NOTICE OF CONSTRUCTION APPLICATION

DARRINGTON, WASHINGTON

Prepared for

PUGET SOUND CLEAN AIR AGENCY

ON BEHALF OF FORTERRA

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ACRONYMS AND ABBREVIATIONS

40 CFR	Title 40 Code of Federal Regulations
Arlington met station	Arlington Municipal Airport monitoring station
ASIL	Acceptable Source Impact Level
BACT	Best Available Control Technology
CLT	cross laminated timber
CNC	Computer Numeric Control
CO	carbon monoxide
COOP	cooperative observer program
DWIC	Darrington Wood Innovation Center LLC
Ecology	Washington Department of Ecology
EPA	United States Environmental Protection Agency
ESP	electrostatic precipitator
GHG	greenhouse gases
HAP	hazardous air pollutant
Mbdft	thousand-board feet
met	meteorology
MFA	Maul Foster & Alongi, Inc.
MMBtu	million British thermal-unit
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_X	nitrogen oxides
NOC	Notice of Construction
NSPS	New Source Performance Standards
NSR	New Source Review
PM	particulate matter
PM_{10}	particulate matter with aerodynamic diameters less than 10 micrometers
$PM_{2.5}$	particulate matter with aerodynamic diameters less than 2.5 micrometers
PSCAA	Puget Sound Clean Air Agency
PSD	Prevention of Significant Deterioration
RBLC	Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate Clearinghouse
SQER	Small Quantity Emission Rate
TAP	toxic air pollutant
VOC	volatile organic compound
WAC	Washington Administrative Code

1 INTRODUCTION

Forterra Darrington Wood Innovation Center LLC (DWIC) is proposing to construct a forest-to-housing manufacturing facility in Darrington, WA (proposed facility). The proposed facility will be located in Snohomish County which is regulated by the Puget Sound Clean Air Agency (PSCAA). Regulation I, Article 6 of the PSCAA requires that any new air pollution source submit a Notice of Construction (NOC) application prior to beginning construction. DWIC retained Maul Foster & Alongi (MFA) to prepare each item required for a Notice of Construction (NOC) application submittal. Applicable NOC forms are provided in Appendix A.

1.1 Facility Description

The proposed facility will include a sawmill, lumber kilns, a natural gas boiler, emergency diesel-fired boiler, a Glulam Beam and cross laminated timber (CLT) panel assembly process, and a modular unit construction operation. All components will be manufactured onsite from whole log feedstock. CLT panels, pre-fabricated wall and floor panels, and other structural members will be pieced together to create modular units for residential and commercial use. The proposed facility will employ up to 125 employees at full operation.

The proposed facility will be located in Darrington, Washington approximately 1 kilometer (0.6 miles) northwest of Darrington town center. An aerial image of the proposed facility location and property boundary is shown in Figure 1-1 (attached).

The area immediately surrounding the proposed facility is characterized by primarily flat terrain and forest lands. The western end of the runway for the Darrington Municipal Airport is due south of the proposed facility location. The proposed facility will be located in a valley generally oriented east-to-west, with high mountain peaks due north, south, and east. The topography of the area immediately surrounding the proposed facility is presented in Figure 1-2 (attached).

1.2 Process Description

Whole logs will be delivered by truck and stored in an onsite log yard. Whole logs will be received directly from point of harvest with a moisture content between 40 and 60 percent on a wet basis (also referred to as "green"). Harvested wood species will primarily include Western Hemlock, Douglas Fir, Engelmann Spruce, and Larch. DWIC anticipates Douglas Fir and Larch will represent approximately 75 percent of annual production, with the remaining 25 percent split between Western Hemlock and Engelmann Spruce.

From the log yard, whole logs will be arranged in the log deck prior to entering a debarking line via front end loader. The front end loader will then transport debarked logs to the sawmill. Once in the sawmill, debarked logs will be bucked (cut) to the appropriate length, sawn, then planed into pieces of green dimensional lumber. Green lumber dimensions will vary based on product specifications for the

CLT facility. Bucked ends from green logs will be pneumatically transferred to a chipper for further processing prior to being moved by a front end loader to a fuel storage bin. The fuel storage bin will be used to supply fuel to the proposed biomass boiler.

After exiting the sawmill, green lumber will be stacked in one of the proposed batch lumber kilns. Green lumber will be dried at a maximum temperature of 200 degrees Fahrenheit and the drying cycle will last for up to 198 hours to achieve the required final moisture content of 12 percent (wet basis). DWIC is proposing to install 10 kiln stalls in two adjacent buildings. Each stall will have four roof vents for a total of 40 roof vents. The lumber kilns will be indirectly heated by steam from the proposed biomass boiler.

Dried lumber will be moved by front end loader to the CLT manufacturing building where it will be introduced to the CLT processing line. The dried lumber will be jointed, planed, cut to achieve the desired dimensions, then laid out in layers typically measuring 12 feet (ft) by 60 ft. The dimensions of each layer will depend on the type of CLT panel being produced. The layers will be conveyed to the glue line through an adhesive gate where a primer and an adhesive will be applied between each layer. Each subsequent layer of dried lumber will be laid out in an alternating perpendicular orientation to the previous layer. This process will be repeated until the desired thickness of the CLT panel is achieved which will be typically between 3 to 9 layers. The finished panel will be conveyed to a cold press. The cold press will utilize high pressure and radio frequencies to cure the adhesive and bind the layers together.

After pressing, CLT panels will be sent to a Computer Numeric Control (CNC) machine for removal of materials in areas where windows, doors, mechanical, electrical, and/or plumbing lines will be installed. After processing in the CNC machine, panels will go through a planer for final dimensioning. Shavings and wood residuals collected by residuals handling equipment inside the CLT manufacturing building will be pneumatically conveyed to a hog to reduce material size. Hogged materials will be transported by front end loader to a fuel storage bin that will provide fuel to the proposed biomass boiler. Exhaust from each jointer, saw, and the CNC machine will be routed to a downstream baghouse for control of particulate matter (PM) emissions prior to venting to atmosphere.

Finished panels will be stored inside the CLT manufacturing building prior to moving to the modular construction building. Once in the CLT modular construction building, finished panels will be spray coated with a water-based wood oil inside a spray booth. After curing, finished panels will be sanded and assembled to create modular buildings of various sizes. Modular buildings will be stored onsite prior to shipment offsite to customers.

The proposed facility will utilize an emergency diesel-fired boiler rated for a maximum heat input capacity of six MMBtu per hour. The emergency boiler will only be used as backup during periods when the proposed biomass boiler is shut down. The emergency boiler will be operational during prescriptive maintenance periods not to exceed one 10-hour shift per day or 50 hours per year.

A process flow diagram of the proposed facility operation is presented in Figure 1-3. The process flow diagram presents each proposed emission unit described in more detail in Section 2.

2 PROPOSED EMISSION UNITS

A comprehensive emissions inventory is presented in Appendix B. The emissions inventory includes the emission calculations and supporting references for each proposed emissions unit detailing the potential to emit criteria pollutants, greenhouse gases (GHGs), hazardous air pollutants (HAPs), and toxic air pollutants (TAPs). Emission estimates are based on equipment capacities and the maximum production scenario for the proposed facility. Each proposed emissions unit is described in more detail in the following subsections.

2.1 Biomass Boiler

DWIC is proposing to install a biomass boiler manufactured by Polytechnik which will be rated for a maximum heat input capacity of 28 million British thermal units (MMBtu) per hour. The proposed biomass boiler will provide steam to heat the lumber kilns and process areas during winter months for personnel comfort. Hogged fuel from debarking and wood residuals collected onsite will be supplied to the proposed biomass boiler as fuel via a fuel storage bin.

Exhaust from the proposed biomass boiler will be routed through a multi-clone for removal of coarse particulate followed by a downstream dry electrostatic precipitator (ESP) for removal of fine particulate emissions prior to exhausting to atmosphere. The dry ESP will be manufactured by Polytechnik and will have a design inlet gas flowrate capacity of approximately 10,000 standard cubic feet per minute. The proposed biomass boiler will also use a flue gas recirculation system to improve the combustion efficiency, reducing potential emissions of carbon monoxide (CO) and nitrogen oxides (NO_X).

The proposed biomass boiler and downstream control devices are conservatively assumed to operate continuously up to 8,760 hours per year . However, the proposed biomass boiler will be shut down for maintenance and cleaning at some point in any given year.

2.2 Emergency Diesel-Fired Boiler

DWIC is proposing to install a diesel-fired boiler with a maximum heat input rating of six MMBtu per hour for emergency backup purposes. The proposed emergency boiler will only operate during periods when the proposed biomass boiler is shut down. Only ultra-low sulfur diesel with sulfur concentrations below 15 parts per million will be utilized as fuel.

2.3 Lumber Kilns

DWIC is proposing to install and operate batch kilns to dry the green dimensional lumber processed in the sawmill. The proposed kilns will be manufactured by Katres Drying Technology. DWIC will construct two kiln buildings. Each building will contain 5 kiln chambers. Therefore, DWIC proposes to install 10 kilns with a total drying capacity of 21,188 thousand-board feet (Mbdft) per year. Each

individual kiln will have a maximum drying capacity of 56.1 Mbdft per batch, while total simultaneous drying capacity between all ten kilns will be 561 Mbdft. Emissions from each kiln will be exhausted to atmosphere through a series of four roof vents.

2.4 Debarker

In the log yard, DWIC is proposing to install a whole log debarker manufactured by Artiglio. The proposed debarker will be capable of processing 134 tons of whole green logs per day over two nine hour shifts. This equates to 48,885 tons of whole green logs annually. The proposed debarker will utilize a steel mesh cage surrounding the rotating blades to capture bark cut from green logs. The steel cage will reduce coarse particulate emissions released during debarking. The proposed debarker will only generate emissions of particulate matter, including PM with aerodynamic diameters of less than 10 and 2.5 micrometers (PM_{10} and $PM_{2.5}$), respectively.

2.5 Sawmill Wood Handling Equipment

DWIC is proposing to install wood handling equipment to process whole green logs to green dimensional lumber in the sawmill. Proposed wood handling equipment will be manufactured by Artiglio and will located inside an enclosed, warehouse-style building with an attached bay door. Proposed wood handling equipment includes a band and edging saw, a planer, and a chipper. Green shavings from sawing and planing will be pneumatically transferred to the chipper for further particle size reduction.

Negligible emissions of sawdust will be generated by the sawmill wood handling equipment due to the high moisture content of the green logs. These activities will also occur inside an enclosed building. Therefore, only a small fraction of generated sawdust will be emitted to atmosphere. The proposed wood handling equipment in the sawmill will generate PM emissions only.

2.6 CLT Facility Wood Handling Equipment

DWIC is proposing to construct a CLT manufacturing building that will contain wood handling equipment to process kiln-dried lumber into CLT panels. Proposed wood handling equipment will be manufactured by Artiglio including a jointer, four planers, two crosscut saws, a flying saw, a CNC machine, and a chipper. Particulate laden exhaust from each piece of equipment in the CLT manufacturing building will be pneumatically conveyed through ductwork to a downstream baghouse for control of coarse and fine particulate emissions prior to exhausting to atmosphere.

2.7 Glue Line

A proposed glue line will be used to apply a primer and an adhesive between the layers of each CLT panel. The primer and adhesive will be applied through low velocity nozzles designed for full coverage of each CLT panel. The proposed primer and adhesive, manufactured by the Henkel Corporation, will have low volatile organic compound (VOC) contents. Potential VOC emissions from the primer and adhesive application process will be released uncontrolled inside the CLT manufacturing building.

Fugitive VOC and TAP emissions are expected to emit to atmosphere through passive roof vents near the proposed glue line area.

2.8 Coating Application

A protective wood oil coating will be applied to finished CLT panels in the proposed CLT modular construction building. The wood oil coating will be applied to both the inside and outside faces of finished CLT panels inside a spray booth. A forced draft fan will be used to provide ventilation inside the spray booth. Exhaust from the forced draft fan will be routed via ductwork through the CLT modular construction building roof and emitted to atmosphere.

3 REGULATORY ANALYSIS

The following subsections detail the federal, state, and local air quality regulations that may appear to apply to the proposed facility.

3.1 New Source Performance Standards

New Source Performance Standards (NSPS) published in Title 40 Code of Federal Regulations (40 CFR) Part 60 establish emission controls for new, modified, or reconstructed equipment or operations as defined in the regulations. Equipment and operations subject to these regulations are required to comply with the pollution control technologies and other provisions specified in the NSPS regulations.

3.1.1 40 CFR Part 60 Subpart A—General Provisions

The General Provisions, Subpart A of 40 CFR Part 60, apply to stationary sources for which there is an applicable standard. Subpart A provides guidance on requirements such as monitoring, recordkeeping, and reporting. Portions of Subpart A are applicable to all other subparts of Part 60. As detailed below, the proposed facility has an applicable NSPS, and therefore, specific conditions in Subpart A will also be applicable to the proposed facility.

3.1.2 40 CFR Part 60 Subpart Dc—Small Industrial-Commercial-Institutional Steam Generating Units

Subpart Dc applies to each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989, and that has a maximum design heat input capacity between 10 to 100 MMBtu per hour. The proposed emergency diesel-fired boiler will have a maximum heat input capacity of only six MMBtu per hour and therefore will not be subject to Subpart Dc.

The proposed biomass boiler will have a maximum heat input capacity of 28 MMBtu per hour and will be constructed after June 9, 1989. Therefore, the proposed biomass boiler will be subject to Subpart Dc requirements. The proposed biomass boiler will only utilize hogged fuel from debarking

and wood residuals. The performance standards for sulfur dioxide only apply to equipment that utilize coal as a fuel. Therefore, the performance standards for sulfur dioxide will not apply. The performance standards for PM apply to equipment that utilize coal, wood, or oil with heat input capacities greater than 30 MMBtu per hour. Since this heat input capacity exceeds the maximum heat input capacity for the proposed biomass boiler, the performance standards for PM will not apply. Hence, the proposed biomass boiler will only be subject to the reporting and recordkeeping requirements under Subpart Dc.

3.2 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAPs) published in 40 CFR Part 61 and 63 regulate specific HAPs or specific stationary sources that emit (or have the potential to emit) HAPs. Some NESHAPs apply only to major sources of HAPs which are sources that have the potential to emit 10 tons per year or more of any single HAP, or 25 tons per year or more of aggregated HAPs. The proposed facility will not exceed either threshold and will not be considered a major source of HAPs as shown in the emissions inventory presented in Appendix B. Therefore, the proposed facility is considered an area source for purposes of NESHAP applicability per §63.2.

3.2.1 40 CFR Part 63 Subpart A—General Provisions

The General Provisions, 40 CFR Part 63 Subpart A apply to sources of HAPs for which there is an applicable standard. Subpart A provides guidance on requirements such as monitoring, recordkeeping, and reporting. Subparts regulating specific sources specify the applicable provisions of Subpart A. As detailed below, the proposed facility will be subject to a NESHAP, and therefore, will be subject to specific conditions from Subpart A.

3.2.2 40 CFR Part 63 Subpart HHHHHH—Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources

Subpart HHHHHH applies to owners and operators of paint stripping operations that use chemical strippers containing methylene chloride and spray application of coatings containing target HAPs to metals and plastics. DWIC will not utilize any coatings containing any target HAP (compounds of chromium, lead, manganese, nickel, or cadmium) and will not apply coatings to plastics or metals. Therefore, the coating application equipment at the proposed facility will not be subject to Subpart HHHHHH requirements.

3.2.3 40 CFR Part 63 Subpart JJJJJJ—Industrial, Commercial, and Institutional Boilers at Area Sources

Subpart JJJJJJ applies to owners and operators of industrial, commercial, or institutional boilers located at area sources of HAPs. The proposed biomass boiler and proposed emergency diesel-fired boiler do not meet the exemption provisions under §63.11195. Therefore, the proposed boilers will be subject to Subpart JJJJJJ including, but not limited to, specific emission limits, work practice standards, and continuous compliance requirements.

3.3 PSCAA Regulations

Business operations that have the potential to create air pollution within King, Kitsap, Pierce, or Snohomish counties are required to register and obtain a permit from the PSCAA prior to beginning construction or installing equipment. The following subsections detail the applicability of Regulations I, II, and III of the PSCAA to the proposed facility.

3.3.1 Article 2—State Environmental Policy Act

Section 2.06 of Regulation I requires a completed environmental checklist be submitted with the NOC application. The completed environmental checklist Form Number 50-150 is presented in Appendix A.

3.3.2 Article 6—NOC Permitting Applicability

Section 6.03(a) of Regulation I requires any new source to submit an NOC application to obtain an Order of Approval prior to commencing construction. A new source means the construction or modification of a stationary source that increases the amount of any air contaminant emitted by such source or that results in the emission of any contaminant not previously emitted per Washington Administrative Code (WAC) 173-400-030(56). PSCAA adopts specific provisions of the New Source Review (NSR) program under the WAC as established by the Washington State Department of Ecology (Ecology).

DWIC is proposing to construct a new stationary source and is therefore submitting this NOC application to obtain approval to construct from the PSCAA. Within 30 days of completing construction of the proposed facility, DWIC will submit the notice of completion form to the PSCAA per Section 6.09 of Regulation I.

3.3.3 Article 7—Operating Permit

The operating permit requirements under Section 7.03 of Regulation I apply to all sources subject to WAC 173-401. Per WAC 173-401-300(1)(a), provisions under Division 401 apply to any source, including area sources, subject to a standard, limitation, or other requirement under section 111 (NSPS regulations) or section 112 (NESHAP regulations) of the Federal Clean Air Act. Therefore, the operating permit program does apply to the proposed facility since the proposed boilers will be subject to applicable NSPS and/or NESHAP regulations. Per WAC 173-401-500(3)(c), DWIC will submit a timely and complete operating permit application within 12 months after commencing operation.

3.4 WAC Regulations

The following subsections detail additional WAC regulations adopted by the PSCAA under Article 6 of Regulation I.

3.4.1 Prevention of Significant Deterioration Applicability

The proposed facility will be located in an area designated as attainment or unclassifiable with respect to the National Ambient Air Quality Standards for all regulated pollutants. Per WAC 173-400-720(1), no major stationary source or major modification is authorized to begin actual construction without first having received a Prevention of Significant Deterioration (PSD) permit. The major stationary source definition can be found under §52.21 per WAC 173-400-710. As set forth under §52.21(b)(1)(i), a major stationary source is one of 28 specifically named source categories with the potential to emit 100 tons per year or more of any regulated NSR pollutant, or any stationary source with the potential to emit 250 tons per year or more of a regulated NSR pollutant.

The proposed facility will not be one of the 28 specifically named source categories and will not have the potential to emit more than 250 tons per year of any regulated NSR pollutant as shown in the emissions inventory presented in Appendix B. Therefore, the proposed facility will not be subject to the PSD permitting program.

3.4.2 Toxic Air Pollutant Regulations

Under WAC 173-460, new or modified sources of TAPs must evaluate the applicability of Toxics Best Available Control Technology (TBACT). Ecology developed de minimis levels, Small Quantity Emission Rates (SQERs), and Acceptable Source Impact Levels (ASILs) for each TAP identified in WAC 173-460-150. An NOC application for a new or modified source of TAPs must demonstrate that the new or modified emission units will employ TBACT for all TAPs for which the increase in emissions will the exceed de minimis emission values per WAC 173-460-040(1).

An evaluation of TBACT is presented in Section 4. A comparison of proposed facility emissions to applicable SQERs are presented in Table 3-1 (attached). The ASIL assessments for TAPs exceeding an SQER are detailed in Section 5.

4 BACT/TBACT ASSESSMENT

Per Section 6.03 in Regulation I of the PSCAA, new sources must comply with the requirements set forth under WAC 173-400-113 and WAC 173-460-060. Per WAC 173-400-113(2), proposed new sources must apply Best Available Control Technology (BACT) for all pollutants not previously emitted. Further, WAC 173-460-060, requires new TAP sources to install and operate TBACT. Therefore, a "top-down" BACT and TBACT evaluation was conducted for each new emissions unit consistent with the 1990 Draft NSR Workshop Manual published by the United States Environmental Protection Agency (EPA).

The top down BACT/TBACT evaluation approach requires that available control technologies (including work-practice standards, pollution prevention techniques, emissions collection and destruction systems, etc.) be identified and ranked in descending order of control effectiveness.

Control technologies that are technically infeasible for site- or project-specific reasons are dismissed. Of the remaining control technologies, the control option with the highest control effectiveness is considered BACT/TBACT, unless it is demonstrated that economic, energy, or environmental considerations outweigh the benefits of the control option.

If the top control option is dismissed, the next highest-ranking control option is evaluated. This continues until either an acceptable control option is identified, or all feasible control options have been dismissed. There are five basic steps in the top down BACT/TBACT evaluation:

- Step 1—Identification of Control Technologies
- Step 2—Elimination of Technically Infeasible Options
- Step 3—Ranking of Remaining Control Technologies by Control Effectiveness
- Step 4—Evaluation of the Most Effective Control Option
- Step 5—Selection of BACT/TBACT

A high level review of the top down BACT/TBACT assessments for each new emissions unit are detailed in the following subsections.

4.1 Biomass Boiler

MFA searched the EPA Reasonably Available Control Technology/BACT/Lowest Achievable Emission Rate Clearinghouse (RBLC) database for biomass boilers with maximum heat input capacities less than 100 MMBtu per hour. The following information was queried:

- Date range: January 1, 2012 to February 25, 2022
- Process Type: 13.120 – Biomass (includes wood, wood waste, bagasse, and other biomass)
- Pollutant(a): All Pollutants

The RBLC search resulted in three separate facilities and two distinct Standard Industrial Classification (SIC) codes that matched the search criteria. Search results that were not representative of the proposed biomass boiler were removed from the evaluation, including boilers that exceeded the maximum heat input capacity of 100 MMBtu per hour. After removing non-representative search results, the following control technologies were identified: no control and good combustion practices.

Good combustion practices represents various techniques to optimize combustion efficiency including, but not limited to, monitoring air-to-fuel ratios, performing routine maintenance and inspections, and minimizing fluctuations in fuel supply quality. DWIC will follow manufacturer recommendations and best work practices to meet good combustion practice techniques which is considered BACT. In addition, DWIC is proposing to install a dry ESP and flue gas recirculation system to limit the potential to emit fine particulate, NO_X, and organic TAPs which is above and beyond what is typically installed as BACT/TBACT for representative boilers based on the EPA RBLC database query results.

4.2 Emergency Diesel-Fired Boiler

MFA performed the following EPA RBLC database search query to identify control technologies and techniques for the proposed emergency diesel-fired boiler:

- Date range: January 1, 2012 to March 3, 2022
- Process Type: 13.220 – Distillate Fuel Oil Combustion (less than 100 MMBtu per hour)
- Pollutant(a): All Pollutants

The RBLC search resulted in four different facilities, each with unique SIC codes, that matched the search criteria. Search results that were not representative of the proposed emergency diesel-fired boiler were removed from the evaluation. After removing non-representative results, the following control technologies were identified: no controls, good combustion practices, and use of low NO_X burners and ultra-low sulfur diesel.

DWIC is proposing to use only ultra-low sulfur diesel as fuel and will operate the proposed emergency diesel-fired boiler consistent with good combustion practices per manufacturer recommendations. The diesel-fired boiler using low NO_X burner control as BACT from the RBLC database was installed at the Hanford site in Washington state. The hourly emission limit for this RBLC database entry is 4.53 pounds of NO_X emissions per hour. As shown in the emissions inventory in Appendix B, the maximum hourly emissions rate for the DWIC emergency diesel-fired boiler will be 0.87 pounds per hour, well below the established hourly emission limit from the RBLC database entry. Therefore, DWIC is already proposing to meet each BACT/TBACT standard through a combination of good combustion practices and use of ultra-low sulfur diesel as fuel.

4.3 Lumber Kilns

MFA performed the following EPA RBLC database search query to identify control technologies and techniques for the proposed lumber kilns:

- Date range: January 1, 2012 to March 14, 2022
- Process Type: 30.800 – Wood L:umber Kilns
- Pollutant(a): All Pollutants

The RBLC search resulted in 14 facilities and two distinct SIC codes that matched the search criteria. Based on a review of EPA's RBLC database, the only control measures identified for lumber drying kilns are proper design and operation of the kiln. Hence, proper design and operation of the proposed lumber drying kilns is considered BACT and TBACT. The proposed lumber drying kilns will be equipped with precise temperature control systems and designed for maximum energy efficiency with advanced sealing and insulating systems. DWIC will maintain consistent moisture contents for each lumber charge and prevent over-drying of lumber by monitoring and drying at temperatures at or below 200°F.

4.4 Others

The remaining proposed emission units will be minor sources of particulate, VOC, and TAP emissions. Where feasible, proposed wood handling equipment will utilize capture hoods to capture particulate laden exhaust that will route to a downstream baghouse for control of PM emissions. A baghouse is considered BACT/TBACT for PM and metals as it has the highest control efficiency available for these pollutants. For the proposed debarker, glue line, and adhesive application emission units, no control is considered BACT/TBACT. DWIC will implement best management practices where practical including, but not limited to, enclosing process equipment and using low-VOC content primers and adhesives to limit the potential for VOC and TAP fugitive releases.

5 AIR QUALITY IMPACT ANALYSIS

One component of the NOC application is to confirm the proposed facility will not cause or contribute to a violation of any ambient air quality standard, in addition to analyzing potential impacts of TAPs per Regulation I, Section 6.01(a) and Regulation III, Section 2.05(b)(1), respectively. The proposed facility will be located in an attainment/unclassifiable area with respect to the National Ambient Air Quality Standards for all applicable pollutants. Following initial conversations with the PSCAA, National Ambient Air Quality Standard compliance demonstrations for emissions of PM_{10} and $PM_{2.5}$ are not required at this time due to the low level of emissions as presented in the emissions inventory included in Appendix B.

To assess potential impacts of TAPs, MFA followed the First Tier Review procedures outlined in Regulation III, Section 2.07(c). Table 3-1 (attached) presents the proposed facility TAP emission estimates that exceed the de minimis and small quantity emission rates (SQER) set forth in WAC 173-460-150. MFA performed the following air quality impact analyses for TAPs that exceeded their applicable SQER to demonstrate that predicted concentrations of each TAP are below the ASILs set forth in WAC 173-460-150. The following subsections detail the dispersion modeling methodology, input data, and results of each modeling assessment.

5.1 Model Selection

MFA prepared and executed the dispersion model using the model versions shown in Table 5-1. Lakes Environmental, a third-party overlay software, was used to perform each modeling assessment.

Table 5-1. Model Selection

Model	Model Version
AERMOD	21112
AERMET	21112
AERMAP	18081
AERSURFACE	20060
BPIP-PRM	04274

5.2 Meteorological Data

MFA used the meteorological (met) and terrain data files shown in Table 5-2 below.

Table 5-2. Meteorological and Terrain Data

Dataset	Station ID	Parameters
Site-Specific 1	Station ID 001 PSCAA Station (DarringtonMet)	Wind speed, wind direction
Site-Specific 2	Station ID 002 PSCAA Station (Darrington)	Temperature (2m), barometric pressure
Surface	Station ID 04205 Arlington Municipal Airport (National Weather Service)	All other surface parameters
Upper Air	Station ID 94240 for Quillayute, WA (National Oceanic and Atmospheric Administration/ Earth System Research Laboratory Radiosonde Database)	All upper air parameters
Terrain	United States Geologic Survey National Elevation Dataset (1/3-arc seconds with horizontal resolution of 10 meter)	Elevation

5.2.1 Site-Specific Data

MFA coordinated with the PSCAA and Ecology to identify a met dataset representative of the conditions at the proposed facility location. Two met stations operated by the PSCAA in Darrington were identified as suitable for dispersion modeling; PSCAA IDs Darrington and DarringtonMet. Each met station provides various critical parameters necessary for dispersion modeling including hourly-average wind speed, wind direction, dry-bulb temperature, and barometric pressure. The two met stations are located 200 feet from each other next to Darrington Elementary school which is roughly one mile from the proposed facility location. MFA combined the hourly-averaged data from these two met stations to create a single five year site-specific dataset for the period between 2017 and 2021.

5.2.2 Primary Surface Data

Ecology recommended surface data from the Automated Weather Observation System Arlington Municipal Airport monitoring station (Arlington met station) (ID KAWO, WBAN 04205) be used to provide cloud cover data, which is not available in the site-specific dataset, and to supplement any missing wind and temperature data in the site-specific dataset. The Arlington met station is located southwest of Arlington at an elevation of 137 feet above mean sea level and 26.2 miles southwest of the proposed facility location. Hourly data for wind speed, wind direction, cloud cover and temperature were downloaded by file transfer protocol from the National Center for Environmental Information for the period between 2017 and 2021.

5.2.3 Upper Air Data

Using the Forecast Systems Laboratory format for Quillayute, WA (station ID 94240), upper-air met data were collected from the National Oceanic and Atmospheric Administration Earth System Research Laboratory Radiosonde Database. Upper-air meteorological data were extracted for the period between 2017 and 2021.

5.2.4 Data Processing—AERMET

The site-specific data, surface met data, and upper air met data were processed using the EPA AERMET program to produce model-ready met data for use in the AERMOD dispersion model. The adjustment to the surface frictional velocity option (i.e., ADJ_U*) was selected as part of the AERMET processing. The land-use surface characteristics were processed using AERSURFACE.

Section 8.4.2(e) of Appendix W to 40 CFR Part 51, "Guideline on Air Quality Models," requires that a full calendar year of site-specific data is required for dispersion modeling. As detailed above, five years of site-specific data were available. To ensure the calendar year with the best data availability was selected for the modeling assessments, MFA processed five years of met data from 2017 to 2021 and compared the number of missing hours for each calendar year. The results of this data completeness evaluation are presented in Table 5-3 (attached). As shown in Table 5-3, the 2018 calendar year represents the highest data availability (99.5%) between each calendar year met dataset. Therefore, the 2018 calendar year met dataset was chosen for dispersion modeling.

A wind rose of the 2018 calendar year met dataset is presented in Figure 5-1, which indicates a bimodal wind distribution of winds blowing predominantly from the southeast and northwest. This is generally consistent with the orientation of the valley around the proposed facility location.

5.3 Land Use

MFA utilized the AERSURFACE land use tool to generate seasonal values for albedo, Bowen ratio, and surface roughness heights. Land cover class definitions from the State of Washington National Land Cover Dataset for 2016, along with concurrent percent impervious surface and percent tree canopy data, were downloaded from the United States Geological Survey and processed using AERSURFACE to generate the surface characteristics necessary to run AERMET. The State of

Washington National Land Cover Dataset for 2016 data were processed in AERSURFACE using the settings shown in Table 5-4 (attached).

Soil moisture conditions were determined following the methodology set forth in Section 3.2.8 of the AERSURFACE User's Guide dated February 2020, which states:

"[Surface moisture] should be entered as either WET, DRY or AVERAGE, where, in general, WET is defined as precipitation amounts equal to or greater than the 70th percentile of the 30-year climatological records; DRY is equal to or less than the 30th percentile; and AVERAGE is between the 30th and 70th percentiles."

