Statement of Basis

Permit to Construct No. P-2010.0016
Project ID 61859

Woodgrain Millwork - Emmett
Emmett, Idaho

Facility ID 045-00006

Final

August 10, 2017
Tom Burnham
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
CAS No.	Chemical Abstracts Service registry number
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBF	million board feet
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration

PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Woodgrain Millwork - Emmett (Woodgrain) owns and operates a lumber mill located at 500 West Main Street in Emmett, Gem County, Idaho. The mill processes logs into dimensional lumber. Operations include log receiving/scales and pile storage, transferring logs from storage piles to the log deck using front end loaders equipped with a grapple, an enclosed debarker, sorter, a sawmill that includes water sprays to help control emissions and to cool the saw blades, dry kilns supplied with steam from natural gas-fired boilers, and a planer mill.

Wood waste management includes a grinder (hog), an enclosed chipper located within the sawmill building, screens, sawdust and green chip bin storage and truck loadout, and planer shavings bin storage and truck loadout. Sawdust and fines from the saws in the mill are pneumatically conveyed to a sawdust storage bin. Green chips are conveyed to the chip bin(s) by a mechanical (chain) conveyor. Planer shavings are pneumatically conveyed to a cyclone where the shavings drop into a planer shavings storage bin, and fine particulates from the cyclone separator are routed to a baghouse.

A diesel-fueled engine is used to run an on-site emergency fire water pump located in a small building northeast of the planer mill building. Small shop and office buildings house support and administrative activities. Electrical power for normal operations is provided by the local utility.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

• March 2, 2016	P-2010.0016, PTC revision to change the name of the facility from Gem Forest Products to Woodgrain Millwork – Emmett. The mailing address and the responsible official were also updated. (A, will be S as a result of this project)
• August 28, 2014	P-2010.0016, PTC revision to change the name of the facility from Emerald Forest Products, Inc. to Gem Forest Products. (S)
• December 30, 2010	P-2010.0016 PTC modification adding a new woodwaste boiler, a woodwaste handling system (i.e., sawmill sawdust and chip bins), emergency generator fire pump, and a request to limit the HAP emissions to less than major source thresholds to avoid Boiler MACT requirements.(S)
• March 8, 2010	P-2010.0016, PTC revision to change the name of the facility from Renewable Energy of Idaho, Inc. to Emerald Forest Products, Inc. The mailing address and the responsible official were also updated. (S)
• January 9, 2006	P-050019, Initial PTC issued to Renewable Energy of Idaho, Inc. Power generating facility from woodwaste-fired boiler and wood product and lumber facility. (S)

Application Scope

This PTC is for a minor modification at an existing minor facility.

The applicant has proposed to:

- Install a second natural gas-fired boiler.

- Increase daily and annual production capacity by installing three additional dry kilns. Emissions of PM, VOCs, and HAPs/TAPs from the dry kilns will be uncontrolled.
- Increase annual production of finished lumber from 32 million board feet (MMBF) to 90 MMBF.
- The new permit will also incorporate projects occurring in 2015 which consisted of converting Boiler1 to fire natural gas exclusively and replacement of the 140 bhp emergency fire pump engine.

Application Chronology

March 17, 2017	DEQ received an application and an application fee.
March 29 – April 13, 2017	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
April 13, 2017	DEQ determined that the application was incomplete.
May 12, 2017	DEQ received supplemental information from the applicant.
June 7, 2017	DEQ determined that the application was complete.
June 15, 2017	DEQ made available the draft permit and statement of basis for peer and regional office review.
July 21, 2017	DEQ made available the draft permit and statement of basis for applicant review.
August 8, 2017	DEQ received the permit processing fee.
August 10, 2017	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Source	Control Equipment	Emission Point ID No.
BOILER1	Boiler1 Boiler No. 1 Manufacturer: Cleaver-Brooks Model: CB 200-500-150, packaged boiler Manufacture date: 1997 Serial No. OLO96563 Rated Heat Input: 20.925 MMBtu/hr Fuel: Natural gas only Max. steam production: 21,572 lb/hr ~675 boiler hp	None	BOILER1 Stack height: 25 ft Exit diameter: 2.0 ft Exhaust flow: 4732 cfm Exit temperature: 350oF
BOILER2	Boiler2 Manufacturer: Nebraska Model: TBD, packaged boiler Manufacture date: 1982 Serial No. TBD Rated Heat Input: ~33.5 MMBtu/hr Fuel: Natural gas only Max. steam production: ~34,510 lb/hr 1,000 boiler hp	None	BOILER2 Stack height: 32 ft Exit diameter: 2.0 ft Exhaust flow: 7570 cfm Exit temperature: 350oF
KILN1	Kiln1 Manufacturer: Wellons Model: Double-track, Length 104 ft Capacity: 180,000 board feet/charge	None	KILN1_01 thru KILN1_20 2 rows of 10 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 0.001 m/s (flow is impeded by vent flap) Exit temp: 170oF
KILN2	Kiln2 Manufacturer: Wellons Model: Double-track, Length 104 ft Capacity: 180,000 board feet/charge	None	KILN2_01 thru KILN2_18 2 rows of 9 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 0.001 m/s (flow is impeded by vent flap) Exit temp: 170oF
KILN3	Kiln3 Manufacturer: Coe Model: Double-track, Length 120 ft Capacity: 180,000 board feet/charge	None	KILN3_01 thru KILN3_28 2 rows of 14 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 0.001 m/s (flow is impeded by vent flap) Exit temp: 170oF

KILN4	Kiln4 Manufacturer: USNR Model: Double-track, Length 120 ft Capacity: 180,000 board feet/charge	None	KILN4_01 thru KILN4_28 2 rows of 14 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 0.001 m/s (flow is impeded by vent flap) Exit temp: 170oF
KILN5	Kiln5 Manufacturer: USNR Model: Double-track, Length 120 ft Capacity: 180,000 board feet/charge	None	KILN5_01 thru KILN5_28 2 rows of 14 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 0.001 m/s (flow is impeded by vent flap) Exit temp: 170oF
PLNMILL	Planer mill, sawmill dust, and chip bins Sawdust generated from the sawmill will be pneumatically conveyed to the sawdust bin. A chipper is fully enclosed within the sawmill. The woodwaste generated by the chipper is chain driven to the chip bin. The sawdust and wood chips are periodically unloaded via a truck through a partially enclosed flap.	PM10 emissions from the planer mill and the chip bins are controlled by a cyclone and a baghouse. Baghouse PM_{10} efficiency is 99%	Exit height: 18.0 ft Exit diameter: 1.5 ft Exit velocity: 0.001 m/s Exit temperature: 77°F
PUMPENGN	Emergency Fire Pump Engine Mfr: Caterpillar Model: C7.1 Displacement < 10 liters per cylinder, 6 cylinder Rated capacity: Max 140 bhp (104 kW) Fuel: ULSD	None	PUMPENGN Stack height: 102.3 in (8.52 ft, 2.60 m) Exit diameter: 4 in (0.33 ft, 0.102 m) Exit velocity: max 50 m/s (vertical, with rain flap) Exit temperature: 855oF
	Fugitive dust sources These include the debarker, sawmill, hog, screens, , woodwaste storage pile, trucks driving on paved and unpaved roads, woodwaste truck unloading, etc.	Reasonable control of fugitive dust	

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the lumber mill operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, GHG, and HAPs were based on emission factors from AP-42, operation of 8,760 hours per year for the boilers and fire pump engine, university research emission factor for each species of wood per load for the kilns, and process information specific to the facility for this proposed project.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a "Synthetic Minor" source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The following table presents the uncontrolled Potential to Emit for regulated air pollutants as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this lumber mill operation uncontrolled Potential to Emit is based upon a worst-case for operation of the facility of 8,760 hr/yr.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources						
Boiler No. 1 (8760 hr/yr)	0.68	0.05	9.00	7.56	0.50	10,864
Boiler No. 2 (8760 hr/yr)	1.09	0.09	14.4	12.10	0.792	17,379
All Dry Kilns (5) @90 MMBF/yr	1.34	0.00	0.00	0.00	57.72	0.00
Planer mill shavings baghouse @90MMBF/yr	12.5	0.00	0.00	0.00	0.00	0.00
Sawdust bin vent	5.23	0.00	0.00	0.00	0.00	0.00
Chip bin vent	1.26	0.00	0.00	0.00	0.00	0.00
Fire Pump Engine	0.017	3.73E-4	0.23	0.29	0.09	40.18
Total, Point Sources	**22.12**	**0.14**	**23.63**	**19.95**	**59.10**	**28283.18**

The following table presents the uncontrolled Potential to Emit for HAP pollutants as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this lumber mill operation uncontrolled Potential to Emit is based upon a worst-case for operation of the facility of 8,760 hr/yr. Then, the worst-case maximum HAP Potential to Emit was determined for this lumber mill operation. Since there are no controls on HAP emitting equipment, this also represents the HAP emissions for the project.

Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

Hazardous Air Pollutants	PTE (T/yr)
2-Methylnaphthalene	5.62E-06
3-Methylchloranthrene	4.21E-07
Acenaphthene	7.69E-07
Acenaphthylene	1.66E-06
Anthracene	1.02E-06
Benzo(a)anthracene	8.33E-07
Benzo(a)pyrene	3.27E-07
Benzo(b)fluoranthene	4.46E-07
Benzo(g,h,i)perylene	2.81E-07
Benzo(k)fluoranthene	5.41E-07
Chrysene	4.59E-07
Dibenzo(a,h)anthracene	3.67E-07
Dichlorobenzene	2.81E-04
Fluoranthene	7.02E-07
Fluorene	2.52E-06
Indeno(1,2,3-cd)pyrene	7.58E-06
Naphthalene	1.43E-04

Naphthalene (as carcinogen)	1.43E-04
Phenanathrene	1.12E-05
Pyrene	2.34E-03
Polycyclic Organic Matter (POM) 7-PAH Group	2.67E-06
Acetaldehyde	2.02E+00
Acrolein	6.14E-02
Benzene	7.20E-04
1,3-Butadiene	9.58E-06
Formaldehyde	1.31E-01
Hexane	4.21E-01
Methanol	3.14E+00
Propionaldehyde	6.08E-02
Toluene	8.96E-04
7,12-Dimethylbenz(a)anthracene	3.75E-06
Butane	4.92E-01
Ethane	7.26E-01
Pentane	6.09E-01
Propane	3.75E-01
Arsenic	4.68E-05
Barium	1.03E-03
Beryllium	2.81E-06
Cadmium	2.58E-04
Chromium	3.28E-04
Cobalt	1.97E-05
Copper	1.99E-04
Manganese	8.90E-05
Mercury	6.09E-05
Molybdenum	2.58E-04
Nickel	4.92E-04
Selenium	5.62E-06
Vanadium	5.38E-04
Zinc	6.79E-03
Total	**8.05**

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria and GHG pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 4 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Boiler No. 1 (8760 hr/yr)	0.16	0.68	0.012	0.05	2.06	9.00	1.73	7.56	0.11	0.50
Existing Dry Kilns (2)	0.200	0.140	0.00	0.00	0.00	0.00	0.00	0.00	21.30	15.50
Planer mill baghouse @32 MMBF/yr	0.25	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sawdust bin vent	1.43	1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chip bin vent	0.35	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fire Pump Engine (500 hr/yr)	0.069	0.017	1.5E-3	3.4E-4	0.921	0.23	1.15	0.29	0.35	0.09
Pre-Project Totals	**2.46**	**3.33**	**0.01**	**0.05**	**2.98**	**9.23**	**2.88**	**7.85**	**21.76**	**16.09**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria and GHG pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 5 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Boiler No. 1 (8760 hr/yr)	0.16	0.68	0.012	0.05	2.06	9.00	1.73	7.56	0.11	0.50
Boiler No. 2 (8760 hr/yr)	0.25	1.09	0.020	0.09	3.29	14.4	2.76	12.10	0.18	0.792
All Dry Kilns (5)	0.42	1.34	0.00	0.00	0.00	0.00	0.00	0.00	31.96	57.72
Planer mill baghouse @ 90 MMBF/yr	0.25	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sawdust bin vent	1.43	5.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chip bin vent	0.35	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fire Pump Engine (500 hr/yr)	0.069	0.017	1.5E-3	3.7E-4	0.921	0.23	1.15	0.29	0.35	0.09
Post Project Totals	**2.93**	**10.12**	**0.03**	**0.14**	**6.27**	**23.63**	**5.64**	**19.95**	**32.60**	**59.10**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 6 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project PTE	**2.46**	**3.33**	**0.01**	**0.05**	**2.98**	**9.23**	**2.88**	**7.85**	**21.76**	**16.09**
Post Project PTE	**2.93**	**10.12**	**0.03**	**0.14**	**6.27**	**23.63**	**5.64**	**19.95**	**32.60**	**59.10**
Changes in PTE	**0.47**	**6.79**	**0.02**	**0.09**	**3.29**	**14.40**	**2.76**	**12.10**	**10.84**	**43.01**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of non-carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 7 PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Yes/No)
Acrolein	3.01E-02	1.70E-02	Yes
Barium	0.000145	0.033	No
Chromium	4.6E-05	0.033	No
Cobalt	2.76E-06	0.0033	No
Copper	2.8E-05	0.013	No
Hexane	0.059199	12	No
Manganese	1.25E-05	0.067	No
Mercury	8.55E-06	0.003	No
Methanol2	1.33E+00	1.73E+01	No

Molybdenum	3.62E-05	0.333	No
Naphthalene	2.01E-05	3.33	No
Pentane	0.08551	118	No
Propionaldehyde	3.22E-02	2.87E-02	Yes
Selenium	7.89E-07	0.013	No
Toluene	0.000112	25	No
Vanadium	7.56E-05	0.003	No
Zinc	9.54E-04	6.67E-01	No

Some of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for acrolein and propionaldehyde because the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 8 POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Yes/No)
2-Methylnaphthalene	7.89E-07	9.10E-05	No
3-Methylchloranthrene	5.92E-08	2.50E-06	No
Acenaphthene	5.92E-08	9.10E-05	No
Acenaphthylene	5.92E-08	9.10E-05	No
Acetaldehyde	1.83E-01	3.00E-03	Yes
Anthracene	7.89E-08	9.10E-05	No
Arsenic	6.58E-06	1.50E-06	Yes
Benzene	6.91E-05	8.00E-04	No
Benzo(g,h,i)perylene	3.95E-08	9.10E-05	No
Beryllium	3.95E-07	2.80E-05	No
Cadmium	3.62E-05	3.70E-06	Yes
Dichlorobenzene	3.95E-05	9.10E-05	No
Fluoranthene	9.87E-08	9.10E-05	No
Fluorene	9.21E-08	9.10E-05	No
Formaldehyde	1.62E-02	5.10E-04	Yes
Naphthalene	2.01E-05	9.10E-05	No
Nickel	6.91E-05	2.70E-05	Yes
Phenanathrene	5.59E-07	9.10E-05	No
Polycyclic Organic Matter (POM([a])	3.75E-07	2.00E-06	No
Pyrene	1.64E-07	9.10E-05	No

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for acetaldehyde, arsenic, cadmium, formaldehyde, and nickel because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, NO_X, and TAP from this project were above applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Gem County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For THAPs (Total Hazardous Air Pollutants) Only:

A = Use when any one HAP has actual or potential emissions $\geq$ 10 T/yr or if the aggregate of all HAPS (Total HAPs) has actual or potential emissions $\geq$ 25 T/yr.

SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits $\geq$ 8 T/yr of a single HAP or $\geq$ 20 T/yr of THAP.

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold

UNK = Class is unknown

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are $\geq$ 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are $\geq$ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are < 80 T/yr.

B = Actual and potential emissions are < 100 T/yr without permit restrictions.

UNK = Class is unknown.

[1] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

Table 97 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	22.12	10.12	**100**	B
PM_{10}	22.12	10.12	**100**	B
$PM_{2.5}$	22.12	10.12	**100**	B
SO_2	0.14	0.14	**100**	B
NO_X	23.63	23.63	**100**	B
CO	19.95	19.95	**100**	B
VOC	59.01	59.01	**100**	B
HAP (single)	3.14	3.14	**10**	B
HAP (total)	8.05	8.05	**25**	B
Pb	0.0001	0.0001	**100**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the proposed new emissions sources. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 ..... Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 ..... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.4 and 5.3.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 ..... Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979 and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following four equations:

IDAPA 58.01.01.701.01.a: If PW is $< 9{,}250$ lb/hr; $E = 0.045\ (PW)^{0.60}$

IDAPA 58.01.01.701.01.b: If PW is $\geq 9{,}250$ lb/hr; $E = 1.10\ (PW)^{0.25}$

For the throughput of 90,000 MBF/Yr, proposed as a result of this project, the PW is calculated from the heaviest wood per load at 22,500 lb/hr E is calculated as follows:

Proposed throughput = 11.25 T/hr x 2,000 lb/1 T = 22,500 lb/hr

Therefore, E is calculated as:

$E = 1.10 \times PW^{0.25} = 1.10 \times (22{,}500)^{0.25} = 13.47$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 2.93 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 5.86 lb-PM/hr (2.93 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 ..... Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, SO_2, NO_X, CO, VOC, and HAP or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 ..... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility is subject to the requirements of 40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, and 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. DEQ is delegated these Subparts.

40 CFR 60, Subpart Dc Standards of Performance for Small Industrial–Commercial–Institutional Steam Generating Units:

Both boilers at this facility only combust natural gas as fuel as required by Permit Condition 2.5. Therefore, the only Sections of this subpart that are applicable to the two boilers at this facility are the Applicability and Delegation of Authority specified in § CFR 60.40c(a), the Recordkeeping requirements of § CFR 60.48c(g) and (i), and the Reporting requirements of § CFR 60.48c(a), (a)(1), and (a)(3). These requirements are already contained in this permit for Boiler 1 in PC 2.8 through 2.10. Boiler 2 is added to this section.

40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines:

The emergency fire pump engine currently being utilized on site is used for emergency purposes only and is only subject to monitoring and recordkeeping requirements of this subpart. Permit conditions 5.9 through 5.12 incorporate these requirements. A breakdown of this subpart for applicability follows:

§60.4200 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in paragraphs (a)(1) through (4) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(3) Owners and operators of any stationary CI ICE that are modified or reconstructed after July 11, 2005 and any person that modifies or reconstructs any stationary CI ICE after July 11, 2005.

The new fire pump engine was installed in 2017 (a project exempt from permitting). The pump engine was reconstructed in early 2015, was not reconstructed as a fire pump engine, and is subject to 40 CFR 60, Subpart IIII.

The emergency fire pump engine is a new140 bhp diesel engine. The engine is subject to the requirements specified in 40 CFR 60, Subpart IIII for an emergency compression ignition engine that was modified or constructed after July 11, 2005, and is not a fire pump engine.

Per Section 60.4200(a), the construction date for this engine is the date the engine was ordered, i.e., March 30, 2015.

§60.4202 What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?

(a) Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later emergency stationary CI ICE with a maximum engine power less than or equal to 2,237 KW (3,000 HP) and a displacement of less than 10 liters per cylinder that are not fire pump engines to the emission standards specified in paragraphs (a)(1) through (2) of this section.

(2) For engines with a maximum engine power greater than or equal to 37 KW (50 HP), the certification emission standards for new nonroad CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants beginning in model year 2007.

None of the above sections (60.4201-60.4203) apply as Woodgrain is not a manufacturer of the engine. However, Per 60.4202(h), Notwithstanding the requirements in paragraphs (a) through (f) of this section, stationary CI internal combustion engine manufacturers are not required to certify reconstructed engines; however manufacturers may elect to do so. The reconstructed engine must be certified to the emission standards specified in paragraphs (a) through (f) of this section that are applicable to the model year, maximum engine power and displacement of the reconstructed emergency stationary CI ICE.

89.112, Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards. Table 1, for rated power equal to 140 bhp (104.398 kW).

