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Meldrim Kiln Project
Prevention of Significant Deterioration
Permit Application - Revised

Prepared for:

Simpson Lumber Company

911 Old River Road

Meldrim, Georgia 31318

October 2011

Project #: 108.0217.00008

PREVENTION OF SIGNIFICANT DETERIORATION APPLICATION

Prepared for:

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This document has been prepared by SLR International Corp. The material and data in this report were prepared under the supervision and direction of the undersigned.

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ACRONYMS

acfm	actual cubic feet per minute
BACT	Best Available Control Technology
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emissions Monitoring System
CO	Carbon Monoxide
CO_2	Carbon dioxide
CO_2-e	Carbon dioxide equivalent
CFR	Code of Federal Regulations
DEM	Digital Elevation Model
EPA	Environmental Protection Agency
ft	Foot
GA EPD	Georgia Environmental Protection Division
GEP	Good Engineering Practice (Stack Height)
GHG	Greenhouse Gas
HAPs	Hazardous Air Pollutants
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NCASI	National Council for Air and Stream Improvement
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standards
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
RACT	Reasonable Achievable Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
sec	second
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds

1. INTRODUCTION

Simpson Lumber Company (Simpson) owns and operates a lumber mill located in Meldrim, Georgia (Meldrim Operations). Simpson Meldrim Operations is currently operating under Part 70 Operating Permit (Permit No. 2421-103-0004-V-04-0) issued December 21, 2010.

The facility is proposing to install one new direct-fired batch lumber drying kiln and convert existing Kiln #3 from batch to continuous. The project is expected to increase volatile organic compounds (VOCs) emissions in excess of the Prevention of Significant Deterioration (PSD) significance thresholds. Simpson is submitting this application for approval in accordance with the Georgia Rule 391-3-1-.02(7). This report provides a description of the facility, emission calculations, regulatory applicability, Best Available Control Technology (BACT) determination, air quality analysis, and toxic analysis and results.

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2. PROJECT DESCRIPTION

Simpson Meldrim Operations is proposing to install one new direct-fired batch lumber drying kiln and convert existing Kiln #3 from batch to continuous.

2.1 FACILITY AND PROCESS DESCRIPTION

Simpson operates a lumber mill located in Meldrim, Georgia. Simpson Meldrim Operations is currently operating under Part 70 Operating Permit (Permit No. 2421-103-0004-V-04-0) issued December 21, 2010.

The production operations at this facility consist of the following: log preparation, sawmill, lumber drying, and planer mill. This lumber mill is capable of operating 24 hours per day, 365 days per year. A description of the lumber manufacturing operations is provided below.

2.1.1 LOG PREPARATION

Southern yellow pine logs of tree length are received by trucks. The logs are stored on ten concrete log pads. The logs are sawn to desired length, debarked and scanned for metal. Bark from the debarker is dropped into a chain conveyor and conveyed to a bark holding bin to be sold off site as fuel.

Poor quality log parts are chipped and used as a paper mill fiber source.

2.1.2 SAWMILL

Sawmills cut the logs into dimensional lumber or timbers. The sawmill equipment includes a twin band saw, a two-saw edger, an 11 inch saw trimmer, a curve saw, and a two-saw vertical double arbor edger. Lumber is trimmed, sorted by length and dimension, and stacked on sticks.

Trim blocks and edger strips are chipped and transferred to the paper mill as a fiber source.

2.1.3 LUMBER DRYING

The lumber and timbers are dried in one of three direct-fired batch kilns, to approximately 19 percent moisture content. Each has a maximum heat input capacity of 18.53 million British thermal units per hours (MMBtu/hr) and uses planer mill shavings as a fuel.

2.1.4 PLANER MILL

The dried lumber and timbers are planed in the planer mill, and then sorted by length, size, and grade, and transported by truck or rail for delivery to the customer.

2.1.5 GENERAL

By-products produced by the facility are wood chips, bark, sawdust, and planer shavings. These by-products are used on site as fuel and excess is sold to outside customers for various uses.

2.2 SITE LOCATION

Simpson Meldrim Operations is located in Effingham County (32° 8' 45.0" N, 81° 23' 14" W), which is currently designated as attainment for all criteria pollutants. An area map indicating the location of the Simpson Meldrim Operations is shown in Figure 1. The area map shows the site property relative to predominant geographical features such as railroads, streams, and roads. Elevation of the site is approximately 28 feet above sea level.

2.3 PROJECT DESCRIPTION

Simpson Meldrim Operations is proposing to install a new 104 foot direct-fired batch drying kiln. The maximum capacity of the new kiln will be approximately 73 million board feet per year (MMBF/yr). The facility is also proposing to modify their existing Kiln #3 from batch to continuous. The maximum capacity of the modified kiln will be approximately 65 MMBF/yr.

After the installation and modification, the total kiln capacity of the facility will be 229 MMBF/yr.

2.4 PROJECT EMISSIONS

The air emissions at this project are generated by the following activities and equipment: new direct-fired batch drying kiln, modification of existing Kiln #3 and associated increase in operation of the planer mill and fuel silo.

The potential emissions of this project are listed in Table 2-1 below.

Table 2-1. Potential Project Emissions

Emission Sources	Proposed Potential Annual Emissions (tons/year)								
	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-e	HAPs
Lumber Drying Kiln #4 (new)	14.9	9.0	8.3	2.7	10.2	24.5	139.6	22,918.5	8.6
Lumber Drying Kiln #3 (conversion)	4.5	3.4	3.2	1.7	9.1	21.8	127.6	14,284.8	7.3
Planer Mill	12.8	6.4	3.8	--	--	--	--	--	--
Fuel Silo	9.98	4.99	2.99	--	--	--	--	--	--
Total Emissions	**42.1**	**23.8**	**18.3**	**4.4**	**19.3**	**46.2**	**267.3**	**37,203.3**	**15.8**

Emissions of nitrogen oxide (NO_X), VOC, carbon monoxide (CO) from the direct-fired kilns are based on emission factors for southern pine direct fired batch lumber drying kiln from National Council for Air and Stream Improvement (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. The NCASI emission factor for VOCs is converted to total VOCs as per Georgia Environmental Protection Division's (GA EPD's) guidance in the Rayonier Wood Products PSD permit issued in July 5, 2007.

Emissions of filterable PM are based on emission factors for southern pine direct-fired batch lumber drying kiln from NCASI Environmental Resource Handbook for Wood Products Plants, Chapter 3, Table 3.3.1.2-1. The condensable particulate matter (PM) emission factors for southern pine direct-fired batch kilns are from unpublished NCASI data provided by David Word, program manager for NCASI. The filterable PM emission factor for the continuous kiln is based on stack tests performed on a direct-fired continuous lumber kiln at Bibler Brother Lumber Company in Russellville, Arkansas. The condensable PM emission factor is currently not available for continuous direct-fired kilns. The emission factor used for condensable PM emissions is based on the ratio of condensable and filterable emission factors for southern pine direct-fired batch kilns from unpublished NCASI data.

Particulate matter less than 10-micron in diameter (PM_{10}) is calculated using 50% of PM following GA EPD's assumptions in the Rayonier Wood Products PSD permit issued in July 5, 2007. Particulate matter less than 2.5-micron in diameter ($PM_{2.5}$) has been estimated as 87% of PM_{10} based on AP-42, Chapter 1.6, for wood combustion. All condensable PM emissions are assumed to PM_{10}/$PM_{2.5}$ per instructions from GA EPD. [1]

Sulfur dioxide (SO_2) emissions were calculated from AP-42 (Table 1.6-2) for wood residue combustion which represents boilers with no controls.

Emissions of hazardous air pollutants (HAPs) identified for direct-fired lumber kilns include acetaldehyde, acrolein, formaldehyde, methanol and propionaldehyde. The emissions of HAPs are based upon NCASI Emission Factors for Southern Pine Lumber Kilns provided by David Word (August, 2004). The formaldehyde emission factor for the continuous kiln is based on stack tests performed on a direct-fired continuous lumber kilns at Bibler Brother Lumber Company in Russellville, Arkansas. A 60% safety factor has been applied to the test results.

PM, PM_{10}, and $PM_{2.5}$ emissions from the planer mill and fuel silo are based on PM emission factors obtained from the "Emission Factor Wood Product" prepared by Oregon Department of Environmental Quality (Oregon DEQ) for "Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust - High Efficiency". It is assumed that PM_{10} is 50% of PM based on Oregon DEQ factors and $PM_{2.5}$ is conservatively assumed to be 60% of PM_{10} based on AP-42, Appendix B-1 for woodworking waste collection operations – (10/1986). The emissions of PM/PM_{10}/$PM_{2.5}$ from the planer mill are controlled by a medium efficiency shavings cyclone, medium efficiency trim block cyclone, and a truck bin baghouse. The fuel silo is also equipped with a cyclone.

Greenhouse Gas (GHG) emissions are also calculated for this project. The six GHG pollutants under consideration for PSD regulation by the Environmental Protection Agency (EPA) are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The international standard practice is to express GHGs in carbon dioxide equivalents (CO_2-e). The mass emissions of each pollutant are multiplied by its Global Warming Potential (GWP) and then summed to produce the CO_2-e tonnage. The emission factors are obtained from Part 98 - Mandatory Greenhouse Gas Reporting Rule, Table C-1, & Table C-2. The GWP are obtained from Table A-1.

Detailed emissions calculations are provided in Appendix A.

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[1] Email correspondence from Bradley Belflower, GA EPD, on May 9, 2011.

2.4.1 ACTUAL EMISSIONS

As defined in Georgia Rule 391-3-1-.02(7)(a)2(i)(II), for an existing emissions unit (other than an electric utility steam generating unit), baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the GA EPD for a permit required under this paragraph or by the reviewing authority for a permit required by a plan, whichever is earlier. Simpson Meldrim Operations is proposing to use the two-year period from 2004 to 2005 to evaluate their actual emissions. A summary of the actual emissions are provided in Table 2-2 below.

Except for PM and formaldehyde emission factors, the emission factors for other pollutants used for actual emissions calculations of Kiln #3 are the same as the emission factors used in potential project emissions. Emissions of filterable PM are based on emission factors for southern pine direct-fired batch lumber drying kiln from NCASI Environmental Resource Handbook for Wood Products Plants, Chapter 3, Table 3.3.1.2-1. The emission factor used for condensable PM emissions is based on the ratio of condensable and filterable emission factors for southern pine direct-fired batch kiln from unpublished NCASI data provided by David Word. The emission factor for formaldehyde is also based upon the NCASI Emission Factors for Southern Pine Lumber Kilns provided by David Word (August, 2004).

Detailed calculations are provided in Appendix A.

Table 2-2. Actual Emissions

Emission Sources	Past Actual Emissions (tons/year)								
	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-e	HAPs
Kiln #3 (existing)	8.6	5.2	4.8	1.6	5.9	14.1	80.4	13,196.8	4.9
Planer Mill	7.0	3.5	2.1	--	--	--	--	--	--
Fuel Silo	5.52	2.76	1.66	--	--	--	--	--	--
Total Emissions	**21.1**	**11.5**	**8.5**	**1.6**	**5.9**	**14.1**	**80.4**	**13,196.8**	**4.9**

2.4.2 NET EMISSIONS INCREASE

The net emissions increase from the proposed modification is calculated by subtracting the actual emissions from the future potential emissions. A summary of the net emissions increase are provided in Table 2-3 below.

Table 2-3. Net Emission Increase

Emission Sources	Net Emissions Increase (tons/year)								
	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-e	HAPs
Future Potential Emissions	42.1	23.8	18.3	4.4	19.3	46.2	267.3	37,203	15.8
Past Actual Emissions	21.1	11.5	8.5	1.6	5.9	14.1	80.4	13,197	4.9
Net Emissions Increase	**21.0**	**12.3**	**9.8**	**2.8**	**13.4**	**32.1**	**186.9**	**24,007**	**10.9**

3. REGULATORY APPLICABILITY

This section describes the applicable regulations triggered by the proposed project for Simpson Meldrim Operations. The applicability determination conducted in this analysis is pursuant to the PSD regulations, New Source Performance Standards (NSPS), and National Emissions Standards for Hazardous Air Pollutants (NESHAP) and applicable State Emission Standards as provided in Georgia Air Quality Control Rule, Chapter 391-3-1.

3.1 PSD APPLICABILITY

Georgia Rule 391-3-1-.02(7) adopts by reference 40 Code of Federal Regulations (CFR) 52.21, except as amended under that section. Simpson Meldrim Operations is located at 911 Old River Road, Meldrim, Effingham County, Georgia. Effingham County is currently designated as attainment for all criteria pollutants; therefore, the facility is not a major source with regards to Nonattainment New Source Review. However, this facility is classified as a "major stationary source" for PSD purposes due to potential emissions greater than 250 tons per year of any one of the pollutants regulated under the Clean Air Act. Since the net emissions increase of VOC from the proposed project is above the PSD significant level (40 tons/yr), this project is reviewed under the PSD rule.

On May 13, 2010 EPA issued a final rule (GHG Tailoring Rule) that sets thresholds for GHG emissions that define when permits under the New Source Review PSD and Title V Operating Permit programs are required for new and existing facilities. During Step 1 (from January 2nd, 2011 to June 30th, 2011) sources currently subject to the PSD permitting program (for pollutants other than GHGs) would also be subject to permitting requirements for their GHG emissions under PSD. A BACT determination will be required for projects with GHG increases of 75,000 tons per year, or more. As provided in Table 3-1, the net emission increases of GHG are below 75,000 tons per year. Therefore, the PSD requirements for GHG under the GHG Tailoring Rule are not applicable for this project.

Table 3-1. PSD Applicability Analysis

Description	Potential Emissions (tons/year)							
	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	CO2-e	VOC
Existing Sources	41.5	23.8	19.6	5.1	19.2	45.9	43,012	262.1
Net Emissions Increase	21.0	12.3	9.8	2.8	13.4	32.1	24,0071	186.9
PSD Significant Levels	25	15	10	40	40	100	75,000	40
PSD Applicability	No	No	No	No	No	No	No	**Yes**

The GA EPD application forms are provided in Appendix B.

3.2 BEST AVAILABLE CONTROL TECHNOLOGY

Under the federal PSD rules (40 CFR §52.21), each major new source and/or major modification must employ BACT for each pollutant for which the new source or modification is considered major. For purposes of this application, only VOCs are subject to PSD and BACT. Simpson proposes using proper maintenance and operation of the proposed new kilns. The

BACT analysis and discussion of control alternatives for the proposed modification is presented in Section 4 of this report.

3.3 NEW SOURCE PERFORMANCE STANDARDS

NSPS are air pollution control standards issued by the EPA under 40 CFR 60. The proposed new and modified lumber drying kilns are not subject to 40 CFR Part 60 Subpart Dc, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, because there are no steam generating units and process heaters as defined under this subpart. The kilns are heated with wood fired combustion systems.

3.4 NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS

NESHAPs have been established in 40 CFR §63 to control the emissions of HAPs. NESHAP regulations establish Maximum Achievable Control Technology (MACT) standards for specific types of equipment at qualifying facilities.

Simpson Meldrim Operations is a major source of hazardous air pollutants and therefore applicable to the MACT standards, 40 CFR 63, Subpart DDDD, National Emission Standards for Hazardous Air Pollutants for Plywood and Composite Wood Products.

The provisions of 40 CFR 63, Subpart DDDD include no control requirements for lumber drying kilns. However, the rule requires submitting an initial notification form by January 26, 2005. The facility has already submitted the initial notification dated January 13, 2005, which was received by the GA EPD on January 19, 2005.

3.5 TITLE V

This facility is currently a major source of air pollutants and has already received a Title V Operating Permit from GA EPD as required under GA Rule 391-3-1-.03(10). In accordance with GA Rule 391-3-1, Simpson Meldrim Operations is submitting an application to modify the Title V Permit for the proposed project. The electronic Title V modification application will be submitted under separate cover.

3.6 GEORGIA EMISSION STANDARDS

The applicability to State Emission Standards as provided in Georgia Air Quality Control Rule, Chapter 391-3-1 is evaluated in the following sections.

3.6.1 GEORGIA RULE 391-3-1.02(2)(E) – PROCESS WEIGHT RULE

The lumber dry kilns, the planer mill, and the fuel silo are subject to GA Rule 391-3-1-.02(2)(e), Particulate Matter Emission from Manufacturing Process. According to this standard, Simpson Meldrim Operations may not discharge or cause the discharge into the atmosphere from the lumber kilns, the planer mill or the fuel silo, any gases that contain particulate matter in excess of the rate derived from one of the following equations (new equipment being that which was placed into service after 1968):

The allowable PM emission rate for new equipment with input rates up to and including 30 tons per hour is expressed by the following equation:

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

The allowable PM emission rate for new equipment with input rates above 30 tons per year is expressed by the following equation:

$E = 55P^{0.11} – 40$,
Where,
E = the allowable PM emission rate in lb/hr
P = the maximum process input weight in tons per hour.

The allowable and the maximum PM emissions are provided in Table 3-2. The production of the lumber kilns has been converted from thousand board feet (MBF) to tons using the weight of lumber (dry) as 2.2 pounds per board foot. As shown, the maximum estimated PM emissions are all lower than the allowable rate under the Process Weight Rule.

Table 3-2. Allowable vs. Maximum PM Emissions (Process Weight Rule)

Source	Maximum Process Input (tons/hr)	Allowable Emissions (lb/hr)	Maximum Emission Rate (lb/hr)
Lumber Drying Kiln #4 (new)	9.17	18.09	3.40
Lumber Drying Kiln #3 (conversion)	8.16	16.74	1.02
Planer Mill Trim Block Chipper	0.78	3.46	0.39
Planer Mill Shavings	5.04	12.12	2.52
Fuel Silo	4.56	11.33	2.28
Planer Mill Truck Bin	5.82	13.34	0.01

3.6.2 GEORGIA RULE 391-3-1-.02(2)(B) – VISIBLE EMISSIONS

The lumber dry kilns are subject to GA Rule 391-3-1-.02(2)(b), Visible Emissions, because these sources are subject to other emission limitations under Georgia Rule 391-3-1-.02(2). This standard limits the visible emissions from processes (including kilns and the planer mill at this facility) to not equal or exceed 40 percent.

3.6.3 GEORGIA RULE 391-3-1-.02(2)(G) – SULFUR DIOXIDE

The lumber dry kilns are subject to GA Rule 391-3-1-.02(2)(g)(2) because they are fuel burning sources below 100 MMBtu of heat input per hour. According to this regulation, the fuel sulfur content limit for fuels burned in the kilns must not exceed 2.5 percent sulfur by weight. The kilns are expected to be in compliance with this regulation because they are only burning wood as fuel.

3.7 COMPLIANCE ASSURANCE MONITORING

40 CFR 64 requires compliance assurance monitoring (CAM) for emissions units with add-on control devices that would have uncontrolled potential emissions greater than 100 tons per year if the control device were not in place. Potential emissions of VOCs from each kiln are less than 100 tons per year. Furthermore, the kilns have no add-on control devices. Therefore, a CAM plan is not required.

4. BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

4.1 BACKGROUND

Under the federal PSD rules (40 CFR 52.21), each major new source and/or major modification must employ BACT for each pollutant for which the new source or modification is considered major. BACT is defined in the Code of Federal Regulations CFR as:

> *…an emission limitation based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any… source… which the Administrator, on a case-by case basis, taking into account energy, environmental, and economic impacts and other costs determines is achievable…*[2]

The following sections describe the methodology used to determine BACT for the lumber kilns.

4.2 BACT METHODOLOGY

A BACT analysis is done on a case-by-case basis and is performed using a "top-down" method as outlined in the EPA's October 1990 Draft New Source Review Workshop Manual. The following steps detail the top-down approach:

1. Identify all potential control technologies – must be a comprehensive list, it may include technology employed outside the United States and must include the Lowest Achievable Emission Rate (LAER) determinations.

2. Eliminate technologically infeasible options – must be well documented and must preclude the successful use of the control option.

3. Rank remaining control technologies – based on control effectiveness, expected emission rate, expected emission reduction, energy impacts, environmental impacts, and economic impacts.

4. Evaluate the most effective controls – based on case-by-case consideration of energy, environmental, and economic impacts.

5. Select BACT.

VOC emissions associated with the modification of the existing lumber drying kiln and installation of new kiln are expected to cause an increase in emissions above the PSD significance thresholds (40 tons/year for VOCs). As a consequence, a BACT analysis is presented for VOCs.

4.3 VOLATILE ORGANIC COMPOUND FORMATION

During the lumber drying process, organic compounds present in the wood will be released. These are organic compounds that are in gaseous form at the elevated temperature of the

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[2] 40 CFR 52.21

wood, and are comprised largely of lower molecular weight volatiles, and higher molecular weight resin and fatty acids. The type and amounts of compounds released will depend on several factors related to the drying process, including the kiln temperature, the surface area of the wood material relative to its mass, initial moisture content, and the amount of moisture removed from the material. It also varies depending on the wood species.

4.4 IDENTIFY NSPS/MACT STANDARDS FOR THE LUMBER DRYING KILN

If the source is subject to an NSPS or NESHAP, the minimum control efficiency to be considered BACT must result in an emission rate less than or equal to the NSPS or NESHAP emission limit. Thus, before a BACT analysis is performed, the applicable NSPS and NESHAP emission limits must be determined.

As discussed in Section 3.3, the NSPS is not applicable to the proposed new and modified lumber drying kilns.

As discussed in Section 3.4, the provisions of 40 CFR 63 Subpart DDDD are applicable to the kilns. However, Subpart DDDD does not include emission limits for lumber drying kilns.

4.5 BACT STEP 1: IDENTIFY ALL CONTROL TECHNOLOGIES

The first of the five steps in the top-down BACT analysis procedure is to evaluate control technologies for each pollutant. The EPA maintains a database of technologies that have been implemented as Reasonable Achievable Control Technology (RACT), BACT, or LAER. This database is known as RACT/BACT/LAER Clearinghouse (RBLC). The RBLC was searched for wood lumber kilns permitted after January 1, 2000. The search was further refined to address only the applicable pollutants for this analysis. A summary of this search is provided in Table 4-3.

A search was also completed of VOC control technologies for other processes that may be applied to a dry lumber kiln. Based on the research described above and other engineering experience, control technologies evaluated are:

- Carbon Adsorption
- Regenerative Thermal Oxidation
- Regenerative Catalytic Oxidation
- Condensation
- Biofiltration
- Wet Scrubbing
- Proper Maintenance & Operation

4.5.1 CARBON ADSORPTION

The core component of a carbon adsorption system is an activated carbon bed contained in a steel vessel. 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.

At proper operating conditions, carbon adsorption systems have demonstrated VOC reduction efficiency of approximately 90 to 95%.

4.5.2 REGENERATIVE THERMAL OXIDATION

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. Usually, there are three or more beds that are continually cycled.

VOC destruction efficiency depends upon the design criteria (i.e., chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing). Typical VOC destructive efficiency ranges from 95 to 99% for RTO systems depending on system requirements and characteristics of the contaminated stream. Lower control efficiencies are generally associated with lower concentration flows.

4.5.3 REGENERATIVE CATALYTIC OXIDATION

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, typically 316 degrees Celsius (°C) to 538 °C (600 °F to 1,000 °F), which reduces auxiliary fuel usage.

Typical VOC destructive efficiency ranges from 90 to 99% for RCO systems. However, this also depends on system requirements and characteristics of the contaminated stream.

4.5.4 CONDENSATION

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. In such cases, the use of a condensation process reduces the concentration load on downstream control equipment. The two most common type of condensation devices are: contact or barometric condensers, and surface condensers.

4.5.5 BIOFILTRATION

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 CO_2 and H_2O with varying efficiency.

4.5.6 WET SCRUBBING

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.

4.5.7 PROPER MAINTENANCE & OPERATION

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.

4.6 BACT STEP 2 – ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

The second of the five steps in the top-down BACT analysis procedure is to eliminate technologically infeasible control technologies. Table 4-1 provides a summary of the feasibility of the control technologies discussed below.

Table 4-1. Control Technological Feasibility

Pollutant	Control Technology	Feasibility
VOC	Carbon Adsorption	Infeasible
	Regenerative Thermal Oxidation	Infeasible
	Regenerative Catalytic Oxidation	Infeasible
	Proper Maintenance & Operation	Feasible

The following sections provide brief explanations on the infeasibility of carbon absorption, RTO, and RCO for the proposed kilns.

4.6.1 CARBON ADSORPTION

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 active adsorption sites. This reduces the capacity and the efficiency of the adsorption system.

For the reason stated above and because there are currently no known lumber drying kilns that are equipped with carbon adsorption system, the use of carbon adsorption systems for the proposed lumber drying kilns is not considered technically feasible and will not be further assessed.

4.6.2 REGENERATIVE THERMAL OXIDATION

Due to the high moisture content and low exit temperature in the exhaust stream, the RTO would be technologically infeasible. Moreover, a review of the EPA's RBLC did not reveal any facilities that have specified RTO as BACT for lumber drying kilns.

4.6.3 REGENERATIVE CATALYTIC OXIDATION

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. Moreover, catalysts must periodically be replaced due to thermal aging. This also adds significantly to the cost of operating the unit in addition to creating solid waste.

Catalytic oxidation has never been applied to a lumber drying kiln. Therefore, regenerative catalytic oxidation is not considered feasible for the proposed dry kilns.

4.6.4 CONDENSATION

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^{o}F. At this temperature, freezing of the water vapor would generate ice, causing unacceptable plugging of the unit. Therefore, condensation is not technologically feasible for the proposed lumber kilns.