Annual precipitation data for the Arlington cooperative observer program (COOP) (ID: 450257) met station were retrieved from the Western Regional Climate Center[1] for the modeling period. The Arlington COOP station was chosen due to its proximity to the Arlington met station and the availability of data for a 30-year period. It is also the only met station with publicly available precipitation data in the immediate area surrounding the proposed facility location that is not located in elevated terrain. As shown in Table 5-5 (attached), the total precipitation collected during the 2018 calendar year at the Arlington COOP station was 55.3 inches, which is greater than the 70th percentile annual precipitation of 52.3 inches. Thus, AERSURFACE was executed assuming WET soil moisture conditions.

MFA followed the land use procedure detailed in Section 7.2.1.1 of Appendix W to 40 CFR Part 51 to determine if urban or rural dispersion coefficients should be used. MFA determined urban land use types (I1, I2, C1, R2, and R3) account for less than 50 percent of the land use within the modeling domain. Therefore, MFA executed the dispersion model using rural dispersion coefficients.

5.4 Receptor Locations and Terrain

Receptors spacing and distances are summarized in Table 5-6. Figure 5-2 presents the receptor spacing and locations in the modeling domain. Figure 5-3 presents the receptor locations in the immediate area surrounding the proposed facility.

Table 5-6. Receptor Locations

Receptor Spacing	Receptor Distance
25 m	Along fence line and out to 600 m from fence line
50 m	600 m to 1,000 m
100 m	1,000 to 2,000 m
250 m	2,000 to 6,000 m
500 m	6,000 m to 10,000 m

Terrain elevations for model receptors, emission unit base elevations, and base elevations of downwash structures were derived from the United States Geological Survey National Elevation Dataset at a resolution of 1/3 arc-seconds (a horizontal resolution of roughly 10 meters). The United

[1] https://wrcc.dri.edu/ [Accessed on January 25, 2022]

States Geological Survey National Elevation Dataset for the modeling domain was processed using the current version of AERMAP as shown in Table 5-1.

5.5 Building Downwash

The current version of the EPA Building Profile Input Program was used as shown in Table 5-1. The locations for proposed structures projected to influence downwash are presented in Figure 5-4. Table 5-7 (attached) presents a summary of the proposed building heights included in the dispersion model.

5.6 Modeled Source Representations

Only proposed emission units with the potential to emit TAPs that exceeded applicable SQERs, as presented in Table 3-1 (attached), were included in the dispersion model. Hence, only the proposed biomass boiler ESP stack, emergency diesel-fired boiler stack, lumber kiln roof vents, and the glue line exhaust through passive roof vents were modeled. Within the dispersion model, each modeled emissions unit was identified with a unique label (model ID). Source parameters for each modeled emissions unit are presented in Table 5-8 (attached). The location for each modeled source is presented in Figure 5-4.

The proposed ESP stack will be vertically-orientated and was represented in the dispersion model as a single point source with a unique label (ESP). Modeled source parameters for the ESP are based on engineering design from DWIC.

Exhaust from the proposed emergency diesel-fired boiler was represented in the dispersion model as a single point source with a unique label (DBOIL). Modeled source parameters for the emergency boiler are based on engineering design from DWIC.

Fugitive emissions from wood drying inside each proposed kiln will exhaust through one of four vertically-oriented, passive roof vents. There will be 20 passive roof vents per kiln building and a total of 40 roof vents for all 10 kilns. Positive pressure from constant airflow in each kiln and elevated temperatures will add vertical trajectory to the exhaust through each kiln vent. As a result, each kiln vent was represented in the dispersion model as a point source. The roof vents were assigned the following unique labels; KILNA1–KILNA20 roof vents on building 1 and KILNB01–KILNB20 for roof vents on building 2. Model source parameters for each point source are based on the height of each vent, kiln flowrate, and exhaust temperature. Each vent will include a rain cap and therefore was modeled using the CAPPED option in AERMOD.

Fugitive TAP emissions from the primer and adhesive application on the proposed glue line are expected to enter the atmosphere through passive roof vents nearby the application site inside the CTL manufacturing building. The passive roof vents were represented in the dispersion model as a single volume source with a unique label (GLUE). Model source parameters for the volume source are based on the physical dimensions of the exhaust vent on the roof directly above the proposed glue line.

5.7 Results

Maximum predicted model concentrations from each TAP modeling assessment are summarized in Table 5-9 (attached). The applicable ASIL and averaging period for each TAP are included for direct comparison. As shown in Table 5-9, each maximum predicted model concentration is below the corresponding ASIL. Therefore, modeled TAP emissions from the proposed facility will not cause or contribute to a violation of any ambient air quality standard.

6 CLOSING

MFA looks forward to working with the PSCAA on this project. If there are any questions or comments, please contact Andrew Rogers at (503) 407-6406 or arogers@maulfoster.com.

LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

TABLES

Table 3-1
TAP Emissions Threshold Evaluation
Forterra CLT Modular Facility—Darrington, Washington

Toxic Air Contaminant	CAS	Emissions Estimate			Averaging Period [1]	De Minimis [1] (lb/avg-period)	SQER [1] (lb/avg-period)	Threshold Evaluation (Yes/No)	
		Hourly (lb/hr)	Daily (lb/day)	Annual (lb/yr)				Exceed De Minimis?	Exceed SQER?
CRITERIA POLLUTANTS									
CO	630-08-0	17.0	405	147,177	1-hr	1.10	43.0	Yes	No
NO_2 [2]	10102-44-0	0.32	7.48	2,699	1-hr	0.46	0.87	No	No
SO_2	2025-88-4	0.70	16.8	6,132	1-hr	0.46	1.20	Yes	No
METALS									
Arsenic	7440-38-2	1.1E-04	1.8E-03	0.46	Year	2.5E-03	0.049	Yes	Yes
Beryllium	7440-41-7	8.4E-07	2.0E-05	7.4E-03	Year	3.4E-03	0.068	Yes	No
Cadmium	7440-43-9	6.5E-05	7.9E-04	0.093	Year	1.9E-03	0.039	Yes	Yes
Chromium VI	18540-29-9	1.1E-05	2.2E-04	0.067	Year	3.3E-05	6.5E-04	Yes	Yes
Cobalt	7440-48-4	6.6E-05	1.6E-03	0.58	24-hr	3.7E-04	7.4E-03	Yes	No
Copper and compounds	7440-50-8	2.9E-04	4.8E-03	1.23	1-hr	9.3E-03	0.19	No	No
Lead	7439-92-1	4.5E-04	6.5E-03	1.29	Year	10.0	14.0	No	No
Manganese	7439-96-5	2.7E-03	0.062	22.4	24-hr	1.1E-03	0.022	Yes	Yes
Mercury	7439-97-6	1.0E-04	1.4E-03	0.26	24-hr	1.1E-04	2.2E-03	Yes	No
Nickel	7440-02-0	2.2E-04	3.3E-03	0.69	Year	0.031	0.62	Yes	Yes
Selenium	7782-49-2	1.3E-04	1.9E-03	0.40	24-hr	0.074	1.50	No	No
Vanadium (fume or dust)	7440-62-2	1.7E-05	4.0E-04	0.15	24-hr	3.7E-04	7.4E-03	Yes	No
ORGANICS									
1,2-Dichloropropane	78-87-5	4.7E-04	0.011	4.12	Year	0.81	16.0	Yes	No
1,3-Butadiene	106-99-0	5.4E-04	5.4E-03	0.027	Year	0.27	5.40	No	No
Acetaldehyde	75-07-0	0.35	8.22	1,362	Year	3.00	60.0	Yes	Yes
Acrolein	107-02-8	0.025	0.42	84.5	24-hr	1.3E-03	0.026	Yes	Yes
Benzene	71-43-2	0.028	0.66	240	Year	1.00	21.0	Yes	Yes
Carbon tetrachloride	56-23-5	5.6E-04	0.014	4.93	Year	1.40	27.0	Yes	No
Chlorine	7782-50-5	0.034	0.82	299	24-hr	5.6E-04	0.011	Yes	Yes
Chlorobenzene	108-90-7	4.6E-04	0.011	4.07	24-hr	3.70	74.0	No	No
Chloroform	67-66-3	5.6E-04	0.014	4.93	Year	0.35	7.10	Yes	No
Ethyl benzene	100-41-4	0.011	0.27	96.9	Year	3.20	65.0	Yes	Yes
Formaldehyde	50-00-0	0.048	0.98	302	Year	1.40	27.0	Yes	Yes
Hexane	110-54-3	8.2E-03	0.19	70.6	24-Hr	2.60	52.0	No	No
Isopropyl alcohol	67-63-0	0.10	2.45	893	1-Hr	0.30	5.90	No	No
Methanol	67-56-1	0.33	7.95	2,504	24-Hr	74.0	1,500	No	No
Methyl bromide	74-83-9	3.2E-04	7.7E-03	2.80	24-Hr	0.019	0.37	No	No
Methyl chloride	74-87-3	1.1E-03	0.025	9.27	24-Hr	0.33	6.70	No	No
Methyl chloroform	71-55-6	1.6E-03	0.039	14.2	24-Hr	19.0	370	No	No
Methylene chloride	75-09-2	0.015	0.37	134	Year	490	9,800	No	No
Methyl ethyl ketone	78-93-3	4.4E-04	0.010	3.83	24-Hr	19.0	370	No	No
Phenol	108-95-2	4.5E-03	0.11	39.2	24-Hr	0.74	15.0	No	No
Phosphorus	7723-14-0	8.7E-03	0.21	76.0	24-Hr	0.074	1.50	Yes	No
Propionaldehyde	123-38-6	0.010	0.25	82.2	24-Hr	0.030	0.59	Yes	No
Styrene	100-42-5	0.013	0.32	117	24-Hr	3.20	65.0	No	No
Toluene	108-88-3	7.5E-04	0.016	5.18	24-Hr	19.0	370	No	No
m-Xylene	108-38-3	9.9E-05	2.4E-03	0.87	24-Hr	0.82	16.0	No	No
p-Xylene	106-42-3	9.9E-05	2.4E-03	0.87	24-Hr	0.82	16.0	No	No
o-Xylene	95-47-6	3.2E-04	7.6E-03	2.77	24-Hr	0.82	16.0	No	No
Xylene (mixture)	1330-20-7	5.8E-05	5.8E-04	2.9E-03	24-Hr	0.82	16.0	No	No
INORGANICS									
Hydrogen fluoride	7664-39-3	6.6E-03	0.16	57.6	24-Hr	0.052	1.00	Yes	No
Hydrochloric acid	7647-01-0	0.13	3.00	1,070	24-Hr	0.033	0.67	Yes	Yes
Ammonia	7664-41-7	0.11	1.06	5.29	24-Hr	1.90	37.0	No	No
PAHS									
Benz[a]anthracene	56-55-3	2.3E-06	5.5E-05	0.020	Year	0.045	0.89	No	No
Benzo[a]pyrene	50-32-8	7.8E-05	1.8E-03	0.67	Year	8.2E-03	0.16	Yes	Yes
Benzo[b]fluoranthene	205-99-2	4.0E-06	9.5E-05	0.035	Year	0.045	0.89	No	No
Benzo[j]fluoranthene	205-82-3	4.4E-06	1.0E-04	0.038	Year	0.045	0.89	No	No
Benzo[k]fluoranthene	207-08-9	1.5E-06	3.5E-05	0.013	Year	0.045	0.89	No	No
Chrysene	218-01-9	2.2E-06	5.3E-05	0.019	Year	0.45	8.90	No	No
Dibenzo[a,h]anthracene	53-70-3	2.7E-07	6.4E-06	2.3E-03	Year	4.1E-03	0.082	No	No
Indeno[1,2,3-cd]pyrene	193-39-5	2.9E-06	6.9E-05	0.025	Year	0.045	0.89	No	No
Naphthalene	91-20-3	3.0E-03	0.069	24.4	Year	0.24	4.80	Yes	Yes
Dioxans & Furans									
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	1.8E-11	4.3E-10	1.6E-07	Year	2.1E-07	4.3E-06	No	No
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	3.9E-11	9.3E-10	3.4E-07	Year	2.1E-07	4.3E-06	Yes	No
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	2.6E-11	6.2E-10	2.3E-07	Year	2.1E-06	4.3E-05	No	No
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	6.2E-11	1.5E-09	5.4E-07	Year	2.1E-06	4.3E-05	No	No
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	6.4E-11	1.5E-09	5.6E-07	Year	2.1E-06	4.3E-05	No	No
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	2.8E-10	6.6E-09	2.4E-06	Year	2.1E-05	4.3E-04	No	No
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	7.0E-10	1.7E-08	6.1E-06	Year	7.4E-04	0.015	No	No
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	2.3E-10	5.6E-09	2.0E-06	Year	2.1E-06	4.3E-05	No	No
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	1.1E-10	2.7E-09	1.0E-06	Year	7.4E-06	1.5E-04	No	No
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	1.6E-10	3.8E-09	1.4E-06	Year	7.4E-07	1.5E-05	Yes	No
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	1.0E-10	2.4E-09	8.9E-07	Year	2.1E-06	4.3E-05	No	No
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	8.9E-11	2.1E-09	7.8E-07	Year	2.1E-06	4.3E-05	No	No
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	1.9E-11	4.4E-10	1.6E-07	Year	2.1E-06	4.3E-05	No	No
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	7.5E-11	1.8E-09	6.6E-07	Year	2.1E-06	4.3E-05	No	No
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	1.6E-10	3.9E-09	1.4E-06	Year	2.1E-05	4.3E-04	No	No
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	2.6E-11	6.3E-10	2.3E-07	Year	2.1E-05	4.3E-04	No	No
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	1.4E-10	3.5E-09	1.3E-06	Year	7.4E-04	0.015	No	No

NOTES:

SQER = small quantity emission rate.

TAC = toxic air contaminant.

References:

[1] Washington Administrative Code 173-460-150, "Table of ASIL, SQER, and De Minimis Emission Values."

[2] An NO_2:NO_X ratio of 0.012 was applied to the fossil fuel boiler NO_X emission rate for comparison to the NO_2 thresholds. The NO_2:NO_X ratio of 0.012 was derived from the US EPA In Stack Ratio Database for boilers firing on fossil fuel. An NO_2:NO_X ratio of 0.05 was applied to the biomass-fired boiler NO_X emission rate for comparison to the NO_2 thresholds. The NO_2:NO_X ratio of 0.05 is the recommended ISR from Section 2.1 of "Evaluation of Bias in AERMOD-PVMRM" Final Report (MACTEC, 2005) prepared for the Alaska Department of Environmental Conservation - Division of Air Quality.

Table 5-3
Meteorological Data Completeness Analysis
Forterra CLT Modular Facility—Darrington, Washington

Quarter [1]	Meteorological Data Assessment per Year [1]														
	2017			2018			2019			2020			2021		
	Total Hours	Missing Hours [2]	Available [a] (%)	Total Hours	Missing Hours [2]	Available [a] (%)	Total Hours	Missing Hours [2]	Available [a] (%)	Total Hours	Missing Hours [2]	Available [a] (%)	Total Hours	Missing Hours [2]	Available [a] (%)
Q1	2,160	199	90.8%	2,160	7	99.7%	2,160	7	99.7%	2,184	11	99.5%	2,160	55	97.5%
Q2	2,184	385	82.4% [3]	2,184	3	99.9%	2,184	15	99.3%	2,184	22	99.0%	2,184	13	99.4%
Q3	2,208	28	98.7%	2,208	22	99.0%	2,208	384	82.6% [3]	2,208	211	90.4%	2,208	891	59.6% [3]
Q4	2,208	39	98.2%	2,208	13	99.4%	2,208	102	95.4%	2,208	36	98.4%	2,208	36	98.4%
Annual	**8,760**	**651**	**92.6%**	**8,760**	**45**	**99.5%** [4]	**8,760**	**508**	**94.2%**	**8,784**	**280**	**96.8%**	**8,760**	**995**	**88.6%**

NOTES:

NOAA = National Oceanic and Atmospheric Administration

NCEI = National Center for Environmental Information

PSCAA = Puget Sound Clean Air Agency

(a) Available hours (%) = (1 - [{missing hours} / {total hours}]) x (100%)

REFERENCES:

[1] Meteorological data obtained from the PSCAA (PSCAA IDs: DarringtonMet, Darrington) and the NOAA NCEI Integrated Surface Database (Arlington Municipal Airport WBAN: 04205).

[2] The number of missing hours was determined by reviewing the SFC QA excel file generated by AERMET version 21112.

[3] Data completeness for this quarter is less than the 90% threshold.

[4] Calendar year identified as highest data completeness for dispersion modeling.

Table 5-4
AERSURFACE Settings
Forterra CLT Modular Facility—Darrington, Washington

Parameter	Surface Station	Site-Specific Station
Met Station	Arlington Municipal Airport	Darrington/DarringtonMet from PSCAA
Study radius for surface roughness	1.0 kilometer	1.0 kilometer
Should continuous snow cover be assumed?	No	No
Is this an arid region?	No	No
Is this an airport site?	Yes	No
Number of sectors	12	12
Months assumed to constitute winter	December, January, and February	December, January, and February
Months assumed to constitute spring	March, April, and May	March, April, and May
Months assumed to constitute summer	June, July, and August	June, July, and August
Months assumed to constitute autumn	September, October, and November	September, October, and November
Period for land use calculations	Monthly	Monthly

Table 5-5
Precipitation Analysis
Forterra CLT Modular Facility—Darrington, Washington

Calendar Year	Total Precipitation [1] (inches)	Climatic Significance [2]	Calendar Year Soil Moisture [3]
2018	55.3	Upper 70th Percentile	Wet

30-Year Climate Precipitation Data [4]			
Average Annual Precipitation	[5]	48.3	(inches)
Lower 30th Percentile Annual Precipitation	[6]	43.8	(inches)
Upper 70th Percentile Annual Precipitation	[7]	52.6	(inches)

REFERENCES:

[1] Climatological data obtained from Western Regional Climate Center for the Arlington COOP (ID: 450257) meteorological station.

[2] Climatic significance represents annual precipitation compared to 30-year climatological period.

[3] Surface moisture conditions correspond to "Dry", "Average" or "Wet" soil content determined by comparing annual precipitation to 30-year climatological period. This method is consistent with the methodology set forth in the current version of the EPA AERSURFACE User's Guide dated February, 2020.

[4] Represents 30-year period between 1990 and 2021.

[5] Represents average annual precipitation during 30-year climatological period.

[6] Represents lower limit of middle 40th percentile annual precipitation during 30-year climatological period.

[7] Represents upper limit of middle 40th percentile annual precipitation during 30-year climatological period.

Table 5-7
Summary of Downwash Structure Heights
Forterra CLT Modular Facility—Darrington, Washington

Downwash Structure Model ID	Downwash Structure Description	Base Elevation [1] (m)	Number of Tiers [1]	Tier Height [2] (m)
SAWMILL	Sawmill	165.41	1	9.14
KILNB1	Lumber Kilns (Building 1)	164.56	1	14.3
KILNB2	Lumber Kilns (Building 2)	164.55	1	14.3
CLT_BUILD	CLT/GLULAM Building	165.41	1	16.2
OFFICE	Offices	165.41	1	16.2
BOIL	Boiler Building	165.28	1	12.2
MODULAR	Modular Building	165.41	1	16.2

REFERENCES:

[1] Base elevation derived from United States Geological Survey National Elevation Dataset via AERMAP terrain preprocessor.

[2] Information provided by Darrington Wood Innovation Center.

Table 5-8
Summary of Modeled Source Parameters
Forterra CLT Modular Facility—Darrington, Washington

Point Sources											
Model ID	Model Source Description	UTM Coordinates [1]		Discharge Orientation [1]	Base Elevation [2] (m)	Release Height [1] (m)	Stack Diameter [1] (m)	Exit Velocity [1] (m/s)	Exit Flowrate [a] (m^3/s)	Exit Temperature [1] (K)
		Easting	Northing							
ESP	Biomass Boiler ESP Stack	603,060.05	5,346,494.30	Vertical	165.28	15.0	0.60	16.4	4.64	433
DBOIL	Emergency Diesel-fired Boiler	603,047.99	5,346,505.74	Vertical	165.28	10.7	0.60	18.1	5.1	515
KILNA01	Building 1 Kiln Vent	602,924.61	5,346,500.07	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA02	Building 1 Kiln Vent	602,924.61	5,346,492.98	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA03	Building 1 Kiln Vent	602,929.17	5,346,500.07	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA04	Building 1 Kiln Vent	602,929.16	5,346,492.97	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA05	Building 1 Kiln Vent	602,934.37	5,346,500.09	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA06	Building 1 Kiln Vent	602,938.90	5,346,500.04	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA07	Building 1 Kiln Vent	602,934.38	5,346,492.99	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA08	Building 1 Kiln Vent	602,938.96	5,346,492.94	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA09	Building 1 Kiln Vent	602,944.13	5,346,500.07	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA10	Building 1 Kiln Vent	602,948.69	5,346,500.07	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA11	Building 1 Kiln Vent	602,953.88	5,346,500.07	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA12	Building 1 Kiln Vent	602,958.43	5,346,500.05	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA13	Building 1 Kiln Vent	602,944.12	5,346,493.00	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA14	Building 1 Kiln Vent	602,948.69	5,346,492.98	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA15	Building 1 Kiln Vent	602,953.88	5,346,492.98	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA16	Building 1 Kiln Vent	602,958.44	5,346,493.00	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA17	Building 1 Kiln Vent	602,963.60	5,346,500.08	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA18	Building 1 Kiln Vent	602,968.15	5,346,500.05	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA19	Building 1 Kiln Vent	602,963.61	5,346,492.96	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNA20	Building 1 Kiln Vent	602,968.16	5,346,492.97	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB01	Building 2 Kiln Vent	602,975.56	5,346,502.74	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB02	Building 2 Kiln Vent	602,975.55	5,346,495.64	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB03	Building 2 Kiln Vent	602,980.11	5,346,502.74	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB04	Building 2 Kiln Vent	602,980.11	5,346,495.64	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB05	Building 2 Kiln Vent	602,985.32	5,346,502.76	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB06	Building 2 Kiln Vent	602,989.84	5,346,502.71	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB07	Building 2 Kiln Vent	602,985.32	5,346,495.65	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB08	Building 2 Kiln Vent	602,989.90	5,346,495.60	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB09	Building 2 Kiln Vent	602,995.08	5,346,502.73	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB10	Building 2 Kiln Vent	602,999.63	5,346,502.73	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB11	Building 2 Kiln Vent	603,004.82	5,346,502.73	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB12	Building 2 Kiln Vent	603,009.37	5,346,502.71	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB13	Building 2 Kiln Vent	602,995.07	5,346,495.67	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB14	Building 2 Kiln Vent	602,999.64	5,346,495.64	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB15	Building 2 Kiln Vent	603,004.82	5,346,495.64	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB16	Building 2 Kiln Vent	603,009.38	5,346,495.66	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB17	Building 2 Kiln Vent	603,014.55	5,346,502.74	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB18	Building 2 Kiln Vent	603,014.55	5,346,495.63	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB19	Building 2 Kiln Vent	603,019.10	5,346,502.71	Capped	165.41	15.0	0.68	0.43	0.16	325
KILNB20	Building 2 Kiln Vent	603,019.10	5,346,495.63	Capped	165.41	15.0	0.68	0.43	0.16	325

Volume Sources									
Model ID	Model Source Description	UTM Coordinates [1]		Base Elevation [2] (m)	Release Height [1] (m)	On or Adjacent to Downwash Structure [1]	Length of Side [3] (m)	Initial Lateral Dimension [b] (m)	Initial Vertical Dimension [c] (m)
		Easting	Northing						
GLUE	Passive Exhaust Vent Above Glue Line	602,899.02	5,346,399.53	165.41	8.08	Yes	1.52	0.354	7.51 [c]

NOTES:

(a) Exit flowrate (m^3/s) = ($\pi/4$) x (stack diameter [m])^2 x (exit velocity [m/s])

(b) Initial lateral dimension (m) = (length of side [m]) / (4.3); see Reference (4).

(c) Initial vertical dimension (m) = (building height [m]) / (2.15); see Reference (4).

CLT building height (m) = 16.2 (5)

REFERENCES:

[1] Information provided by Darrington Wood Innovation Center.

[2] Base elevation derived from United States Geological Survey National Elevation Dataset via AERMAP terrain preprocessor.

[3] Length of side equal to width of vent opening.

[4] Table 3-2 of the "User's Guide for the AMS/EPA Regulatory Model (AERMOD)" prepared by the USEPA (EPA-454/B-21-001) dated April 2021.

[5] See Table 5-7, Summary of Downwash Structure Heights. Glue line is located in CLT building

Table 5-9
ASIL Modeling Results
Forterra CLT Modular Facility—Darrington, Washington

Toxic Air Pollutant	CAS	Maximum Predicted Model Concentration [1] (ug/m^3)	ASIL [2] (ug/m^3)	Maximum Predicted Model Concentration Exceed ASIL? (Yes/No)
24-Hour				
Manganese	7439-96-5	0.009	0.30	*No*
Acrolein	107-02-8	0.07	0.35	*No*
Chlorine	7782-50-5	0.125	0.15	*No*
Hydrochloric acid	7647-01-0	0.45	9.00	*No*
Annual				
Arsenic	7440-38-2	2.60E-05	3.00E-04	*No*
Cadmium	7440-43-9	5.16E-05	2.40E-04	*No*
Chromium VI	18540-29-9	3.75E-06	4.00E-06	*No*
Acetaldehyde	75-07-0	0.34	0.37	*No*
Benzene	71-43-2	1.35E-02	0.13	*No*
Ethyl benzene	100-41-4	5.43E-03	0.40	*No*
Formaldehyde	50-00-0	0.025	0.17	*No*
Nickel	7440-02-0	3.88E-05	3.80E-03	*No*
Benzo[a]pyrene	50-32-8	3.75E-05	1.00E-03	*No*
Naphthalene	91-20-3	1.37E-03	0.03	*No*

NOTES:

ug/m^3 = microgram per cubic meter.

ASIL = Acceptable Souce Impact Level.

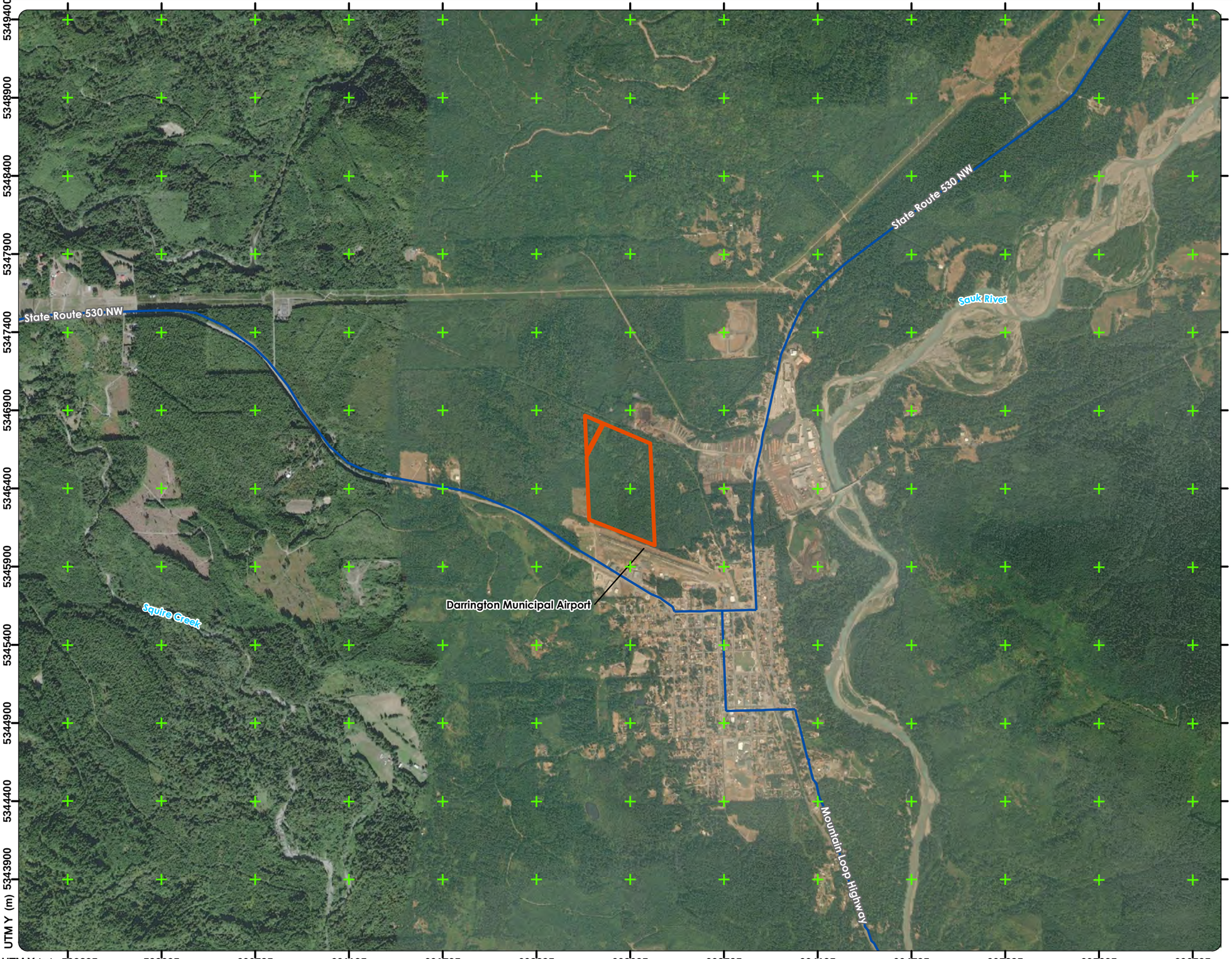
References:

[1] Represents the highest first high modeled concentration for the identified averaging period.

[2] Washington Administrative Code 173-460-150, "Table of ASIL, SQER, and De Minimis Emission Values".

FIGURES

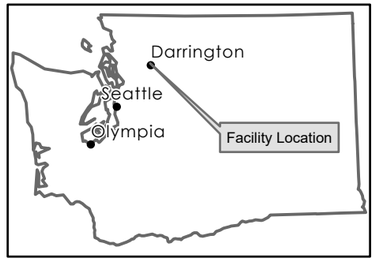
Figure 2-1
Proposed Facility Location
Forterra CLT Modular Facility
Darrington, Washington



Legend

- UTM Grid Guideline
- Highway
- Proposed Property Boundary

KEY MAP



0 250 500
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online

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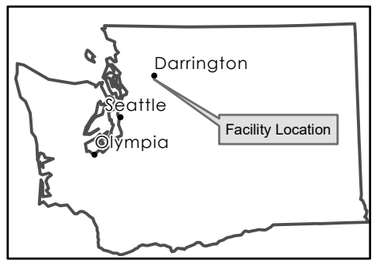
Path: X:\1122.08\001\Fig1-1_Proposed_Facility_Location.mxd
Print Date: 3/25/2022
Approved By: B. Snuffer
Produced By: aguse
Project: 1122.08.001

Figure 2-2
Local Topography
Forterra CLT Modular Facility
Darrington, Washington

Legend

- UTM Grid Guideline
- Proposed Property Boundary

KEY MAP



0 250 500
Meters

Source: Topographic map obtained from USGS.