(a) Exhaust emission from nonroad engines to which this subpart is applicable shall not exceed the applicable emission standards contained in Table 1, as follows:

Table 1.—Emission Standards (g/kW-hr)

Rated Power (kW)	Tier	Model Year	NOx	HC	NMHC + NOx	CO	PM
75 ≤ kW < 130	Tier 3	2007	---	---	4.0	5.0	0.30

89.113, Smoke Emission Standard

(a) Exhaust opacity from compression-ignition nonroad engines for which this subpart is applicable must not exceed:

(1) 20 percent during the acceleration mode;

(2) 15 percent during the lugging mode; and

(3) 50 percent during the peaks in either the acceleration or lugging modes.

(f) Owners and operators of any modified or reconstructed emergency stationary CI ICE subject to this subpart must meet the emission standards applicable to the model year, maximum engine power, and displacement of the modified or reconstructed CI ICE that are specified in paragraphs (a) through (e) of this section.

Woodgrain will meet the requirements of section (b) and the corresponding Part 89 requirements by complying with PC 5.3 and PC 5.9.

§60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.

Woodgrain will meet the requirement of section 60.4205(b) and the corresponding Part 89 requirements and will meet the standards through the life of the engine by complying with PC 5.3 and PC 5.9.

FUEL REQUIREMENTS FOR OWNERS AND OPERATORS

§60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?

(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted.

60.4207 (b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must purchase diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel.

80.510(b) Beginning June 1, 2010. Except as otherwise specifically provided in this subpart, all NR and LM diesel fuel is subject to the following per-gallon standards:

(1) Sulfur content.

(i) 15 ppm maximum for NR diesel fuel.

(ii) 500 ppm maximum for LM diesel fuel.

(2) Cetane index or aromatic content, as follows:

(i) A minimum cetane index of 40; or

(ii) A maximum aromatic content of 35 volume percent.

Woodgrain will meet the fuel requirements described above by complying with PC 5.8 and PC 5.10.

§60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.

(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

Woodgrain will install a non-resettable meter to comply with this requirement in accordance with PC 5.11.

§60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under paragraph (g) of this section:

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

(f) If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (f)(1) through (3) of this section. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (3) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(ii) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. Except as provided in paragraph (f)(3)(i) of this section, the 50 hours per calendar year for non-

emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator;

(B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(D) The power is provided only to the facility itself or to support the local transmission and distribution system.

(E) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

***Woodgrain will meet the requirements of* §60.4211 by complying with PC 5.11.**

NOTIFICATION, REPORTS, AND RECORDS FOR OWNERS AND OPERATORS

§60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

(b) If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

Woodgrain will maintain usage hour records. The new unit will meet §60.4214 (b) by complying with PC 5.12.

(d) If you own or operate an emergency stationary CI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §60.4211(f)(2)(ii) and (iii) or that operates for the purposes specified in §60.4211(f)(3)(i), you must submit an annual report according to the requirements in paragraphs (d)(1) through (3) of this section.

(1) The report must contain the following information:

(i) Company name and address where the engine is located.

(ii) Date of the report and beginning and ending dates of the reporting period.

(iii) Engine site rating and model year.

(iv) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.

(v) Hours operated for the purposes specified in §60.4211(f)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in §60.4211(f)(2)(ii) and (iii).

(vi) Number of hours the engine is contractually obligated to be available for the purposes specified in §60.4211(f)(2)(ii) and (iii).

(vii) Hours spent for operation for the purposes specified in §60.4211(f)(3)(i), including the date, start time, and end time for engine operation for the purposes specified in §60.4211(f)(3)(i). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

(2) The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.

(3) The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (*www.epa.gov/cdx*). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in §60.4.

Woodgrain will compile all applicable reporting requirements in accordance with §60.4214 by complying with PC 5.12.

NESHAP Applicability (40 CFR 61)

The proposed source is not an affected source subject to NESHAP in 40 CFR 61, and this permitting action does not alter the applicability status of existing affected sources at the facility.

MACT Applicability (40 CFR 63)

The facility is not subject to any MACT standards in 40 CFR Part 63.

The proposed source is not an affected source subject to NESHAP in 40 CFR Part 63, and this permitting action does not alter the applicability status of existing affected sources at the facility.

40 CFR Part 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines – this subpart is not applicable because the emergency engine is subject to 40 CFR 60, Subpart IIII.

40 CFR Part 63 Subpart JJJJJJ: NESHAP for Area Sources: Industrial, Commercial, and Institutional Boilers - this subpart is not applicable because the boilers are subject to 40 CFR 60, Subpart Dc.

40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters – The kilns are not subject to this because the facility is not a major source of HAPs.

Permit Conditions Review

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Boilers

References to the Wellons wood-fired boiler have been removed, along with fuel burning equipment requirements as it is now decommissioned and de-installed. Emissions limits were added for PM_{10}, NO_x, and opacity in PC 2.3 and PC 2.4, respectively. Emission limits for other criteria pollutants were not included because they are much lower than significant impact levels (SIL). For facility-wide emissions, $PM_{2.5}$ and NO_x are very close to NAAQS in the modeling analysis, so they are regulated for the boilers, and enforced with NG fuel restriction and steam usage and monitoring. VOC emissions for the entire facility are over significant level and similarly regulated. Operating permit conditions for steam generation was modified to require natural gas only for both Boiler1 and Boiler 2 in PC 2.5and steam production was increased to the levels applied for Boiler 1 and Boiler 2 in PC 2.6. PC 2.8 was added to require a monitoring device, so steam production can be monitored and recorded in added PC 2.8. Requirements for 40 CFR 60, Subpart Dc remain in permit conditions 2.9 through 2.11.

Kilns

$PM_{2.5}$ is demonstrated to be 10.0536 lb/day by following the kiln loading scenarios and this was rounded up to 10.1 lb/hr at the request of the applicant. This limit is listed along with VOC in Table 3.1 of PC 3.3. A VOC limit was include due to the significant levels in the emissions. This is to be achieved using six loading scenarios presented in PC 3.8, requiring exact combinations of species specific kiln loads at any given time as shown in Table 3.1. If a different combination of kiln loading is utilized at the facility, the facility must first show that the new loading scenario will meet the $PM_{2.5}$ and VOC limit by using kiln alternative loading in PC 3.9. They may do so using modeling for NAAQS if desired, but at minimum need to demonstrate ability to meet the limits of this permit.

Kilns 1 and 2 cannot be running at the same time, as requested by the applicant to meet the NAAQS. Permit condition 3.5 assures this.

Operating temperature requirements of 200°F or less were already in the permit and remain the same, as all emissions factors were taken from below this temperature.

Monitoring and recordkeeping permit conditions 3.10 through 3.13 require temperature, operating times, throughput by species, and $PM_{2.5}$ to be monitored to assure compliance with the permit emission limits.

Planar Mill

Throughput limits were increased to 90 MMBf annually, and 7.5 MMBf monthly in PC 4.3. Otherwise, this section remains the same.

Emergency Fire Pump Engine

40 CFR 60, Subpart IIII monitoring and recordkeeping were added in permit conditions 5.9 through 5.12, as well as a daily one hour limit for testing and maintenance in PC 5.4 as requested by the applicant. The 40 CFR 63, Subpart ZZZZ requirements were removed, as they no longer apply.

Fugitive Dust Sources

The ash bin associated with the decommissioned wood-fired boiler is removed from the list of fugitive sources in PC 6.1. Otherwise, this section remains the same.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

PRE-PROJECT EMISSIONS

	PM_{10}		$PM_{2.5}$		SO_2		NOx		CO		VOC		Lead		CO_2	CO_2e
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr		T/yr	T/yr	T/yr
Boiler No. 1 (8760 hr/yr)	0.16	0.68	0.16	0.68	0.012	0.05	2.06	9.00	1.73	7.56	0.11	0.50		4.50E-05	10,805	10,864
Existing Dry Kilns (2) @32 MMBF/yr	0.200	0.140	0.200	0.14							21.30	15.50				
Planer mill shavings baghouse @32	0.25	0.18	0.25	0.18												
Sawdust bin vent	1.43	1.86	0.43	0.56												
Chip bin vent	0.35	0.45	0.35	0.45												
Fire Pump Engine (500 hr/yr)	0.069	0.017	0.069	0.017	1.49E-03	3.73E-04	0.921	0.23	1.15	0.29	0.35	0.09			40.18	40.18
TOTAL	**2.45**	**3.33**	**1.45**	**2.03**	**0.014**	**0.05**	**2.98**	**9.23**	**2.88**	**7.85**	**21.77**	**16.08**		**4.50E-05**	**10,846**	**10,904**

POST-PROJECT EMISSIONS

	PM_{10}		$PM_{2.5}$		SO_2		NOx		CO		VOC		Lead		CO_2	CO_2e
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr	T/yr
Boiler No. 1 (8760 hr/yr)	0.16	0.68	0.16	0.68	0.012	0.05	2.06	9.00	1.73	7.56	0.11	0.50		4.50E-05	10,805	10,864
Boiler No. 2 (8760 hr/yr)	**0.25**	**1.09**	**0.25**	**1.09**	**0.020**	**0.09**	**3.29**	**14.4**	**2.76**	**12.10**	**0.18**	**0.792**		**7.20E-05**	**17,286**	**17,379**
All Dry Kilns (5) @90 MMBF/yr	**0.42**	**1.34**	**0.419**	**1.34**							**31.96**	**57.72**				
Planer mill shavings baghouse @90	0.25	0.50	0.25	0.50												
Sawdust bin vent	1.43	5.23	0.43	1.57												
Chip bin vent	0.35	1.26	0.35	1.26												
Fire Pump Engine (1 hr/day, 500 hr/yr)	0.069	0.017	0.069	0.017	1.49E-03	3.73E-04	0.921	0.23	1.15	0.29	0.35	0.09			40.18	40.18
TOTAL	**2.92**	**10.14**	**1.91**	**6.47**	**0.03**	**0.14**	**6.27**	**23.64**	**5.64**	**19.95**	**32.61**	**59.10**	**0.00**	**1.17E-04**	**28,132**	**28,283**

CHANGE IN EMISSIONS OF CRITERIA POLLUTANTS

	PM_{10}		$PM_{2.5}$		SO_2		NOx		CO		VOC		Lead		CO_2	CO_2e
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr	T/yr
Pre-Project Emissions	2.45	3.33	1.45	2.03	0.014	0.05	2.98	9.23	2.88	7.85	21.77	16.08		4.50E-05	10,846	10,904
Post-Project Emissions	2.92	10.14	1.91	6.47	0.03	0.14	6.27	23.64	5.64	19.95	32.61	59.10		1.17E-04	28,132	28,283
Change in Emissions	**0.47**	**6.81**	**0.47**	**4.45**	**0.02**	**0.09**	**3.29**	**14.41**	**2.76**	**12.10**	**10.84**	**43.01**		**7.20E-05**	**17,286**	**17,379**

Emissions Calculator for Sawmills

EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, December 2012

This spreadsheet calculates and compiles volatile organic compound (VOC) and hazardous air pollutant (HAP) emission factors (EF) in units of pounds of pollutant per thousand board feet of lumber dried (lb/mbf) that are preferred by EPA Region 10 for estimating emissions from lumber drying kilns. The EFs are based on actual lab-scale emission test data when available; when not available, EFs for similar species are substituted. When there are more than one similar species, the highest of the EF for the similar species is substituted.