4.6.5 BIOFILTRATION

The most important variable affecting bioreactor operations is temperature. Most microorganisms can survive and flourish in a temperature range of 60 to 105^{o}F (30 to 41^{o}C). The exiting exhaust temperature of the proposed lumber kilns is approximately 500^{o}F. Furthermore, the VOC emissions from the kilns are primarily terpenes. Terpenes are highly viscous and would foul the biofilter. Therefore, biofiltration is not technologically feasible for the proposed lumber kilns

4.6.6 WET SCRUBBING

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 of a wet scrubber. Therefore, wet scrubber is not technologically feasible for the proposed lumber kilns.

4.7 BACT STEP 4: EVALUATE MOST EFFECTIVE CONTROL & DOCUMENT RESULTS

Based on the control technologies/methods presented above, proper maintenance and operation is the only remaining technology/method for this application. None of the other control technologies have been proposed or demonstrated for use on a lumber drying kiln.

4.8 BACT STEP 5: SELECT BACT

The fifth and final step in the top-down BACT analysis procedure is the selection of the BACT level of control for each pollutant. Per EPA guidance, BACT is the most effective control technology not eliminated by the previous four steps of the analysis. Proper maintenance and operation is the only remaining VOC technology/method for this application and is the proposed BACT for the new proposed lumber drying kilns.

Table C-1 in Appendix C provides the VOC BACT determination included in EPA's RBLC Database. Table C-2 in Appendix C provides BACT determinations from recent PSD permits for lumber drying kilns issued by the GA EPD – Air Protection Branch. The search results indicate that the operation of the wood drying kilns without add-on VOC control is the only feasible approach and is consistent with approved industry practices for other new kiln projects. In order to be consistent with recent BACT determinations, Simpson Meldrim Operations is proposing to apply "proper maintenance and operation" as BACT for the proposed lumber drying kilns.

4.9 REFERENCES

Air & Waste Management Association, *Air Pollution Engineering Manual*, Van Nostrand Reinhold, 1992.

Air Pollution Control Technology Fact Sheet – Thermal Incinerator, EPA-452/F-03-022, Environmental Protection Agency.

A*ir Pollution Control Technology Fact Sheet – Catalytic Incinerator*, EPA-452/F-03-018, Environmental Protection Agency.

Air Pollution Control Technology Fact Sheet – Regenerative Incinerator, Environmental Protection Agency.

Inspection Workshop for Volatile Organic Air Pollutants (Selected Readings), Crowder Environmental Associates, Inc., February 1991

5. AMBIENT AIR QUALITY ANALYSIS

Pursuant to 40 CFR 52.21(k), a source impact analysis must be conducted, for each pollutant potentially emitted at a significant emission rate by the proposed source or modification, to demonstrate the emissions would not cause or contribute to a violation of any National Ambient Air Quality Standards (NAAQS). Therefore, a modeling analysis would be required for VOC emissions; however, there are no ambient air quality standards for VOC; although, VOCs are identified as a precursor to ozone, which does have a NAAQS. Therefore the emissions increase for the proposed project is evaluated in terms of its affect on attainment status of ozone (see Section 5.1 below).

In addition, an air quality analysis is presented for the toxic air pollutants (TAP) emissions from the facility to demonstrate compliance with GAEPD's Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions.[3] Predicted ambient concentrations are determined and assessed for acetaldehyde, formaldehyde, propionaldehyde, and methanol. This section discusses the dispersion modeling methodology and setup that is used for the TAP analysis. Model methodology and setup parameters used in this analysis follow the modeling protocol submitted by SLR on October 12, 2010, subsequent comments received from GA EPD on October 28, 2010, and SLR response to comments submitted January 5, 2011 (Appendix D).[4, 5, 6] All modeling input and output files are provided on the enclosed CD at the end of the report.

5.1 AIR QUALITY SUMMARY FOR OZONE

Pursuant to 40 CFR 52.21(m), air quality monitoring must be conducted for each pollutant potentially emitted at a significant emission rate by the proposed source or modification. Therefore, a pre-construction ambient monitoring analysis would be required for VOC emissions, and monitoring data would be required to be submitted as part of the application. The GA EPD may exempt the owner or operator of a proposed source or modification from pre-construction monitoring for a specific pollutant if the owner or operator demonstrates that the air quality impact from the emissions increase would be less than the significant monitoring concentrations. However, there is no significant monitoring concentration for VOC. For ozone (O_3), pre-construction monitoring is required for any net increase of 100 tons/year or more of VOCs from a source or modification subject to PSD. Existing monitoring data is used to satisfy the O_3 monitoring analysis requirements. The nearest monitor is located in Savannah, Georgia (Site ID 130510021, E. President Street); approximately 34 kilometers east of the facility and 15 feet lower in elevation. The 8-hour ozone concentrations for 2006 through 2009 are shown in Table 5-1 below. Based on these concentrations, the region is in attainment for ozone. The VOC emission increase for the proposed project of 356 tons per year represents only 0.1% of

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[3] Georgia (GA) Environmental Protection Division's (EPD's) *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions,* June 21, 1998.

[4] Simpson Lumber Company, LLC Meldrim Operations Modeling Protocol, October 12, 2010. Eri Ottersburg. SLR Intl. Corp.

[5] Review of State Air Toxics Air Dispersion Modeling Protocol Proposed Addition of 2 Kilns to the Simpson Lumber Co. Site, Effingham Co., GA, October 28, 2010. Peter S. Courtney, P.E. Georgia Natural Resources Department, Environmental Protection Division, Air Protection Branch.

[6] Response to comments on Meldrim Modeling Protocol, January 5, 2011. Eri Ottersburg. SLR Intl. Corp.

the total VOC emissions in the region (Bryan, Bulloch, Chatham, and Effingham Counties).[7] Therefore, the project is not expected to affect the attainment status of the region.

Table 5-1. Summary of 8-hour Ozone Monitoring Data from 2006 to 2009

Year	1st Max	2nd Max	3rd Max	4th Max	Days > NAAQS	# Days	3-year Average	% of NAAQS
2006	0.076	0.070	0.069	0.069	1	240	--	--
2007	0.068	0.067	0.066	0.065	0	236	--	--
2008	0.071	0.069	0.069	0.067	0	242	0.067	89%
2009	0.075	0.066	0.063	0.062	0	244	0.065	86%

Source: GA EPD Ambient Monitoring Program, Annual Data Reports 2006 through 2009.

5.2 ACCEPTABLE AMBIENT CONCENTRATIONS

Under Georgia's air toxics program, the total facility-wide emissions are modeled and the predicted concentration compared to the Acceptable Ambient Concentration (AAC). The AAC was determined for each pollutant using pollutant toxicity data from various sources listed in the Toxic Assessment Guideline. A list of AACs was compiled per EPD guidelines, and as described in the modeling protocol, EPD protocol comments, and response to comments. Table 5-2 provides a finalized list of pollutants and AACs applicable to the project.

[7] EPA AirData County Emissions Map, 2002 (http://www.epa.gov/air/data/geosel.html). Total emissions reported were 284,746.67 tons for Bryan, Bulloch, Chatham, and Effingham Counties.

Table 5-2. Acceptable Ambient Concentrations

Pollutant	Averaging Period	AAC ($\mu g/m^3$)	AAC Dosage Parameter and Organization(1)
Acetaldehyde	Annual	5(2)	IRIS, RBAC
	15-min	4,500(2)	ACGIH Ceiling
Formaldehyde	Annual	1.1(3)	Revised IRIS, RBAC
	15-min	245(2)	OSHA, STEL
Propionaldehyde	Annual	8(4)	IRIS, RfC
Methanol	24-hr	619(2)	OSHA, PEL
	15-min	32,800(2)	ACGIH, STEL

(1) Dosage acronyms: RBAC = risk-based air concentrations, CL = ceiling level, RfC = reference dose concentrations, STEL = short-term exposure limits, LD50 = lethal dose 50% population, PEL = permissible exposure limit. Organization acronyms: IRIS = Integrated Risk Information System, OSHA = Occupational Safety and Health Administration, ACGIH = American Conference of Governmental and Industrial Hygienists, NIOSH = National Institute for Occupational Safety and Health.
(2) AACs were provided by Rosenda Majano, Air Protection Branch – Data and Modeling Unit Georgia Environmental Protection Division, May 9, 2008.
(3) Adjusted based on life-time average inhalation rate. Approved by email from Dr. Manning, GA EPD, received October 28, 2010.
(4) Propionaldehyde annual AAC based on chronic non-carcinogenic inhalation effects. RfC assessed and revised September 30, 2008.

5.3 SOURCE PARAMETERS

The only sources of HAP at the facility are the batch and proposed continuous kilns. Simpson Meldrim Operations plans to operate two batch kilns and two continuous kilns. Emissions from the three batch kilns are released from rooftop vents. Batch kilns #1 and #2 have ten vents each, and the new Kiln #4 has 12 vents. The vents are 21.5 inch square. Each vent is modeled as a point source with exit velocities based on the average measured flow rate with all vents open. The exhaust temperature is also based on measurements taken at each vent with all vents open. The inner diameter is calculated from the cross-sectional area of the square vent opening to maintain the correct flow rate in the model.

The proposed continuous kiln, converted Kiln #3, releases emissions through two openings on either end of the kiln where lumber enters and exits the kiln. Volume or area source types are usually used for this type of fugitive emission source. However, using volume or area sources will not model the appropriate buoyancy flux of the hot exhaust gas from the kiln. Therefore, Kiln #3 is modeled as two “pseudo-point” sources to represent the fugitive nature of these emissions while maintaining the relatively high temperature. It is not identified as a typical point source because the vertical release velocity is adjusted to 0.001 meters per second so as to prevent overestimating stack momentum flux. The pseudo-point source has a release height and inner diameter equal to the height and width of the kiln opening, respectively. For this pseudo-point source it is not appropriate to run the model with the default option for stack-tip downwash due to the false large stack diameter. Therefore, a separate model run was created for Kiln #3 and results were added to the predicted concentration of Kilns 1, 2, and 4 run with stack-tip downwash active.

The source parameters for the kilns are shown in Table 5-3. Figure 3 shows the location of the sources relative to other structures and the facility fenceline.

Table 5-3. Point Source Parameters

Source	Source Type	Exit Temperature (°C)	Inner Stack Diameter (m)	Release Height (m)	Exit Velocity (m/s)
Kiln 1	Point	112	0.6	9.14	4.1
Kiln 2	Point	112	0.6	9.14	4.1
Kiln 3	Pseudo-Point	112	3.56	4.76	0.001
Kiln 4	Point	112	0.6	9.14	4.1

5.4 MODELED EMISSIONS

Modeled emission rates are adjusted for comparison with annual, 24-hour, and 15-minute AACs. For annual averaging periods, emission rates are derived from maximum annual production. Regarding 24-hour and 15-minute averaging periods, emission rates are derived from maximum production rates as follows:

- For the two existing batch kilns, the maximum hourly production is derived from the throughput per batch per kiln of 115 MBF and minimum drying time per batch of 19 hours.
- For the new batch kiln, the maximum hourly production is derived rom the throughput per batch of 192 MBF and minimum drying time per batch of 19 hours.
- For the continuous kiln (converted Kiln #3), the maximum hourly production is based on annual production records of similarly sized kilns and the expected annual hours of operation.
- For both the continuous and batch kilns, the maximum 15-minute production is calculated from the hourly production by dividing by 4.

The production rates are presented in Table 5-4.

Table 5-4. Kiln Production Rates

Averaging Period	Production (MBF/averaging period)			
	Kiln 1	Kiln 2	Kiln 3 (converted)	Kiln 4 (new)
Annual	45,667	45,667	68,501	73,000
24-hour	145[(a)]	145[(a)]	188	243
15-minute	1.5[(b)]	1.5[(b)]	2.0	2.5

(a) Production (MBF/24-hours) = [Batch Capacity (MBF/batch)] / [Minimum Drying Time (hr/batch)] x [24 hours/period]
Batch Capacity (MBF/batch) = 115 (existing) and 192 (new)
Minimum Drying Time (hr/batch) = 19

(b) Production (MBF/15-minute) = [Batch Capacity (MBF/batch)] / [Minimum Drying Time (hr/batch)] / [4 periods/hour]

The emission factors discussed in Section 2.4 are used to calculate the modeled emission rate for each pollutant and averaging period. The calculated emission rates are provided in Table 5-5. For the model, the emissions are divided evenly between each exhaust point. The two existing batch kilns, Kiln #1 and #2, have 10 exhaust points each. Kiln #3, converted to continuous, has two exhaust points from the openings on both ends of the kiln building. The proposed new batch Kiln #4 has 12 exhaust points.

Table 5-5. Modeled Emission Rates

Pollutant	Averaging Period	Emissions (lb/averaging period)			
		Kiln 1	Kiln 2	Kiln 3 (converted)	Kiln 4 (new)
Acetaldehyde	Annual	1.28E+03	1.28E+03	1.82E+03	2.04E+03
	15-minute	4.24E-02	4.24E-02	5.19E-02	7.07E-02
Formaldehyde	Annual	1.83E+03	1.83E+03	1.82E+03	2.92E+03
	15-minute	6.05E-02	6.05E-02	5.19E-02	1.01E-01
Propionaldehyde	Annual	4.57E+01	4.57E+01	6.50E+01	7.30E+01
Methanol	24-hour	2.32E+01	2.32E+01	2.85E+01	3.88E+01
	15-minute	2.42E-01	2.42E-01	2.97E-01	4.04E-01
Pollutant	**Averaging Period**	**Emissions (g/s)**			
Acetaldehyde	Annual	1.84E-02	1.84E-02	1.84E-02	2.94E-02
	15-minute	2.14E-02	2.14E-02	2.14E-02	3.57E-02
Formaldehyde	Annual	2.63E-02	2.63E-02	2.63E-02	4.20E-02
	15-min	3.05E-02	3.05E-02	3.05E-02	5.09E-02
Propionaldehyde	Annual	6.57E-04	6.57E-04	6.57E-04	1.05E-03
Methanol	24-hr	1.22E-01	1.22E-01	1.22E-01	2.04E-01
	15-min	1.22E-01	1.22E-01	1.22E-01	2.04E-01

5.5 MODEL SETUP AND METHODOLOGY

Two dispersion models are used to assess impacts from the project. As stipulated in comments received from GA EPD, the ISC3 (version 02035) model is used to assess concentrations at receptors with elevations below minimum stack height, whereas the AERMOD (version 09040) model is used for receptors with elevations greater than minimum stack height.

GA EPD recommended including building downwash in the analysis with AERMOD. As such, building downwash is accounted for in the AERMOD modeling using the BPIP (version 04274) pre-processor. GA EPD also recommended including building downwash in the analysis if elevations above stack height exist within 2 kilometers of the facility. However, because are no receptors at elevations above stack height within 2 km of the stacks, building downwash is not included in the ISC3 analysis.

5.5.1 AVERAGING PERIODS

The AACs presented as an annual average are based on life-time exposure factors. However, the modeling period is defined for 5 years. Therefore, to approximate a life-time average concentration, the model results are conservatively averaged over the 5-year modeling period. The model can calculate 24-hour average and maximum 1-hour concentrations. To estimate maximum 15-minute concentrations for the 15-minute AACs, the results are multiplied by 1.32 as specified in the GA EPD toxics guidance and EPA guidance.[8]

5.5.2 ISC3 METEOROLOGY

The ISC3 meteorological data was provided by GA EPD.[9] The meteorological data was collected at the Savannah Municipal Airport surface station and the upper air station located at the Waycross Ware County Airport. The data covers 5 years of observational data taken from 1982 to 1986.

5.5.3 AERMOD METEOROLOGY

The AERMOD data was processed and obtained from GA EPD.[10] GA EPD used AERMET (version 06341) to pre-process and format the meteorological data for use in AERMOD. The surface meteorological data was collected at Savannah Municipal Airport and was coupled with upper air data collected at the Charleston International Airport. Data covers the period from 1990 to 1994.

AERMET requires that surface parameters including albedo, bowen ratio, and surface roughness be assessed and incorporated in the final stage of pre-processing of metrological data for use in AERMOD. These surface parameters are generated from the AERSURFACE (version 08009) program using land use data from the USGS Seamless server (NLCD 92 land use categories).[11] Meteorological files provided by GA EPD are processed in AERMET using landuse characteristics of the area surrounding the airport. However, surface characteristics of the facility site may be substituted if the area surrounding meteorological station does not have similar surface characteristics to the area surrounding the facility site. An AERSURFACE analysis of both the facility site and meteorological station was completed and the surface characteristics were compared to determine the appropriate surface characteristics to use. AERSURFACE processing options for both the meteorological station and facility are shown in Table 5-6, and are based on GA EPD and EPA guidance.[12] Tables 5-7 and 5-8 show the output summary of surface parameters from the NLCD 92 dataset used in the surface analysis for the facility and meteorological station, respectively.

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[8] Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised, EPA-450/R-92-019, October, 1992.
[9] http://www.georgiaair.org/airpermit/html/sspp/modeling.htm
[10] Email from Peter Courtney (GA EPD), received November 10, 2010 and updated August 11, 2011.
[11] http://seamless.usgs.gov/
[12] AERSURFACE User's Guide, January, 2008. U.S. EPA, EPA-454/B-08-001. Ref. url: http://www.epa.gov/ttn/scram/7thconf/aermod/aersurface_userguide.pdf

Table 5-6. Summary of AERSURFACE Inputs

Parameter	Value
Surface roughness study radius	1 kilometer (km)
Bowen ratio and albedo study regions	10 km by 10 km
Vary by sector?	Yes: 0, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330
Temporal Resolution	Summer: June, July, August Autumn: September, October, November Winter: December, January, February Spring: March, April, May
Continuous snow-cover most of the winter?	No
Is the site near an airport?	No, for facility site Yes, for meteorological station site
Is the site an arid region?	No
Surface Moisture	1990: Dry 1991: Wet 1992: Wet 1993: Average 1994: Wet

Table 5-7. Surface Characteristics Surrounding the Facility

Sector	Seasons	Albedo	Bowen Ratio Dry	Bowen Ratio Average	Bowen Ratio Wet	Surface Roughness
1	Summer	0.14	0.46	0.29	0.18	0.478
	Autumn	0.14	0.69	0.45	0.22	0.478
	Winter	0.14	0.69	0.54	0.22	0.312
	Spring	0.14	0.64	0.40	0.20	0.348
2	Summer	0.14	0.46	0.29	0.18	0.372
	Autumn	0.14	0.69	0.45	0.22	0.372
	Winter	0.14	0.69	0.54	0.22	0.273
	Spring	0.14	0.64	0.40	0.20	0.298
3	Summer	0.14	0.46	0.29	0.18	0.431
	Autumn	0.14	0.69	0.45	0.22	0.431
	Winter	0.14	0.69	0.54	0.22	0.295
	Spring	0.14	0.64	0.40	0.20	0.324
4	Summer	0.14	0.46	0.29	0.18	0.470
	Autumn	0.14	0.69	0.45	0.22	0.469
	Winter	0.14	0.69	0.54	0.22	0.325
	Spring	0.14	0.64	0.40	0.20	0.359
5	Summer	0.14	0.46	0.29	0.18	0.478
	Autumn	0.14	0.69	0.45	0.22	0.477
	Winter	0.14	0.69	0.54	0.22	0.410
	Spring	0.14	0.64	0.40	0.20	0.436
6	Summer	0.14	0.46	0.29	0.18	0.555
	Autumn	0.14	0.69	0.45	0.22	0.555
	Winter	0.14	0.69	0.54	0.22	0.467
	Spring	0.14	0.64	0.40	0.20	0.521
7	Summer	0.14	0.46	0.29	0.18	0.339
	Autumn	0.14	0.69	0.45	0.22	0.339
	Winter	0.14	0.69	0.54	0.22	0.126
	Spring	0.14	0.64	0.40	0.20	0.155

Sector	Seasons	Albedo	Bowen Ratio Dry	Bowen Ratio Average	Bowen Ratio Wet	Surface Roughness
8	Summer	0.14	0.46	0.29	0.18	0.384
	Autumn	0.14	0.69	0.45	0.22	0.384
	Winter	0.14	0.69	0.54	0.22	0.107
	Spring	0.14	0.64	0.40	0.20	0.137
9	Summer	0.14	0.46	0.29	0.18	0.531
	Autumn	0.14	0.69	0.45	0.22	0.531
	Winter	0.14	0.69	0.54	0.22	0.277
	Spring	0.14	0.64	0.40	0.20	0.337
10	Summer	0.14	0.46	0.29	0.18	0.390
	Autumn	0.14	0.69	0.45	0.22	0.390
	Winter	0.14	0.69	0.54	0.22	0.120
	Spring	0.14	0.64	0.40	0.20	0.154
11	Summer	0.14	0.46	0.29	0.18	0.359
	Autumn	0.14	0.69	0.45	0.22	0.359
	Winter	0.14	0.69	0.54	0.22	0.115
	Spring	0.14	0.64	0.40	0.20	0.146
12	Summer	0.14	0.46	0.29	0.18	0.309
	Autumn	0.14	0.69	0.45	0.22	0.309
	Winter	0.14	0.69	0.54	0.22	0.148
	Spring	0.14	0.64	0.40	0.20	0.175

Table 5-8. Surface Characteristics Surrounding the Airport

Sector	Seasons	Albedo	Bowen Ratio Dry	Bowen Ratio Average	Bowen Ratio Wet	Surface Roughness
1	Summer	0.15	0.68	0.38	0.24	0.068
	Autumn	0.15	0.99	0.57	0.30	0.062
	Winter	0.15	0.99	0.63	0.30	0.039
	Spring	0.15	0.88	0.48	0.26	0.048
2	Summer	0.15	0.68	0.38	0.24	0.074
	Autumn	0.15	0.99	0.57	0.30	0.068
	Winter	0.15	0.99	0.63	0.30	0.051
	Spring	0.15	0.88	0.48	0.26	0.059
3	Summer	0.15	0.68	0.38	0.24	0.063
	Autumn	0.15	0.99	0.57	0.30	0.057
	Winter	0.15	0.99	0.63	0.30	0.029
	Spring	0.15	0.88	0.48	0.26	0.037
4	Summer	0.15	0.68	0.38	0.24	0.061
	Autumn	0.15	0.99	0.57	0.30	0.054
	Winter	0.15	0.99	0.63	0.30	0.033
	Spring	0.15	0.88	0.48	0.26	0.041
5	Summer	0.15	0.68	0.38	0.24	0.076
	Autumn	0.15	0.99	0.57	0.30	0.072
	Winter	0.15	0.99	0.63	0.30	0.043
	Spring	0.15	0.88	0.48	0.26	0.051
6	Summer	0.15	0.68	0.38	0.24	0.088
	Autumn	0.15	0.99	0.57	0.30	0.084
	Winter	0.15	0.99	0.63	0.30	0.036
	Spring	0.15	0.88	0.48	0.26	0.045
7	Summer	0.15	0.68	0.38	0.24	0.062
	Autumn	0.15	0.99	0.57	0.30	0.056
	Winter	0.15	0.99	0.63	0.30	0.041
	Spring	0.15	0.88	0.48	0.26	0.048

Sector	Seasons	Albedo	Bowen Ratio Dry	Bowen Ratio Average	Bowen Ratio Wet	Surface Roughness
8	Summer	0.15	0.68	0.38	0.24	0.053
	Autumn	0.15	0.99	0.57	0.30	0.046
	Winter	0.15	0.99	0.63	0.30	0.027
	Spring	0.15	0.88	0.48	0.26	0.035
9	Summer	0.15	0.68	0.38	0.24	0.035
	Autumn	0.15	0.99	0.57	0.30	0.029
	Winter	0.15	0.99	0.63	0.30	0.017
	Spring	0.15	0.88	0.48	0.26	0.024
10	Summer	0.15	0.68	0.38	0.24	0.069
	Autumn	0.15	0.99	0.57	0.30	0.063
	Winter	0.15	0.99	0.63	0.30	0.050
	Spring	0.15	0.88	0.48	0.26	0.059
11	Summer	0.15	0.68	0.38	0.24	0.148
	Autumn	0.15	0.99	0.57	0.30	0.136
	Winter	0.15	0.99	0.63	0.30	0.087
	Spring	0.15	0.88	0.48	0.26	0.110
12	Summer	0.15	0.68	0.38	0.24	0.060
	Autumn	0.15	0.99	0.57	0.30	0.052
	Winter	0.15	0.99	0.63	0.30	0.034
	Spring	0.15	0.88	0.48	0.26	0.044

Land cover at the facility is different compared with land cover at the meteorological station. The facility is located in a more rural setting with agricultural fields and tree cover. The meteorological station is located in a more urban setting surrounded by commercial facilities, and roads. In terms of surface characteristics, the bowen ratios determined for the meteorological station are roughly 30% higher, and aerodynamic surface roughness lengths for the airport are roughly 140% lower. Albedo is roughly the same between the facility and meteorological station due to the similarities in surface reflectivity for the range of land cover types observed at both locations. Based on the relatively significant differences between meteorological station and facility surface roughness, the AERSURFACE land cover analysis should be centered on the facility. The AERSURFACE output from the analysis centered on the facility was provided to GA EPD for processing in AERMET.

5.5.4 RECEPTORS

All receptor elevations and hill height scaling factors (for AERMOD) were calculated using AERMAP (version 09040). AERMAP input data consists of 1-arc-second resolution (or ~30 meters) USGS NED terrain data obtained from the USGS Seamless server.