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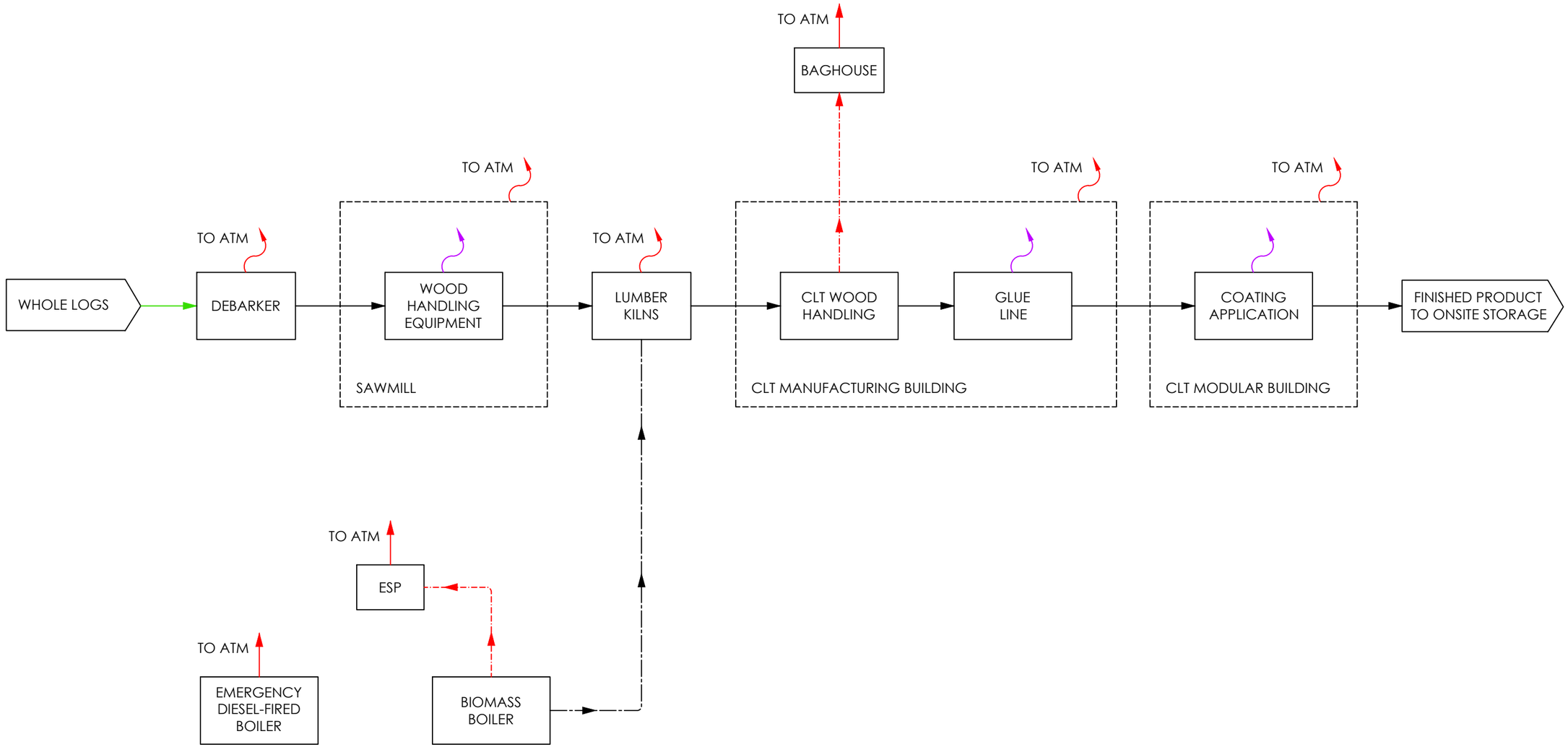
UTM Y: 5349400, 5348900, 5348400, 5347900, 5347400, 5346900, 5346400, 5345900, 5345400, 5344900, 5344400, 5343900

UTM X: 599395, 599995, 600595, 601195, 601795, 602395, 602995, 603595, 604195, 604795, 605395, 605995, 606595

Path: X:\1122.08\001\Fig2-2_Local_Topography.mxd
Project: 1122.08.001 Produced By: aguse Approved By: B. Snuffer Print Date: 3/25/2022



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LEGEND

- PRODUCT
- RAW MATERIALS
- HEAT INPUT
- EMISSIONS

CLT CROSS LAMINATED TIMBER
ESP ELECTROSTATIC PRECIPITATOR

- EMISSIONS TO BUILDING (FUGITIVE SOURCE)
- EMISSIONS TO ATMOSPHERE (VENT OR STACK)
- EMISSIONS TO ATMOSPHERE (FUGITIVE SOURCE)

Figure 2-3
Process Flow Diagram
Forterra CLT Modular Facility
Darrington, Washington

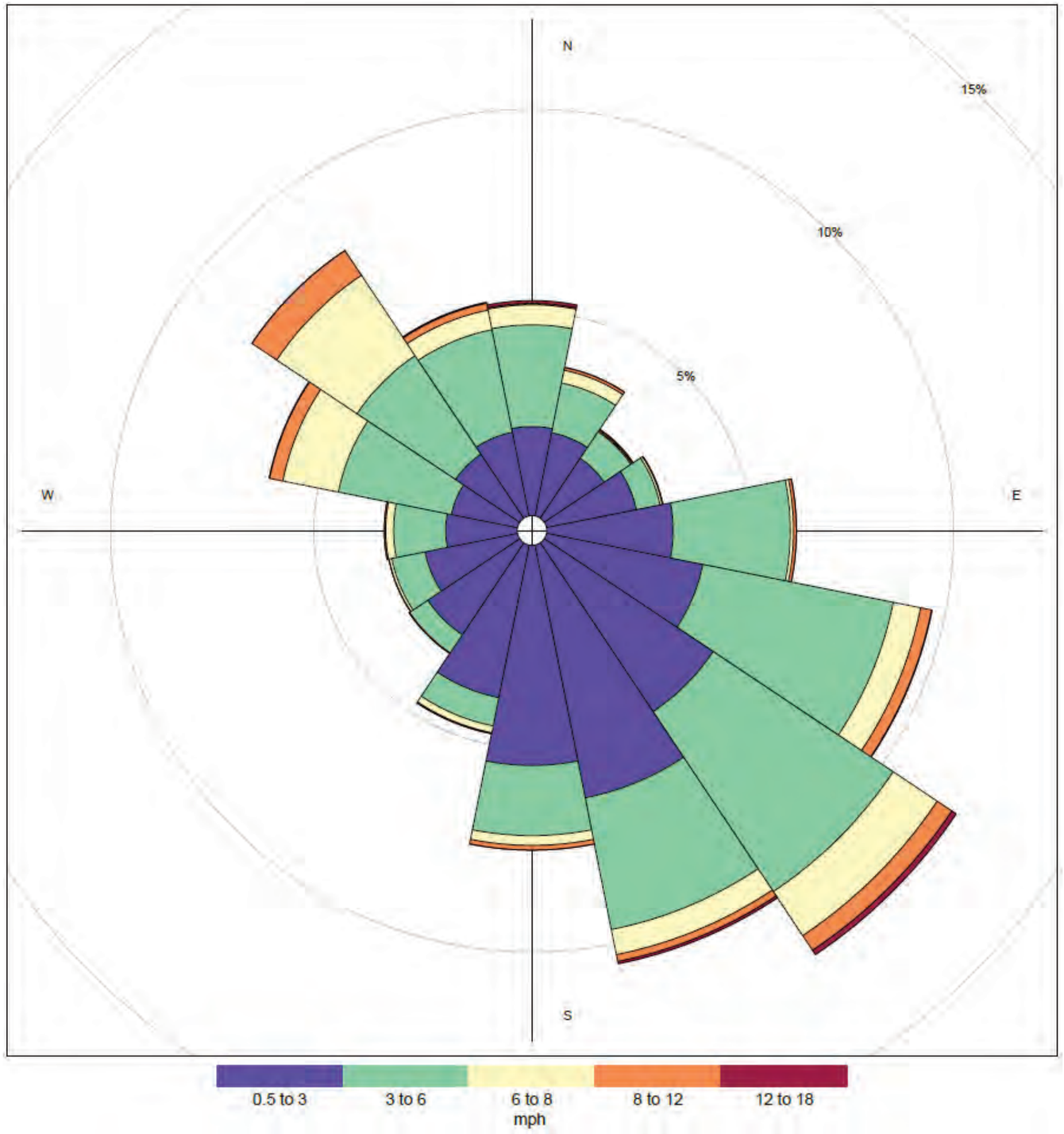

Figure 5-1
Wind Rose

Forterra CLT Modular Facility
Darrington, Washington

NOTES:
Wind Direction = Blowing From
Total Number of Hours = 8,760
Average Wind Speed = 3.31 mph
Data Availability = 99.5%

Meteorological data obtained from two stations operated by the Puget Sound Clean Air Agency for the period between January 1, 2018 to December 31, 2018.

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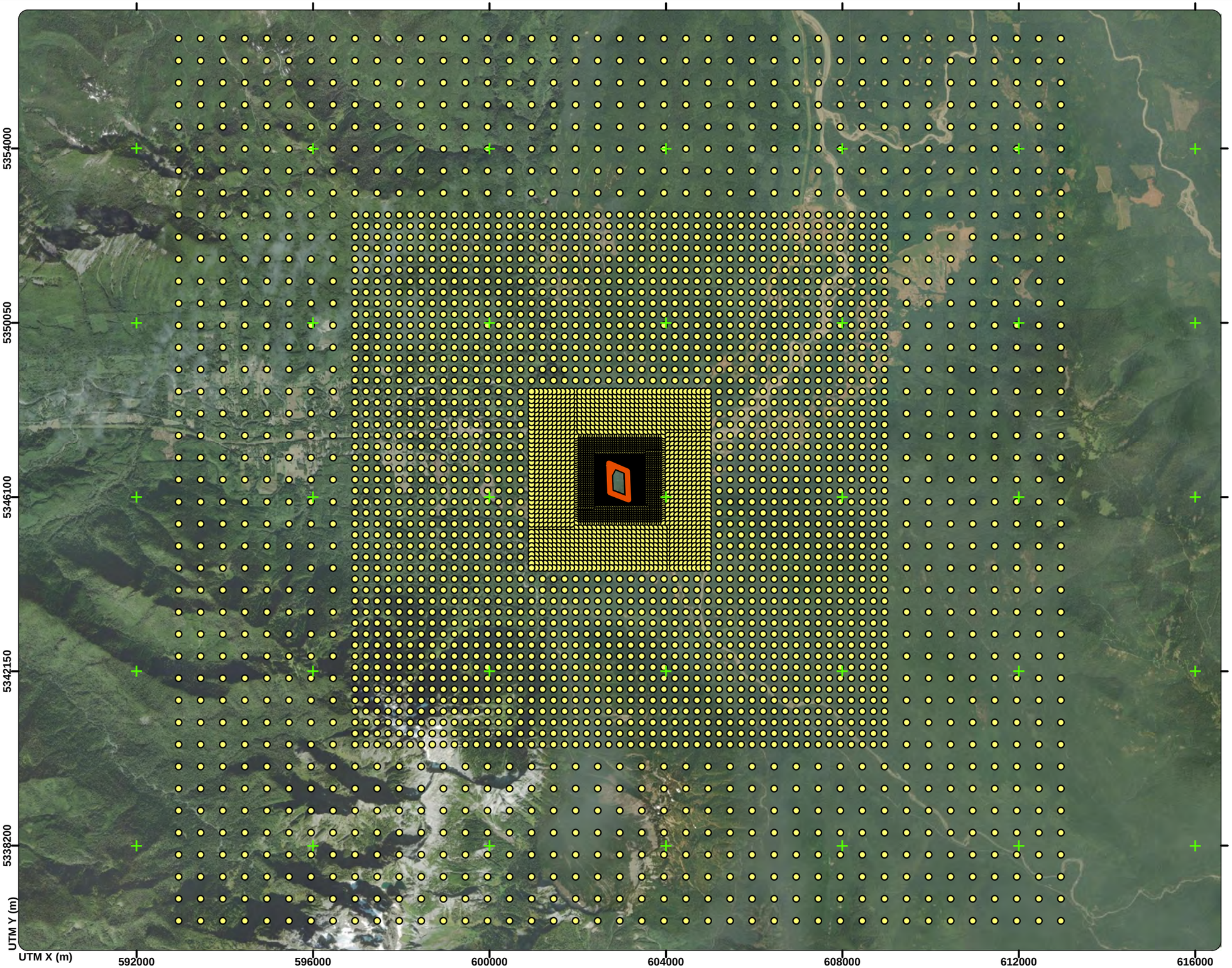
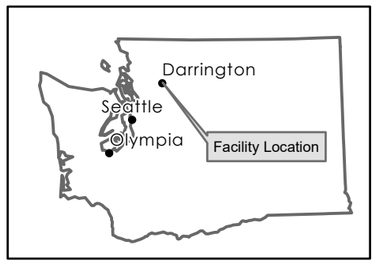
Figure 5-2
Model Receptor Grid
Forterra CLT Modular Facility
Darrington, Washington



Legend

- Receptor Location
- UTM Grid Guideline
- Proposed Property Boundary

KEY MAP



0 1 2
Kilometers

Source: Aerial photograph obtained from Esri ArcGIS Online

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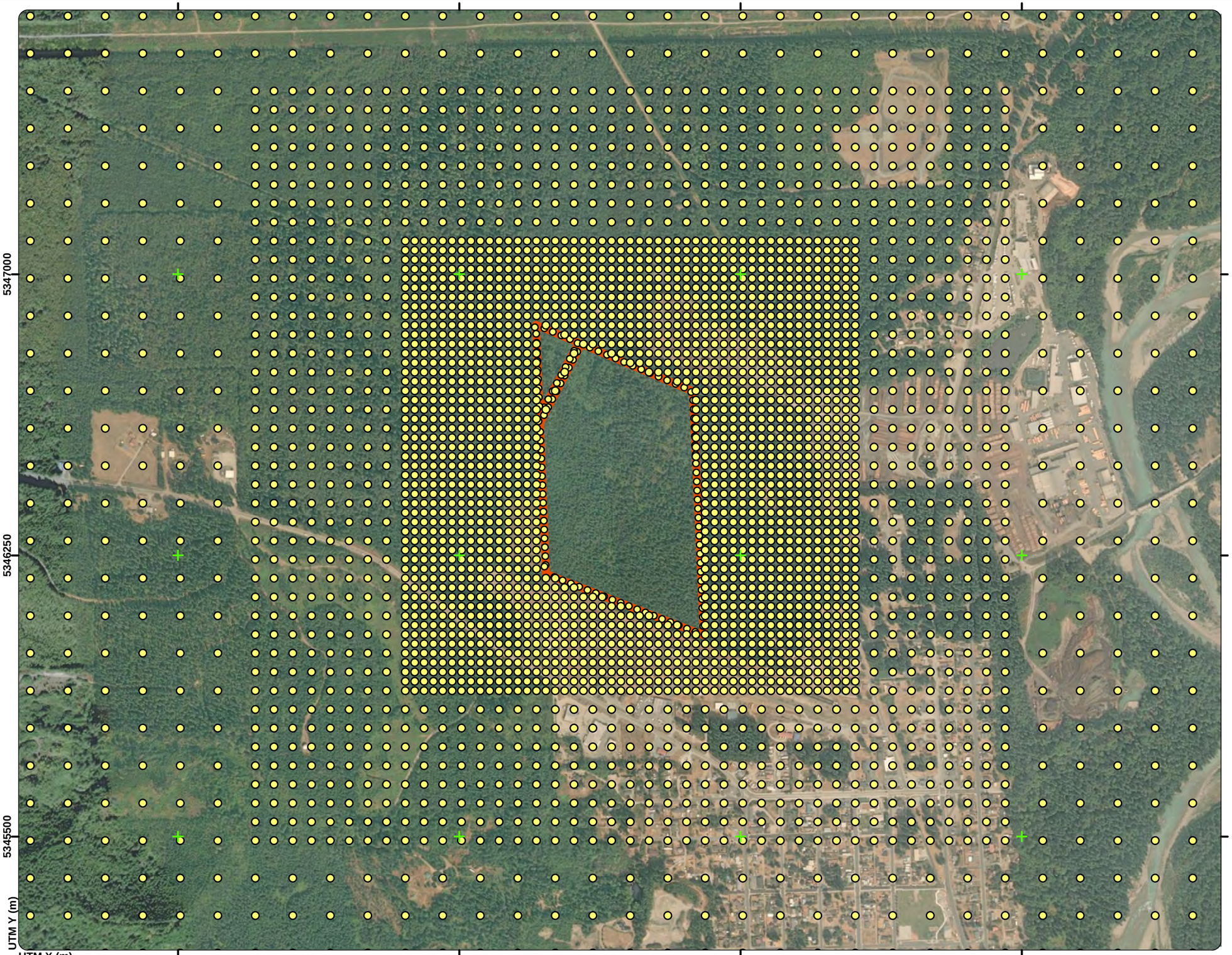
Path: X:\1122.08\001\Fig5-1_Model_Receptor_Grid.mxd
Print Date: 3/24/2022
Approved By: B. Snuffer
Produced By: agusse
Project: 1122.08.001

Figure 5-3
Receptors in the Immediate Area

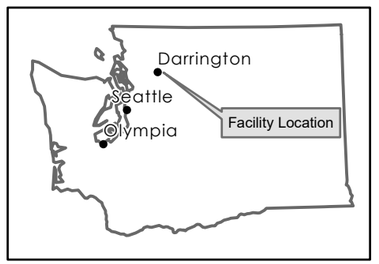
Forterra CLT Modular Facility
Darrington, Washington



Legend

- Receptor Location
- Proposed Property Boundary
- UTM Grid Guideline

KEY MAP



0 150 300
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online

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Path: X:\1122.08\001\Fig5-2_Receptors_in_Immediate_Area.mxd
Project: 1122.08.001 Produced By: aguse Approved By: B. Snuffer Print Date: 3/24/2022

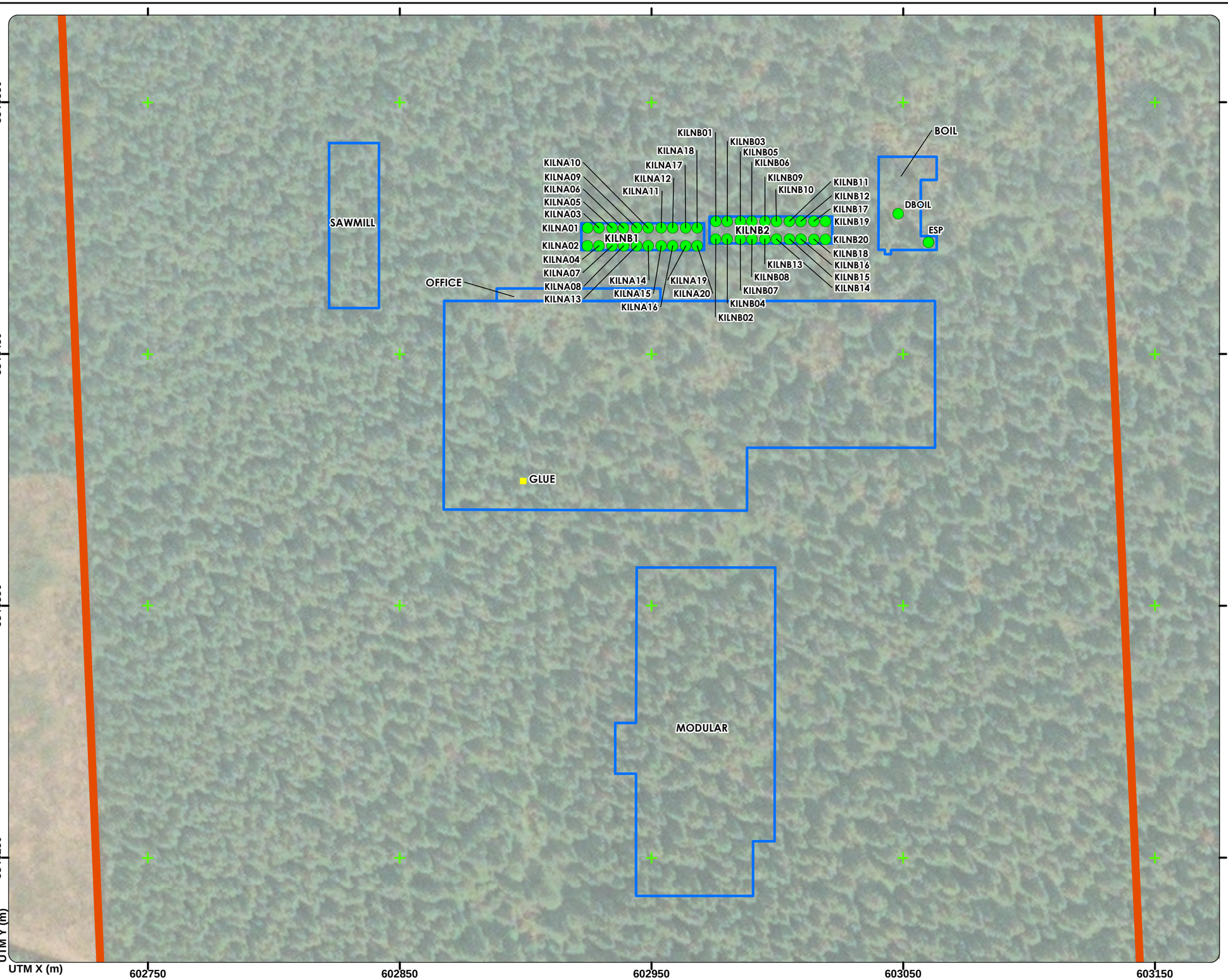


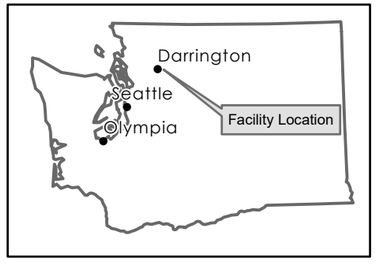
Figure 5-4
Location of Proposed Downwash Structures and Modeled Emission Units

Forterra CLT Modular Facility
Darrington, Washington

Legend

- Point Source Location
- Volume Source Location
- Proposed Property Boundary
- Proposed Building Location
- UTM Grid Guideline

KEY MAP



0 25 50
Meters

Source: Aerial photograph obtained from Esri ArcGIS Online

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APPENDIX A

NOC APPLICATION FORMS

ONLY	NOC#: 12246	REG#: 30402	Date Fee Pd:	Eng. Assigned:

PUGET SOUND
Clean Air Agency

1904 3rd Ave #105, Seattle, WA 98101
206-343-8800
pscleanair.gov

NOTICE OF CONSTRUCTION APPLICATION FOR ORDER OF APPROVAL

The following information must be submitted as part of this application packet before an Agency engineer is assigned to review your project.

SECTION 1. FACILITY INFORMATION

Business Name Darrington Wood Innovation Center LLC			
Equipment Installation Address 1300 Block of SR 530	City Darrington	State WA	Zip 98241

Is the business registered with the Agency at this equipment installation address?

☐ Yes. Current Registration or AOP No. _____ ☒ No, not registered ☐ Unknown

Business Owner Name Forterra Strong Communities Fund II, LP			
Business Mailing Address PO Box 4189	City Seattle	State WA	Zip 98194

Type of Business
Social Impact Building Developer and Owner

Is the installation address located within the city limits?

☒ Yes ☐ No

NAICS Code	NAICS Description
321213	Manufacturing solid wood structural members and Sawmills

Contact Name (for this application) Trevina Wang	Phone 206-465-7333	Email twang@forterra.org

Description for Agency Website

Provide a 1-2 sentence simple description of this project. See examples www.pscleanair.gov/176

The town of Darrington, in conjunction with Forterra, Inc. is proposing the development of the Darrington Wood Innovation Center (DWIC). The DWIC will will include a sawmill, lumber kilns, a biomass boiler, emergency diesel-fired boiler, a cross laminated timber panel assembly process, and a modular unit construction operation.

SECTION 2: REQUIRED APPLICATION PACKET ATTACHMENTS

1) **Process flow diagram**
   ☒ YES, attached. ☐ NO, not attached. This application is incomplete

2) **Emission estimate**. Emission rate increases for all pollutants.
   ☒ YES, attached. ☐ NO, not attached. This application is incomplete.

3) **Environmental Checklist** (or a determination made by another Agency under the State Environmental Policy Act) www.pscleanair.gov/DocumentCenter/View/170
   ☒ YES, attached. ☐ NO, not attached. This application is incomplete.

NOTICE OF CONSTRUCTION APPLICATION FOR ORDER OF APPROVAL

SECTION 2: REQUIRED APPLICATION PACKET ATTACHMENTS (CONT)

4) Attach **equipment form**(s) applicable to your operation. Forms are available online at www.pscleanair.gov/179

☒ YES, attached. ☐ NO, not attached. This application is incomplete.

5) **Detailed Project Description**

The project description must include a detailed description of the project, a list of process and control equipment to be installed or modified, a description of how the proposed project will impact your existing operations (if applicable), and measures that will be taken to minimize air emissions.

Detailed description of the proposed project included in packet?

☒ YES, attached. ☐ NO, not attached. This application is incomplete.

6) **$1,550 filing fee** (nonrefundable)

☐ PAY BY CHECK – Attached and made payable to **Puget Sound Clean Air Agency**

☒ PAY BY CREDIT – Accounting technician will contact person identified below for payment information

Contact Name:	Contact Number:
Erin Stewart	206-456-3302

SECTION 3: PROCESS AND CONTROL EQUIPMENT (attach additional pages if necessary)

Process Equipment		Does this equipment have air pollution control equipment?	Air Pollution Control Equipment	
# of Units	Equipment Type & Design Capacity		# of Units	Equipment Type
See	attached NOC application	☐ Yes ☐ No		
		☐ Yes ☐ No		
		☐ Yes ☐ No		
		☐ Yes ☐ No		

SECTION 4: CERTIFICATION STATEMENT

I, the undersigned, certify that the information contained in this application and the accompanying forms, plans, specifications, and supplemental data described herein is, to the best of my knowledge, accurate and complete.

Signature: Michelle Connor
B63BE6C6071A4E7...

3/29/2022

Signature — Date

Michelle Connor — Officer/President

Printed Name — Title

SECTION 5: APPLICATION SUBMITTAL

☒ **EMAIL application and attachments to:**

NOC@pscleanair.gov

-OR-

☐ **MAIL application, payment, and attachments to:**

Puget Sound Clean Air Agency
ATTN: NOC Application Submittal
1904 3rd Ave, Suite 105 - Seattle, WA 98101

pscleanair.org
Puget Sound Clean Air Agency

Puget Sound Clean Air Agency
1904 Third Avenue, Suite 105 | Seattle, WA 98101-3317
Phone 206-343-8800 | 206-343-7522 Fax

ENVIRONMENTAL CHECKLIST

Because of the State Environmental Policy Act, the action for which you are filing a Notice of Construction and Application for Approval to this Agency requires the completion of an environmental checklist.

BUT: If you can answer "yes" to either of the following statements with respect to the action being proposed, the attached checklist need not be completed:

1. I have obtained a State, City, or County Permit and filled out an environmental checklist.

☐ **Yes** ☒ **No**

If yes, complete the following:

State, City or County Department: _____

Date the checklist was completed: _____

Attach a copy of the checklist

2. An environmental checklist or assessment has previously been filled out for another agency.

☒ **Yes** ☐ **No**

If yes, complete the following:

Agency: The Town of Darrington

Date the checklist was completed: 8/4/21

Attach a copy of the checklist

If your answers are NO to both of the above statements, you must complete the attached environmental checklist.

Prepared by:

Signature _____

Name _____

Position _____

Agency/Organization _____

Date Submitted _____

Town of Darrington

SEPA Determination
WAC 197-11-970
MITIGATED DETERMINATION OF NONSIGNIFICANCE

Description of proposal:

The Town of Darrington (hereafter referred to as "the Town"), in conjunction with Forterra, INC., proposes an access road, walking paths, and water main through the site to serve the Darrington Wood Innovation Center (DWIC), which will reside on a landlocked property approximately 700 feet north and northeast of State Highway 530. The waking path will connect with the Whitehorse Trail, a regional recreational amenity, north of the main DWIC campus. This is part of a phased project to be built on 93.6 acres within the northwest portion of the Town's Urban Growth Area (UGA). The DWIC and its associated infrastructure, including roads, utilities, and parking, will occupy 43 acres of the site. Early clearing and grading proposes to clear approximately 33 total acres, remove approximately 1.5 feet of duff, and build a temporary construction access road off of Washington State Routh (SR) 530. For purposes of roadwork, walking trail, and the water main, there will be approximately 3200 cubic yards of excavation which will then be replaced by asphalt and gravel. Impervious coverage would be less than 3 percent of the total parcel.

Proponent: Glen M. Lyons, OAC Services, Inc. on behalf of The Town of Darrington and Forterra

Location of proposal, including street address, if any:

1300 Block of SR 530, Darrington, WA 98241

Lead agency: The Town of Darrington

Threshold Determination:
The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) **IS NOT** required under RCW 43.21C.030 (2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

Mitigation Measures:

1. This SEPA decision is for the Access Road and pedestrian walkways for the DWIC only. A separate SEPA checklist shall be submitted with a threshold determination decision made based on a detailed site plan and supplemental documents for any additional phases of the project.
2. Protection of any Critical Areas on site shall be delineated on site with high visibility fencing.
3. The construction contractor must obtain and adhere to a Washington State Department of Ecology Construction Stormwater Permit, and keep a small project SWPPP, including a spill plan on site.
4. The construction contractor must comply with Best Management Practices Standards and Specifications for source control of stormwater pollution, preservation of natural drainage systems and outfalls, on-site stormwater management, runoff Treatment, Flow Control, and Critical Areas protection as prescribed under Volume 2 of the Washington Department of Ecology Stormwater Management in Western Washington, 2012 edition.
5. The construction contractor must implement a "No-idle" policy for all trucks and equipment on site while not operating to reduce construction noise and air quality impacts of construction.
6. Any proposed changes or adjustments to the Development Agreement shall be submitted for review by the Town of Darrington Council and mayor and shall require an amendment to the SEPA Checklist.

☐ There is no comment period for this MDNS.

☐ This MDNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

■ This MDNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 21 days from the date below. Comments must be submitted by August 23, 2021.

Town of Darrington

SEPA Determination
WAC 197-11-970
MITIGATED DETERMINATION OF NONSIGNIFICANCE

Responsible official: Dianne Allen

Position/title: Town of Darrington SEPA Officer **Phone:** (360) 436-1131

Address: PO Box 397, Darrington, WA 98241

Date. 8-04-2021 **Signature** Dianne Allen

■ You may appeal this determination to Dianne Allen at Town Hall 1005 Cascade Street, Darrington, WA 98241 no later than 5:00 pm August 23, 2021 by mail or submit written comments in person at 1005 Cascade Street, Darrington, WA 98241.

