products Plants, Chapter 3, Table 3.3.1.1-1, Table 3.3.1.1-2, and Table 3.3.1.1-3). The annual CO emission rate from Kiln 3 is therefore:

$$CO_{Kiln\ 3} = \frac{65,000\ mbf / yr \times 0.67\ lb / mbf}{2000\ lb / ton} = 21.78\ tons / yr$$

For Kiln 4, CO = 24.46 tons/yr.

The VOC emission factor, 3.93 lb/mbf is based on data from NCASI Environmental Resource Handbook for Wood Products Plants, Chapter 3, Table 3.3.1.1-1, Table 3.3.1.1-2, and Table 3.3.1.1-3 converted from as carbon to as VOC. The annual VOC emission rate from Kiln 3 is therefore:

$$VOC_{Kiln3} = \frac{65,000 \text{ mbf} / \text{yr} \times 3.93 \text{ lb} / \text{mbf}}{2000 \text{ lb} / \text{ton}} = 127.73 \text{ tons} / \text{yr}$$

For Kiln 4, VOC = 143.45 tons/yr.

The SO₂ emission factor (from AP-42 Table 1.6-2 for Wood Residue Combustion) is 0.025 lb/MMBtu. The annual SO₂ emission rate from Kiln 3 is therefore:

$$SO2_{Kiln3} = \frac{7,963 \text{ tons} / \text{yr} \times 0.025 \text{ lb} / \text{MMBtu} \times 8500 \text{ Btu} / \text{lb}}{1,000,000 \text{ Btu} / \text{MMBtu}} = 1.69 \text{ tons} / \text{yr}$$

For Kiln 4, SO₂ = 2.71 tons/yr.

The Greenhouse Gas (GHG) emissions were calculated using the procedures published in 40 CFR 98 – *Mandatory Greenhouse Gas Reporting*, Subpart C – *General Stationary Fuel Combustion Sources*. Per Table C-1 to 40 CFR 98 Subpart C, the default high heat value for “wood and wood residuals” is 15.38 MMBtu/ton, and the default CO₂ emission factor is 93.80 kg /MMBtu. Per Table C-2 to 40 CFR 98 Subpart C, the default emission factors for “biomass fuels – solid” are 3.2 x 10⁻² kg/MMBtu for CH₄ and 4.2 x 10⁻³ kg/MMBtu for N₂O.

The emissions of CO₂ are calculated using Equation C-1 and the emissions of CH₄ and N₂O are calculated using Equation C-8. For Kiln 3:

$$CO_2 = 7,963 \frac{\text{tons}}{\text{yr}} \times 15.38 \frac{\text{MMBtu}}{\text{ton}} \times 93.80 \frac{\text{kg}}{\text{MMBtu}} \times 1.10231 \times 10^{-3} \frac{\text{ton}}{\text{kg}} = 12,663.1 \text{ tons} / \text{yr}$$

$$CH_4 = 7,963 \frac{\text{tons}}{\text{yr}} \times 15.38 \frac{\text{MMBtu}}{\text{ton}} \times 3.2 \times 10^{-2} \frac{\text{kg}}{\text{MMBtu}} \times 1.10231 \times 10^{-3} \frac{\text{ton}}{\text{kg}} = 4.3 \text{ tons} / \text{yr}$$

$$N_2O = 7,963 \frac{\text{tons}}{\text{yr}} \times 15.38 \frac{\text{MMBtu}}{\text{ton}} \times 4.2 \times 10^{-3} \frac{\text{kg}}{\text{MMBtu}} \times 1.10231 \times 10^{-3} \frac{\text{ton}}{\text{kg}} = 0.6 \text{ tons} / \text{yr}$$

The CO₂, CH₄, and N₂O emissions are converted to a CO₂ equivalent (CO₂e) basis by multiplying by the respective global warming potentials from 40 CFR 98 Subpart A, Table A-1. The global warming potential for CO₂ is 1, for CH₄ is 21, and for N₂O is 310. The total annual GHG emission rate from Kiln No. 3 is, therefore:

$$GHG = 12,663.1 \times 1 + 4.3 \times 21 + 0.6 \times 310 = 12,929.6 \text{ tons} / \text{yr}$$

For Kiln 4, CO₂ = 20,315.3 tons/yr; CH₄ = 6.9 tons/yr; and N₂O = 0.9 tons/yr; so GHG = 20,742.9 tons/yr CO₂e.

Past Emissions – Kiln 3

The past actual emissions from Kiln 3 are calculated the same way as the projected emissions except some inputs and emission factors are different. The annual production for Kiln 3 was 42,034 mbf/yr and the fuel usage was 7,356 tons/yr. The PM, PM₁₀, and PM_{2.5} emission factors are the same as for Kiln 4 future emissions. The VOC emission factor is 3.8 lb/mbf (NCASI Environmental Resource Handbook for Wood Products Plants, Chapter 3, Table 3.3.1.1-1, Table 3.3.1.1-2, Table 3.3.1.1-3, and Table 3.3.1.2-1). Note that the VOC emission factor is lower than the Division has used in the past for batch direct-fired kilns, so the past actual emissions may be underestimated. All of the other emission factors are identical to those used above. The resulting past actual emissions for Kiln 3 are: PM = 8.56 tons/yr; PM₁₀ = 5.20 tons/yr; and PM_{2.5} = 4.76 tons/yr; NO_x = 5.88 tons/yr; CO = 14.08 tons/yr; VOC = 80.40 tons/yr; SO₂ = 1.56 tons/yr; CO₂ = 11,697.8 tons/yr; CH₄ = 4.0 tons/yr; N₂O = 0.5 tons/yr; and GHG = 11,944.0 tons/yr CO₂e.