A summary of the EFs for each species of wood is included on this sheet. The sheets that follow present the original test data as well as the calculations for creating each EF. There are two sheets per lumber species: one for HAPs and one for VOCs. To assure adequate conservatism for use in applicability determinations and compliance assurance applications, the EFs represent the 90th percentile of the data when three or more test values are available and the maximum test value of the data when less than three test values are available.

Species	Maximum Kiln Temp (°F)	WPP1 VOC[1] (lb/mbf)	Total HAP (lb/mbf)	Methanol (lb/mbf)	Form-aldehyde (lb/mbf)	Acet-aldehyde (lb/mbf)	Propion-aldehyde (lb/mbf)	Acrolein (lb/mbf)
Non-Resinous Softwood Species								
White Fir[3]	≤200	0.5875	0.1825	0.1220	0.0028	0.0550	0.0012	0.0015
	>200	1.0902	0.4956	0.4200	0.0163	0.0550	0.00176	0.00255
Western Hemlock	≤200	0.3803	0.2049	0.0809	0.0013	0.1200	0.0012	0.0015
	>200	0.6615	0.3661	0.2196	0.0044	0.1378	0.00176	0.00255
Western Red Cedar	≤200	0.3602	0.2460	0.1220	0.0013	0.1200	0.0012	0.0015
	>200	1.1453	0.5784	0.4200	0.0163	0.1378	0.00176	0.00255
Resinous Softwood Species (Non-Pine Family)								
Douglas Fir	≤200	0.7679	0.0924	0.0389	0.0013	0.0510	0.0005	0.0007
	>200	1.6969	0.1913	0.1170	0.0043	0.0682	0.0007	0.00105
Engelmann Spruce	≤200	0.1770	0.0631	0.0250	0.0013	0.0360	0.0003	0.0005
	>200	0.2161	0.1201	0.0780	0.0044	0.0360	0.0007	0.0010
Larch	≤200	0.7679	0.1629	0.1170	0.0043	0.0396	0.0008	0.0012
	>200	1.6969	0.1914	0.1170	0.0044	0.0682	0.0007	0.00105
Resinous Softwood Species (Pine Family)								
Lodgepole Pine	≤200	1.3803	0.0926	0.0730	0.0040	0.0120	0.0019	0.0017
	>200	2.1552	0.1640	0.0628	0.0041	0.0884	0.00344	0.0053
Ponderosa Pine	≤200	1.9645	0.1034	0.0550	0.0028	0.0420	0.0019	0.0017
	>200	4.4346	0.2503	0.1440	0.0092	0.0884	0.00344	0.0053
Western White Pine	≤200	2.8351	0.1034	0.0550	0.0028	0.0420	0.0019	0.0017
	>200	4.4346	0.2503	0.1440	0.0092	0.0884	0.00344	0.0053

1. 2015-01-06 ODEQ – Final Summary Kiln HAP and VOC EFs revised January 2015.xlsx

Emissions Calculator for Sawmills

EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, December 2012

This spreadsheet calculates and compiles volatile organic compound (VOC) and hazardous air pollutant (HAP) emission factors (EF) in units of pounds of pollutant per thousand board feet of lumber dried (lb/mbf) that are preferred by EPA Region 10 for estimating emissions from lumber drying kilns. The EFs are based on actual lab-scale emission test data when available; when not available, EFs for similar species are substituted. When there are more than one similar species, the highest of the EF for the similar species is substituted.

Species	Maximum Kiln Temp (°F)	WPP1 VOC[1] (lb/mbf)	Total HAP (lb/mbf)	Methanol[2] (lb/mbf)	Form-aldehyde[2] (lb/mbf)	Acet-aldehyde (lb/mbf)	Propion-aldehyde (lb/mbf)	Acrolein (lb/mbf)
Non-Resinous Softwood Species								
White Fir[3]	≤200	0.5875	0.1825	0.1220	0.0028	0.0550	0.0012	0.0015
	>200	1.0902	0.4956	0.4200	0.0163	0.0550	0.00176	0.00255
Western Hemlock	≤200	0.3803	0.2049	0.0809	0.0013	0.1200	0.0012	0.0015
	>200	0.6615	0.3661	0.2196	0.0044	0.1378	0.00176	0.00255
Western Red Cedar	≤200	0.3602	0.2460	0.1220	0.0013	0.1200	0.0012	0.0015
	>200	1.1483	0.5784	0.4200	0.0163	0.1378	0.00176	0.00255
Resinous Softwood Species (Non-Pine Family)								
Douglas Fir	≤200	0.7679	0.0924	0.0389	0.0013	0.0510	0.0005	0.0007
	>200	1.6969	0.1913	0.1170	0.0043	0.0682	0.0007	0.00105
Engelmann Spruce	≤200	0.1770	0.0631	0.0250	0.0013	0.0360	0.0003	0.0005
	>200	0.2161	0.1201	0.0780	0.0044	0.0360	0.0007	0.0010
Larch	≤200	0.7679	0.1629	0.1170	0.0043	0.0396	0.0008	0.0012
	>200	1.6969	0.1914	0.1170	0.0044	0.0682	0.0007	0.00105
Resinous Softwood Species (Pine Family)								
Lodgepole Pine	≤200	1.3803	0.0926	0.0730	0.0040	0.0120	0.0019	0.0017
	>200	2.1552	0.1640	0.0628	0.0041	0.0884	0.00344	0.0053
Ponderosa Pine	≤200	1.9645	0.1034	0.0550	0.0028	0.0420	0.0019	0.0017
	>200	4.4346	0.2503	0.1440	0.0092	0.0884	0.00344	0.0053
Western White Pine	≤200	2.8351	0.1034	0.0550	0.0026	0.0420	0.0019	0.0017
	>200	4.4346	0.2503	0.1440	0.0092	0.0884	0.00344	0.0053

Wood Species Estimate (2016):

White Fir	25%
Douglas Fir	20%
Pine (Ponderosa)	50%

Maximum Annual Production (All Kilns): 90,000 MBF

Wood Species	Maximum Kiln Temp (°F)	Percentage of Total Wood Processed (Annual)	EF (lb/MBF)	Minimum hours per cycle (hrs)	Kiln 1 or Kiln2 Max Charge (MBF)	Kilns 3-5 Max Charge (MBF)	PM Emissions: Scenario 1 WF/PP/LP lb/hr/cy WF Kiln 1 or 2; 90%/10% PP/LP 3-5	PM Emissions: Scenario 2 DF/larch PP/LP lb/hr/cy 90% DF&PP / 10% WLALP Kiln 1 or 2 & 3-5	PM Emissions: Scenario 3 Spruce PP/LP lb/hr/cy Spruce Kiln 1 or 2 & 90% PP / 10% LP 3-5	PM Emissions: Scenario 4-6 WF PP/LP lb/hr/cy WF Kiln 1 or 2&3,4, or 5; 90% PP/ 10% LP 3,4, or 5	Annual PM Emissions T/yr @ est. percentage
Non-Resinous Softwood Species											
White Fir	< 200	25.00%	0.051	65	180	210	0.1412			0.1412	0.574
White Fir	> 200									0.1648	
Western Hemlock	< 200	0.00%									
Western Hemlock	> 200										
Western Red Cedar	< 200	0.00%									
Western Red Cedar	> 200										
Resinous Softwood Species (Non-Pine)											
Douglas Fir	< 200	20.00%	0.0240	32	180	210		0.1502			0.216
Douglas Fir	> 200										
Engelmann Spruce	< 200	10.00%	0.051	44	131	152			0.1518		0.230
Engelmann Spruce	> 200										
Larch	< 200	10.00%	0.051	32	180	210					0.230
Larch	> 200										
Resinous Softwood Species (Pine)											
Lodgepole Pine	< 200	10.00%	0.051	36	131	152	0.1127	0.1127	0.1127	0.1127	0.23
Lodgepole Pine	> 200										
Ponderosa Pine	< 200	50.00%	0.024	36	131	152					0.54
Ponderosa Pine	> 200										
Western White Pine	< 200	0.00%									
Western White Pine	> 200										
											1.34

LB/HR EMISSIONS PER MAX CHARGES MBF AND DAILY DISTRIBUTION OF SPECIES

Species	Maximum Kiln Temp (°F)	WPP1 VOC[1] (lb/hr)	Total HAP (lb/hr)	Methanol[2] (lb/hr)	Form-aldehyde[2] (lb/hr)	Acet-aldehyde (lb/hr)	Propion-aldehyde (lb/hr)	Acrolein (lb/hr)
Non-Resinous Softwood Species								
White Fir[3]	≤200	1.63	0.51	0.34	7.75E-03	0.15	3.32E-03	4.15E-03
	>200	1.90	0.59	0.39	9.05E-03	0.18	3.88E-03	4.85E-03
Western Hemlock	≤200							
	>200							
Western Red Cedar	≤200							
	>200							
Resinous Softwood Species (Non-Pine Family)								
Douglas Fir	≤200	3.89	0.47	0.20	6.58E-03	0.26	2.53E-03	3.54E-03
	>200							
Engelmann Spruce	≤200	0.53	0.19	0.07	3.87E-03	0.11	8.93E-04	1.49E-03
	>200							
Larch	≤200	0.43	0.09	0.07	2.42E-03	0.02	4.50E-04	6.75E-04
	>200							
Resinous Softwood Species (Pine Family)								
Lodgepole Pine	≤200	1.75	0.12	0.09	5.07E-03	0.02	2.41E-03	2.15E-03
	>200							
Ponderosa Pine	≤200	7.47	0.39	0.21	1.06E-02	0.16	7.22E-03	6.46E-03
	>200							
Western White Pine	≤200							
	>200							
	TOTAL	31.96	2.12	1.33	0.06	0.80	0.0322	0.0301