You should be prepared to make specific factual objections. Contact Dianne Allen to read or ask about the procedures for SEPA appeals.

There is no agency appeal per DMC 17.116.010 (C). Judicial appeals can be made to the Growth Management Hearing Board on the overall action as per RCW 43.21C.075

Grandy LAKE

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable: Darrington Wood Innovation Center Early Clear and Grade

2. Name of applicant: Town of Darrington

3. Address and phone number of applicant and contact person: Dianne Allen, Town Clerk
1005 Cascade St. PO Box 397, Darrington, WA 98241 360-436-1131

4. Date checklist prepared: August 14, 2020

5. Agency requesting checklist: Snohomish County

6. Proposed timing or schedule (including phasing, if applicable):
Permit Application: August 17, 2020
Clearing and Grading: March – June 2021

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Yes. This SEPA checklist covers the Clear and Grade proposal. This early clearing and grading permit is for the site preparation for the final condition. The final condition of the DWIC will include vehicular roads, pedestrian pathways, two slab-on-grade buildings, landscaping, and stormwater infiltration facilities

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
Scoping assessment – April 10, 2019, Amy Lucas
Wetland Survey – October 2019, GeoEngineers
Geotech Analysis – November 2019, MTC
Wetland Delineation Report prepared January 31, 2020 GeoEngineers

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No applications are currently pending for government approval affecting the property covered by the proposal.

10. List any government approvals or permits that will be needed for your proposal, if known.

Snohomish County Clearing and Grading permit
Snohomish County Land Disturbing Activity permit
WSDOT Access Connection Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

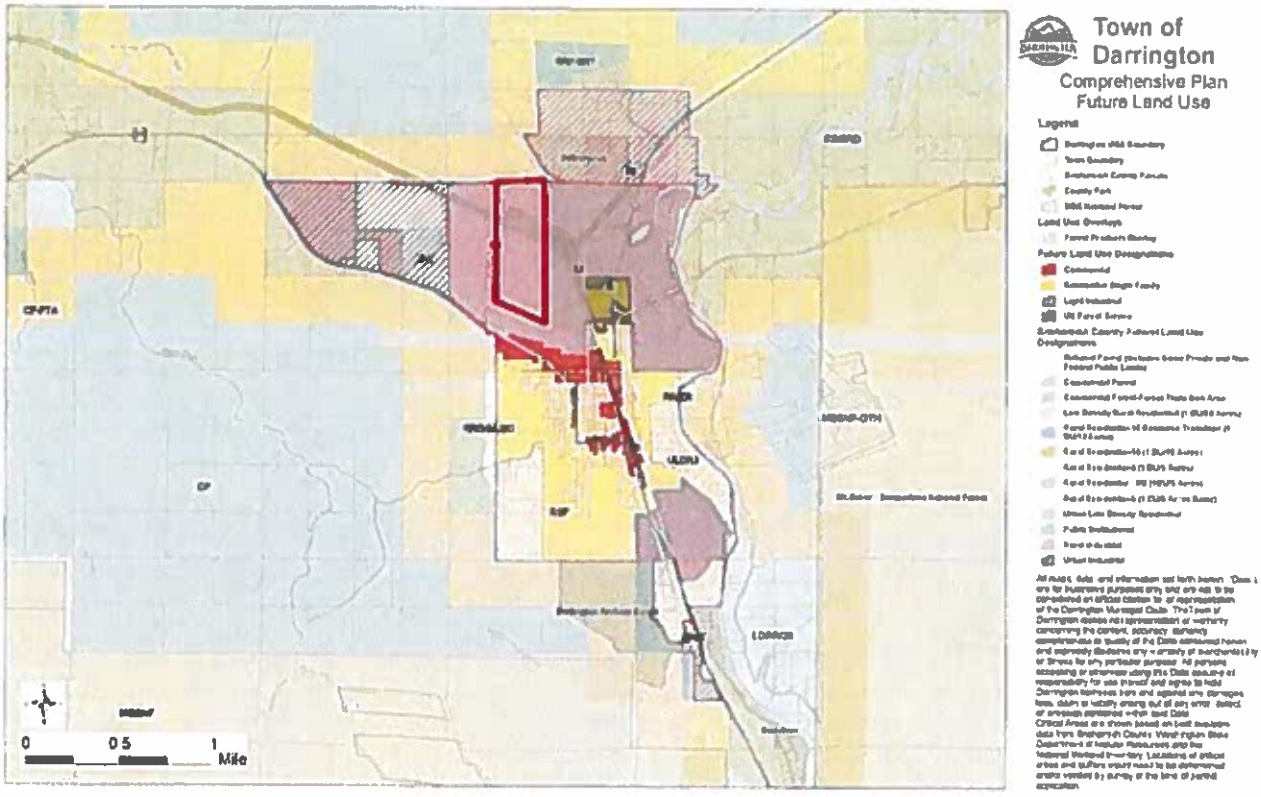
The Town of Darrington (the Town), in conjunction with Forterra, Inc. is proposing the development of the Darrington Wood Innovation Center (DWIC), as a phased project, to be built on a 93.6 acre site on the northwest side of the Town within the Darrington Urban Growth Area. The DWIC and its associated

infrastructure such as roads, parking and utilities will occupy 43 acres of the site. The DWIC early clearing and grading package proposes to clear approximately 33 acres on-site, remove roughly 1.5 feet of duff, perform minor grading, and construct a temporary construction access road off of SR-530.

An additional 15 acres owned by Washington State Department of Natural Resources (DNR) will be cleared and developed in the future for access to the site. The full project will consist of 203,250 square feet of building pads, 2 parking areas providing 140 stalls, and roadways for access and operations. A cumulative total of 58 acres will be cleared for development on the south portion of the site, and the remaining 50 acres will be left in a natural state. Passive footpaths, including a foot path to the Whitehorse Regional Trail may be also developed in the future.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

1300 Block of SR 530 (no address)
Darrington, WA 98241
Located within the Town of Darrington UGA as defined in the following map

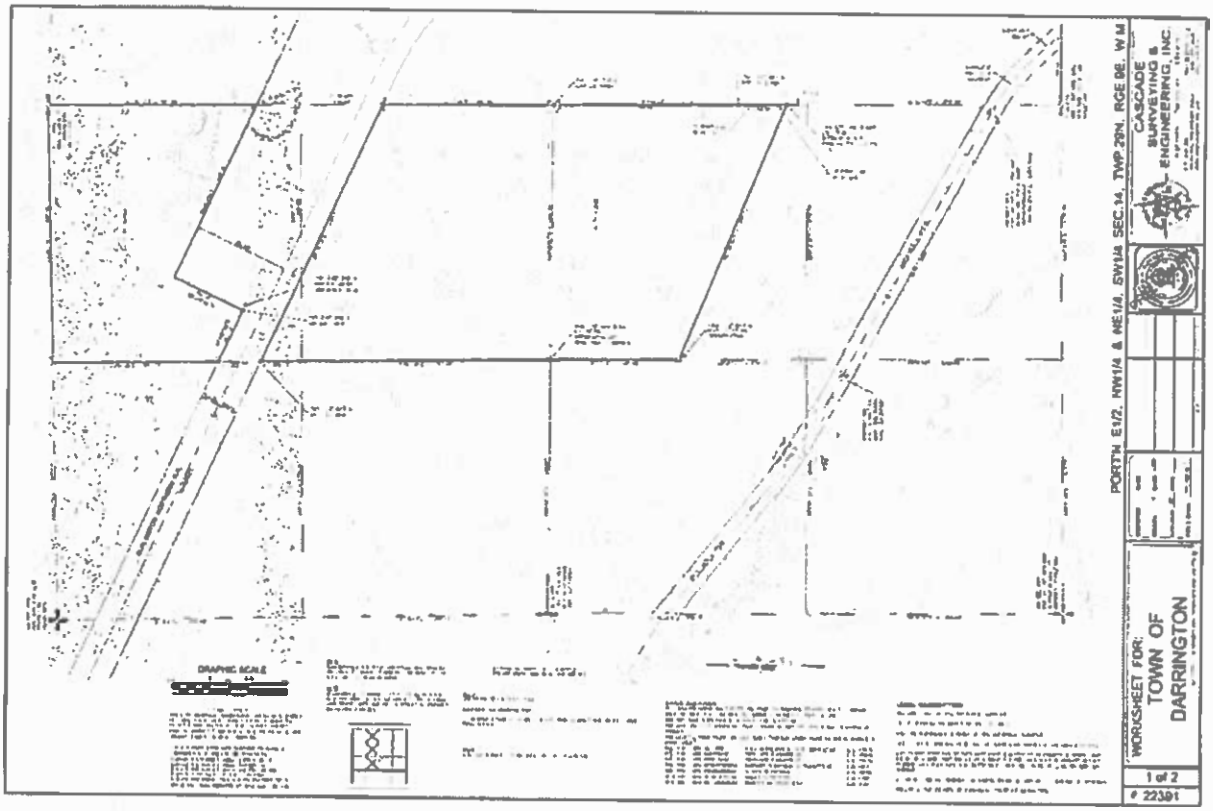


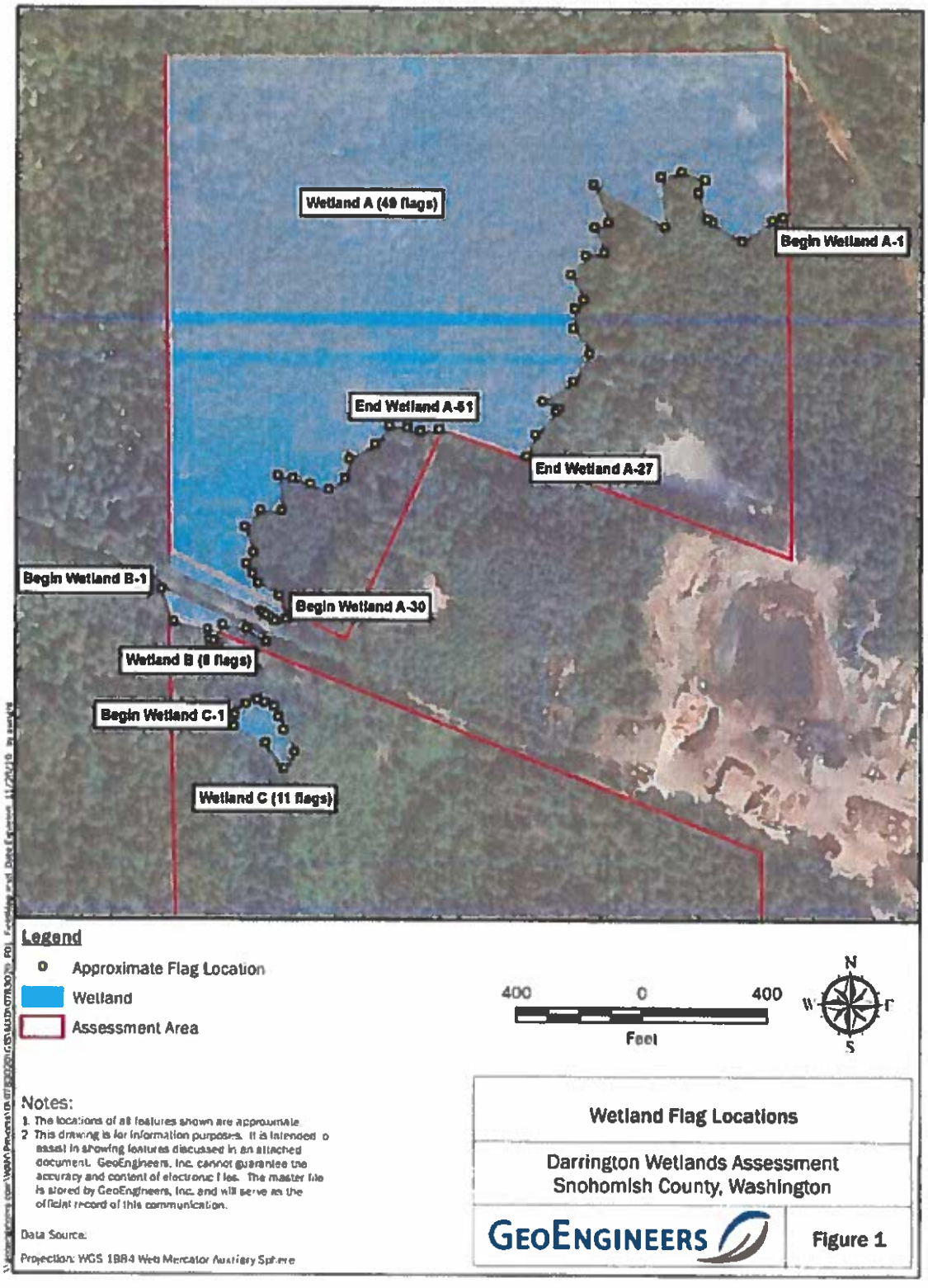
Site Legal Description:

Snohomish County Parcel 32091400200300

THE EAST HALF OF THE NORTHWEST QUARTER;
EXCEPT BURLINGTON NORTHERN RIGHT OF WAY;
AND THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER;
EXCEPT THEREFROM RIGHTS OF WAY OF BURLINGTON NORTHERN RAILROAD COMPANY;
AND EXCEPT PORTIONS OF SAID NORTHEAST QUARTER OF SOUTHWEST QUARTER LYING SOUTH OF A LINE THAT BEGINS AT A POINT 110 FEET NORTH OF SOUTHEAST CORNER THEREOF AND RUNS NORTH 66"30'00" WEST 1460 FEET, MORE OR LESS, TO WEST LINE THEREOF.
ALL IN SECTION 14, TOWNSHIP 32 NORTH, RANGE 9 EAST OF THE 'MLLAMETTE MERIDIAN.
SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

The project site is defined under the following Site Survey and Critical Area Survey maps.




Wetland A (49 flags)
Begin Wetland A-1
End Wetland A-51
End Wetland A-27
Begin Wetland B-1
Begin Wetland A-30
Wetland B (8 flags)
Begin Wetland C-1
Wetland C (11 flags)
Legend
Approximate Flag Location
Wetland
Assessment Area
400
0
400
Feet
N
W
E
S
Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
Data Source:
Projection: WGS 1984 Web Mercator Auxiliary Sphere
Wetland Flag Locations
Darrington Wetlands Assessment
Snohomish County, Washington
GeoEngineers
Figure 1

B. Environmental Elements [HELP]

1. Earth [help]

a. General description of the site:

(circle one): (Flat,) rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)? Less than 5%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The following soils can be found within the site:

Greenwater Loamy Sands

The site generally consists of a layer of organic sand to silty sand topsoil overlying alluvial soils and lahar deposits. The alluvial soils and lahar deposits are predominantly sand

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

There is no history of unstable soils in the immediate vicinity.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Topsoil removal and rough grading will be preformed on 33.2 acres to prepare the site and access road for the final condition. There will be approximately 80,880 cubic yards (CY) of top soil cut and approximately 42,854 CY cut and 31,469 CY fill of rough grading.

A 0.7 acre access road will be built to access the site. Approximately 1,620 CY cut will be performed to prepare the access road and approximately 1,620 CY fill of crushed surfacing base course will be imported.

A geotechnical report produced by MTC on January 14, 2020 concluded the site does not appear susceptible to potential deep settlement from loose or soft soils or liquefaction-induced settlement after development. Design and Construction Recommendations within the geotechnical report will be implemented including, but not limited to, removing organic topsoils and soft upper soils will be removed to native subgrade, subgrade compaction, and fill compaction.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion is not anticipated to occur as slopes are generally flat and erosion control Best Management Practices (BMPs) will be implemented according to NPDES and Construction Stormwater General Permit requirements. At project completion, the site will be permanently stabilized.

A geotechnical report produced by MTC on January 14, 2020 provided construction and site recommendations for stormwater runoff during the wet season which will be followed and implemented as part of the Stormwater Pollution Protection Plan.

The final conditions will ensure that all surface runoff is treated on-site and the entire project area will be graded to drain as sheet-flow runoff towards drainage swales and/or infiltration ponds. The ponds will be sized subject to the 2017 Snohomish County Drainage Manual and will comply with flow control, water quality, and on-site stormwater management. Additionally, there are no anticipated runoff impacts from the manufacturing activities taking place inside the facilities.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

For this phase of the project, 2.0% of the site will be covered with impervious surfaces. Cumulatively, under final conditions, the DWIC and its associated infrastructure such as roads, parking and utilities will occupy 43 acres of the site (46%).

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The native shallow sandy subgrade at presumed excavation depths are unlikely to become moisture sensitive during construction. During wet weather, the contractor will take measures to protect exposed subgrades and limit construction traffic during earthwork activities as appropriate. Erosion control BMPs such as silt fencing and slope protection will be implemented according to NPDES and Construction Stormwater General Permit requirements.

Once a subgrade has been approved, further measures will be implemented to prevent degradation or disturbance of the subgrade. These measures could include, but are not limited to, placing a layer of crushed rock or lean concrete on the exposed subgrade, or covering the exposed subgrade with a plastic tarp and keeping construction traffic off the subgrade.

During wet weather, earthen berms or other methods will be used to prevent runoff from draining into excavations. All runoff will be collected and disposed of properly. Measures may also be required to reduce the moisture content of on-site soils in the event of wet weather. These measures can include, but are not limited to, air drying and soil amendment, etc.

Since the native site soils may be difficult to work with during periods of wet weather due to elevated soil moisture content, and frozen soil is not suitable for use as structural fill, earthwork activities will generally take place in late spring, summer or early fall.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Construction activities may produce dust from groundwork. During this process, truck and heavy equipment will also emit exhaust.
Under final operations, the site will be powered by site generated wood waster

incinerated in bio-mass boilers, and additional wood waste will be transported to a Co-Gen plant less than 1 mile from the site.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no off site sources of emissions or odor that will affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Impacts from wood generated energy consumption will be minimal to residents as the site is zoned Industrial. Maintaining forested buffers on the south, east and west of the site, and maintaining forested conditions on the remaining norther 50 acres of the site, will reduce impacts of emissions, as well as implementing a "No Idle" zone during truck loading and unloading during operational periods.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

There are no surface water bodies on or in the immediate vicinity of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Non-applicable

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No wetlands will be disturbed on the site, and will be protected as a Critical Area.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No, the project does not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No, the site is not within the 100 year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No, the proposal does not involve any discharges of waste materials to surface

waters.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No, the site will be served by Town of Darrington municipal water.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No wastewater will be discharged into the ground from septic tanks or other sources.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

On-site and access road stormwater runoff will employ full dispersion and disperse to the existing forested land to the north, identical to the existing condition. Stormwater runoff from the temporary construction access road will sheet flow disperse to the northwest.

2) Could waste materials enter ground or surface waters? If so, generally describe.

The proposed development would not generate waste material run-off into ground or surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The proposal will not alter or otherwise affect drainage patterns in the vicinity of the site, and mimics the natural drainage pattern by dispersing stormwater to the north.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

The project will use stormwater infiltration and/or filtration combined with other low impact development (LID) best management practices (BMPs) to satisfy stormwater management requirements. There is currently no stormwater infrastructure available for connection or extension. No discharges to surface waters are proposed.

A NPDES permit will be required for the excavation and construction phase to mitigate adverse stormwater impacts from construction activities. The project is not mapped within a single source aquifer recharge area. The site is currently flat and forested, nearly all surface water runoff currently infiltrates. The project would mimic existing stormwater mechanisms by collecting and conveying runoff from impervious surfaces to infiltration facilities, and cause no changes to surface water runoff patterns.

4. *Plants* [help]

a. Check the types of vegetation found on the site:

__X_deciduous tree: alder, maple, aspen, other
__X_evergreen tree: fir, cedar, pine, other
__X_shrubs
__X_grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
__X_ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
__X_other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

43 acres of shrub and secondary growth forest, planted for harvest

c. List threatened and endangered species known to be on or near the site.

There are no threatened or endangered species observed on or known to be near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The site will be landscaped according to Snohomish County Code, and 50 acres north of the development will remain in natural, forested conditions.

e. List all noxious weeds and invasive species known to be on or near the site.

Pasture grass, Himalayan blackberry, California blackberry, cut-leaf blackberry, scotch broom, thistle and reed canary grass were observed on the site.

5. *Animals* [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other _____

Birds: Hawks, eagles, songbirds, hummingbirds, swifts

Mammals: Deer, bear, coyotes, mountain lions, various small mammals

Fish: salmon, trout, chum are present in the Stillaguamish and Sauk Rivers within a mile of the site

b. List any threatened and endangered species known to be on or near the site.

Observed on Site: None
Source:

Potentially Near Site:
Source: Critical Areas Report
Marbled Murrelet
Grey Wolf
Yellow-billed Cuckoo
Oregon Spotted Frog
North American Wolverine
Steelhead Trout
Chinook Salmon
Bull Trout

c. Is the site part of a migration route? If so, explain.

The site is located along possible migration route of: Marbled Murrelet, Bald Eagle, various swift and hummingbird species

d. Proposed measures to preserve or enhance wildlife, if any:

The conceptual design proposes to keep all critical areas including buffers undisturbed and protected as open space as well as maintain 50 acres in natural, forested conditions.

e. List any invasive animal species known to be on or near the site.

None known or observed

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

The early clearing and grading scope does not require any energy. The facility will be

powered by site generated wood waster incinerated in bio-mass boilers, and additional wood waste will be transported to a Co-Gen plant less than 1 mile from the site.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The proposed development would not affect the potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

No energy conservation features are proposed.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

The project does not propose any development that would result in any environmental health hazards. The primary facilities – the sawmill, CLT/glulam plant, and modular assembly factory – will not utilize or produce any toxic, hazardous, or radioactive substances.

1) Describe any known or possible contamination at the site from present or past uses.

None on site

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None on site

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

None are proposed

4) Describe special emergency services that might be required.

No special emergency services will be required

5) Proposed measures to reduce or control environmental health hazards, if any:

No environmental health hazards are anticipated

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Seasonal logging may produce noise that affects the project site, but would be minimal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Construction levels may exceed 55 decibels of exterior noise, however there are no residences near the site. Construction will occur during allowed periods of operation.

Final operation noise levels may exceed 55 decibels of exterior noise during shipping and delivery when trucks enter and leave the site.

3) Proposed measures to reduce or control noise impacts, if any:

Construction-related noises will be kept to a minimum and limited to the allowable hours for construction operations. Forested conditions will be retained on the all sides of the proposed facility, with 50 acres remaining in natural conditions, minimizing noise impacts to the regional trail and future campground.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The site is zoned Heavy Industrial and is currently in use as forested timber land. Adjacent properties are zoned Commercial Forest and Light Industrial. No land uses on adjacent or nearby properties will be affected.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The site has been used as working forest lands in the past. Forty-three (43) acres will be converted for development.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No, the project will not affect or be affected by surrounding working forest land normal business operations, and will supplement the forestry industry in the Town of Darrington

c. Describe any structures on the site.

There are no structures on the site.

d. Will any structures be demolished? If so, what?

Non-applicable

e. What is the current zoning classification of the site?

Heavy Industrial

f. What is the current comprehensive plan designation of the site?

Urban Industrial

g. If applicable, what is the current shoreline master program designation of the site?

Non-applicable

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No part of the site has been classified as a critical area by Snohomish County. A wetland was surveyed on the northern portion of the parcel which will be left in natural conditions.

i. Approximately how many people would reside or work in the completed project?

No people will reside or work in the completed clearing and grading scope. The proposed project would employ approximately 150 people directly and could employ up to 400 indirectly through logging and trucking jobs.

j. Approximately how many people would the completed project displace?

No people would be displaced.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Non-applicable.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project is an allowed land use within the Heavy Industrial zone, and the proposed use fits the logging and timber use surrounding the parcel.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

The project will support harvests on nearby forest lands.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Non-applicable, this is not a residential project

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Non-applicable, this is not a residential project

c. Proposed measures to reduce or control housing impacts, if any:

Non-applicable

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

No structures are proposed as part of the early clearing and grading scope. The tallest proposed structure in the final project would be 65 feet on one side.

b. What views in the immediate vicinity would be altered or obstructed?

No views will be obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any:

No impacts are expected during the Clearing and Grading phase. Maximum height in the zone is sixty-five feet. No building will exceed this height, and vegetated buffers are proposed on the south, east and west, while forested conditions will be maintained on the northern 50 acres of the site.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

No light or glare will be produced from the proposed facility or construction.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No light glare from the finished project will be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

There are no off-site sources of light or glare that may affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

Non-applicable

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

Fishing, bicycling, baseball fields, regional trail, passive recreation

b. Would the proposed project displace any existing recreational uses? If so, describe.

No recreational uses will be displaced. Additional passive recreation space may be added by any future development as footpaths within the natural area and as a connection to the Whitehorse Regional Trail.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Non-applicable.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

There are no buildings present on the site.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

The Washington State Archaeological Predictive Model rates the site at High Risk for discovery. A Cultural Resources Survey was conducted between July 16 – August 29, 2019 consisting of 75 separate shovel probes. One site of camping or timber activity refuse was discovered, but it was concluded that no precontact cultural resources exist on the site.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

As part of the Cultural Resources Study, WillametteCRA consulted with archeologists from the Sauk Suiattle Tribe, and Cultural Resources staff from the Stillaguamish Tribe. The Tribal representatives from the Sauk Suiattle and Stillaguamish were on site during archaeology survey work. No

evidence of Indian or historic use or occupation was found within surveyed areas.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

A cultural resources study was performed in August of 2019. No evidence of Indian or historic use or occupation was found within surveyed areas. The archaeology consulting firm placed recommendations within the Archaeology Investigation Report that recommended a Universal Discovery Plan for development of the site.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The site is accessed from State Route 530, a Washington state highway. An access permit will be obtained from WSDOT for an access road to enter the site from SR 530.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

Community Transit provides a bus stop within a half mile of the property. The owners will work with the transit authority on future service prior to development of the site.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

The early clearing and grading will not add any parking spaces and eliminates zero spaces. The final development will provide approximately 140 parking stalls within 2 parking areas.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The development will not require improvements to existing roads or state transportation facilities, but access roads as well as internal roadways will be constructed as part of the project.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project is adjacent to the Darrington Municipal Airport but does not obstruct flight paths or runways, and does not occur within the Runway Clear Zone. The project does not occur in the immediate vicinity of water or rail transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Project Trip Generation Method (Estimated PM Peak Hour Trips)

Programmatic (estimated based on anticipated scheduling) – 101 trips
ITE Trip Generation Manual
Employee – 66 trips (recommended method and presented in memo)
Acres – 150 trips
Square-feet – 168 trips

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No, the project will not interfere with or affect the movement of agricultural and forest products on roads or streets in the area. The adjacent tree farm is access via a separate roadway. The project may be affected by the movement of agricultural and forest products on nearby roadways during times of production.

h. Proposed measures to reduce or control transportation impacts, if any:

This is a non-project action, The conceptual design includes commercial square footage including a Town Center. The intent of the development is to increase employment within the Town and reduce employment oriented commuting and commuting for goods and services within the region. A more detailed traffic study will need to be performed when a site plan detailing square footage for specific uses is submitted for permitting.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No, the project is not anticipated to result in an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Not applicable; no public services impacts are anticipated.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

The site is currently undeveloped

d. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No utilities are proposed for early clearing and grading scope
The final facility will be powered by site generated wood waster incinerated in bio-mass boilers, and additional wood waste will be transported to a Co-Gen plant less than 1 mile from the site.
Water will be provided by the Darrington Municipal Water system.
Garbage collection service will be provided by Snohomish County Waste Management
Phone and other communications will be provided by Ziply Fiber Communications
Waste water will be treated by an onsite waste water treatment system

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Dianne Allen

Name of signee Dianne Allen

Position and Agency/Organization Town of Darrington SEPA Officer

Date Submitted: 8-18-2020

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

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NOC APPLICATION SUPPLEMENTAL FORM

Other Emission Sources (Not Otherwise Listed)

This application is for activities or equipment that is (check all that apply):

- ☒ New (including existing, unpermitted equipment)
- ☐ Physical or operational modification of existing equipment
- ☐ Relocation of existing equipment

Estimated date to begin construction: TBD Estimated date to startup: TBD

Name of Emission Source: Whole Log Debarker

Manufacturer: Artiglio Model: SC 120.950

Description of Emission Source:

A whole log debarker that will be used to remove bark from the whole logs in the log storage yard prior to entering into the proposed sawmill. The proposed debarker will generate emissions of PM, PM10, and PM2.5. Emissions estimates are provided in the attachment B of the NOC application.

Operating Data

Maximum Rated Capacity (specify units): 134 ton-logs/day

Raw Materials and/or Fuel Required for Process: Whole logs

Estimated Annual Usage of Each Raw Material and/or Fuel (specify units): 48,885 ton-logs/yr

Normal Operation 18 hours/day 7 days/week 52 weeks/yr

Maximum Operation 18 hours/day 7 days/week 52 weeks/yr

Control Equipment
Are the emissions from the source controlled? ☐ Yes ☒ No If yes, provide the following:
Type of Control Device: _____
Manufacturer: _____ Model: _____
Pollutant(s) Controlled: _____ Removal Efficiency (%): _____

Stack Parameters	**Building Dimensions of Project Location**
Stack diameter: n/a inches	Building Height (highest point of roof) n/a ft
Stack height above ground: n/a feet	Building Width n/a ft
Exhaust Flow Rate: n/a acfm	Building Length n/a ft
Exhaust Temperature: n/a °F	

Required Attachments

1. Facility layout diagram showing location of the source (and its stack), associated buildings, and property lines.
2. Manufacturer specification sheet for each piece of equipment.
3. Agency specific control device form (if applicable), located at www.pscleanair.org/180/Source-Specific-Applications-for-Permits.
4. A copy of each applicable New Source Performance Standard (NSPS) with the applicable portions of each rule marked.
5. A copy of each applicable National Emissions Standard for Hazardous Air Pollutants (NESHAP) with the applicable portions of each rule marked.

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NOC APPLICATION SUPPLEMENTAL FORM

Other Emission Sources (Not Otherwise Listed)

This application is for activities or equipment that is (check all that apply):

- ☒ New (including existing, unpermitted equipment)
- ☐ Physical or operational modification of existing equipment
- ☐ Relocation of existing equipment

Estimated date to begin construction: TBD Estimated date to startup: TBD

Name of Emission Source: Sawmill Wood Handling Equipment

Manufacturer: Artilgio Model: n/a

Description of Emission Source:

DWIC is proposing to install wood handling equipment to process whole green logs to green dimensional lumber in the sawmill. Proposed wood handling equipment will be located inside an enclosed, warehouse-style building with an attached bay door. Proposed wood handling equipment includes a band and edging saw, a planer, and a chipper. Green shavings from sawing and planing will be pneumatically transferred to the chipper for further particle size reduction. Negligible emissions of sawdust will be generated by the sawmill wood handling equipment due to the high moisture content of the green logs. These activities will also occur inside an enclosed building. Therefore, only a small fraction of generated sawdust will be emitted to atmosphere. The proposed wood handling equipment in the sawmill will generate particulate emissions only.

Operating Data

Maximum Rated Capacity (specify units): 134 ton-log/day

Raw Materials and/or Fuel Required for Process: Green whole logs

Estimated Annual Usage of Each Raw Material and/or Fuel (specify units): 48,885 ton-log/yr

Normal Operation 18 hours/day 7 days/week 52 weeks/yr

Maximum Operation 18 hours/day 7 days/week 52 weeks/yr

Form 50-184 | 03/20

Other Emission Sources (Not Otherwise Listed)

Control Equipment
Are the emissions from the source controlled? ☐ Yes ☒ No If yes, provide the following: Type of Control Device: _____ Manufacturer: _____ Model: _____ Pollutant(s) Controlled: _____ Removal Efficiency (%): _____

Stack Parameters	**Building Dimensions of Project Location**
Stack diameter: n/a inches Stack height above ground: n/a feet Exhaust Flow Rate: n/a acfm Exhaust Temperature: n/a °F	Building Height (highest point of roof) 30 ft Building Width 65 ft Building Length 215 ft

Required Attachments
1. Facility layout diagram showing location of the source (and its stack), associated buildings, and property lines. 2. Manufacturer specification sheet for each piece of equipment. 3. Agency specific control device form (if applicable), located at www.pscleanair.org/180/Source-Specific-Applications-for-Permits. 4. A copy of each applicable New Source Performance Standard (NSPS) with the applicable portions of each rule marked. 5. A copy of each applicable National Emissions Standard for Hazardous Air Pollutants (NESHAP) with the applicable portions of each rule marked.

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Additional Notice of Construction Application Requirements for

MELTING FURNACES, KILNS, BAKING OVENS, ROASTING OVENS, CURING OVENS

General

Description of Equipment and its Purpose [*Specify melting furnace, kiln, or oven and its intended use (melt metal or glass; manufacture cement, lime, bricks; bake or roast foods; dry or cure parts; etc.)*]

Identify which of the following categories the project fits into:

1. New Construction *(New construction also includes existing, unpermitted equipment or processes*)
2. Reconstruction *(Reconstruction means the replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost that would be required to construct a comparable entirely new facility)*
3. Modification *(Modification means any physical change in, or change in the method of operation of, a source, except an increase in the Hours of Operation or production rates (not otherwise prohibited) or the use of an alternative fuel or raw material that the source is approved to use under an Order of Approval or operating permit, that increases the amount of any air contaminant emitted or that results in the emission of any air contaminant not previously emitted)*
4. Amendment to Existing Order of Approval Permit Conditions

Date of Manufacture (month/yr) [*This is the date when the unit was built by the manufacturer. It is required only for secondary lead furnaces (pot, blast, cupola, reverbatory), secondary brass and bronze furnaces not at foundries (reverbatory, electric, blast, cupola), basic oxygen process furnaces, ferroalloy (electric arc), carbon, alloy or specialty steel furnaces (electric arc, argon-oxygen decarbuization), glass furnaces (other than hand melting), cement kilns, and lime kilns.*]

Estimated Hours of Operation (hr/day, day/wk, wk/yr) [*Estimate the hours of operation for the new furnace, kiln or oven - not necessarily the entire facility*]
24 hours/day, 7 days/week, 52 weeks/year
Estimated Installation Date [*Estimate the date when the furnace, kiln or oven will be put into service*] TBD

Raw Material Properties

Raw Materials Charged [*Specify the raw materials put into the furnace, kiln or oven*]
Dimensional green lumber
Charging Rate (lb/hr) [*Specify the average amount of each material charged on an hourly basis*]
56,100 bdft / Kiln / Batch

Design ***[Most design information is available from the manufacturer or vendor. Submittal of a brochure, scale drawing or process and instrumentation diagram will facilitate the review of the permit application]***

Make & Model *[Specify the manufacturer of the furnace, kiln or oven and its model number - not its serial number]*

Katres Drying Technology, Model: KAD 8P

Type of Furnace, Kiln, or Oven

- *For melting furnaces, specify electric arc, induction, crucible, pot, reverbatory, annealing, heat treating, reheating, glass, retort, or other (describe).*
- *For kilns, specify cement, lime, brick or other (describe).* Dimensional green lumber
- *For ovens, specify curing, core baking, bread baking, coffee roasting, or other (describe)*

Type of Fuel [*Specify natural gas, distillate (#2 fuel oil, diesel), residual (#6 fuel oil, bunker oil), waste oil (used oil), wood, coal, or other (describe)*] N/A

Rated Heat Input (MMBtu/hr) [*Specify the rated heat input - not the heat output. The rated heat input is equal to the maximum fuel firing rate times its upper heating value*] N/A

Estimated Fuel Usage (Million cu ft/yr, thousand gal/yr, tons/yr) [*Estimate how many million cubic feet of gaseous fuel, thousands of gallons of liquid fuel (not waste), or tons of solid fuel (not waste) will be burned annually. Alternatively, specify how many billion Btu/yr.*] N/A

Rated Capacity [*Specify*] (production units/hr) 56,100 bdft / Kiln / Batch

Estimated Annual Production (production units/yr) 21,188 MMbdft/year

Nitrogen Oxide Emission Controls N/A

- *Specify if using low-NOx burners,or*
- *staged combustion, or*
- *flue gas recirculation, or*
- *ammonia injection, or*
- *selective catalytic reduction.*

If applicable, complete the permit form for selective catalytic reduction. If selective noncatalytic reduction is used, describe the system in detail N/A

Particulate Emission Controls [*Specify 'none', baghouse, Venturi scrubber, or ESP and complete the applicable permit forms*] N/A

Sulfur Dioxide Emission Controls [*Specify 'none', dry injection, spray dryer, or absorber and complete the applicable permit forms*] N/A

Emissions Estimate (lb/hr, lb/yr) [*Estimate the emissions of each pollutant and include your calculations. Emission factors are available from http://www.epa.gov/ttn/chief/ap42/index.html*]

Stack [*Required only for units without add on control equipment. Otherwise, use the appropriate permit forms for control equipment (spray dryer, dry injection, baghouse, absorber, ESP, selective catalytic reduction, selective noncatalytic reduction, ammonia or urea injection)*]

Stack Height (ft) [*Specify the height of the top of the stack above ground level - not above the building or sea level*] 49.3 ft

Stack Diameter or Rectangular Cross-Sectional Dimensions (inches) [*Specify the internal dimensions - not the external dimensions*] 23.6 in x 23.6in

Exhaust Flowrate (acfm) [*Specify the airflow in actual cubic feet per minute*] 330 cfm/vent

Exhaust Temperature (°F) [*Specify the temperature of the exhaust leaving the stack*] 125

Distance to Nearest Property Line (ft) [*Specify the distance from the base of the stack to the nearest property line*] 368 ft

Height, Length and Width of Buildings (ft) [*Specify the approximate dimensions of any buildings that are >40% of the stack height and are located within 5 building heights from the stack*]
47 ft height x 25 ft width x 160 ft length

Operation and Maintenance

Describe Preventive Maintenance [*Specify the periodic maintenance recommended by the manufacturer and its frequency*] TBD

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NOC APPLICATION SUPPLEMENTAL FORM

Boilers and Process Heaters

This application is for activities or equipment that is (check all that apply):

- ☒ New (including existing, unpermitted equipment)
- ☐ Physical or operational modification of existing equipment
- ☐ Relocation of existing equipment

Estimated date to begin construction: TBD Estimated date to startup: TBD

Operating Data

Normal 24 hours/day 7 days/week 52 weeks/yr

Maximum 24 hours/day 7 days/week 52 weeks/yr

Boiler/Heater

Manufacturer: Polytechnik Biomass Energy Pty Ltd Model: TBD

Max. Heat Input Rating: 28,000,000 BTU per hour

Boiler Type: ☒ Water-Tube ☐ Fire-Tube

Turndown Ratio: 1:4 (dry fuel) 1:3 (wet fuel) Percent Excess Air: TBD

Burner

Manufacturer(s): TBD Model(s): TBD

Number of burners: TBD Rating of each burner: TBD BTU per hour

Heat Transfer		
Heat Transfer Medium: water		
Temperature (°F) Input: 205 Output: 169	Pressure (psia) Input: 43.5 Output: 43.5	Flow Rate (specify units): Average: TBD Maximum: TBD

Fuel Type (check all that apply)

☐ Natural Gas ☐ Liquefied Petroleum Gas ☐ Refinery Gas ☐ Digester Gas ☐ Landfill Gas

☒ Other Green/Dry wood chips, bark ☐ Fuel Oil (specify grade) _____

Emission Controls (check all that apply)	**Exhaust Stack Parameters**
☐ Low NOx Burner ☒ Flue Gas Recirculation ☐ Oxygen Trim ☐ CO Catalyst ☐ Selective Catalytic Reduction (SCR) ☐ Selective Non-Catalytic Reduction (SNCR) ☐ Baghouse ☒ Electrostatic Precipitator ☒ Other, describe: multi-clone	☒ Stack information is specified on NOC Application Supplemental Form for proposed control device ☐ Stack information is specified below: Stack diameter: _____ inches Stack height above ground: _____ feet Exhaust Flow Rate: _____ acfm Exhaust Temperature: _____ °F Building Dimensions of project location: Building Height (highest point of roof) _____ ft Building Width _____ ft Building Length _____ ft

Fuel Information

If gas or oil fuel is used, attach the fuel specification sheet requested below. If wood fuel is used, provide the following:

Heat Value: 5,500 (avg) Btu/lb wood - Specify if on: ☒ Wet or ☐ Dry basis

% bark: 0-10

% sander dust: 0

% reinjected cinders: 0

% moisture: 12-60

Required Attachments

1. Manufacturer specification sheets for boiler, burner(s), and each identified control device (including guaranteed emission rates).
2. Supplier-provided fuel specification sheet.
3. Any applicable Agency specific control device form.
   See: www.pscleanair.org/180/Source-Specific-Applications-for-Permits
4. A copy of each applicable New Source Performance Standard (NSPS) with the applicable portions of each rule marked.
5. A copy of each applicable National Emissions Standard for Hazardous Air Pollutants (NESHAP) with the applicable portions of each rule marked.

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NOC APPLICATION SUPPLEMENTAL FORM

Boilers and Process Heaters

This application is for activities or equipment that is (check all that apply):

- ☒ New (including existing, unpermitted equipment)
- ☐ Physical or operational modification of existing equipment
- ☐ Relocation of existing equipment

Estimated date to begin construction: TBD Estimated date to startup: TBD

Operating Data

Normal 0 hours/day 0 days/week 0 weeks/yr

Maximum 10 hours/day 5 days/week 1 weeks/yr

Boiler/Heater

Manufacturer: Smith Cast Iron Boilers Model: 28HE-17

Max. Heat Input Rating: 5,238 BTU per hour

Boiler Type: ☒ Water-Tube ☐ Fire-Tube

Turndown Ratio: TBD Percent Excess Air: TBD

Burner

Manufacturer(s): Smith Cast Iron Boilers Model(s): C4-0A

Number of burners: 1 Rating of each burner: 5,238 BTU per hour

Heat Transfer		
Heat Transfer Medium: Water		
Temperature (°F) Input: TBD Output: TBD	Pressure (psia) Input: TBD Output: TBD	Flow Rate (specify units): Average: TBD Maximum: TBD

Fuel Type (check all that apply)

☐ Natural Gas ☐ Liquefied Petroleum Gas ☐ Refinery Gas ☐ Digester Gas ☐ Landfill Gas

☐ Other_____ ☒ Fuel Oil (specify grade) Distillate No. 2

Emission Controls (check all that apply)	**Exhaust Stack Parameters**
☐ Low NOx Burner ☐ Flue Gas Recirculation ☐ Oxygen Trim ☐ CO Catalyst ☐ Selective Catalytic Reduction (SCR) ☐ Selective Non-Catalytic Reduction (SNCR) ☐ Baghouse ☐ Electrostatic Precipitator ☐ Other, describe: _____	☐ Stack information is specified on NOC Application Supplemental Form for proposed control device ☒ Stack information is specified below: Stack diameter: 23.6 inches Stack height above ground: 35 feet Exhaust Flow Rate: 180 acfm Exhaust Temperature: 467.3 °F Building Dimensions of project location: Building Height (highest point of roof) 40 ft Building Width 77 ft Building Length 121 ft

Fuel Information

If gas or oil fuel is used, attach the fuel specification sheet requested below. If wood fuel is used, provide the following:

Heat Value: _____ Btu/lb wood - Specify if on: ☐ Wet or ☐ Dry basis

% bark: _____

% sander dust: _____

% reinjected cinders: _____

% moisture: _____

Required Attachments

1. Manufacturer specification sheets for boiler, burner(s), and each identified control device (including guaranteed emission rates).
2. Supplier-provided fuel specification sheet.
3. Any applicable Agency specific control device form.
   See: www.pscleanair.org/180/Source-Specific-Applications-for-Permits
4. A copy of each applicable New Source Performance Standard (NSPS) with the applicable portions of each rule marked.
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Additional Notice of Construction Application Requirements for

ELECTROSTATIC PRECIPITATORS (ESP)

General

Equipment or Process Being Controlled *[Specify the source(s) of the particulate matter to be controlled. If the source(s) are also new, complete the applicable permit forms]*

Identify which of the following categories the project fits into:

1. New Construction *(New construction also includes existing, unpermitted equipment or processes*)
2. Reconstruction *(Reconstruction means the replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost that would be required to construct a comparable entirely new facility)*
3. Modification *(Modification means any physical change in, or change in the method of operation of, a source, except an increase in the Hours of Operation or production rates (not otherwise prohibited) or the use of an alternative fuel or raw material that the source is approved to use under an Order of Approval or operating permit, that increases the amount of any air contaminant emitted or that results in the emission of any air contaminant not previously emitted)*
4. Amendment to Existing Order of Approval Permit Conditions

Estimated Hours of Operation (hr/day, day/wk, wk/yr) *[Estimate the hours of operation for the new ESP - not necessarily the entire facility]*
24 hours/day, 7 days/week, 52 weeks/year
Estimated Installation Date *[Estimate the date when the new ESP will be put into service]*
TBD

Inlet Gas Stream Characteristics *[Pretreatment (e.g., heating or dilution) is necessary if the temperature is not 50-100 °F above the dewpoint]*

Particulate Concentration (lb/hr, gr/acf, or gr/dscf) *[Specify the amount of particulate matter being vented to the ESP in pounds per hour, grains per actual cubic foot, or grains per dry standard cubic foot. (One pound contains 7000 grains.)]*
0.005 gr/dscf
Particle Mean Diameter (micrometers) *[Specify the mass mean aerodynamic diameter of the particles in micrometers]*
2.5 microns
Particle Resistivity (ohm-cm) *[Specify the approximate electrical resistivity of the particles on the collection plate in ohm-cm]*
TBD
Flowrate (acfm) *[Specify the airflow in actual cubic feet per minute. This is usually determined from the fan performance 'curve' based upon the expected static pressure caused by the sum of the pressure losses from each component in the ductwork, including the ESP]*
TBD

Temperature (°F) *[Specify the temperature in degrees Fahrenheit]*
TBD
Moisture (% by volume) *[Specify the moisture (water vapor) concentration in percent by volume]*
TBD

Design *[Most design information is available from the manufacturer or vendor. Submittal of a brochure, scale drawing or process and instrumentation diagram will facilitate the review of the permit application]*

Make & Model *[Specify the manufacturer and model of the ESP - not the serial number]*
Make: Scheuch, Model: TBD
Type of ESP *[Specify plate/wire, plate/plate, or tube/wire. Also specify if irrigated with water to remove collected particles.]*
Dry ESP
Number of Stages *[Specify one stage or two. (Two stage ESPs have separate ionization and collection stages.)]*
One stage
Collection Efficiency (%) *[Specify the control efficiency of the ESP, as stated by the manufacturer]*
TBD
Specific Collection Area (ft2) *[Specify the total dust collection area of the ESP plates or tubes]*
TBD
Particle Migration (Drift) Velocity (ft/s) *[Specify the particle migration velocity, often called the drift velocity. This is the velocity at which the particles migrate toward the collection plate or tube.]*
TBD
Gas Conditioning Equipment (if any) *[Specify any reagents injected to adjust the resistivity of the dust cake, any upstream control equipment to remove coarse particles, and any heaters or dilution air used to keep the gas stream above the dew point]*
TBD
Method Used to Design/Size the ESP *[Specify the method used to select this design and size of ESP. If design calculations were performed, they should be submitted. If the design and sizing was based on similar (successful) applications, list the owners and the city and state where they are located]*

Stack

Stack Height (ft) *[Specify the height of the top of the stack above ground level - not above the building or sea level]*
49.23 ft
Stack Diameter or Rectangular Cross-Sectional Dimensions (inches) *[Specify the internal dimensions - not the external dimensions]*
1.97 ft
Exhaust Flowrate (acfm) *[Specify the airflow in actual cubic feet per minute. This is usually determined from the fan performance 'curve' based upon the expected static pressure caused by the sum of the pressure losses from each component in the ductwork, including the cyclone]*
9,840 acfm
Exhaust Temperature (ºF) *[Specify the temperature of the exhaust leaving the stack]*
320

Distance to Nearest Property Line (ft) *[Specify the distance from the base of the stack to the nearest property line.]*
237 ft

Height, Length and Width of Buildings (ft) *[Specify the approximate dimensions of any buildings that are >40% of the stack height and are located within 5 building heights from the stack]*
40 ft height x 77 ft width x 121 ft length

Operation and Maintenance

Method Used to Establish Cleaning Frequency and Intensity *[Specify the method used to determine the rapping frequency and intensity.]*
TBD

Describe Preventive Maintenance *[Specify the expected inspection frequencies for broken discharge wires or rapping equipment, spark rate, voltage, etc. Also specify the records to be kept (e.g., records of all inspections and repairs, the amount of dust collected per month), and specify any spare parts to be kept on-site (e.g., electrodes, rapping equipment)]*
TBD

Methods Used to Prevent Emissions From Handling and Disposal of Dust *[Specify the equipment, procedures, and methods used to prevent emissions from the handling and disposal of dust. Is the receiving hopper completely enclosed? How is the dust hopper emptied without causing emissions?]*
TBD

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NOC APPLICATION SUPPLEMENTAL FORM

Baghouse, Cartridge-Type Dust Collector, and Fabric Filter

This baghouse or cartridge-type dust collector is:

- ☒ New (including existing, unpermitted equipment)
- ☐ A replacement of an existing baghouse or cartridge-type dust collector
- ☐ A substantial alteration of an existing baghouse or cartridge-type dust collector
- ☐ Relocation

Specify the source of the particulate matter being controlled: CLT Wood Handling Equipment

Hours of operation per day: 18 Hours of operation per year: 6,570

Inlet Gas Stream Characteristics

Inlet Flowrate (acfm): 9500

Inlet Particulate Concentration (gr/dscf): 5.00

Temperature Range of Inlet Gas Stream (°F): 72

Moisture Range of Inlet Gas Stream (%): 12

Outlet Gas Stream Characteristics

Outlet Flowrate (acfm): 9500

Outlet Particulate Concentration (gr/dscf): 0.005

Temperature Range of Outlet Gas Stream (°F): 72

Moisture Range of Outlet Gas Stream (%): 12

Design Specifications

Make: Scheuch Model: Ligno

Filter Fabric Material: polyester

Filter Cleaning Method:

- ☐ Mechanically shaken
- ☐ Manually shaken
- ☐ Reverse air
- ☒ Pulse-jet
- ☐ Other: _____

Air to Cloth Ratio (acfm/ft2): 108

Baghouse Fan Configuration

- ☐ Induced draft
- ☒ Forced draft
- ☐ Other: _____

Stack Parameters

Exhaust stack parameters (Leave blank for non-ventilated spray areas):

Stack diameter (inches): N/A Stack height above ground (feet): 55

Building Dimensions of project location:

Building Height (highest point of roof) (feet): 53

Building Width (feet): 636 Building Length (feet) 272

Stack damper/rain guard:

☐ None ☒ Hexagonal ☐ Stack within stack ☐ Butterfly ☐ Inverted Cone

☐ Other (specify): _____

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NOC APPLICATION SUPPLEMENTAL FORM

Spray Coating Operations

This application is for activities or equipment that is:

- ☒ New (including existing, unpermitted equipment)
- ☐ Physical or operational modification of existing equipment
- ☐ Relocation of existing equipment

This application is for activities or equipment that is:

- ☐ Aerospace
- ☐ Wood furniture
- ☐ Motor vehicles
- ☒ Other, please describe: Dimensional Lumber

Note: Spray coating operations for motor vehicles may instead qualify for the General Order of Approval - Automotive Refinishing Operations Spray Booths. www.pscleanair.gov/AutobodyGeneralOrder

Hours of operation per day: 18 Hours of operation per year: 6,570

Spray Coating area is:

- ☐ Spray booth/room
- ☐ Outdoor spray area, describe enclosure: _____
- ☒ Prep area
- ☐ Other, please describe: _____

Design Specifications

Volume of enclosure (cubic feet): N/A

Exhaust flow rate (cfm): N/A

Make: N/A Model: N/A

Exhaust System Overspray Control

☐ Dry filter system:

Dry filter make: _____ Dry filter model: _____

Manometer or differential pressure gauge installed: ☐ Yes ☐ No

☐ Water wash system:

Water flow rate (feet/minute): _____

Flow meter installed: ☐ Yes ☐ No

Form 50-114 | 03/20

Spray Gun Parameters

Type of spray equipment:

- ☐ Air-assisted airless
- ☐ Airless; specify viscosity of coatings: _____
- ☐ Electrostatic
- ☐ High volume low pressure (HVLP)
- ☒ Low volume low pressure (LVLP)
- ☐ Other, please describe: _____

Stack Parameters

- ☐ Stack information is specified on NOC Application Supplemental Form for proposed control device
- ☒ Stack information specified below:

Stack damper/rain guard:

☒ None ☐ Hexagonal ☐ Stack within stack ☐ Butterfly ☐ Inverted Cone

☐ Other (specify): _____

Stack diameter (inches): 68 Stack height above ground (feet): 53

Building Dimensions of project location:

Building Height (highest point of roof) (feet): 53

Building Width (feet): 636 Building Length (feet) 272

Required Attachments

1. Table (Excel file preferred) containing proposed annual usage (gallons/year) of each coating, solvents and other VOC containing materials. Coatings, solvents, and VOC containing materials must be identified with manufacturer, name, product ID, and VOC content (lb/gal)
2. Safety Data Sheets (SDS) for each coating to be applied.
3. Environmental Data Sheets (EDS), Product Data Sheets (PDS), or SDS which show the VOC content (lb/gal) of each coatings and solvents to be applied or used during surface preparation and surface coating

Henkel Corporation

CERTIFIED PRODUCT DATA SHEET

(Properties of materials "as supplied" by the manufacturer)

Manufacturer's Name:	HENKEL CORPORATION	Date: 09/23/2019
Customer's Material Code:		
Product I. D. Name/Number:		
Product Description:	LOCTITE HB X102 PURBOND	
Person Preparing Data Sheet / Phone Number:		

LB/GAL VOC less water: 0.02

LB/GAL solids: 10.08

A.	Density (Dc)s:	10.10	lbs./gal.				ASTM D1475	X
B.	Total Volatiles (Wv)s:	0.20	Weight Percent	0.20	Volume Percent		other (2)	
C.	Water Content (Ww)s:	0.00	Weight Percent	0.00	Volume Percent		ASTM D2369	
D.	Organic Volatiles (Wo)s: Excluding Exempts	0.20	Weight Percent	0.20	Volume Percent		other (2a)	X
	Organic Volatiles (Wo)s: Including Exempts	0.20	Weight Percent	0.20	Volume Percent			
E.	Nonvolatile Content (Wn)s:	99.80	Weight Percent	99.72	Volume Percent		ASTM D3792	
F.	Total HAP Content (HAP)s:	16.29	Weight Percent				ASTM D4017	
G.	Total VHAP Content (Wn)s:	0.00	Weight Percent	0.00	Volume Percent		other (2b)	X

H. Constituents (List all VOC's, HAP's (3), SARA 313 Chemicals)

List Method Used: Formulation [X] Method 311 [ ]

VOC, HAP, SARA 313 Ingredients	VOC	HAP	SARA 313	CAS Number	Target Weight Percent Volatiles	Target Weight Percent Non-Volatiles	Density (lbs./gal.)
Diphenylmethandiisocyanate, isom.+homol.			Y	9016-87-9		36.83	8.34
4,4'-Methylenediphenyl diisocyanate		Y	Y	101-68-8		16.29	9.93
hexaboron dizinc undecaoxide			Y	12767-90-7		2.40	8.34
Dimorpholinodiethyl ether 2,2-	Y			6425-39-4	0.20		8.88
Totals: ---------->					0.20	55.52	

(1) The subscript "s" denotes each value is for the ink or coating "as supplied" by the manufacturer.
(2) Explain the other method used in an attachment to this form.
(2a) 105 °C +/- 1 °C 1-3 hrs 1 gram +/- 0.1. (2b) Typically not applicable. D3792 or D4017 are used when required.
(3) HAP must be reported if present at 0.1 % or greater. VHAP = Volatile HAP

Henkel Corporation

CERTIFIED PRODUCT DATA SHEET

(Properties of materials “as supplied” by the manufacturer)

Manufacturer’s Name:	HENKEL CORPORATION	Date: 12/30/2021
Customer’s Material Code:		
Product I. D. Name/Number:	2124420	
Product Description:	LOCTITE PR 3105 PURBOND NA	
Person Preparing Data Sheet / Phone Number:		

LB/GAL VOC: 0.01

LB/GAL solids: 8.94

A.	Density (Dc)s:	9.18	lbs./gal.				ASTM D1475	X
B.	Total Volatiles (Wv)s:	2.61	Weight Percent	2.88	Volume Percent		other (2)	
C.	Water Content (Ww)s:	2.50	Weight Percent	2.73	Volume Percent		ASTM D2369	
D.	Organic Volatiles (Wo)s: Excluding Exempts	0.11	Weight Percent	0.15	Volume Percent		other (2a)	X
	Organic Volatiles (Wo)s: Including Exempts	0.11	Weight Percent	0.15	Volume Percent			
E.	Nonvolatile Content (Wn)s:	97.39	Weight Percent	97.06	Volume Percent		ASTM D3792	
F.	Total HAP Content (HAP)s:	0.11	Weight Percent				ASTM D4017	
G.	Total VHAP Content (Wn)s:	0.11	Weight Percent	0.18	Volume Percent		other (2b)	X

H. Constituents (List all VOC’s, HAP’s (3), SARA 313 Chemicals)

List Method Used: Formulation [X] Method 311 [ ]

VOC, HAP, SARA 313 Ingredients	VOC	HAP	SARA 313	CAS Number	Target Weight Percent Volatiles	Target Weight Percent Non-Volatiles	Density (lbs./gal.)
Acetaldehyde	Y	Y	Y	75-07-0	0.10		6.59
Totals: ---------->					0.10		

(1) The subscript “s” denotes each value is for the ink or coating “as supplied” by the manufacturer.
(2) Explain the other method used in an attachment to this form.
(2a) 105 °C +/- 1 °C 1-3 hrs 1 gram +/- 0.1. (2b) Typically not applicable. D3792 or D4017 are used when required.
(3) HAP must be reported if present at 0.1 % or greater. VHAP = Volatile HAP

PUGET SOUND
Clean Air Agency

1904 3rd Ave #105, Seattle, WA 98101
206-343-8800
pscleanair.gov

NOC APPLICATION SUPPLEMENTAL FORM

Spray Coating Operations

This application is for activities or equipment that is:

- ☒ New (including existing, unpermitted equipment)
- ☐ Physical or operational modification of existing equipment
- ☐ Relocation of existing equipment

This application is for activities or equipment that is:

- ☐ Aerospace
- ☐ Wood furniture
- ☐ Motor vehicles
- ☒ Other, please describe: CLT panels

Note: Spray coating operations for motor vehicles may instead qualify for the General Order of Approval - Automotive Refinishing Operations Spray Booths. www.pscleanair.gov/AutobodyGeneralOrder

Hours of operation per day: 18 Hours of operation per year: 6,570

Spray Coating area is:

- ☐ Spray booth/room
- ☐ Outdoor spray area, describe enclosure: _____
- ☒ Prep area
- ☐ Other, please describe: _____

Design Specifications

Volume of enclosure (cubic feet): N/A

Exhaust flow rate (cfm): N/A

Make: N/A Model: N/A

Exhaust System Overspray Control

☐ Dry filter system:

Dry filter make: _____ Dry filter model: _____

Manometer or differential pressure gauge installed: ☐ Yes ☐ No

☐ Water wash system:

Water flow rate (feet/minute): _____

Flow meter installed: ☐ Yes ☐ No

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Spray Gun Parameters

Type of spray equipment:

- ☐ Air-assisted airless
- ☐ Airless; specify viscosity of coatings: _____
- ☐ Electrostatic
- ☐ High volume low pressure (HVLP)
- ☒ Low volume low pressure (LVLP)
- ☐ Other, please describe: _____

Stack Parameters

☐ Stack information is specified on NOC Application Supplemental Form for proposed control device

☒ Stack information specified below:

Stack damper/rain guard:

☒ None ☐ Hexagonal ☐ Stack within stack ☐ Butterfly ☐ Inverted Cone

☐ Other (specify): _____

Stack diameter (inches): 68 Stack height above ground (feet): 53

Building Dimensions of project location:

Building Height (highest point of roof) (feet): 53

Building Width (feet): 180 Building Length (feet) 427

Required Attachments

1. Table (Excel file preferred) containing proposed annual usage (gallons/year) of each coating, solvents and other VOC containing materials. Coatings, solvents, and VOC containing materials must be identified with manufacturer, name, product ID, and VOC content (lb/gal)
2. Safety Data Sheets (SDS) for each coating to be applied.
3. Environmental Data Sheets (EDS), Product Data Sheets (PDS), or SDS which show the VOC content (lb/gal) of each coatings and solvents to be applied or used during surface preparation and surface coating

Safety data sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code: **YS---M009/-----**
Product name **HYDRO-OIL FOR WOODEN FLOORING AND FURNITURE - CLEAR**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **FURNITURE OIL**

1.3. Details of the supplier of the safety data sheet

Name **RENNER ITALIA S.p.A.**
Full address **Via Ronchi Inferiore, 34**
District and Country **40061 Minerbio BO**
Italia
Tel. +39 051-6618211
Fax +39 051-6606312

e-mail address of the competent person responsible for the Safety Data Sheet **sds@renneritalia.com**

Product distribution by:

1.4. Emergency telephone number

For urgent inquiries refer to **RENNER ITALIA S.p.A. - Tel. +39 051-6618211 (dal lunedì al venerdì dalle 8.30 - 13.00 e dalle 14.00 - 17.30)**
ITALIA
Centro antiveleni Milano - Tel. +39 02-66101029
Centro antiveleni Firenze - Tel. +39 055-7947819
CROATIA
Služba za izvanredna stanja (112)
Centar za kontrolu otrovanja (01/2348-342)
HUNGARY
Egészségügyi Toxikológiai Tájékoztató Szolgálat (ETTSZ)
1096 Budapest, Nagyvárad tér 2.
Telefon: +36 1 476 6464 (8-16 óráig), +36 80 201 199 (éjjel-nappal hívható) magyar nyelven
LATVIA
Valsts ugunsdzesibas un glabšanas dienests: (+371) 112
Saindešanas un zalu informacijas centrs: (+371) 67042473 (visu diennakti)
LITHUANIA
Apsinuodijimų kontrolės ir Informacijos biuras visą parą tel. (8 5) 236 2052
Bendras pagalbos telefonas: 112
NORWAY
Emergency number: 113
POLSKA
Numer telefonu alarmowego: +48 22 615 27 51
PORTUGAL
Centro de Informação Anti-Venenos: +351 808 250 143
BULGARIA - България
Национален център по токсикология, МБАЛСМ "Пирогов"
телефон: +359 2 9154 233

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP).
However, since the product contains hazardous substances in concentrations such as to be declared in section no. 3, it requires a safety data sheet with appropriate information, compliant to EC Regulation 1907/2006 and subsequent amendments.