Future Emissions – Cyclones and Baghouse

The PM emission factors for the cyclones are based on “Emission Factor Wood Product” prepared by the Oregon Department of Environmental Quality. For a medium efficiency cyclone, the PM emission factor is 0.50 lb/ton. PM₁₀ is assumed to be 50% of PM (based on data from Oregon DEQ) and PM_{2.5} is 60% of PM₁₀ (based on AP-42, Appendix B.1, Section 10.5). The resulting emission factors are 0.25 lb/ton for PM₁₀ and 0.15 lb/ton for PM_{2.5}. The emission factor for PM emissions from the baghouse is 0.001 lb/ton (based on data from Oregon DEQ). All PM emissions from the baghouse are assumed to be PM₁₀ and PM_{2.5}. The projected material processed is 6,798 tons/yr for the Planer Mill Trim Block Chipper Cyclone; 44,178 tons/yr for the Planer Mill Shavings Cyclone; 39,918 tons/yr for the Fuel Silo Cyclone; and 50,977 tons/yr for the Planer Mill Truck Bin Baghouse. The PM emissions are calculated as follow for the Planer Mill Trim Block Chipper Cyclone:

$$PM = \frac{6,798 \text{ tons / yr} \times 0.5 \text{ lb / ton}}{2000 \text{ lb / ton}} = 1.7 \text{ tons / yr}$$

Similarly, for the Planer Mill Trim Block Chipper Cyclone, PM₁₀ = 0.8 tons/yr and PM_{2.5} = 0.5 tons/yr. For the Planer Mill Shavings Cyclone, PM = 11.0 tons/yr; PM₁₀ = 5.5 tons/yr; and PM_{2.5} = 3.3 tons/yr. For the Fuel Silo Cyclone, PM = 10.0 tons/yr; PM₁₀ = 5.0 tons/yr; and PM_{2.5} = 3.0 tons/yr. For the Planer Mill Truck Bin Baghouse, PM, PM₁₀, and PM_{2.5} = 0.025 tons/yr.

Past Emissions – Cyclones and Baghouse

The past emissions for the cyclones and baghouse are calculated identically to the future emissions except the production rates are: Planer Mill Trim Block Chipper Cyclone – 3,738 tons/yr; Planer Mill Shavings Cyclone – 24,292 tons/yr; Fuel Silo Cyclone – 22,068 tons/yr; and Planer Mill Truck Bin Baghouse – 28,030 tons/yr. The resulting past actual emissions are, for the Planer Mill Trim Block Chipper Cyclone, PM = 0.93 tons/yr; PM₁₀ = 0.47 tons/yr; and PM_{2.5} = 0.28 tons/yr. For the Planer Mill Shavings Cyclone, PM = 6.1 tons/yr; PM₁₀ = 3.0 tons/yr; and PM_{2.5} = 1.8 tons/yr. For the Fuel Silo Cyclone, PM = 5.5 tons/yr; PM₁₀ = 2.8 tons/yr; and PM_{2.5} = 1.7 tons/yr. For the Planer Mill Truck Bin Baghouse, PM, PM₁₀, and PM_{2.5} = 0.014 tons/yr.

Table 1-3: Net Change in Emissions Due to the Major PSD Modification

| Pollutant | Increase from Kilns 3 & 4 | | Associated Units Increase (tpy) | Total Increase (tpy) |
|-------------------|---------------------------|---------------|---------------------------------|----------------------|
| | Past Actual | Future Actual | | |
| PM | 8.6 | 19.3 | 10.2 | 21.0 |
| PM ₁₀ | 5.2 | 12.4 | 5.1 | 12.3 |
| PM _{2.5} | 4.8 | 11.5 | 3.1 | 9.8 |
| VOC | 80.5 | 271.2 | 0.0 | 190.7 |
| NO _x | 5.9 | 19.3 | 0.0 | 13.4 |
| CO | 14.1 | 46.2 | 0.0 | 32.1 |
| SO ₂ | 1.6 | 4.4 | 0.0 | 2.8 |
| GHG | 11,944.0 | 33,742.9 | 0.0 | 21,798.9 |

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 1-4 below:

Table 1-4: Emissions Increases from the Project

| Pollutant | Potential Emissions Increase (tpy) | PSD Significant Emission Rate (tpy) | Subject to PSD Review |
|-------------------|------------------------------------|-------------------------------------|-----------------------|
| PM | 21.0 | 25 | No |
| PM ₁₀ | 12.3 | 15 | No |
| PM _{2.5} | 9.8 | 10 | No |
| VOC | 186.9 | 40 | Yes |
| NO _x | 13.4 | 40 | No |
| CO | 32.1 | 100 | No |
| SO ₂ | 2.8 | 40 | No |
| TRS | 0 | 10 | No |
| Pb | 0 | 0.6 | No |
| Fluorides | 0 | 3 | No |
| H ₂ S | 0 | 10 | No |
| SAM | 0 | 7 | No |
| GHG | 24,007 | 75,000 | No |

Based on the information presented in Tables 1-4 and 1-3 above, Simpson Lumber's proposed modification, as specified per Georgia Air Quality Application No. 20735, is classified as a major modification under PSD because the potential VOC emissions increase exceeds 40 tons per year.