TPY BASED ON 90,000 MBF AND PERCENT OF SPECIES PROCESSED

Species	Maximum Kiln Temp (°F)	WPP1 VOC[1] (T/yr)	Total HAP (T/yr)	Methanol (T/yr)	Form-aldehyde (T/yr)	Acet-aldehyde (T/yr)	Propion-aldehyde (T/yr)	Acrolein (T/yr)
Non-Resinous Softwood Species								
White Fir[3]	≤200	6.81	2.05	1.37	0.032	0.62	0.014	0.017
	>200							
Western Hemlock	≤200	0.00	0.00	0.00	0.000	0.00	0.000	0.000
	>200							
Western Red Cedar	≤200							
	>200							
Resinous Softwood Species (Non-Pine Family)								
Douglas Fir	≤200	6.91	0.83	0.35	0.012	0.46	0.005	0.006
	>200							
Engelmann Spruce	≤200	0.80	0.28	0.11	0.01	0.16	0.00	0.00
	>200							
Larch	≤200	3.46	0.73	0.53	0.02	0.18	0.00	0.01
	>200							
Resinous Softwood Species (Pine Family)								
Lodgepole Pine	≤200	6.21	0.42	0.33	0.018	0.05	0.009	0.008
	>200							
Ponderosa Pine	≤200	44.20	2.33	1.24	0.06	0.95	0.04	0.04
	>200							
Western White Pine	≤200							
	>200							
	TOTAL	57.72	5.21	3.14	0.11	2.02	0.06	0.06

[1] VOC emissions have been approximated consistent with EPA's Interim VOC Measurement Protocol for the Wood Products Industry - July 2007 (WPP1 VOC). Employing WPP1 VOC underestimates emissions when the mass-to-carbon ratio of unidentified VOC exceeds that of propane. Ethanol and acetic acid are examples of compounds that contribute to lumber drying VOC emissions (for some species more than others), and both have mass-to-carbon ratios exceeding that of propane.

2

[3] White fir in this context refers to any one of several species of true fir grown in the West. The collection of timber commonly referred to as "white fir" includes the following species: white fir, grand fir, noble fir and subalpine fir.

"NCASI Environmental Resource Handbook for Wood Products Plants", October 31, 2004, Chapter 3: Wood Drying, Table 3.3.1.2-1 *Kiln- Steam Heated, Unfilterable PM =* *0.009* *lb/MBF* *NOT USED - NO DOCUMENTATION*

Emissions Calculator for Sawmills

Boiler 1	8760	hr/yr			
Boiler 2	8760	hr/yr	Emerg. Engine	500	hr/yr

Hazardous Air Pollutants (HAPs) - T/yr emissions					
	Boiler No. 1	Boiler No. 2	140 bhp Emergency Engine	Kilns @ < 200°F	TOTAL
PAH HAPs					
2-Methylnaphthalene	**2.16E-06**	**3.46E-06**			5.62E-06
3-Methylchloranthrene	**1.62E-07**	**2.59E-07**			4.21E-07
Acenaphthene	**1.62E-07**	**2.59E-07**	**3.48E-07**		7.69E-07
Acenaphthylene	**1.62E-07**	**2.59E-07**	**1.24E-06**		1.66E-06
Anthracene	**2.16E-07**	**3.46E-07**	**4.58E-07**		1.02E-06
Benzo(a)anthracene	**1.62E-07**	**2.59E-07**	**4.12E-07**		8.33E-07
Benzo(a)pyrene	**1.08E-07**	**1.73E-07**	**4.61E-08**		3.27E-07
Benzo(b)fluoranthene	**1.62E-07**	**2.59E-07**	**2.43E-08**		4.46E-07
Benzo(g,h,i)perylene	**1.08E-07**	**1.73E-07**			2.81E-07
Benzo(k)fluoranthene	**1.62E-07**	**2.59E-07**	**1.20E-07**		5.41E-07
Chrysene	**1.62E-07**	**2.59E-07**	**3.80E-08**		4.59E-07
Dibenzo(a,h)anthracene	**1.08E-07**	**1.73E-07**	**8.65E-08**		3.67E-07
Dichlorobenzene	**1.08E-04**	**1.73E-04**	**1.43E-07**		2.81E-04
Fluoranthene	**2.70E-07**	**4.32E-07**			7.02E-07
Fluorene	**2.52E-07**	**4.03E-07**	**1.86E-06**		2.52E-06
Indeno(1,2,3-cd)pyrene	**1.62E-07**	**2.59E-07**	**7.15E-06**		7.58E-06
Naphthalene	**5.49E-05**	8.79E-05	**9.19E-08**		1.43E-04
Naphthalene (as carcinogen)	**5.49E-05**	**8.79E-05**	**9.19E-08**		1.43E-04
Phenanathrene	**1.53E-06**	**2.45E-06**	**7.20E-06**		1.12E-05
Pyrene	**4.50E-07**	**7.20E-07**	**2.34E-03**		2.34E-03
Polycyclic Organic Matter (POM) 7-PAH Group	**1.03E-06**	**1.64E-06**	**1.68E-09**		2.67E-06
Non-PAH HAPs					
Acetaldehyde			**1.88E-04**	**2.02E+00**	2.02E+00
Acrolein			2.27E-05	6.14E-02	6.14E-02
Benzene	**1.89E-04**	**3.03E-04**	**2.29E-04**		7.20E-04
1,3-Butadiene			**9.58E-06**		9.58E-06
Formaldehyde	**6.75E-03**	**1.08E-02**	**1.65E-05**	**1.14E-01**	1.31E-01
Hexane	1.62E-01	2.59E-01			4.21E-01
Methanol				3.14	3.14E+00
Propionaldehyde				6.08E-02	6.08E-02
Toluene	3.06E-04	4.90E-04	1.00E-04		8.96E-04
Non-HAP Organic Compounds					
7,12-Dimethylbenz(a)anthracene	1.44E-06	2.30E-06			3.75E-06
Butane	1.89E-01	3.03E-01			4.92E-01
Ethane	2.79E-01	4.47E-01			7.26E-01
Pentane	2.34E-01	3.75E-01			6.09E-01
Propane	1.44E-01	2.30E-01			3.75E-01
Metals (HAPs)					
Arsenic	**1.80E-05**	**2.88E-05**			4.68E-05
Barium	3.96E-04	6.34E-04			1.03E-03
Beryllium	**1.08E-06**	**1.73E-06**			2.81E-06
Cadmium	**9.91E-05**	**1.58E-04**			2.58E-04
Chromium	1.26E-04	2.02E-04			3.28E-04
Cobalt	7.56E-06	1.21E-05			1.97E-05
Copper	7.65E-05	1.22E-04			1.99E-04
Manganese	3.42E-05	5.47E-05			8.90E-05
Mercury	2.34E-05	3.75E-05			6.09E-05
Molybdenum	9.91E-05	1.58E-04			2.58E-04
Nickel	**1.89E-04**	**3.03E-04**			4.92E-04
Selenium	2.16E-06	3.46E-06			5.62E-06
Vanadium	2.07E-04	3.31E-04			5.38E-04
Zinc	2.61E-03	4.18E-03			6.79E-03
				TOTAL	**8.05**
				Max of any HAP	3.14

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM /

DATE: **July 20**, 2017

TO: **Tom Burnham**, Permit Writer, Air Program

FROM: Thomas Swain, Air Quality Modeler, Analyst 3, Air Program

PROJECT: Woodgrain Millwork, Emmett Mill, in Emmett, Idaho, a Permit to Construct (PTC) P-2016.0016, Project 61859, Facility ID No. 045-00006

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

1.0 Summary

Woodgrain Millwork, Emmett, Idaho, (WM), submitted an application for a Permit to Construct (PTC) on December 1, 2016, for a modification to an existing facility located in Emmett, Idaho, denoted as PTC P-2016.0016.

WM is a lumber mill facility producing dimensional lumber from timber logs. The operations for this project include log receiving/scaling, pile storage, log transfer, debarking, sorting, a sawmill, drying kilns, and a planer mill. Wood waste management activities are also a part of this project, and include a grinder, a chipper, screens, storage for sawdust and green chip, truck loadout, and storage and truck loadout for planer shavings.

Details of the entire process are discussed in the main body of the DEQ Statement of Basis supporting the issued proposed PTC. This modeling review memorandum provides a summary and approval of the ambient air impact analyses submitted with the permit application. It also describes DEQ's review of those analyses, DEQ's verification analyses, additional clarifications, and conclusions.

Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were submitted to DEQ to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard as required by IDAPA 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03).

Stantec Consulting Services (Stantec) performed the ambient air impact analyses for this project on behalf of WM. The analyses were performed to demonstrate compliance with applicable air quality standards. The DEQ review summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that the estimated emissions increases at the facility associated with the proposed project will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. Evaluation of emissions estimates is the responsibility of the permit writer and is addressed in the main body of the Statement of Basis. The accuracy of emissions estimates was not evaluated as part of DEQ's review of the air impact analyses submitted and described in this modeling review memorandum.

A modeling protocol was submitted at the pre-application meeting for this project on July 15, 2016. This protocol was conditionally approved on August 10, 2016. Stantec submitted a 15-day application on December 1, 2016. This application was denied on December 9, 2016. DEQ received a revised application on March 23, 2017. This application was deemed incomplete on April 13, 2017. There was additional discussion between Stantec and DEQ regarding the resolution of these issues before another application was submitted on May 12, 2017. This application was deemed complete on June 6, 2017.

The final submitted air quality impact analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at ambient air locations where and when the project has a significant impact; 5)

showed that Toxic Air Pollutant (TAP) emissions increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments.