As mentioned above, receptors with elevations below minimum stack height are modeled in ISC3, whereas the AERMOD model is used for receptors with elevations greater than minimum stack height. The minimum release height is taken from Kiln #3 door openings at 13.7 meters above sea level. Terrain near the facility is relatively flat and below the minimum release height; consequently, AERMOD receptors are predominately confined to the medium and coarse receptor grids. Receptors modeled by ISC3 are located at the fence line, as well as the fine, medium, and coarse receptor grids.

For the short-term averaging periods (15-minute and 24-hour) receptor grid extents and spacing are as follows:

- Fence: 100 meter spacing along the fenceline (ISC3)

- Fine grid: 100 meter spacing, extending 2,000 meters from the facility (ISC3 and AERMOD)
- Medium grid: 250 meter spacing, extending between 2,000-5,000 meters (ISC3 and AERMOD)
- Coarse grid: 500 meter spacing, extending between 5,000-15,000 meters (ISC3 and AERMOD)

For the annual average period, only discrete receptors placed at each residence or place of business surrounding the facility fence line (i.e., as determined by satellite imagery) are included in the modeling. These are the locations where humans are expected to be generally exposed to emissions from the facility on an annual or life-time basis.

Figures 6 to 8 show the location of the receptors and surrounding terrain.

5.6 TOXICS MODELING RESULTS

Results from ISC3 and AERMOD are calculated on 1-hour, 24-hour, and 5-year period averages. The 15-minute average concentration is calculated by multiplying the 1-hour concentration by 1.32. The maximum 1st high receptor concentrations for all averaging periods are compared with AACs.[13]

Modeling results are shown in Table 5-8 and a concentration plots are provided in Figures 8 to 14. The modeling results show that impacts from the project are below all AACs. Therefore, project air toxic emissions are within acceptable guideline levels prescribed for the protection of human health. The highest predicted concentrations are located to the northeast of the modeled sources either on the facility fenceline (for short term averaging periods) or house receptor (for the annual averaging periods).

Table 5-8. Toxics Modeling Results

Pollutant	Averaging Period	AAC[(1)] ($\mu g/m^3$)	Model Result ($\mu g/m^3$)	Result < AAC?
Acetaldehyde	Annual	5	0.7	YES
	15-min	4,500	112	YES
Formaldehyde	Annual	1.1	0.88	YES
	15-min	245	117	YES
Propionaldehyde	Annual	8	0.03	YES
Methanol	24-hr	619	75.9	YES
	15-min	32,800	638	YES

(1) See Table 5-2.

[13] Review of State Air Toxics Air Dispersion Modeling Protocol Proposed Addition of 2 Kilns to the Simpson Lumber Co. Site, Effingham Co., GA, October 28, 2010. Peter S. Courtney, P.E. Georgia Natural Resources Department, Environmental Protection Division, Air Protection Branch.

6. ADDITIONAL IMPACTS ANALYSIS

An additional impacts analysis considers an analysis of impairment to visibility, soils and vegetation, and growth associated with the proposed project.

6.1 VISIBILITY IMPAIRMENT

Since VOCs are the only pollutant of concern in this proposed modification, no visibility screening analysis was performed. No adverse impact to visibility degradation is expected as a result of the project.

6.2 SOIL AND VEGETATION ANALYSIS

No sensitive aspects of the soil and vegetation in the area surrounding the facility have been identified. Consequently, the evaluation of the secondary NAAQS can be used to demonstrate that the increase in pollutants from the proposed project will not result in harmful effects. There are no secondary NAAQS established for VOCs. However, based on the HAP air quality evaluation, the increase in VOCs from the proposed project is not expected have an adverse impact upon local soils and vegetation.

6.3 GROWTH ANALYSIS

The purpose of the growth analysis is to predict and quantify how much new growth is likely to occur as a result of the modification and estimate the emissions that will result from the associated growth. The proposed project is not expected to create any growth in the region.

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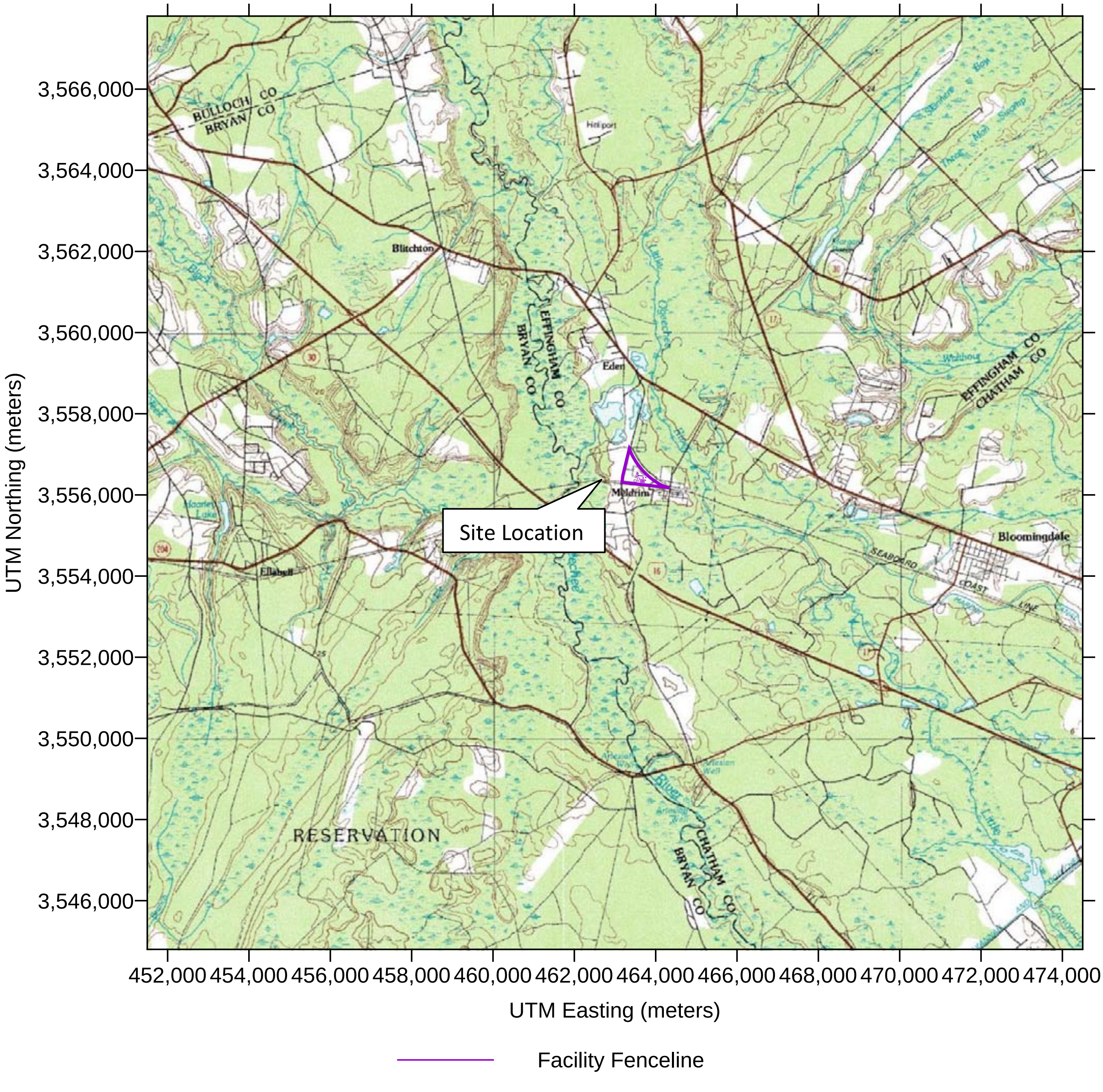
FIGURES



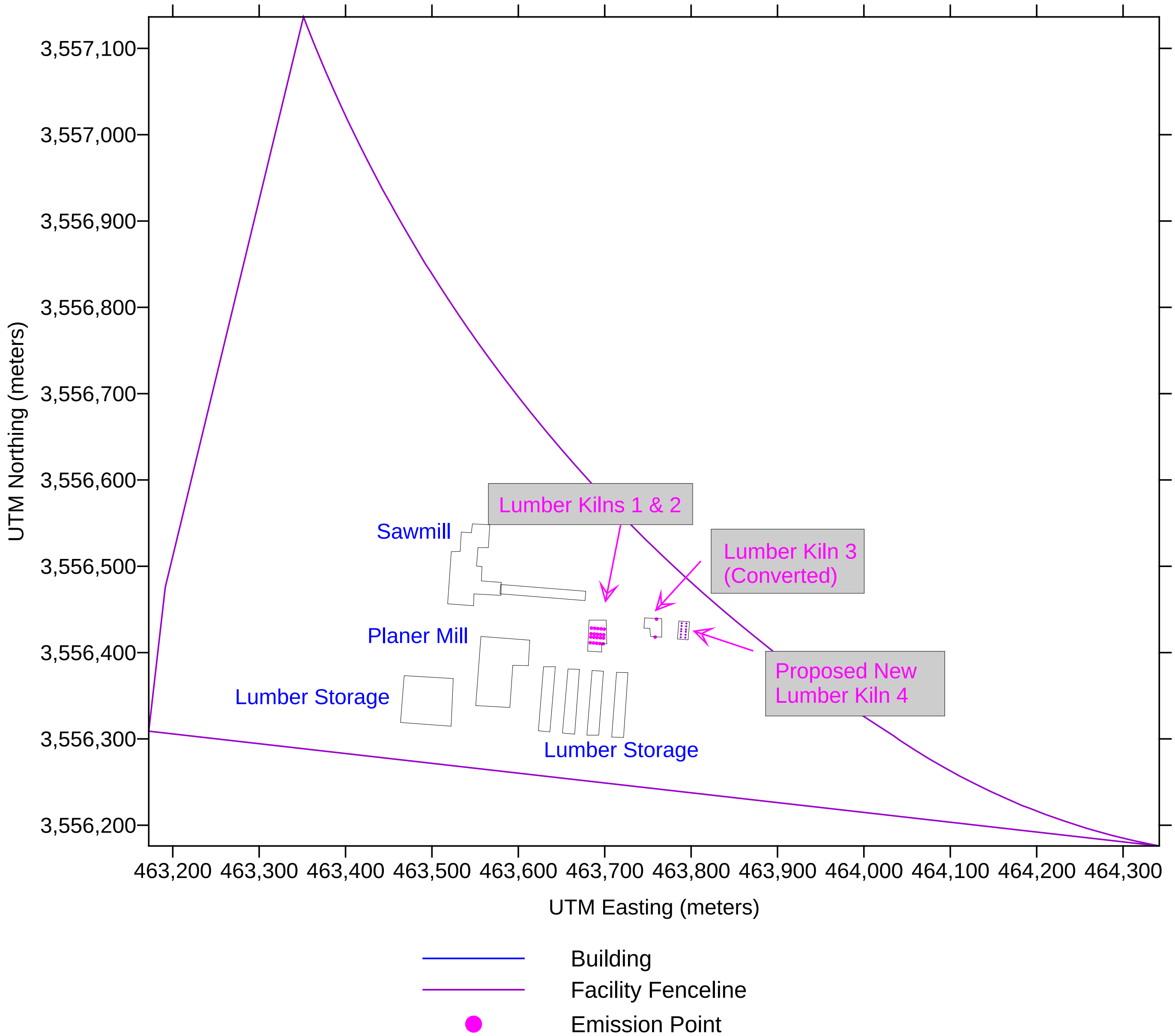
UTM ZONE 17, NAD 83

SCALE

0km 1km 2km 3km 4km

SLR

Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing FACILITY AND SURROUNDING AREA		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name Surrounding Area.srf	Project No. 108.00217.00008	1



UTM ZONE 17, NAD 83

SCALE

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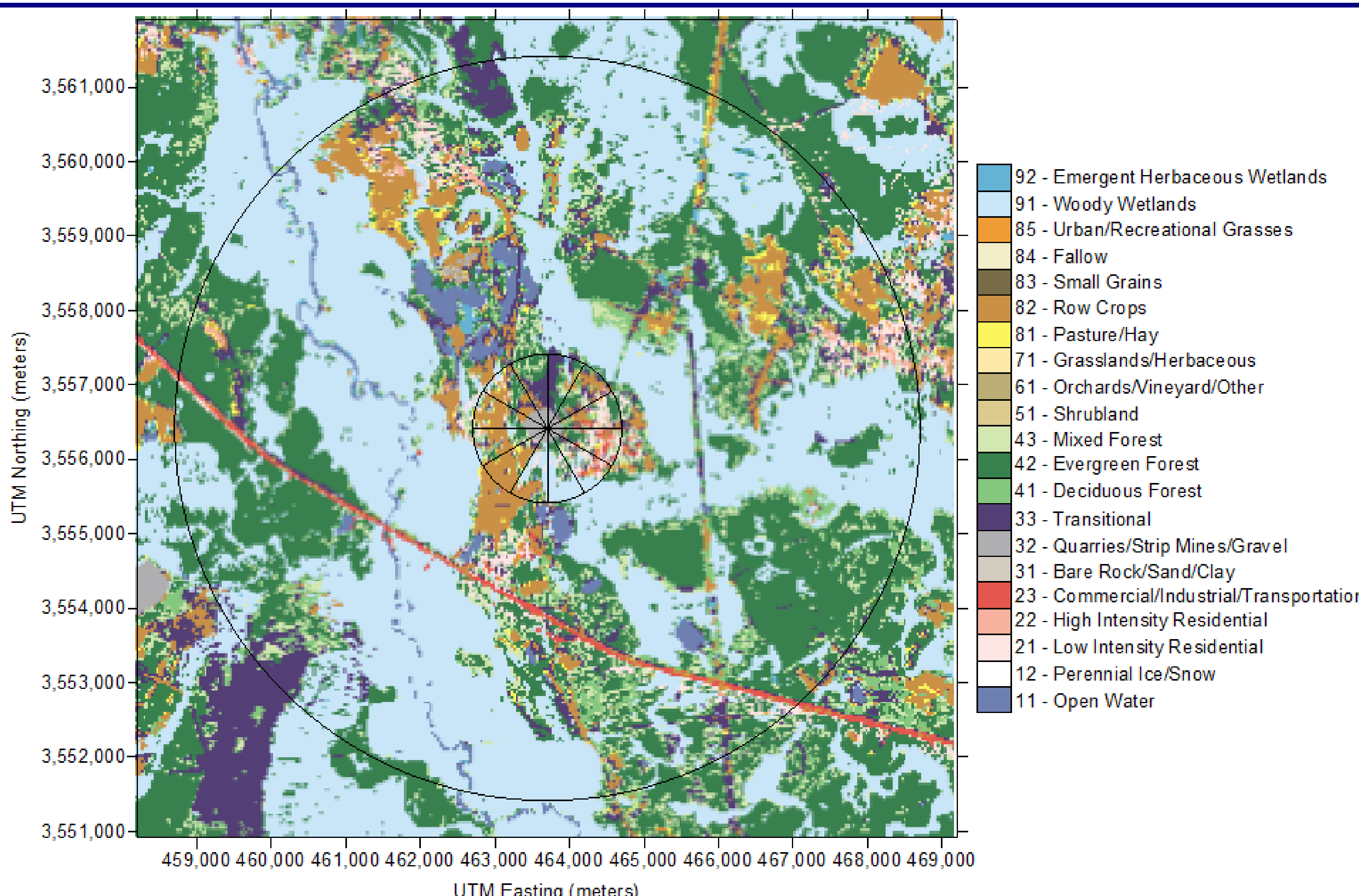
Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing SOURCES, MAJOR BUILDINGS, AND FENCELINE		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name Facility.srf	Project No. 108.00217.00008	2



UTM ZONE 17, NAD 83

SCALE

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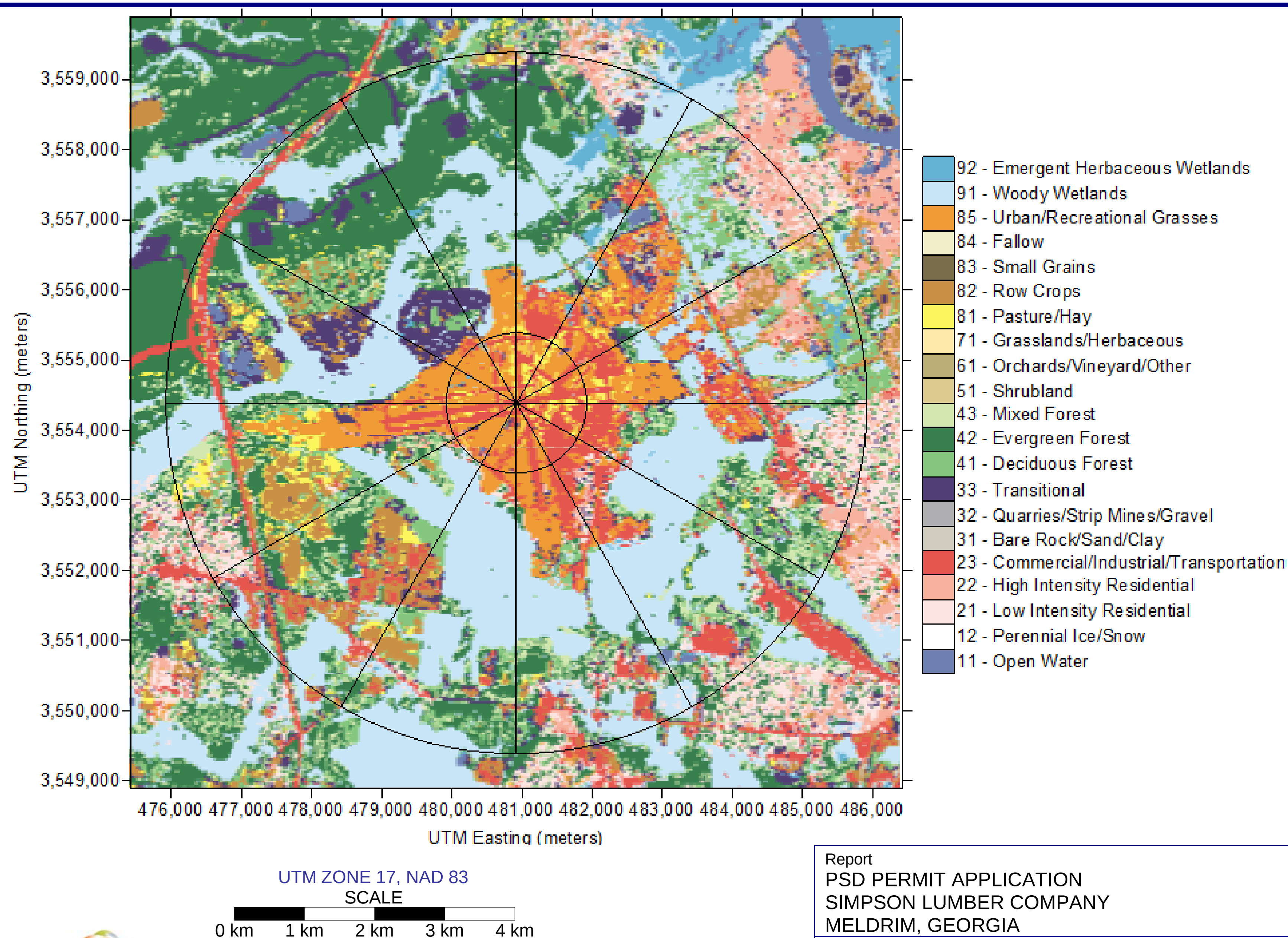
SLR

Report
PSD PERMIT APPLICATION
SIMPSON LUMBER COMPANY
MELDRIM, GEORGIA

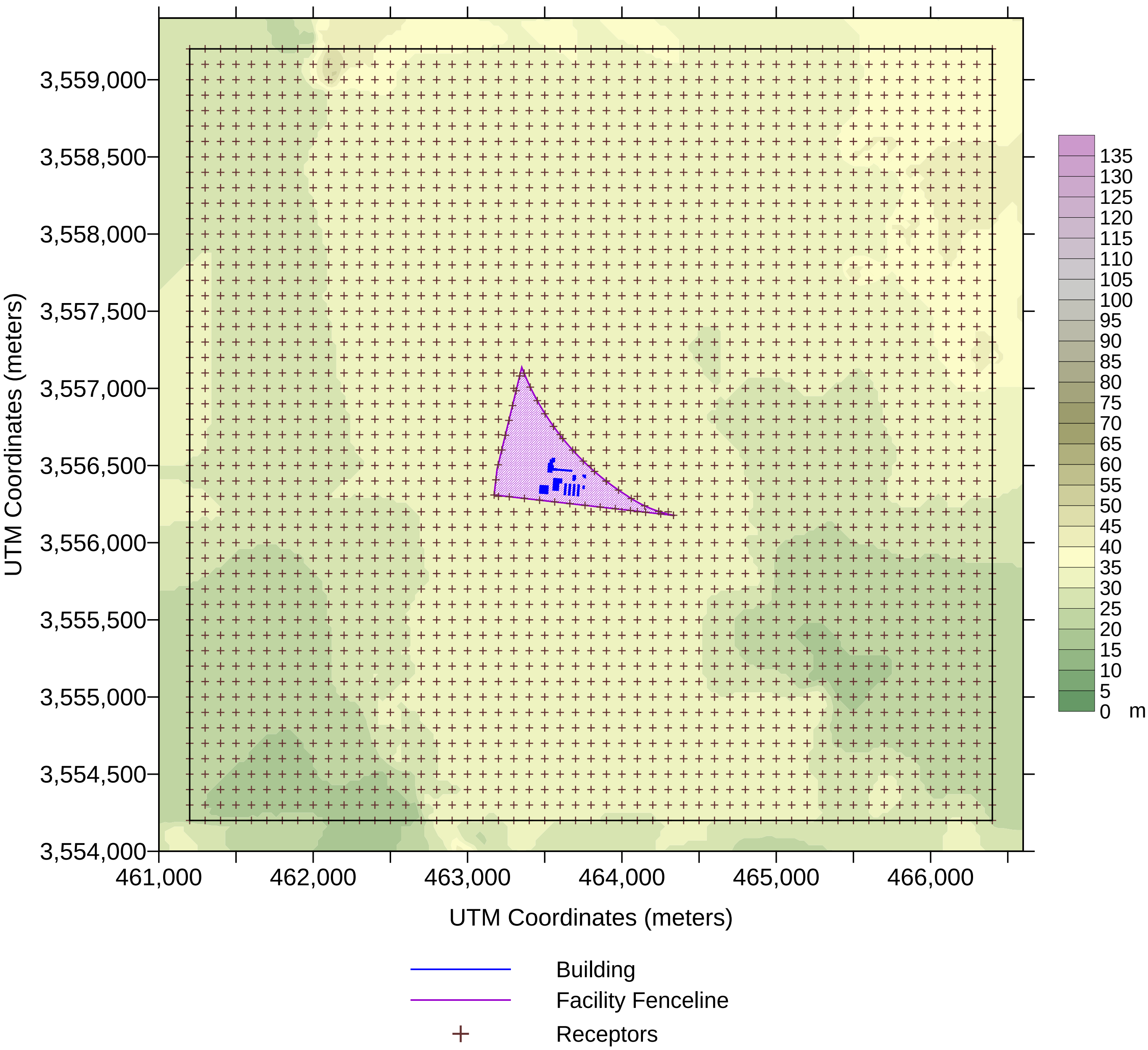
Drawing
NLCD92 LAND USE SURROUNDING FACILITY

Date October 2011	Scale AS SHOWN	Fig. No.
File Name Land Use_facility	Project No. 108.00217.00008	3



SLR

Report		
PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing NLCD92 LAND USE SURROUNDING MET STATION		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name Land Use_met	Project No. 108.00217.00008	4