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

2.0 PROCESS DESCRIPTION

According to Application No. 20735, Simpson Lumber has proposed to convert Kiln 3 from batch to continuous operation and construct a new direct-fired batch lumber drying kiln (Kiln 4). Kiln 3 will be lengthened from 64 feet to 84 feet and converted to continuous operation. The modification of Kiln 3 will increase the capacity from 42 million board feet per year to approximately 65 million board feet per year. Kiln 4 will be 104 feet long and will have a maximum capacity of approximately 73 million board feet per year. The increased lumber drying capacity for the facility will result in more material processed through the Planer Mill and the Fuel Silo resulting in an increase in emissions from these units.

The Simpson Lumber permit application 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), Construction Permit, 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, saying 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, limits the opacity of visible emissions from any air contaminant source, which is subject to some other emission limitation under 391-3-1-.02(2). The opacity of visible emissions from regulated sources may not exceed 40 percent under this general visible emission standard. It is expected that the opacity of all emissions from the drying kilns, the planer mill, and the fuel silo will be well below 40% at all times.

Georgia Rule 391-3-1-.02(2)(e), Particulate Matter Emission from Manufacturing Processes, commonly known as the process weight rate rule, limits PM emissions from the kilns and other manufacturing processes. The Permittee may not discharge or cause the discharge into the atmosphere from each of the dry kilns, or any other process (e.g., planer mill), any gases that contain particulate matter in excess of the rate derived from one of the following equations:

- 1) The allowable PM emissions rate for input rates up to and including 30 tons per hour (TPH) is expressed by the following equation:

$E = 4.1P^{0.67}$, where E equals the allowable PM emission rate in pounds per hour (lb/hr) and P equals the process input weight in TPH.

- 2) The allowable PM emissions rate for input rates above 30 TPH is expressed by the following equation:

$E = 55P^{0.11} - 40$, where E equals the allowable PM emission rate in lb/hr and P equals the process input weight in TPH.

Georgia Rule 391-3-1-.02(2)(g), Sulfur Dioxide, applies to all “fuel burning” sources. The “fuel burning” sources are the lumber drying kilns. Rule (g) limits the fuel burned in these sources to no more than 2.5 percent sulfur by weight. Because these sources are waste wood-fired, they are expected to easily comply with Rule (g).

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 located 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 Georgia EPD considers, but is not legally bound to accept, EPA comments or guidance. 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; and
- Public notification of the proposed plant 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, which EPA reviews. The five steps of a top-down BACT review procedure specified by EPA in its 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; and
- 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.

New Source Performance Standards

No New Source Performance Standards (NSPS) are applicable to any of the equipment at this facility.

National Emissions Standards For Hazardous Air Pollutants

Subpart A (General Provisions) imposes generally applicable requirements for initial notifications, initial compliance testing, monitoring, and record keeping requirements.

Subpart DDDD (National Emission Standard for Hazardous Air Pollutants for Plywood and Composite Wood Products) regulates HAP emissions from Plywood and Composite Wood Products (PCWP) facilities that are major sources of HAPs. The PCWP MACT indicates that the MACT is applicable to sawmills with lumber kilns, which are major for HAPs. At this facility, the potential methanol emissions are over 10 tons per year, and potential total HAPs are more than 25 tons per year. The facility is, therefore, major for HAPs and the MACT is applicable. However, the provisions of 40 CFR 63, Subpart DDDD include no control requirements for lumber kilns.

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 Kilns 3 and 4 associated with the proposed project would most likely result from a malfunction of the kilns. The facility cannot anticipate or predict malfunctions. However, the facility is required to minimize emissions during periods of startup, shutdown, and malfunction.

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, along with the Title V application. A CAM Plan provides an 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 emissions levels exceed the major source thresholds under the Title V permitting program. Although other units may potentially be subject to CAM upon renewal of the Title V operating permit, such units are not being modified under the proposed project and need not be considered for CAM applicability at this time. Therefore, this applicability evaluation only addresses Kilns 3 and 4, which do not employ any air pollution control devices; therefore, the CAM requirements are not triggered by the proposed modification.

4.0 CONTROL TECHNOLOGY REVIEW

The proposed project will result in emissions that are significant for VOC and, therefore, trigger PSD review.

Kilns 3 and 4 - Background

Kilns 3 and 4 (Emission Unit ID Nos. 7000 and 8000) are direct-fired lumber kilns. Kiln 3 will be modified from a batch kiln to continuous operation. Kiln 4 will be a new batch kiln. For the continuous kiln, dimensional lumber will be loaded onto railcars and continuously pulled through the lumber kiln. For the batch kiln, dimensional lumber will be loaded on railcars that are rolled into the kiln. The moisture in the wood is reduced from approximately 50 percent to 19 percent.

Kilns 3 and 4 – VOC Emissions

Applicant's Proposal

Simpson Lumber identified seven potential VOC control methods: (1) carbon absorption, (2) regenerative thermal oxidation, (3) regenerative catalytic oxidation, (4) condensation, (5) biofiltration, (6) wet scrubbing, and (7) proper maintenance & operation.

Each potential control method is addressed as follows:

Carbon Adsorption

Per Section 4.5.1 of Application 20735, "The VOC-laden gases pass through the carbon bed and the VOCs are adsorbed on the activated carbon. The cleaned gas is discharged to the atmosphere. The spent carbon is regenerated either at an onsite regeneration facility or by an off-site activated carbon supplier. Steam is used to replace adsorbed organic compounds at high temperatures to regenerate the spent carbon." Per Section 4.6.1 of the application, "Carbon adsorption is not practical because of the high moisture content of the exhaust stream from the kilns. At high moisture content, water molecules begin to compete with the hydrocarbon molecules for activated adsorption sites." Carbon adsorption is, therefore, not a technically feasible technology for controlling VOC emissions from lumber kilns.

Regenerative Thermal Oxidation

Per Section 4.5.2 of Application 20735, "Regenerative Thermal Oxidizer (RTO) units use beds of ceramic pieces to recover and store heat. VOC-laden air passes through a heated ceramic bed before entering a combustion chamber. In the combustion chamber, the VOC-laden waste gas stream is heated by auxiliary fuel (natural gas) combustion to a final oxidation temperature typically between 1,400 degrees Fahrenheit (°F) to 1,500°F and maintained at this temperature to achieve maximum VOC destruction. The exhaust gases from the combustion chamber are used to heat another ceramic bed. Periodically, the flow is reversed so the bed that was being heated is now used to preheat the solvent-laden gas stream." Per Section 4.6.2 of the application, "Due to the high moisture content and low exit temperature in the exhaust stream, the RTO would be technologically infeasible." Regenerative thermal oxidation is, therefore, not a technically feasible technology for controlling VOC emissions from lumber kilns.

Regenerative Catalytic Oxidation

Per Section 4.5.3 of Application 20735, "Regenerative catalytic oxidizer (RCO) functions similar to RTO, except that the heat recovery beds in RCO contains catalytic media. The catalyst accelerates the rate of VOC oxidation and allows for VOC destruction at lower temperatures than in an RTO." Per Section 4.6.3 of the application, "Although regenerative catalytic oxidizers can operate at a lower temperature than thermal oxidizers, the temperature of the exit stream from the kiln is still not high enough for optimal function of the catalytic oxidizer. Furthermore, loss of catalytic activity occurs due to fouling by particulate matter or suppression or poisoning from other contaminants in the waste

gas stream. In order to effectively use catalytic oxidation, the contaminants must be removed from the waste gas stream. Removing these contaminants would require additional control equipment which adds greatly to the cost of the system.” Regenerative catalytic oxidation is, therefore, not a technically feasible technology for controlling VOC emissions from lumber kilns.

Condensation

Per Section 4.5.4 of Application 20735, “Condensation removes vaporous contaminants from the gas stream by cooling it and converting the vapor into a liquid. In some instances, control of VOC can be satisfactorily achieved entirely by condensation. However, most applications require additional control methods.” Per Section 4.6.4 of the application, “Condensation is only effective when the emissions can be cooled to a temperature where the vapor pressure of the emissions is less than the VOC concentration. To reduce the vapor pressure of terpenes, the primary constituent of lumber kiln emissions, the temperature would need to be reduced to -40 °F . At this temperature, the unit would plug up with ice from the water vapor.” Condensation is, therefore, not a technically feasible technology for controlling VOC emissions from lumber kilns.

Biofiltration

Per Section 4.5.5 of Application 20735, “Biofiltration is an air pollution control technology in which off-gases containing biodegradable organic compounds are vented, under controlled temperature and humidity through a special filter material containing microorganisms. As exhaust gases pass through the biofilter, VOC is absorbed on the filter material, and the microorganisms break down the compounds and transform them into CO₂ and H₂O with varying efficiency.” Per Section 4.6.5 of the application, “The most important variable affecting bioreactor operations is temperature. Most microorganisms can survive and flourish in a temperature range of 60 °F to 105 °F.” The temperature of the exhaust from the kilns is approximately 170 to 200 °F. (Note that the application incorrectly states that the exhaust temperature is 500 °F) Section 4.6.5 of the application continues, “Furthermore, the VOC emissions from the kilns are primarily terpenes. Terpenes are highly viscous and would foul the biofilter.” Biofiltration is, therefore, not a technically feasible technology for controlling VOC emissions from lumber kilns.