Table 1 presents key assumptions and results to be considered in the development of the permit.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (*Guideline on Air Quality Models*). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and analyses demonstrated to the satisfaction of the Department that operation of the proposed facility will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
General Emissions Rates. Emissions rates used in the modeling analyses, as listed in this memorandum, represent maximum potential emissions as given by design capacity or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses. Emissions for kiln emission scenarios of wood fuel combinations not listed in application have not been modeled to demonstrate compliance with NAAQS.
Modeling Thresholds for Criteria Pollutant Emissions. Maximum short-term and long-term emissions of the criteria pollutants NO_2, PM_{10}, and $PM_{2.5}$ associated with the proposed project are above the Level 1 threshold for each pollutant. Therefore, a demonstration of compliance with NAAQS was done for those criteria pollutants and applicable averaging times.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds, or for pollutant increases above BRC thresholds (where the pollutant-specific BRC modeling exemption can be used). Compliance with NAAQS has not been demonstrated for emissions that exceed the emission estimates presented in the application.
TAPS Modeling. Emission rates of the TAPs arsenic, cadmium, nickel, and formaldehyde exceeded Emissions Screening Level (EL) rates of Idaho Air Rules Section 585 and 586.	Air impact analyses demonstrating compliance with TAPS, as required by Idaho Air Rules Section 203.03, is required for pollutants having an emissions rate greater than ELs. Therefore, a demonstration of compliance with TAPs increments was required.
Operation of Kilns: Kiln 1 and 2 must not operate simultaneously in the short-term (hourly or daily) and the issued permit must establish this restriction.	Compliance with NAAQS was not demonstrated for simultaneous operation of Kiln 1 and 2.

2.0 Background Information

This section provides background information applicable to the project and the site where the facility is located. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

WM is an existing facility located in Emmett, Idaho, produces dimensional lumber from raw timber logs. This project proposed to increase the allowable production from 32 million board feet per year (MMBF) to 90 MMBF. A second natural gas-fired boiler (designated boiler #2) and three new lumber drying kilns (designated kilns 3,4, and 5) will be added to allow for the increased production.

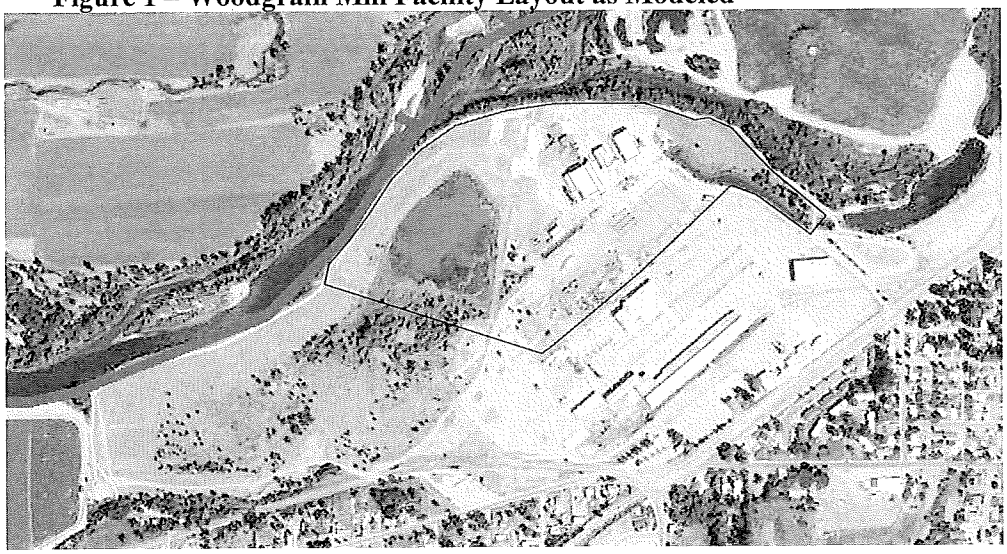
Six possibilities of short term species scenarios were assessed in the modeling analyses to demonstrate compliance with the NAAQS. These scenarios are discussed further in section 3.3.2

The air impact analyses performed by Stantec, as part of the permit application, were submitted to show that facility-wide emissions do not cause or contribute to an exceedance of any NAAQS or TAPS AACs or AACCs. A detailed description of the facility is listed in Section 1 of the application.

2.2 Proposed Location and Area Classification

The WM facility is located at the property previously occupied by Boise Cascade, at 500 W. Main Street in Emmett, Idaho. At the time of the modeling application, WM owned a 53-acre parcel and planned to purchase an additional 19 acres of adjacent property. The modeling assumes ownership or control of both parcels of land, as shown below in Figure 1. WM, at the time of permit issuance, has indeed purchased the additional acreage. This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

Figure 1 – Woodgrain Mill Facility Layout as Modeled



2.3 Air Impact Analyses Required for All Permits to Construct

Criteria Pollutant and TAP Impact Analyses for a PTC are addressed in Idaho Air Rules Sections 203.02 and 203.03:

No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:

02. NAAQS. *The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*

03. Toxic Air Pollutants. *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

Estimates of Ambient Concentrations. *All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted using methods and data as outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

DEQ has developed modeling applicability thresholds that effectively assure that project-related emissions increases below stated values will result in ambient air impacts below the applicable SILs. The threshold levels and dispersion modeling analyses supporting those levels are presented in the *State of Idaho Guideline for Performing Air Quality Impact Analyses*[1] (*Idaho Air Modeling Guideline*). Use of a modeling threshold represents the use of conservative modeling, performed in support of the threshold, as a project SIL analysis. Project-specific modeling applicability for this project is addressed in Section 3.1.1 of this memorandum.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from facility-wide emissions, and emissions from any nearby co-contributing sources, and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the

facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. If the SIL analysis indicates the facility/modification has an impact exceeding the SIL, the facility might not have a significant contribution to a violation if impacts are below the SIL at the specific receptor showing the violation during the time periods when a modeled violation occurred.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	75 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years. The O_3 standard was revised (the notice was signed by the EPA Administrator on October 1, 2015) to 70 ppb. However, this standard will not be applicable for permitting purposes until it is incorporated by reference *sine die* into Idaho Air Rules.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or b) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or c) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 *Toxic Air Pollutant Analyses*

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

Per Idaho Air Rules Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP.

3.0 Analytical Methods and Data

This section describes the methods and data used in analyses to demonstrate compliance with applicable air quality impact requirements.

3.1 Emission Source Data

Emissions rates of criteria pollutants and TAPs for the project were provided by the applicant for various applicable averaging periods. Review and approval of estimated emissions was the responsibility of the DEQ permit writer, and is not addressed in this modeling memorandum. DEQ modeling review included verification that the application's potential emissions rates were properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emissions rates used in the dispersion modeling analyses submitted by Stantec, as listed in this memorandum, should be reviewed by the DEQ permit writer against those in the emissions inventory of the permit application. All modeled criteria air pollutant and TAP emissions rates should be equal to or greater than the facility's emissions calculated in other sections of the PTC application or requested permit allowable emission rates.

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

If the modification-related or facility-wide potential to emit (PTE) values for a specific criteria pollutant would qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 if it were not for some pollutants exceeding BRC thresholds, then an air impact analysis for that pollutant may not be required for permit issuance. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules (Policy on NAAQS Compliance Demonstration Requirements, DEQ policy memorandum, July 11, 2014) is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the

emissions of another criteria pollutant." The interpretation policy also states that the exemption criteria of uncontrolled PTE not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year.

DEQ has generated non-site-specific project modeling thresholds for those projects that cannot use the BRC exemption from an impact analysis (if there are specific permitted emissions limits that require changing, etc.). Modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*. These thresholds were based on assuring an ambient impact of less than established SIL for that specific pollutant and averaging period.

If project-specific total emissions rates are below Level I Modeling Thresholds, project-specific air impact analyses are not necessary for permitting. Use of level II modeling thresholds are conditional, requiring DEQ approval. Table 3 provides the emissions-based modeling applicability summary. The submitted application did not evaluate estimated emissions increases against BRC thresholds. It was assumed that the project would not qualify for the BRC exclusion from NAAQS compliance demonstration because various existing permit limits/restrictions must be changed, which could not be accomplished under an exemption. The submitted modeling report evaluated modeling applicability based on comparison of emissions to Level 1 Modeling Applicability Thresholds. Emissions of all criteria pollutants except SO_2, CO, and Lead resulting from the proposed project are greater than the Level 1 modeling thresholds, and therefore air impact analyses are required for these criteria pollutants. Emissions as modeled for each scenario and criteria pollutant are listed in Table 4 and Table 5. These scenarios are discussed further in section 3.3

Table 3. MODELING APPLICABILITY ANALYSIS RESULTS

Pollutant	Averaging Period	Emissions	BRC Threshold[a] (ton/year)	Level I Modeling Thresholds (lb/hour or ton/year)	Level II Modeling Thresholds (lb/hour or ton/year)	Modeling Required
$PM_{2.5}$	Annual	4.45 ton/yr[a]	1.0	0.350	4.1	Yes
	24-hour	0.47 lb/hr[b]		0.054	0.63	Yes
PM_{10}	24-hour	0.47 lb/hr[b]	1.5	0.22	2.6	Yes
NOx	Annual	14.4 ton/yr[a]	4.0	1.2	14	Yes
	1-hour	3.29 lb/hr[b]		0.2	2.4	Yes
SO_2	Annual	0.1 ton/yr[a]	4.0	1.2	14	No
	1-hour	0.02 lb/hr[b]		0.21	2.5	No
CO	1,8 hour	2.8 lb/hr[b]	10.0	15	175	No
Lead	Annual	7.0 E-05 lb/yr[c]	0.06	14 pounds/month		No

a. No criteria pollutant emissions increases could qualify for a BRC exemption.
b. Tons/year.
c. Pounds/hour.
d. Pounds/year

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

Allowable emissions estimates of VOCs and NOx are below the 100 tons/year threshold, and DEQ determined it was not appropriate or necessary to require a quantitative source specific O_3 impact analysis.