UTM ZONE 17, NAD 83
SCALE
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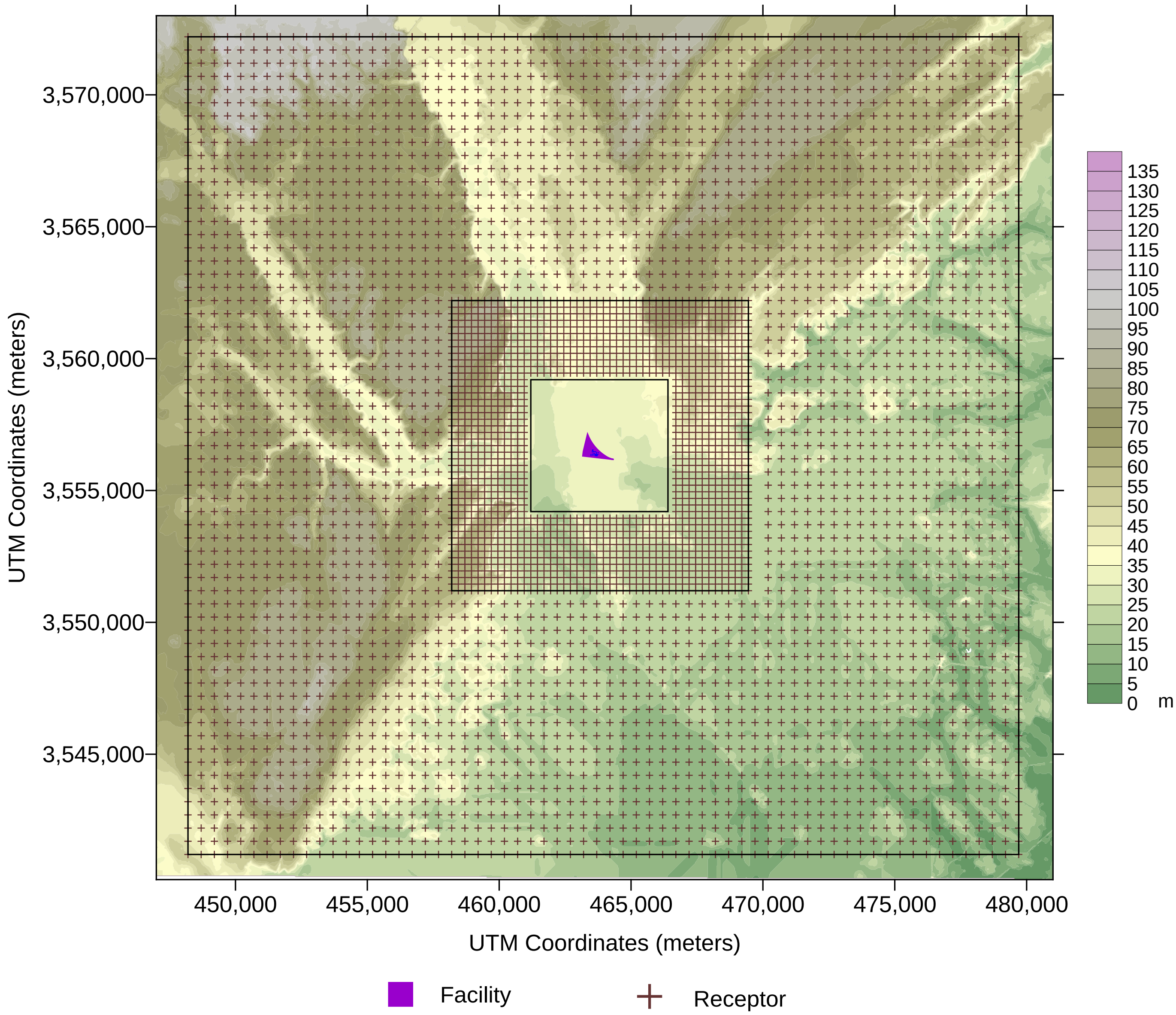
SLR

Report		
PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing FINE RECEPTOR GRID		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name Receptor Grids_fine	Project No. 108.00217.00008	5



UTM ZONE 17, NAD 83

SCALE

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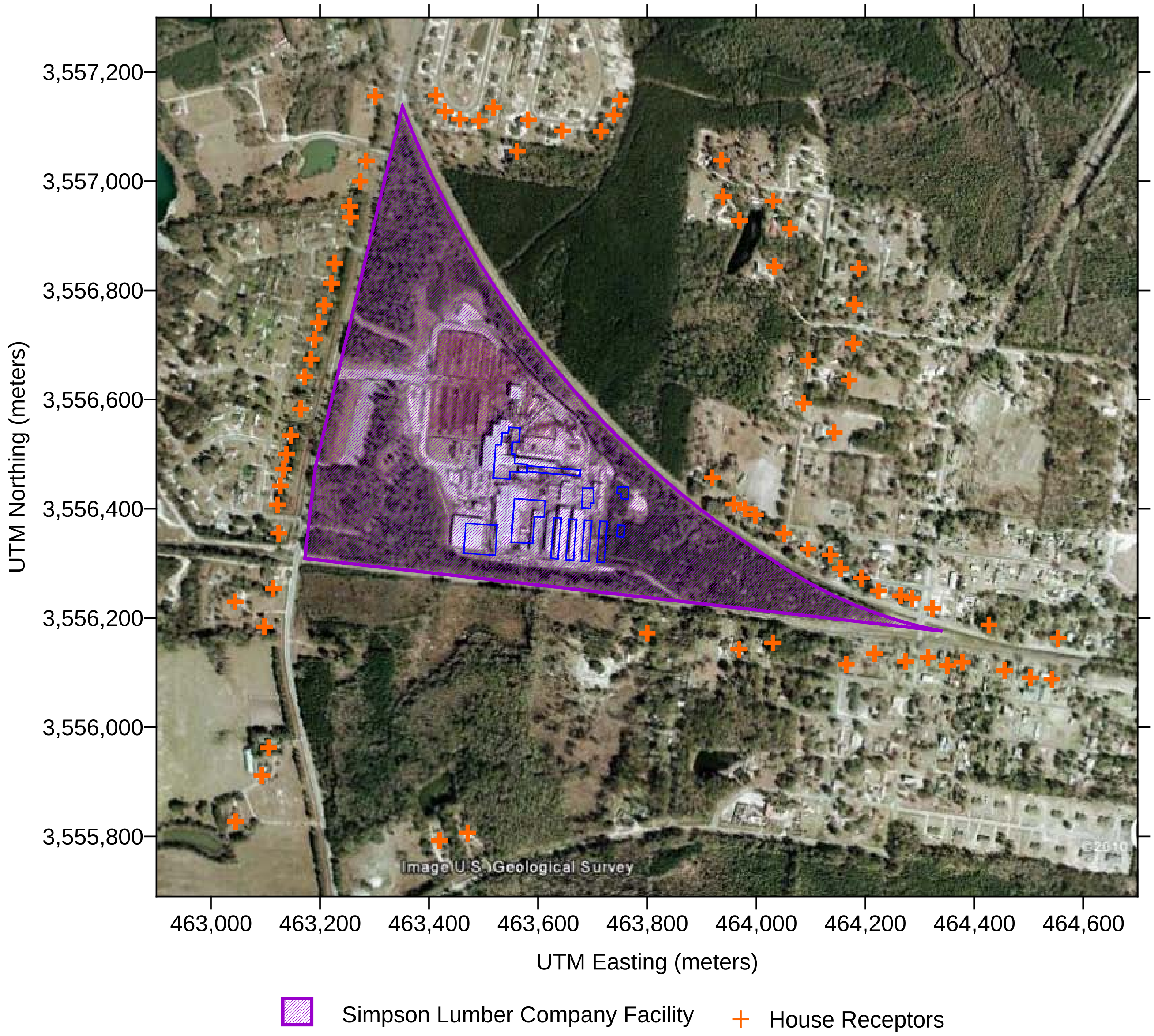
Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing MEDIUM & COARSE RECEPTOR GRID		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name Receptor Grids_Coarse & Med	Project No. 108.00217.00008	6



UTM ZONE 17, NAD 83
SCALE
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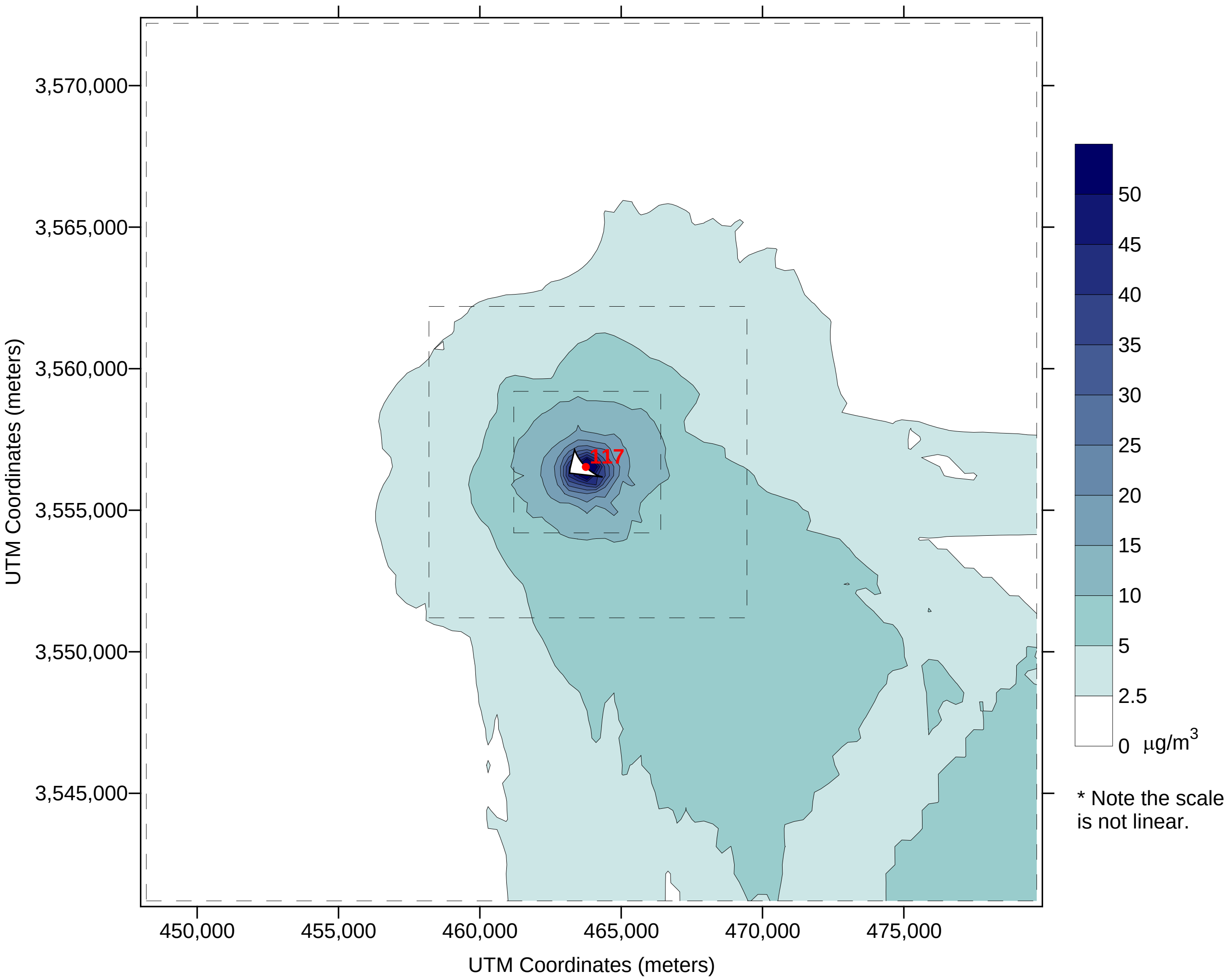
SLR

Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing HOUSE RECEPTORS		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name House Receptors v2	Project No. 108.00217.00008	7



UTM ZONE 17, NAD 83

SCALE

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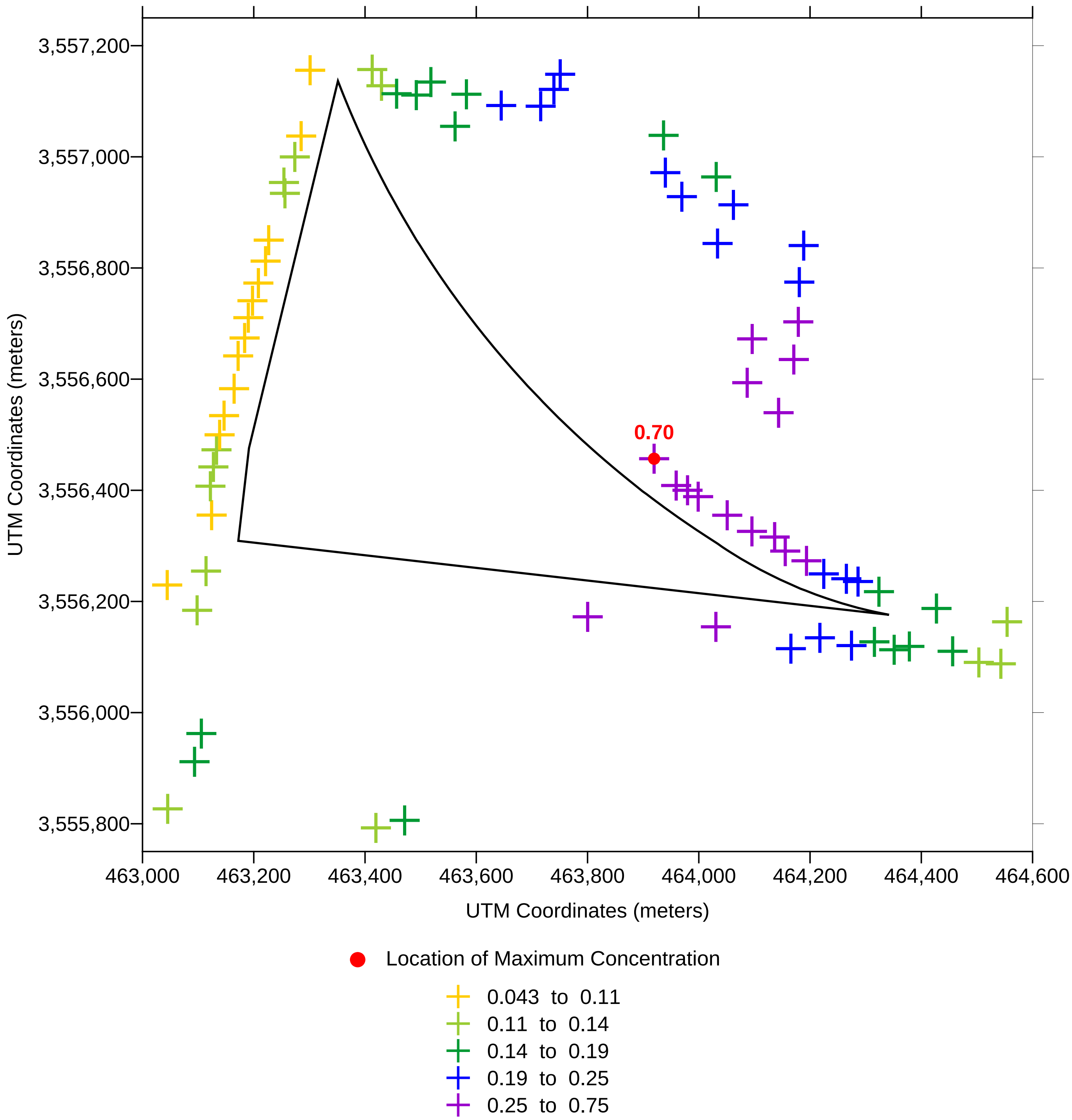
SLR

Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing ACETALDEHYDE CONCENTRATION 15-MIN AVERAGE		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name ACET15min	Project No. 108.00217.00008	8



UTM ZONE 17, NAD 83

SCALE

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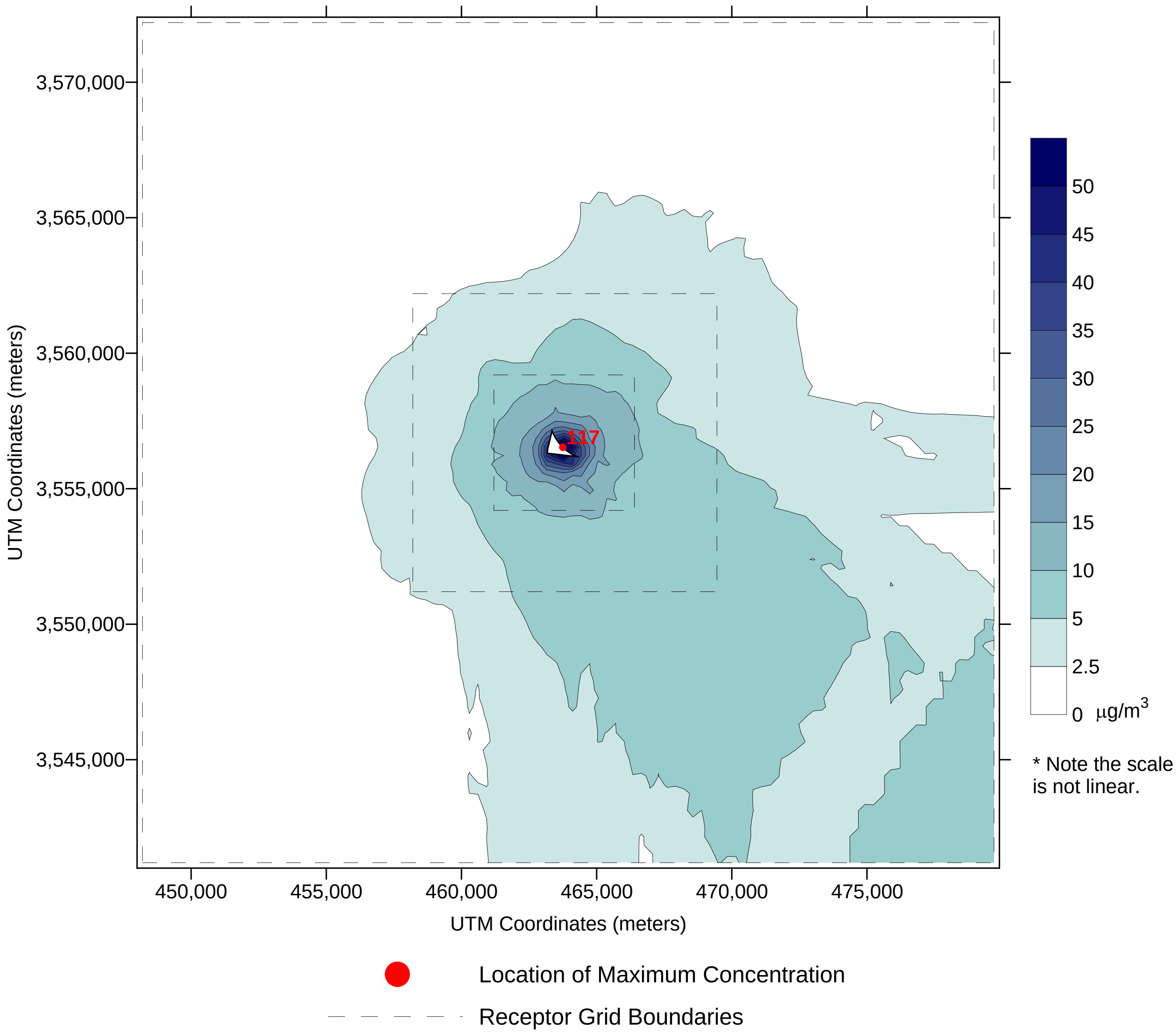
SLR

Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing ACETALDEHYDE CONCENTRATION ANNUAL AVERAGE		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name ACETA	Project No. 108.00217.00008	9



UTM ZONE 17, NAD 83

SCALE

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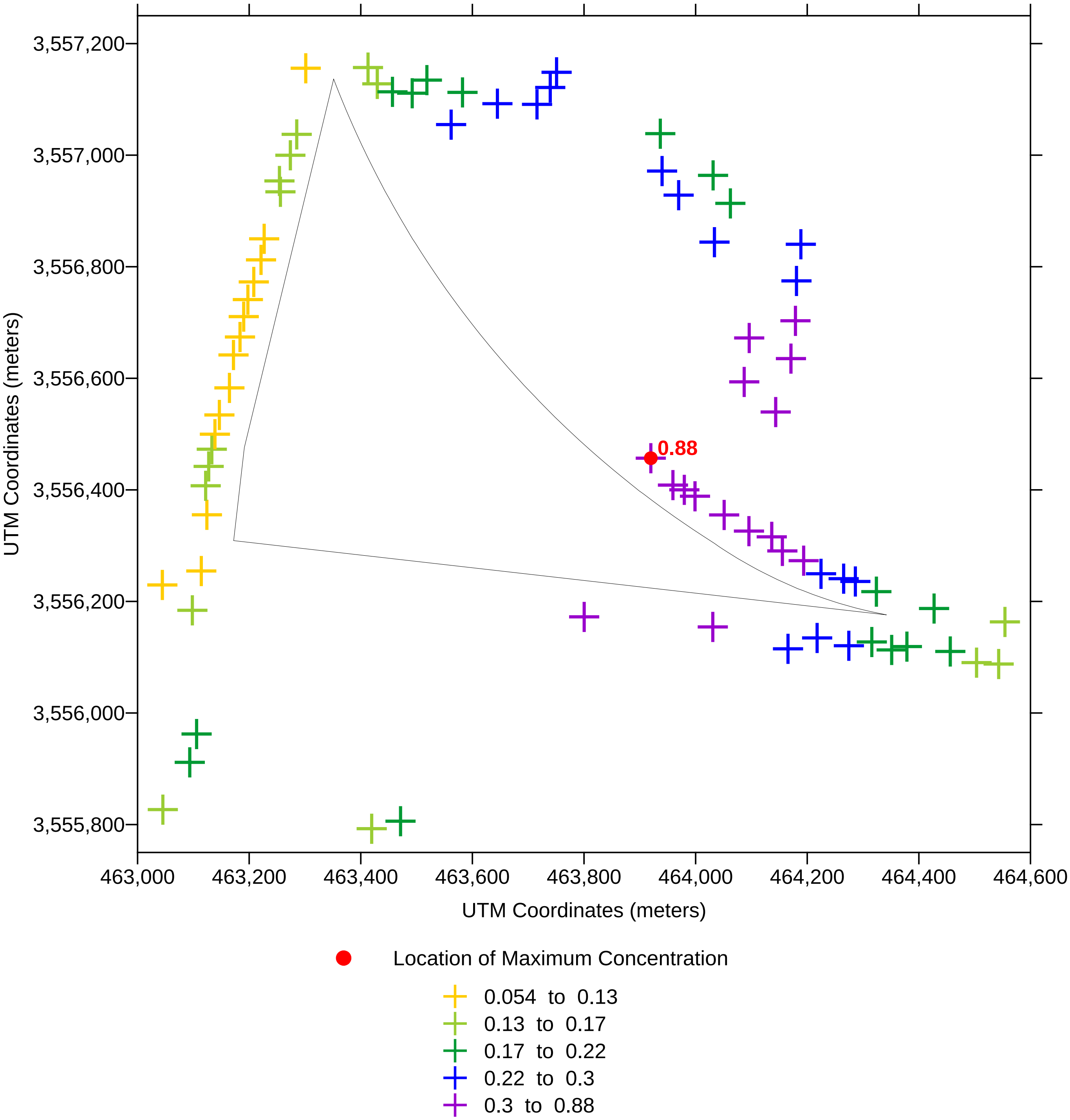
SLR

Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing FORMALDEHYDE CONCENTRATION 15-MIN AVERAGE		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name FORM15min	Project No. 108.00217.00008	**10**



UTM ZONE 17, NAD 83

SCALE

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SLR

Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
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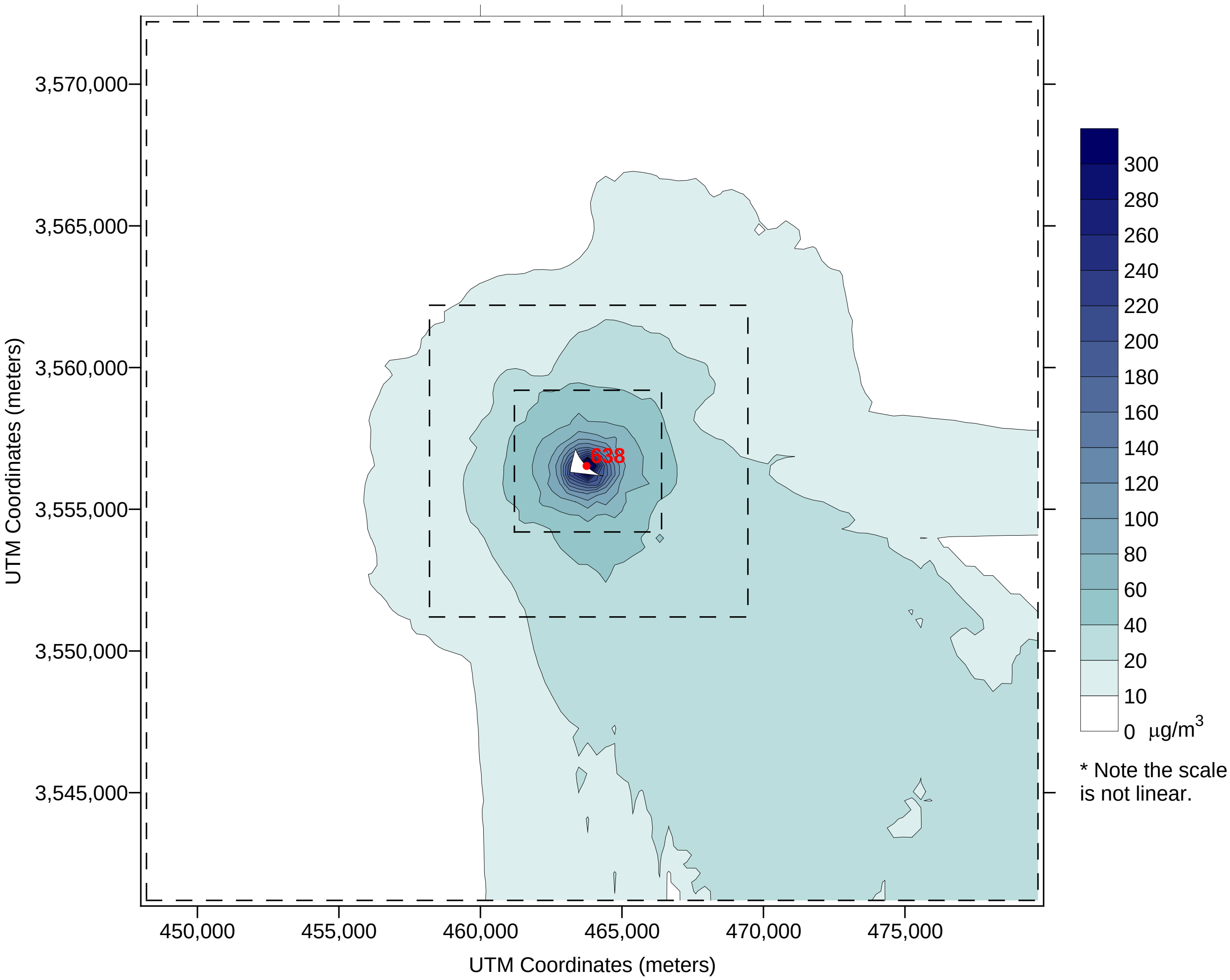
Date October 2011	Scale AS SHOWN	Fig. No.
File Name FORMA	Project No. 108.00217.00008	11



UTM ZONE 17, NAD 83
SCALE
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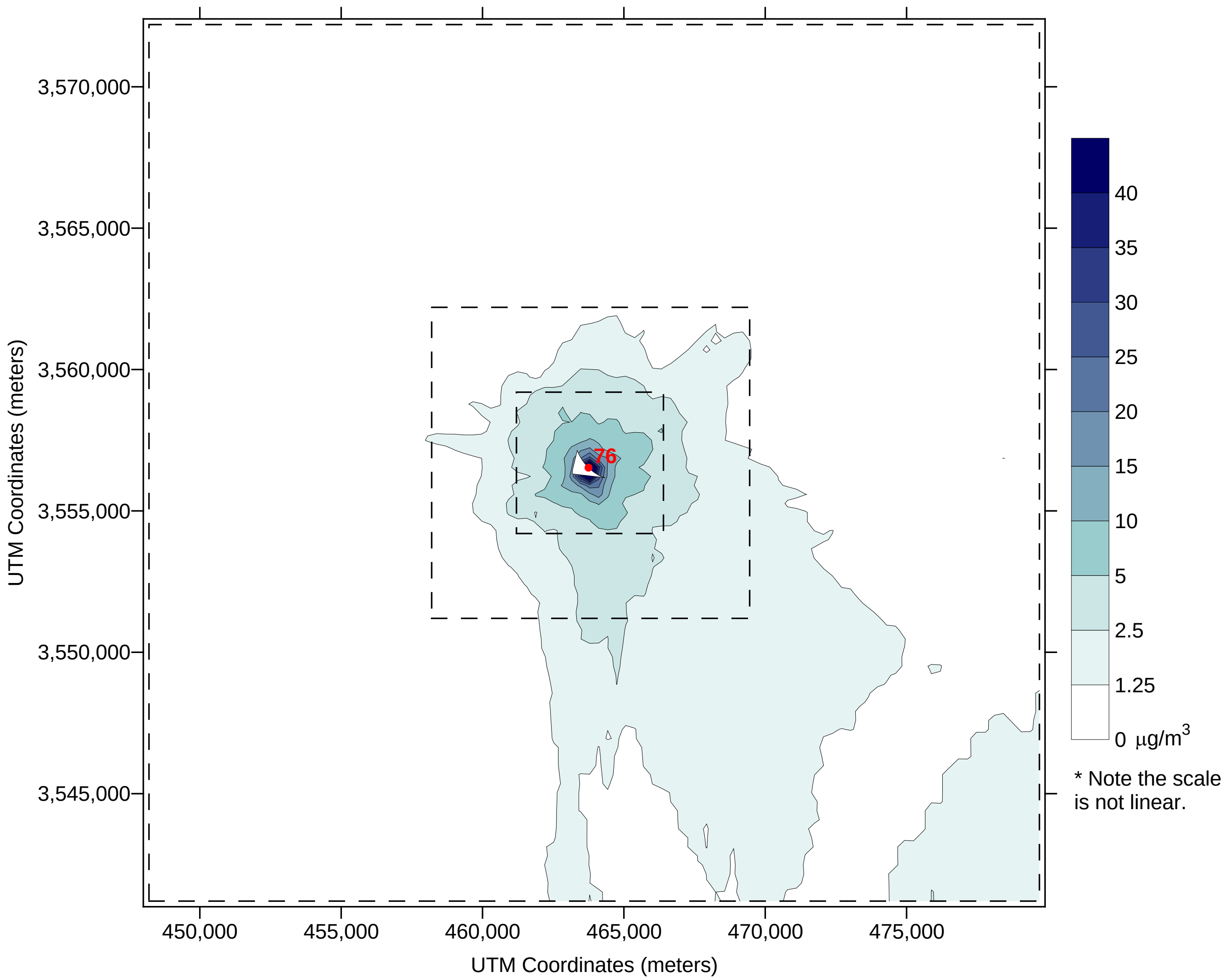
Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing METHANOL CONCENTRATION 15-MIN AVERAGE		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name METH15min	Project No. 108.00217.00008	**12**



UTM ZONE 17, NAD 83

SCALE

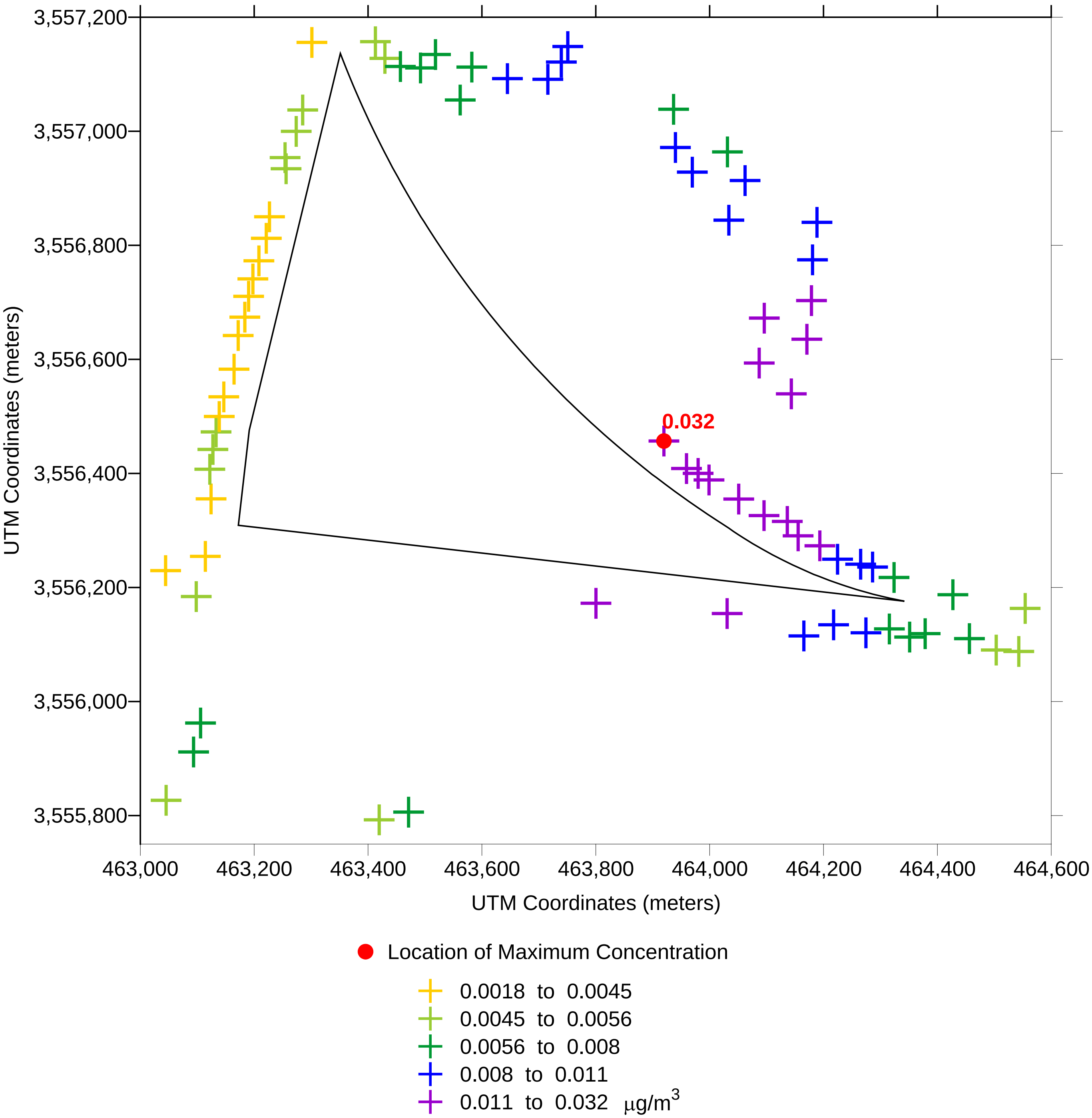
0km 2km 4km 6km 8km

SLR

Report
PSD PERMIT APPLICATION
SIMPSON LUMBER COMPANY
MELDRIM, GEORGIA

Drawing
METHANOL CONCENTRATION 24-HR AVERAGE

Date October 2011	Scale AS SHOWN	Fig. No.
File Name METH24	Project No. 108.00217.00008	13



UTM ZONE 17, NAD 83

SCALE

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SLR

Report PSD PERMIT APPLICATION SIMPSON LUMBER COMPANY MELDRIM, GEORGIA		
Drawing PROPIONALDEHYDE CONCENTRATION ANNUAL AVERAGE		
Date October 2011	Scale AS SHOWN	Fig. No.
File Name PROPA	Project No. 108.00217.00008	14

APPENDIX A

DETAILED EMISSION CALCULATIONS

Table 1. Annual Production/Fuel Consumption
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Emission Source	Unit	2004-2005 Average Production	Projected Maximum Production(1)
Direct Fired Lumber Drying Kiln #4 (new)			
Material Processed (Southern Yellow Pine Lumber)	MBF	--	73,000
Fuel Consumption (planer mill shavings)	tons	--	12,775
Direct Fired Lumber Drying Kiln #3 (Conversion from Batch to Continuous)			
Material Processed (Southern Yellow Pine Lumber)	MBF	42,034	65,000
Fuel Consumption (planer mill shavings)	tons	7,356	7,963
Cyclones and Baghouse			
Wood Shaving Cyclone	tons	24,292	44,178
Trim Block Chipper Cyclone	tons	3,738	6,798
Fuel Silo Cyclone	tons	22,068	39,918
Truck Bin Baghouse	tons	28,030	50,977

Notes:
(1) Maximum production are provided by Simpson. Simpsson assumes the fuel consumption rate of a direct-fired batch kiln is 350 lb of shavings per 1,000 board feet of dried lumber and continuous kilns generally consumes about 30% less fuel than batch kilns.

Table 2. New Dry Kiln #4 Potential Emissions
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Pollutant	Emission Factor			Potential Emissions[b,c] (tons/yr)
Criteria Pollutants				
PM	4.07E-01	lb/MBF	(a)	14.87
PM_{10}	2.47E-01	lb/MBF	(1)	9.03
$PM_{2.5}$	2.27E-01	lb/MBF	(1)	8.27
SO_2	2.50E-02	lb/MMBtu	(4)	2.71
NO_X	2.80E-01	lb/MBF	(2)	10.22
CO	6.70E-01	lb/MBF	(2)	24.46
VOC	3.83E+00	lb/MBF	(2,3)	139.63
CO_2	2.07E+02	lb/MMBtu	(5)	22,455.90
CH_4	7.00E-02	lb/MMBtu	(5)	7.60
N_2O	9.00E-03	lb/MMBtu	(5)	0.98
CO_2-e	--	--	(d)	22,918.48
Hazardous Air Pollutants				
Acetaldehyde	2.8E-02	lb/MBF	(6)	1.02
Acrolein	6.0E-03	lb/MBF	(6)	0.22
Formaldehyde	4.0E-02	lb/MBF	(6)	1.46
Propionaldehyde	1.0E-03	lb/MBF	(6)	0.04
Methanol	1.6E-01	lb/MBF	(6)	5.84
Total HAPs	**2.4E-01**	**lb/MBF**		**8.58**

Calculations:

(a) Total PM Emission Factor (lb/MBF) = Filterable PM Emission Factor (lb/MBF) + Condensable PM Emission Factor (lb/MBF)

Filterable PM Emission Factor (lb/MBF) =	3.2E-01	(2)
Condensable PM Emission Factor (lb/MBF) =	8.7E-02	(7)

(b) Annual Emissions (tons/yr) = [Material Processed (MBF/yr)] x [Emission Factor (lbs/MBF)] / [2,000 lbs/ton]

Material Processed (MBF/yr) =	73,000	(8)

(c) Annual Emissions (tons/yr) = [Annual Fuel Usage (tons/yr)] x [Heating Value (Btu/lb) x 2,000 lb/ton x 1 MMBtu/1,000,000 Btu] x [Emission Factor (lb/MMBtu)] / [2,000 lbs/ton]

Annual fuel usage (tons/yr) =	12,775	(8)
Heating Value (Btu/lb) =	8,500	(9)

(d) Total CO_2 Equivalent Emissions (metric ton/yr) = [CO_2 Emissions] + [CH_4 Emissions * CH_4 Global Warming Potential] + [N_2O Emissions * N_2O Global Warming Potential]

CH_4 Global Warming Potential =	21	(5)
N_2O Global Warming Potential =	310	(5)

Notes:

(1) PM_{10} represents 50% of PM (filterable) per GA EPD guidance. $PM_{2.5}$ estimated as 87% of PM_{10} (filterable) based on AP-42 for wood combustion. All of the condensable PM are included in the PM10 and PM2.5 emission factors per GA EPD's instruction.
(2) Based on emission factors for southern pine direct fired batch lumber drying kiln from 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.
(3) NCASI emission factor for VOC is converted to total VOC as per guidance in GA DEP's recently issued Rayonier Wood Products' PSD permit.
(4) AP-42 Table 1.6-2 for Wood Residue Combustion.
(5) Part 98 - Mandatory Greenhouse Gas Reporting, Table A-1, Table C-1, & Table C-2
(6) Updated NCASI Emission Factors for Southern Pine Lumber Kilns provided by David Word (August, 2004).
(7) Condensable PM emission factor is currently not available for continuous direct fired kiln. The proposed emission factor is based on the ratio of condensable and filterable emission factors for southern pine direct fired (gassifier) batch kilns from unpublished NCASI data provided by David Word.
(8) See Table 1.
(9) Heating Value from Title V Permit Application.

Table 3. Existing Kiln #3 (Modification) Potential Emissions
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Pollutant	Emission Factor			Potential Emissions[b,c] (tons/yr)
Criteria Pollutants				
PM	1.38E-01	lb/MBF	(a)	4.48
PM_{10}	1.04E-01	lb/MBF	(1)	3.37
$PM_{2.5}$	9.91E-02	lb/MBF	(1)	3.22
SO_2	2.50E-02	lb/MMBtu	(4)	1.69
NO_X	2.80E-01	lb/MBF	(2)	9.10
CO	6.70E-01	lb/MBF	(2)	21.78
VOC	3.93E+00	lb/MBF	(2,3)	127.63
CO_2	2.07E+02	lb/MMBtu	(5)	13,996.48
CH_4	7.00E-02	lb/MMBtu	(5)	4.74
N_2O	9.00E-03	lb/MMBtu	(5)	0.61
CO_2-e	--	--	(d)	14,284.80
Hazardous Air Pollutants				
Acetaldehyde	2.8E-02	lb/MBF	(6)	0.91
Acrolein	6.0E-03	lb/MBF	(6)	0.20
Formaldehyde	2.8E-02	lb/MBF	(7)	0.92
Propionaldehyde	1.0E-03	lb/MBF	(6)	0.03
Methanol	1.6E-01	lb/MBF	(6)	5.20
Total HAPs	**2.2E-01**	**lb/MBF**		**7.25**

Calculations:

(a) Total PM Emission Factor (lb/MBF) = Filterable PM Emission Factor (lb/MBF) + Condensable PM Emission Factor (lb/MBF)

Filterable PM Emission Factor (lb/MBF) =	6.83E-02	(7)
Condensable to Filterable Ratio =	1.016	(8)
Condensable PM Emission Factor (lb/MBF) =	6.94E-02	(8)

(b) Annual Emissions (tons/yr) = [Material Processed (MBF/yr)] x [Emission Factor (lbs/MBF)] / [2,000 lbs/ton]

Material Processed (MBF/yr) =	65,000	(9)

(c) Annual Emissions (tons/yr) = [Annual Fuel Usage (tons/yr)] x [Heating Value (Btu/lb) x 2,000 lb/ton x 1 MMBtu/1,000,000 Btu] x [Emission Factor (lb/MMBtu)] / [2,000 lbs/ton]

Annual fuel usage (tons/yr) =	7,963	(9)
Heating Value (Btu/lb) =	8,500	(10)

(d) Total CO_2 Equivalent Emissions (metric ton/yr) = [CO_2 Emissions] + [CH_4 Emissions * CH_4 Global Warming Potential] + [N_2O Emissions * N_2O Global Warming Potential]

CH_4 Global Warming Potential =	21	(5)
N_2O Global Warming Potential =	310	(5)

Notes:

(1) PM_{10} represents 50% of PM (filterable) per GA EPD guidance. $PM_{2.5}$ estimated as 87% of PM_{10} (filterable) based on AP-42 for wood combustion. All of the condensable PM are included in the PM10 and PM2.5 emission factors per GA EPD's instruction.
(2) Based on emission factors for southern pine direct fired batch lumber drying kiln 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.
(3) NCASI emission factor for VOC is converted to total VOC as per guidance in GA DEP's recently issued Rayonier Wood Products' PSD permit.
(4) AP-42 Table 1.6-2 for Wood Residue Combustion.
(5) Part 98 - Mandatory Greenhouse Gas Reporting, Table A-1, Table C-1, & Table C-2
(6) Updated NCASI Emission Factors for Southern Pine Lumber Kilns provided by David Word (August, 2004).
(7) Based on the stack tests performed on a direct fired continuous lumber kilns at Bibler Brother Lumber Company, Russellville, AR. Average of 3 tests for PM and 2 tests for formaldehyde. 60% safety factor above this test result was applied for formaldehyde emissions.
(8) Condensable PM emission factor is currently not available for continuous direct fired kiln. The proposed emission factor is based on the ratio of condensable and filterable emission factors for southern pine direct fired (gassifier) batch kiln from unpublished NCASI data provided by David Word.
(9) See Table 1.
(10) Heating Value from Title V Permit Application.

Table 4. Cyclones Potential Emissions
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Source	Material Processed (tons/yr)[1]	Potential Emissions (tons/yr)		
		PM	PM_{10}	$PM_{2.5}$
Planer Mill Trim Block Chipper Cyclone (Medium Efficiency)	6,798	1.7E+00	8.5E-01	5.1E-01
Planer Mill Shavings Cyclone (High Efficiency)	44,178	1.1E+01	5.5E+00	3.3E+00
Fuel Silo Cyclone (High Efficiency)	39,918	1.0E+01	5.0E+00	3.0E+00

Calculations:

(a) Annual Emissions (tons/yr) = [Material Processed (tons/yr)] x [Emission Factor (lb/ton)] x [tons/2,000 lb]

	Medium Efficiency	High Efficiency	
PM Emission Factor (lb/ton) =	5.0E-01	2.0E-01	(2)
PM_{10} Emission Factor (lb/ton) =	2.5E-01	1.0E-01	(2)
$PM_{2.5}$ Emission Factor (lb/ton) =	1.5E-01	6.0E-02	(2)

Notes:

(1) See Table 1, Annual Production/Fuel Consumption

(2) Emission factor is obtained from the "Emission Factor Wood Product" prepared by Oregon Department of Environmental Quality (Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust - High Efficiency). PM_{10} is 50% of PM (Oregon) and $PM_{2.5}$ is 60% of PM10 (AP-42).

Table 5. Baghouse Potential Emissions
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Source	Material Processed (tons/yr)[1]	Potential Emissions (tons/yr)		
		PM	PM_{10}	$PM_{2.5}$
Planer Mill Truck Bin Baghouse	50,977	2.5E-02	2.5E-02	2.5E-02

Calculations:

(a) Annual Emissions (tons/yr) = [Material Processed (tons/yr)] x [Emission Factor (lb/ton)] x [tons/2,000 lb]

PM Emission Factor (lb/ton) =	1.0E-03	(2)
PM_{10} Emission Factor (lb/ton) =	1.0E-03	(2)
$PM_{2.5}$ Emission Factor (lb/ton) =	1.0E-03	(2)

Notes:

(1) See Table 1, Annual Production/Fuel Consumption

(2) Emission factor is obtained from the "Emission Factor Wood Product" prepared by Oregon Department of Environmental Quality (Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust - Baghouse Control). All is PM_{10} (Oregon) and $PM_{2.5}$.

Table 6. Existing Dry Kiln #3 - Past Actual Emissions
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Pollutant	Emission Factor			Past Actual Emissions[b,c] (tons/yr)
Criteria Pollutants				
PM	4.1E-01	lb/MBF	(a)	8.56
PM_{10}	2.5E-01	lb/MBF	(1)	5.20
$PM_{2.5}$	2.3E-01	lb/MBF	(1)	4.76
SO_2	2.5E-02	lb/MMBtu	(2)	1.56
NO_X	2.8E-01	lb/MBF	(3)	5.88
CO	6.7E-01	lb/MBF	(3)	14.08
VOC	3.8E+00	lb/MBF	(3,4)	80.40
CO_2	2.1E+02	lb/MMBtu	(5)	12,930.39
CH_4	7.0E-02	lb/MMBtu	(5)	4.38
N_2O	9.0E-03	lb/MMBtu	(5)	0.56
CO_2-e	--	--	(d)	13,196.75
Hazardous Air Pollutants				
Acetaldehyde	2.8E-02	lb/MBF	(6)	0.59
Acrolein	6.0E-03	lb/MBF	(6)	0.13
Formaldehyde	4.0E-02	lb/MBF	(6)	0.84
Propionaldehyde	1.0E-03	lb/MBF	(6)	0.02
Methanol	1.6E-01	lb/MBF	(6)	3.36
Total HAPs	**2.4E-01**	**lb/MBF**		**4.94**

Calculations:

(a) Total PM Emission Factor (lb/MBF) = Filterable PM Emission Factor (lb/MBF) + Condensable PM Emission Factor (lb/MBF)

Filterable PM Emission Factor (lb/MBF) = 3.2E-01 (3)

Condensable PM Emission Factor (lb/MBF) = 8.7E-02 (7)

(b) Annual Emissions (tons/yr) = [Material Processed (MBF/yr)] x [Emission Factor (lbs/MBF)] / [2,000 lbs/ton]

Past Material Processed (MBF/yr) = 42,034 (8)

(c) Annual Emissions (tons/yr) = [Annual Fuel Usage (tons/yr)] x [Heating Value (Btu/lb) x 2,000 lb/ton x 1 MMBtu/1,000,000 Btu] x [Emission Factor (lb/MMBtu)] / [2,000 lbs/ton]

Past Fuel Usage (tons/yr) = 7,356 (8)

Heating Value (Btu/lb) = 8,500 (9)

(d) Total CO_2 Equivalent Emissions (metric ton/yr) = [CO_2 Emissions] + [CH_4 Emissions * CH_4 Global Warming Potential] + [N_2O Emissions * N_2O Global Warming Potential]

CH_4 Global Warming Potential = 21 (5)

N_2O Global Warming Potential = 310 (5)

Notes:

(1) PM_{10} represents 50% of PM (filterable) per GA EPD guidance. $PM_{2.5}$ estimated as 87% of PM_{10} (filterable) based on AP-42 for wood combustion. All of the condensable PM are included in the PM10 and PM2.5 emission factors per GA EPD's instruction.
(2) AP-42 Table 1.6-2 for Wood Residue Combustion.
(3) Based on emission factors for southern pine direct fired batch lumber drying kiln from 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.
(4) NCASI emission factor for VOC is converted to total VOC as per guidance in GA EPD's recently issued Rayonier Wood Products' PSD permit.
(5) Part 98 - Mandatory Greenhouse Gas Reporting, Table A-1, Table C-1, & Table C-2
(6) Updated NCASI Emission Factors for Southern Pine Lumber Kilns provided by David Word (August, 2004).
(7)The condensable PM emission factor is based on the ratio of condensable and filterable emission factors for southern pine direct fired batch kiln from unpublished NCASI data provided by David Word.
(8) Average actual production/fuel usage of 2004 and 2005 provided by Simpson.
(9) Heating Value from Title V Permit Application.

Table 7. Cyclones Past Actual Emissions
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Source	Material Processed (tons/yr)(1)	Past Actual Emissions (tons/yr)		
		PM	PM_{10}	$PM_{2.5}$
Planer Mill Trim Block Chipper Cyclone	3,738	9.3E-01	4.7E-01	2.8E-01
Planer Mill Shavings Cyclone	24,292	6.1E+00	3.0E+00	1.8E+00
Fuel Silo Cyclone	22,068	5.5E+00	2.8E+00	1.7E+00

Calculations:

(a) Annual Emissions (tons/yr) = [Material Processed (tons/yr)] x [Emission Factor (lb/ton)] x [tons/2,000 lb]

PM Emission Factor (lb/ton) =	5.0E-01	(2)
PM_{10} Emission Factor (lb/ton) =	2.5E-01	(2)
$PM_{2.5}$ Emission Factor (lb/ton) =	1.5E-01	(2)

Notes:

(1) See Table 1, Annual Production/Fuel Consumption

(2) Emission factor is obtained from the "Emission Factor Wood Product" prepared by Oregon Department of Environmental Quality (Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust - Medium Efficiency). PM_{10} is 50% of PM (Oregon) and $PM_{2.5}$ is 60% of PM10 (AP-42).

Table 8. Baghouse Past Actual Emissions
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Source	Material Processed (tons/yr)(1)	Past Actual Emissions (tons/yr)		
		PM	PM_{10}	$PM_{2.5}$
Planer Mill Truck Bin Baghouse	28,030	1.4E-02	1.4E-02	1.4E-02

Calculations:

(a) Annual Emissions (tons/yr) = [Material Processed (tons/yr)] x [Emission Factor (lb/ton)] x [tons/2,000 lb]

PM Emission Factor (lb/ton) =	1.0E-03	(2)
PM_{10} Emission Factor (lb/ton) =	1.0E-03	(2)
$PM_{2.5}$ Emission Factor (lb/ton) =	1.0E-03	(2)

Notes:

(1) See Table 1, Annual Production/Fuel Consumption

(2) Emission factor is obtained from the "Emission Factor Wood Product" prepared by Oregon Department of Environmental Quality (Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust - Baghouse Control). All is PM_{10} (Oregon) and $PM_{2.5}$.

Table 9. Facility Wide Pollutant Emissions Summary
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

Emission Sources	Past Actual Emissions (tons/year)								
	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-e	HAPs
Lumber Drying Kiln #3 (existing)	8.6	5.2	4.8	1.6	5.9	14.1	80.4	13,196.8	4.9
Planer Mill	7.0	3.5	2.1	--	--	--	--	--	--
Fuel Silo	5.52	2.76	1.66	--	--	--	--	--	--
Total Emissions	**21.1**	**11.5**	**8.5**	**1.6**	**5.9**	**14.1**	**80.4**	**13,196.8**	**4.9**

Emission Sources	Proposed Potential Annual Emissions (tons/year)								
	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-e	HAPs
Lumber Drying Kiln #4 (new)	14.9	9.0	8.3	2.7	10.2	24.5	139.6	22,918.5	8.6
Lumber Drying Kiln #3 (conversion)	4.5	3.4	3.2	1.7	9.1	21.8	127.6	14,284.8	7.3
Planer Mill	12.8	6.4	3.8	--	--	--	--	--	--
Fuel Silo	9.98	4.99	2.99	--	--	--	--	--	--
Total Emissions	**42.1**	**23.8**	**18.3**	**4.4**	**19.3**	**46.2**	**267.3**	**37,203.3**	**15.8**

Emission Sources	Net Emissions Increase (tons/year)								
	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-e	HAPs
Lumber Drying Kiln #4 (new)	14.9	9.0	8.3	2.7	10.2	24.5	139.6	22,918.5	8.6
Lumber Drying Kiln #3 (conversion)	-4.1	-1.8	-1.5	0.1	3.2	7.7	47.2	1,088.1	2.3
Planer Mill	5.7	2.9	1.7	--	--	--	--	--	--
Fuel Silo	4.5	2.2	1.3	--	--	--	--	--	--
Future Potential Emissions	42.1	23.8	18.3	4.4	19.3	46.2	267.3	37,203	15.8
Past Actual Emissions	21.1	11.5	8.5	1.6	5.9	14.1	80.4	13,197	4.9
Net Emissions Increase	**21.0**	**12.3**	**9.8**	**2.8**	**13.4**	**32.1**	**186.9**	**24,007**	**10.9**
PSD Threshold	**25**	**15**	**10**	**40**	**40**	**100**	**40**	**75,000**	**--**
PSD Project (Yes/No)	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**--**

Table 10. HAP Emissions Summary
Net Emission Increase Calculation
Simpson Lumber Company, LLC, Meldrim, GA

HAP	Dry Kiln #4	Dry Kiln #3	Total HAP Emissions (tons/yr)
Acetaldehyde	1.02E+00	3.22E-01	1.34E+00
Acrolein	2.19E-01	6.89E-02	2.88E-01
Formaldehyde	1.46E+00	7.45E-02	1.53E+00
Propionaldehyde	3.65E-02	1.15E-02	4.80E-02
Methanol	5.84E+00	1.84E+00	7.68E+00
TOTAL HAPs	8.58	2.31	**10.89**

APPENDIX B

APPLICATION FORMS

Georgia SIP Air Permit Application
Instructions for the completion of Form 1.00 General Information

This form is to be completed and submitted with any Georgia SIP Air Permit application for the construction, operation, and/or modification of process equipment, fuel burning equipment, air pollution control equipment, etc. The latest version of form 1.00 is located at http://www.georgiaair.org/airpermit/. **Do not submit instructions with the SIP application**.

Items 1-4: Self-Explanatory

Item 5: The Authorized Official is responsible for the overall operation of the manufacturing, production, or operating facilities applying for a permit or their duly authorized representative.

Item 6: More than one of the following may apply to an individual application.

- **New Facility (to be constructed)**: If the facility is requesting a permit to construct and operate a new facility that is currently not constructed or in operation.
- **Existing Facility (initial or modification application)**: The facility is currently constructed and operating, and now needs an initial Georgia Air Permit, or the facility is currently permitted and is proposing a modification.
- **Permit to Construct**: The facility is requesting a permit to construct new emission units or air pollution control devices.
- **Permit to Operate**: The facility is requesting a Georgia Air Permit to operate previously constructed equipment or to operate new equipment.
- **Change of Location**: If no other modification is being performed then the only form required is Form 1.00 General Information.
- **Permit to Modify Existing Equipment**: The facility is requesting a permit to modify existing emission units or air pollution control devices. If modifying existing equipment, the facility must include the affected permit number, this being the permit or amendment that is being modified.
- **Revision of Data Submitted in an Earlier Application**: If data has changed for an existing application, the facility should submit a revision to their application. The Application No. of the application that is being revised and its original submittal date should be included here. If the Application No. is not known, please contact the engineer that is working on the application.

Examples:
- For a new facility: Check "New Facility", "Permit to Operate", and "Permit to Construct"
- For an existing facility that now needs a permit: Check "Existing Facility" and "Permit to Operate"
- For an existing facility adding new equipment: Check "Existing Facility", "Permit to Operate", and "Permit to Construct"
- For an existing facility modifying equipment: Check "Existing Facility" and "Permit to Modify Existing Equipment".

For a name change or ownership change, use the **Name Change Form** or **Change in Ownership Form** found on the Internet at http://www.georgiaair.org/airpermit/. If the only permitting action being requested is a name change or ownership change, then do not include any SIP application forms.

Item 7: Permit Exemption Activity:
Georgia Air Quality Rule 391-3-1-.03(6)(i)3 provides an exemption from permitting for a modification or modifications that meet the requirements of the rule. If a modification or a consecutive set of unpermitted modifications have cumulative potential emission increases less than the thresholds indicated in the rule, permitting action can be deferred under Rule 391-3-1-.03(6)(i)3.

When the cumulative potential emission increases for a pollutant reaches the threshold for that pollutant, permitting action must occur for the modification(s) that exceeded the threshold.

If any modification performed at the facility meets these requirements, then please go to http://www.georgiaair.org/airpermit/ and follow the instructions on the SIP Exemption Attachment Form located within the attachments section of SIP Application web page.

Item 8: If the Georgia Small Business Assistance Program (SBAP) provided assistance, enter only the "Name of Contact" and "Telephone No." information. If a consultant or a consulting firm was employed for assistance in completing the application, please enter all the requested information.

Item 9: Each application must include **Form 1.00** ***General Information***. If the facility needs to include multiples of one form, e.g. the facility has more emission units than can fit on one Form 2.00 *Emission Unit List*, then the facility should enter "2" in the "No. of Forms" column. Submit 2 copies of the complete application, all forms applicable to the permitting action and any attachments. See the ***Submittal Instructions*** located at http://www.georgiaair.org/airpermit/ for further information.

Item 10: Self-Explanatory.

Item 11: Confidential Business Information (CBI). If the facility has CBI in the application, please refer to the latest version of EPD's *Procedures for Requesting that Submitted Information be treated as Confidential* (http://www.georgiaair.org/airpermit/ downloads/infodocs/confinfo.pdf).

Item 12: The facility should fill out the New Facility Emissions Summary table **only** if the facility is being newly constructed. If the facility has more individual Hazardous Air Pollutants (HAPs) than can be listed in the table, please include them in an attachment (See Item 16). For guidance in calculating the facility's potential-to-emit please refer to the *Procedures to Determine PTE* (http://www.georgiaair.org/airpermit/ downloads/infodocs/pteguide.pdf).

Item 13: The facility should fill out the Existing Facility Emissions Table if the facility is proposing a modification or if the facility has never applied for a Georgia Air Quality Permit. The "After Modification" columns should only be filled out if the facility-wide potential emissions are increasing or decreasing due to a modification.

If the facility has more individual Hazardous Air Pollutants (HAPs) than can be listed in the table, please include them in an attachment (See Item 16). For guidance in calculating the facility's potential to emit (PTE) please refer to the *Procedures to Determine PTE* (http://www.georgiaair.org/airpermit/ downloads/infodocs/confinfo.pdf).

Item 14: To determine the facility's 4-digit Source Identification Code (SIC) and SIC description, examine either of the following OSHA websites, http://www.osha.gov/pls/imis/sicsearch.html to search the SIC listings or to see the SIC Division structure go to http://www.osha.gov/pls/imis/sic_manual.html. For example, an automobile manufacturer would use SIC Code - 3711: Motor Vehicles and Passenger Car Bodies.

To determine the facility's 6-digit North American Industry Classification System (NAICS) and NAICS description, examine the following website, http://www.naics.com/search.htm to search the NAICS listings. If you know the facility SIC code you can use it to search out the NAICS code. For further information on the NAICS Association go to http://www.naics.com/. For example, an automobile manufacturer would use NAICS Code - 336111: Automobile Manufacturing.

Item 15: Self-explanatory.

Item 16: List any additional attachments made to the application from any Form included in the application, including plot diagrams, maps, emissions calculations, equipment diagrams, and flow diagrams.

Item 17: Please include the following information unless it has been submitted in a previous application:

- Plot Plan/Map: Attach a plot plan showing the location of the facility and points of air emission discharge points, identified by source code used in the application, in relation to the surrounding area. Plot plans should show roadways, residences and other permanent structures, the scale used and at least one set of longitude lines or UTM coordinates. In practice, many applicants find it convenient to show a sketch of the plant area on one plot and to locate the general plant site on a separate county or city map.

- Flow Diagram: Attach a flow diagram identifying process and control equipment, where raw material enters processes, where waste exits, where air emissions are generated and where finished products are handled. Each point should be identified according to the source codes used in the application in addition to its normal description.

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

Stationary Source Permitting Program
4244 International Parkway, Suite 120
Atlanta, Georgia 30354
404/363-7000
Fax: 404/363-7100

SIP AIR PERMIT APPLICATION

EPD Use Only

Date Received: ______________ Application No. ______________

FORM 1.00: GENERAL INFORMATION

1. Facility Information

Facility Name: Simpson Timber Company
AIRS No. (if known): 04-13- 103 - 00004
Facility Location: Street: 911 Old River Road
City: Meldrim Georgia Zip: 31318 County: Effingham

2. Facility Coordinates

Latitude: 32° 8' 45" **NORTH** Longitude: 81° 23' 14" **WEST**
UTM Coordinates: 463466.2 **EAST** 3556455.5 **NORTH** **ZONE** 17

3. Facility Owner

Name of Owner: Simpson Timber Company
Owner Address Street: 911 Old River Road
City: Meldrim State: GA Zip: 31318

4. Permitting Contact and Mailing Address

Contact Person: Linda Bryan Title: Environmental Coordinator
Telephone No.: (912) 748-2219 Ext. ______ Fax No.: (912) 748-8341
Email Address: lbryan@simpson.com
Mailing Address: Same as: Facility Location: ☒ Owner Address: ☐ Other: ☐
If Other: Street Address: ______________
City: ______________ State: ______________ Zip: ______________

5. Authorized Official

Name: Bruce Harris Title: Mill Manager
Address of Official Street: 911 Old River Road
City: Meldrim State: GA Zip: 31318

This application is submitted in accordance with the provisions of the Georgia Rules for Air Quality Control and, to the best of my knowledge, is complete and correct.

Signature: ______________________ Date: ______________

6. **Reason for Application: (Check all that apply)**

- ☐ New Facility (to be constructed)
- ☐ Existing Facility (initial or modification application)
- ☒ Permit to Construct
- ☐ Permit to Operate
- ☐ Change of Location
- ☐ Permit to Modify Existing Equipment: Affected Permit No.: ____________

☐ Revision of Data Submitted in an Earlier Application

Application No.: ____________

Date of Original Submittal: ____________

7. **Permitting Exemption Activities (for permitted facilities only):**

Have any exempt modifications based on emission level per Georgia Rule 391-3-1-.03(6)(i)(3) been performed at the facility that have not been previously incorporated in a permit?

☒ **No** ☐ **Yes, please fill out the SIP Exemption Attachment** (See Instructions for the attachment download)

8. **Has assistance been provided to you for any part of this application?**

☐ **No** ☐ **Yes, SBAP** ☒ **Yes, a consultant has been employed or will be employed.**

If yes, please provide the following information:

Name of Consulting Company: SLR International Corp.

Name of Contact: Eri Ottersburg

Telephone No.: (425) 402-8800 Fax No.: (425) 402-8488

Email Address: eottersburg@slrconsulting.com

Mailing Address: Street: 22122 20th Ave. SE, G202

City: Bothell State: WA Zip: 98021

Describe the Consultant's Involvement:

Permit Application, Best Available Control Technology Analysis, & Dispersion Modeling

9. **Submitted Application Forms:** Select only the necessary forms for the facility application that will be submitted.

No. of Forms	Form
1	2.00 Emission Unit List
1	2.01 Boilers and Fuel Burning Equipment
	2.02 Storage Tank Physical Data
	2.03 Printing Operations
	2.04 Surface Coating Operations
	2.05 Waste Incinerators (solid/liquid waste destruction)
	2.06 Manufacturing and Operational Data
	3.00 Air Pollution Control Devices (APCD)
	3.01 Scrubbers
	3.02 Baghouses & Other Filter Collectors
	3.03 Electrostatic Precipitators
1	4.00 Emissions Data
	5.00 Monitoring Information
	6.00 Fugitive Emission Sources
1	7.00 Air Modeling Information

10. **Construction or Modification Date**

Estimated Start Date: To be determined

11. **If confidential information is being submitted in this application, were the guidelines followed in the "Procedures for Requesting that Submitted Information be treated as Confidential"?**

☒ No ☐ Yes

12. New Facility Emissions Summary

Criteria Pollutant	New Facility	
	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)		
Nitrogen oxides (NOx)		
Particulate Matter (PM)		
PM <10 microns (PM10)		
PM <2.5 microns (PM2.5)		
Sulfur dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Total Hazardous Air Pollutants (HAPs)		
Individual HAPs Listed Below:		

13. Existing Facility Emissions Summary

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)	45.9	29.4	76.2	65.2
Nitrogen oxides (NOx)	19.2	12.3	31.8	27.2
Particulate Matter (PM)	41.5	23	60.4	51.2
PM <10 microns (PM10)	23.7	15.3	34.9	30.8
PM <2.5 microns (PM2.5)	19.6	12.6	28.5	24.8
Sulfur dioxide (SO_2)	5.1	3.5	7.8	6.7
Volatile Organic Compounds (VOC)	262.1	167.8	438.1	375.3
Total Hazardous Air Pollutants (HAPs)	16.1	10.3	26.3	22.5
Individual HAPs Listed Below:				
Acetaldahyde	1.92	1.23	2.59	2.13
Acrolein	0.411	0.263	0.56	0.46
Formaldehyde	2.74	1.75	3.33	2.68
Propionadehyde	0.0685	0.0439	0.093	0.076
Methanol	11	7.02	14.8	12.2

14. 4-Digit Facility Identification Code:

SIC Code: 2421 SIC Description: Sawmill & Planing Mill, General (Kiln Drying)

NAICS Code: 321999 NAICS Description: All Other Miscellaneous Wood Product Manufacturing

15. Description of general production process and operation for which a permit is being requested. If necessary, attach additional sheets to give an adequate description. Include layout drawings, as necessary, to describe each process. References should be made to source codes used in the application.

Simpson Lumber Company (Simpson) owns and operates a lumber mill located in Meldrim, Georgia. Simpson is currently operating under Part 70 Operating Permit (Permit No. 2421-103-0004-V-04-0) issued December 21, 2010.

The facility is proposing to install one new direct-fired batch lumber drying kiln and upgrade existing kiln #3 from batch to continuous. The project is expected to increase volatile organic compound (VOC) emissions in excess of the Prevention of Significant Deterioration (PSD) significance thresholds. Simpson is submitting this application for approval in accordance with the Georgia Rule 391-3-1-.02(7).

Please see application report for detail information.

16. Additional information provided in attachments as listed below:

Attachment A - Existing Actual & Potential Emissions Calculation

Attachment B -

Attachment C -

Attachment D -

Attachment E -

Attachment F -

17. Additional Information: Unless previously submitted, include the following two items:

☒ Plot plan/map of facility location or date of previous submittal:

☒ Flow Diagram or date of previous submittal:

Table 1. Annual Production/Fuel Consumption
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

Emission Source	Unit	Maximum Production[1]	2010 Production[1]
Direct Fired Lumber Drying Kiln #1			
Material Processed (Southern Yellow Pine Lumber)	MBF	45,667	29,237
Fuel Consumption (planer mill shavings)	tons	7,992	5,485
Direct Fired Lumber Drying Kiln #2			
Material Processed (Southern Yellow Pine Lumber)	MBF	45,667	29,237
Fuel Consumption (planer mill shavings)	tons	7,992	5,485
Direct Fired Lumber Drying Kiln #3			
Material Processed (Southern Yellow Pine Lumber)	MBF	45,667	29,237
Fuel Consumption (planer mill shavings)	tons	7,992	5,485
Direct Fired Lumber Drying Kiln #4 (new)			
Material Processed (Southern Yellow Pine Lumber)	MBF	--	
Fuel Consumption (planer mill shavings)	tons	--	
Cyclones and Baghouse			
Wood Shaving Cyclone	tons	26,391	16,897
Trim Block Chipper Cyclone	tons	4,061	2,600
Fuel Silo Cyclone	tons	23,975	16,456
Truck Bin Baghouse	tons	30,453	19,497

Notes:
(1) Provided by Simpson Lumber Company.

Table 2. Dry Kiln #1 Emissions
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

Pollutant	Emission Factor			Potential Emissions(b) (tons/yr)	Past Actual Emissions(b) (tons/yr)
Criteria Pollutants					
PM (filterable)	3.20E-01	lb/MBF	(a)	7.31	4.68
CPM	8.75E-02	lb/MBF	(a)	2.00	1.28
PM (Total)	4.07E-01	lb/MBF	(a)	9.30	5.96
PM_{10}	2.47E-01	lb/MBF	(1)	5.65	3.62
$PM_{2.5}$	2.27E-01	lb/MBF	(1)	5.18	3.31
SO_2	2.50E-02	lb/MMBtu	(c,2)	1.70	1.17
NO_X	2.80E-01	lb/MBF	(3)	6.39	4.09
CO	6.70E-01	lb/MBF	(3)	15.30	9.79
VOC	3.83E+00	lb/MBF	(3,4)	87.35	55.93
CO_2	2.07E+02	lb/MMBtu	(5)	14,047.85	9,642.12
CH_4	7.00E-02	lb/MMBtu	(5)	4.76	3.26
N_2O	9.00E-03	lb/MMBtu	(5)	0.61	0.42
CO_2-Eq	--	--	(d)	14,337.23	9,840.74
Hazardous Air Pollutants					
Acetaldehyde	2.8E-02	lb/MBF	(6)	0.64	0.41
Acrolein	6.0E-03	lb/MBF	(6)	0.14	0.09
Formaldehyde	4.0E-02	lb/MBF	(6)	0.91	0.58
Propionaldehyde	1.0E-03	lb/MBF	(6)	0.02	0.01
Methanol	1.6E-01	lb/MBF	(6)	3.65	2.34
Total HAPs	**2.4E-01**	**lb/MBF**		**5.37**	**3.44**

Calculations:

(a) Total PM Emission Factor (lb/MBF) = Filterable PM Emission Factor (lb/MBF) + Condensable PM Emission Factor (lb/MBF)

Filterable PM Emission Factor (lb/MBF) = 3.2E-01 (3)
Condensable PM Emission Factor (lb/MBF) = 8.7E-02 (7)

(b) Annual Emissions (tons/yr) = [Material Processed (MBF/yr)] x [Emission Factor (lbs/MBF)] / [2,000 lbs/ton]

Potential Material Processed (MBF/yr) = 45,667 (8)
Past Material Processed (MBF/yr) = 29,237 (8)

(c) Annual Emissions (tons/yr) = [Annual Fuel Usage (tons/yr)] x [Heating Value (Btu/lb) x 2,000 lb/ton x 1 MMBtu/1,000,000 Btu] x [Emission Factor (lb/MMBtu)] / [2,000 lbs/ton]

Potential Fuel Usage (tons/yr) = 7,992 (8)
Past Fuel Usage (tons/yr) = 5,485 (8)
Heating Value (Btu/lb) = 8,500 (9)

(d) Total CO_2 Equivalent Emissions (metric ton/yr) = [CO_2 Emissions] + [CH_4 Emissions * CH_4 Global Warming Potential] + [N_2O Emissions * N_2O Global Warming Potential]

CH_4 Global Warming Potential = 21 (5)
N_2O Global Warming Potential = 310 (5)

Notes:

(1) PM_{10} represents 50% of PM per GA EPD guidance. $PM_{2.5}$ estimated as 87% of PM_{10} based on AP-42 for wood combustion. All condensable PM emissions are summed to $PM_{10}/PM_{2.5}$ per instructions from GA EPD.

(2) AP-42 Table 1.6-2 for Wood Residue Combustion.

(3) Based on emission factors for southern pine direct fired batch lumber drying kiln from 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.

(4) NCASI emission factor for VOC is converted to total VOC as per guidance in GA EPD's recently issued Rayonier Wood Products' PSD permit.

(5) Part 98 - Mandatory Greenhouse Gas Reporting, Table A-1, Table C-1, & Table C-2

(6) Updated NCASI Emission Factors for Southern Pine Lumber Kilns provided by David Word (August, 2004).

(7)The condensable PM emission factor is based on the ratio of condensable and filterable emission factors for southern pine direct fired batch kiln from unpublished NCASI data provided by David Word.

(8) See Table 1.

(9) Heating Value from Title V Permit Application.

Table 3. Dry Kiln #2 Emissions
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

Pollutant	Emission Factor			Potential Emissions(b) (tons/yr)	Past Actual Emissions(b) (tons/yr)
Criteria Pollutants					
PM	3.20E-01	lb/MBF	(a)	7.31	4.68
CPM	8.75E-02	lb/MBF	(a)	2.00	1.28
PM (Total)	4.07E-01	lb/MBF	(a)	9.30	5.96
PM_{10}	2.47E-01	lb/MBF	(1)	5.65	3.62
$PM_{2.5}$	2.27E-01	lb/MBF	(1)	5.18	3.31
SO_2	2.50E-02	lb/MMBtu	(c,2)	1.70	1.17
NO_X	2.80E-01	lb/MBF	(3)	6.39	4.09
CO	6.70E-01	lb/MBF	(3)	15.30	9.79
VOC	3.83E+00	lb/MBF	(3,4)	87.35	55.93
CO_2	2.07E+02	lb/MMBtu	(5)	14,047.85	9,642.12
CH_4	7.00E-02	lb/MMBtu	(5)	4.76	3.26
N_2O	9.00E-03	lb/MMBtu	(5)	0.61	0.42
CO_2-Eq	--	--	(d)	14,337.23	9,840.74
Hazardous Air Pollutants					
Acetaldehyde	2.8E-02	lb/MBF	(6)	0.64	0.41
Acrolein	6.0E-03	lb/MBF	(6)	0.14	0.09
Formaldehyde	4.0E-02	lb/MBF	(6)	0.91	0.58
Propionaldehyde	1.0E-03	lb/MBF	(6)	0.02	0.01
Methanol	1.6E-01	lb/MBF	(6)	3.65	2.34
Total HAPs	**2.4E-01**	**lb/MBF**		**5.37**	**3.44**

Calculations:

(a) Total PM Emission Factor (lb/MBF) = Filterable PM Emission Factor (lb/MBF) + Condensable PM Emission Factor (lb/MBF)

Filterable PM Emission Factor (lb/MBF) =	3.2E-01	(3)
Condensable PM Emission Factor (lb/MBF) =	8.7E-02	(7)

(b) Annual Emissions (tons/yr) = [Material Processed (MBF/yr)] x [Emission Factor (lbs/MBF)] / [2,000 lbs/ton]

Potential Material Processed (MBF/yr) =	45,667	(8)
Past Material Processed (MBF/yr) =	29,237	(8)

(c) Annual Emissions (tons/yr) = [Annual Fuel Usage (tons/yr)] x [Heating Value (Btu/lb) x 2,000 lb/ton x 1 MMBtu/1,000,000 Btu] x [Emission Factor (lb/MMBtu)] / [2,000 lbs/ton]

Potential Fuel Usage (tons/yr) =	7,992	(8)
Past Fuel Usage (tons/yr) =	5,485	(8)
Heating Value (Btu/lb) =	8,500	(9)

(d) Total CO_2 Equivalent Emissions (metric ton/yr) = [CO_2 Emissions] + [CH_4 Emissions * CH_4 Global Warming Potential] + [N_2O Emissions * N_2O Global Warming Potential]

CH_4 Global Warming Potential =	21	(5)
N_2O Global Warming Potential =	310	(5)

Notes:

(1) PM_{10} represents 50% of PM per GA EPD guidance. $PM_{2.5}$ estimated as 87% of PM_{10} based on AP-42 for wood combustion. All condensable PM emissions are summed to $PM_{10}/PM_{2.5}$ per instructions from GA EPD.

(2) AP-42 Table 1.6-2 for Wood Residue Combustion.