Wet Scrubbing

Per Section 4.5.6 of Application 20735, “Scrubbing of gas or vapor pollutants from a gas stream is usually accomplished in a packed column (or other type of column) where pollutants are absorbed by counter-current flow of a scrubbing liquid. A VOC gas stream with relatively high water solubility is required in order for the wet scrubber to be effective.” Per Section 4.6.6 of the application, “The VOC emissions from the kilns are primarily terpenes. Terpenes are not very soluble. Moreover, they are highly viscous and would foul the absorption media.” Wet Scrubbing is, therefore, not a technically feasible technology for controlling VOC emissions from lumber kilns.

Proper Maintenance & Operation

Per Section 4.5.7 of Application 20735, “Proper maintenance and operation of lumber drying kilns can effectively reduce VOC emissions. Proper drying schedule and temperature should be selected based on moisture content and manufacturer’s specifications. Routine maintenance should also be completed on all kilns based on manufacturer’s recommendations.” Proper maintenance and operation is a technically feasible technology for controlling VOC emissions from lumber kilns.

As indicated above, carbon adsorption, regenerative thermal oxidation, regenerative catalytic oxidation, condensation, biofiltration, and wet scrubbing were all eliminated because these technologies are not technically feasible for controlling VOC emission from lumber kilns and have not been demonstrated for use in controlling a lumber kiln. Proper maintenance and operation was identified as the only technically feasible control technology.

EPD Review – VOC Control

The Division reviewed all of the RBLC entries for VOC from lumber drying kilns since 2000 (see Table 4-1). This review showed that none of the entries require an add-on control device for VOC and that BACT is proper maintenance and operation.

Table 4-1: Summary of BACT Determinations for VOC from Lumber Drying Kilns (2000-2010)

| Facility Name | RBLC ID | Facility State | Permit Issuance Date | Limits | Control | Notes |
|--|---------|----------------|----------------------|-------------------------------|----------------------------------|------------------------|
| Chesterfield Lumber Company | SC-0050 | SC | 4/10/2000 | 353.5 lb/day 64.51 tons/yr | None Specified | 1 Indirect-Fired Kiln |
| Weyerhaeuser Company | MS-0054 | MS | 12/28/2000 | 4.2 lb/mbf 467.5 tons/yr | No Add On Controls Feasible | 5 Direct-Fired Kilns |
| Weyerhaeuser Company | MS-0054 | MS | 12/28/2000 | 4.2 lb/mbf 73.5 tons/yr | No Add On Controls Feasible | 1 Direct-Fired Kiln |
| Weyerhaeuser Company | MS-0054 | MS | 12/28/2000 | 11.46 lb/hr 47.5 tons/yr | No Controls Required | 4 Kilns |
| Potlatch – Ozan Unit | AR-0046 | AR | 3/8/2001 | 3.5 lb/mbf | None Specified | 1 Indirect-Fired Kiln |
| Charles Ingram Lumber Company | SC-0070 | SC | 8/15/2001 | 192.5 tons/yr | Work Practices | 1 Direct-Fired Kiln |
| International Paper Company Morton Lumber Mill | MS-0048 | MS | 9/5/2001 | 5.2 lb/mbf 137 tons/yr | None Specified | 3 Direct-Fired Kilns |
| International Paper Company Morton Lumber Mill | MS-0048 | MS | 9/5/2001 | 5.2 lb/mbf 78 tons/yr | None Specified | 1 Direct-Fired Kiln |
| Collum's Lumber Mill | SC-0059 | SC | 4/8/2002 | 195 tons/yr | None Specified | 2 Indirect-Fired Kilns |
| T.R. Miller Mill | AL-0225 | AL | 5/16/2002 | 6.78 lb/mbf | Good Engineering Practices | 1 Kiln |
| Leola Lumber Mill | AR-0064 | AR | 11/1/2002 | 423 lb/charge 88.2 tons/yr | None Specified | 1 Indirect-Fired Kiln |
| Georgia-Pacific Corp. – El Dorado Sawmill | AR-0062 | AR | 11/7/2002 | 5572 lb/charge 304 tons/yr | Proper Maintenance and Operation | 7 Indirect-Fired Kilns |
| West Fraser (South), Inc. – Huttig Mill | AR-0065 | AR | 11/7/2002 | 3.5 lb/mbf 91.9 lb/hr | None Specified | 1 Indirect-Fired Kiln |
| New South Lumber Company, Inc.- Camden Plant | SC-0082 | SC | 3/7/2003 | 4.2 lb/mbf | Work Practices | 5 Indirect-Fired Kilns |
| Albertville Sawmill | AL-0195 | AL | 6/4/2003 | 7 lb/mbf | Good Engineering Practices | 2 Indirect-Fired Kilns |
| Holden Wood Products Mill | LA-0187 | LA | 6/18/2003 | 89.15 lb/hr 89.8 tons/yr | None Specified | 2 Direct-Fired Kilns |
| Holden Wood Products Mill | LA-0187 | LA | 6/18/2003 | 66 lb/hr 59.69 tons/yr | None Specified | 3 Direct-Fired Kilns |
| New South Lumber Company, Inc.-Conway Plant | SC-0090 | SC | 9/5/2003 | 4.2 lb/mbf 363.7 tons/yr | Work Practices | 5 Kilns |
| Elliot Sawmilling Company | SC-0085 | SC | 5/23/2004 | 4.5 lb/mbf | Work Practices | 1 Direct-Fired Kiln |
| Joyce Mill | LA-0180 | LA | 7/19/2004 | 367.77 lb/hr 750 tons/yr | Proper Kiln Design and Operation | 4 Indirect-Fired Kilns |
| Temple-Inland Diboll Operations | TX-0483 | TX | 11/1/2004 | 30.6 lb/hr 85.35 tons/yr | None Specified | 4 Kilns |
| Waldo | AR-0080 | AR | 1/12/2005 | 3.5 lb/mbf | None Specified | 5 Indirect-Fired Kilns |

| Facility Name | RBLC ID | Facility State | Permit Issuance Date | Limits | Control | Notes |
|--------------------------------------|---------|----------------|----------------------|-------------------------------|---------------------------------------|---------------------------------|
| Coushatta Sawmill | LA-0181 | LA | 7/13/2005 | 28 lb/hr 122.6 tons/yr | None Specified | 1 Indirect-Fired Kiln |
| Potlatch Corporation – Ozan Unit | AR-0083 | AR | 7/26/2005 | 3.5 lb/mbf 119 lb/hr | Proper Operation | 4 Indirect-Fired Kilns |
| Skagit County Lumber Mill | WA-0327 | WA | 1/25/2006 | 54 T/YR | Computerized Steam Management System | 7 Kilns |
| Wright City Complex | OK-0113 | OK | 7/21/2006 | 4.8 lb/mbf | None Specified | 1 Kiln |
| Albertville Sawmill | AL-0235 | AL | 4/9/2008 | 7 lb/mbf | Daily and Monthly Kiln I/M Procedures | 2 Indirect-Fired Kilns |
| Bibler Brothers Lumber Company | AR-0101 | AR | 8/25/2008 | 3.8 lb/mbf 46.5 lb/hr/kiln | None Specified | 2 Continuous Direct-Fired Kilns |
| North Florida Lumber/Bristol Sawmill | FL-0315 | FL | 08/04/2009 | 116.93 tons/yr | Best operating practices | 1 Indirect-Fired Kiln |

Conclusion – VOC Control

For Kiln 3, which will be converted from a direct-fired batch kiln to a continuous kiln, a VOC emission limit of 3.83 lb/1,000 board feet lumber dried, based on proper maintenance and operation, is BACT. For Kiln 4, which will be a direct-fired batch kiln, a VOC emission limit of 3.93 lb/1,000 board feet lumber dried, based on proper maintenance and operation, is BACT. A review of VOC limits for lumber kilns in the RBLC (Table 4-1) shows that all direct-fired kilns have higher BACT emission limits than the limits proposed in this permit. The only limits in the RBLC are for indirect-fired kilns. The BACT selection for Kilns 3 and 4 is summarized below in Tables 4-2 and 4-3:

Table 4-2: BACT Summary for the Kiln 3 (continuous kiln)

| Pollutant | Control Technology | Proposed BACT Limit | Averaging Time | Compliance Determination Method |
|-----------|----------------------------------|---|----------------|---------------------------------|
| VOC | Proper maintenance and operation | 3.83 lb VOC/1,000 board feet lumber dried | Daily | Inspection program |

Table 4-3: BACT Summary for the Kiln 4 (batch kiln)

| Pollutant | Control Technology | Proposed BACT Limit | Averaging Time | Compliance Determination Method |
|-----------|----------------------------------|---|----------------|---------------------------------|
| VOC | Proper maintenance and operation | 3.93 lb VOC/1,000 board feet lumber dried | Daily | Inspection program |

5.0 TESTING AND MONITORING REQUIREMENTS

Testing Requirements:

In order to avoid PSD review for PM_{2.5}, Simpson Lumber relied on emission factors for PM and assumed ratios for PM/PM₁₀/PM_{2.5} for three cyclones, and one baghouse. These emission factors are described in detail in Section 1.0 of this Preliminary Determination. The Division believes that these emission factors represent the best available estimate of emissions from these sources. The Division also recognizes the fact that cyclones are not typically configured to allow emission testing and that any modifications to allow testing would likely alter the performance of the cyclones. The Division, therefore, is not requiring any emission testing on the cyclones. Because the PM_{2.5} emission increase from the baghouse is negligible (0.02 tons per year), the Division is also not requiring emissions testing from the baghouse.

The Division has not required testing for VOC from the kilns. The emissions from lumber kilns are not routed through any stack or duct. Testing of the kilns would require extensive construction of multiple temporary stacks or hoods. The Division believes that any results would be unreliable.

Monitoring Requirements:

There are no applicable monitoring requirements being imposed because, as indicated in Section 5.0 of this Preliminary Determination, add-on control equipment is not considered feasible or practical for control of VOC emissions from Kilns 3 and 4.

CAM Applicability:

Because Kilns 3 and 4 do not utilize a control device to meet the applicable emission limits, CAM is not applicable and is not being triggered by the proposed modification. Therefore, no CAM provisions are being incorporated into the facility's permit.

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 emitted from 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 NO₂, CO, PM_{2.5}, PM₁₀, SO₂, Ozone (O₃), and lead. PSD increments exist for SO₂, NO₂, and PM₁₀.

The proposed project at Simpson Lumber triggers PSD review for VOC. 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.

Because the actual and potential emissions increase of VOC will exceed 100 tons per year, the applicant was required to submit an ozone impact analysis. The photochemistry underlying the generation of ground-level ozone is very complex and not well understood. As such, no air quality dispersion model has yet been developed which is capable of accurately predicting ambient ozone concentrations resulting from the precursor emissions of a single facility. Consequently, the analysis of the potential impacts of VOC on ground level ozone generation must be conducted by other means.

The analysis submitted by the applicant consisted of an evaluation of existing ambient monitoring data for the area, as well as a qualitative evaluation of the increase in the ozone precursor pollutants of VOC and NO_x that will be emitted, relative to background concentrations of these pollutants in the area. The applicant concluded that the additional VOC and NO_x emissions from Simpson Lumber will have a negligible effect on ambient ozone concentrations in the area. The Division has evaluated the analysis submitted by the applicant and agrees with its conclusions.

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 consideration of impacts of a PSD source on Class I Increments to facilities that are 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 three Class I areas within approximately 200 kilometers of Simpson Lumber are the Wolf Island National Wildlife Refuge, located approximately 100 kilometers south of the facility; the Okefenokee National Wildlife Refuge, located approximately 180 kilometers south of the facility; and the Cape Romain National Wildlife Refuge, located approximately 190 kilometers northeast of the facility. The U.S. Fish and Wildlife Service (FWS) is the designated Federal Land Manager (FLM) responsible for oversight of all three of these Class I areas. Because VOC is the only pollutant subject to PSD review and VOC is not visibility impacting, there are no Class I issues at this facility.

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 impact projected for the area as a result of the general commercial, residential, and other growth associated with the proposed project.

Soils and Vegetation

The applicant submitted an analysis of the potential adverse impacts of increased VOC emissions on soils and vegetation (see Section 6.2 of Application No. 20735) in the areas surrounding the facility. The analysis concluded that any adverse impacts are expected to be insignificant.

Growth

The purpose of a growth analysis is to predict how much new growth is likely to occur as a result of the project and the resulting air quality impacts from this growth. According to Section 6.3 of Application 20735, no growth in the region is expected from this project. Any impact due to growth will, therefore, be minimal.

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.

VOC emissions do not impact visibility. Therefore, the project will not impact Class I and Class II visibility for purposes of PSD review of the project. (See Section 6.1 of Application 20735)

Georgia Toxic Air Pollutant Modeling Analysis

Georgia EPD regulates the emissions of toxic air pollutant (TAP) emissions through a program covered 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)*."

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 established Acceptable Ambient Concentration (AAC) values. The TAPs evaluated are restricted to those that may increase due to the proposed project. Thus, the TAP analysis would generally be an assessment of off-property impacts due to facility-wide emissions of any TAP emitted by a facility. To conduct a facility-wide TAP impact evaluation for every pollutant that could conceivably be emitted by the facility is impractical. 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 waste wood fed to the combustion sources, and the fact that there are complex chemical reactions occurring in that combustion. The vast majority of compounds potentially emitted by wood combustion, however, are emitted in only trace amounts that are not reasonably quantifiable.

Acetaldehyde, formaldehyde, propionaldehyde, and methanol have been identified as the primary TAPs emitted from lumber kilns, mainly from the drying of wood. Other TAPs that may be present are emitted in insignificant quantities. The emission rates were determined using emission factors developed by the National Council for Air and Stream Improvement (NCASI). The Simpson Lumber Company analysis of toxic emissions can be found in Sections 5.2 through 5.6 of Application No. 20735. Note that there are no emission factors for wood drying kilns in AP-42.

For each TAP identified for further analysis, both the short-term and long-term AACs were calculated following the procedures provided 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. Langdale Forest Products referenced the resources previously detailed to determine the long-term (i.e., annual average) and short-term AAC (i.e., 24-hour or 15-minute average). The AACs were verified by the EPD.

Determination of Toxic Air Pollutant Impact

The Georgia EPD *Guideline* recommends a tiered approach to model TAP impacts, beginning with screening analyses using SCREEN3, followed by refined modeling, if necessary, with ISCST3 or ISCLT3. For the refined modeling completed, the infrastructure setup for the SIA analyses was relied upon with appropriate sources added for the TAP modeling. Note that per the Georgia EPD's *Guideline*, downwash was not considered in the TAP assessment.

Initial Screening Analysis Technique

Generally, an initial screening analysis is performed in which the total TAP emission rate is modeled from the stack with the lowest effective release height to obtain the maximum ground level concentration (MGLC). Note the MGLC could occur within the facility boundary for this evaluation method. The individual MGLC is obtained and compared to the smallest AAC. Due to the likelihood that this screening would result in the need for further analysis for most TAP, the analyses were initiated with the secondary screening technique.