Table 4. MODELED CRITERIA POLLUTANTS FOR ALL SCENARIOS

Emissions Source ID	Source Description	Modeled Emissions Rates				
		$PM_{2.5}$		PM_{10}	NO_2	
		24-hour (lb/hr)[a]	Annual (ton/yr)[b]	24-hour (lb/hr)	24-hour (lb/hr)	Annual (ton/yr)
BOILER1	Boiler No. 1	0.156	0.683		2.06	9.02
BOILER2	Boiler No. 2	0.250	1.095		3.29	14.41
PUMPENGN	Fire Pump Engine	0.0690	0.0173		0.921	0.230
PLANERBH	Planer Baghouse	0.250	0.526			
SAWBIN	Sawdust Bin Vent	0.429	1.577	1.431		
CHIPBIN	Green Chips Bin Vent	0.345	1.270	0.345		
SAWLOAD	Sawdust Truck Loadout	0.00239	0.00311	0.00798		
CHIPLOAD	Chips Truck Loadout	0.00195	0.00254	0.0195		
SHAVLOAD	Shavings Loadout	0.00216	0.00280	0.00216		

a. Pounds/hour.
b. Tons/year divided evenly throughout 8,760 hours/year.

Table 5. MODELED KILN CRITERIA POLLUTANTS FOR OPERATIONAL SCENARIOS						
Emissions Source	**Modeled Emissions**					
	Scenario 1	**Scenario 2**	**Scenario 3**	**Scenario 4**	**Scenario 5**	**Scenario 6**
$PM_{2.5}$ and PM_{10} 24-hour (pounds/hour)						
Kiln 1 or 2[a]	0.141	0.150	0.152	0.141	0.141	0.141
Kiln 3[b]	0.113	0.113	0.113	0.165	0.113	0.113
Kiln 4[b]	0.113	0.113	0.113	0.113	0.165	0.113
Kiln 5[b]	0.113	0.113	0.113	0.113	0.113	0.165
$PM_{2.5}$ Annual – all Scenarios (tons/year)[c]						
Kiln 1 or 2[a]	0.336					
Kiln 3[b]	0.336					
Kiln 4[b]	0.336					
Kiln 5[b]	0.336					

a. Distributed evenly among 20 vents for Kiln 1 and 18 vents for Kiln 2.
b. Distributed evenly among 28 vents.
c. Evenly distributed throughout 8,760 hours/year.

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible based on the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts would be anticipated.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed after July 1, 1995. The submitted emissions inventory in the application identified five TAPs having potential emission increases that could exceed screening emissions levels (ELs) of Idaho Air Rules Section 585 or 586. Potential increases in emissions of other TAPs were all less than applicable ELs. Table 6 lists emission increases for theses TAPs and compares them to the EL.

Table 6. MODELED TAP EMISSIONS RATES			
Pollutant	**CAS No.**	**Total Emissions Increase (lbs/hr)[a]**	**Screening Emissions Level (EL) (lbs/hr)**
Arsenic	7440-38-2	6.58E-06	1.5E-06
Cadmium	7440-43-9	3.62E-05	3.7E-06
Formaldehyde	50-00-0	2.47E-03	5.1E-04
Nickel	7440-02-0	6.91E-05	2.70E-05

a. Pounds/hour, PTE.

Table 7 provides source-specific TAP emission rates as provided in the air impact analyses.

Table 7. TAPS EMISSIONS AS MODELED PER SOURCE				
Source ID	**Arsenic** (lb/hr)[a]	**Cadmium** (lb/hr)	**Formaldehyde** (lb/hr)	**Nickel** (lb/hr)
Boiler # 2	6.58E-06	3.62E-05	2.47E-03	6.91E-05

a. Pounds/hour, PTE.

3.2 Emission Release Parameters

Table 8 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for facility sources as used in the final modeling assessment.

Stack parameters used in the modeling analyses were largely documented/justified adequately in the application. Derivation of stack parameters and emission variation for the kilns was based on refined information from the applicant and a consultant, Mr. Sprague. The characterization of the emissions for typical runs was justified with documented studies of kiln operations in similar facilities in Oregon.

Table 8. MODELING PARAMETERS

Point Sources

Source ID	Description	Easting[a] (X) (m)	Northing[b] (Y) (m)	Stack Height (ft)[c]	Temp. (°F)[d]	Exit Vel. (fps)[e]	Stack Diam. (ft)[c]
BOILER1	Existing Boiler	539037.2	4858312.0	25	350.0	36.18	2.00
BOILER2	New Boiler	539076.0	4858212.3	32	350.0	57.87	2.00
PUMPENGN	Pump Engine	539163.7	4858337.8	8.53	855.0	164.04	0.33
PLANERBH	Planer Baghouse	539120.4	4858343.4	50	-459.7	69.29	3.50
SAWBIN	Sawhouse Dust Bin	538992.7	4858253.0	48	-459.7	0.00	4.92
CHIPBIN	Green Chips Bin Vent	538998.5	4858240.6	50	-459.7	0.00	4.90
KILN1_01-20	Existing Kiln 1	539054.5	4858298.2	29	170.0	20.73	1.70
KILN2_01-18	Existing Kiln 2	539063.1	4858305.6	29	170.0	20.73	1.70
KILN3_01-28	New Kiln #3	539070.3	4858196.6	29	170.0	20.73	1.70
KILN4_01-28	New Kiln #4	539078.0	4858188.6	29	170.0	20.73	1.70
KILN5_01-28	New Kiln #5	539085.2	4858180.1	29	170.0	20.73	1.70

Volume Sources

Source ID	Description	Easting[a] (X) (m)	Northing[b] (Y) (m)	Release Ht (ft)[c]	Init. Horiz. Dimen. (ft)[c]	Init. Vert. Dimen. (ft)[c]
SAWLOAD	Sawust Truck Loadout	538990.1	4858249.3	12	2.33	6.46
CHIPLOAD	Chips Truck Loadout	538997.8	4858236.9	12	2.33	6.46
SHAVLOAD	Shaving Loadout	539122.2	4858334.7	12	2.33	6.46

a. Universal Transverse Mercator coordinates in meters in the east/west direction.
b. Universal Transverse Mercator coordinates in meters in the north/south direction.
c. Feet.
d. Temperature in degrees Fahrenheit.
e. Feet/second.

3.2 Background Concentrations

Background concentrations were obtained from NWAirquest[2], based on the coordinates of the center of the facility. These values are listed in Table 11, *Results for Cumulative NAAQS Impacts*.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Analyses

Stantec performed project-specific air impact analyses that were determined by DEQ to be reasonably representative of the proposed facility as described in the application. Results of the submitted analyses demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 9 provides a brief description of parameters used in the modeling analyses.

Table 9. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Emmett, Idaho	The facility is located in an area that is attainment or unclassified for all criteria air pollutants
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 16216r
Meteorological Data	2011-2015 surface data and upper air data from Boise, ID	See Section 3.3.4 for a detailed discussion on the meteorological data.
Terrain	Considered	See Section 5.3 below.
Building Downwash	Considered	Because buildings are present at the WM facility, BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
Receptor Grid	Grid 1	25-meter spacing along the areas of ambient boundary out to 100 meters
	Grid 2	50-meter spacing out to distances of 500 meters with respect to the facility
	Grid 3	100-meter spacing out to approximately 1000 meters
	Grid 4	250- meter spacing out to 2500 meters
	Grid 5	500-meter spacing out to 5000 meters

3.3.2 Modeling protocol and Methodology

A modeling protocol was submitted at the pre-application meeting for this project on July 15, 2016. This protocol was conditionally approved on August 10, 2016. Stantec submitted a 15-day pre-permit construction approval application on December 1, 2016. This application was denied on December 9, 2016. The reasons for the denial included limitations on potential emissions, emission factors, inadequate treatment of kiln vent operation, incomplete receptor grid representation, missing forms, and lack of T-RACT documentation. Additional meetings were held with WM and Stantec on December 22, 2016, and February 23, 2017. DEQ received a revised application on March 23, 2017. This application was deemed incomplete

on April 13, 2017, due to numerous items: inconsistencies in listed versus modeled emissions, missing documentation on exhaust parameters, erroneous receptor elevations, and confirmation/documentation of kiln operations and emissions. There was additional discussion between Stantec and DEQ regarding the resolution of these issues before another application was submitted on May 12, 2017. This application was deemed complete on June 6, 2017.

Project-specific modeling and other required impact analyses were generally conducted using data and methods discussed in pre-application correspondence and in the *Idaho Air Quality Modeling Guideline*[1].

Six possibilities of short term species scenarios were assessed in the modeling analyses to demonstrate compliance with the NAAQS. Stantec states that only one of the existing kilns (#1 and #2) will be operating at the same time. Therefore, there are twelve total modeling assessments; there are six scenarios as listed in Table 9, each with options for Kiln #1 or Kiln #2 in operation. Compliance was demonstrated with these species restrictions only, and these should be contained in the issued permit.

Table 10. KILN SPECIATION SCENARIOS

Scenario	Kilns	Tree Species	Max BF/Kiln
1	1 or 2	White Fir	180,000
	3,4,5	90% Pond, 10% Lodgepole	152,000
2	1 or 2	90% Doug Fir, 10% Larch	180,000
	3,4,5	90% Pond, 10% Lodgepole	152,000
3	1 or 2	Spruce	131,000
	3,4,5	90% Pond, 10% Lodgepole	152,000
4	1 or 2	White Fir	180,000
	3	White Fir	210,000
	4,5	90% Pond, 10% Lodgepole	152,000
5	1 or 2	White Fir	180,000
	4	White Fir	210,000
	3,5	90% Pond, 10% Lodgepole	152,000
6	1or 2	White Fir	180,000
	5	White Fir	210,000
	3,4	90% Pond, 10% Lodgepole	152,000

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 16216r was used by the applicant for the air impact modeling analyses to evaluate impacts of the facility. This version is the current version at the time the application was received by DEQ.

3.3.4 Meteorological Data

Stantec used meteorological data collected at the NWS site located at Boise International Airport for the period 2011-2015. Upper air data were taken from the Boise, Idaho, airport. DEQ suppled these data, and determined the meteorological data used in the submitted analyses were representative for modeling for this permit in the locale of WM.

3.3.5 Effects of Terrain on Modeled Impacts

Terrain data were extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files in the WGS84 datum (approximately equal to the NAD83 datum). Stantec used 1/3 Arc Second resolution data, which are adequate for this analysis.