SECTION 2. Hazards identification ... / >>

Hazard classification and indication: --

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms: --

Signal words: --

Hazard statements:
EUH210 Safety data sheet available on request.

Precautionary statements: --

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.1. Substances

Information not relevant

3.2. Mixtures

Contains:

Identification	**x = Conc. %**	**Classification 1272/2008 (CLP)**

DIPROPYLENE GLYCOL MONOMETHYL ETHER

CAS	*34590-94-8*	1 <= x < 2,5	Substance with a community workplace exposure limit.
EC	*252-104-2*		
INDEX			
Reg. no.	*01-2119450011-60-xxxx*		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT
The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.
UNSUITABLE EXTINGUISHING EQUIPMENT
Do not use jets of water. Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

SECTION 5. Firefighting measures ... / >>

Excess pressure may form in containers exposed to fire at a risk of explosion. Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION
Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Block the leakage if there is no hazard.
Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.
Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

BGR	България	МИНИСТЕРСТВО НА ТРУДА И СОЦИАЛНАТА ПОЛИТИКА МИНИСТЕРСТВО НА ЗДРАВЕОПАЗВАНЕТО НАРЕДБА No 13 от 30 декември 2003 г
CZE	Česká Republika	Nařízení vlády č. 361/2007 Sb. kterým se stanoví podmínky ochrany zdraví při práci
DEU	Deutschland	MAK-und BAT-Werte-Liste 2012
DNK	Danmark	Graensevaerdier per stoffer og materialer
ESP	España	INSHT - Límites de exposición profesional para agentes químicos en España 2015
EST	Eesti	Töökeskkonna keemiliste ohutegurite piirnormid 1. Vastu võetud 18.09.2001 nr 293 RT I 2001, 77, 460 - Redaktsiooni jõustumise kp: 01.01.2008
FRA	France	JORF n°0109 du 10 mai 2012 page 8773 texte n° 102

SECTION 8. Exposure controls/personal protection ... / >>

GBR	United Kingdom	EH40/2005 Workplace exposure limits
GRC	Ελλάδα	ΕΦΗΜΕΡΙΣ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ -ΤΕΥΧΟΣ ΠΡΩΤΟ Αρ. Φύλλου 19 - 9 Φεβρουαρίου 2012
HUN	Magyarország	50/2011. (XII. 22.) NGM rendelet a munkahelyek kémiai biztonságáról
ITA	Italia	Decreto Legislativo 9 Aprile 2008, n.81
LTU	Lietuva	DĖL LIETUVOS HIGIENOS NORMOS HN 23:2007 CHEMINIŲ MEDŽIAGŲ 2007 m. spalio 15 d. Nr. V-827/A1-287
LVA	Latvija	Ķīmisko vielu aroda ekspozīcijas robežvērtības (AER) darba vides gaisā 2012
POL	Polska	ROZPORZĄDZENIE MINISTRA PRACY I POLITYKI SPOŁECZNEJ z dnia 16 grudnia 2011r
PRT	Portugal	Ministério da Economia e do Emprego Consolida as prescrições mínimas em matéria de protecção dos trabalhadores contra os riscos para a segurança e a saúde devido à exposição a agentes químicos no trabalho - Diaro da Republica I 26; 2012-02-06
SVK	Slovensko	NARIADENIE VLÁDY Slovenskej republiky z 20. júna 2007
SVN	Slovenija	Uradni list Republike Slovenije 15. 6. 2007
SWE	Sverige	Occupational Exposure Limit Values, AF 2011:18
TUR	Türkiye	2000/39/EC sayılı Direktifin ekidir
EU	OEL EU	Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2016

DIPROPYLENE GLYCOL MONOMETHYL ETHER

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		
		mg/m3	ppm	mg/m3	ppm	
TLV	BGR	308				SKIN
TLV	CZE	270		550		SKIN
AGW	DEU	310	50	310	50	
MAK	DEU	310	50	310	50	
TLV	DNK	300	50			
VLA	ESP	308	50			SKIN
TLV	EST	300	50	450	75	SKIN
VLEP	FRA	308	50			SKIN
WEL	GBR	308	50			SKIN
TLV	GRC	600	100	900	150	
AK	HUN	308		308		
VLEP	ITA	308	50			SKIN
RD	LTU	300	50	450	75	SKIN
RV	LVA	308	50			SKIN
NDS	POL	240		480		
VLE	PRT	308	50			SKIN
NPHV	SVK	308	50			SKIN
MV	SVN	308	50			SKIN
MAK	SWE	300	50	450	75	SKIN
ESD	TUR	308	50			SKIN
OEL	EU	308	50			SKIN
TLV-ACGIH		606	100	909	150	SKIN

Predicted no-effect concentration - PNEC

Normal value in fresh water	19	mg/l
Normal value in marine water	1,9	mg/l
Normal value for fresh water sediment	70,2	mg/kg
Normal value for marine water sediment	7,02	mg/kg
Normal value for water, intermittent release	190	mg/l
Normal value of STP microorganisms	4168	mg/l
Normal value for the terrestrial compartment	2,74	mg/kg

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral				1,67 mg/kg/d				
Inhalation				37,2 mg/m3				310 mg/m3
Skin				15 mg/kg/d				65 mg/kg/d

DIETHYLENE GLYCOL MONOETHYL ETHER

SECTION 8. Exposure controls/personal protection ... / >>

Threshold Limit Value

Type	Country	TWA/8h mg/m3	TWA/8h ppm	STEL/15min mg/m3	STEL/15min ppm
MAK	SWE		15		30

Predicted no-effect concentration - PNEC

Normal value in fresh water	1,98	mg/l
Normal value in marine water	0,198	mg/l
Normal value for fresh water sediment	7,32	mg/kg
Normal value for marine water sediment	0,732	mg/kg
Normal value of STP microorganisms	500	mg/l
Normal value for the food chain (secondary poisoning)	444	mg/kg
Normal value for the terrestrial compartment	0,34	

Health - Derived no-effect level - DNEL / DMEL

	Effects on consumers				Effects on workers			
Route of exposure	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral				50 mg/kg bw/d				
Inhalation			18 mg/m3	37 mg/m3			30 mg/m3	61 mg/m3
Skin				25 mg/kg bw/d				83 mg/kg bw/d

Legend:
(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

8.2. Exposure controls

Take the normal precautions for handling chemicals and apply an adequate standard of workplace hygiene.
Users must assess the risks in their workplace and adopt:
- Primary collective protective measures such as adequate natural ventilation and local extraction
- Personal protective equipment to manage the combination of residual risks
Personal protective equipment varies according to the possible exposure and hazardousness of the working conditions, so the final choice depends on the risk assessment.

HAND PROTECTION
Use category III chemical resistant gloves according to the EN 374 standard
Brief contact (splash protection) – non-exhaustive list
Suitable material: NITRILE RUBBER (NBR)
Glove thickness: greater than 0.4 mm
Breakthrough time: from 30 to 60 minutes
Breakthrough index: at least 2
The gloves must be replaced if there are signs of deterioration. In any case, users must assess the risks to determine the most suitable type of glove for the conditions of use.

SKIN PROTECTION
Wear work clothes and safety footwear that complies with EN ISO 20344

EYE PROTECTION
Wear safety glasses (EN 166).

RESPIRATORY PROTECTION
Use a mask with EN140 and/or EN136 approval, with an ABEK type filter (EN 14387)
ENVIRONMENTAL EXPOSURE CONTROLS
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

NOTE: Determination of the flash point may be NA (not applicable), the product being non flammable.

9.1. Information on basic physical and chemical properties

Appearance		Liquid
Colour		white
Odour		Typical
Odour threshold		Not available
pH		Not available
Melting point / freezing point		Not available
Initial boiling point	>	65 °C
Boiling range		Not available
Flash point	>	60 °C
Evaporation speed		Not available
Flammability (solid, gas)		Not available
Lower inflammability limit		Not available
Upper inflammability limit		Not available
Lower explosive limit		Not available
Upper explosive limit		Not available
Vapour pressure		Not available
Vapour density		Not available
Relative density		1,02
Solubility		partially soluble in water
Partition coefficient: n-octanol/water		Not available
Auto-ignition temperature		Not available
Decomposition temperature		Not available
Viscosity		Not available
Explosive properties		Not available
Oxidising properties		Not available

9.2. Other information

Total solids (250°C / 482°F)	20,03 %			
VOC (Directive 2010/75/EC) :	4,16 %	-	42,47	g/litre
VOC (volatile carbon) :	2,35 %	-	23,93	g/litre

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

DIPROPYLENE GLYCOL MONOMETHYL ETHER
May react with: oxidising substances. When heated to decomposition releases: harsh fumes, zinc alloys.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

DIETHYLENE GLYCOL MONOETHYL ETHER
DIETHYLENE GLYCOL MONOETHYL ETHER - it can form explosive mix with air in presence of high temperature (T> 94°C)

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

SECTION 10. Stability and reactivity ... / >>

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:	Not classified (no significant component)
LD50 (Oral) of the mixture:	Not classified (no significant component)
LD50 (Dermal) of the mixture:	Not classified (no significant component)

DIPROPYLENE GLYCOL MONOMETHYL ETHER

LD50 (Oral)	> 5000 mg/kg
LD50 (Dermal)	> 2000 mg/kg

DIETHYLENE GLYCOL MONOETHYL ETHER

LD50 (Oral)	6031 mg/kg
LD50 (Dermal)	9143 mg/kg
LC50 (Inhalation)	0,02 mg/l 8 h

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

SECTION 11. Toxicological information ... / >>

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

DIPROPYLENE GLYCOL MONOMETHYL ETHER	
LC50 - for Fish	> 1000 mg/l/96h Poecillia reticulata
EC50 - for Crustacea	1919 mg/l/48h Daphnia magna
EC50 - for Algae / Aquatic Plants	> 969 mg/l/72h Pseudokirchneriella subcapitata
Chronic NOEC for Crustacea	0,5 mg/l Daphna magna
Chronic NOEC for Algae / Aquatic Plants	969 mg/l Pseudokirchneriella subcapitata

DIETHYLENE GLYCOL MONOETHYL ETHER	
LC50 - for Fish	6010 mg/l/96h
EC50 - for Crustacea	1982 mg/l/48h Daphnia magna

12.2. Persistence and degradability

DIPROPYLENE GLYCOL MONOMETHYL ETHER	
Solubility in water	1000 - 10000 mg/l
Rapidly biodegradable	

DIETHYLENE GLYCOL MONOETHYL ETHER	
Rapidly biodegradable	> 80%

12.3. Bioaccumulative potential

DIPROPYLENE GLYCOL MONOMETHYL ETHER	
Partition coefficient: n-octanol/water	0,0043

DIETHYLENE GLYCOL MONOETHYL ETHER	
BCF	< 100

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

For disposal or recovery in EU countries , use the relevant waste code (EWC code) identified in the European Waste Catalogue. The producer of the waste must assign the EWC code according to the sector and type of process. Disposal must be carried out by an authorised waste management company.
After the producer of the waste has assigned the EWC code, the contaminated packaging must be sent for recovery or disposal in compliance with the European waste management regulations. Disposal must be carried out by an authorised waste management

company.
For waste disposal or recovery in countries outside the EU, comply with the national or local regulations in force. For disposal or recovery of contaminated packaging in countries outside the EU, comply with the national or local regulations in force.
Waste transportation may be subject to regulations on transportation of hazardous goods.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

Only for uses exempt from EU DIRECTIVE 2004/42/CE.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisarion (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Information not available

SECTION 15. Regulatory information ... / >>

15.2. Chemical safety assessment

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

EUH210 Safety data sheet available on request.

LEGEND:
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY
1. Regulation (EU) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

SECTION 16. Other information ... / >>

Note for users:
The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:
The following sections were modified:
08 / 11 / 12.

APPENDIX B
EMISSIONS INVENTORY

Table 1
Input Assumptions and Parameters
Forterra CLT Modular Facility - Darrington, Washington

Process	Proposed Allowable Production or Throughput Rate							
	Hourly Parameter		Daily Parameter		Annual Parameter		Kiln Capacity	
Energy Usage								
Biomass Boiler								
Hours of Operation	--		24.0	(hrs/day) (1)	8,760	(hrs/yr) (1)	--	
Wood Fuel Consumption	28.0	(MMBtu/hr) (2)	672	(MMBtu/day) (a)	245,280	(MMBtu/yr) (b)	--	
Emergency Fossil Fuel (Diesel) Boiler								
Hours of Operation	--		10.0	(hrs/day) (3)	50.0	(hrs/yr) (4)	--	
Diesel Fuel Consumption	36.5	(gal/hr) (5)	365	(gal/day) (a)	1.83	(Mgal/yr) (c)	--	
Additional Processes								
Sawmill								
Hours of Operation	--		18.0	(hrs/day) (1)	6,570	(hrs/yr) (e)	--	
Log Throughput (Volume-basis)	8.78	(m^3/hr) (f)	158	(m^3/day) (2)	57,670	(m^3/yr) (g)	--	
Log Throughput (Mass-basis)	7.4	(ton logs/hr) (h)	134	(ton logs/day) (h)	48,885	(ton logs/yr) (h)	--	
Lumber Kilns								
Hours of Operation	--		24.0	(hrs/day) (7)	8,760	(hrs/yr) (e)	--	
Kiln Throughput (Western Hemlock)	--		--		4,240	(Mbdf/yr) (8)	--	
Kiln Throughput (Other Species)	--		--		16,948	(Mbdf/yr) (9)	--	
Total Kiln Throughput (All Species)	--		--		21,188	(Mbdf/yr) (2)	561	(Mbdft/batch) (10)
CLT Facility								
Hours of Operation	--		18.0	(hrs/day) (1)	6,570	(hrs/yr) (e)	--	
CLT Panel Production (Volume-basis)	233	(cf/hr) (i)	4,200	(cf/day) (2)	1,533	(Mcf/yr) (j)	--	
CLT Panel Production (Mass-basis)	3.60	(BDT/hr) (k)	64.8	(BDT/day) (l)	23,634	(BDT/yr) (m)	--	
Glue Line								
Loctite HB X102 Purbond (Adhesive)	12.9	(lb/hr) (n)	230	(lb/day) (o)	84,894	(lb/yr) (p)	--	
Loctite PR 3105 (Primer)	12.9	(lb/hr) (n)	230	(lb/day) (o)	84,894	(lb/yr) (p)	--	
Coating Application								
YS---M009 Wood Oil	11.1	(lb/hr) (q)	200	(lb/day) (2)	37,500	(lb/yr) (2)	--	

NOTES:

BDT = bone-dry ton

MMBtu = million British thermal units

Mgal = thousand gallons

Mbdft = thousand board feet

Mcf = thousand cubic feet

(a) Daily fuel consumption (MMBtu or gal/day) = (hourly fuel consumption [MMBtu or gal/hr]) X (operational hours per day [hrs/day])

(b) Annual fuel consumption (MMBtu/yr) = (hourly fuel consumption [MMBtu/hr]) x (operational hours per year [hrs/yr])

(c) Annual fuel consumption (Mgal/yr) = (hourly fuel consumption [gal/hr]) x (Mgal/1,000 gal) x (operational hours per year [hrs/yr])

(d) Total Kiln Throughput (Western Hemlock)

(e) Annual hours of operation (hrs/yr) = (daily hours of operation [hrs/day]) x (operational days per year [days/yr])

Operational days per year (days/yr) = 365 (2)

(f) Hourly log throughput (m^3/hr) = (daily log throughput [m^3/day]) / (daily hours of operation [hrs/day])

(g) Annual log throughput (m^3/yr) = (hourly log throughput [m^3/hr]) x (annual hours of operation [hrs/yr])

(h) Log throughput (ton logs/"period") = (log throughput [m^3/"period"]) x (density of green logs [kg/m^3]) x (2.205 lb/kg) / (2,000 lb/ton)

Green log density (kg/m^3) = 769 (6)

(i) Hourly wood throughput (cf/hr) = (daily wood throughput [cf/day]) / (daily hours of operation [hrs/day])

(j) Annual wood throughput (Mcf/yr) = (daily wood throughput [cf/day]) x (operational days per year [days/yr]) / (1,000 cf/Mcf)

Operational days per year (days/yr) = 365 (2)

(k) Hourly CLT production (BDT/hr) = (hourly CLT production [cf/hr] x [density of wood (oven-dried basis) {lb/cf}]) / (2,000 lb/ton)

Wood density (oven-dried basis) (lb/cf) = 30.8 (11)

(l) Daily CLT production (BDT/day) = ([hourly CLT production {BDT/hr}] x [daily hours of operation {hrs/day}])

(m) Annual CLT production (BDT/yr) = ([hourly CLT production {BDT/hr}] x [annual hours of operation {hrs/yr}])

(n) Hourly glue throughput (lb/hr) = (hourly CLT production rate [sqft/hr]) / [1,000 sqft]) / [glue application rate [lb/1,000-sqft])

Glue application rate (lb/1,000-sqft) = 28.0 (2)

Hourly CLT production rate (sqft/hr) = 461 (12)

(o) Daily glue throughput (lb/day) = (daily CLT production rate [sqft/day]) / [1,000 sqft]) / [glue application rate [lb/1,000-sqft])

Glue application rate (lb/1,000-sqft) = 28.0 (2)

Daily CLT production rate (sqft/day) = 9,612 (12)

(p) Annual glue throughput (lb/yr) = (annual CLT production rate [sqft/yr]) / [1,000 sqft]) / [glue application rate [lb/1,000-sqft])

Glue application rate (lb/1,000-sqft) = 28.0 (2)

Annual CLT production rate (sqft/yr) = 3,031,933 (12)

Glue application rate (lb/1,000-sqft) = 28.0 (2)

Annual CLT production rate (sqft/yr) = 3,031,933 (12)

(q) Hourly coating application rate (lb/hr) = (daily coating application rate [lb/day]) / [daily hours of operation [hr/day])

REFERENCES:

(1) Information provided by Forterra. Assumes two nine hour shifts per day operation.

(2) Information provided by Forterra.

(3) Representative of maximum anticipated operational time per day for maintanence purposes.

(4) Washington Administrative Code (WAC) 173-400-930(2)(c) An emergency engine can operate a maximum of 50 hours per year for maintenance and testing or other nonemergency use.

(5) Information provided by diesel boiler manufacturer.

(6) Represents highest density among proposed species to be dried. Density representative of Larch species with a 50% moisture content.

(7) Information provided by Forterra. Assumes continuous daily operation.

(8) Information provided by Forterra. Assumes the maximum requested throughput of Western Hemlock proposed to be processed on an annual basis.

(9) Information provided by Forterra. Assumes the maximum total throughput of all other wood species processed by the proposed facility including; Larch, Douglas-Fir, and Engelmann Spruce.

(10) Information provided by kiln manufacturer. Represents maximum total capacity of all 10 kilns.

(11) Represents highest density among proposed species to be dried. Density representative of Larch species with a 20% moisture content. Converted to oven-dried density (i.e., moisture content is 0%).

(12) See Table 2, Material Handling Input Process Rates and Parameters.

Table 2
Material Handling Input Process Rates and Parameters
Forterra CLT Modular Facility - Darrington, Washington

CLT Manufacturing	Parameter		
Boards			
Board Width	6.00	(in)	(1)
Board Length	13.0	(ft)	(1)
Board Height	1.50	(in)	(1)
Board Volume	0.81	(cf/board)	(a)
Board Surface Area	16.4	(ft^2/board)	(b)
Layers			
Layer Width	12.0	(ft)	(2)
Layer Length	60.0	(ft)	(2)
Layer Height	1.50	(in)	(2)
Layer Surface Area	1,458	(ft^2/layer)	(c)
Layer Volume	90.0	(cf/layer)	(d)
CLT Panels			
Number of Layers	9.00	(layers/ panel)	(3)
Panel Volume	810	(cf/panel)	(e)
Panel Surface Area	1,602	(ft^2/panel)	(f)
CLT Production			
Hourly Panel Production	0.29	(panels/hr)	(g)
Daily Panel Production	6.00	(panels/day)	(h)
Annual Panel Production	1,893	(panels/yr)	(i)
Hourly Panel Production (Area-basis)	461	(ft^2/hr)	(j)
Daily Panel Production (Area-basis)	9,612	(ft^2/day)	(k)
Annual Panel Surface (Area-basis)	3,031,933	(ft^2/yr)	(l)
CLT Production Wood			
Wood Removed Per Layer	15.19	(cf/layer)	(m)
Wood Removed Per Panel (volume-basis)	137	(cf/panel)	(n)
Wood Removed Per Panel (mass-basis)	2.11	(BDT/panel)	(o)
Hourly Wood Removed	0.61	(BDT/hr)	(p)
Daily Wood Removed	12.6	(BDT/day)	(q)
Annual Wood Removed	3,988	(BDT/yr)	(r)

NOTES:

(a) Board volume (ft^3/panel) = (board length [ft]) x (board width [in]) x (ft/12 in) x (board height [in]) x (ft/12 in)

(b) Board surface area (ft^2) = 2 x ([board length {ft}] x [board width {ft}] + [board length {ft}] x [board height {ft}] + [board width {ft}] + [board width {ft}] x [board height {ft}])

(c) Layer surface area (ft^2) = 2 x ([layer length {ft}] x [layer width {ft}] + [layer length {ft}] x [layer height {in} / 12] + [layer width {ft}] x [layer height {ft}])

(d) Layer volume (ft^3/panel) = (layer width [ft] x (layer length [ft]) x (layer height [in]) x (ft/12 in)

(e) Panel volume (ft^3/panel) = (layer volume [ft^3/layer]) x (number of layers)

(f) Panel surface area (ft^2) = 2 x ([layer length {ft}] x [layer width {ft}] + [layer length {ft}] x [layer height {in}] x [ft/12 in] x [number of layers]+ [layer width {ft}] x [layer height {in}] x [ft/12 in] x [number of layers])

(g) Hourly panel production (panels/hr) = (hourly CLT production [cf/hr]) / (panel volume [cf/panel)

Hourly CLT production (cf/hr) = 233 (4)

(h) Daily panel production (panels/day) = (daily CLT production [cf/day]) / (panel volume [cf/panel)

Daily CLT production (cf/day) = 4,200 (4)

(i) Annual panel production (panels/yr) = (annual production volume basis [Mcf/yr] x 1,000 cf/Mcf) / (panel volume [cf/panel)

Annual CLT production (Mcf/day) = 1,533 (4)

(j) Hourly panel production (sqft/hr) = (hourly panel production [panel/hr]) x (panel surface area [sqft/panel)

(k) Daily panel production (sqft/day) = (daily panel production [panel/day]) x (panel surface area [sqft/panel)

(l) Annual panel production (sqft/yr) = (annual panel production [panel/yr]) x (panel surface area [sqft/panel)

(m) Wood removed per layer (cf/layer) = (layers surface area [ft^2]) x (depth of cut [in]) x (ft/12in)

Depth of cut (in) = 0.125 (5)

(n) Wood removed per panel (volume-basis) (cf/panel) = (wood removed per layer [cf/layer]) x (number of layers per panel)

(o) Wood removed per panel (mass-basis) (BDT/panel) = (wood removed per panel [cf/panel]) x [density of wood {oven-dried basis} {lb/cf} / [2,000 lb/ton])

Wood density (oven-dried basis) (lb/cf) = 30.8 (6)

(p) Wood removed per hour (BDT/hr) = (wood removed per panel [BDT/panel]) x (hourly panel production [panels/hr])

(q) Wood removed per day (BDT/day) = (wood removed per panel [BDT/panel]) x (daily panel production [panels/day])

(r) Wood removed per year (BDT/yr) = (wood removed per panel [BDT/panel]) x (annual panel production [panels/yr])

REFERENCES:

(1) Information provided by Forterra.

(2) Layer dimensions are variable and not fully known at this time. Layer length, width, and height are estimated based on comparable layers from other CLT manufacturing facilities.

(3) Information provided by Forterra. Range of layers between 3 and 9.

(4) See Table 1, Input Assumptions and Parameters.

(5) Assumes 1/8-inch is removed from each surface.

(6) See Table 1, Input Assumptions and Parameters, Reference 10.

Table 3
Criteria Pollutant Emissions from Proposed Biomass Boiler
Forterra CLT Modular Facility - Darrington, Washington

Pollutant	Emission Factor (lb/MMBtu)		Emission Estimates		
			Hourly [(a)] (lb/hr)	Daily [(b)] (lb/day)	Annual [(c)] (ton/yr)
PM	0.071	[(d)]	1.99	47.7	8.71
PM_{10}	0.057	[(e)]	1.60	38.3	6.99
$PM_{2.5}$	0.052	[(f)]	1.46	34.9	6.38
SO_2	0.025	[(4)]	0.70	16.8	3.07
NO_X	0.220	[(4)]	6.16	148	27.0
CO	0.60	[(4)]	16.8	403	73.6
VOC	0.017	[(5)]	0.48	11.4	2.08
Pb	7.3E-04	[(6)]	0.020	0.49	0.090
CO_2	207	[(g)]	5,791	138,989	25,366
CH_4	0.016	[(g)]	0.44	10.7	1.95
N_2O	7.9E-03	[(g)]	0.22	5.33	0.97
CO_2e	210	[(h)]	5,869	140,845	25,704

NOTES:

MMBtu = million British thermal units

ESP = electrostatic precipitator

(a) Hourly emissions estimate (lb/hr) = (emission factor [lb/MMBtu]) x (boiler hourly heat input [MMBtu/hr])
Boiler hourly heat input (MMBtu/hr) = 28.0 (1)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (boiler daily heat input [MMBtu/day])
Boiler daily heat input (MMBtu/day) = 672.0 (1)

(c) Annual emissions estimate (ton/yr) = (emission factor [lb/MMBtu]) x (boiler annual heat input [MMBtu/yr]) / (2,000 lb/ton)
Boiler annual heat input (MMBtu/yr) = 245,280 (1)

(d) PM emission factor (lb/MMBtu) = (filterable PM emission factor [lb/MMBtu]) + (condensable PM emission factor [lb/MMBtu])
Filterable PM emission factor (lb/MMBtu) = 0.0540 (2)
Condensable PM emission factor (lb/MMBtu) = 0.017 (3)

(e) PM_{10} emission factor (lb/MMBtu) = (filterable PM_{10} emission factor [lb/MMBtu]) + (condensable PM emission factor [lb/MMBtu])
Filterable PM emission factor (lb/MMBtu) = 0.0400 (2)
Condensable PM emission factor (lb/MMBtu) = 0.017 (3)

(f) $PM_{2.5}$ emission factor (lb/MMBtu) = (filterable $PM_{2.5}$ emission factor [lb/MMBtu]) + (condensable PM emission factor [lb/MMBtu])
Filterable PM emission factor (lb/MMBtu) = 0.0350 (2)
Condensable PM emission factor (lb/MMBtu) = 0.017 (3)

(g) Emission factor (lb/MMBtu) = (emission factor [kg/MMBtu]) x (2.205 lb/kg)
CO_2 emission factor (kg/MMBtu) = 93.8 (7)
CH_4 emission factor (kg/MMBtu) = 7.20E-03 (8)
N_2O emission factor (kg/MMBtu) = 3.60E-03 (8)

(h) CO_2e emission factor (lb/MMBtu) = (CO_2 emission factor [lb/MMBtu]) + ([CH_4 emission factor {lb/MMBtu}] x [CH_4 global warming potential]) + ([N_2O emission factor {lb/MMBtu}] x [N_2O global warming potential])
Global warming potential of CH_4 = 25.0 (9)
Global warming potential of N_2O = 298 (9)

REFERENCES:

(1) See Table 1, Proposed Input Process Rates and Parameters.

(2) AP-42 Chapter 1.6 (September 2003), Table 1.6-1 "Emission Factors for PM from wood residue combustion." Emission factor representative of Electrostatic Precipitator control

(3) AP-42 Chapter 1.6 (September 2003), Table 1.6-1 "Emission Factors for PM from wood residue combustion." Emission factor representative of condensable PM emissions for any control device or no control device.

(4) AP-42 Chapter 1.6 (September 2003), Table 1.6-2 "Emission Factors for NO_X, SO_2, and CO from Wood Residue Combustion." Proposed boiler will burn wet wood/bark.

(5) AP-42 Chapter 1.6 (September 2003), Table 1.6-3 "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion."

(6) Emission factor provided by the Oregon Department of Environmental Quality. Emission Factor representative of fabric filter/ESP control.

(7) 40 CFR Part 98 Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel."

(8) 40 CFR Part 98 Subpart C, Table C-2, "Default CH_4 and N_2O Emission Factors for Various Types of Fuel."

(9) 40 CFR Part 98 Subpart A, Table A-1, "Global Warming Potentials."