Simpson Lumber Company used the ISCST3 and AERMOD dispersion models to evaluate the impacts of acetaldehyde, formaldehyde, propionaldehyde, and methanol. Receptors were placed along the facility property line at 25 meter intervals, on a grid at 25 meter intervals to a distance of 200 meters from the property line, and on a grid at 100 meters interval to a distance of 2,000 meters from the property line. For the annual averaging period, discrete receptors were placed at each residence or place of business surrounding the facility's fence line. See Section 5.5.4 of Application 20735 for a more detailed explanation of the receptor locations. In the Simpson Lumber Company model, all modeled concentrations were below both the long-term and short-term AACs

The Division used the ISCST3 dispersion model to evaluate the modeling submitted by Simpson Lumber Company. Details of the modeling can be found in EPD'S Air Toxics Assessment Review in Appendix C of this Preliminary Determination. Modeling was conducted for acetaldehyde, formaldehyde, propionaldehyde, and methanol, which as indicated above are known to be the primary air toxics from lumber drying kilns.

As noted in Appendix C of this Preliminary Determination, the Division placed receptors at the property line for both the short term and annual models. The modeled 15-minute and annual acetaldehyde, propionaldehyde, and methanol concentrations and the modeled 15-minute formaldehyde concentration were found to be less than the established Acceptable Ambient Concentration (AAC) values at all receptors. The modeled annual formaldehyde concentration, however, was greater than the AAC. The maximum ground level concentration (MGLC) was $1.31 \mu\text{g}/\text{m}^3$, which is 118 percent of the $1.11 \mu\text{g}/\text{m}^3$ AAC. As noted in Appendix C, "the receptors with concentration slightly in excess of the long-term (annual) AAC exist at the facility property boundary. A public road bounds the plant site at this location." Since the exceeded AAC is annual and it is reasonable to believe that no person would remain

continuously on this segment of road, it is extremely unlikely that chronic exposure to concentrations over $1.11 \mu\text{g}/\text{m}^3$, by non-plant personnel, will take place. Therefore, the model is viewed as passing the *Guideline*.

8.0 EXPLANATION OF DRAFT PERMIT CONDITIONS

The permit requirements for this proposed facility are included in draft Permit Amendment No. 2421-103-0004-V-04-1.

Section 1.0: Facility Description

Simpson Lumber Company, LLC Meldrim Operations operates three direct-fired batch lumber drying kilns, a sawmill, and a planer mill. Simpson Lumber proposes to convert Kiln 3 from batch to continuous operation, which will increase the drying capacity of Kiln 3 from 42.0 million board feet per year to 65.0 million board feet per year and construct a new direct-fired batch lumber drying kiln (Kiln 4) with a capacity of 73.0 million board feet per year.

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

Conditions 3.2.1 and 3.2.2 are added to cap the production in modified Kiln 3 and new Kiln 4. These production limits were relied upon to ensure that the increase in emissions of PM_{2.5} does not exceed 10 tons per year.

Conditions 3.4.3 (Georgia Rule (b)) and 3.4.6 (Georgia Rule (g)) are modified to add the new kiln (Emission Unit ID 8000) to these conditions.

Condition 3.4.7 is added to establish the VOC BACT limit of 3.83 lb/mbf for modified Kiln.

Condition 3.4.8 is added to establish the VOC BACT limit of 3.93 lb/mbf for new Kiln 4.

Conditions 3.4.9 and 3.4.10 are added to limit PM_{2.5} emissions from the Planer Mill Trim Block Chipper Cyclone (Condition 3.4.9), the Fuel Silo Cyclone (Condition 3.4.9), the Planer Mill Shavings Cyclone (Condition 3.4.9), and the Planer Shavings Truck Bin Baghouse (Condition 3.4.10). These emission limits were relied upon to ensure that the increase in emissions of PM_{2.5} does not exceed 10 tons per year.

Section 4.0: Requirements for Testing

Condition 4.1.3 has been modified to include the applicable test methods for determining compliance with the new emission limits in this permit.

Section 5.0: Requirements for Monitoring

No conditions in Section 5.0 are being added, deleted or modified as part of this permit action.

Section 6.0: Other Recordkeeping and Reporting Requirements

Condition 6.1.7 is modified by adding paragraphs b. i and ii., which require reporting if the production limit on Kiln 3 or 4 is exceeded.

Conditions 6.2.2 and 6.2.3 are added requiring the tracking and reporting of the production in Kilns 3 and 4.

Section 7.0: Other Specific Requirements

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

APPENDIX A

Draft Revised Title V Operating Permit Amendment
Simpson Lumber Company, LLC Meldrim Operations
Meldrim (Effingham County), Georgia

APPENDIX B

Simpson Lumber Company, LLC Meldrim Operations PSD Permit Application and Supporting Data

Contents Include:

1. PSD Permit Application No. 20735, dated October 10, 2011
2. Additional Information Package Dated December 28, 2011

APPENDIX C

EPD'S PSD Dispersion Modeling and Air Toxics Assessment Review