(3) Based on emission factors for southern pine direct fired batch lumber drying kiln from 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.

(4) NCASI emission factor for VOC is converted to total VOC as per guidance in GA EPD's recently issued Rayonier Wood Products' PSD permit.

(5) Part 98 - Mandatory Greenhouse Gas Reporting, Table A-1, Table C-1, & Table C-2

(6) Updated NCASI Emission Factors for Southern Pine Lumber Kilns provided by David Word (August, 2004).

(7)The condensable PM emission factor is based on the ratio of condensable and filterable emission factors for southern pine direct fired batch kiln from unpublished NCASI data provided by David Word.

(8) See Table 1.

(9) Heating Value from Title V Permit Application.

Table 4. Dry Kiln #3 Emissions
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

Pollutant	Emission Factor			Potential Emissions[(b)] (tons/yr)	Past Actual Emissions[(b)] (tons/yr)
Criteria Pollutants					
PM	3.20E-01	lb/MBF	(a)	7.31	4.68
CPM	8.75E-02	lb/MBF	(a)	2.00	1.28
PM (Total)	4.07E-01	lb/MBF	(a)	9.30	5.96
PM_{10}	2.47E-01	lb/MBF	(1)	5.65	3.62
$PM_{2.5}$	2.27E-01	lb/MBF	(1)	5.18	3.31
SO_2	2.50E-02	lb/MMBtu	(c,2)	1.70	1.17
NO_X	2.80E-01	lb/MBF	(3)	6.39	4.09
CO	6.70E-01	lb/MBF	(3)	15.30	9.79
VOC	3.83E+00	lb/MBF	(3,4)	87.35	55.93
CO_2	2.07E+02	lb/MMBtu	(5)	14,047.85	9,642.12
CH_4	7.00E-02	lb/MMBtu	(5)	4.76	3.26
N_2O	9.00E-03	lb/MMBtu	(5)	0.61	0.42
CO_2-Eq	--	--	(d)	14,337.23	9,840.74
Hazardous Air Pollutants					
Acetaldehyde	2.8E-02	lb/MBF	(6)	0.64	0.41
Acrolein	6.0E-03	lb/MBF	(6)	0.14	0.09
Formaldehyde	4.0E-02	lb/MBF	(6)	0.91	0.58
Propionaldehyde	1.0E-03	lb/MBF	(6)	0.02	0.01
Methanol	1.6E-01	lb/MBF	(6)	3.65	2.34
Total HAPs	**2.4E-01**	**lb/MBF**		**5.37**	**3.44**

Calculations:

(a) Total PM Emission Factor (lb/MBF) = Filterable PM Emission Factor (lb/MBF) + Condensable PM Emission Factor (lb/MBF)

Filterable PM Emission Factor (lb/MBF) =	3.2E-01	(3)
Condensable PM Emission Factor (lb/MBF) =	8.7E-02	(7)

(b) Annual Emissions (tons/yr) = [Material Processed (MBF/yr)] x [Emission Factor (lbs/MBF)] / [2,000 lbs/ton]

Potential Material Processed (MBF/yr) =	45,667	(8)
Past Material Processed (MBF/yr) =	29,237	(8)

(c) Annual Emissions (tons/yr) = [Annual Fuel Usage (tons/yr)] x [Heating Value (Btu/lb) x 2,000 lb/ton x 1 MMBtu/1,000,000 Btu] x [Emission Factor (lb/MMBtu)] / [2,000 lbs/ton]

Potential Fuel Usage (tons/yr) =	7,992	(8)
Past Fuel Usage (tons/yr) =	5,485	(8)
Heating Value (Btu/lb) =	8,500	(9)

(d) Total CO_2 Equivalent Emissions (metric ton/yr) = [CO_2 Emissions] + [CH_4 Emissions * CH_4 Global Warming Potential] + [N_2O Emissions * N_2O Global Warming Potential]

CH_4 Global Warming Potential =	21	(5)
N_2O Global Warming Potential =	310	(5)

Notes:

(1) PM_{10} represents 50% of PM per GA EPD guidance. $PM_{2.5}$ estimated as 87% of PM_{10} based on AP-42 for wood combustion. All condensable PM emissions are summed to $PM_{10}/PM_{2.5}$ per instructions from GA EPD.

(2) AP-42 Table 1.6-2 for Wood Residue Combustion.

(3) Based on emission factors for southern pine direct fired batch lumber drying kiln from 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.

(4) NCASI emission factor for VOC is converted to total VOC as per guidance in GA EPD's recently issued Rayonier Wood Products' PSD permit.

(5) Part 98 - Mandatory Greenhouse Gas Reporting, Table A-1, Table C-1, & Table C-2

Southern Pine Lumber Kilns provided by

(7)The condensable PM emission factor is based on the ratio of condensable and filterable emission factors for southern pine direct fired batch kiln from unpublished NCASI data provided by David Word.

(8) See Table 1.

(9) Heating Value from Title V Permit Application.

Table 5. Cyclones Emissions
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

Source	Potential Material Processed (tons/yr)[1]	Past Material Processed (tons/yr)[1]	Potential Emissions (tons/yr)[a]			Past Actual Emissions (tons/yr)[a]		
			PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Planer Mill Trim Block Chipper Cyclone	4,061	2,600	1.0E+00	5.1E-01	3.0E-01	6.5E-01	3.3E-01	2.0E-01
Planer Mill Shavings Cyclone	26,391	16,897	6.6E+00	3.3E+00	2.0E+00	4.2E+00	2.1E+00	1.3E+00
Fuel Silo Cyclone	23,975	16,456	6.0E+00	3.0E+00	1.8E+00	4.1E+00	2.1E+00	1.2E+00

Calculations:

(a) Annual Emissions (tons/yr) = [Material Processed (tons/yr)] x [Emission Factor (lb/ton)] x [tons/2,000 lb]

PM Emission Factor (lb/ton) = 5.0E-01 (2)
PM_{10} Emission Factor (lb/ton) = 2.5E-01 (2)
$PM_{2.5}$ Emission Factor (lb/ton) = 1.5E-01 (2)

Notes:
(1) See Table 1, Annual Production/Fuel Consumption
(2) Emission factor is obtained from the "Emission Factor Wood Product" prepared by Oregon Department of Environmental Quality (Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust - Medium Efficiency). PM_{10} is 50% of PM (Oregon) and $PM_{2.5}$ is 60% of PM_{10} (AP-42).

Table 6. Baghouse Emissions
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

Source	Potential Material Processed (tons/yr)[1]	Past Material Processed (tons/yr)[1]	Potential Emissions (tons/yr)			Past Actual Emissions (tons/yr)		
			PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Planer Mill Truck Bin Baghouse	30,453	19,497	1.5E-02	1.5E-02	1.5E-02	9.7E-03	9.7E-03	9.7E-03

Calculations:

(a) Annual Emissions (tons/yr) = [Material Processed (tons/yr)] x [Emission Factor (lb/ton)] x [tons/2,000 lb]

PM Emission Factor (lb/ton) = 1.0E-03 (2)
PM_{10} Emission Factor (lb/ton) = 1.0E-03 (2)
$PM_{2.5}$ Emission Factor (lb/ton) = 1.0E-03 (2)

Notes:
(1) See Table 1, Annual Production/Fuel Consumption
(2) Emission factor is obtained from the "Emission Factor Wood Product" prepared by Oregon Department of Environmental Quality (Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust - Baghouse Control). All PM assumed to be PM_{10} (Oregon) and $PM_{2.5}$.

Table 7. Facility Wide Pollutant Emissions Summary
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

Emission Sources	Potential Emissions (tons/year)								
	PM (total)	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-Eq	HAPs
Direct Fired Lumber Drying Kiln #1	9.3	5.7	5.2	1.7	6.4	15.3	87.4	14,337.2	5.4
Direct Fired Lumber Drying Kiln #2	9.3	5.7	5.2	1.7	6.4	15.3	87.4	14,337.2	5.4
Direct Fired Lumber Drying Kiln #3	9.3	5.7	5.2	1.7	6.4	15.3	87.4	14,337.2	5.4
Planer Mill	7.6	3.8	2.3	--	--	--	--	--	--
Fuel Silo	5.99	3.00	1.80	--	--	--	--	--	--
Total Emissions	**41.5**	**23.8**	**19.6**	**5.1**	**19.2**	**45.9**	**262.1**	**43,012**	**16.1**

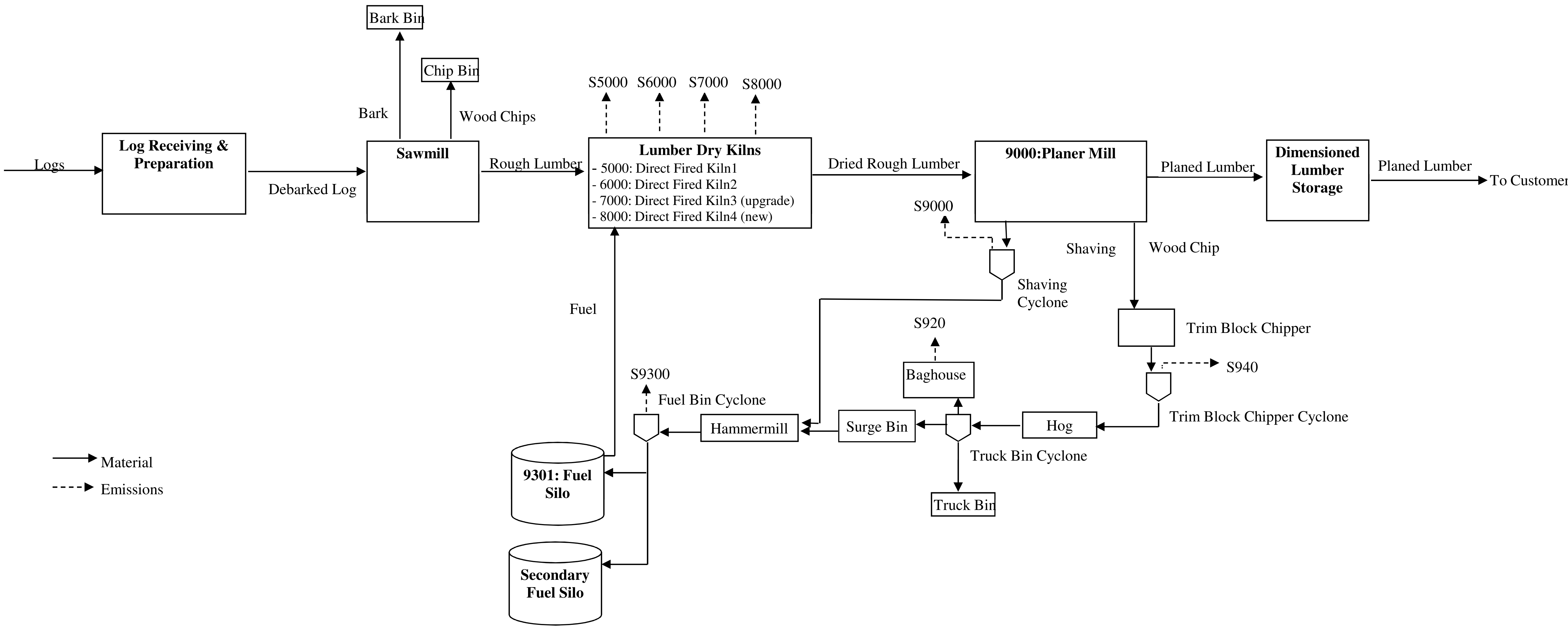
Emission Sources	Past Actual Emissions (tons/year)								
	PM (total)	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2-Eq	HAPs
Direct Fired Lumber Drying Kiln #1	4.7	3.6	3.3	1.2	4.1	9.8	55.9	9,840.7	3.4
Direct Fired Lumber Drying Kiln #2	4.7	3.6	3.3	1.2	4.1	9.8	55.9	9,840.7	3.4
Direct Fired Lumber Drying Kiln #3	4.7	3.6	3.3	1.2	4.1	9.8	55.9	9,840.7	3.4
Planer Mill	4.9	2.4	1.5	--	--	--	--	--	--
Fuel Silo	4.11	2.06	1.23	--	--	--	--	--	--
Total Emissions	**23.0**	**15.4**	**12.6**	**3.5**	**12.3**	**29.4**	**167.8**	**29,522.2**	**10.3**

Table 8. HAP Emissions Summary
Existing Emissions
Simpson Lumber Company, LLC, Meldrim, GA

HAP	Potential HAP Emissions (tons/yr)			Total HAP Emissions (tons/yr)
	Dry Kiln #1	Dry Kiln #2	Dry Kiln #3	
Acetaldehyde	6.39E-01	6.39E-01	6.39E-01	1.92E+00
Acrolein	1.37E-01	1.37E-01	1.37E-01	4.11E-01
Formaldehyde	9.13E-01	9.13E-01	9.13E-01	2.74E+00
Propionaldehyde	2.28E-02	2.28E-02	2.28E-02	6.85E-02
Methanol	3.65E+00	3.65E+00	3.65E+00	**1.10E+01**
TOTAL HAPs	5.37	5.37	5.37	**16.10**

HAP	Past Actual HAP Emissions (tons/yr)			Total HAP Emissions (tons/yr)
	Dry Kiln #1	Dry Kiln #2	Dry Kiln #3	
Acetaldehyde	4.09E-01	4.09E-01	4.09E-01	1.23E+00
Acrolein	8.77E-02	8.77E-02	8.77E-02	2.63E-01
Formaldehyde	5.85E-01	5.85E-01	5.85E-01	1.75E+00
Propionaldehyde	1.46E-02	1.46E-02	1.46E-02	4.39E-02
Methanol	2.34E+00	2.34E+00	2.34E+00	7.02E+00
TOTAL HAPs	3.44	3.44	3.44	**10.31**

Simpson Lumber Company- Meldrim
Title V Modification Application
Process Flowchart



Georgia SIP Air Permit Application
Instructions for the Completion of Form 2.00 Emission Unit List

This form is to be completed and submitted with any Georgia SIP Air Permit application that involves the construction, operation, and/or modification of any emission unit or any related air pollution control device (Forms 3.00-3.03) or monitoring information (Form 5.00). The latest version of Form 2.00 is located at http://www.georgiaair.org/airpermit/.
Do not submit instructions with the SIP application.

Emission Unit ID:	The Emission Unit ID is an alpha-numeric code with a maximum of four characters (e.g. 27, D1, AA, BL1, BL01). The alpha-numeric identifier is unique to each piece of equipment at a facility. Do not include air pollution control devices (APCD), stacks, or fugitive emission sources on this form. See Form 1.00 General Information, Item 8 for a complete list of all forms.
Name:	Simple Name of the emission unit, e.g. Boiler No. 1, No. 2 Spray Booth, Tank No. 3.
Manufacturer and Model Number	Self-Explanatory.
Description:	Description of emission unit, e.g. Liquid Fuel fired 100 MMBtu/hr boiler, Parts touch-up spray booth, Chemical mix tank. Any other identifying information that would allow the differentiation of one emission unit from another should be included here.

Facility Name: Simpson Lumber Company - Meldrim Operation **Date of Application:** October 3, 2011

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
7000	Kiln #3 (existing)	McConnell	Existing batch kiln converting o continuous kiln
8000	Kiln #4	N/A	80' direct-fired batch lumber drying kiln (new)

Georgia SIP Air Permit Application
Instructions for the Completion of Form 2.01 Boilers and Fuel Burning Equipment

This form is to be completed and submitted with any Georgia SIP Air Permit application that involves the construction, operation, and/or modification of any fuel burning equipment (e.g. boiler, burner, engine, turbine, dryer, smelter.) excluding incinerators. Information on incinerators should be included on Form 2.05 *Incinerators (Solid/Liquid Waste Destruction)*. The latest version of Form 2.01 is located at http://www.georgiaair.org/airpermit/. **Do not submit instructions with the SIP application.**

Boilers and Fuel Burning Equipment Table

Emission Unit ID:	Refer to Form 2.00 *Emission Unit List* and enter the emission unit ID assigned to the new or modified fuel burning equipment in this column. The Emission Unit ID is an alphanumeric code with a maximum of four characters (e.g. 27, D1, AA, BL1, BL01). Emission Unit IDs are unique to each piece of equipment at a facility. Emission units, air pollution control devices, and stacks cannot have the same ID.
Type of Burner:	Enter the specific type of fuel burner, e.g. a spreader stoker, pulverized coal, Dry-low NOx burners.
Type of Draft:	Enter the specific type of air-flow draft for the emission unit, e.g. forced draft, induced draft, balanced draft. This information does not have to be filled out for natural gas only fired equipment.
Design Capacity of Unit:	Enter the design (rated) heating capacity of the boiler or fuel burning equipment in million Btu per hour (MMBtu/hr). If any other units are used, please indicate the units used.
Percent Excess Air:	Enter the percent excess air for the fuel burning equipment.
Dates:	Enter the construction and installation date of the fuel burning equipment separately. The construction date is the original date of construction of the emission unit, where as the installation date is the date when the emission unit was first installed at the facility.
Date & Description of Last Modification:	Enter the date of the last boiler or fuel burning equipment modification. Also include a short description of what was done to the equipment. If necessary, include an attachment and list it in Form 1.00 General Information, Item 16 and enter “See Attachment #” in this column.

Fuel Data Table

Emission Unit ID:	Use the same Id as described in “Boilers and Fuel Burning Equipment Table”.
Fuel Type(s):	Enter the specific type(s) of fuel(s) that is fired or will fire in the fuel burning equipment, e.g. No. 2 distillate fuel oil, coal, natural gas. If the unit burns multiple fuels in the same unit, each fuel should be listed separately.
Potential Annual Consumption:	Enter the potential annual amount of fuel that is fired or will be fired, with the appropriate units (e.g. lb/hr, gpm, cfm). Also specify the percent of fuel that is fired or will be fired during the ozone season and non-ozone season.
Hourly Consumption:	Enter the hourly amount of fuel that is fired or will be fired with the appropriate units (e.g. lb/hr, gal/hr, ft^3/hr). The maximum (Max) hourly consumption is the maximum hourly fuel consumption that the unit is designed to achieve. The average (Avg.) hourly consumption is the anticipated average consumption during normal operations of the emission unit.

Heat Content:	Enter the minimum and average heat content of the fuel in the appropriate units, e.g. Btu per square feet (Btu/ft^3), Btu per gallon (Btu/gal), Btu per pound (Btu/lb). If such information is obtained from the fuel supplier, indicate the fuel supplier's name and address in the next table.
Percent Sulfur:	Enter the average and maximum percent of sulfur content of the fuel. The maximum (Max.) sulfur content is the maximum amount of sulfur in the fuel that the facility is allowed to fire, typically defined by regulation. The average (Avg.) sulfur content is the average fuel sulfur content that the facility expects to fire or currently fires in the emission unit. If the Avg. sulfur content is obtained from the fuel supplier, indicate the fuel supplier's contact information.
Percent Ash in Solid Fuel:	Enter the average and maximum percent of ash content in the solid fuel. The maximum (Max.) percent ash is the maximum amount of ash in the fuel that the facility is allowed to operate. The average (Avg.) ash content is the average ash content of the fuel that the facility expects to burn or currently burns. If the Avg. ash content is obtained from the fuel supplier, indicate the fuel supplier's contact information.

Fuel Supplier Information Table

This table must be filled out if the fuel supplier supplied any information regarding the fuel "Heat Content", "Percent Sulfur" or "Percent Ash in Solid Fuel" in the Fuel Data Table.

Name of Supplier	Enter the company name of the fuel supplier.
Phone Number	Enter the phone number of the fuel supplier.
Supplier Location:	Enter the contact address for the fuel supplier.

Facility Name: Simpson Lumber Company - Meldrim Operation **Date of Application:** October 3, 2011

FORM 2.01 – BOILERS AND FUEL BURNING EQUIPMENT

Emission Unit ID	Type of Burner	Type of Draft[1]	Design Capacity of Unit (MMBtu/hr Input)	Percent Excess Air	Dates		Date & Description of Last Modification
					Construction	Installation	
7000	Wood gasifier	Updraft	22.87	10%	N/A	N/A	modification of existing unit
8000	Wood gasifier	Updraft	29.95	10%	N/A	N/A	new batch kiln

[1] This column does not have to be completed for natural gas only fired equipment.

Facility Name: Simpson Lumber Company - Meldrim Operation **Date of Application:** October 3, 2011

FUEL DATA

Emission Unit ID	Fuel Type	Potential Annual Consumption				Hourly Consumption		Heat Content		Percent Sulfur		Percent Ash in Solid Fuel	
		Total Quantity		Percent Use by Season									
		Amount	Units	Ozone Season May 1 - Sept 30	Non-ozone Season Oct 1 - Apr 30	Max.	Avg.	Min.	Avg.	Max.	Avg.	Max.	Avg.
7000	Wood/Shavings	7,963	TPY	40%	60%	1,817 lb/hr			8,500 Btu/lb		0.02		0.25
8000	Wood/Shavings	12,775	TPY	40%	60%	2,917 lb/hr			8,500 Btu/lb		0.02		0.25

Fuel Supplier Information

Fuel Type	Name of Supplier	Phone Number	Supplier Location			
			Address	City	State	Zip
	NA					

Georgia SIP Air Permit Application
Instructions for the completion of Form 4.00 Emissions Information

This form is to be completed and submitted with any Georgia SIP Air Permit application for the construction, operation, and/or modification of process equipment, fuel burning equipment, and/or air pollution control equipment. The latest version of Form 4.00 is located at http://www.georgiaair.org/airpermit/. **Do not submit instructions with the SIP application**.

Emission Unit ID:	Refer to Form 2.00, *Emission Unit List*, and enter the unit ID assigned to the new or modified emission unit in this column.
Air Pollution Control Device ID:	Refer to Form 3.00 *Air Pollution Control Devices*, and enter the APCD ID to the new of modified APCD unit in this column.
Stack ID:	The Stack ID is an alphanumeric code with a maximum of four characters (e.g. S1, SK, DK1, ST1, ST01, et. al.). Designate each stack with a unique Stack ID within the same facility. If an emission unit exhausts through multiple stacks, list all stacks in one block.
Pollutant Emitted:	List the pollutant that is emitted. If multiple pollutants are emitted from one emission unit list them separately.
Emission Rates:	
Hourly Actual Emissions	Estimate the actual pounds per hour emission rate from the emission unit for each pollutant emitted, based on actual operating parameters.
Hourly Potential Emissions	Estimate the potential pounds per hour emission rate from each emission unit for each pollutant emitted, based on the maximum capacity of an emission unit to emit any air pollutant under its physical and operational design.
Annual Actual Emissions	Estimate the annual actual emission rate from the emission unit for each pollutant emitted, based on actual operating parameters.
Annual Potential Emissions	Estimate the annual potential emission rate from each emission unit for each pollutant emitted, based on the maximum capacity of an emission unit to emit any air pollutant under its physical and operational design. For guidance in calculating the facility's potential-to-emit please see the *Procedures to Determine PTE* (http://www.georgiaair.org/airpermit /downloads/infodocs/pteguide.pdf).
Method of Determination	Enter the method that was used to determine the emission estimates, e.g. Stack Test, AP-42, and Material Balance. If the emission rates were determined by a source test, submit the test report indicating the method used and the results. Indicate any attachments in Form 1.00 *General Information*, Item 16.

Facility Name: Simpson Lumber Company - Meldrim Operation **Date of Application:** October 3, 2011

FORM 4.00 – EMISSION INFORMATION

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination
7000	None	7000	Please see detailed					
			emission calculations					
			in application report					
8000	None	8000	Please see detailed					
			emission calculations					
			in applicaton report					

Georgia SIP Air Permit Application
Instructions for the Completion of Form 7.00: Air Modeling Information

This form is to be completed and submitted with any Georgia SIP Air Permit application that involves the construction, operation, and/or modification of an emission unit(s)/source(s) that discharges air pollutants into the atmosphere generally through a stack(s) and requires computer air modeling. The latest version of Form 7.00 is located at http://www.georgiaair.org/airpermit/. **Do not submit instructions with the SIP application**.

Air Modeling Information: Stack Data

Stack ID: The Stack ID is an alphanumeric code with a maximum of four characters (e.g. S1, SK, DK1, ST1, ST01, et. al.). Designate each stack with a unique Stack ID within the same facility. Stack IDs are unique to each piece of equipment at a facility. Emission units, air pollution control devices, and stacks cannot have the same ID.

Emission Unit ID: Associate which emission unit(s) exhausts from the Stack ID from the first column, include all the possible emission units exhausting through the individual stack. Refer to Form 2.00, *Emission Unit List*, and enter the assigned Emission Unit ID.

Stack Information – Height Above Grade and Inside Diameter: Enter the dimensions of the stack. The "Height Above Grade" refers to the elevation of the stack exhaust from the ground, not necessarily the length of the stack. Note that the "Inside Diameter" is the diameter at the outlet/exit of the stack. If the cross section of the stack outlet/exit is not circular, use the equation below to determine its "equivalent diameter":

$$D = 1.13 \times \left(\sqrt{S}\right)$$

Where: D = equivalent diameter of the stack outlet, ft.
S = cross section area of the stack outlet, $ft.^2$

Exhaust Direction: Indicate the direction the exhaust flows leaving the stack: Choose one of the following: Towards the Sky, Towards the Ground, Perpendicular (at a right-angle) to the Ground, or Other.

Dimensions of Largest Structure Near Stack: These two columns are required only if the height of a stack is greater than 90 feet. A structure is considered near a stack if the distance between the stack and the structure is less than 5 times the height or width of the structure. The structure that the stack is coming from is also considered "near" the stack.

Exit Gas Conditions at Maximum Emission Rate: Enter the gas velocity, temperature, and flow rate at the stack outlet/exit measured or calculated at the actual stack exit conditions. Do not convert any data to the values under standard conditions. Note that the unit of the flow rate is actual cubic feet per minute (acfm). For stacks with variable speed fans/bowers, enter the flow rate at normal fan speed as average flow rate, and the flow rate at maximum fan speed as maximum flow rate.

Note: If emissions are vented through openings (doors, windows, convey cut-outs, natural draft wall and roof vents, et. al.) other than a stack, describe points of discharge here and, if necessary, on an attachment. Also describe the configuration/design of the stack outlet such as discharge direction, rain cap type, and cross section shape. A simple drawing or picture of the stack outlet is preferred. List any attachments on Form 1.00 General Information, Item 16.

Air Modeling Information: Chemicals Data

Chemical:	List all chemicals, intermediates, and toxic materials used in the production process at the facility. IUPAC or commonly known chemical names are preferred, and if known, include the CAS No. If only a trade name is known, indicate the manufacturer.
Potential Emission Rate	Enter the maximum emission rate in pounds per hour for each chemical in the first column.
Toxicity:	Toxicity information should consist of IRIS unit risk factors, inhalation reference concentrations (RFC), OSHA PEL's, ACGIH TLV's, NIOSH REL's, NATA, etc. For more information on toxics, please see the Toxic Impact Assessment Guidelines (pdf) located on the Air Branch website, http://www.georgiaair.org/airpermit/ under "Other Forms & Info". If no toxicity information is available for the raw material or none is needed, insert "Not Applicable"
Reference:	Enter which toxic reference you used, IRIS, RFCs, OSHA PELs, ACGIH TLVs, NIOSH REL's, NATA, etc.
MSDS Attached:	Indicate by checking the box if the Material Safety Data Sheets (MSDS) have been included in the application. If the MSDSs have been provided, please include it in the list of attachments on Form 1.00 General Information, Item 16.

Facility Name: Simpson Lumber Company – Mildrim Operations **Date of Application:** October 3, 2011

FORM 7.00 – AIR MODELING INFORMATION: Stack Data

Stack ID	Emission Unit ID(s)	Stack Information			Dimensions of largest Structure Near Stack		Exit Gas Conditions at Maximum Emission Rate			
		Height Above Grade (ft)	**Inside Diameter** (ft)	**Exhaust Direction**	**Height** (ft)	**Longest Side** (ft)	**Velocity** (ft/sec)	**Temperature** (°F)	**Flow Rate** (acfm)	
									Average	**Maximum**
5000	5000	30	2.0	Vertical	NA		13.55	234	2,610	
6000	6000	30	2.0	Vertical	NA		13.55	234	2,610	
8000	8000	30	2.0	Vertical	NA		13.55	234	2,610	

NOTE: If emissions are not vented through a stack, describe point of discharge below and, if necessary, include an attachment. List the attachment in Form 1.00 *General Information*, Item 16.

EU7000 is fugitive emission source. Emissions exhaust through two kiln openings on each side.
Please see Section 5 of the PSD application report for more detailed information on stack parameters.

Facility Name: Simpson Lumber Company – Mildrim Operations **Date of Application:** October 3, 2011

FORM 7.00 AIR MODELING INFORMATION: Chemicals Data

Chemical	Potential Emission Rate (lb/hr)	Toxicity	Reference	MSDS Attached
Acetaldehyde - Annual	0.88	5	IRIS, RBAC	☐
Acetaldehyde – 15 min	1.00	4,500	ACGIH Ceiling	☐
Formaldehyde – Annual	1.17	1.1	Revised IRIS, RBAC	☐
Formaldehyde – 15 min	1.34	245	OSHA, STEL	☐
Methanol – 24 hr	5.71	619	OSHA, PEL	☐
Methanol – 15 min	5.71	32,800	ACGIH, STEL	☐
Propionaldehyde	0.03	8	IRIS,RfC	☐
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APPENDIX C

RACT/BACT/LAER CLEARINGHOUSE DATABASE SEARCH RESULTS

Table C-1. Summary of RBLC Database Search Results

Permit Date	Facility Name	State	Permit No.	Process	Throughput	Control Method	Emission Limits
8/04/2009	North Florida Lumber/Bristol Saw Mill	FL	0770007-014-AC (PSD-FL-407)	Steam Heated Lumber Drying Kiln	92,000 MBF/yr	Best operating practices	116.93 tons/yr
8/25/2008	Bibler Brothers Lumber Company	AR	1628-AOP-R5	2 Direct Fired Continuous Operating Kilns	12.1 MBF/hr (each)	None	3.8 lb/MBF
4/9/2008	Bowater Inc. - Albertville Sawmill	AL	711-S001-X004	2 Steam Heated Lumber Drying Kilns (North & South - K100/K101)	182.14 MBF/charge	Operate with wet bulb set point drying schedule of less than or equal to 185°F; Daily and monthly I/M procedures.	7 lb/MBF
7/21/2006	Wright City Complex	OK	99-052-C (M-2) PSD	Lumber Kilns (indirect fired)	Not Specified	None	4.8 lb/MBF
1/25/2006	Sierra Pacific Industries - Skagit Lumber Manufacturing Facility	WA	PSD 05-04	7 Dry Kilns	300 MMBF/yr	Best operating practice/computerized steam management system	54 tons/yr
7/26/2005	Potlatch Corporation - Ozan Unit	AR	0117-AOP-R4	Indirect fired drying kilns 1-4	265 MMBF/yr	Proper Operation	3.5 lb/MBF
7/13/2005	Hood Industries Inc. - Couhatta Sawmill	LA	PSD-LA-708	Wood Lumber Kilns (indirect fired)	N/A	None	28 lb/hr
1/12/2005	Deltic Timber Corp. - Waldo	AR	697-AOP-R6	5 Steam Heated Lumber Drying Kilns	225 MMBF/yr	None	3.5 lb/MBF
11/1/2004	Temple-Inland Diboll Operations	TX	PSD-TX-1008	East Lumber Kilns 1&2 (indirect)	171.35 MMBF/yr (total)	None	30.6 lb/hr (each)
				West Lumber Kilns 1&3 (indirect)			

Permit Date	Facility Name	State	Permit No.	Process	Throughput	Control Method	Emission Limits
7/19/2004	West Frasier (South), Inc. - Joyce Mill	LA	PSD-LA-701	Wood Lumber Kilns (indirect fired)	N/A	Proper Kiln Design & Operation	367.77 lb/hr
5/23/2004	Elliot Sawmilling Company	SC	1280-0004-CH	Lumber Drying Kiln (Direct-fired)	53 MMBF/hr	Work Practices	4.5 lb/MBF (LAER)
9/5/2003	New South Lumber Company, Inc. - Conway Plant	SC	1340-0029	5 Steam heated Lumber Drying Kilns	N/A	Work Practices	4.2 lb/MBF (LAER)
6/18/2003	Holden Wood Products Mill	LA	PSD-LA-692	Kiln 1 (1-79)	44 MMBF/yr	None	89.15 lb/hr (LAER)
				Kiln 2 (2-79)	45 MMBF/yr	None	89.15 lb/hr (LAER)
				Kiln 3 (1-89)	33 MMBF/yr	None	66 lb/hr (LAER)
				Kiln 4 (1-93)	34 MMBF/yr	None	67 lb/hr (LAER)
				Kiln 5 (1-01)	44 MMBF/yr	None	68 lb/hr (LAER)
6/4/2003	Bowater Inc. - Albertville Sawmill	AL	711-S001/UNIT 002	2 Steam Heated Lumber Drying Kilns (2)	125 MMBF/yr	Good operating practices, routine equipment inspections, and recordkeeping	7 lb/MBF
3/7/2003	New South Lumber Company, Inc. - Camden Plant	SC	1380-0025	5 Steam heated Lumber Drying Kilns	182.1 MMBF/yr	Work Practice & Production Limit	4.2 lb/MBF (LAER)
11/7/2002	Georgia-Pacific Corp. - El Dorado Sawmill	AR	703-AOP-R1	Lumber Drying Kilns (3 directed fired & 4 steam-heated)	90,000 tons/yr	Proper maintenance & operation	5572 lb/charge
11/7/2002	West Fraser (South), Inc. - Huttig Mill	AR	118-AOP-R2	Lumber Drying Kiln (steam-heated)	230 MMBF/yr	None	3.5 lb/MBF

Permit Date	Facility Name	State	Permit No.	Process	Throughput	Control Method	Emission Limits
11/1/2002	International Paper Co. - Leola Lumber Mill	AR	0057-AOP-R2	Lumber Drying Kiln (steam-heated)	29410 MBF/yr	None	423 lb/charge
5/16/2002	T.R. Miller Mill	AL	502-S002	Lumber Drying Kiln (steam heated)	125 MBF/hr	Good Engineering Practices	6.78 lb/MBF
4/8/2002	Collum's Lumber Mill	SC	0160-0004-CR	2 Steam Heated Lumber Drying Kilns	55.75 MMBF/yr	None	195 tons/yr (LAER)
9/5/2001	International Paper Company Morton Lumber Mill	MS	2420-00031	Wood Dry Kilns 1, 2, & 3 (Direct-Fired) – existing	52.55 MMBF/yr	None	5.2 lb/MBF
				Wood Dry Kiln 4 (Direct-Fired) - new	30.0 MMBF/yr	None	5.2 lb/MBF
8/15/2001	Charles Ingram Lumber Company	SC	1040-0016-CB	Direct Fired Lumber Kiln	110 MMBF/yr	Work Practices consisting of daily, weekly, monthly, semi-annual, and annual inspection and maintenance.	192.5 tons/yr (LAER)
3/8/2001	Potlatch Corporation - Ozan Unit	AR	117-AOP-R1 (50-0001)	Steam Heated Lumber Drying Kilns (2)	230 MMBF/yr	None	3.5 lb/MBF
12/28/2000	Weyerhaeuser Company	MS	2280-00050	Lumber Drying Kilns (5 direct-fired)	222.5 MMBF/yr	Good Combustion Control. No add on controls feasible.	4.2 lb/MBF
				Lumber Drying Kiln, AA-007 (direct fired)	35 MMBF/yr	Good Combustion Control. No add on controls feasible.	4.2 lb/MBF
8/6/2000	Temple Inland Pineland Manufacturing Complex	TX	PSD-TX-924	(4) Kilns 1-4 (indirect)	200 MMBF/yr	None	11.46 lb/hr
4/10/2000	Chesterfield Lumber Company	SC	0820-0045	Steam Heated Lumber Drying Kiln	Not Specified	None	353.5 lb/day (LAER)

Table C-2. GA EPD's Recent PSD Permits for Lumber Drying Kilns

Date	Facility Name	County	Project	Production Capacity	VOC Control Method	VOC Emission Limits
07/16/2007	Rayonier Wood Products LLC., Swainsboro Mill	Emanuel	Modification of their lumber drying kilns	An increase in lumber drying capacity to 220 MMBF/year	Work Practice Standards	None
05/24/2006	Temple -Inland - Rome Lumber Mill	Floyd	Removal of production limitations on the kilns	An increase in the total lumber production capacity of the mill up to 180.0 MMBF/year in the three lumber drying kilns	Good Operating Practices	None
9/27/2004	International Paper- Augusta Lumber Mill	Richmond	Modification of 3 kilns to improve drying efficiency, the removal of the production restrictions on kilns and the modification of the infeed of the sharp chain (sawmill) by installing a mini double length infeed	An increase in the total lumber production capacity of the mill up to 157.0 MMBF/year in the three lumber drying kilns	Work Practice Standards	None

APPENDIX D

PREVENTION OF SIGNIFICANT DETERIORATION DISPERSION MODELING PROTOCOL

October 12, 2010

Pete Courtney
Data and Modeling Unit
Air Protection Branch
Environmental Protection Division
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Re: Simpson Lumber Company, LLC Meldrim Operations Modeling Protocol

Dear Mr. Courtney,

Simpson Lumber Company, LLC in Meldrim, Georgia is proposing to install two new lumber kilns. The new equipment is expected to cause an increase in volatile organic compound (VOC) emissions above the Significant Emission Rates and require a Prevention of Significant Deterioration (PSD) permit. As part of preparing a permit application a toxic assessment will be prepared according to the Georgia Environmental Protection Division's (EPD's) Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions for acetaldehyde, formaldehyde, propionaldehyde, and methanol. This letter requests approval of the modeling methodology outlined below.

Under this program the total facility-wide emissions are modeled and the predicted concentration compared to the acceptable ambient concentration (AAC). The AAC was determined for each pollutant using pollutant toxicity data from various sources listed in the Toxic Assessment Guideline. An initial list of AACs was provided by Georgia EPD. This list was refined and updated based on recent toxicity data and other factors as described below.

The reference dose concentration (RfC) for propionaldehyde was assessed and revised in September 30, 2008. Therefore, an annual AAC for propionaldehyde was added. Likewise, an annual AAC was added for methanol based on inhalation effects calculated by California Environmental Protection Agency (CalEPA).

The annual AAC for formaldehyde is based on toxicity data in the Integrated Risk Information System (IRIS). However, the Environmental Protection Agency's (EPA's) Exposure Factors Handbook states that the IRIS default inhalation rate of 20 cubic meters(m^3)/day is not recommended. This rate is based on a person in moderate activity, which could not practicably be sustained over a long-term exposure period. In the Exposure Factors Handbook, the life-time average inhalation rates for women and men are 10 m^3/day and 14 m^3/day, respectively. Using an average inhalation rate of 12 m^3/day, SLR is proposing to adjust the human health-based risk assessment levels for formaldehyde. Thus, the calculated AAC is 1.28 micrograms (µg)/m^3(= 0.77 * 20 / 12).

The complete list of AACs is provided in Table 1.

Table 1. Acceptable Ambient Concentration

Pollutant	Averaging Period	AAC (ug/m^3)	AAC Dosage Parameter and Organization[(1)]
Acetaldehyde	Annual	5[(2)]	RBAC, IRIS
	15-min	4,500[(2)]	CL, ACGIH
Formaldehyde	Annual	1.28[(2)]	RBAC, IRIS
	15-min	245[(2)]	STEL, OSHA
Propionaldehyde	Annual	8[(3)]	RfC, IRIS
	24-hr	57[(2)]	LD50, NIOSH
Methanol	24-hr	619[(2)]	PEL, OSHA
	15-min	32,800[(2)]	STEL, ACGIH
	Annual	10,000[(4)]	REL, EPA and CalEPA

(1) Dosage acronyms: RBAC = risk-based air concentrations, CL = ceiling level, RfC = reference dose concentrations, STEL = short-term exposure limits, LD50 = lethal dose 50% population, PEL = permissible exposure limit. Organization acronyms: IRIS = Integrated Risk Information System, OSHA = Occupational Safety and Health Administration, ACGIH = American Conference of Governmental and Industrial Hygienists, NIOSH = National Institute for Occupational Safety and Health.
(2) AACs were provided by Rosenda Majano, Air Protection Branch – Data and Modeling Unit Georgia Environmental Protection Division, May 9, 2008
(3) Propionaldehyde annual AAC based on chronic non-carcinogenic inhalation effects. RfC assessed and revised 9/30/2008.
(4) Methanol annual AAC based on chronic non-carcinogenic inhalation effects calculated by CalEPA and cited by U.S. EPA (http://www.epa.gov/ttn/atw/hlthef/methanol.html).

Emissions will be modeled with ISC3 and meteorology for Savannah/Waycross downloaded from the Georgia EPD modeling website.[1] Building downwash will not be included per Georgia EPD guidance.[2] Modeled emissions will be the facility expected maximum short-term potential emissions. The dry lumber kilns are the only sources of toxic air pollutants at the facility.

For comparison with the 24-hour and annual AACs, the potential emissions from the entire facility will be modeled with receptors placed at each of the nearest residences. These residences are the nearest locations where people may be expected to spend significant amounts of time. Figure 1 shows an aerial photograph of the area and the location of the receptors. The 15-minute standards will be modeled with receptors placed on the facility fence line at 100 meter spacing and nested receptor grids as follows:

(1) A fine grid at 100 meter spacing extending to 2,000 meters.
(2) A medium grid at 500 meter spacing extending to 5,000 meters.
(3) A coarse grid at 1,000 meter spacing extending to 15,000 meters.

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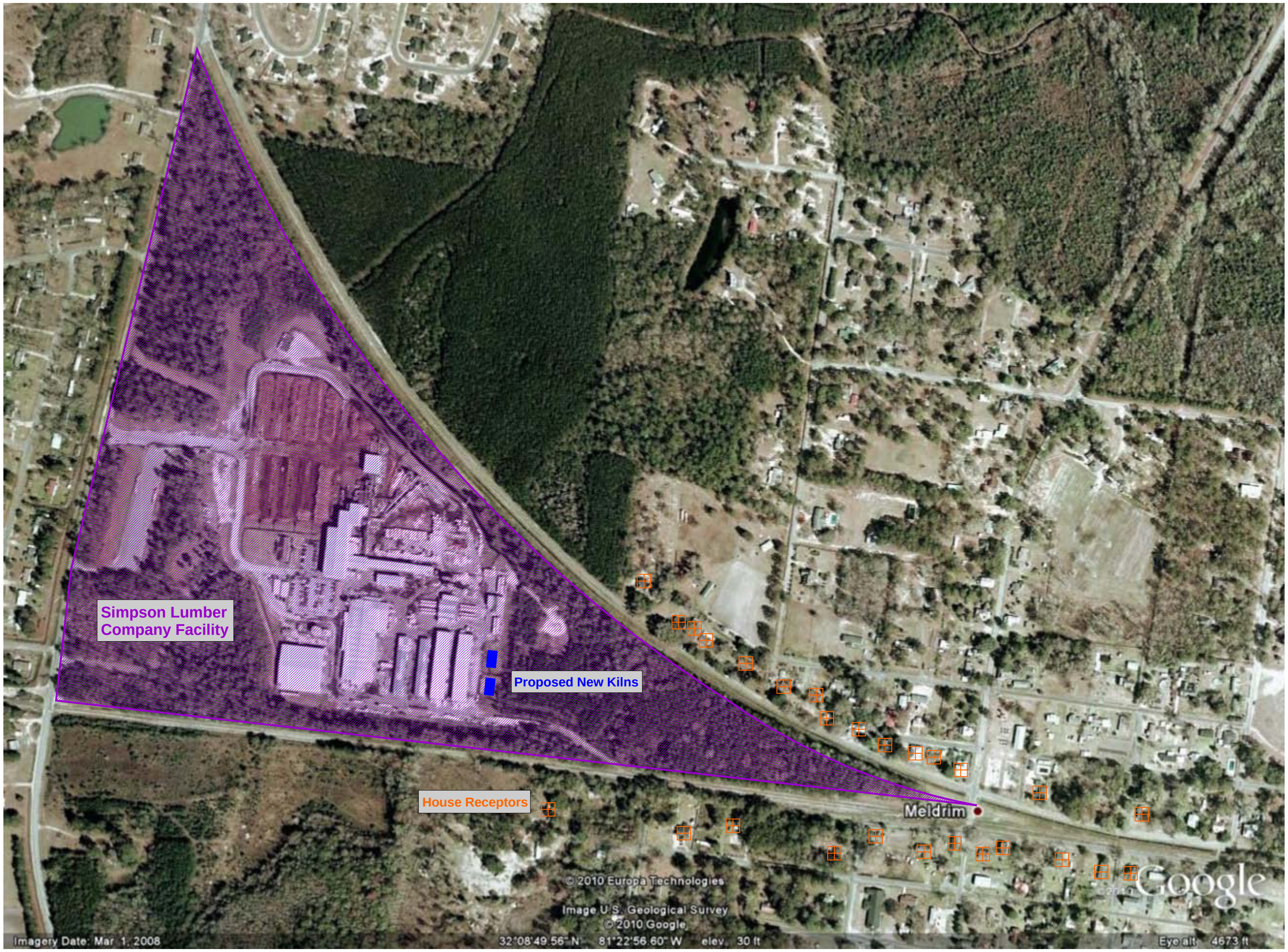
[1] http://www.georgiaair.org/airpermit/html/sspp/modeling.htm
[2] Telephone conversation with Pete Courtney, Georgia EPD, June 8, 2010.

Figure 1


Simpson Lumber
Company Facility
Proposed New Kilns
House Receptors
Meldrim
© 2010 Europa Technologies
Image U.S. Geological Survey
© 2010 Google
Imagery Date: Mar 1, 2008
32°08'49.56" N 81°22'56.60" W elev. 30 ft
Eye alt 4673 ft
Google

SLR desires to proceed with the proposed modeling approach upon receipt of approval from Georgia EPD. Please provide a written response of approval or comments regarding the proposed modeling approach. We look forward to hearing from you.

Sincerely,
SLR International Corp

Eri Ottersburg
Project Engineer

Heather Bartlett
Principal Engineer

CC John Yntema, Georgia Environmental Protection Division
Dr. Randy Manning, Georgia Environmental Protection Division
Bruce Harris, Simpson Lumber Company

January 5, 2011

Pete Courtney
Data and Modeling Unit
Air Protection Branch
Environmental Protection Division
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Re: Response to comments on Meldrim Modeling Protocol
Meldrim Operations, Simpson Lumber Company, LLC

Dear Mr. Courtney,

Thanks for your comments on our October 12, 2010 modeling protocol. Generally we agree with all of the changes you proposed. Details are provided below.

Comment 1

We accept the use of the AACs presented. Note 1 of Table 1 requests approval of the long-term AAC from Dr. Randy Manning. In accordance with Dr. Manning's email on October 28, 2010, the Formaldehyde AAC will be 1.1 $\mu g/m^3$ instead of 1.28 $\mu g/m^3$.

Comment 2

Receptors will be placed at each residence surrounding the property.

Comment 3

We will use AERMOD version 09040 with USGS NED to obtain base elevations for modeled objects.

Comment 4

The grid resolutions will be changed as proposed. No receptors located within 2 km of the modeled sources are at elevations equal to or greater than stack height. Therefore, downwash will not be included in the modeling. However, there are receptors above stack height at locations greater than 2 km from the modeled source. These receptors (located within the medium and coarse grids) will be modeled in AERMOD using meteorology provided on November 10, 2010. Receptors in the fine grid, on the facility boundary, and residence receptors will continue to be modeled in ISC3.

Comment 5

SLR agrees with your hourly average emissions calculations for annual AACs. To clarify, there are no restrictions on the annual production, therefore, annual rates are the same as the short-term rates. However, as necessary, the facility may take restrict the annual production in the future to stay below certain regulatory thresholds. The annual rates will reflect any restrictions proposed.

The emission rates are calculated from the throughput of the kiln in board feet and an emission factor of pounds per board foot. Therefore both the production and emission factor should be considered in calculating the short-term emission rates.

Kiln Production

For the annual averaging periods, the emission rates will be derived from maximum annual throughput.

Regarding short-term averaging periods (24-hour and 15-minute), SLR will take the following approach to derive the maximum production.

- For existing batch kilns, the maximum hourly production will be derived from the throughput per batch per kiln and hours of operations per batch.
- For the new kilns continuous kilns, SLR will derive the maximum hourly production based on annual production records of similarly sized kilns and the expected annual hours of operation.
- For both the continuous and batch kilns, the maximum 15-minute production is calculated from the hourly production by dividing by 4.

Emission Factors

SLR proposes to use the most conservative emission factor based on the available data for direct-fired batch and continuous kilns. Regarding the 15-minute averaging period, we understand NCASI has data showing spikes in formaldehyde and methanol emissions over the processing of a batch for direct fired kilns. Based on the conversation and other correspondence with John Yntema (see attached email) and NCASI Technical Bulletin 845, the following method could be used to calculate the short term emission factor for formaldehyde and methanol. The emissions are multiplied by four to represent hourly emissions for input to the model.

Formaldehyde

The highest emission rate from Figure AA.1 of NCASI Technical Bulletin 845 is 2.60E-04 lb/MBF per minute. Therefore, the emission factor is:

2.60E-04 lb/MBF per min x 15 min x 4 = 0.0156 lb/MBF

Methanol

The highest emission rate from Figure AA.7 of NCASI Technical Bulletin 845 is 3.80E-04 lb/MBF per minute. Therefore, the emission factor is:

3.80E-04 lb/MBF per min x 15 min x 4 = 0.023 lb/MBF

However, the emission factors for formaldehyde and methanol that SLR found for batch operations are 0.04 and 0.16 lb/MBF, respectively (also published by NCASI). For continuous operation, the emission factor for formaldehyde is 0.03 lb/MBF. This is based on recent source testing of a continuous kiln. Due to the lack of data on methanol emissions from a continuous kiln, SLR will use the same emission factor as the batch kiln for the continuous kiln. The manufacturer has indicated that in general, emissions from continuous kilns are lower than batch kilns.

Please note that the emission factors SLR proposed are higher than the emission factors derived from the NCASI Technical Bulletin for 15-minute averaging.

Please let us know which emission factors you would like SLR to use for 15-minute AACs.

<u>Comment 6</u>

The annual AACs will be compared to the maximum 5-year average concentration.

SLR desires to proceed with the proposed modeling approach upon receipt of approval from Georgia EPD. Please provide a written response of approval or further comments regarding the proposed modeling approach. We look forward to hearing from you.

Sincerely,
SLR International Corp

Eri Ottersburg
Project Engineer

Fuad Wadud, P.E.
Associate Engineer

APPENDIX E

CD OF MODEL INPUT AND OUTPUT FILES