Table 4
Criteria Pollutant Emissions from Proposed Emergency Diesel-Fired Boiler
Forterra CLT Modular Facility - Darrington, Washington

Pollutant	Emission Factor (lb/Mgal)		Emission Estimates		
			Hourly [a] (lb/hr)	Daily [b] (lb/day)	Annual [c] (ton/yr)
PM	3.30	[d]	0.12	1.20	3.0E-03
PM_{10}	3.30	[2]	0.12	1.20	3.0E-03
$PM_{2.5}$	3.30	[2]	0.12	1.20	3.0E-03
SO_2	2.1E-03	[e]	7.8E-05	7.8E-04	1.9E-06
NO_X	20.0	[3]	0.73	7.30	0.018
CO	5.00	[3]	0.18	1.83	4.6E-03
VOC	0.34	[6]	0.012	0.12	3.1E-04
Pb	8.3E-03	[7]	3.0E-04	3.0E-03	7.6E-06
CO_2	22,505	[f]	821	8,214	20.5
CH_4	0.91	[g]	0.033	0.33	8.3E-04
N_2O	0.18	[g]	6.7E-03	0.067	1.7E-04
CO_2e	22,583	[h]	824	8,243	20.6

NOTES:

Mgal = thousand gallons

(a) Hourly emissions estimate (lb/hr) = (emission factor [lb/Mgal]) x (boiler hourly fuel consumption [Mgal/hr])

Boiler hourly fuel consumption (Mgal/hr) = 0.037 (1)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (boiler daily fuel consumption [Mgal/day])

Boiler daily fuel consumption (Mgal/day) = 0.37 (1)

(c) Annual emissions estimate (ton/yr) = (emission factor [lb/Mgal]) x (boiler annual fuel consumption [Mgal/yr]) / (2,000 lb/ton)

Boiler annual fuel consumption (Mgal/yr) = 1.83 (1)

(d) PM emission factor (lb/Mgal) = (filterable PM emission factor [lb/Mgal]) + (condensable PM emission factor [lb/Mgal])

Filterable PM emission factor (lb/Mgal) = 2.00 (3)

Condensable PM emission factor (lb/Mgal) = 1.30 (4)

(e) SO_2 emission factor (lb/Mgal) = (SO_2 emission factor [lb/Mgal]) x (ULSD sulfur content [ppm] / 1,000,000)

SO_2 emission factor (lb/Mgal) = 142 (3)

ULSD sulfur content (ppm) = 15.0 (5)

(f) CO_2 emission factor (lb/Mgal) = (CO_2 emission factor [kg/MMBtu]) x (default high heat value [MMBtu/gal]) x (2.205 lb/kg) x (1,000 gal/Mgal)

CO_2 emission factor (kg/MMBtu) = 73.96 (8)

Default high heat value (MMBtu/gal) = 0.138 (8)

(g) CH_4 or N_2O emission factor (lb/gal) = (CH_4 or N_2O emission factor [kg/MMBtu]) x (default high heat value [MMBtu/gal]) x (2.205 lb/kg) x (1,000 gal/Mgal)

CH_4 emission factor (kg/MMBtu) = 3.0E-03 (9)

N_2O emission factor (kg/MMBtu) = 6.0E-04 (9)

Default high heat value (MMBtu/gal) = 0.138 (8)

(h) CO_2e emission factor (lb/gal) = (CO_2 emission factor [lb/gal]) + (CH_4 emission factor [lb/gal]) x (CH_4 global warming potential) + (N2O emission factor [lb/gal]) x (N2O global warming potential) x (1,000 gal/Mgal)

CH_4 global warming potential = 25.0 (10)

N_2O global warming potential = 298 (10)

References:

[1] See Table 1, Proposed Input Process Rates and Parameters.

[2] Assumes that 100% of PM is $PM_{2.5}$.

[3] AP-42 Chapter 1.3 (May 2010), Table 1.3-1 "Criteria Pollutant Emission Factors for Fuel Oil Combustion." Emission factor representative of distillate oil fired combustion less than 100 MMBtu/hr.

[4] AP-42 Chapter 1.3 (May 2010), Table 1.3-2 "Condensable Particulate Matter Emission Factors for Fuel Oil Combustion." Emission factor representative of No. 2 oil fired.

[5] 40 CFR Part 80 Subpart I, §80.510. All highway and nonroad, locomotive, marine (NRLM) diesel fuel sulfur standards must meet 15 ppm after June 1, 2012.

[6] AP-42 Chapter 1.3 (May 2010), Table 1.3-3 "Emission Factors for TOC, Methane, and Nonmethane TOC from Uncontrolled Fuel Oil Combustion." Emission factor representative of NMTOC from distillate oil fired combustion less than 100 MMBtu/hr.

[7] Emission factors from Ventura County Air Pollution Control District AB2588 "Combustion Emission Factors." Representative of external diesel combustion.

[8] 40 CFR Part 98 Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel." Assumes Distillate Fuel Oil No. 2.

[9] 40 CFR Part 98 Subpart C, Table C-2, "Default CH_4 and N_2O Emission Factors for Various Types of Fuel."

[10] 40 CFR Part 98 Subpart A, Table A-1, "Global Warming Potentials."

Table 5
Lumber Kiln Emission Factors
Forterra CLT Modular Facility - Darrington, Washington

Parameter	Value
Inlet Maximum Temperature (°F)	200.0 [1]

Pollutant	CAS	Speciated Emission Factor (lbs/Mbdft)				Daily Emission Factor [2] (lbs/Mbdft)	Annual Emission Factor Western Hemlock (lbs/Mbdft)	Annual Emission Factor Other Species [3] (lbs/Mbdft)
		Larch	Western Hemlock	Engelmann Spruce	Douglas Fir			
Criteria Pollutants								
PM	--	0.0505 [4]				0.0505	0.0505	0.0505
PM_{10}	--	0.0505 [4]				0.0505	0.0505	0.0505
$PM_{2.5}$	--	0.0505 [4]				0.0505	0.0505	0.0505
VOC	--	1.12 [a]	0.40 [b]	0.22 [5]	1.12 [c]	1.12	0.40	0.94
Toxic Air Pollutants								
Acetaldehyde	75-07-0	0.043 [5]	0.11 [5]	0.034 [5]	0.043 [5]	0.11	0.11	0.0430
Acrolein	107-02-8	7.5E-04 [5]	1.8E-03 [5]	7.5E-04 [5]	7.5E-04 [5]	1.8E-03	1.8E-03	7.5E-04
Formaldehyde	50-00-0	2.5E-03 [d]	2.1E-03 [e]	2.4E-03 [f]	2.1E-03 [g]	2.5E-03	2.1E-03	2.5E-03
Methanol	67-56-1	0.075 [h]	0.11 [i]	0.044 [j]	0.11 [k]	0.11	0.11	0.11
Propionaldehyde	123-38-6	9.0E-04 [5]	1.2E-03 [5]	5.0E-04 [5]	9.0E-04 [5]	1.2E-03	1.2E-03	9.0E-04

NOTES:

Mbdft = thousand board-feet.

VOC = volatile organic compound

(a) VOC emission factor [Larch] (lb/Mbdft) = (0.015 x maximum kiln inlet temperature [°F]) - (1.8842) (5)

(b) VOC emission factor [Western Hemlock] (lb/Mbdft) = (0.0052 x maximum kiln inlet temperature [°F]) - (0.6436) (5)

(c) VOC emission factor [Douglas Fir] (lb/Mbdft) = (0.015 x maximum kiln inlet temperature [°F]) - (1.8842) (5)

(d) Formaldehyde emission factor [Larch] (lb/Mbdft) = (3.8×10^{-4} x maximum kiln inlet temperature [°F]) - (5.1×10^{-3}) (5)

(e) Formaldehyde emission factor [Western Hemlock] (lb/Mbdft) = (6.2×10^{-5} x maximum kiln inlet temperature [°F]) - (0.010327) (5)

(f) Formaldehyde emission factor [Engelmann Spruce] (lb/Mbdft) = (5.6×10^{-5} x maximum kiln inlet temperature [°F]) - (0.0088) (5)

(g) Formaldehyde emission factor [Douglas Fir] (lb/Mbdft) = (3.8×10^{-5} x maximum kiln inlet temperature [°F]) - (0.0051) (5)

(h) Methanol emission factor [Larch] (lb/Mbdft) = (1.26×10^{-3} x maximum kiln inlet temperature [°F]) - (0.1766) (5)

(i) Methanol emission factor [Western Hemlock] (lb/Mbdft) = (2.73×10^{-3} x maximum kiln inlet temperature [°F]) - (0.43628) (5)

(j) Methanol emission factor [Engelmann Spruce] (lb/Mbdft) = (9.6×10^{-4} x maximum kiln inlet temperature [°F]) - (0.1485) (5)

(k) Methanol emission factor [Douglas Fir] (lb/Mbdft) = (0.00126 x maximum kiln inlet temperature [°F]) - (0.1766) (5)

References:

[1] Information provided by Forterra.

[2] Representative of the highest emission factor per pollutant between wood species processed by the proposed facility.

[3] Representative of the highest emission factor per pollutant between non-Western Hemlock wood species processed by the proposed facility.

[4] "2013 SWCAA Dry Kiln Test Data Summary VOC and HAP - ODEQ and EPA Region 10." Assumes PM_{10} and $PM_{2.5}$ are equivalent to PM.

[5] EPA Region 10 (January 2021), "VOC and HAP Emission Factors for Lumber Drying".

Table 6
Criteria Pollutant Emissions from Proposed Kiln Lumber Drying
Forterra CLT Modular Facility - Darrington, Washington

Pollutant	Emission Factor [1] (lbs/Mbdft)			Emissions Estimate		
	Daily	Annual (Western Hemlock)	Annual (Other Species)	Maximum Hourly [a] (lbs/hr)	Maximum Daily [b] (lbs/day)	Annual [c] (tons/yr)
PM	0.0505	0.0505	0.0505	0.14	3.43	0.53
PM_{10}	0.0505	0.0505	0.0505	0.14	3.43	0.53
$PM_{2.5}$	0.0505	0.0505	0.0505	0.14	3.43	0.53
VOC	1.12	0.40	0.94	3.16	75.9	8.77

NOTES:

Mbdft = thousand board-feet

VOC = volatile organic compound

(a) Maximum hourly emissions estimate (lbs/hr) = (maximum daily emission factor [lbs/Mbdft]) x ([capacity of kiln per batch {Mbdft/batch}] / [calculated drying time per batch {hrs/batch}])

Capacity of kilns per batch (Mbdft/batch) = 561 (2)

Calculated drying time per batch (hrs/batch) = 198 (3)

(b) Maximum daily emissions estimate (lbs/day) = (hourly emissions estimate [lbs/hr]) x (daily hours of operation [hrs/day])

Maximum daily hours of operation (hrs/day) = 24.0 (2)

(c) Annual emissions estimate (tons/yr) = ([annual emission factor {western hemlock} {lbs/Mbdft}] x [annual kiln throughput {western hemlock} {Mbdft/yr}] + [annual emission factor {other species} {lb/Mbdft} x [annual kiln throughput {other species} [Mbdft/yr}]) x (ton/2,000 lbs)

Annual kiln throughput (Western Hemlock) (Mbdft/yr) = 4,240 (2)

Annual kiln throughput (other species) (Mbdft/yr) = 16,948 (2)

References:

[1] See Table 5, Lumber Kiln Emission Factors.

[2] See Table 1, Input Assumptions and Parameters.

[3] Information provided by kiln manufacturer. Represents estimated time needed to dry lumber from 60% to 12%.

Table 7
Criteria Pollutant Emissions from Proposed Debarker
Forterra CLT Modular Facility - Darrington, Washington

Pollutant	Emission Factor (lb/ton-log)		Maximum Emissions Estimate		
			Hourly [a] (lbs/hr)	Daily [b] (lbs/day)	Annual [c] (tons/yr)
PM	0.024	[2]	0.18	3.21	0.59
PM_{10}	0.012	[d]	0.089	1.61	0.29
$PM_{2.5}$	6.0E-03	[e]	0.045	0.80	0.15

NOTES:

(a) Hourly emissions estimate (lb/hr) = (emission factor [lb/ton-log]) x (hourly throughput [ton-log/hr])

Hourly throughput (ton-log/hr) = 7.44 (1)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/ton-log]) x (daily throughput [ton-log/day])

Daily throughput (ton-log/day) = 134 (1)

(c) Annual emissions estimate (ton/yr) = (emission factor [lb/ton-log]) x (annual throughput [ton-log/yr]) / (2,000 lbs/ton)

Annual throughput (ton-log/yr) = 48,885 (1)

(d) PM_{10} emission factor (lb/ton) = (PM emission factor [lb/ton]) x ([PM_{10} percentage of PM] / 100)

PM_{10} fraction of PM = 50.0 (2)

(e) $PM_{2.5}$ emission factor (lb/ton) = (PM emission factor [lb/ton]) x ([$PM_{2.5}$ percentage of PM] / 100)

$PM_{2.5}$ fraction of PM = 25.0 (2)

References:

[1] See Table 1, Proposed Input Process Rates and Parameters.

[2] EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014. Emission factor and PM fractions for log debarking.

Table 8
Criteria Pollutant Emissions from Proposed Sawmill
Forterra CLT Modular Facility - Darrington, Washington

Pollutant	Emission Factor (lb/ton-log)		Maximum Emissions Estimate		
			Hourly [a] (lbs/hr)	Daily [b] (lbs/day)	Annual [c] (tons/yr)
PM	0.35	[3]	0.13	2.34	0.43
PM_{10}	0.18	[d]	0.065	1.17	0.21
$PM_{2.5}$	0.0875	[e]	0.033	0.59	0.11

NOTES:

(a) Hourly emissions estimate (lb/hr) = (emission factor [lb/ton-log]) x (hourly throughput [ton-log/hr]) x (1 - [enclosure control efficiency {%} / 100])

Hourly throughput (ton-log/hr) = 7.4 (1)

Enclosure control efficiency (%) = 95.0 (2)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/ton-log]) x (daily throughput [ton-log/day]) x (1 - [enclosure control efficiency {%} / 100])

Daily throughput (ton-log/day) = 134 (1)

(c) Annual emissions estimate (ton/yr) = (emission factor [lb/ton-log]) x (annual throughput [ton-log/yr]) x (1 - [enclosure control efficiency {%} / 100]) / (2,000 lbs/ton)

Annual throughput (ton-log/yr) = 48,885 (1)

(d) PM_{10} emission factor (lb/ton-log) = (PM emission factor [lb/ton-log]) x ([PM_{10} percentage of PM] / 100)

PM_{10} fraction of PM = 50.0 (3)

(e) $PM_{2.5}$ emission factor (lb/ton-log) = (PM emission factor [lb/ton-log]) x ([$PM_{2.5}$ percentage of PM] / 100)

$PM_{2.5}$ fraction of PM = 25.0 (3)

References:

[1] See Table 1, Proposed Input Process Rates and Parameters.

[2] EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014. Note 1: If any activity occurs within a building, reduce the PM, PM10, and PM2.5 EF by 100 percent as emissions struggle to escape through doorways and other openings. Conservatively assumes 95% control provided by enclosure of sawmill sources within the sawmill building.

[3] EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014. Emission factor and PM fractions for sawing. Note 6: Sawing consists of the following cumulative activities: breaking the log into cants and flitches with a smooth edge, breaking cant further down into multiple flitches and/or boards, taking the flitch and trim off all irregular edges to leave four-sided lumber and trimming to square the ends. Therefore, this EF represents total PM emissions for all wood handling processes at the sawmill.

Table 9
Criteria Pollutant Emissions from Proposed Wood Handling Equipment 1 (CLT Facility)
Forterra CLT Modular Facility - Darrington, Washington

Source	Lamella planer	Small gluelam planer	Lamella planer 2	Big planer	Chipper	Total
Proposed Permit ID	CLT-LP1	CLT-SGP	CLT-LP2	CLT-BP	CLT-CH	
Hourly Wood Removed (BDT/hr)	0.061 [a]	0.061 [a]	0.061 [a]	0.061 [a]	0.61 [1]	
Daily Wood Removed (BDT/day)	1.26 [b]	1.26 [b]	1.26 [b]	1.26 [b]	12.6 [1]	
Annual Wood Removed (BDT/yr)	399 [c]	399 [c]	399 [c]	399 [c]	3,988 [1]	

Source	Emission Factor (lb/BDT)	Emission Estimates																	
		Maximum Hourly [d] (lbs/hr)	Daily Average [e] (lbs/day)	Annual Average [f] (tons/yr)	Maximum Hourly [d] (lbs/hr)	Daily Average [e] (lbs/day)	Annual Average [f] (tons/yr)	Maximum Hourly [d] (lbs/hr)	Daily Average [e] (lbs/day)	Annual Average [f] (tons/yr)	Maximum Hourly [d] (lbs/hr)	Daily Average [e] (lbs/day)	Annual Average [f] (tons/yr)	Maximum Hourly [d] (lbs/hr)	Daily Average [e] (lbs/day)	Annual Average [f] (tons/yr)	Maximum Hourly (lbs/hr)	Daily Average (lbs/day)	Annual Average (tons/yr)
PM	1.0E-03 [6]	6.1E-05	1.3E-03	2.0E-04	6.1E-05	1.3E-03	2.0E-04	6.1E-05	1.3E-03	2.0E-04	6.1E-05	1.3E-03	2.0E-04	6.1E-04	0.013	2.0E-03	8.5E-04	0.018	2.8E-03
PM_{10}	1.0E-03 [g]	6.0E-05	1.3E-03	2.0E-04	6.0E-05	1.3E-03	2.0E-04	6.0E-05	1.3E-03	2.0E-04	6.0E-05	1.3E-03	2.0E-04	6.0E-04	0.013	2.0E-03	8.5E-04	0.018	2.8E-03
$PM_{2.5}$	9.9E-04 [h]	6.0E-05	1.3E-03	2.0E-04	6.0E-05	1.3E-03	2.0E-04	6.0E-05	1.3E-03	2.0E-04	6.0E-05	1.3E-03	2.0E-04	6.0E-04	0.013	2.0E-03	8.4E-04	0.018	2.8E-03

NOTES:

BDT = bone-dry ton

(a) Houly wood removed (BDT/hr) = (hourly wood removed [BDT/hr]) / (Number of CLT facility wood handling equipment)

Hourly wood removed (BDT/hr) = 0.61 (1)

Number of CLT wood handling equipment = 10 (2)

(b) Daily wood removed (BDT/day) = (daily wood removed [BDT/day]) / (Number of CLT facility wood handling equipment)

Daily wood removed (BDT/day) = 12.6 (1)

Number of CLT wood handling equipment = 10 (2)

(c) Annual wood removed (BDT/yr) = (annual wood removed [BDT/yr]) / (Number of CLT facility wood handling equipment)

Annual wood removed (BDT/yr) = 3,988 (1)

Number of CLT wood handling equipment = 10 (2)

(d) Hourly emissions estimate (lb/hr) = (emission factor [lb/BDT]) x (hourly wood removed [BDT/hr])

(e) Daily emissions estimate (lb/day) = (emission factor [lb/BDT]) x (daily wood removed [BDT/day])

(f) Annual emissions estimate (ton/yr) = (emission factor [lb/BDT]) x (annual wood removed [BDT/yr]) / (2,000 lbs/ton)

(g) PM_{10} emission factor (lbs/ton) = (PM emission factor [lbs/ton]) x (PM_{10} percentage of PM [%]) /100

PM_{10} percentage of PM (%) = 99.5 (7)

(h) $PM_{2.5}$ emission factor (lbs/ton) = (PM emission factor [lbs/ton]) x ($PM_{2.5}$ percentage of PM [%]) /100

$PM_{2.5}$ percentage of PM (%) = 99.0 (8)

References:

[1] See Table 2, Material Handling Input Process Rates and Parameters.

[2] Represents the total number of planers, saws, and jointers supporting the wood handling equipment in the CLT manufacturing building.

[3] See Table 2, Material Handling Input Process Rates and Parameters. Assumes total amount of wood removed from wood handling equipment at the CLT manufacturing building.

[4] See Table 1, Input Assumptions and Parameters.

[5] Estimate based on conservative engineering judgement.

[6] Oregon Department of Environmental Quality, Wood Products Emission Factors AQ-EF02 (August 1, 2011). Emission factor representative of baghouse processing shavings.

[7] Oregon Department of Environmental Quality, AQ-EF03 (August, 2011), "PM_{10} fraction of total PM". Assumes PM_{10} is 99.5% of total PM for bag filter systems.

[8] Oregon Department of Environmental Quality, AQ-EF03 (August, 2011), "$PM_{2.5}$ fraction of total PM". Assumes $PM_{2.5}$ is 99% of total PM for bag filter systems.

Table 10
Criteria Pollutant Emissions from Proposed Wood Handling Equipment 2 (CLT Facility)
Forterra CLT Modular Facility - Darrington, Washington

Source	Finger jointer	BAZ Uniteam	CNC Beam	Total
Proposed Permit ID	CLT-LP1	CLT-SGP	CLT-LP2	
Hourly Wood Removed (BDT/hr)	0.061 [a]	0.061 [a]	0.061 [a]	
Daily Wood Removed (BDT/day)	1.26 [b]	1.26 [b]	1.26 [b]	
Annual Wood Removed (BDT/yr)	399 [c]	399 [c]	399 [c]	

Source	Emission Factor (lb/BDT)	Emission Estimates											
		Maximum Hourly [a] (lbs/hr)	Daily Average [b] (lbs/day)	Annual Average [c] (tons/yr)	Maximum Hourly [a] (lbs/hr)	Daily Average [b] (lbs/day)	Annual Average [c] (tons/yr)	Maximum Hourly [a] (lbs/hr)	Daily Average [b] (lbs/day)	Annual Average [c] (tons/yr)	Maximum Hourly (lbs/hr)	Daily Average (lbs/day)	Annual Average (tons/yr)
PM	0.040 [3]	2.4E-03	0.051	8.0E-03	2.4E-03	0.051	8.0E-03	2.4E-03	0.051	8.0E-03	7.3E-03	0.15	0.024
PM_{10}	4.0E-02 [d]	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	7.2E-03	0.15	0.024
$PM_{2.5}$	4.0E-02 [e]	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	7.2E-03	0.15	0.024

NOTES:

BDT = bone-dry ton

(a) Houly wood removed (BDT/hr) = (hourly wood removed [BDT/hr]) / (Number of CLT facility wood handling equipment)

Hourly wood removed (BDT/hr) = 0.61 (1)

Number of CLT wood handling equipment = 10 (2)

(b) Daily wood removed (BDT/day) = (daily wood removed [BDT/day]) / (Number of CLT facility wood handling equipment)

Daily wood removed (BDT/day) = 12.6 (1)

Number of CLT wood handling equipment = 10 (2)

(c) Annual wood removed (BDT/yr) = (annual wood removed [BDT/yr]) / (Number of CLT facility wood handling equipment)

Annual wood removed (BDT/yr) = 3,988 (1)

Number of CLT wood handling equipment = 10 (2)

(d) PM_{10} emission factor (lbs/ton) = (PM emission factor [lbs/ton]) x (PM_{10} percentage of PM [%]) /100

PM_{10} percentage of PM (%) = 99.5 (4)

(e) $PM_{2.5}$ emission factor (lbs/ton) = (PM emission factor [lbs/ton]) x ($PM_{2.5}$ percentage of PM [%]) /100

$PM_{2.5}$ percentage of PM (%) = 99.0 (5)

References:

[1] See Table 2, Material Handling Input Process Rates and Parameters.

[2] Represents the total number of planers, saws, and jointers supporting the wood handling equipment in the CLT manufacturing building.

[3] Oregon Department of Environmental Quality, Wood Products Emission Factors AQ-EF02 (August 1, 2011). Emission factor representative of baghouse processing sanderdust. Material being controlled is conservatively assumed to be similar to sanderdust.

[4] Oregon Department of Environmental Quality, AQ-EF03 (August, 2011), "PM_{10} fraction of total PM". Assumes PM_{10} is 99.5% of total PM for bag filter systems.

[5] Oregon Department of Environmental Quality, AQ-EF03 (August, 2011), "$PM_{2.5}$ fraction of total PM". Assumes $PM_{2.5}$ is 99% of total PM for bag filter systems.

Table 11
Criteria Pollutant Emissions from Proposed Saws (CLT Facility)
Forterra CLT Modular Facility - Darrington, Washington

Source	X-cut Saw 1	X-cut Saw 1	Flying Saw	Total
Proposed Permit ID	CLT-LP1	CLT-SGP	CLT-LP2	
Hourly Wood Removed (BDT/hr)	0.061 [a]	0.061 [a]	0.061 [a]	
Daily Wood Removed (BDT/day)	1.26 [b]	1.26 [b]	1.26 [b]	
Annual Wood Removed (BDT/yr)	399 [c]	399 [c]	399 [c]	

Source	Emission Factor (lb/BDT)	Emission Estimates											
		Maximum Hourly [a] (lbs/hr)	Daily Average [b] (lbs/day)	Annual Average [c] (tons/yr)	Maximum Hourly [a] (lbs/hr)	Daily Average [b] (lbs/day)	Annual Average [c] (tons/yr)	Maximum Hourly [a] (lbs/hr)	Daily Average [b] (lbs/day)	Annual Average [c] (tons/yr)	Maximum Hourly (lbs/hr)	Daily Average (lbs/day)	Annual Average (tons/yr)
PM	0.040 [3]	2.4E-03	0.051	8.0E-03	2.4E-03	0.051	8.0E-03	2.4E-03	0.051	8.0E-03	7.3E-03	0.15	0.024
PM_{10}	4.0E-02 [d]	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	7.2E-03	0.15	0.024
$PM_{2.5}$	4.0E-02 [e]	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	2.4E-03	0.050	7.9E-03	7.2E-03	0.15	0.024

NOTES:

BDT = bone-dry ton

(a) Houly wood removed (BDT/hr) = (hourly wood removed [BDT/hr]) / (Number of CLT facility wood handling equipment)

Hourly wood removed (BDT/hr) = 0.61 (1)

Number of CLT wood handling equipment = 10 (2)

(b) Daily wood removed (BDT/day) = (daily wood removed [BDT/day]) / (Number of CLT facility wood handling equipment)

Daily wood removed (BDT/day) = 12.6 (1)

Number of CLT wood handling equipment = 10 (2)

(c) Annual wood removed (BDT/yr) = (annual wood removed [BDT/yr]) / (Number of CLT facility wood handling equipment)

Annual wood removed (BDT/yr) = 3,988 (1)

Number of CLT wood handling equipment = 10 (2)

(d) PM_{10} emission factor (lbs/ton) = (PM emission factor [lbs/ton]) x (PM_{10} percentage of PM [%]) /100

PM_{10} percentage of PM (%) = 99.5 (4)

(e) $PM_{2.5}$ emission factor (lbs/ton) = (PM emission factor [lbs/ton]) x ($PM_{2.5}$ percentage of PM [%]) /100

$PM_{2.5}$ percentage of PM (%) = 99.0 (5)

References:

[1] See Table 2, Material Handling Input Process Rates and Parameters.

[2] Represents the total number of planers, saws, and jointers supporting the wood handling equipment in the CLT manufacturing building.

[3] Oregon Department of Environmental Quality, Wood Products Emission Factors AQ-EF02 (August 1, 2011). Emission factor representative of baghouse processing sanderdust. Material being controlled is conservatively assumed to be similar to sanderdust.

[4] Oregon Department of Environmental Quality, AQ-EF03 (August, 2011), "PM_{10} fraction of total PM". Assumes PM_{10} is 99.5% of total PM for bag filter systems.

[5] Oregon Department of Environmental Quality, AQ-EF03 (August, 2011), "$PM_{2.5}$ fraction of total PM". Assumes $PM_{2.5}$ is 99% of total PM for bag filter systems.

Table 12
VOC Emissions from Proposed Glue Line
Forterra CLT Modular Facility - Darrington, Washington

Product	Vendor	Pollutant	CAS	Volatile Weight % of VOC	Maximum Emissions Estimate		
					Hourly [a] (lbs/hr)	Daily [b] (lbs/day)	Annual [c] (tons/yr)
Loctite HB X102 Purbond (Adhesive)	Henkel Corp.	VOC	--	0.20 [2]	2.58E-02	0.46	0.08
Loctite PR 3105	Henkel Corp.	VOC	--	0.11 [3]	1.42E-02	0.25	4.67E-02
		Acetaldehyde	75-07-0	0.10 [3]	1.29E-02	0.23	4.24E-02
Total		**VOC**	**--**	**--**	**0.04**	**0.71**	**0.13**
		Acetaldehyde	**75-07-0**	**--**	**1.29E-02**	**0.23**	**0.04**

NOTES:

VOC = volatile organic compound

(a) Maximum hourly emissions estimate (lbs/hr) = (weight percent of VOC [%] / 100) x (hourly product usage [lbs/hr])

Hourly product usage (HB X102 Purbond) (lb/hr) =	12.9	(1)
Hourly product usage (PR 3105) (lb/hr) =	12.9	(1)

(b) Maximum daily emissions estimate (lbs/day) = (weight percent of VOC [%] / 100) x (daily product usage [lbs/day])

Daily product usage (HB X102 Purbond) (lb/day) =	230	(1)
Daily product usage (PR 3105) (lb/day) =	230	(1)

(c) Maximum annual emissions estimate (tons/yr) = (weight percent of VOC [%] / 100) x (annual product usage [lbs/yr]) x (ton/2,000 lbs)

Annual product usage (HB X102 Purbond) (lb/yr) =	84,894	(1)
Annual product usage (PR 3105) (lb/yr) =	84,894	(1)

References:

[1] See Table 1, Input Assumptions and Parameters.

[2] Technical Data Sheet, Henkel Corporation, Loctite HB X102 Purbond, dated September, 2019.

[3] Technical Data Sheet, Henkel Corporation, Loctite PR 3105 Purabond, dated September, 2019.

Table 13
VOC Emissions from Proposed Modular Coatings Application Line
Forterra CLT Modular Facility - Darrington, Washington

Product	Vendor	Pollutant	CAS	VOC [1] (Wt %)	Maximum Emissions Estimate		
					Hourly [a] (lbs/hr)	Daily [b] (lbs/day)	Annual [c] (tons/yr)
YS---M009 Wood Oil	Renner Italia S.p.A	VOC	--	4.16	0.46	8.32	0.78
		Dipropylene Glycol Monomethyl Ether	34590-94-8	2.50	0.28	5.00	0.47

NOTES:

VOC = volatile organic compound

(a) Maximum hourly emissions estimate (lbs/hr) = (weight percent of VOC [%] / 100) x (hourly coating application rate [lbs/hr])

Hourly coating application rate (lb/hr) = 11.1 (2)

(b) Maximum daily emissions estimate (lbs/day) = (weight percent of VOC [%] / 100) x (daily coating application rate [lbs/day])

Daily coating application rate (lb/day) = 200 (2)

(c) Maximum annual emissions estimate (tons/yr) = (weight percent of VOC [%] / 100) x (annual coating application rate [lbs/yr]) x (ton/2,000 lbs)

Annual coating application rate (lb/yr) = 37,500 (2)

References:

(1) Technical Data Sheet, Renner Italia S.p.A., dated July 12, 2018.

(2) See Table 1, Input Assumptions and Parameters.

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Table 14
Proposed Total Criteria Pollutant Emissions
Forterra CLT Modular Facility - Darrington, Washington

Criteria Pollutant Emission Estimates

Process	PM			PM_{10}			$PM_{2.5}$			NO_X		
	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)
Energy Usage												
Biomass Boiler	1.99	47.7	8.71	1.60	38.3	6.99	1.46	34.9	6.38	6.16	148	27.0
Emergency Diesel-Fired Boiler	0.12	1.20	3.0E-03	0.12	1.20	3.0E-03	0.12	1.20	3.0E-03	0.73	7.30	0.018
Sawmill												
Debarker	0.18	3.21	0.59	0.089	1.61	0.29	0.045	0.80	0.15	--	--	--
Sawmill Wood Handling	0.13	2.34	0.43	0.065	1.17	0.21	0.033	0.59	0.11	--	--	--
Wood Drying												
Lumber Kiln	0.14	3.43	0.53	0.14	3.43	0.53	0.14	3.43	0.53	--	--	--
CLT Facility												
CLT Wood Handling 1	8.5E-04	0.018	2.8E-03	8.5E-04	0.018	2.8E-03	8.4E-04	0.018	2.8E-03	--	--	--
CLT Wood Handling 2	7.3E-03	0.15	0.024	7.2E-03	0.15	0.024	7.2E-03	0.15	0.024	--	--	--
CLT Saws	7.3E-03	0.15	0.024	7.2E-03	0.15	0.024	7.2E-03	0.15	0.024	--	--	--
Glue Line	--	--	--	--	--	--	--	--	--	--	--	--
Coatings Application	--	--	--	--	--	--	--	--	--	--	--	--
Facility Total	**2.58**	**58.2**	**10.3**	**2.03**	**46.0**	**8.09**	**1.81**	**41.3**	**7.22**	**6.89**	**155**	**27.0**

Process	CO			SO_2			Pb			VOC			CO_2e		
	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lb/day)	Annual (tons/yr)
Energy Usage															
Biomass Boiler	16.8	403	73.6	0.70	16.8	3.07	0.020	0.49	0.090	0.48	11.4	2.08	5,869	140,845	25,704
Emergency Diesel-Fired Boiler	0.18	1.83	4.6E-03	7.8E-05	7.8E-04	1.9E-06	3.0E-04	3.0E-03	7.6E-06	0.012	0.12	3.1E-04	824	8,243	20.6
Sawmill															
Debarker	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sawmill Wood Handling	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Wood Drying															
Lumber Kiln	--	--	--	--	--	--	--	--	--	3.16	75.9	8.77	--	--	--
CLT Facility															
CLT Wood Handling 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CLT Wood Handling 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CLT Saws	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Glue Line	--	--	--	--	--	--	--	--	--	0.040	0.71	0.13	--	--	--
Coatings Application	--	--	--	--	--	--	--	--	--	0.46	8.32	0.78	--	--	--
Facility Total	**17.0**	**405**	**73.6**	**0.70**	**16.8**	**3.07**	**0.021**	**0.49**	**0.090**	**3.69**	**88.1**	**11.0**	**6,693**	**149,088**	**25,725**

Table 15
HAP/TAP Emissions from Proposed Biomass Boiler
Forterra CLT Modular Facility - Darrington, Washington

TAP	CAS	HAP?	Emission Factor [1] (lb/MMBtu)	Emissions Estimate		
				Hourly [a] (lb/hr)	Daily [b] (lb/day)	Annual [c] (tons/yr)
Metals						
Arsenic	7440-38-2	Yes	1.88E-06	5.3E-05	1.3E-03	2.3E-04
Beryllium	7440-41-7	Yes	3.01E-08	8.4E-07	2.0E-05	3.7E-06
Cadmium	7440-43-9	Yes	3.66E-07	1.0E-05	2.5E-04	4.5E-05
Chromium VI	18540-29-9	Yes	2.72E-07	7.6E-06	1.8E-04	3.3E-05
Cobalt	7440-48-4	Yes	2.35E-06	6.6E-05	1.6E-03	2.9E-04
Copper and compounds	7440-50-8	No	4.99E-06	1.4E-04	3.4E-03	6.1E-04
Lead	7439-92-1	Yes	5.21E-06	1.5E-04	3.5E-03	6.4E-04
Manganese	7439-96-5	Yes	9.13E-05	2.6E-03	6.1E-02	1.1E-02
Mercury	7439-97-6	Yes	1.06E-06	3.0E-05	7.1E-04	1.3E-04
Nickel	7440-02-0	Yes	2.80E-06	7.8E-05	1.9E-03	3.4E-04
Selenium	7782-49-2	Yes	1.62E-06	4.5E-05	1.1E-03	2.0E-04
Vanadium (fume or dust)	7440-62-2	No	5.94E-07	1.7E-05	4.0E-04	7.3E-05
Organic Compounds						
1,2-Dichloropropane	78-87-5	Yes	1.68E-05	4.7E-04	1.1E-02	2.1E-03
Acetaldehyde	75-07-0	Yes	2.83E-04	7.9E-03	1.9E-01	3.5E-02
Acrolein	107-02-8	Yes	2.60E-04	7.3E-03	1.7E-01	3.2E-02
Benzene	71-43-2	Yes	9.80E-04	2.7E-02	6.6E-01	1.2E-01
Carbon tetrachloride	56-23-5	Yes	2.01E-05	5.6E-04	1.4E-02	2.5E-03
Chlorine	7782-50-5	Yes	1.22E-03	3.4E-02	8.2E-01	1.5E-01
Chlorobenzene	108-90-7	Yes	1.66E-05	4.6E-04	1.1E-02	2.0E-03
Chloroform	67-66-3	Yes	2.01E-05	5.6E-04	1.4E-02	2.5E-03
Ethyl benzene	100-41-4	Yes	3.95E-04	1.1E-02	2.7E-01	4.8E-02
Formaldehyde	50-00-0	Yes	1.02E-03	2.9E-02	6.9E-01	1.3E-01
Hexane	110-54-3	Yes	2.88E-04	8.1E-03	1.9E-01	3.5E-02
Isopropyl alcohol	67-63-0	No	3.64E-03	1.0E-01	2.4E+00	4.5E-01
Methanol	67-56-1	Yes	7.32E-04	2.0E-02	4.9E-01	9.0E-02
Methyl bromide	74-83-9	Yes	1.14E-05	3.2E-04	7.7E-03	1.4E-03
Methyl chloride	74-87-3	Yes	3.78E-05	1.1E-03	2.5E-02	4.6E-03
Methyl chloroform	71-55-6	Yes	5.78E-05	1.6E-03	3.9E-02	7.1E-03
Methylene chloride	75-09-2	Yes	5.47E-04	1.5E-02	3.7E-01	6.7E-02
Methyl ethyl ketone	78-93-3	No	1.56E-05	4.4E-04	1.0E-02	1.9E-03
Phenol	108-95-2	Yes	1.60E-04	4.5E-03	1.1E-01	2.0E-02
Phosphorus	7723-14-0	Yes	3.10E-04	8.7E-03	2.1E-01	3.8E-02
Propionaldehyde	123-38-6	Yes	2.52E-04	7.1E-03	1.7E-01	3.1E-02
Styrene	100-42-5	Yes	4.77E-04	1.3E-02	3.2E-01	5.8E-02
Toluene	108-88-3	Yes	2.11E-05	5.9E-04	1.4E-02	2.6E-03
m-Xylene	108-38-3	Yes	3.54E-06	9.9E-05	2.4E-03	4.3E-04
p-Xylene	106-42-3	Yes	3.54E-06	9.9E-05	2.4E-03	4.3E-04
o-Xylene	95-47-6	Yes	1.13E-05	3.2E-04	7.6E-03	1.4E-03
Inorganic Compounds						
Hydrogen fluoride	7664-39-3	Yes	2.35E-04	6.6E-03	1.6E-01	2.9E-02
Hydrochloric acid	7647-01-0	Yes	4.36E-03	1.2E-01	2.9E+00	5.3E-01
PAHs						
Benz[a]anthracene	56-55-3	Yes	8.13E-08	2.3E-06	5.5E-05	1.0E-05
Benzo[a]pyrene	50-32-8	Yes	2.73E-06	7.6E-05	1.8E-03	3.3E-04
Benzo[b]fluoranthene	205-99-2	Yes	1.42E-07	4.0E-06	9.5E-05	1.7E-05
Benzo[j]fluoranthene	205-82-3	Yes	1.56E-07	4.4E-06	1.0E-04	1.9E-05
Benzo[k]fluoranthene	207-08-9	Yes	5.18E-08	1.5E-06	3.5E-05	6.4E-06
Chrysene	218-01-9	Yes	7.90E-08	2.2E-06	5.3E-05	9.7E-06
Dibenzo[a,h]anthracene	53-70-3	Yes	9.56E-09	2.7E-07	6.4E-06	1.2E-06
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	1.02E-07	2.9E-06	6.9E-05	1.3E-05
Naphthalene	91-20-3	Yes	9.96E-05	2.8E-03	6.7E-02	1.2E-02
Dioxans & Furans						
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	6.33E-13	1.8E-11	4.3E-10	7.8E-11
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	1.38E-12	3.9E-11	9.3E-10	1.7E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	9.22E-13	2.6E-11	6.2E-10	1.1E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	2.20E-12	6.2E-11	1.5E-09	2.7E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	2.28E-12	6.4E-11	1.5E-09	2.8E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	9.89E-12	2.8E-10	6.6E-09	1.2E-09
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	2.50E-11	7.0E-10	1.7E-08	3.1E-09
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	8.30E-12	2.3E-10	5.6E-09	1.0E-09
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	4.09E-12	1.1E-10	2.7E-09	5.0E-10
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	5.67E-12	1.6E-10	3.8E-09	7.0E-10
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	3.64E-12	1.0E-10	2.4E-09	4.5E-10
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	3.17E-12	8.9E-11	2.1E-09	3.9E-10
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	6.62E-13	1.9E-11	4.4E-10	8.1E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	2.69E-12	7.5E-11	1.8E-09	3.3E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	5.82E-12	1.6E-10	3.9E-09	7.1E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	9.33E-13	2.6E-11	6.3E-10	1.1E-10
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	5.15E-12	1.4E-10	3.5E-09	6.3E-10
Total TAP Emissions Estimate				**0.44**	**10.49**	**1.91**
Total HAP Emissions Estimate				**0.33**	**8.03**	**1.47**

NOTES:

HAP = hazardous air pollutant

MMBtu = million British thermal unit

TAP = toxic air pollutant

(a) Hourly emissions estimate (lb/hr) = (emission factor [lb/MMBtu]) x (hourly hogged-fuel heat input [MMBtu/hr])

Hourly hogged-fuel input (MMBtu/hr) = 28.0 (2)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (hourly hogged-fuel input [MMBtu/day])

Hourly hogged-fuel input (MMBtu/day) = 672 (2)

(c) Annual emissions estimate (tons/yr) = (emission factor [lb/MMBtu]) x (annual hogged-fuel input [MMBtu/yr]) / (2,000 lbs/ton)

Annual hogged-fuel input (MMBtu/yr) = 245,280 (2)

References:

[1] Emission factors based on the Oregon Department of Environmental Quality approved list of TAC emissions for wood-fired combustion. Emission factor representative of fabric filter/ESP control.

[2] See Table 1, Input Assumptions and Parameters.

Table 16
HAP/TAP Emissions from Proposed Emergency Diesel-Fired Boiler
Forterra CLT Modular Facility - Darrington, Washington

TAP	CAS	HAP?	Emission Factor (lb/Mgal)	Emissions Estimate		
				Hourly [a] (lb/hr)	Daily [b] (lb/day)	Annual [c] (tons/yr)
Metals						
Arsenic	7440-38-2	Yes	1.60E-03 [2]	5.8E-05	5.8E-04	1.5E-06
Cadmium	7440-43-9	Yes	1.50E-03 [2]	5.5E-05	5.5E-04	1.4E-06
Chromium VI	18540-29-9	Yes	1.00E-04 [2]	3.7E-06	3.7E-05	9.1E-08
Copper and compounds	7440-50-8	No	4.10E-03 [2]	1.5E-04	1.5E-03	3.7E-06
Lead	7439-92-1	Yes	8.30E-03 [2]	3.0E-04	3.0E-03	7.6E-06
Manganese	7439-96-5	Yes	3.10E-03 [2]	1.1E-04	1.1E-03	2.8E-06
Mercury	7439-97-6	Yes	2.00E-03 [2]	7.3E-05	7.3E-04	1.8E-06
Nickel	7440-02-0	Yes	3.90E-03 [2]	1.4E-04	1.4E-03	3.6E-06
Selenium	7782-49-2	Yes	2.20E-03 [2]	8.0E-05	8.0E-04	2.0E-06
Organic Compounds						
1,3-Butadiene	106-99-0	Yes	1.48E-02 [2]	5.4E-04	5.4E-03	1.4E-05
Acetaldehyde	75-07-0	Yes	3.51E-01 [2]	1.3E-02	1.3E-01	3.2E-04
Acrolein	107-02-8	Yes	3.51E-01 [2]	1.3E-02	1.3E-01	3.2E-04
Benzene	71-43-2	Yes	4.40E-03 [2]	1.6E-04	1.6E-03	4.0E-06
Ethyl benzene	100-41-4	Yes	2.00E-04 [2]	7.3E-06	7.3E-05	1.8E-07
Formaldehyde	50-00-0	Yes	3.51E-01 [2]	1.3E-02	1.3E-01	3.2E-04
Hexane	110-54-3	Yes	3.50E-03 [2]	1.3E-04	1.3E-03	3.2E-06
Toluene	108-88-3	Yes	4.40E-03 [2]	1.6E-04	1.6E-03	4.0E-06
Xylene (mixture), including m-xylene, o-xylene, p-xyl	1330-20-7	Yes	1.60E-03 [2]	5.8E-05	5.8E-04	1.5E-06
Inorganic Compounds						
Ammonia	7664-41-7	No	2.90 [3]	1.1E-01	1.1E+00	2.6E-03
Hydrochloric acid	7647-01-0	Yes	1.86E-01 [3]	6.8E-03	6.8E-02	1.7E-04
PAHs						
Benzo[a]pyrene	50-32-8	Yes	3.57E-05 [3]	1.3E-06	1.3E-05	3.3E-08
Naphthalene	91-20-3	Yes	5.30E-03 [3]	1.9E-04	1.9E-03	4.8E-06
Total TAP Emissions Estimate				**0.15**	**1.53**	**0.00**
Total HAP Emissions Estimate				**0.05**	**0.47**	**0.00**

NOTES:

HAP = hazardous air pollutant

Mgal = thousand gallons

TAP = toxic air pollutant

PAHs = polycyclic aromatic hydrocarbons

(a) Hourly emissions estimate (lb/hr) = (emission factor [lb/Mgal]) x (boiler hourly fuel consumption [Mgal/hr])

Boiler hourly fuel consumption (Mgal/hr) = 0.037 (1)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (boiler daily fuel consumption [Mgal/day])

Boiler daily fuel consumption (Mgal/day) = 0.365 (1)

(c) Annual emissions estimate (ton/day) = (emission factor [lb/Mgal]) x (boiler annual fuel consumption [Mgal/yr]) / (2,000 lbs/ton)

Boiler annual fuel consumption (Mgal/yr) = 1.83 (1)

References:

(1) See Table 1, Input Assumptions and Parameters.

(2) Emission factors from Ventura County Air Pollution Control District AB2588 "Combustion Emission Factors." Representative of external diesel combustion.

(3) Emission factors from South Coast Air Quality Management District AB2588, Table B-2. Representative of external combustion equipment.

Table 17
HAP/TAP Emissions from Proposed Kiln Lumber Drying
Forterra CLT Modular Facility - Darrington, Washington

TAP	CAS	HAP?	Emission Factor [1] (lb/Mbdft)			Emissions Estimate		
			Daily	Annual (Western Hemlock)	Annual (Other Species)	Maximum Hourly [a] (lbs/hr)	Maximum Daily [b] (lbs/day)	Annual [c] (tons/yr)
Acetaldehyde	75-07-0	Yes	0.11	0.11	0.043	0.32	7.67	0.60
Acrolein	107-02-8	Yes	1.8E-03	1.8E-03	7.5E-04	5.0E-03	0.12	0.010
Formaldehyde	50-00-0	Yes	2.5E-03	2.1E-03	2.5E-03	7.1E-03	0.17	0.026
Methanol	67-56-1	Yes	0.11	0.11	0.11	0.31	7.46	1.16
Propionaldehyde	123-38-6	Yes	1.2E-03	1.2E-03	9.0E-04	3.4E-03	0.082	0.010
Total HAP/TAP Emissions Estimate						0.65	15.50	1.81

NOTES:

Mbdft = thousand board-feet

TAP = toxic air pollutant

(a) Maximum hourly emissions estimate (lbs/hr) = (maximum hourly emission factor [lbs/Mbdft]) x ([capacity of kiln per batch {Mbdft/batch}] / [calculated drying time per batch {hrs/batch}])

Capacity of kilns per batch (Mbdft/batch) = 561 (2)

Calculated drying time per batch (hrs/batch) = 198 (3)

(b) Maximum daily emissions estimate (lbs/day) = (hourly emissions estimate [lbs/hr]) x (daily hours of operation [hrs/day])

Maximum daily hours of operation (hrs/day) = 24.0 (2)

(c) Annual emissions estimate (tons/yr) = ([annual emission factor {western hemlock} {lbs/Mbdft}] x [annual kiln throughput {western hemlock} {Mbdft/yr}] + [annual emission factor {other species} {lb/Mbdft} x [annual kiln throughput {other species} [Mbdft/yr}]] x (ton/2,000 lbs)

Annual kiln throughput (Western Hemlock) (Mbdft/yr) = 4,240 (2)

Annual kiln throughput (other species) (Mbdft/yr) = 16,948 (2)

References:

[1] See Table 5, Lumber Kiln Emission Factors.

[2] See Table 1, Input Assumptions and Parameters.

[3] Information provided by kiln manufacturer. Represents estimated time needed to dry lumber from 60% to 12%.

Table 18
Proposed Total HAP/TAP Emissions
Forterra CLT Modular Facility - Darrington, Washington

Pollutant	CAS	HAP	Emissions Estimate																	
			Biomass Boiler			Emergency Diesel Boiler			Lumber Kilns			Glue Line			Coating Application			Total Facility		
			Hourly (lbs/hr)	Daily (lbs/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lbs/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lbs/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lbs/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lbs/day)	Annual (tons/yr)	Hourly (lbs/hr)	Daily (lbs/day)	Annual (tons/yr)
METALS																				
Arsenic	7440-38-2	Yes	5.3E-05	1.3E-03	2.3E-04	5.8E-05	5.8E-04	1.5E-06	--	--	--	--	--	--	--	--	--	1.1E-04	1.8E-03	2.3E-04
Beryllium	7440-41-7	Yes	8.4E-07	2.0E-05	3.7E-06	--	--	--	--	--	--	--	--	--	--	--	--	8.4E-07	2.0E-05	3.7E-06
Cadmium	7440-43-9	Yes	1.0E-05	2.5E-04	4.5E-05	5.5E-05	5.5E-04	1.4E-06	--	--	--	--	--	--	--	--	--	6.5E-05	7.9E-04	4.6E-05
Chromium VI	18540-29-9	Yes	7.6E-06	1.8E-04	3.3E-05	3.7E-06	3.7E-05	9.1E-08	--	--	--	--	--	--	--	--	--	1.1E-05	2.2E-04	3.3E-05
Cobalt	7440-48-4	Yes	6.6E-05	1.6E-03	2.9E-04	--	--	--	--	--	--	--	--	--	--	--	--	6.6E-05	1.6E-03	2.9E-04
Copper and compounds	7440-50-8	No	1.4E-04	3.4E-03	6.1E-04	1.5E-04	1.5E-03	3.7E-06	--	--	--	--	--	--	--	--	--	2.9E-04	4.8E-03	6.2E-04
Lead	7439-92-1	Yes	1.5E-04	3.5E-03	6.4E-04	3.0E-04	3.0E-03	7.6E-06	--	--	--	--	--	--	--	--	--	4.5E-04	6.5E-03	6.5E-04
Manganese	7439-96-5	Yes	2.6E-03	0.061	0.011	1.1E-04	1.1E-03	2.8E-06	--	--	--	--	--	--	--	--	--	2.7E-03	6.2E-02	1.1E-02
Mercury	7439-97-6	Yes	3.0E-05	7.1E-04	1.3E-04	7.3E-05	7.3E-04	1.8E-06	--	--	--	--	--	--	--	--	--	1.0E-04	1.4E-03	1.3E-04
Nickel	7440-02-0	Yes	7.8E-05	1.9E-03	3.4E-04	1.4E-04	1.4E-03	3.6E-06	--	--	--	--	--	--	--	--	--	2.2E-04	3.3E-03	3.5E-04
Selenium	7782-49-2	Yes	4.5E-05	1.1E-03	2.0E-04	8.0E-05	8.0E-04	2.0E-06	--	--	--	--	--	--	--	--	--	1.3E-04	1.9E-03	2.0E-04
Vanadium (fume or dust)	7440-62-2	No	1.7E-05	4.0E-04	7.3E-05	--	--	--	--	--	--	--	--	--	--	--	--	1.7E-05	4.0E-04	7.3E-05
ORGANICS																				
1,2-Dichloropropane	78-87-5	Yes	4.7E-04	1.1E-02	2.1E-03	--	--	--	--	--	--	--	--	--	--	--	--	4.7E-04	1.1E-02	2.1E-03
1,3-Butadiene	106-99-0	Yes	--	--	--	5.4E-04	5.4E-03	1.4E-05	--	--	--	--	--	--	--	--	--	5.4E-04	5.4E-03	1.4E-05
Acetaldehyde	75-07-0	Yes	7.9E-03	1.9E-01	3.5E-02	1.3E-02	1.3E-01	3.2E-04	3.2E-01	7.7E+00	6.0E-01	1.3E-02	2.3E-01	4.2E-02	--	--	--	3.5E-01	8.2E+00	6.8E-01
Acrolein	107-02-8	Yes	7.3E-03	1.7E-01	3.2E-02	1.3E-02	1.3E-01	3.2E-04	5.0E-03	1.2E-01	1.0E-02	--	--	--	--	--	--	2.5E-02	4.2E-01	4.2E-02
Benzene	71-43-2	Yes	2.7E-02	6.6E-01	1.2E-01	1.6E-04	1.6E-03	4.0E-06	--	--	--	--	--	--	--	--	--	2.8E-02	6.6E-01	1.2E-01
Carbon tetrachloride	56-23-5	Yes	5.6E-04	1.4E-02	2.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	5.6E-04	1.4E-02	2.5E-03
Chlorine	7782-50-5	Yes	3.4E-02	8.2E-01	1.5E-01	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-02	8.2E-01	1.5E-01
Chlorobenzene	108-90-7	Yes	4.6E-04	1.1E-02	2.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	4.6E-04	1.1E-02	2.0E-03
Chloroform	67-66-3	Yes	5.6E-04	1.4E-02	2.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	5.6E-04	1.4E-02	2.5E-03
Dipropylene Glycol Monomethyl Ether	34590-94-8	Yes	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-01	5.0E+00	4.7E-01	2.8E-01	5.0E+00	4.7E-01
Ethyl benzene	100-41-4	Yes	1.1E-02	2.7E-01	4.8E-02	7.3E-06	7.3E-05	1.8E-07	--	--	--	--	--	--	--	--	--	1.1E-02	2.7E-01	4.8E-02
Formaldehyde	50-00-0	Yes	2.9E-02	6.9E-01	1.3E-01	1.3E-02	1.3E-01	3.2E-04	7.1E-03	1.7E-01	2.6E-02	--	--	--	--	--	--	4.8E-02	9.8E-01	1.5E-01
Hexane	110-54-3	Yes	8.1E-03	1.9E-01	3.5E-02	1.3E-04	1.3E-03	3.2E-06	--	--	--	--	--	--	--	--	--	8.2E-03	1.9E-01	3.5E-02
Isopropyl alcohol	67-63-0	No	1.0E-01	2.4E+00	4.5E-01	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-01	2.4E+00	4.5E-01
Methanol	67-56-1	Yes	2.0E-02	4.9E-01	9.0E-02	--	--	--	3.1E-01	7.5E+00	1.2E+00	--	--	--	--	--	--	3.3E-01	8.0E+00	1.3E+00
Methyl bromide	74-83-9	Yes	3.2E-04	7.7E-03	1.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-04	7.7E-03	1.4E-03
Methyl chloride	74-87-3	Yes	1.1E-03	2.5E-02	4.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-03	2.5E-02	4.6E-03
Methyl chloroform	71-55-6	Yes	1.6E-03	3.9E-02	7.1E-03	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-03	3.9E-02	7.1E-03
Methylene chloride	75-09-2	Yes	1.5E-02	3.7E-01	6.7E-02	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-02	3.7E-01	6.7E-02
Methyl ethyl ketone	78-93-3	No	4.4E-04	1.0E-02	1.9E-03	--	--	--	--	--	--	--	--	--	--	--	--	4.4E-04	1.0E-02	1.9E-03
Phenol	108-95-2	Yes	4.5E-03	1.1E-01	2.0E-02	--	--	--	--	--	--	--	--	--	--	--	--	4.5E-03	1.1E-01	2.0E-02
Phosphorus	7723-14-0	Yes	8.7E-03	2.1E-01	3.8E-02	--	--	--	--	--	--	--	--	--	--	--	--	8.7E-03	2.1E-01	3.8E-02
Propionaldehyde	123-38-6	Yes	7.1E-03	1.7E-01	3.1E-02	--	--	--	3.4E-03	8.2E-02	1.0E-02	--	--	--	--	--	--	1.0E-02	2.5E-01	4.1E-02
Styrene	100-42-5	Yes	1.3E-02	3.2E-01	5.8E-02	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-02	3.2E-01	5.8E-02
Toluene	108-88-3	Yes	5.9E-04	1.4E-02	2.6E-03	1.6E-04	1.6E-03	4.0E-06	--	--	--	--	--	--	--	--	--	7.5E-04	1.6E-02	2.6E-03
m-Xylene	108-38-3	Yes	9.9E-05	2.4E-03	4.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	9.9E-05	2.4E-03	4.3E-04
p-Xylene	106-42-3	Yes	9.9E-05	2.4E-03	4.3E-04	--	--	--	--	--	--	--	--	--	--	--	--	9.9E-05	2.4E-03	4.3E-04
o-Xylene	95-47-6	Yes	3.2E-04	7.6E-03	1.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	3.2E-04	7.6E-03	1.4E-03
Xylene (mixture)	1330-20-7	Yes	--	--	--	5.8E-05	5.8E-04	1.5E-06	--	--	--	--	--	--	--	--	--	5.8E-05	5.8E-04	1.5E-06
Inorganic Compounds																				
Hydrogen fluoride	7664-39-3	Yes	6.6E-03	1.6E-01	2.9E-02	--	--	--	--	--	--	--	--	--	--	--	--	6.6E-03	1.6E-01	2.9E-02
Hydrochloric acid	7647-01-0	Yes	1.2E-01	2.9E+00	5.3E-01	6.8E-03	6.8E-02	1.7E-04	--	--	--	--	--	--	--	--	--	1.3E-01	3.0E+00	5.3E-01
Ammonia	7664-41-7	No	--	--	--	1.1E-01	1.1E+00	2.6E-03	--	--	--	--	--	--	--	--	--	1.1E-01	1.1E+00	2.6E-03
PAHs																				
Benz[a]anthracene	56-55-3	Yes	2.3E-06	5.5E-05	1.0E-05	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-06	5.5E-05	1.0E-05
Benzo[a]pyrene	50-32-8	Yes	7.6E-05	1.8E-03	3.3E-04	1.3E-06	1.3E-05	3.3E-08	--	--	--	--	--	--	--	--	--	7.8E-05	1.8E-03	3.3E-04
Benzo[b]fluoranthene	205-99-2	Yes	4.0E-06	9.5E-05	1.7E-05	--	--	--	--	--	--	--	--	--	--	--	--	4.0E-06	9.5E-05	1.7E-05
Benzo[j]fluoranthene	205-82-3	Yes	4.4E-06	1.0E-04	1.9E-05	--	--	--	--	--	--	--	--	--	--	--	--	4.4E-06	1.0E-04	1.9E-05
Benzo[k]fluoranthene	207-08-9	Yes	1.5E-06	3.5E-05	6.4E-06	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-06	3.5E-05	6.4E-06
Chrysene	218-01-9	Yes	2.2E-06	5.3E-05	9.7E-06	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-06	5.3E-05	9.7E-06
Dibenzo[a,h]anthracene	53-70-3	Yes	2.7E-07	6.4E-06	1.2E-06	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-07	6.4E-06	1.2E-06
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	2.9E-06	6.9E-05	1.3E-05	--	--	--	--	--	--	--	--	--	--	--	--	2.9E-06	6.9E-05	1.3E-05
Naphthalene	91-20-3	Yes	2.8E-03	6.7E-02	1.2E-02	1.9E-04	1.9E-03	4.8E-06	--	--	--	--	--	--	--	--	--	3.0E-03	6.9E-02	1.2E-02
Dioxans & Furans																				
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	1.8E-11	4.3E-10	7.8E-11	--	--	--	--	--	--	--	--	--	--	--	--	1.8E-11	4.3E-10	7.8E-11
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	3.9E-11	9.3E-10	1.7E-10	--	--	--	--	--	--	--	--	--	--	--	--	3.9E-11	9.3E-10	1.7E-10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	2.6E-11	6.2E-10	1.1E-10	--	--	--	--	--	--	--	--	--	--	--	--	2.6E-11	6.2E-10	1.1E-10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	6.2E-11	1.5E-09	2.7E-10	--	--	--	--	--	--	--	--	--	--	--	--	6.2E-11	1.5E-09	2.7E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	6.4E-11	1.5E-09	2.8E-10	--	--	--	--	--	--	--	--	--	--	--	--	6.4E-11	1.5E-09	2.8E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	2.8E-10	6.6E-09	1.2E-09	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-10	6.6E-09	1.2E-09
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	7.0E-10	1.7E-08	3.1E-09	--	--	--	--	--	--	--	--	--	--	--	--	7.0E-10	1.7E-08	3.1E-09
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	2.3E-10	5.6E-09	1.0E-09	--	--	--	--	--	--	--	--	--	--	--	--	2.3E-10	5.6E-09	1.0E-09
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	1.1E-10	2.7E-09	5.0E-10	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-10	2.7E-09	5.0E-10
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	1.6E-10	3.8E-09	7.0E-10	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-10	3.8E-09	7.0E-10
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	1.0E-10	2.4E-09	4.5E-10	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-10	2.4E-09	4.5E-10
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	8.9E-11	2.1E-09	3.9E-10	--	--	--	--	--	--	--	--	--	--	--	--	8.9E-11	2.1E-09	3.9E-10
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	1.9E-11	4.4E-10	8.1E-11	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-11	4.4E-10	8.1E-11
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	7.5E-11	1.8E-09	3.3E-10	--	--	--	--	--	--	--	--	--	--	--	--	7.5E-11	1.8E-09	3.3E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	1.6E-10	3.9E-09	7.1E-10	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-10	3.9E-09	7.1E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	2.6E-11	6.3E-10	1.1E-10	--	--	--	--	--	--	--	--	--	--	--	--	2.6E-11	6.3E-10	1.1E-10
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	1.4E-10	3.5E-09	6.3E-10	--	--	--	--	--	--	--	--	--	--	--	--	1.4E-10	3.5E-09	6.3E-10
Total TAP			**0.44**	**10.5**	**1.91**	**0.15**	**1.53**	**3.83E-03**	**0.65**	**15.5**	**1.81**	**0.01**	**0.23**	**0.04**	**0.28**	**5.00**	**0.47**	**1.53**	**32.8**	**4.24**
Total HAP			**0.33**	**8.03**	**1.47**	**0.05**	**0.47**	**1.18E-03**	**0.65**	**15.5**	**1.81**	**0.01**	**0.23**	**0.04**	**0.28**	**5.00**	**0.47**	**1.32**	**29.2**	**3.79**
Maximum Single HAP (Methanol)																		**0.35**	**8.22**	**1.25**