The terrain preprocessor AERMAP Version 11103 was used to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

DEQ reviewed the area surrounding the facility by using the web-based mapping program Google Earth, which uses the WGS84 datum. DEQ also overlaid modeling files with a digital photograph background images acquired from the 2013 ARCGIS NAIP (National Agriculture Imagery Program) data base. The immediate area is effectively flat with regard to dispersion modeling affects. Elevations in the modeling domain matched those indicated by the background images.

3.3.6 Facility Layout

DEQ compared the facility layout used in the model to that indicated in aerial photographs on Google Earth. The modeled layout was consistent with aerial photographs in Google Earth as well as from those in the ARCGIS 2013 NAIP database.

3.3.7 Effects of Building Downwash on Modeled Impacts

Potential downwash effects on emissions plumes are usually accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were needed as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME) because there are existing structures affecting the emissions plumes at the facility.

3.3.8 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." Public access to the WM facility is limited by existing fencelines on the edge of the facility property. This approach is adequate to preclude public access to areas

excluded from the air impact assessment. As noted in Section 2, WM previously owned a 53-acre parcel and has purchased an additional 19 acres of adjacent property. The modeling assumes ownership or control of both parcels of land, and the compliance demonstration is based on these boundaries.

3.3.9 Receptor Network

Table 9 describes the receptor grid used in the submitted analyses. The receptor grid met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[1]. DEQ determined this grid assured maximum impacts were reasonably resolved by the model considering: 1) types of sources modeled; 2) modeled impacts and the modeled concentration gradient; 3) conservatism of the methods and data used as inputs to the analyses; 4) potential for continual exposures or exposure to sensitive receptors. Additionally, DEQ performed sensitivity analyses using a finer grid-spaced receptor network to assure that maximum concentrations were below all applicable standards. Maximum concentrations did not change from those listed in the application by more than 0.2 ug/m^3 .

3.3.10 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

H = S + 1.5L, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

Buildings exist in the vicinity of all point sources modeled. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 Impact Modeling Results

4.1 Results for NAAQS Significant Impact Level Analyses

Because estimated emissions for the project were above Level I Modeling Applicability Thresholds, air quality dispersion modeling was necessary for all criteria pollutants. The ambient air impact analyses submitted with the PTC application demonstrated to DEQ's satisfaction that emissions as modeled did not exceed the significant impact levels for all criteria pollutants. These results, performed for all four modeled scenarios, are listed in Table 11. As shown in the range of results listed below, impacts are fairly consistent between the scenarios. The maximum $PM_{2.5}$ 24-hour values are from scenarios 5 and 6, while the annual

$PM_{2.5}$ results are identical for all scenarios. The maximum PM_{10} 24-hour results are derived from scenarios 4 and 5. The NO_2 results are the same for all scenarios, as there are no gaseous emissions being modeled from the kiln sources.

Table 11. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES

Pollutant	Averaging Period	Maximum Modeled Design Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
$PM_{2.5}$[b]	24-hour	11.6-12.6[e]	22	34.6	35
	Annual	3.2-3.3[g]	8.1	11.4	12
PM_{10}[c]	24-hour	34.7-35.3[f]	64	99.3	150
NO_2[d]	1-hour	109.1[e]	65.8	174.9	188
	Annual	7.5	7.34	14.8	100

a. Micrograms/cubic meter
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Nitrogen dioxide. 1-hour Background is 35 ppb, equal to 65.8 $\mu g/m^3$ and annual background is 3.9 ppb equal to 7.5 $\mu g/m^3$.
e. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of 8th highest modeled concentrations for each year modeled.
f. Maximum of 6th highest modeled concentrations for a 5-year period (or the maximum of the 2nd highest modeled concentrations if only 1 year of meteorological data are modeled).
g. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of highest modeled concentrations for each year modeled.
h. Maximum of 2nd highest modeled concentrations for each year modeled.

4.2 Results for TAPs Impact Analyses

Dispersion modeling is required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 585 and 586 for those TAPs with project-specific emission increases exceeding emissions screening levels (ELs). Because there are several TAPs emissions that exceeds the ELs, modeling analyses were needed to demonstrate compliance with those AACs and AAACs. Results are listed in Table 12 and show compliance with all AACs and AAACs.

Table 12. TAP MODELING RESULTS

Pollutant	CAS No.	Average	Modeled Conc. ($\mu g/m^3$)[a]	AAC/AAAC[b] ($\mu g/m^3$)	%AAC/AAAC
Arsenic	7440-38-2	Annual	7.0E-05	2.3E-04	1%
Cadmium	7440-43-9	Annual	5.0E-05	5.6E-04	3%
Formaldehyde	50-00-0	Annual	2.4E-02	7.7E-02	2%
Nickel	7440-02-0	Annual	9.0E-05	4.2E-03	1%

a. Micrograms per cubic meter.
b. Acceptable Ambient Concentration or Acceptable Ambient Concentration of a Carcinogen.

5.0 Conclusions

The ambient air impact analyses and other air quality analyses submitted with the PTC application demonstrated to DEQ's satisfaction that emissions from the WM project will not cause or significantly contribute to a violation of any ambient air quality standard.

References:

1. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

2. Air Quality Environmental Science and Technology Consortium (NW AIRQUEST). *Lookup 2009-2011 Design Values of Criteria Pollutants.* Available at: http://lar.wsu.edu/nw-airquest/lookup.html.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on July 31, 2017:

Facility Comment: Thank you for the opportunity to review and comment on the draft permit for Woodgrain Millwork in Emmett. Listed below are a handful of comments and recommended changes we have. Please let us know if you have any other questions. Thanks

- Table 1 – Kilns 3-5 need to be updated to reflect a maximum charge of 210,000
- Table 1 – The Deutz engine has been replaced with a Caterpillar C7.1 unit. (replace; see attached documentation)
    - Tier 3 certified or better
    - This was purchased in lieu of performance testing per Subpart IIII
    - The Tier 3 certification is consistent with assumed emissions in EI

DEQ Response: Table 1 has been updated for Kilns 3-5 and the Caterpillar C7.1 unit.

Facility Comment: **Section 2** has incorrect numbering after condition 2.5

DEQ Response: Section 2 numbering was a typo and has been corrected, Thankyou.

Facility Comment: NSPS Dc Notification condition – is notification of the EPA necessary as it is our understanding that Idaho DEQ has been delegated administrator of the subpart. Please review the EPA portion.

DEQ Response: Dc notification to EPA has been removed from the permit. Notification to IDEQ remains.

Facility Comment: Permit condition 3.1 - There is a spacing issue when discussing Boiler 1 and Boiler 2.

DEQ Response: Permit Condition 3.1 spacing was a typo and has been fixed, Thankyou.

Facility Comment: Permit Condition 3.3 – The 10.05 lb/day limit goes to the 100^{th} decimal place. Woodgrain proposes to adjust that to the 10^{th} place either to 10.1 due to rounding.

DEQ Response: Permit Condition 3.3 limit has been rounded up. This is justified because none of the modeled pollutants were at 100% of the NAAQS, so a slight adjustment is allowed and the limit to the $1/10^{th}$ pound per hour is more reasonable.

Facility Comment: Permit condition 3.6 – The first bullet requires a monthly throughput limit. Woodgrain and Stantec feel that this limit is unnecessary for a couple of reasons.

- There is no monthly ambient air requirement that is required. Rather Woodgrain has demonstrated compliance with the daily and hourly and annual NAAQS through the scenarios described in condition 3.8.
- As long as the 90 million 12-month rolling average is maintained compliance is demonstrated
- There appears to be no other Idaho permits that regulate kilns that require any throughput limit but annually. See the Idaho Forest Products PTC's for reference

DEQ Response: This monthly limit has been removed, as it is implicit in the 12-consecutive month period, allows for flexibility, is demonstrated in the emissions inventory, and supported by modeling. It was specifically supported by presenting kiln loading scenarios across greater than 24-hour periods in the emissions inventory.

Facility Comment: Permit Conditions 3.12 and 3.13 will be demonstrated via Woodgrain's continuous reports. All reports contain or will contain the type of species, max charge rate, total number of drying hours and any species ratio. Therefore, Woodgrain and Stantec feel as though the PM lb/hr rate will be equal to or less than those outlined in Table 3.1 if all inputs on the report are met. Only when using the alternative scenarios will Woodgrain calculate the appropriate pound per hour. If DEQ is in agreement, please modify 3.13 to reflect the calculation only be required under the alternative scenario.

DEQ Response: Permit Conditions 3.12 and 3.13 have been changed to only calculate the pounds per hour when alternative loading scenarios are being used.

Facility Comment: Permit Condition 4.3 – The first bullet should be updated to reflect only a weekly or monthly limit to allow flexibility in daily work schedules. The portion of the total impact associated with the planer baghouse is minimal. Approximately 8% (maximum) of the total impact is derived from the planer BH. However, the geographic locations of the maximums are different. One is on the north side of the property and the other on the south side. The planer BH impact percentage at the same location of the overall maximum is ~2% of the 24-hr PM2.5. A slight daily increase of throughput due to work schedules variance is essentially negligible.

DEQ Response: Permit Condition 4.3 has been changed to a monthly limit of 7.5 MMBF to allow flexibility.

Facility Comment: Permit Section 5 – Condition 1 needs to be updated to reflect the new Caterpillar engine. Permit Condition 11 may need to updated now that a certified engine is purchased.

DEQ Response: Permit Condition 5 has been updated to reflect the new caterpillar engine.

Facility Comment: Statement of Basis – There are a couple of references to an additional 19 acres of adjacent property (See Table 1 and section 2.2of the modeling memo). The 53 acres includes that additional 19 acres which has already been purchased. The entire property was modeled as shown in Figure 1 of the memo. Please update the verbiage in section 2.2 and Table 1.

DEQ Response: Modeling staff has removed the reference to the leased 19 acres in the Appendix B of the SOB.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company: Woodgrain Millwork - Emmett
Address: 500 West Main
City: Emmett
State: ID
Zip Code: 83716
Facility Contact: Bob Shaw
Title: General Manager
AIRS No.: 045-00006

N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	14.4	0	14.4
SO_2	0.1	0	0.1
CO	12.1	0	12.1
PM10	6.8	0	6.8
VOC	43.0	0	43.0
TAPS/HAPS	8.1	0	8.1
Total:	0.0	0	**84.4**
Fee Due	**$ 5,000.00**		

Comments: